Attachment 1

VERSION FOR PUBLIC CONSULTATION

PREPARED BY HEMSON FOR THE CITY OF VAUGHAN

DEVELOPMENT CHARGES BACKGROUND STUDY FOR THE EDGELEY POND AND PARK AND BLACK CREEK CHANNEL WORKS

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EXECUTIVE SUMMARY

The following summarizes the finding of the City of Vaughan's Area-Specific Development Charges (ASDC) Background Study for the Edgeley Pond and Park and Black Creek Channel Works. The development charges identified in the study would be applied in addition to the City-wide DCs levied under DC By-law 083-2018.

A. STUDY CONSISTENT WITH DEVELOPMENT CHARGES LEGISLATION

- The 2016 Black Creek Financial Strategy was developed over several years through extensive consultation with a variety of stakeholders with interests in the Black Creek and Edgeley Pond Renewal. Through this process Fabian Papa & Partners and Hemson Consulting Ltd. produced a methodology that considers the functional benefit of each component line item to each stakeholder in the funding equation. The approach is based on the premise that various groups of landowners derive varying levels of benefit depending on the flood control and urban design relative to their property.

- In June 2016, the Council of the City of Vaughan approved By-law 079-2016 to impose an Area Specific Development Charge for the Edgeley Pond and Black Creek Channel Works.

- In May 2018, the Council of the City of Vaughan approved the City-wide and Area-Specific Development Charges Background Study and passed City-wide DC By-law 083-2018 and 12 ASDC By-laws which all thirteen by-laws came into force on September 21, 2018. This study did not address DC By-law 079-2016.

- This ASDC Background Study and associated by-law relates only to By-law 079-2016 which constitutes the works associated with Edgeley Pond and Park and Black Creek Channel Works. This study recalculates area-specific development charges in compliance with the provisions of the *Development Charges Act, 1997* (DCA) and its associated regulation (*Ontario Regulation 82/98*) and the recently amended provisions of the legislation.

- Since the approval of the ASDC by-law staff have continued working with a series of external consultants to refine the cost estimates for the Edgeley Park and Pond as the design has advanced significantly and the cost being used in the strategy is more accurate.

- Please note, as general consensus on the allocation methodology was achieved in 2016, staff have determined that the existing methodology for the allocation of costs should be maintained with updates only being applied to the cost components by using updated information provided from the more detailed design and costing of the works.

- The City needs to implement development charges to fund the Edgeley Pond and Park and Black Creek Channel Works which benefit the identified land owners so that new development pays for its capital requirements to the extent allowed by the DCA and so that new services required by growth are provided in a fiscally responsible manner.

- The DCA and Ontario Regulation (O. Reg.) 82/98 require that a development charges background study be prepared in which development charges are determined with reference to:

  - A forecast of the amount, type and location of residential and non-residential development anticipated;
  - A review of future capital projects, including an analysis of gross expenditures, funding sources and net expenditures incurred or to be incurred by the City to provide for the expected development, including the determination of the development and non-development-related components of the capital projects;
  - An examination of the long-term capital and operating costs for the capital infrastructure required for each service to which the development charges by-law relates; and
  - An asset management plan to deal with all assets whose capital costs are proposed to be funded under the DC by-law, and that demonstrates that all assets are financial sustainable over their full life cycle.

- This report identifies the development-related net capital costs attributable to land to be developed within the three areas to which the works relate. As permitted by the legislation and consistent with the City's existing practice, the area-specific stormwater management development charges have been calculated on a land area (per net hectare) basis.

- The calculated charges are the maximum charges the City may adopt. Lower charges may be approved; however, this will require a reduction in the capital plan and reduced service levels, or financing from other sources, likely property taxes and utility rates.

A. ENGINEERING SERVICES WITH AREA-SPECIFIC DEVELOPMENT-RELATED COSTS INCLUDED IN THE ANALYSIS

- The following City services have been included in the development charge analysis:
    - Area-Specific Stormwater and/or Floodplain Management
    - City-wide Engineering
    - City-wide Parks and Open Space Development
- This ASDC Background Study calculates development charges related to the provision of stormwater and/or floodplain management infrastructure within the three specific benefitting land areas.
- The area-specific approach is applied to the service to align the capital costs for this service with the particular areas that will be serviced by the required infrastructure.

B. DEVELOPMENT FORECAST

- As permitted by the legislation and consistent with the City's existing practice, the area-specific stormwater management development charges have been calculated on a land area (per net hectare) basis.
- The area-specific development charges calculated in this study are based on the development or redevelopment of three defined geographies within the Black Creek watershed and Vaughan Metropolitan Centre (VMC) areas. The applicable areas are illustrated in the Area-Specific Development Charges maps (Appendix C) and summarized in the table below.

Development Areas Included in the Study

Area Description	Net Hectares
Immediately Affected Landowners (Map 1)	5.78 (ha removed from floodplain)
Vaughan Metropolitan Centre Areas Draining to Edgeley Pond (Map 2)	20.06 (developable ha)
Undeveloped Lands in Black Creek Drainage Shed (Map 3)	144.58 (developable ha)

C. DEVELOPMENT-RELATED CAPITAL PROGRAM

- The City of Vaughan provided the capital project listing and cost estimates contained in the capital program setting out the projects that are required to facilitate development to 2041. Many of the costs were prepared by specialized consultants retained by the City.

- The development-related capital program is based on a 2041 benefiting period with the assumption that all lands will develop/redevelop over the 2021 to 2041 period.

- The total cost associated with the area-specific development-related works related to the three benefiting areas amounts to $221.0 million. The costs included in the ASDC are inclusive of the works associated with the Black Creek Channelization works and the Edgeley Pond and Park improvements.

- The *Development Charges Act* requires that gross capital costs be reduced by grants, subsidies, and recoveries from other governments, capital replacements or other benefits provided to the existing community and amounts that exceed historic service levels. Therefore, of the total 221.0 million gross program, about $76.2 million is attributed to those benefiting land owners for recovery from this ASDC. A summary of the apportionment is shown in the table below.

Capital Cost Summary by Funding Source

Description	**Cost ($000)**	**%**
Immediately Affected Landowners	$54,025	24.4%
Vaughan Metropolitan Centre Areas Draining to Edgeley Pond	$9,818	4.4%
Undeveloped Land in Black Creek Drainage Shed	$12,353	5.6%
City-Wide Development Charges – Engineering	$57,243	25.9%
City-Wide Development Charges – Parks and Open Space	$13,381	6.1%
Benefit to Existing Funding (non-DC Sources)	$61,185	27.7%
Local Service	$8,953	4.1%
Other Governments (York, TRCA)	$4,067	1.8%
Totals	**$221,026**	**100.0%**

- Appendix A provides details on the calculation for the infrastructure works.

D. DEVELOPMENT CHARGES ARE CALCULATED WITH FULL REFERENCE TO THE DCA

- The fully calculated ASDCs are recommended on a land area (per net hectare) basis and applicable to all net land areas (illustrated in the maps below).
- The charge for Immediately Affected Landowners is levied on the net hectares removed from the floodplain whereas the other two area-specific charges are levied on net hectares of developable land.
- The charges shown below are not cumulative and more than one charge could apply to a given land area. See the Area-Specific Development Charges Maps in Appendix C.
- Consistent with the methodology employed in 2016, the calculated rates assume that the City would issue external debt for projects constructed in the first four years (between 2021 and 2024) while projects emplaced after 2024 were assumed to be reserve funded with long-term interest rates of 5% applied to negative balances and 3.5% applied to positive balances.

ASDC Areas	**Calculated Rates ($/net ha)**
Map 1 – Immediately Affected Landowners	$9,467,470
Map 2 – VMC Draining to Edgeley Pond	$465,823
Map 3 – Undeveloped Land in the Black Creek Drainage Shed	$96,260

1. INTRODUCTION AND BACKGROUND

This City of Vaughan Area-Specific Development Charges (ASDC) Background Study for the Edgeley Pond and Park and Black Creek Channel Works is presented as part of a process to lead to the approval of a new ASDC by-law in compliance with the *Development Charges Act, 1997* (DCA) and its associated *Ontario Regulation 82/98* (O. Reg. 82/98).

The 2016 Black Creek Financial Strategy was developed over several years through extensive consultation with a variety of stakeholders with interests in the Black Creek and Edgeley Pond and Park Renewal. Through this process Fabian Papa & Partners and Hemson Consulting Ltd. produced a methodology that considers the functional benefit of each component line item to each stakeholder in the funding equation. The approach is based on the premise that various groups of landowners derive varying levels of benefit depending on the flood control and urban design relative to their property. Importantly, the methodology established in the 2016 study used to develop the allocation of costs based on the improvement of hydrologic capacity has been maintained in this 2021 ASDDC Study.

In June 2016, the Council of the City of Vaughan approved By-law 079-2016 to impose an Area Specific Development Charge for the Edgeley Pond and Park and Black Creek Channel Works. Since the approval of the ASDC by-law staff have continued working with a series of external consultants to refine the cost estimates for the Edgeley Park and Pond as the design has advanced significantly and the cost being used in the strategy is more accurate.

In order for the City to continue collecting DCs for the required works, the City needs to update the existing ASDCs to fund development-related capital projects so that development may be serviced in a fiscally responsible manner.

The DCA and O. Reg. 82/98 require that a development charges background study be prepared in which development charges are determined with reference to:

- A forecast of the amount, type and location of development anticipated;
- A review of capital works in progress and anticipated future capital projects, including an analysis of gross expenditures, funding sources, and net expenditures incurred or to be incurred by the City or its local boards to provide for the expected development, including the determination of the development and non-development-related components of the capital projects;

- An examination of the long-term capital and operating costs for the capital infrastructure required for each service to which the development charges by-laws would relate; and

- An asset management plan to deal with all assets whose capital costs are proposed to be funded under the DC by-law, demonstrating that all assets included in the capital program are financially sustainable over their full life cycle.

This study presents the results of the review, which determines the net capital costs attributable to new development/redevelopment that is forecast to occur within the three benefiting land areas between 2021 and 2041. The area-specific development charges calculated in this study are based on the development or redevelopment of three defined geographies within the Black Creek watershed and Vaughan Metropolitan Centre (VMC) areas. As permitted by the legislation and consistent with the City's existing practice, the area-specific stormwater management development charges have been calculated on a land area (per net hectare) basis.

The City of Vaughan currently levies development charges on a city-wide, uniform basis in addition to other area-specific development charges. The city-wide charges recover for development-related costs for the provision of Engineering (city-wide), Public Works, Community Services, Library, Fire & Rescue, and General Government. These city-wide services as well as the remaining twelve 2018 Area-Specific development Charges by-law are not being reviewed as part of this study.

The DCA provides for a period of public review and comment regarding the proposed development charges. This process includes considering and responding to comments received by members of the public about the calculated charges and methodology used. Following completion of this process, and in accordance with the DCA and Council's review of this study, it is intended that Council will pass new ASDCs for the three defined geographies within the Black Creek watershed and Vaughan Metropolitan Centre (VMC) areas.

The remainder of this study sets out the information and analysis upon which the proposed development charges are based.

Section 2 designates the services for which the development charges are proposed and the areas within the City to which the development charges will apply. It also briefly reviews the methodology that has been used in this background study.

Section 3 presents a summary of the remaining net developable land areas to be developed over the 2021–2041 period.

Section 4 summarizes the future development-related capital costs associated with the provision of services related to development/redevelopment in within the Black Creek watershed and Vaughan Metropolitan Centre (VMC) areas.

Section 5 details the calculated ASDC rates for development or redevelopment of three defined geographies.

Section 6 provides an examination of the long-term capital and operating cost impacts for the infrastructure included in the ASDC calculation. It also addresses the asset management provisions required to maintain the development-related components of the capital projects included in the analysis.

Section 7 provides a discussion of other issues and considerations including by-law administration, rules and policies.

2. AREA-SPECIFIC APPROACH IS USED TO ALIGN DEVELOPMENT-RELATED COSTS AND BENEFITS

Several key steps are required when calculating any development charge. However, specific circumstances arise in each municipality that must be reflected in the calculation. Therefore, we have tailored our approach to the unique circumstances in the City of Vaughan and the specific benefitting areas to which the works apply. The approach to the calculated area-specific development charges is focused on providing a reasonable alignment of development-related costs with the development that necessitates them.

A. AREA-SPECIFIC DEVELOPMENT CHARGES ARE CALCULATED

The DCA provides municipalities with flexibility to define services that will be included in the development charge by-laws, provided that the other provisions of the Act and its associated regulations are met. The DCA also requires that the by-laws designate the areas within which the by-laws shall be imposed. The development charges may apply to all lands in the municipality or to other designated development areas as specified in the by-laws.

The City of Vaughan currently levies development charges on both a City-wide and Area-Specific basis.

- The following City services have been included in the development charge analysis:
    - Area-Specific Stormwater and/or Floodplain Management
    - City-wide Engineering
    - City-wide Parks and Open Space Development

This ASDC Background Study calculates development charges related to the provision of stormwater and/or floodplain management infrastructure within the three specific benefitting land areas. The area-specific approach is applied to the service to align the capital costs for this service with the particular areas that will be serviced by the required infrastructure.

- As permitted by the legislation and consistent with the City's existing practice, the area-specific stormwater management development charges have been calculated on a land area (per net hectare) basis.

- The area-specific development charges calculated in this study are based on the development or redevelopment of three defined geographies within the Black Creek watershed and Vaughan Metropolitan Centre (VMC) areas. The applicable areas are illustrated in the Area-Specific Development Charges maps (Appendix C) and summarized in the following section.

No changes to the City-wide DC by-law or remaining twelve ASDC by-laws are proposed as part of this study.

- Please note that both the City-wide engineering and city-wide parks share identified in this analysis will be recovered for under the City-wide DC by-law and will be included in the subsequent update study and Community Benefit Charges study and corresponding CBC by-law.

B. KEY STEPS IN DETERMINING AREA-SPECIFIC DEVELOPMENT CHARGES FOR FUTURE DEVELOPMENT-RELATED PROJECTS

Several key steps are required in calculating development charges for future development-related projects. These are summarized below.

1. Developable Land Area Forecast

Land area based development charge is proposed for the purposes of calculating an ASDC for the three benefitting land areas.

For the purposes of the ASDC calculation, the total net developable land area means the gross area of land less the area of lands conveyed or to be conveyed into public ownership for the purpose of open space, parks, woodlots, schools, storm water management facilities, buffers and road widening's along Regional Roads and Ontario Hydro utility corridors and less the area of any wood lots in private ownership if zoned as such, but shall include the area of all road allowances dedicated to the City. For the purposes of this study and by-law the net benefiting area for Map 1 shall include parkland.

2. Development-Related Capital Program and DC Eligible Costs to be Recovered Through the ASDCs

City staff, in collaboration with the consulting team have created a development-related capital program setting out those projects that are required to facilitate development within the three benefitting areas. The growth-related capital program is based on a 2041 benefiting period with the assumption that all lands will develop/redevelop over the period. The City of Vaughan provided the project listing and cost estimates contained in the capital program. Many of the costs were prepared by specialized consultants retained by the City.

The program identifies development-related projects and their gross and net costs, after allowing for capital grants, subsidies or other contributions as required by the Act (DCA, s. 5. (2)). The capital forecast provides another cornerstone upon which development charges are based. The DCA requires that the increase in the need for service attributable to the anticipated development may include an increase:

> *... only if the council of the municipality has indicated that it intends to ensure that such an increase in need will be met. (s. 5. (1) 3.)*

The development-related capital program prepared for this study ensures that development charges are only imposed to help pay for projects that have been or are intended to be purchased or built in order to accommodate future anticipated development. It is not sufficient in the calculation of development charges merely to have had the service in the past. There must also be a demonstrated commitment to continue to emplace facilities or infrastructure in the future. In this regard, Ontario Regulation 82/98, s. 3 states that:

> *For the purposes of paragraph 3 of subsection 5 (1) of the Act, the council of a municipality has indicated that it intends to ensure that an increase in the need for service will be met if the increase in service forms part of an Official Plan, capital forecast or similar expression of the intention of the council and the plan, forecast or similar expression of the intention of the council has been approved by the council.*

As required by the DCA, s. 5. (1) 6., any portion of projects and their associated net costs that are considered to benefit existing residents are the funding responsibility of the City from non-development charges sources. Those specific shares of projects are further identified and quantified in section 4 of this report.

3. Attribution to Types of Development

Once the total gross capital project costs have been identified and all necessary reductions and adjustments have been made, the ASDC is calculated based on the net developable land area and expressed as a rate per net hectare.

4. Final Adjustment

The final determination of the development charge results from adjustments made to development-related net capital costs resulting from the application of any unallocated reserve fund balances available to finance the development-related capital costs in the capital forecast. A cash flow analysis is also undertaken to account for the timing of projects and receipt of development charges. Interest earnings or borrowing costs are therefore accounted for in the calculation as allowed under the *DCA*.

For the purposes of the cash-flow analysis, it has been assumed that the City would issue external debt for projects constructed between 2021 and 2024. An 18-year debenture with a current Infrastructure Ontario fixed interest rate of 2.42% is assumed. Projects emplaced after 2024 were assumed to be reserve funded with long-term interest rates of 5% applied to negative balances and 3.5% applied to positive balances. This approach is consistent with the methodology employed in the 2016 Study.

3. DEVELOPMENT FORECAST

This section provides the basis for the total net developable land area forecasts used in calculating area-specific development charges for the three benefitting areas to which the Edgeley Pond and Park and Channelization Works apply. The total developable land area was informed based on data provided by the City's engineering/design consultants and through discussions with City staff.

This practice aligns with the provisions of the DCA, which require that development charges be determined with reference to "the amount, type and location of development for which development charges can be imposed…" (s.5.(1)1.). This section portrays a summary of the results of the total developable land area, net of non-developable areas.

A. LAND AREA FORECAST

The area-specific development charges calculated in this study are based on the development or redevelopment of three defined geographies within the Black Creek watershed and Vaughan Metropolitan Centre (VMC) areas. The applicable areas are illustrated in the Area-Specific Development Charges maps (Appendix C) and summarized in the table below.

Table 1 – The City of Vaughan – Development Areas Included in the Study

Area Description	Net Hectares
Immediately Affected Landowners (Map 1)	5.78 (ha removed from floodplain)
Vaughan Metropolitan Centre Areas Draining to Edgeley Pond (Map 2)	20.06 (developable ha)
Undeveloped Lands in Black Creek Drainage Shed (Map 3)	144.58 (developable ha)

For the purposes of the ASDC calculation, the total net developable land area means the gross area of land less the area of lands conveyed or to be conveyed into public ownership for the purpose of open space, parks, woodlots, schools, storm water management facilities, buffers and road widening's along Regional Roads and Ontario Hydro utility corridors and less the area of any wood lots in private ownership if zoned as such, but shall include the area of all road allowances dedicated to the City. For the purposes of this study and by-law the net benefiting area for Map 1 includes parkland.

4. THE DEVELOPMENT-RELATED CAPITAL PROGRAM

The DCA requires the Council of a municipality to express its intent to provide future capital facilities at the average historical service level incorporated in the development charges calculation. As noted above in Section II, Ontario Regulation 82/98, s. 3 states that:

For the purposes of paragraph 3 of subsection 5 (1) of the Act, the council of a municipality has indicated that it intends to ensure that an increase in the need for service will be met if the increase in service forms part of an official plan, capital forecast or similar expression of the intention of the council and the plan, forecast or similar expression of the intention of the council has been approved by the council.

A. A DEVELOPMENT-RELATED CAPITAL FORECAST IS PROVIDED FOR COUNCIL'S APPROVAL

Based on the development forecasts detailed in Section III, City staff, in collaboration with the consulting team have created a development-related capital program setting out those projects that are required to facilitate development within the three benefitting areas. The growth-related capital program is based on a 2041 benefiting period with the assumption that all lands will develop/redevelop over the period. The City of Vaughan provided the project listing and cost estimates contained in the capital program. Many of the costs were prepared by specialized consultants retained by the City while some costs were maintained from the 2016 DC Study but adjusted for the effects of inflation.

One of the recommendations contained in this ASDC Background Study is for Council to adopt the capital programs created for the purposes of this area-specific development charges calculation. It is assumed that future capital budgets and forecasts will continue to bring forward the development-related projects contained herein, that are consistent with the development occurring in areas. It is acknowledged that changes to the forecast presented here may occur through the City's normal capital budget process.

B. THE DEVELOPMENT-RELATED CAPITAL FORECAST FOR SERVICES RELATED TO THE EDGELEY POND AND PARK AND BLACK CREEK CHANNEL WORKS

Table 2 provides the development-related capital recoveries for service related to the Edgeley Pond and Black Creek Channel Works.

The area-specific capital program totals $221.0 million and provides servicing for anticipated development over the planning period to 2041. One of the attributing factors to the increased cots relates to an update to the cost to acquire land along the Black Creek Channel. Land costs continue to rise in the VMC area and the revised land costs reflect a current estimation of value based on present values being seen in the area. The City now anticipates that a great deal of land will have to be acquired to complete the works in a timely manner. Of the total value, land acquisition costs represent $80.4 million (or 36%) of the total.

The *Development Charges Act* requires that gross capital costs be reduced by grants, subsidies, and recoveries from other governments, capital replacements or other benefits provided to the existing community; amounts that exceed historic service levels or considered to benefit development beyond the planning horizon. Given that the increase in need for service identified for these lands considered in the ASDC calculation relate to engineered services, the ASDC calculations are not subject to the same service level restrictions applied for general services, thus no funding level caps have been applied.

As indicated in Table 2, of the total $221.0 million gross program, about $76.2 million is attributed to those benefiting land owners and included in the calculation of the ASDC rates in this study. In addition to those costs funded from ASDCs in this study, an additional $70.6 million is anticipated to be funded through the City-wide Engineering and Community Services DCs (those rates are not considered under this study). A summary of the apportionment is shown below.

Table 2 – Capital Cost Summary by Funding Source

Description	Cost ($000)	%
Immediately Affected Landowners	$54,025	24.4%
Vaughan Metropolitan Centre Areas Draining to Edgeley Pond	$9,818	4.4%
Undeveloped Land in Black Creek Drainage Shed	$12,353	5.6%
City-Wide Development Charges – Engineering	$57,243	25.9%
City-Wide Development Charges – Parks and Open Space	$13,381	6.1%
Benefit to Existing Funding (non-DC sources)	$61,185	27.7%
Local Service	$8,953	4.1%
Other Governments (York, TRCA)	$4,067	1.8%
Totals	**$221,026**	**100.0%**

- It should be noted that development charges reserve funds which do exist for Maps 2 and 3 for which development has already occurred have been applied to the opening balance in the cash-flow analysis and considered in the calculation of the rates.

5. AREA-SPECIFIC DEVELOPMENT CHARGES ARE CALCULATED IN ACCORDANCE WITH THE DCA

This section summarizes the calculation of ASDCs for each of the benefiting land areas. The calculation of the "unadjusted" per net hectare are reviewed.

It is noted that the calculation of the ASDCs does not include any provision for exemptions required under the DCA, such as the exemption from the payment of DCs for industrial buildings. Such legislated exemptions, or other exemptions that Council may choose to provide, will result in loss of DC revenue for the affected types of development. However, any such revenue loss may not be made up by offsetting increases in other portions of the calculated charge.

A. DEVELOPMENT CHARGES CALCULATION

A summary of the calculated ASDCs is presented in the following table, however, further details of the calculations are available in Appendix A.

Table 3 - Calculated Area-Specific Development Charges

Lands to which the ASDC is Applicable (Maps provided in Appendix C)	**Cost ($000)**	**Area (net ha)**	**Unadjusted Charge ($/ha)**	**Adjusted Charge after Cash Flow ($/ha)**
Immediately Affected Landowners	$54,024.8	5.78	$9,343,619	$9,467,470
Vaughan Metropolitan Centre Draining to Edgeley Pond	$9,818.4	20.06	$489,439	$465,823
Undeveloped Lands in Black Creek Drainage Shed	$12,353.2	144.58	$85,440	$96,260
Totals	**$76,196.4**	or 34.5% of the total costs		

- The charge for Immediately Affected Landowners is levied on the net hectares removed from the floodplain whereas the other two area-specific charges are levied on net hectares of developable land.

- The charges shown above are not cumulative, however, more than one charge could apply to a given land area. See the Area-Specific Development Charges Maps in Appendix C.

- The unadjusted charges do not consider the timing of development and the timing of infrastructure emplacement.

- The adjusted charge considers the anticipated timing of projects and land development. The timing assumptions were developed in consultation with City Staff taking into account known development applications. Specific cash flow assumptions and forecasts are detailed in Appendix A, but a summary of the key assumptions are:

    - Consistent with the 2016 methodology, it is assumed that the City would issue external debt for projects constructed in the first four years between 2021 and 2024. An 18-year debenture with a current Infrastructure Ontario fixed interest rate of 2.42% is assumed.

    - Projects emplaced after 2024 were assumed to be reserve funded with long-term interest rates of 5% applied to negative balances and 3.5% applied to positive balances. An inflation rate of 2% per annum is used.

B. COMPARISON OF PROPOSED AND EXISTING DEVELOPMENT CHARGES

Tables 4 presents a comparison of total calculated Area-Specific development charges for the three benefitting areas respectively with the City's existing charges (as at January 1 2021).

Table 4 shows that the calculated charges produce fairly substantial increase over the present development charges with increases ranging between the different areas relative to the cost drivers for each.

Table 4 Comparison of Current vs. Calculated Area-Specific Development Charges

ASDC Area	Current Rates	Calculated Rates	*Difference*
Immediately Affected Landowners	$2,972,699	$9,467,470	*$6,494,771*
Vaughan Metropolitan Centre Draining to Edgeley Pond	$98,656	$465,823	*$367,167*
Undeveloped Lands in Black Creek Drainage Shed	$26,695	$96,260	*$69,565*

The quantum of the rate increase is reflective of a series of factors:

- Some changes to the study that have had an impact on the overall cost include the update to the cost to acquire land along the Black Creek Channel. Land costs continue to rise in the VMC area and the revised land costs reflect a current estimation of value based on present values being seen in the area. The City now anticipates that a great deal of land will have to be acquired to complete the works in a timely manner.

- Another notable change to the strategy is with regards to the cost estimates for the Edgeley Park and Pond. In the original strategy the costs were based on a high-level concept. Now that the Edgeley Pond and Park design has advanced significantly the cost being used in the strategy are much more accurate. This has caused costs to increase in some areas, but it has also resulted in the City's ability to lower the

contingencies being applied to the park and pond related components of the infrastructure.

- Finally, the Black Creek Optimization study had identified the need to replace the existing culvert under Highway 7. As York Region is responsible for replacement of the existing culvert and had previously informed staff of their decision to defer the works until the culvert approaches its end of life cycle this component was not included in the original Financial Strategy costing. Since that time, City staff have reinitiated discussions with Regional Staff to determine how to advance these works as a part of the broader Black Creek Channel construction. This would further mitigate the added risk of potential flooding in the intersection at Jane Street and Highway 7. As a result, an additional cost for the culvert has been included in the Black Creek Financial Strategy with the assumption that a share of the cost would be borne by the Region.

6. Long-Term Capital and Operating Costs and Asset Management Provisions

This section provides a brief examination of the long-term capital and operating costs for the area-specific capital facilities and infrastructure to be included in the ASDC by-law. Also addressed is the required asset management provisions that must be considered.

As indicated in previous sections of this report, there are components of the development-related capital program that will require funding from non-development charges sources. Overall, the benefit to existing share amounts to $61.2 million and will require funding from non-DC Sources.

Consistent with the requirements of the *Development Charge Act*, assets that are proposed to be funded under the development charges by-law have been included in the analysis. Overall, the City will need to fund an additional $736,800 per annum in order to properly fund the life cycle replacement costs of the new assets related to all servicing costs supported under the development charges by-law. In addition to the annual contributions for asset replacement, annual maintenance activities are estimated at $997,200 which were assumed to require 4% of the initial capital costs for continuous projects and 2% for projects with finite useful lives.

Please note, although all capital assets considered in the study have been evaluated, some projects/assets are not covered by the ASDC or do not necessarily require future replacement or ongoing maintenance and therefore excluded from the analysis. Additional details regarding the long-term maintenance of assets and asset management requirements is outlined in Appendix B.

The calculated annual provisions identified in this study are considered financially sustainable as it is expected that the increased capital asset management requirements, as well as the annual maintenance requirements can be absorbed by the tax and user base over the long-term. Importantly, the City's annual operating budget review will allow staff to continue to monitor and implement mitigating measures should the program become less sustainable.

7. OTHER ISSUES AND CONSIDERATION

A. DEVELOPMENT CHARGES ADMINISTRATION

No significant changes are recommended to the City's current policies and practices regarding development charge administration. In this regard:

- It is recommended that practices regarding collection of development charges and by-law administration continue to the extent possible.
- As required under the DCA, the City should codify any rules regarding application of the by-laws and exemptions within the development charges by-laws proposed for adoption.
- It is recommended that Council adopt the development-related capital program included in this background study, subject to annual review through the City's normal capital budget process.

APPENDIX A

AREA-SPECIFIC EDGELEY POND AND PARK AND BLACK CREEK CHANNEL WORKS

TECHNICAL APPENDIX

APPENDIX A – AREA SPECIFIC EDGELEY POND AND PARK AND BLACK CREEK CHANNEL WORKS

This appendix provides the detailed analysis undertaken to establish the area-specific development charge rates for the Edgeley Pond and Park and Black Creek Channel Works within the Black Creek watershed and Vaughan Metropolitan Centre (VMC) areas. This section is divided into three main components:

1) Summary of the Development-Related Capital Program and Calculation of the Rates. This includes an overview of the program and the calculation of the unadjusted and adjusted charges applicable.

2) Specific Cost Elements and Benefits related to Black Creek Channel Works (Category A)

3) Specific Cost Elements and Benefits related to the Edgelely Pond Improvements (Category B)

A. SUMMARY OF THE DEVELOPMENT-RELATED CAPITAL PROGRAM AND CALCULATION OF THE RATES

Based on the development forecasts detailed in Section III, City staff, in collaboration with the consulting team have created a development-related capital program setting out those projects that are required to facilitate development within the three benefitting areas. The growth-related capital program is based on a 2041 benefiting period with the assumption that all lands will develop/redevelop over the 21-year period. The City of Vaughan provided the project listing and cost estimates contained in the capital program. Many of the costs were prepared by specialized consultants retained by the City. It should be noted that the City of Vaughan engaged a design team that underwent a public and stakeholder engagement process to develop design options and ultimately contract documents for the pond improvements.

Table 1 provide details of the projects included in the area-specific infrastructure development charges calculations and the allocation of costs to the various funding sources to which the works relate to. For example, certain projects would have a benefit to the specific areas to which this ASDC is applicable to (in regards to Map 1, 2 or 3) while also benefitting existing development or requiring recovery from the City-wide engineering or Community Services DCs.

Table 1 - Summary of Cost Apportionment										
Component	Timing	Black Creek Floodplain Reductions - Immediately Affected Landowners	Vaughan Metropolitan Centre (VMC) Areas Draining to Edgeley Pond	Undeveloped Lands in Black Creek Drainage Shed	City-Wide Development Charges - Engineering	City-Wide Development Charges - Parks & Open Space	Benefit to Existing Funding	Local Service	Other Governments (York, TRCA)	Totals
A. BLACK CREEK CHANNELIZATION WORKS										
A1. Realignment, Earthworks and Restoration	2022 - 2027	49.2%	0.0%	11.25%	13.2%	0.0%	26.4%	0.0%	0.0%	100.0%
A2. Structures										
A2.1 Interchange Way Crossing	2022 - 2027	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
A2.2 Doughton Road Crossing	2022 - 2027	24.6%	0.0%	5.6%	56.6%	0.0%	13.2%	0.0%	0.0%	100.0%
A2.3 Culvert Under Hwy 7	2022 - 2027	30.7%	0.0%	7.0%	8.2%	0.0%	16.5%	0.0%	37.6%	100.0%
A2.4 Peelar Road Crossing	2022 - 2027	24.6%	0.0%	5.6%	56.6%	0.0%	13.2%	0.0%	0.0%	100.0%
A2.5 Mews	2022 - 2027	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
A2.6 Retaining Walls	2022 - 2027	49.2%	0.0%	11.3%	13.2%	0.0%	26.4%	0.0%	0.0%	100.0%
A2.7 Removal of existing driveway culvert (access to arena) and restoration.	2022 - 2027	49.2%	0.0%	11.3%	13.2%	0.0%	26.4%	0.0%	0.0%	100.0%
A2.8 Temporary Access to 7581 Jane Street	2022 - 2027	49.2%	0.0%	11.3%	13.2%	0.0%	26.4%	0.0%	0.0%	100.0%
A3. Bank Treatments, Urban Design and Landscape										
A3.1 Naturalized western edge plus eastern edge south of Peelar Road (plantings, trails, lighting)	2022 - 2027	41.8%	0.0%	9.6%	11.2%	15.0%	22.4%	0.0%	0.0%	100.0%
A3.2 Terraced Steps	2022 - 2027	31.4%	0.0%	7.2%	8.4%	11.3%	16.8%	25.0%	0.0%	100.0%
A3.3 Urban buffer (amenitized eastern edge - promenade paving, furniture, lighting)	2022 - 2027	0.0%	0.0%	0.0%	25.0%	25.0%	25.0%	25.0%	0.0%	100.0%
Sub-Totals - Before Land Acquisitions										
A4. Land Acquisitions										
Allocation Distribution for Land										
A4.1 Region/Provincial Land	2021 - 2021	40.1%	0.0%	9.2%	27.0%	0.0%	23.8%	0.0%	0.0%	100.0%
A4.2 Private Land	2021 - 2021	40.1%	0.0%	9.2%	27.0%	0.0%	23.8%	0.0%	0.0%	100.0%
A4.3 Land Conveyance	2021 - 2021	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Total Black Creek Channelization Works										
Allocation Distribution										
B. EDGELEY POND IMPROVEMENTS										
B1 Design Components										
B1.1 Earthworks, Erosion/Sediment Control, Site Preparation	2022 - 2027	0.0%	25.0%	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	100.0%
B1.2 Natural Channel Realignment and Restoration	2022 - 2027	0.0%	25.0%	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	100.0%
B1.3 Plant Material	2022 - 2027	0.0%	25.0%	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	100.0%
B1.4 Inlet and Outlet Control Structures - Main Pond	2022 - 2027	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
B1.5 Structures Servicing VMC Lands	2022 - 2027	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
B1.6 Edge Treatments (Base Design)	2022 - 2027	0.0%	25.0%	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	100.0%
B1.7 Urban Design Features (Base Design)	2022 - 2027	0.0%	25.0%	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	100.0%
B1.8 NE Corner Culvert - North of Hwy 7	2021 - 2023	19.7%	0.0%	4.5%	40.3%	0.0%	10.5%	25.0%	0.0%	100.0%
B1.9 Urban plazas - paving, furniture, lighting (Intersection of Jane and Highway 7 & SE Platform)	2023 - 2025	0.0%	0.0%	0.0%	25.0%	25.0%	0.0%	25.0%	25.0%	100.0%
B1.10 Sustainable Transitional Feature NE Corner of Jane & Hwy 7	2021 - 2023	0.0%	0.0%	0.0%	37.5%	37.5%	0.0%	25.0%	0.0%	100.0%
B2 Enhanced Design Components										
B2.1 Urban Design Features (Enhanced Design)										
B2.1.1 Concrete pedestrian walkways	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.1.2 Amphitheater works	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.1.3 Paving and fencing	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.1.4 Shade structure	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.2 Site Furnishing										
B2.2.1 Adult Exercise Equipment	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.2.2 Benches, bike racks, planting pots, bollards, picnic tables	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.2.3 Stone seat walls in valley	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.2.4 Signage and safety	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.2.5 Lighting	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.2.6 Electrical	2022 - 2027	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
B2.3 Bridges - Long term										
B2.3.1 North and south valley bridges	2022 - 2027	0.0%	0.0%	0.0%	0.0%	62.5%	37.5%	0.0%	0.0%	100.0%
B2.3.2 East bioswale bridge at Barnes outfall	2022 - 2027	0.0%	0.0%	0.0%	0.0%	62.5%	37.5%	0.0%	0.0%	100.0%
B2.3.3 Pedestrian Bridge (main bridge)	2022 - 2027	0.0%	0.0%	0.0%	0.0%	62.5%	37.5%	0.0%	0.0%	100.0%
B2.3.4 Valley Lands Bridge	2022 - 2027	0.0%	0.0%	0.0%	0.0%	62.5%	37.5%	0.0%	0.0%	100.0%
B2.4 South Pond Enhancements (Area 'C')										
B2.4.1 Retaining wall enhancements	2021 - 2023	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Total Edgeley Pond Improvements										
Allocation Distribution										
C. EROSION IMPROVEMENTS, HIGHWAY 407 TO STEELES AVENUE WEST	2022 - 2027	0.0%	0.0%	0.0%	0.0%	0.0%	76.4%	0.0%	23.6%	100.0%
D. PUBLIC ART	2021 - 2039	0	0.0%	0	0	0.0%	0.0%	100.0%	0.0%	100.0%
E. SWM POND/TANK FOR SOUTHEAST QUADRANT OF VMC (Ultimate Solution)	2022 - 2027	0	0.0%	0	100%	0.0%	0.0%	0.0%	0	100.0%
F. DC AND RELATED ENGINEERING STUDIES	2021 - 2026	26.0%	4.7%	5.9%	27.5%	6.4%	29.4%			100.0%

Summary of Capital Costs

Component	Timing	Component Cost Estimate	Labour Recovery	Component Cost Estimate with Labour Recovery	Component-Specific Contingency	Soft Cost and Constuction Contingency	Net HST	City Admin Fee	Totals
A. BLACK CREEK CHANNELIZATION WORKS			$ 825,000						
A1. Realignment, Earthworks and Restoration	2022 - 2027	$13,000,000	$ 206,334	$13,206,334	30.0%	30.0%	1.76%	3.0%	$23,392,860
A2. Structures									
A2.1 Interchange Way Crossing	2022 - 2027	$1,800,000	$ 28,569	$ 1,828,569	30.0%	30.0%	1.76%	3.0%	$3,239,011
A2.2 Doughton Road Crossing	2022 - 2027	$1,200,000	$ 19,046	$ 1,219,046	30.0%	30.0%	1.76%	3.0%	$2,159,341
A2.3 Culvert Under Hwy 7	2022 - 2027	$4,319,527	$ 68,559	$ 4,388,086	30.0%	30.0%	1.76%	3.0%	$7,772,775
A2.4 Peelar Road Crossing	2022 - 2027	$1,200,000	$ 19,046	$ 1,219,046	30.0%	30.0%	1.76%	3.0%	$2,159,341
A2.5 Mews	2022 - 2027	$900,000	$ 14,285	$ 914,285	30.0%	30.0%	1.76%	3.0%	$1,619,506
A2.6 Retaining Walls	2022 - 2027	$240,000	$ 3,809	$ 243,809	30.0%	30.0%	1.76%	3.0%	$431,868
A2.7 Removal of existing driveway culvert (access to arena) and restoration.	2022 - 2027	$600,000	$ 9,523	$ 609,523	30.0%	30.0%	1.76%	3.0%	$1,079,670
A2.8 Temporary Access to 7581 Jane Street	2022 - 2027	$300,000	$ 4,762	$ 304,762	30.0%	30.0%	1.76%	3.0%	$539,835
A3. Bank Treatments, Urban Design and Landscape									
A3.1 Naturalized western edge plus eastern edge south of Peelar Road (plantings, trails, lighting)	2022 - 2027	$2,642,789	$ 41,946	$ 2,684,735	30.0%	30.0%	1.76%	3.0%	$4,755,569
A3.2 Terraced Steps	2022 - 2027	$4,200,000	$ 66,662	$ 4,266,662	30.0%	30.0%	1.76%	3.0%	$7,557,693
A3.3 Urban buffer (amenitized eastern edge - promenade paving, furniture, lighting)	2022 - 2027	$2,675,438	$ 42,464	$ 2,717,902	30.0%	30.0%	1.76%	3.0%	$4,814,319
Sub-Totals - Before Land Acquisitions		**$33,077,754**	**$525,006**	**$33,602,759**					**$59,521,788**
A4. Land Acquisitions									
Allocation Distribution for Land									
A4.1 Region/Provincial Land	2021 - 2021	$9,377,039		$ 9,377,039	25.0%	0.0%	1.76%	3.0%	$12,285,422
A4.2 Private Land	2021 - 2021	$51,992,533		$ 51,992,533	25.0%	0.0%	1.76%	3.0%	$68,118,536
A4.3 Land Conveyance	2021 - 2021	$0		$ -	25.0%	0.0%	1.76%	3.0%	$0
Total Black Creek Channelization Works									**$139,925,746**
Allocation Distribution									
B. EDGELEY POND IMPROVEMENTS			$ 495,000						
B1 Design Components		***$30,340,394***	***$369,278***	***$30,709,672***					***$42,238,240***
B1.1 Earthworks, Erosion/Sediment Control, Site Preparation	2022 - 2027	$9,115,953	$ 110,952	$ 9,226,905	15.0%	14.0%	1.76%	3.0%	$12,678,651
B1.2 Natural Channel Realignment and Restoration	2022 - 2027	$3,017,789	$ 36,730	$ 3,054,519	15.0%	14.0%	1.76%	3.0%	$4,197,202
B1.3 Plant Material	2022 - 2027	$1,629,123	$ 19,828	$ 1,648,951	15.0%	14.0%	1.76%	3.0%	$2,265,817
B1.4 Inlet and Outlet Control Structures - Main Pond	2022 - 2027	$4,880,673	$ 59,403	$ 4,940,076	15.0%	14.0%	1.76%	3.0%	$6,788,138
B1.5 Structures Servicing VMC Lands	2022 - 2027	$3,173,654	$ 38,627	$ 3,212,281	15.0%	14.0%	1.76%	3.0%	$4,413,982
B1.6 Edge Treatments (Base Design)	2022 - 2027	$1,441,510	$ 17,545	$ 1,459,055	15.0%	14.0%	1.76%	3.0%	$2,004,881
B1.7 Urban Design Features (Base Design)	2022 - 2027	$244,086	$ 2,971	$ 247,057	15.0%	14.0%	1.76%	3.0%	$339,480
B1.8 NE Corner Culvert - North of Hwy 7	2021 - 2023	$4,768,143	$ 58,034	$ 4,826,177	15.0%	14.0%	1.76%	3.0%	$6,631,629
B1.9 Urban plazas - paving, furniture, lighting (Intersection of Jane and Highway 7 & SE Platform)	2023 - 2025	$1,404,530	$ 17,095	$ 1,421,625	15.0%	14.0%	1.76%	3.0%	$1,953,449
B1.10 Sustainable Transitional Feature NE Corner of Jane & Hwy 7	2021 - 2023	$664,933	$ 8,093	$ 673,026	20.0%	14.0%	1.76%	3.0%	$965,011
B2 Enhanced Design Components									
B2.1 Urban Design Features (Enhanced Design)		***$1,257,988***	***$15,311***	***$1,273,299***					***$1,749,635***
B2.1.1 Concrete pedestrian walkways	2022 - 2027	$339,952	$ 4,138	$ 344,090	15.0%	14.0%	1.76%	3.0%	$472,812
B2.1.2 Amphitheater works	2022 - 2027	$105,894	$ 1,289	$ 107,183	15.0%	14.0%	1.76%	3.0%	$147,280
B2.1.3 Paving and fencing	2022 - 2027	$639,235	$ 7,780	$ 647,015	15.0%	14.0%	1.76%	3.0%	$889,061
B2.1.4 Shade structure	2022 - 2027	$172,907	$ 2,104	$ 175,011	15.0%	14.0%	1.76%	3.0%	$240,483
B2.2 Site Furnishing		***$937,392***	***$11,409***	***$948,801***					***$1,303,744***
B2.2.1 Adult Exercise Equipment	2022 - 2027	$130,625	$ 1,590	$ 132,215	15.0%	14.0%	1.76%	3.0%	$181,676
B2.2.2 Benches, bike racks, planting pots, bollards, picnic tables	2022 - 2027	$148,176	$ 1,803	$ 149,979	15.0%	14.0%	1.76%	3.0%	$206,086
B2.2.3 Stone seat walls in valley	2022 - 2027	$53,572	$ 652	$ 54,224	15.0%	14.0%	1.76%	3.0%	$74,509
B2.2.4 Signage and safety	2022 - 2027	$162,444	$ 1,977	$ 164,421	15.0%	14.0%	1.76%	3.0%	$225,930
B2.2.5 Lighting	2022 - 2027	$223,350	$ 2,718	$ 226,068	15.0%	14.0%	1.76%	3.0%	$310,640
B2.2.6 Electrical	2022 - 2027	$219,225	$ 2,668	$ 221,893	15.0%	14.0%	1.76%	3.0%	$304,903
B2.3 Bridges - Long term		***$7,630,842***	***$92,876***	***$7,723,718***					***$10,665,129***
B2.3.1 North and south valley bridges	2022 - 2027	$1,705,784	$ 20,761	$ 1,726,545	15.0%	14.0%	1.76%	3.0%	$2,372,439
B2.3.2 East bioswale bridge at Barnes outfall	2022 - 2027	$478,840	$ 5,828	$ 484,668	15.0%	14.0%	1.76%	3.0%	$665,980
B2.3.3 Pedestrian Bridge (main bridge)	2022 - 2027	$4,059,000	$ 49,403	$ 4,108,403	20.0%	10.0%	1.76%	3.0%	$5,684,094
B2.3.4 Valley Lands Bridge	2022 - 2027	$1,387,218	$ 16,884	$ 1,404,102	20.0%	10.0%	1.76%	3.0%	$1,942,616
B2.4 South Pond Enhancements (Area 'C')		***$503,300***	***$6,126***	***$509,426***					***$700,000***
B2.4.1 Retaining wall enhancements	2021 - 2023	$503,300	$ 6,126	$ 509,426	15.0%	14.0%	1.76%	3.0%	$700,000
Total Edgeley Pond Improvements		**$ 40,669,916**	**$ 495,000**	**$ 41,164,916**					**$56,656,747**
Allocation Distribution									
C. EROSION IMPROVEMENTS, HIGHWAY 407 TO STEELES AVENUE WEST	2022 - 2027	$1,822,000	$ 28,919	$1,850,919	25.0%	15.0%	1.76%	3.0%	$2,788,749
D. PUBLIC ART	2021 - 2039	$2,000,000			15.0%	15.0%	1.76%	3.0%	$2,772,299
E. SWM POND/TANK FOR SOUTHEAST QUADRANT OF VMC (Ultimate Solution)	2022 - 2027	$17,079,000	$ 271,076	$ 17,350,076			1.76%	3.0%	$18,185,100
F. DC AND RELATED ENGINEERING STUDIES	2021 - 2026	$500,000	$ 165,000	$ 665,000			1.76%	3.0%	$697,005
TOTAL ALLOCATION OF COSTS									**$221,025,647**

Summary of Capital Costs By Funding Source									
Component	Black Creek Floodplain Reductions - Immediately Affected Landowners	Vaughan Metropolitan Centre (VMC) Areas Draining to Edgeley Pond	Undeveloped Lands in Black Creek Drainage Shed	City-Wide Development Charges - Engineering	City-Wide Development Charges - Parks & Open Space	Benefit to Existing Funding	Local Service	Other Governments (York, TRCA)	Totals
A. BLACK CREEK CHANNELIZATION WORKS									
A1. Realignment, Earthworks and Restoration	$11,509,287	$0	$2,631,697	$3,087,857	$0	$6,164,019	$0	$0	$23,392,860
A2. Structures									
A2.1 Interchange Way Crossing	$0	$0	$0	$3,239,011	$0	$0	$0	$0	$3,239,011
A2.2 Doughton Road Crossing	$531,198	$0	$121,463	$1,222,187	$0	$284,493	$0	$0	$2,159,341
A2.3 Culvert Under Hwy 7	$2,387,565	$0	$545,937	$640,566	$0	$1,278,706	$0	$2,920,000	$7,772,775
A2.4 Peelar Road Crossing	$531,198	$0	$121,463	$1,222,187	$0	$284,493	$0	$0	$2,159,341
A2.5 Mews	$0	$0	$0	$1,619,506	$0	$0	$0	$0	$1,619,506
A2.6 Retaining Walls	$212,479	$0	$48,585	$57,007	$0	$113,797	$0	$0	$431,868
A2.7 Removal of existing driveway culvert (access to arena) and restoration.	$531,198	$0	$121,463	$142,516	$0	$284,493	$0	$0	$1,079,670
A2.8 Temporary Access to 7581 Jane Street	$265,599	$0	$60,731	$71,258	$0	$142,247	$0	$0	$539,835
A3. Bank Treatments, Urban Design and Landscape									
A3.1 Naturalized western edge plus eastern edge south of Peelar Road (plantings, trails, lighting)	$1,988,779	$0	$454,751	$533,575	$713,335	$1,065,128	$0	$0	$4,755,569
A3.2 Terraced Steps	$2,370,470	$0	$542,028	$635,980	$850,240	$1,269,551	$1,889,423	$0	$7,557,693
A3.3 Urban buffer (amenitized eastern edge - promenade paving, furniture, lighting)	$0	$0	$0	$1,203,580	$1,203,580	$1,203,580	$1,203,580	$0	$4,814,319
Sub-Totals - Before Land Acquisitions	**$20,327,773**	**$0**	**$4,648,119**	**$13,675,230**	**$2,767,155**	**$12,090,507**	**$3,093,003**	**$2,920,000**	**$59,521,788**
A4. Land Acquisitions									
Allocation Distribution for Land	40.1%	0.0%	9.2%	27.0%		23.8%			100%
A4.1 Region/Provincial Land	$4,921,704	$0	$1,125,390	$3,311,009	$0	$2,927,320	$0	$0	$12,285,422
A4.2 Private Land	$27,289,194	$0	$6,239,907	$18,358,431	$0	$16,231,005	$0	$0	$68,118,536
A4.3 Land Conveyance							$0		$0
Total Black Creek Channelization Works	**$52,538,671**	**$0**	**$12,013,416**	**$35,344,670**	**$2,767,155**	**$31,248,832**	**$3,093,003**	**$2,920,000**	**$139,925,746**
Allocation Distribution	37.5%	0.0%	8.6%	25.3%	2.0%	22.3%	2.2%	2.1%	100%
B. EDGELEY POND IMPROVEMENTS									
B1 Design Components	***$1,305,105***	***$9,785,490***	***$298,423***	***$3,521,461***	***$850,241***	***$23,601,635***	***$2,387,522***	***$488,362***	***$42,238,240***
B1.1 Earthworks, Erosion/Sediment Control, Site Preparation	$0	$3,169,663	$0	$0	$0	$9,508,988	$0	$0	$12,678,651
B1.2 Natural Channel Realignment and Restoration	$0	$1,049,300	$0	$0	$0	$3,147,901	$0	$0	$4,197,202
B1.3 Plant Material	$0	$566,454	$0	$0	$0	$1,699,363	$0	$0	$2,265,817
B1.4 Inlet and Outlet Control Structures - Main Pond	$0	$0	$0	$0	$0	$6,788,138	$0	$0	$6,788,138
B1.5 Structures Servicing VMC Lands	$0	$4,413,982	$0	$0	$0	$0	$0	$0	$4,413,982
B1.6 Edge Treatments (Base Design)	$0	$501,220	$0	$0	$0	$1,503,661	$0	$0	$2,004,881
B1.7 Urban Design Features (Base Design)	$0	$84,870	$0	$0	$0	$254,610	$0	$0	$339,480
B1.8 NE Corner Culvert - North of Hwy 7	$1,305,105	$0	$298,423	$2,671,220	$0	$698,974	$1,657,907	$0	$6,631,629
B1.9 Urban plazas - paving, furniture, lighting (Intersection of Jane and Highway 7 & SE Platform)	$0	$0	$0	$488,362	$488,362	$0	$488,362	$488,362	$1,953,449
B1.10 Sustainable Transitional Feature NE Corner of Jane & Hwy 7	$0	$0	$0	$361,879	$361,879	$0	$241,253	$0	$965,011
B2 Enhanced Design Components									
B2.1 Urban Design Features (Enhanced Design)	***$0***	***$0***	***$0***	***$0***	***$1,749,635***	***$0***	***$0***	***$0***	***$1,749,635***
B2.1.1 Concrete pedestrian walkways	$0	$0	$0	$0	$472,812	$0	$0	$0	$472,812
B2.1.2 Amphitheater works	$0	$0	$0	$0	$147,280	$0	$0	$0	$147,280
B2.1.3 Paving and fencing	$0	$0	$0	$0	$889,061	$0	$0	$0	$889,061
B2.1.4 Shade structure	$0	$0	$0	$0	$240,483	$0	$0	$0	$240,483
B2.2 Site Furnishing	***$0***	***$0***	***$0***	***$0***	***$1,303,744***	***$0***	***$0***	***$0***	***$1,303,744***
B2.2.1 Adult Exercise Equipment	$0	$0	$0	$0	$181,676	$0	$0	$0	$181,676
B2.2.2 Benches, bike racks, planting pots, bollards, picnic tables	$0	$0	$0	$0	$206,086	$0	$0	$0	$206,086
B2.2.3 Stone seat walls in valley	$0	$0	$0	$0	$74,509	$0	$0	$0	$74,509
B2.2.4 Signage and safety	$0	$0	$0	$0	$225,930	$0	$0	$0	$225,930
B2.2.5 Lighting	$0	$0	$0	$0	$310,640	$0	$0	$0	$310,640
B2.2.6 Electrical	$0	$0	$0	$0	$304,903	$0	$0	$0	$304,903
B2.3 Bridges - Long term	***$0***	***$0***	***$0***	***$0***	***$6,665,706***	***$3,999,423***	***$0***	***$0***	***$10,665,129***
B2.3.1 North and south valley bridges	$0	$0	$0	$0	$1,482,774	$889,665	$0	$0	$2,372,439
B2.3.2 East bioswale bridge at Barnes outfall	$0	$0	$0	$0	$416,238	$249,743	$0	$0	$665,980
B2.3.3 Pedestrian Bridge (main bridge)	$0	$0	$0	$0	$3,552,559	$2,131,535	$0	$0	$5,684,094
B2.3.4 Valley Lands Bridge	$0	$0	$0	$0	$1,214,135	$728,481	$0	$0	$1,942,616
B2.4 South Pond Enhancements (Area 'C')	***$0***	***$0***	***$0***	***$0***	***$0***	***$0***	***$700,000***	***$0***	***$700,000***
B2.4.1 Retaining wall enhancements	$0	$0	$0	$0	$0	$0	$700,000	$0	$700,000
Total Edgeley Pond Improvements	**$1,305,105**	**$9,785,490**	**$298,423**	**$3,521,461**	**$10,569,326**	**$27,601,059**	**$3,087,522**	**$488,362**	**$56,656,747**
Allocation Distribution	2.3%	17.3%	0.5%	6.2%	18.7%	48.7%	5.4%	0.9%	100%
C. EROSION IMPROVEMENTS, HIGHWAY 407 TO STEELES AVENUE WEST	$0	$0	$0	$0	$0	$2,129,749	$0	$659,000	$2,788,749
D. PUBLIC ART	$0	$0	$0	$0	$0	$0	$2,772,299	$0	$2,772,299
E. SWM POND/TANK FOR SOUTHEAST QUADRANT OF VMC (Ultimate Solution)	$0	$0	$0	$18,185,100	$0	$0	$0	$0	$18,185,100
F. DC AND RELATED ENGINEERING STUDIES	$181,032	$32,900	$41,394	$191,816	$44,839	$205,024	$0	$0	$697,005
TOTAL ALLOCATION OF COSTS	**$54,024,807**	**$9,818,390**	**$12,353,233**	**$57,243,047**	**$13,381,321**	**$61,184,663**	**$8,952,824**	**$4,067,362**	**$221,025,647**

The area-specific capital program totals $221.0 million and provides servicing for anticipated development over the planning period to 2041. One of the largest cost components relates to the acquisition of land along the Black Creek Channel. Land costs continue to rise in the VMC area and the revised land costs reflect a current estimation of value based on present values being seen in the area. The City now anticipates that a great deal of land will have to be acquired to complete the works in a timely manner. Of the total value, land acquisition costs represent $80.4 million (or 36%) of the total.

The *Development Charges Act* requires that gross capital costs be reduced by grants, subsidies, and recoveries from other governments, capital replacements or other benefits provided to the existing community; amounts that exceed historic service levels or considered to benefit development beyond the planning horizon. Given that the increase in need for service identified for these lands considered in the ASDC calculation relate to engineered services, the ASDC calculations are not subject to the same service level restrictions applied for general services, thus no funding level caps have been applied.

As indicated in Table 2, of the total $221.0 million gross program, about $76.2 million is attributed to those benefiting land owners and included in the calculation of the ASDC rates in this study. A summary of the calculation of the rates is shown in table 2 below – the table identifies the net attributable cost (to each area) relative to the net land area to which the cost applies. The attributable cost divided by the net area (in ha), yields an unadjusted charge per land area.

Table 2 – Calculation of the Unadjusted Area-Specific Development Charge

Lands to which the ASDC is Applicable (Maps provided in Appendix C)	**Cost ($000)**	**Area (net ha)**	**Unadjusted Charge ($/ha)**
Immediately Affected Landowners	$54,024.8	5.78	$9,343,619
Vaughan Metropolitan Centre Draining to Edgeley Pond	$9,818.4	20.06	$489,439
Undeveloped Lands in Black Creek Drainage Shed	$12,353.2	144.58	$85,440
Totals	**$76,196.4**	or 34.5% of the total costs	

Cash-Flow Analysis

A cash flow analysis is also undertaken to account for the timing of projects and receipt of development charges. Interest earnings or borrowing costs are therefore accounted for in the calculation as allowed under the *DCA*. The cash flow analysis is displayed on Table 3.

APPENDIX A - PAGE 1

CITY OF VAUGHAN
CASHFLOW AND DETERMINATION OF DEVELOPMENT CHARGE
IMMEDIATELY AFFECTED LANDOWNERS
DEVELOPMENT CHARGE PER HECTARE
(in $000)

IMMEDIATELY AFFECTED LANDOWNERS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	TOTAL
OPENING CASH BALANCE	$0.0	$911.6	$1,728.6	$2,630.5	($28.5)	$3,987.4	$7,998.7	$12,323.4	$11,808.6	$11,317.9	$13,311.7	$15,468.2	$17,795.2	$15,460.6	$12,866.7	$10,180.3	$7,398.1	$4,516.6	$1,532.3	$764.6	$249.0	
2021 - 2041 FUNDING REQUIREMENTS																						
- Non Inflated	$32,676.1	$3,853.2	$3,853.2	$3,418.1	$3,418.1	$3,418.1	$3,388.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$54,024.8**
- Reserve Funded (Inflated)					$3,699.9	$3,773.9	$3,815.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$11,289.2**
- Debenture Principal	$1,470.1	$1,682.5	$1,903.6	$2,112.9	$2,164.0	$2,216.3	$2,270.0	$2,324.9	$2,381.2	$2,438.8	$2,497.8	$2,558.3	$2,620.2	$2,683.6	$2,748.5	$2,815.0	$2,883.2	$2,952.9	$763.5	$510.1	$245.0	**$44,242.5**
NEW DEVELOPMENT																						
- Hectares	0.33	0.34	0.37	0.04	1.04	1.02	1.02	0.20	0.20	0.41	0.41	0.41	0.01	-	-	-	-	-	-	-	-	**5.78**
REVENUE																						
- DC Receipts: Inflated	$3,143.2	$3,289.8	$3,621.5	$358.3	$10,694.0	$10,625.7	$10,838.2	$2,120.7	$2,163.1	$4,620.7	$4,713.1	$4,807.3	$171.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$61,166.6**
INTEREST																						
- Interest on Opening Balance	$0.0	$31.9	$60.5	$92.1	($1.6)	$139.6	$280.0	$431.3	$413.3	$396.1	$465.9	$541.4	$622.8	$541.1	$450.3	$356.3	$258.9	$158.1	$53.6	$26.8	$8.7	**$5,327.2**
- Interest on In-year Transactions	$29.3	$28.1	$30.1	($48.2)	$84.5	$81.1	$83.2	($5.6)	($6.0)	$38.2	$38.8	$39.4	($67.3)	($73.8)	($75.6)	($77.4)	($79.3)	($81.2)	($21.0)	($14.0)	($6.7)	**($103.7)**
- Debenture Interest	($790.8)	($850.3)	($906.6)	($948.3)	($897.2)	($844.8)	($791.2)	($736.2)	($680.0)	($622.4)	($563.3)	($502.9)	($441.0)	($377.6)	($312.6)	($246.1)	($178.0)	($108.2)	($36.8)	($18.3)	($5.9)	**($10,858.3)**
TOTAL REVENUE	$2,381.7	$2,499.5	$2,805.5	($546.1)	$9,879.8	$10,001.5	$10,410.1	$1,810.1	$1,890.4	$4,432.6	$4,654.4	$4,885.2	$285.6	$89.8	$62.1	$32.8	$1.7	($31.3)	($4.1)	($5.5)	($4.0)	**$55,531.7**
CLOSING CASH BALANCE	$911.6	$1,728.6	$2,630.5	($28.5)	$3,987.4	$7,998.7	$12,323.4	$11,808.6	$11,317.9	$13,311.7	$15,468.2	$17,795.2	$15,460.6	$12,866.7	$10,180.3	$7,398.1	$4,516.6	$1,532.3	$764.6	$249.0	$0.0	

2021 Adjusted Charge Per Ha	**$9,467,470**

Allocation of Capital Program	
Residential Sector	Combined
Non-Residential Sector	Combined
Reserve Rates for 2015	
Inflation Rate	2.0%
Interest Rate on Positive Balances	3.5%
Interest Rate on Negative Balances	5.5%

APPENDIX A - PAGE 2

CITY OF VAUGHAN
CASHFLOW AND DETERMINATION OF DEVELOPMENT CHARGE
VMC AREAS DRAINING TO EDGELEY POND
DEVELOPMENT CHARGE PER HECTARE
(in $000)

VMC AREAS DRAINING TO EDGELEY POND	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	TOTAL
OPENING CASH BALANCE	$870.4	$2,120.3	$3,321.5	$4,669.7	$4,677.9	$2,870.4	$753.9	($1,467.7)	($1,614.2)	($1,763.0)	($1,580.2)	($1,374.8)	($1,145.1)	($1,212.7)	($1,640.3)	($926.2)	($150.9)	$690.7	$689.7	$351.2	$119.2	
2021 - 2041 FUNDING REQUIREMENTS																						
- Non Inflated	$5.5	$1,636.4	$1,636.4	$1,636.4	$1,636.4	$1,636.4	$1,630.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$9,818.4**
- Reserve Funded (Inflated)					$1,771.3	$1,806.7	$1,836.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$5,414.7**
- Debenture Principal	$0.2	$75.3	$153.8	$235.6	$241.3	$247.2	$253.1	$259.3	$265.5	$272.0	$278.5	$285.3	$292.2	$299.3	$306.5	$313.9	$321.5	$329.3	$336.9	$229.6	$117.3	**$5,113.7**
NEW DEVELOPMENT																						
- Hectares	2.57	2.57	2.98	0.40	0.40	-	-	0.54	0.54	1.13	1.13	1.13	0.59	0.00	1.86	1.86	1.86	0.50	-	-	-	**20.06**
REVENUE																						
- DC Receipts: Inflated	$1,198.8	$1,222.8	$1,443.0	$199.6	$203.6	$0.0	$0.0	$287.6	$293.3	$627.3	$639.9	$652.6	$348.2	$1.2	$1,143.5	$1,165.2	$1,188.5	$328.7	$0.0	$0.0	$0.0	**$10,943.9**
INTEREST																						
- Interest on Opening Balance	$30.5	$74.2	$116.3	$163.4	$163.7	$100.5	$26.4	($80.7)	($88.8)	($97.0)	($86.9)	($75.6)	($63.0)	($66.7)	($90.2)	($50.9)	($8.3)	$24.2	$24.1	$12.3	$4.2	**$31.6**
- Interest on In-year Transactions	$21.0	$20.1	$22.6	($1.0)	($49.7)	($56.5)	($57.5)	$0.5	$0.5	$6.2	$6.3	$6.4	$1.0	($8.2)	$14.6	$14.9	$15.2	($0.0)	($9.3)	($6.3)	($3.2)	**($62.4)**
- Debenture Interest	($0.1)	($40.5)	($79.9)	($118.2)	($112.5)	($106.7)	($100.7)	($94.6)	($88.3)	($81.9)	($75.3)	($68.5)	($61.6)	($54.6)	($47.3)	($39.9)	($32.3)	($24.5)	($16.5)	($8.4)	($2.8)	**($1,255.0)**
TOTAL REVENUE	$1,250.1	$1,276.6	$1,501.9	$243.9	$205.1	($62.7)	($131.8)	$112.8	$116.7	$454.7	$484.0	$514.9	$224.6	($128.3)	$1,020.6	$1,089.2	$1,163.0	$328.4	($1.7)	($2.4)	($1.9)	**$9,658.0**
CLOSING CASH BALANCE	$2,120.3	$3,321.5	$4,669.7	$4,677.9	$2,870.4	$753.9	($1,467.7)	($1,614.2)	($1,763.0)	($1,580.2)	($1,374.8)	($1,145.1)	($1,212.7)	($1,640.3)	($926.2)	($150.9)	$690.7	$689.7	$351.2	$119.2	($0.0)	

2021 Adjusted Charge Per Ha	**$465,823**

Allocation of Capital Program	
Residential Sector	Combined
Non-Residential Sector	Combined
Reserve Rates for 2015	
Inflation Rate	2.0%
Interest Rate on Positive Balances	3.5%
Interest Rate on Negative Balances	5.5%

APPENDIX A - PAGE 3

CITY OF VAUGHAN
CASHFLOW AND DETERMINATION OF DEVELOPMENT CHARGE
UNDEVELOPED LANDS IN BLACK CREEK DRAINAGE SHED
DEVELOPMENT CHARGE PER HECTARE
(in $000)

UNDEVELOPED LANDS IN BLACK CREEK DRAINAGE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	TOTAL
OPENING CASH BALANCE	$308.7	$471.0	$589.5	$661.5	$691.8	($255.3)	($1,281.0)	($2,396.3)	($2,462.8)	($2,517.7)	($2,560.0)	($2,588.7)	($2,602.8)	($2,601.2)	($2,582.6)	($2,545.9)	($2,489.5)	($2,412.2)	($2,312.4)	($1,662.6)	($894.5)	
2021 - 2041 FUNDING REQUIREMENTS																						
- Non Inflated	$7,471.7	$881.1	$881.1	$781.6	$781.6	$781.6	$774.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$12,353.2**
- Reserve Funded (Inflated)					$968.2	$1,021.5	$1,068.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$3,057.9**
- Debenture Principal	$336.2	$384.7	$435.3	$483.1	$494.8	$506.8	$519.1	$531.6	$544.5	$557.7	$571.1	$585.0	$599.1	$613.6	$628.5	$643.7	$659.3	$675.2	$174.6	$116.6	$56.0	**$10,116.4**
NEW DEVELOPMENT																						
- Hectares	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	**144.58**
REVENUE																						
- DC Receipts: Inflated	$662.7	$676.0	$689.5	$703.3	$717.4	$731.7	$746.4	$761.3	$776.5	$792.0	$807.9	$824.0	$840.5	$857.3	$874.5	$892.0	$909.8	$928.0	$946.6	$965.5	$984.8	**$17,087.6**
INTEREST																						
- Interest on Opening Balance	$10.8	$16.5	$20.6	$23.2	$24.2	($14.0)	($70.5)	($131.8)	($135.5)	($138.5)	($140.8)	($142.4)	($143.2)	($143.1)	($142.0)	($140.0)	($136.9)	($132.7)	($127.2)	($91.4)	($49.2)	**($1,783.8)**
- Interest on In-year Transactions	$5.7	$5.1	$4.4	$3.9	($20.5)	($21.9)	($23.1)	$4.0	$4.1	$4.1	$4.1	$4.2	$4.2	$4.3	$4.3	$4.3	$4.4	$4.4	$13.5	$14.9	$16.3	**$44.7**
- Debenture Interest	($180.8)	($194.4)	($207.3)	($216.8)	($205.1)	($193.2)	($180.9)	($168.3)	($155.5)	($142.3)	($128.8)	($115.0)	($100.8)	($86.3)	($71.5)	($56.3)	($40.7)	($24.7)	($8.4)	($4.2)	($1.4)	**($2,482.9)**
TOTAL REVENUE	$498.4	$503.2	$507.3	$513.5	$515.9	$502.6	$471.9	$465.2	$489.6	$515.4	$542.4	$570.9	$600.8	$632.2	$665.2	$700.0	$736.6	$775.0	$824.5	$884.7	$950.5	**$12,865.6**
CLOSING CASH BALANCE	$471.0	$589.5	$661.5	$691.8	($255.3)	($1,281.0)	($2,396.3)	($2,462.8)	($2,517.7)	($2,560.0)	($2,588.7)	($2,602.8)	($2,601.2)	($2,582.6)	($2,545.9)	($2,489.5)	($2,412.2)	($2,312.4)	($1,662.6)	($894.5)	$0.0	

2021 Adjusted Charge Per Ha	**$96,260**

Allocation of Capital Program	
Residential Sector	Combined
Non-Residential Sector	Combined
Reserve Rates for 2015	
Inflation Rate	2.0%
Interest Rate on Positive Balances	3.5%
Interest Rate on Negative Balances	5.5%

For the purposes of the cash-flow analysis, it has been assumed that the City would issue external debt for projects constructed between 2021 and 2024. An 18-year debenture with a current Infrastructure Ontario fixed interest rate of 2.42% is assumed. Projects emplaced after 2024 were assumed to be reserve funded with long-term interest rates of 5% applied to negative balances and 3.5% applied to positive balances.

It should be noted that development charges reserve funds which do exist for land areas contained within Maps 2 and 3 for which some development has already occurred have been applied to the opening balance in the cash-flow analysis and considered in the calculation of the rates. Table 4 below summarizes the existing reserve funds on hand at the end of the period.

Table 4 – Summary of Existing Reserve Funds

Benefitting Area	**Uncommitted DC Reserves:** **December 31st 2020**
Map 1: Immediately Affected Landowners	$0.00
Map 2: Vaughan Metropolitan Centre Draining to Edgeley Pond	$870,362.89
Map 3: Undeveloped Lands in Black Creek Drainage Shed	$308,732.36

Note: Reserve balances were unaudited at the time of the study

After cash flow considerations, the development charge rates increase for Map 1 and 3 while decreasing in Map 2. The adjusted charge considers the anticipated timing of projects and land development. The timing assumptions were developed in consultation with City staff taking into account known development applications.

Table 5 – Comparison of the Unadjusted vs. Adjusted Area-Specific Development Charge

Lands to which the ASDC is Applicable (Maps provided in Appendix C)	**Unadjusted Charge ($/ha)**	**Adjusted Charge after Cash Flow ($/ha)**	***Difference in Charges***
Immediately Affected Landowners	$9,343,619	$9,467,470	*$123,851 (or 1%)*
Vaughan Metropolitan Centre Draining to Edgeley Pond	$489,439	$465,823	*($23,616) (or -5%)*
Undeveloped Lands in Black Creek Drainage Shed	$85,440	$96,260	*$10,819 (or 13%)*

B. BLACK CREEK CHANNELIZATION WORKS (CATEGORY A)

The improvements to the stretch of Black Creek extending from Highway 7 to the Highway 407 corridor along the east side of Jane Street include a variety of elements and components that, in addition to the function of increasing hydraulic capacity and thereby containing the floodplain to within the limits of the channel, also provide benefits to individual landowners, future development within the tributary drainage shed as well as existing and future residents and employees of the City.

The subsequent sections discuss the benefitting interest groups and the allocation of costs among them associated with each of these benefits in mind.

Each of the project components will serve one or more functional benefits which need to be treated differently in terms of beneficial interests and, in turn, funding sources. As an example, a bridge structure for a new road connection may serve a transportation function in addition to improving the hydraulic capacity of the creek at the road crossing. The approach is to firstly identify the various functional benefits to be considered, and secondly to ascribe the degree to which each component contributes to providing each of the functional benefits.

The following functional benefits have been identified as relevant for this analysis, each of which is described in detail below:

- Improvement of hydraulic capacity of Black Creek waterway (flood control);
- Transportation; and
- Open Space Network.

5. Immediately Affected Landowners

The implementation of the proposed improvements will result in the removal of both non-developable public and developable (private and public) lands from the regulatory floodplain, the extent to which is illustrated in Figure 2. Accordingly, benefits will accrue to private landowners whose properties will be improved as a result of the work and, similarly, the publicly owned rights-of-way will become less susceptible to flooding, resulting in a benefit to the existing development in the City (addressed below). Furthermore, the planned works will serve to “unlock” these lands and thereby allowing the development of new uses to proceed.

Consistent with the assumptions contained in the 2016 ASDC Study, the allocation to lands in the Black Creek Drainage Shed is 11.25%. The remaining amount to be allocated is thus

88.75% for which it is instructive to consider the relative amount of land removed from the floodplain as a result of the planned improvement works. Based on the floodplain modelling and as illustrated in Figure 2 and consistent with the figures identified in the 2016 Model, 49.20% of the total costs are related to hydraulic improvements. The remaining 44.59% of the 88.75% allocation, being 39.55%, is attributable to public sector improvements and is the topic of the next section.

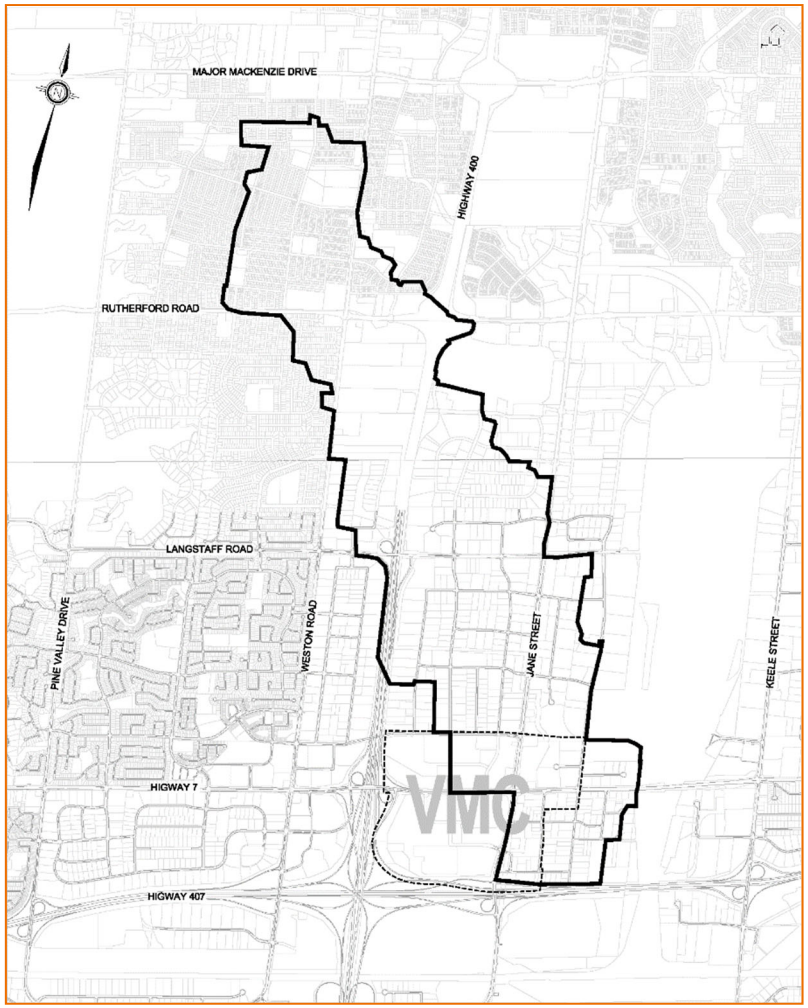


Figure 1
Black Creek Drainage Shed Tributary to Improvement Works

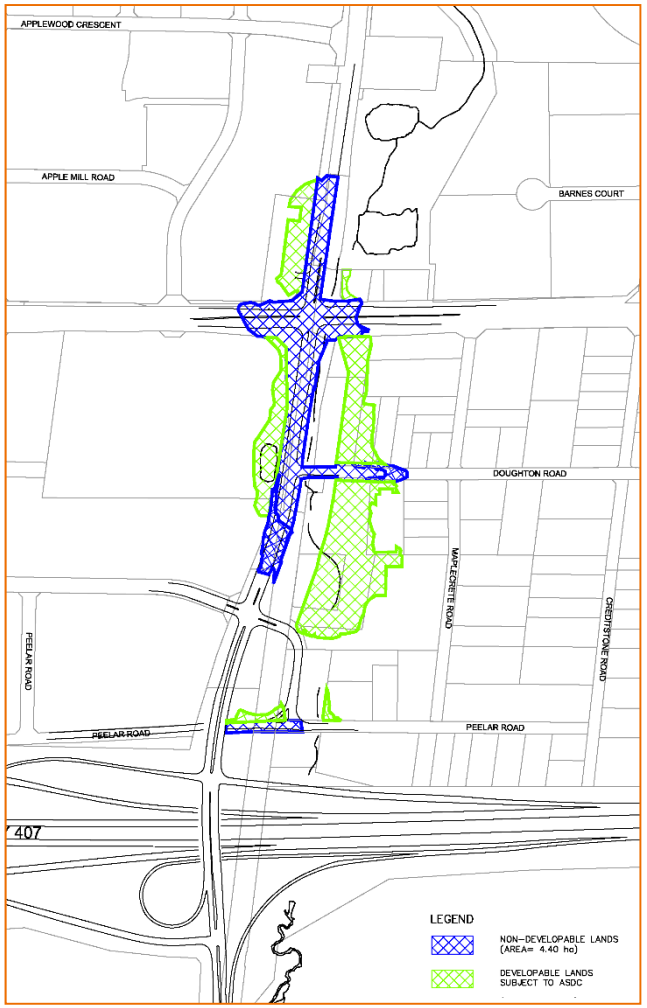


Figure 2
Reduction in Floodplain during Regional Storm with Proposed Improvements

6. City-Wide Future Development & Existing Development

Consistent with the approach utilized in the City's previous Development Charges By-law, certain works are deemed to provide benefits to the City as a whole which can be funded through City-wide development charges. In this regard all transportation, streetscaping and related engineered services and open space network projects have been considered at the City-wide level.

The allocation of costs related to the benefit accruing to the City as a whole may be funded through City-wide Development Charges under the 2018 by-law (083-2018) or a subsequent development charges by-law.

The allocation of costs relating to the benefit accruing to existing development (residents and employees) in the City are to be funded through the City's internal resources, such as general taxation, and utility rates (likely stormwater for this infrastructure) and other charges wherever applicable.

The distribution of the remaining 39.55% of benefits resulting from improvements in the hydraulic capacity of Black Creek between existing and future development can be apportioned based on existing and future population and employment, respectively. The 2016 Census population and employment total in Vaughan was 515,700 while the forecast future (2041) population and employment is 785,700 (Hemson estimate). Based on these figures, the existing population and employment represents 65.6% of the 2041 population and employment and new growth represents 34.4%. Applying these values to the remaining 39.55% of benefits noted above results in the following apportionment of costs related to the benefits accruing to these interest groups:

- New Development (to be recovered through City-wide Development Charges): 13.20%
- Existing Development (to be recovered through the City's internal resources): 26.35%

Summary

To the extent that any individual project components are deemed to provide a hydraulic benefit, the allocation of costs indicated in Table 6 is applied.

Table 6 Allocation of Costs Related to Hydraulic (Flood Control) Benefits

Benefitting Interest Group	Allocation
Black Creek Drainage Shed	11.25%
Immediately Affected Landowners	49.20%
City-wide Future Development	13.20%
Existing Development	26.35%
Total	100.00%

7. Transportation

While certain bridge structures are planned on existing roads to improve the hydraulic capacity of Black Creek, certain other bridge structures, both vehicular and pedestrian, are required as part of the planned development and in support of the population and employment growth of the Vaughan Metropolitan Center (VMC) and the City in general. Following the City's policy, all growth-related transportation infrastructure is deemed to be of benefit to the City as a whole and is funded through City-wide development charges.

8. Open Space Network

The planned improvements to Black Creek are also intended to create value in a social dimension by virtue of the planned open space network. Maintaining consistency with the City's current practice, all new open space network projects are considered to benefit the City as whole and will now be funded 100% through City-wide development charges. Recent changes to the *Development Charges Act* legislation eliminated the 10% statutory deduction and development-related costs are entirely eligible for recovery.

ALLOCATION OF FUNCTIONAL BENEFIT BY COMPONENT

CATEGORY A1: CHANNEL WORKS

A1.1 Realignment, earthworks, restoration

This component predominantly provides a flood control benefit by increasing the hydraulic capacity of this stretch of Black Creek and, accordingly, the functional benefits are allocated in accordance with Table 6.

Category A2: Structures

A2.1 Interchange Way Crossing

This is an example of a crossing of the Black Creek which doesn't currently exist and is associated with the extension of a new road. Accordingly, this component's predominant function is that of transportation and its functional benefits are allocated accordingly to City-wide Engineering DC for recovery.

A2.2 Doughton Road Crossing

The reconstruction of the Doughton Road crossing provides both a hydraulic benefit by improving conveyance capacity of the Black Creek, as well as a transportation benefit in relation to a future roadway connection extending to the west side of Jane Street. For purposes of this work, these functional benefits are allocated as follows:

- Flood Control: 50% which, in turn, is allocated in accordance with Table 6
- Transportation: 50%

A2.3 Culvert Under Highway 7

The Black Creek Optimization study had identified the need to replace the existing culvert under Highway 7. As York Region is responsible for replacement of the existing culvert and had previously informed staff of their decision to defer the works until the culvert approaches its end of life cycle this component was not included in the original Financial Strategy costing. Since that time, City staff have reinitiated discussions with Regional Staff to determine how to advance these works as a part of the broader Black Creek Channel construction. This would further mitigate the added risk of potential flooding in the intersection at Jane Street and Highway 7. As a result, an additional cost for the culvert has been included in the Black Creek Financial Strategy with the assumption that a share of the cost would be borne by the Region. For purposes of this work, these functional benefits are allocated consistent with the shares in Table 6 after considering the Region of York commits about $2.92 million to the project.

A2.4 Peelar Road Crossing

This component provides both a hydraulic benefit by improving conveyance capacity of the Black Creek, as well as a transportation benefit. For purposes of this work, these functional benefits are allocated the same as Doughton Road as follows:

- Flood Control: 50% which, in turn, is allocated in accordance with Table 6

- Transportation: 50%

A2.5 Mews

The Mews identified in the VMC Secondary Plan which crosses the Black Creek and connects Jane Street with the future road network east thereof. The VMC Secondary Plan speaks to the intended purpose and function of a mews to serve as a right-of-way for transportation and utilities, amongst other matters. It is noted that the transportation function may include either or both of routine and emergency/special operations. Given these functions, this component of the work is allocated as a transportation benefit, and in turn, a City-wide DC recoverable item.

A2.6 Retaining Walls

The predominant function of this component is that of improved hydraulic conveyance and its functional benefits are allocated in accordance with Table 6.

A2.7 Removal of Existing Driveway Culvert (Access to Arena) and Restoration

The existing driveway providing access to the Doublerink Arenas/Vaughan Iceplex facility includes a culvert through which the Black Creek flows and which also represents a restriction to flow. In order to improve the hydraulic capacity of the Black Creek, this driveway and culvert have been identified for removal and, therefore, this component predominantly provides a flood control benefit with the functional benefits allocated in accordance with Table 6.

A2.8 Temporary Access to 7581 Jane Street

During the construction of the works, the existing access to 7581 Jane Street will need to be removed and reinstated on a temporary basis. These works are predominantly required to improve the hydraulic conveyance function of Black Creek and its functional benefits are accordingly allocated in accordance with Table 6.

Category A3: Bank Treatments, Urban Design and Landscape

A3.1 Naturalized Western Edge plus Eastern Edge South of Peelar Road

Based on the City's interactions with TRCA this component was identified as part of the construction of the hydraulic improvements along Black Creek is necessary to facilitate development in the VMC. While this treatment is required, in part to create the channel itself, thus providing a hydraulic function, it is also considered an enhancement that provides additional benefit to the public through its integration with pedestrian trails and

similar functions. For purposes of this work, these functional benefits are allocated as follows:

- Flood Control: 85% which, in turn, is allocated in accordance with Table 6
- Parks and Open Space:15%

A3.2 Terraced Steps

Similar to the above, the terraced steps along the channel provide both a hydraulic function and, by virtue of aesthetics and integration with the public realm, also provide non-engineering benefits. In addition, they also provide a local service benefit to adjacent landowners. For purposes of this work, these functional benefits are allocated as follows:

- Local Service: 25%
- Flood Control & Parks: 75% general allocation which is further allocated as follows:
    - Flood Control: 85% which, in turn, is allocated in accordance with Table 6
    - Parks and Open Space:15%

A3.3 Urban Buffer – Amenitized eastern edge, promenade paving, furniture, lighting

Following the methodology of the City's Streetscape Implementation Manual & Financial Strategy Plan which identifies a multi-pronged approach to funding this type of work, and given that this component is located at the intersection of two arterial roads, the local development contribution is deemed to be 25%. The remainder of the costs associated with this work is allocated evenly to the City-wide Development Charges related to both Engineering and Community Services, as well as Benefit to Existing (non-dc funding share).

Land Acquisitions

The land acquisitions required to implement the above works are to be distributed to the benefitting interest groups so as to match the distribution to these groups following the above noted allocations. The underlying rationale is that the acquisitions are a necessary element to achieving all of the other benefits noted above.

The City retained a third party appraisal firm to estimate the market values of the land required for the Black Creek Channel Revitalization Works for budgeting purposes. The estimated market value was based on existing and anticipated future land uses. The appraisal provided for a low, medium, median and high value per category and was not a property specific appraisal but rather for categories of land uses. The median value for each of the land use categories which were identified in the future VMC Secondary Plan. The categories used were as follows:

- Station Precinct
- Neighbourhood Precinct
- Major Park & Open Space
- Industrial

The established rates by category were then applied to the estimated number of hectares per category. The total value was then divided by the total estimated number of hectares required for the Black Creek Channel Revitalization Works to establish the blended rate. The resulting blended rate using this methodology is approximately $12.1 million per hectare. For comparison purposes, the blended rate per hectare used in the 2016 ASDC calculation was $2.7 million per hectare, therefore, the present day valuations are over 300% higher than those contained in the 2016 ASDC. Land costs continue to rise in the VMC area and the revised land costs reflect a current estimation of value based on present values being seen in the area. Furthermore, the City now anticipates that land will have to be acquired to complete the works in a timely manner. One of the attributing factors for the cumulative cost increases contained in this study is a direct result of the increase in land values in the VMC.

Importantly, the land acquisition costs contained in the study do assume:

- That certain parcels of land will be acquired at less than market value for parcels where discussions with Regional or Provincial agencies have already taken place. In general, the estimates contained in this study for these specific parcels still do pose a risk if the City is unable to retain those properties at the below market rate. That said, the assumption is considered to be appropriate as this ASDC Study is anticipated to be updated when the independent property specific appraisals are prepared to facilitate the acquisitions.

- For two specific properties, the City may need to acquire land outside of what is required to facilitate the works and what is included in the calculation of the rates. In this case, it is assumed the residual properties acquired may be resold by the City providing a net benefit to the landowners (which is considered in the rates).

Please note, this should not be considered to be the value of land for any specific parcel to be acquired. An independent property specific appraisal prepared by an accredited appraiser in good standing with the Appraisal Institute of Canada within 6 months of the acquisition is required. The land areas used are also estimates and require a reference plan to confirm actual land areas. Based on future acquisitions, the City reserves the right to reopen the ASDC By-law to review and adjust the land values as deemed necessary.

C. EDGELEY POND AND PARK IMPROVEMENTS (CATEGORY B)

The planned improvement and expansion works to the existing SWM facility located at the northeast corner of Jane Street and Highway 7 (Edgeley Pond and Park) provide several functional benefits. In the absence of any development, there is a need to improve the existing pond's function and this project includes these previously identified retrofits that benefit the existing community. Beyond this, the planned facility also provides the opportunity to provide a functional benefit, particularly in terms of water quality control, for a portion of the lands within the VMC. Additional future (re-)development lands within the upstream drainage shed also benefit from the improved function of the facility. Given the strategic location of the facility and the future vision for the VMC, this project capitalizes on the opportunity to provide a meaningful enhancement to the space to be enjoyed by the public.

The City of Vaughan has engaged a design team that underwent a public and stakeholder engagement process to develop design options and ultimately contract documents for the pond improvements. The core function of Edgeley Pond, being flood control and stormwater quality management, was achieved through significant design enhancements to Black Creek, resilient ecological design, restoration and enhancements to natural heritage features, and integrated engineering solutions. These site improvements were strengthened by urban design features to make this new park a key VMC destination.

The subsequent sections discuss the benefitting interest groups and the allocation of costs among them associated with each of these benefits in mind.

Beneficial Interests: Lands in VMC Serviced by Pond

The Edgeley Pond will collect and process flows from the contributing drainage area within the Vaughan Metropolitan Centre (see Figure 3) for purposes of water quality control. Accordingly, there is a substantial benefit accruing to these landowners noting that, in the absence of this opportunity, additional developable tablelands would have been required to satisfy this water quality control objective given the size of the catchment area in question. Moreover, it is likely that two facilities would have been required given the physical division of the entire drainage area by Jane Street, thereby reducing efficiencies related to economies of scale.

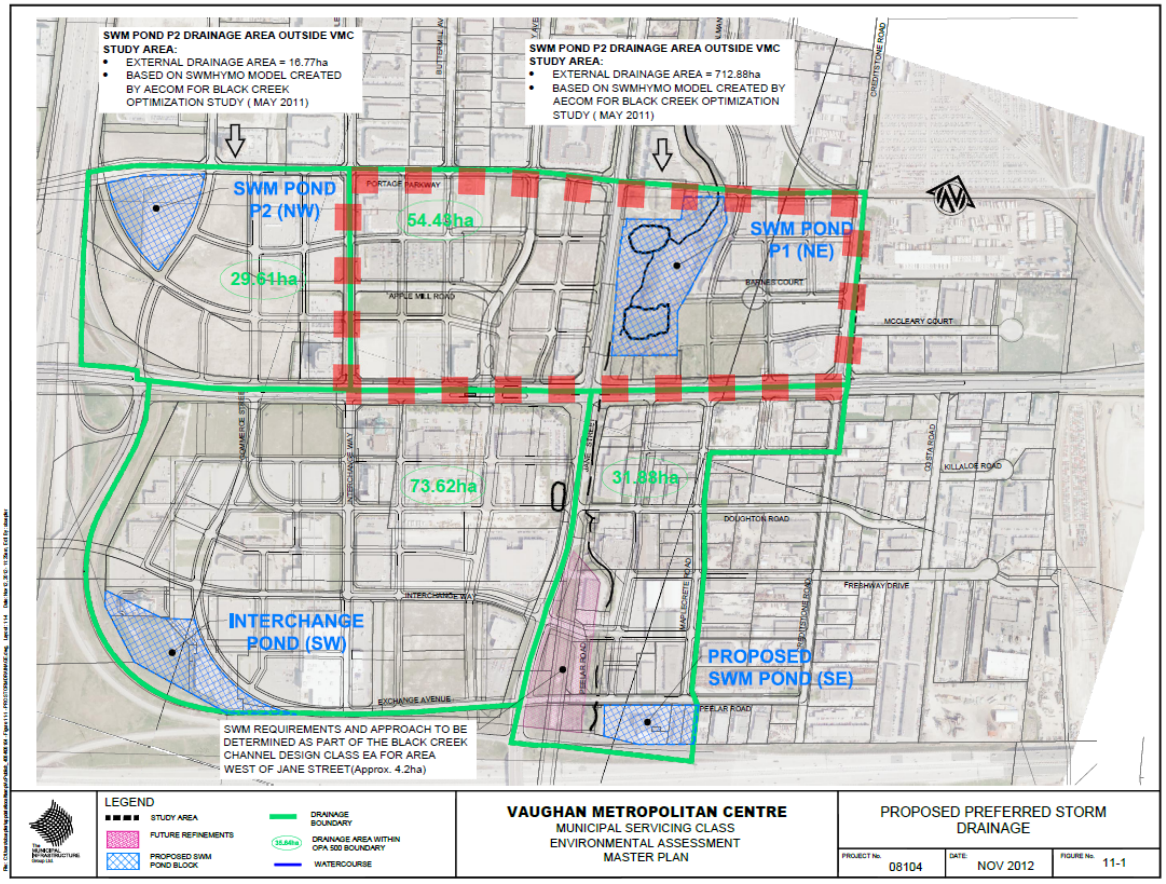
Beneficial Interests: The City as a Whole

This facility is intended to provide an interesting and enjoyable public space and certain elements of the project contribute to this specifically.

Beneficial Interests: Existing Development

In the absence of development in the VMC and the public realm elements noted above, it is recognized that the retrofit of this pond is desirable to improve its function as a stormwater management facility, improving downstream quality in addition to providing other related benefits. It is noted that a more streamlined "retrofit-only" design of the pond could not provide the required flood controls and broader benefit to development in the VMC as well as the City as a whole as currently envisioned.

Figure 3: Areas in VMC Tributary to Edgeley Pond (SWM Pond P1 NE)



Note: 2016 ASDC Study but an annotated excerpt from VMC Municipal Servicing Class EA Master Plan prepared by TMIG, 2012.

Allocation of Benefit between VMC Lands Serviced by Pond and Existing Development

Wherever it is deemed that works provide benefit to both these interest groups, the allocation is weighted more heavily against existing development, in recognition of the need to retrofit this facility and the large upstream drainage area it handles. Simultaneously, the

benefit afforded to private landowners by permitting the use of this facility and avoiding loss of developable lands is quite considerable. For the purposes of this work, the allocation of benefit to these interest groups remains consistent with the 2016 ASDC Study methodology and is provided in Table 7 for reference.

Table 7 Allocation of Costs Related to Edgeley Pond Improvements

Benefitting Interest Group	Allocation
Lands in VMC Serviced by Pond	25%
Existing Development	75%

CATEGORY B1: DESIGN COMPONENTS

One notable change to the strategy is with regards to the cost estimates for the Edgeley Park and Pond. In the original strategy the costs were based on a high-level concept. Now that the Edgeley Pond and Park design has advanced significantly the cost being used in the strategy are much more accurate. This has caused costs to increase in some areas, but it has also resulted in the City's ability to lower the contingencies being applied to the park and pond related components of the infrastructure.

B1.1 Earthworks, Erosion/Sediment Control, Site Preparation

Significant soil removal is required to achieve stormwater quantity control as well as earthworks to ensure the pond meets safety guidelines, maintenance and human accessibility needs. This will require significant tree removal and site preparation. Due to the large site area, construction must be phased and erosion and sediment controls will be strategically implemented as the construction progresses.

B1.2 Natural Channel Realignment and Restoration

To strengthen ecological and flood resiliency, Black Creek has been realigned using natural geomorphological design which will reduce long-term maintenance, protect against scouring and failure during storm events and provide aquatic and riparian habitat.

B1.3 Plant Material

Due to largescale earthworks, Edgeley Pond will require tree, shrub, meadow and aquatic planting to protect against erosion and reestablish the natural open space. These components of the work (i.e., B1.1 to B1.3) are required for the construction of the pond as a whole and, as such, the allocation of costs is in accordance with Table 7.

B1.4 Inlet and Outlet Control Structures – Main Pond

The engineered control structure provides protection from different sized storm events while the concrete structures and walls provide additional stormwater storage. The control structure also connects to the box culverts under the future north east plaza, the future widened culvert connection under Hwy 7 and will daylight Black Creek south of future south east plaza. These structures are deemed to be for the sole benefit of the existing facility and are allocated entirely to the existing development.

B1.5 Structures Servicing VMC Lands

In order to improve stormwater quality, engineered oil grit separators provide significant treatment to the urban stormwater entering Edgeley Pond. To facilitate these structures, walls are needed to transfer grade differences between the street and pond connections. This category of costs includes those structures which convey and process stormwater drainage derived from that portion of the VMC lands which drain to this pond. Costs associated with these works are ascribed entirely to this benefitting interest group.

B1.6 Edge Treatments (Enhanced Design)

This class of edge treatments is considered to be typical of stormwater management pond design and affects the pond as a whole. The allocation of costs is therefore in accordance with Table 7. Please note a share of the total costs associated with this line item is also related to the pond walls while the residual cost is considered to be local service and attributed to the retaining wall enhancements under line item B2.4 (south pond enhancements).

B1.7 Urban Design Features (Enhanced Design)

Simple maintenance trails that allow safe public access to Edgeley Pond are included as a base design feature. Urban design features are common in contemporary stormwater management pond design and this component addresses the base, rather than the enhanced component of design. The allocation of costs is therefore in accordance with Table 7.

B1.8 NE Corner Culvert – North of Highway 7

This component provides several functions in addition to the hydraulic benefit associated with flood control which can be accomplished using an open channel. Additional benefits accrue to the adjacent landowner who is able to utilize the land atop the channel enclosure. In recognition of the benefit to the City as a whole resulting from the enclosure and the increase of usable and accessible space, an allocation of the costs is assessed to the City-

wide development charge related to engineering given the engineering function of the culvert. For purposes of this work, these benefits are allocated as follows:

- Flood Control: 40% which, in turn, is allocated in accordance with Table 6
- Local Service: 25%
- The residual is allocated to City-wide engineering

B1.9 Urban Plazas – Paving, furniture, lighting (Intersection of Jane and Highway 7)

The costs related to these works have been split across four categories. Consistent with the 2016 ASDC Study, a 25% local service share is identified based on the arterial road guidelines in the City's Streetscape Implementation Manual & Financial Strategy Plan. A 25% share has been assumed to be funded by the Region of York. For the remaining 50%, it is anticipated that this project will have equivalent parks and open space and streetscape components resulting in a 25% apportionment to City-wide parks and engineering development charges respectively. Since this is a new project no benefit to existing shares are identified.

B1.10 Sustainable Transitional Feature NE Corner of Jane and Highway 7

This feature sits atop the proposed enclosure of the Black Creek identified in B1.8 and, similarly, provides a local service benefit which is deemed to be 25%. The remainder of the benefits are deemed to be equally divided among City-wide Development Charges related to both Engineering (based on technical function of wetlands) and Parks and Open Space (based on aesthetics and public enjoyment of space).

Category B2: Enhanced Design Components

B2.1 Urban Design Features (Enhanced Design)

Accent unit paving, concrete paving, pavement markings, shade structure and amphitheater stair access along with a simple chain link fence to replace the existing east fence are included the enhanced design features. These features elevate a simple stormwater pond to a park destination for the VMC.

B2.2 Site Furnishing

To support public park related comfort for all users, benches and picnic tables, waste receptacles, bike racks, information and regulatory signage, pond safety equipment, guardrails and pedestrian lights will be provided. The works that fall into the above categories (i.e. B2.1 & B2.2) are above and beyond what would normally be expected and are provided to improve the public space. These works provide a City-wide benefit and are allocated to Parks and Open Space Development Charges.

B2.3 Bridges

There are five key bridges included in the Edgeley Pond improvements. Two maintenance and pedestrian bridges cross over Black Creek at the north and south ends as well as a smaller bridge on the east that provides access over the east stormwater outlet. Two additional bridges are included in the calculation to provide increased pond connectivity to public space. While the bridges envisioned for the pond provide an improvement to the public space, they are designed for and serve the additional benefit of access to the pond for purposes of maintenance. This also provides benefit to the existing lands as well as future lands draining into the facility. For purposes of this work, these functional benefits are allocated as follows:

- Park and Open Space: 62.5%
- Benefit to Existing 37.5%

B2.4 South Pond Enhancements (Area 'C')

To accommodate increased stormwater storage, the control structure includes a large concrete wall along the south pond and a smaller wall on the east stormwater outfall. Proposed improvements to this significant feature, both in its functional performance and presence within the park, includes an ornamental treatment to the concrete surface that will provide artistic interest and beautify the urban park. This share of cost is considered to be a local contribution at an upset limit of $700,000. The remaining cost of the works is captured in line item: B1.6 Edge Design.

ADDITIONAL WORKS

CATEGORY C: EROSION IMPROVEMENTS

These works include improvements to the Black Creek south of Highway 407 towards Steeles Avenue West. Given that the works serve to improve existing conditions to a perceivably greater extent compared to the facilitation of future development in the upstream drainage shed, the allocation of costs related to this work are assigned to existing development. It is worth noting that funds are understood to be available through TRCA and which have been historically collected for this sort of activity. Based on this, the cost apportionment is further divided such that $659,000 is ascribed to "other government" funding sources and the remainder is deemed to benefit the existing community.

CATEGORY D: PUBLIC ART

Any public art installation is deemed to be a Local Service that will be paid for by the specific developer as part of its development negotiation process with the City.

CATEGORY E: SWM POND/TANK FOR SOUTHEAST QUADRANT OF VMC

The 2012 Municipal Class EA Master Plan for the Vaughan Metropolitan Centre identified the need for a stormwater management (SWM) pond to be located on the south side of Peelar Road, immediately east of the Black Creek. Since the time of the 2012 Master Plan, an alternative stormwater management strategy was presented that would eliminate the need for the SWM pond. This alternative SWM strategy consisted of implementing 15mm on-site retention via Low Impact Development (LID) measures for municipal road right of ways and within development blocks. The 2018 Black Creek Renewal Environmental Assessment, approved by MECP and supported by TRCA incorporated this SWM strategy. A feasibility assessment is being conducted to ensure the 15mm on-site retention for municipal right of ways can be achieved with LID measures. Should it be infeasible to implement the required LIDs within the municipal right of way, a means of reducing flow to the Black Creek will be required, which can include, but not limited to an underground tank along the east side of the realigned Black Creek corridor. The benefits of this work are ascribed to future re-development (growth) in the area through City-wide development charges related to engineering.

CATEGORY F: DC AND RELATED ENGINEERING STUDIES

Similar to the methodology applied earlier to land acquisitions required in relation to the Black Creek channelization works, these studies are treated herein to be distributed to the benefitting interest groups so as to match the distribution to these groups following all the above noted allocations (i.e. Categories A to E). The underlying rationale is that the studies are a necessary element to achieving all of the other benefits noted above. Of note, the parks-related studies could also be funded though the City's general government development charges service category.

CONTINGENCIES & SOFT COSTS

In addition to the estimated construction cost of the works, additional provisions need to be accounted for when establishing actual overall costs that may be incurred.

A component-specific contingency is carried in the analysis and accounts for the variability in the construction cost estimate provided. This variability, and the resultant contingency, can be wide and is dependent upon various factors including the degree of certainty relating to the scope of the project, the level to which designs have been advanced, the ability to cluster project components to achieve economies of scale, and timing impacts amongst other matters. For instance, given the fragmented ownership of lands associated with the Black Creek Channelization Works, it is possible that implementation of the works will occur on a piecemeal basis, however, this will be determined through the detailed design process, thereby resulting in inefficiencies which are intended to be accounted for by the contingencies applied to these works.

Also, the remaining costs to complete the design work (soft costs) as well as construction-related contingencies are included in the overall costs. Similarly, these can vary significantly depending on the extent to which detailed design work is still required, as well as the uncertainties associated with implementation of the project. For instance, the values used for this category of additional costs are lower for works related to the Edgeley Pond improvements relative to the Black Creek Channelization work since there is more knowledge (and less uncertainty) related to the pond improvements. Further, the pond works are generally self-contained within a single site whereas the channelization works will be complicated by the numerous and fragmented properties along its route, in addition to road crossings, as well as proximity to Jane Street and other actively used transportation and business elements. As well, the channelization works will occur through a narrow corridor for which the drainage function must be maintained during construction which can significantly impact the cost of construction. In contrast, within the pond there is space and opportunity to stage works in a manner that maintains functionality during construction.

APPENDIX B

ASSET MANAGEMENT PLAN

APPENDIX B – ASSET MANAGEMENT PLAN

The Development Charges Act now requires that municipalities complete an Asset Management Plan before passing a development charges by-law. A key function of the Asset Management Plan is to demonstrate that all assets proposed to be funded under the development charges by-law are financially sustainable over their full life cycle.

1. Asset Types

A summary of the future municipal-owned assets and estimated useful life assumptions for eligible DC services considered as part of the study are outlined in Table 1. The useful life assumptions identified herein remain consistent with those used in the 2016 ASDC Study and generally consistent with the City's Asset Management framework

Although all capital assets considered in the study have been evaluated, some projects/assets are covered by the ASDC or do not necessarily require future replacement or ongoing maintenance and therefore excluded from Table 1. The specific reasons are as follows:

- Certain assets may be covered by other funding sources (e.g. City-Wide DCs, Local Service, etc.) that are or will be addressed through other municipal/public processes. In such cases, these are identified as "Not Applicable – not part of ASDC".
- Some of the works identified herein represent one-time costs and are temporary in nature and, as such, there are no ongoing operation and maintenance costs, nor are there ultimate replacement costs related to them. These works may include matters such as grading, removals or works that are temporary in nature. These cases are identified as "Not Applicable – one-time cost; not a long-term asset".
- Some of the costs identified herein do not pertain to infrastructure (e.g., land costs) and, similarly, there are no ongoing operation and maintenance costs, nor are there ultimate replacement costs, related to them. These cases are identified as "Not Applicable – not infrastructure".

Certain assets, particularly those relating to landscaping and related matters, are considered herein to not have a "useful life" in the traditional sense, but are rather considered to provide the requisite level of service on a continuous basis through regular (annual) maintenance activities. Accordingly, the "useful life" is identified in Table 1 as "Continuous Useful Life subject to Ongoing Maintenance Activities", rather than in years.

It is noted that the cost estimates prepared for each of the projects' components as identified in this study include the "lumping" of numerous individual elements. Accordingly, some assumptions are necessary when estimating future funding requirements, which are discussed in later sub-sections.

Table 1 – Summary of Asset Useful Covered in ASDC

Asset Description	Estimated Useful Life
A2.2 Doughton Road Crossing	40 years
A2.3 Culvert Under Hwy 7	40 years
A2.4 Peelar Road Crossing	40 years
A2.6 Retaining Walls	50 years
A3.1 Naturalized western edge plus eastern edge south of Peelar Road (plantings, trails, lighting)	Continuous Useful Life subject to Ongoing Maintenance Activities
A3.2 Terraced Steps	50 years
B1.3 Plant Material	Continuous Useful Life subject to Ongoing Maintenance Activities
B1.5 Structures Servicing VMC Lands	100 years
B1.6 Edge Treatments	Continuous Useful Life subject to Ongoing Maintenance Activities
B1.7 Urban Design Features	Continuous Useful Life subject to Ongoing Maintenance Activities
B1.8 NE Corner Culvert – North of Hwy 7	40 years

2. Asset Management Strategy

The purpose of the asset management strategy is to inform the activities that will enable the assets to provide the desired levels of service on a continuous basis and in a sustainable manner. For the sake of completeness, the following sub-sections identify the various components that are typically considered in such strategies, although only some are applied in this assessment.

Non-Infrastructure Solutions

Non-infrastructure solutions are actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.). Given that the proposed infrastructure will be new and land use plans well established, the City should diligently control development applications within the affected watershed to ensure compliance with the design intent of the infrastructure. The City should also routinely monitor the condition as well as the actual performance of the infrastructure over time to better understand these matters and adapt as necessary to ensure the continued sustainability of the infrastructure and the levels of service it provides. For purposes of this work, costs associated with these activities are not explicitly assigned and are assumed to be adequately covered in other components of the life cycle costs. Subsequent asset management plans to be developed by the City for its overall stock of infrastructure will have the opportunity to explicitly consider this for the infrastructure.

Maintenance Activities

Maintenance activities, typically funded though operations, include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events. For purposes of this work and consistent with the assumption applied in the 2016 ASDC Study, it is assumed that annual maintenance activities will amount to 2% of the initial capital cost of the work over the life of assets with finite useful lives, and 4% of the initial capital cost for those with continuous useful lives. Subsequent asset management plans to be developed by the City for its overall stock of infrastructure will have the opportunity to refine this approach.

Renewal and Rehabilitation Activities

Renewal/rehabilitation activities include significant repairs designed to extend the life of the asset. For purposes of this exercise, it is assumed that the costs associated with these activities are included in other components of the life cycle costs. Subsequent asset

management plans to be developed by the City for its overall stock of infrastructure will have the opportunity to explicitly consider this for the infrastructure in question.

Replacement Activities

Replacement activities are those that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option. For purposes of this work, it is assumed that replacement occurs at the end of the useful life of each asset as identified in Table 1, and the estimated cost is equal to the initial capital cost, adjusted for inflation at a rate of 2% per annum. As noted above, certain assets associated with the infrastructure considered in the Area-Specific Development Charges considered herein, particularly those relating to landscaping and related matters, are considered to not have a "useful life" in the traditional sense, but are rather considered to provide the requisite levels of service on a continuous basis through regular (annual) maintenance activities.

Disposal Activities

This includes activities associated with disposing of an asset once it has reached the end of its useful life, or is otherwise no longer needed by the municipality. For purposes of this exercise, it is assumed that the costs associated with these activities are negligible and/or are otherwise included in other components of the life cycle costs. Subsequent asset management plans to be developed by the City for its overall stock of infrastructure will have the opportunity to explicitly consider this for the identified infrastructure.

Expansion Activities

This includes planned expansion activities (if necessary) required to extend services to previously unserviced areas, or expand services to meet growth demands. This is not applicable to the infrastructure considered in the Area-Specific Development Charges by-law

3. Annual Provision

When assets require rehabilitation or are due for replacement, the source of funds is limited to reserves or contributions from operating. Capital expenditures to carry out the rehabilitation and replacement of aging infrastructure are not development-related and are therefore not eligible for funding through development charge revenues or other developer contributions.

Based on information obtained from City staff on the useful life, capital cost of acquiring and/or emplacing each asset, a provision for infrastructure replacement has been

calculated for the applicable assets considered within the ASDC Background Study. Provisions for infrastructure replacement are initially calculated for each asset based on their useful life and the anticipated cost of replacement. The aggregate of all individual provisions form the required annual capital provision. In calculating the annual provisions, a number of assumptions are made to account for inflation (2.0 per cent) and interest (3.5 per cent).

Consistent with the requirements of the *Development Charge Act*, assets that are proposed to be funded under the development charges by-law have been included in the analysis. As shown in Table 2, the City will need to fund an additional $736,800 per annum in order to properly fund the life cycle replacement costs of the new assets related to all servicing costs supported under the development charges by-law. In addition to the annual contributions for asset replacement, annual maintenance activities are estimated at $997,200 which were assumed to require 4% of the initial capital costs for continuous projects and 2% for projects with finite useful lives.

Table 2 – Calculated Annual Requirements by 2040

Description	Initial Capital Cost	Useful Life (years)	Maintenance Activities (Fraction of Initial Cost) (1)		Replacement Cost	Annual Contribution for Asset Replacement (1)
A2.2 Doughton Road Crossing	$2.159,341	40	2%	$43,200	$5,369,411	$61.400
A2.3 Culvert Under Highway 7	$7,772,775	40	2%	$155,500	$19,327,871	$220,900
A2.4 Peelar Road Crossing	$2.159,341	40	2%	$43,200	$5,369,411	$61,400
A2.6 Retaining Walls	$431,868	50	2%	$8,600	$1,309,064	$9,700
A3.1 Naturalized W. Edge plus E. Edge S. of Peelar Road	$4,755,569	continuous	4%	$190,200	$-	$-
A3.2 Terraced Steps	$7,557,693	50	2%	$151,200	$22,908,617	$169,000
B1.3 Plant Material	$2,265,817	continuous	4%	$90,600	$-	$-
B1.5 Structures Servicing VMC Lands	$4,413,982	100	2%	$88,300	$36,012,126	$40,300
B1.6 Edge Treatments (Base Design)	$2,004,881	continuous	4%	$80,200	$-	$-
B1.7 Urban Design Features (Base Design)	$339,480	continuous	4%	$13,600	$-	$-
B1.8 NE Corner Culvert - North of Highway 7	$6,631,629	40	2%	$132,600	$15,234,474	$174,100
Totals	**$40,492,400**			**$997,200**	**$105,531,000**	**$736,800**
1: figures have been rounded						

4. Financial Sustainability of the Program

Future Revenue Growth

The calculated annual funding provision should be considered within the context of the City's projected growth. This growth will have the effect of increasing the overall assessment base and additional user fee and charges revenues to offset the capital asset provisions required to replace the infrastructure proposed to be funded under the development charges by-law. The collection of these funds is intended to be allocated to the City's reserves for the future replacement of these assets.

Annual Budgetary Reviews

In order to maintain, protect and manage the City's infrastructure and assets, staff monitor current levels of service and life cycle trends. These assessments are used to schedule appropriate activities, such as the relining of linear infrastructure.

Levels of service are expected to be reviewed from time to time as routine updates to the Master Plans are undertaken, in addition to any specific studies that relate to the infrastructure in question. Among the external issues that may affect the levels of service offered by the infrastructure, perhaps the impacts of climate change are among the most important for the City to monitor.

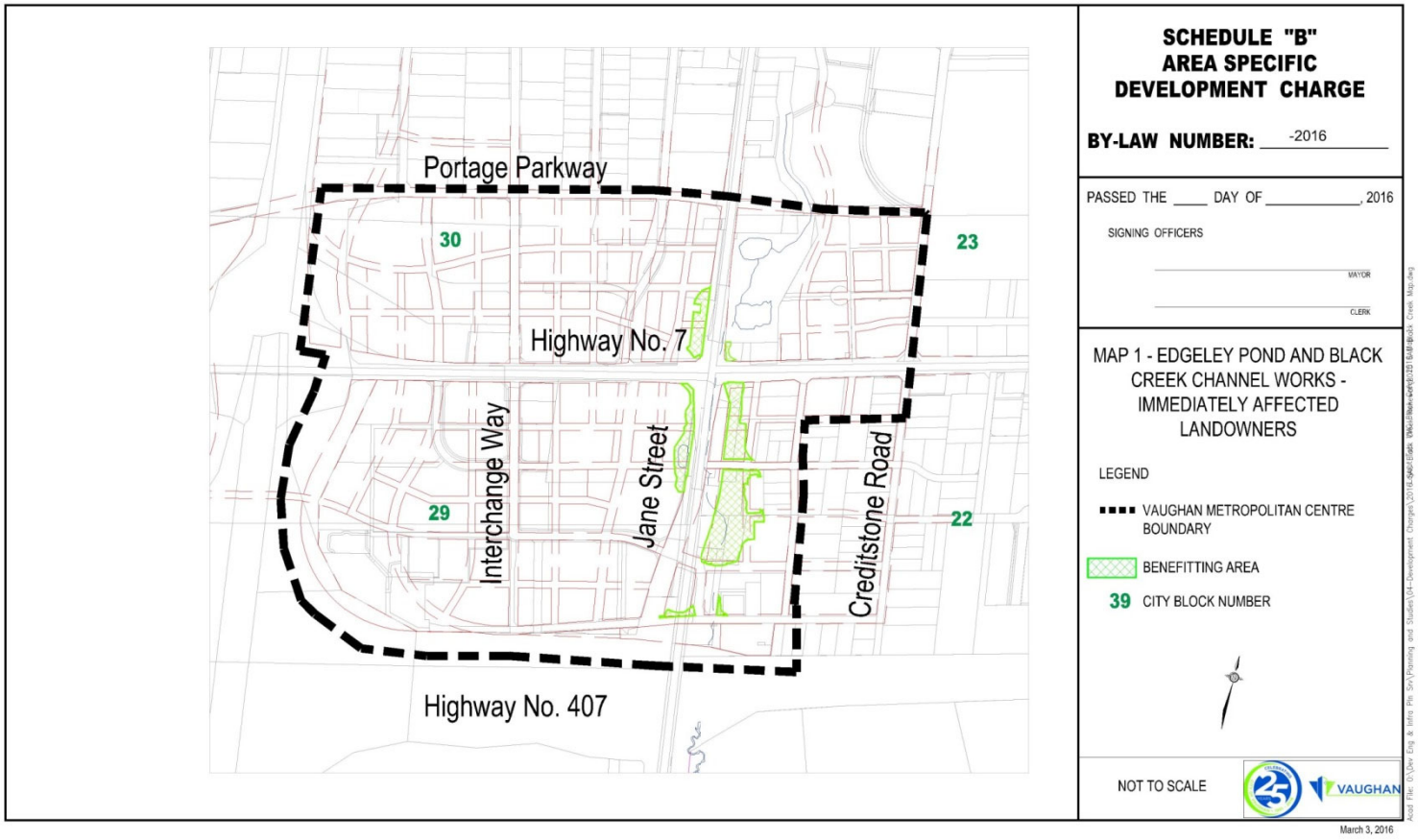
The Program is Deemed Financially Sustainable

The calculated annual provisions identified in Table 2 are considered financially sustainable as it is expected that the increased capital asset management requirements, as well as the annual maintenance requirements can be absorbed by the tax and user base over the long-term. Importantly, the City's annual operating budget review will allow staff to continue to monitor and implement mitigating measures should the program become less sustainable.

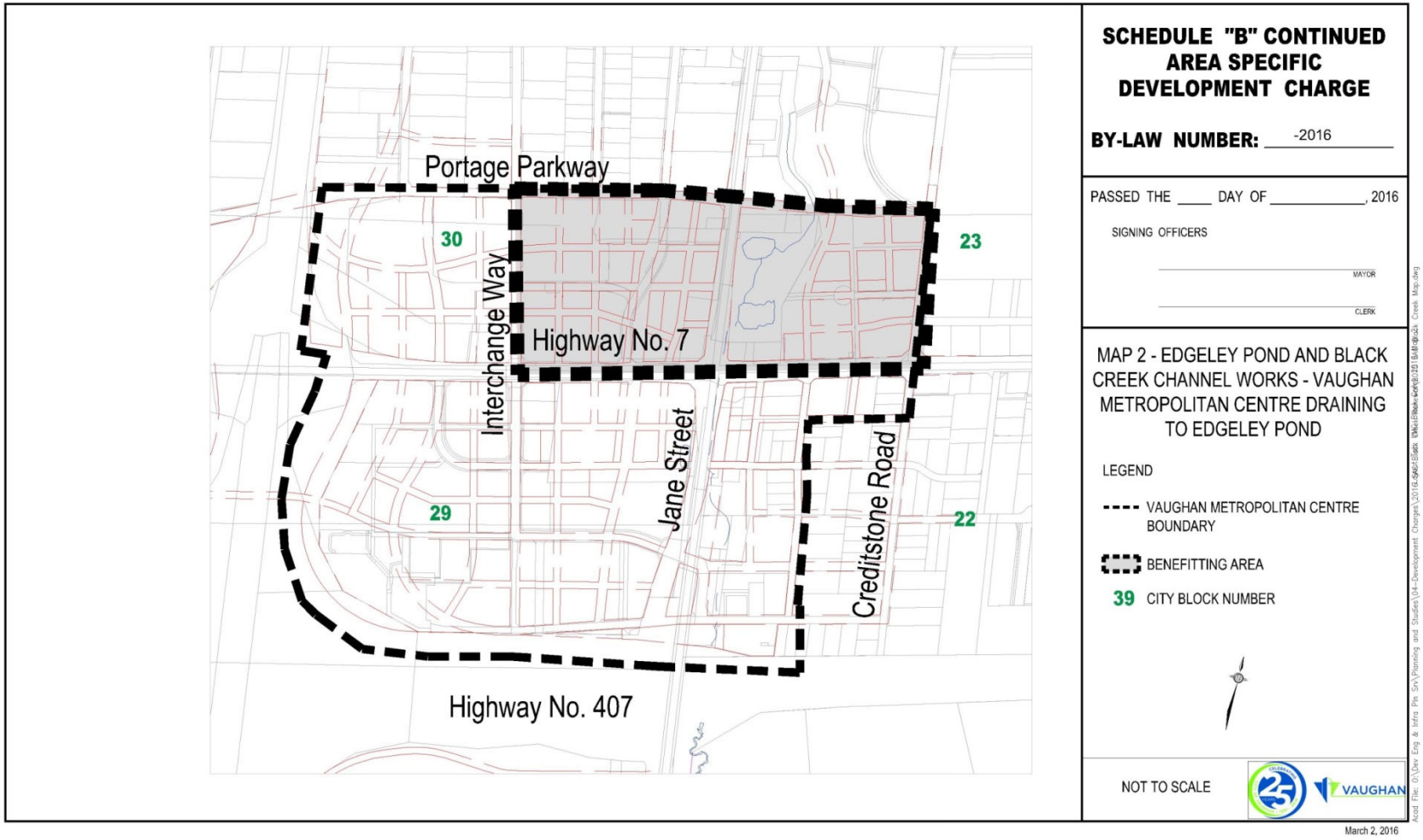
APPENDIX C

MAPPING

Map 1
Immediately Affected Landowners



Map 2
VMC Draining to Edgeley Pond



Map 3
Undeveloped Land in the Black Creek Drainage Shed