REGION OF DURHAM

2017 BACKGROUND STUDY REGARDING A PROPOSED DEVELOPMENT CHARGE BY-LAW FOR THE REGIONAL TRANSIT SERVICE

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Executive Summary

1. Purpose of this Background Study

The Regional Municipality of Durham is responsible for providing transit services within the Region of Durham. Durham Region began imposing development charges (D.C.s) for transit services in 2008 under by-law 67-2007 and continues to impose D.C.s under by-law 47-2012 (as amended). By-law 47-2012 (as amended) imposes transit D.C.s on residential and non-residential new development. By-law 47-2012 (as amended) expires on December 31, 2017.

D.C.s represent one source of funding development-related capital expenditures for transit. As a result, the purpose of this D.C. Background Study is to calculate a Regional D.C. for transit purposes which is to come into force as of January 1, 2018.

2. Bill 73 –D.C. Requirements for Transit Services

The provincial government enacted changes to the *Development Charges Act, 1997* (D.C.A.), which came into effect January 2016, with direct implications for how Durham Region plans and funds future transit services. Changes in the D.C.A. have resulted in alterations to the Durham Region's growth-related transit funding mechanisms. Most notably, the mandatory 10% reduction of eligible growth related capital costs has been removed and a prescribed method and criteria is provided to estimate the planned level of service for transit (O.Reg 82/98).

Moreover, the D.C.A. was amended to require all D.C. Background Studies to include an asset management plan that deals with all assets whose capital costs are proposed to be funded under the D.C. By-law and demonstrate that the assets are financially sustainable over their full lifecycle.

3. The Regional Transit Capital Program, 2018-2027

Durham Region's 10-year Capital Program for transit purposes is summarized in Table ES-1. The total capital program is $317.5 million which includes $215.8 million in growth-related capital and $101.7 million in replacement / rehabilitation capital. This 10-year capital forecast does not include the capital components of the Phase 1 Highway 2 Bus Rapid Transit Project as well as the Phase 1 Public Transit Infrastructure Fund (PTIF) projects, which are being funded predominately by the Province through the

Quick Win program and the Federal Government through PTIF federal funding, respectively.

Table ES-1

Durham Region Transit 10-Year Capital Plan (2018$)

	2018-2022	2023-2027	2018-2027
Growth Related Capital	**(000's)**	**(000's)**	**(000's)**
1.1 Vehicles			
- Number of Vehicles	81	76	157
- Capital Cost	41,160	40,870	82,030
1.2 Facilities	54,750	62,300	117,050
1.3 Systems	8,590	8,130	16,720
Subtotal	104,500	111,300	215,800
Replacement Rehabilitation			
1.4 Vehicles			
- Number of Vehicles	139	132	271
- Capital Cost	43,813	42,386	86,199
1.5 Facilities	1,279	$25	1,304
1.6 Systems	8,730	5,460	14,190
Subtotal	53,822	47,871	101,693
Total Capital Plan	$158,322	$159,171	$317,493

4. Potential Transit D.C. Recovery

As shown in table ES-2, the Region's transit D.C. is designed to fund approximately $133.1 million over the next decade, which represents approximately 62% of the Durham Region's Transit Growth Related Capital program and 42% of its total capital forecast for transit purposes.

This Background Study calculates the 10-year transit D.C. recovery which can be made by Durham Region, in part, over the term of the by-law of up to five years, based on the following calculations required by the *Development Charges Act, 1997* (D.C.A.):

Table ES-2
Potential Transit D.C. Recovery

	2018 $ (000'S)
Growth Related Capital Needs 2018-2027 for Transit (buses, facilities, and system improvements)	215,800
Benefit provided to existing development in Durham	(69,056)
Any Gas Tax or other grant funding that is applicable to these development related buses or projects [1]	(0)
Post Period Benefit Deduction	(13,694)
TOTAL 10-YEAR D.C. RECOVERY FOR TRANSIT	**$133,050**

Notes
[1] Provincial Gas Tax revenues are to be fully applied to non-D.C. capital works, (i.e. including capital improvements relating to transit security, bus replacements and bus refurbishments), operating costs to implement service enhancements in order to attract ridership

5. Development-Related Buses and Facilities

The $215.8 million in gross capital expenditures includes Bus Rapid Transit (BRT), conventional and specialized buses, non-revenue service vehicles, bus stops, shelters, facilities, PRESTO systems, fare boxes, radios and other related system improvements. On this basis, the 10-year D.C. Program includes 157 vehicles and associated support facilities.

These vehicles represent fleet expansions (rather than replacements) and are identified in Durham Region Transit's Regional Council approved service plan and service standards to meet the transit growth needs in the Region. These vehicles will be deployed on routes within and connecting new subdivisions and growth areas throughout the Region to GO stations, retail/employment/service centres and other destinations, particularly in Pickering, Ajax, Whitby, Oshawa and Clarington, where most of the Region's residential and non-residential development will occur during the 10-year interval (Appendix A).

6. Transit D.C. Calculation (Durham Region)

A D.C. calculation was made as to the 2018 charge per single-detached unit, required to be paid by 69,600 single detached equivalent units (SDE's), as part of funding $91.8 million in residential transit costs. The growth forecasts were derived based on the growth directions contained in Durham Regional Official Plan Amendment No. 128, updated as per the 2016 Statistics Canada Census (where available) and recent residential and non-residential development activity.

The calculated D.C. per single detached unit is $1,143. A charge of $5.78/sq.mt ($0.54 per square foot) of non-residential floor area was calculated on a similar basis. It is proposed that these amounts will be subject to annual indexing based on the Statistics Canada Non-Residential Construction Price Statistics Index.

7. Existing Transit D.C.s in Durham

The existing Regional Transit D.C. is $564 for a single detached unit and $3.65 per sq.mt. ($0.34 per square foot) of non-residential development.

The proposed Regional charges are higher than the existing charges due to the demands for transit services from new development (as provided in the Regional Transit Service Development Charge Background Study prepared by IBI Group contained in Appendix B which utilizes the proposed TMP and Regional Official Plan), as well as the recent amendments to the D.C.A. and regulation (O.Reg 82/98), which fundamentally changed the methodology for calculating a Transit D.C. rate. This report provides the rationale for expected capital needs in the context of the anticipated development and the Durham Region's planned level of service over the forecast period 2018-2027.

8. The Proposed Schedule of Charges

The proposed Regional Transit D.C. By-law is set out in Appendix D. It is similar to Durham Region's existing D.C. By-laws for other services, with the adjustment of service references and non-residential development coverage.

The schedule of D.C.s in the proposed By-law, together with Durham Region's existing D.C.s for water, sanitary sewer, roads and other services, is set out below. It is noted that the latter set of charges is expected to be modified in the spring of 2018 through the Regional Council approved review of the Regional D.C. By-law.

Table ES-3
Schedule of Durham Region D.C.s (1)

	By-law No. 16-2013	GO Transit By-law No. 86-2001	Proposed Transit By-law	Total Regional Charge[1] (Three By-laws Combined)
Residential (per unit)				
Single and Semi Detached	$26,515	$702	$1,143	$28,360
Medium Density Multiples	$21,301	$622	$919	$22,842
Apartments				
- Two Bedrooms & Larger	$15,400	$441	$664	$16,505
- One Bedroom & Smaller	$10,036	$262	$431	$10,729
Non-residential				
Commercial (per sq.ft.)	$13.74		$0.54	$14.28
Industrial (per sq.ft.)	$11.07		$0.54	$11.61
Institutional (per sq.ft.)	$8.72		$0.54	$9.26

Notes

[1] In addition, Regional area specific development charges exist for the Seaton Community for water and sanitary sewerage services (By-law # 19-2013) and for the Carruthers Creek Area for water supply (By-law #18-2013) and sanitary sewerage services (By-law #17-2013).

1. Introduction

1.1 Purpose of This Background Study

The Regional Municipality of Durham is responsible for the operation, maintenance, regulation and financing of the municipal public transit system in Durham Region. The Region imposes D.C.s for transit services under by-law 47-2012 (as amended) which expires on December 31, 2017.

The purpose of this D.C. Background Study is to provide the basis for a replacement Regional D.C. By-law for the transit service, to be implemented on January 1, 2018.

1.2 Transit D.C. By-law Strategy

A standalone Regional Transit D.C. by-law will replace the existing Regional Transit D.C. By-law, effective January 1, 2018. In addition, the Region-wide D.C. By-law (No. 16-2013) is being replaced in the spring of 2018. The Region is maintaining its approach of implementing a free-standing by-law for transit services due to the much more prescriptive requirements for transit services under O.Reg 82/98. This Background Study involves the passage of a Region-wide Transit D.C. By-law.

1.3 Conformity with Applicable Legislation

The transit D.C. By-law has been prepared in conformity with the provisions of the D.C.A., the Provincial Policy Statement and the Durham Regional Official Plan.

The provincial government enacted changes to the D.C.A., which came into effect January 2016, with direct implications for how the Region plans and funds future transit services. Changes in the D.C.A. have resulted in alteration, most notably, the mandatory 10% reduction of eligible growth related capital costs has been removed and a prescribed method and criteria has been provided to be used in estimating the planned level of service for transit (O.Reg 82/98).

The D.C.A. also now requires all D.C. Background Studies to include an asset management plan that deals with all assets whose capital costs are proposed to be funded under the D.C. by-law and demonstrate that the assets are financially sustainable over their full lifecycle. With regard to transit services, O.Reg 82/98 contains more substantial asset management requirements for transit services including:

- state of local infrastructure;
- planned level of service;
- asset management strategy; and
- financial strategy.

The detailed requirements of the asset management plan for transit services are provided in Appendix C.

1.3 Summary of the Process

The public meeting required under Section 12 of the D.C.A., 1997, has been scheduled for October 11, 2017. Its purpose is to present the study to the public and to solicit public input on the proposed D.C. by-law. The meeting is also being held to answer any questions regarding the study's purpose and methodology. Figure 1-1 outlines the proposed schedule to be followed with respect to the D.C. by-law adoption process.

In accordance with the legislation, the D.C. Background Study and proposed D.C. By-Law were available for public review on September 26, 2017.

The process to be followed in finalizing the report and recommendations includes:

- consideration of responses received prior to, at or immediately following the public meeting; and
- finalization of the study and Council consideration of the by-law on December 13, 2017.

Figure 1-1
Schedule of Key D.C. Process Dates

	Process Steps	Dates
1.	D.C. background study and proposed D.C. by-law available to public (60 days prior to by-law passage)	September 26, 2017
2.	Statutory notice of Public Meeting advertisement placed in newspaper(s)	20 clear days prior to public meeting
3.	Public Meeting of Council	October 11, 2017
4.	Committee of the Whole considers adoption of D.C. background study and by-law	December 6, 2017
5.	Council considers adoption of D.C. background study and passage of by-law	December 13, 2017
6.	Newspaper notice given of by-law passage	By 20 days after passage
7.	Last day for by-law appeal	40 days after passage
8.	Region makes available D.C. pamphlet	by 60 days after in force date

2. Current Region of Durham Transit D.C. Policy

2.1 By-Law Enactment

On November 21, 2012, the Regional Municipality of Durham passed By-law 47-2012 under the D.C.A. The by-law came into effect on January 1, 2013 and imposes D.C.s for transit services. D.C.s are imposed on a uniform Region-wide basis.

2.2 Current D.C.s

The by-law provides for mandatory annual indexing of the charges. Table 2-1 provides the charges currently in effect

Table 2-1
Regional Municipality of Durham
Current Transit Services D.C.s

	Region Transit By-Law 47-2012 (as amended)
Residential (per unit)	
Single and Semi Detached	$564
Medium Density Multiples	$453
Apartments	
- Two Bedrooms & Larger	$326
- One Bedroom & Smaller	$212
Non-residential	
Commercial (per sq.ft.)	$0.34
Industrial (per sq.ft.)	$0.34
Institutional (per sq.ft.)	$0.34

2.3 Timing of D.C. Calculation and Payment

In accordance with the currently approved Regional D.C. By law, D.C.s are due and payable in full to the Region at the time a building permit is issued for any land, buildings or structures constituting development.

2.4 Redevelopment Credit

The current approved Regional D.C. by-law provides non-statutory D.C. credits for residential and non-residential redevelopments where existing dwelling units or non-residential gross floor area is being replaced. However, where additional floor area or dwellings are being created in excess of those demolished, D.C.s are payable.

The redevelopment credit is provided if the land was improved by occupied structures, if the last use of the building being demolished would be subject to D.C.s under the Region's By-law and if the demolition permit related to the site was issued less than 10 years prior to the issuance of a building permit. The credit can, in no case, exceed the amount of D.C.s that would otherwise be payable.

2.5 Exemptions

The Region's approved D.C. by-law includes statutory exemptions from payment of D.C.s with respect to:

- Industrial additions of up to and including 50% of the existing gross floor area of the building – for industrial additions which exceed 50% of the existing gross floor area, only the portion of the addition in excess of 50% is subject to D.C.s;
- Land used for Municipal or Board of Education purposes; and
- Residential development that results in only the enlargement of an existing dwelling unit, or that results only in the creation of up to two additional dwelling units (as specified by O.Reg. 82/98).

Although not identified in the Durham Region's DC By-laws, Colleges established under the Ontario Colleges of Applied Arts and Technology Act, 2002 and Universities pursuant to the Crown Agencies Act are agents of the Crown, therefore they are exempt from paying D.C.s under the DCA when they construct buildings for their own use. The UOIT Act goes one step further and provides additional exemptions from D.C.s. If a private developer constructs a building to be leased by UOIT, D.C.s will not be paid to the Region for that development.

The D.C. by-law also provides Durham-specific non-statutory exemptions from payment of D.C.s in keeping with prior policy decisions of Regional Council with respect to Regional D.C.s, including:

- agricultural uses and farm buildings;
- places of worship;

- public hospitals receiving aid under *the Public Hospitals Act* R.S.O. 1990, c. P.40, excluding such buildings or structures or parts thereof used, designed or intended for use primarily for or in connection with a commercial purpose;
- any part of a building or structure used for the parking or loading of motor vehicles; and
- free standing roof-like structures and canopies that do not have exterior walls.

3. Anticipated Development in the Region of Durham

The Development Charges Act, 1997 (D.C.A.) prescribes the methodology that must be followed for calculating a development charge. The D.C.A. requires that in order to determine the development charge that may be imposed, it is a requirement of Section 5 (1) of the D.C.A. that "the anticipated amount, type and location of development, for which development charges can be imposed, must be estimated."

The D.C. growth forecast has been derived from the Region of Durham Official Plan. In compiling the growth forecast, the following information sources were also relied on to help assess residential and non-residential development potential for the Region over the forecast period; including:

- A review of historical development activity as well as the supply of units identified in the development approvals process; and
- Discussions with Regional staff regarding the anticipated residential and non-residential development trends for the Region of Durham.

Appendix A contains the growth forecast for the anticipated development for which the Region of Durham will be required to provide transit services, over a 10-year time horizon to 2027.

Table 3-1 shows the calculation of the standard equivalent units which are used for calculating the residential development charge. Standard equivalent units represent total annual anticipated residential development expressed as single detached units, based on an average number of persons per unit for low-density households.

Table 3-2 provides the projected employment and non-residential floor space forecasts, gross floor area (GFA) in square metres, for the 2017 – 2027 period by major employment category for the calculation of the non-residential D.C. Annualized non-residential floor space estimates for the 10-year forecast period are used to calculate the non-residential development charge.

Table 3-1
Residential Unit Growth Forecast

Standard Equivalent Units											
Period	Residential Dwelling Unit Forecast (All Types of Units)	Residential Dwelling Unit Forecast (by Type of Unit)				Standard Equivalent Units (by Type of Unit)				Std. Equivalent Total
		Single /Semi Detached	Medium Density Multiple	Apartment		Single/Semi Detached	Medium Density	Apartment		
				2 Bedroom+	1 Bedroom	(100%)	(80.4%)	2 Bedroom+ (58.1%)	1 Bedroom (37.7%)	
2017-2018	5,720	3,320	1,320	700	380	3,320	1,060	405	145	**4,930**
2018-2019	7,044	4,090	1,625	860	470	4,090	1,305	500	175	**6,070**
2019-2020	7,044	4,090	1,625	860	470	4,090	1,305	500	175	**6,070**
2020-2021	7,044	4,090	1,625	860	470	4,090	1,305	500	175	**6,070**
2021-2022	9,721	5,640	2,245	1,190	645	5,640	1,805	690	245	**8,380**
2022-2023	9,742	4,635	2,670	1,580	850	4,635	2,150	920	320	**8,025**
2023-2024	9,742	4,635	2,670	1,580	850	4,635	2,150	920	320	**8,025**
2024-2025	9,742	4,635	2,670	1,580	850	4,635	2,150	920	320	**8,025**
2025-2026	9,742	4,635	2,670	1,580	850	4,635	2,150	920	320	**8,025**
2026-2027	7,262	3,455	1,990	1,180	635	3,455	1,600	685	240	**5,980**
2017 - 2022	**36,573**	**21,225**	**8,435**	**4,475**	**2,430**	**21,225**	**6,785**	**2,600**	**915**	**31,525**
2023-2027	**46,230**	**21,995**	**12,675**	**7,510**	**4,040**	**21,995**	**10,195**	**4,360**	**1,525**	**38,075**
2017-2027	**82,803**	**43,225**	**21,115**	**11,980**	**6,470**	**43,225**	**16,975**	**6,960**	**2,440**	**69,600**

Table 3-2
Non-Residential Growth (Square Metres)

Employment and Non-Residential Floor Space and Forecasts by Sector, 2017 to 2027											
Period	Population	Employment						Floor Space (m^2)			
		Industrial	Commercial	Institutional	Primary	Work at Home	Total	Industrial	Commercial	Institutional	Total
2017	673,560	49,740	84,435	52,545	1,970	22,095	210,785	5,916,107	3,340,751	3,227,383	12,484,241
2022	757,624	74,865	94,625	55,285	1,970	24,590	251,335	8,869,175	3,739,835	3,400,798	16,009,808
2027	847,894	97,055	104,905	56,815	1,970	27,075	287,820	11,504,222	4,142,824	3,496,943	19,143,989
Growth											
2017-2022	84,064	25,125	10,190	2,740	-	2,495	40,550	2,953,068	399,084	173,415	3,525,567
2022-2027	90,270	22,190	10,280	1,530	-	2,485	36,485	2,635,047	402,989	96,145	3,134,181
2017-2027	174,334	47,315	20,470	4,270	-	4,980	77,035	5,588,115	802,073	269,560	6,659,748

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2018-2027
Employment	8,110	8,110	8,110	8,110	8,110	7,297	7,297	7,297	7,297	7,297	77,035
Floor Space (m2)	705,114	705,114	705,114	705,113	705,114	626,836	626,836	626,836	626,836	626,836	6,659,749

4. Calculation of the Region's Transit D.C.

4.1 Introduction

The method that must be used in determining the development charges that may be imposed by a municipality, as part of preparing a development charge by-law, is set out in s.s.5(1) of the D.C.A. As referenced in section 1.3, the D.C.A. and O.Reg. 82/98 have been amended to include requirements for prescribed services.

The provincial government enacted changes to the D.C.A., which came into effect January 2016, with direct implications for how the Region plans and funds future transit services. Historically, transit services could only be funded through D.C.s in the following manner:

- Service costs could only be recovered at up to 90% of total capital cost due to a D.C.A. mandatory 10% reduction of eligible growth related capital cost applied to transit services; and
- Growth-related capital expenditures for transit infrastructure were limited to expenditures that supported maintaining historic service levels. This was calculated based on the average level of service over the prior ten years.

Changes in the D.C.A. have resulted in alterations to the Region's growth-related transit funding mechanisms. These changes are summarized as follows:

- The mandatory 10% reduction of eligible growth-related capital costs has been removed for transit services, allowing growth related transit services to be 100% recoverable through D.C.
- The introduction of planned levels of services for transit, with the prescribed method and criteria to establish the service level (outlined in O.Reg. 428/15). This allows municipalities to be forward-looking in estimating future level of service for transit D.C. calculations and apportion them to growth accordingly. It also included new highly prescriptive reporting requirements associated with the background reporting for D.C.

The new reporting requirements that need to be outlined in the D.C. background study related to transit include:

- The calculations that were used to prepare the estimate for the planned level of service for transit services;

- An identification of the portion of the total estimated capital costs related to the transit service that would benefit the anticipated development over the ten-year D.C. period and after the ten-year D.C. period;
- An identification of the anticipated excess capacity that would exist at the end of the ten-year D.C. period;
- An assessment of ridership forecasts for all modes of transit services proposed to be funded, categorized by development types and whether the ridership will be from existing or planned development; and,
- An assessment of the ridership capacity for all modes of transit services proposed to be funded by the D.C.

The Regional Transit Services growth-related capital needs, and many of the requirements of the D.C.A. are addressed in the "Regional Transit Service Development Charge Background Study" prepared by IBI Group (IBI Group Study). This study is contained in Appendix B.

4.2 Durham Region Transportation Master Plan

The assessment of transit needs for this D.C. Background Study is consistent with the travel demand modelling approach and high-level network assumptions of Durham Region's 2017 Transportation Master Plan (Draft June 2017). The future transit demand in Durham Region was projected using the Durham Region Transportation Model for the AM peak period.

4.3 Durham Region Transit Five-Year Service Strategy

The 2022 transit network was developed based on the DRT's 2016 Five Year Service Plan. Routes were assumed to have frequencies based on DRT's recommended service design guidelines for service frequency (DRT Five Year Service Plan, 2016, Appendix B) where grid and local routes have 30 minute headways or better in the weekday peak period. The 2027 transit network was developed by building upon the 2022 transit network with the additions and modifications to grid and local routes to move the network in the direction of the recommended 2031 transit network identified in the Durham Transportation Master Plan.

4.4 2017 Durham Region Transit Servicing and Financing Study

Each year, the Region develops and produces an annual Durham Region Transit (DRT) Servicing and Financing Study. This study focuses on the key transit servicing

(operating and capital) requirements, and financing needs for the upcoming budget year. It also provides an update to DRT's 5-year service plan outlook, 10-year capital requirements, and longer term financing needs, based on the principles identified in the Connecting Communities Service Strategy.

Report #2017-COW-20 (2017 Durham Region Transit Servicing and Financing Study) provided a comprehensive review of the Region's 2017 and ten year forecast (2017-2026) of transit services, capital requirements, and financing plan. This study which is part of the Regional Business Planning and Budget process, informs the Durham Region Transit Budget, which is approved by Regional Council on an annual basis.

The outlook in the 2017 Durham Region Transit Servicing and Financing Study has been included in Durham Region's Transit's 10-Year Capital Budget Forecast. For the purposes of updating the Regional Transit Development Charge, Background Study and By-law, the growth related capital program has been updated by the findings of the IBI Group Study, as contained in Appendix B. The updated capital plan is summarized in section 4.5 below.

4.5 The Durham Transit Capital Program 2018-2027

The Region's proposed 10-year growth related capital forecast for transit purposes (Table 4-1) is expected to be approved by Regional Council as part of its consideration of this Background Study. Regional Council's approval of the transit capital forecast on which the D.C. calculation is based, is a statutory requirement of the adoption of a development charge under the D.C.A. This is in accordance with paragraph 3 of s.s.5(1) of the D.C.A., in order for Council to indicate that it intends to ensure that the increase in the need for transit service which is the subject of the development charge, will be met.

It is noted that the Region's Transit Capital Forecast consists of the following two components:

a) Growth Related Capital, including buses, facilities and system improvements; and
b) Replacement/Rehabilitation Capital, including buses, facilities and system improvements.

Growth Related Capital is largely development-related, with a portion thereof expected to provide some benefit to existing development (by attracting additional riders from the existing population via the provision of new routes or more frequent service) and that

portion is therefore not D.C.-recoverable. This 10-year capital forecast does not include the capital components of the Phase 1 Highway 2 Bus Rapid Transit Project as well as the Phase 1 PTIF projects, which are being funded predominately by the Province through the Quick Win programs and the Federal Government through PTIF federal funding, respectively. In total, the Region's transit D.C. is designed to fund approximately $133.1 million over the next decade, which represents 62% of the Region's Transit Growth Related Capital program and 42% of its total capital forecast for transit purposes.

4.6 Planned Level of Service

Subsection 5.2(3) of the D.C.A. requires for transit services, "…that the estimate for the increase in need for a prescribed service (i.e. transit services) shall not exceed the planned level of service over the 10-year period immediately following the preparation of the background study…" The municipality has the ability to determine how it estimates the planned level of service.

The IBI Group Study contained in Appendix B summarizes the planned level of service estimate for transit services. The planned level of service for transit service in Durham Region is identified in the Regional Council approved Durham Region Transit Five Year Service Plan and Durham Transportation Master Plan, which takes a longer term horizon. These level of service measures include service frequency, coverage and service hours, and reflect Council's intent for service provision over the 10-year forecast period.

The growth related capital program provided in the IBI Group Study for the 2018-2027 forecast period is within the planned level of service for the Regional Transit Service.

Table 4-1
Durham Region Transit 10-Year Capital Plan ($000's 2018)

CAPITAL EXPENDITURES ($000's)

EXPENDITURES	2018		2019		2020		2021		2022		2023		2024		2025		2026		2027		TOTAL	
	#	$	#	$	#	$	#	$	#	$	#	$	#	$	#	$	#	$	#	$	#	$
GROWTH RELATED CAPITAL																						
BUSES:																						
Conventional Bus Expansion BRT	-	-	-	-	-	-	-	-	-	-	6	3,600	5	3,000	6	3,600	6	3,600	6	3,600	**29**	**17,400**
Conventional Bus Expansion	7	3,745	16	8,560	18	9,630	16	8,560	18	9,630	10	5,350	8	4,280	7	3,745	10	5,350	7	3,745	**117**	**62,595**
Specialized Mini Bus Expansion	1	200	1	200	1	200	1	200	1	200	1	200	1	200	1	200	1	200	1	200	**10**	**2,000**
Non Revenue Service Vehicle	1	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**	**35**
sub-total	**9**	**3,980**	**17**	**8,760**	**19**	**9,830**	**17**	**8,760**	**19**	**9,830**	**17**	**9,150**	**14**	**7,480**	**14**	**7,545**	**17**	**9,150**	**14**	**7,545**	**157**	**82,030**
FACILITIES:																						
New Indoor Bus Storage/Servicing Facility		4,250		-		50,500		-	-	-	-	-				-				37,300	**-**	**92,050**
New Facility in Seaton Phase 1		-		-		-		-	-	-	-	25,000		-							**-**	**25,000**
sub-total	**-**	**4,250**	**-**	**-**	**-**	**50,500**	**-**	**-**	**-**	**-**	**-**	**25,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**37,300**	**-**	**117,050**
SYSTEMS IMPROVEMENT:																						
Hard Surface Stops	45	342	45	342	45	342	45	342	45	342	45	342	45	342	45	342	45	342	45	342	**450**	**3,420**
Shelters	9	59	9	59	9	59	9	59	9	59	9	59	9	59	9	59	9	59	9	59	**90**	**585**
Additional PRESTO for Growth Buses	7	98	16	224	18	252	16	224	18	252	16	224	13	182	13	182	16	224	13	182	**146**	**2,044**
Additional Fareboxes/Radios For Growth Buses	7	133	16	304	18	342	16	304	18	342	16	304	13	247	13	247	16	304	13	247	**146**	**2,774**
Additional ITS/Annunciators for Growth Buses	7	105	16	240	18	270	16	240	18	270	16	240	13	195	13	195	16	240	13	195	**146**	**2,190**
Automated Q-straint	7	140	16	320	18	360	16	320	18	360	16	320	13	260	13	260	16	320	13	260	**146**	**2,920**
Additional PRESTO for Specialized Buses	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	**10**	**20**
Trapeze for Specialized Buses	1	8	1	8	1	8	1	8	1	8	1	8	1	8	1	8	1	8	1	8	**10**	**79**
Smart Technology Upgrades	-	438	-	250		250	-	250	-	250	-	250	-	250	-	250	-	250	-	250	**-**	**2,688**
sub-total	**84**	**1,324**	**120**	**1,748**	**128**	**1,884**	**120**	**1,748**	**128**	**1,884**	**120**	**1,748**	**108**	**1,544**	**108**	**1,544**	**120**	**1,748**	**108**	**1,544**	**1,144**	**16,720**
REPLACEMENT / REHABILITATION CAPITAL																						
BUSES:																						
New Conventional Bus Replacement	11	5,885	11	5,885	11	5,885	11	5,885	11	5,885	11	5,885	11	5,885	11	5,885	11	5,885	11	5,885	**110**	**58,850**
Specialized Mini Bus Replacement	4	800	4	800	4	800	4	800	4	800	4	800	4	800	4	800	4	800	4	800	**40**	**8,000**
Refurbishing of Buses	17	3,145	9	1,665	9	1,665	9	1,665	9	1,665	9	1,665	9	1,665	9	1,665	9	1,665	9	1,665	**98**	**18,130**
Service Vehicle Replacement	2	106	1	53	3	159	2	106	3	159	4	212	2	106	2	106	2	106	2	106	**23**	**1,219**
sub-total	**34**	**9,936**	**25**	**8,403**	**27**	**8,509**	**26**	**8,456**	**27**	**8,509**	**28**	**8,562**	**26**	**8,456**	**26**	**8,456**	**26**	**8,456**	**26**	**8,456**	**271**	**86,199**
FACILITIES:																						
Works		137		-		-															**-**	**137**
Raleigh Office Area Demolition and Rebuild								1,030													**-**	**1,030**
Maintenance Shop Equipment		34		66		-		12		-		-		25		-		-			**-**	**137**
sub-total	**-**	**171**	**-**	**66**	**-**	**-**	**-**	**1,042**	**-**	**-**	**-**	**-**	**-**	**25**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1,304**
SYSTEMS IMPROVEMENT:																						
PRESTO/INIT MACD- Decommn/install	11	132	11	132	11	132	11	132	11	132	11	132	11	132	11	132	11	132	11	132	**110**	**1,320**
PRESTO Equipment Refresh/Upgrade	0	0		1,000		0	0	0	0	0	0	0		0		0		0		0	**-**	**1,000**
Bus Stop Infrastructure Requirements	0	960		960		960	0	960	0	960	0	960		960		960		960		960	**-**	**9,600**
Radio Transition (New Arrangement NextGen)			275	2,000	0	0	0	0	0	0	0	0			0	0					**275**	**2,000**
Advanced Fuel Mgt System				250	0	0	0	0	0	0	0	0			0	0					**-**	**250**
Supervisor Vehicle GPS		0		20		0	0	0	0	0	0	0			0	0					**-**	**20**
sub-total	**11**	**1,092**	**286**	**4,362**	**11**	**1,092**	**11**	**1,092**	**11**	**1,092**	**11**	**1,092**	**11**	**1,092**	**11**	**1,092**	**11**	**1,092**	**11**	**1,092**	**385**	**14,190**
TOTAL EXPENDITURES	**138**	**20,753**	**448**	**23,339**	**185**	**71,815**	**174**	**21,098**	**185**	**21,315**	**176**	**45,552**	**159**	**18,597**	**159**	**18,637**	**174**	**20,446**	**159**	**55,937**	**1,957**	**317,493**

4.7 Deduction for Benefit to Existing Development

Paragraph 6 of s.s.5(1) of the D.C.A. requires that the increase in the development-related need for service must be reduced by the extent to which such increase would benefit existing development. Moreover, the requirement under s.4 of O.Reg 428/15 that the background study shall include "an assessment of the ridership capacity for all modes of transit services proposed to be funded by the development charge over the 10-year period immediately following the preparation of the background study, categorized by development types, and whether the forecast ridership will be from existing or planned development". This requirement will further inform the calculation of deductions for benefits to existing development.

The IBI Group Study provided a forecast in ridership for the 10-year forecast period based upon the draft TMP and Official Plan and approved service levels. Extracted from those Studies and summarized below in Table 4-2, Durham Region Transit AM peak period local ridership on DRT is expected to increase from 13,430 in 2017 to 19,520 by 2027. Based on estimates of existing and future transit mode share in Durham, the change in mode share for the existing residents and workers would represent the incremental increase in transit trip made by existing development. Mode share is estimated to increase from 4.8% in 2017 to 5.5% in 2027. This change in mode share equates to an additional 1,970 transit trips made by existing residents and workers, which is 32% of the total increase in transit trips over the period.

Table 4-2
Durham Region Transit AM Peak Period Ridership Forecast (2017-2027)

	2017	2022	2027	Increase (2017-2027)
Total Trips (auto + transit)	280,050	314,700	352,650	72,600
Local transit (DRT) share	4.8%	5.2%	5.5%	0.7%
Local transit (DRT) trips	13,430	16,290	19,520	6,090

4.8 Deduction for Grants, Subsidies and Other Contributions

Paragraph 7 of s.s.5(1) of the D.C.A. requires that the capital costs necessary to provide the increased services must be reduced by the capital grants, subsidies and other contributions made to a municipality or that Council of the municipality anticipates will be made in respect of the capital costs.

s.6 of O.Reg. 82/98 requires that where a capital grant, subsidy or other contribution is made and the person making it has not expressed a clear intention that all or part of it is

to be used to benefit existing development or new development, the D.C. recoverable capital costs shall be reduced by the amount of the grant, in the same proportion as the increase in the need for service was reduced, in making the benefit for existing development reduction in paragraph 6 of s.s.5(1) of the D.C.A.

Provincial Gas Tax revenues will be fully applied to non-D.C. capital works, (i.e. including capital improvements relating to transit security, bus replacements and bus refurbishments), operating costs to implement service enhancements in order to attract ridership. The 10-year capital forecast does not include the capital components of the Phase 1 Highway 2 Bus Rapid Transit Project as well as the Phase 1 Public Transit Infrastructure Fund (PTIF) projects, which have been funded predominately by the Province through the Quick Win program and the Federal Government through PTIF federal funding, respectively.

Based on the foregoing, no deductions for anticipated grants, subsidies, or other contributions have been applied to fund the 10 year growth related capital program.

4.9 Deduction for Post Period Capacity (Beyond 2028)

There is no explicit requirement in the D.C.A. to reduce capital costs so as to avoid funding “post period capacity”, that is, capacity which is not fully required by development proceeding within the calculation planning period, i.e. in this case, 2017-2026.

Paragraph 2 of s.s.5(1) requires that an estimate be made of the need for service attributable to the anticipated amount, type and location of the development for which the development charges are being imposed.

Paragraph 5 requires that a deduction be made for “excess capacity”, but this is the excess capacity which already exists as of the D.C. calculation and can potentially be used to meet the increase in the need for service. This requirement does not apply, where Council expressed a clear intention at the time the excess capacity was created, that it would be paid for (subsequently) by D.C.s or other similar charges.

However, s.4 of O.Reg 428/15 requires that the total estimated capital costs that would benefit anticipated development after the 10-year period immediately following the preparation of the background study as well as the anticipated excess capacity that would exist at the end of the 10-year period immediately following preparation of the background study be assessed. These requirements infer the need to assess whether a deduction for post-period capacity should be made for transit services.

The 10 year capital plan includes a second expansion phase of a new indoor bus storage and service facility in 2027 at an estimated cost of $37.3 million. A post period benefit associated with this second expansion phase in 2027 has been calculated through consideration of the excess capacity this will have at the end of the forecast period. The post period benefit has been calculated to be $13,694,000.

4.10 Residential vs. Non-Residential Cost Attributions

The D.C. calculation (paragraph 2 of s.s.5(6) of the D.C.A.) requires that each identified type of development must only pay development charges which are consistent with the applicable capital costs arising from that type of development.

The first step in complying with this requirement is to allocate the D.C. recoverable costs between residential and non-residential development (i.e. industrial, commercial and institutional). This can be done in various ways, but for services such as transit, it is typically done based on the incremental increase in population and employment over the course of the 10-year D.C. calculation period. This approach provides, on average, equal usage weighting between the needs of each additional population and each additional employee. This serves to deal with all potential development-related users and indirectly to consider the benefits of both the origin and destination of the transit trips.

The Region-wide D.C. growth forecast (as per Appendix A), results in the following residential/non-residential cost allocation for transit D.C. calculation purposes:

Residential:	$\frac{174,334}{174,334 + 77,035}$	=	69%
Non-Residential:	100% – 69%	=	31%

4.11 Development Charge Cash Flow Calculation

The Region's transit development charge has been calculated on a cash flow basis, with updated financing assumptions reflecting future circumstances. This approach considers the anticipated timing of D.C. recoverable capital expenditures and the calculation is designed to start with an uncommitted opening residential D.C. reserve fund balance of approximately $12.7 million and $2.9 million for non-residential and concludes with a reserve fund balances of nil. This means that the calculated charge is just sufficient to fund the D.C. recoverable costs.

Appendix A sets out the growth forecasts for residential development (population and single detached unit equivalents) and non-residential development (floor space) used in calculating the Regional Transit D.C.

Table 4-3 summarizes the 2018-2027 transit development-related capital program, together with the deductions required under the Act. The total program amounts to $215.8 million (2018$).

Table 4-3 sets out the $133.1 million portion of this program eligible for inclusion in the calculation of the development charge. Also, the table summarized the $69.1 million deducted as benefit to existing development and a $13.7 million deduction for post-period benefit for the second phase of the new facility expansion in 2027. Of the $133.1 million to be collected from the D.C. over the next 10 years, approximately $91.8 million is attributable to residential development and $41.2 million is attributable to non-residential development. A portion of the latter is non-recoverable as a result of statutory or voluntary D.C. exemptions.

Table 4-4 calculates the Transit D.C. required to fund the residential growth-related expenditures in the third column (Nominal Development Related Expenditures) which match the residential D.C. recoverable amounts in Table 4-3, and is inflated as shown in the fourth Column. The amount for a single and semi-detached unit is $1,143.

Table 4-5 makes a similar calculation for non-residential growth-related expenditures, resulting in a D.C. rate at $5.78/sq.m. ($0.54/sq.ft).

Table 4-3
Infrastructure Costs Covered in the D.C. Calculation (2018 $)

Growth Related Capital	Phase	Gross Capital Cost	Benefit to Existing		Post Period	Grants, Subsidies and Contrib.	Total Deductions	Net Costs benefitting new development	Residential	Non Residential
			32%						69%	31%
FLEET, STATIONS/STOPS										
Buses – BRT (0)	2018-2022	-	32%	-			-	-	-	-
Buses – BRT (29)	2023-2027	17,400,000	32%	5,568,000			5,568,000	11,832,000	8,164,080	3,667,920
Buses – Conventional (75)	2018-2022	40,125,000	32%	12,840,000			12,840,000	27,285,000	18,826,650	8,458,350
Buses – Conventional (42)	2023-2027	22,470,000	32%	7,190,400			7,190,400	15,279,600	10,542,924	4,736,676
Specialized Bus Expansion	2018-2022	1,000,000	32%	320,000			320,000	680,000	469,200	210,800
Specialized Bus Expansion	2023-2027	1,000,000	32%	320,000			320,000	680,000	469,200	210,800
Non Revenue Service Vehicle	2018	35,000	32%	11,200			11,200	23,800	16,422	7,378
Hard Surface Stops	2018-2027	3,420,000	32%	1,094,400			1,094,400	2,325,600	1,604,664	720,936
Shelters	2018-2027	585,000	32%	187,200			187,200	397,800	274,482	123,318
Subtotal		**86,035,000**		**27,531,200**	**-**	**-**	**27,531,200**	**58,503,800**	**40,367,622**	**18,136,178**
FACILITIES										
New Indoor Bus Storage/Servicing Facility	2018-2027	92,050,000	32%	29,456,000	13,694,000		43,150,000	48,900,000	33,741,000	15,159,000
New Facility in Seaton Phase 1	2023	25,000,000	32%	8,000,000			8,000,000	17,000,000	11,730,000	5,270,000
Subtotal		**117,050,000**		**37,456,000**	**13,694,000**	**-**	**51,150,000**	**65,900,000**	**45,471,000**	**20,429,000**
SYSTEMS										
Additional PRESTO for Growth Buses	2018-2022	1,050,000	32%	336,000			336,000	714,000	492,660	221,340
Additional PRESTO for Growth Buses	2023-2027	994,000	32%	318,080			318,080	675,920	466,385	209,535
Additional PRESTO for Specialized Buses	2018-2027	20,000	32%	6,400			6,400	13,600	9,384	4,216
Additional Fareboxes/Radios For Growth Buses	2018-2022	1,425,000	32%	456,000			456,000	969,000	668,610	300,390
Additional Fareboxes/Radios For Growth Buses	2023-2027	1,349,000	32%	431,680			431,680	917,320	632,951	284,369
Additional ITS/Annunciators for Growth Buses	2018-2022	1,125,000	32%	360,000			360,000	765,000	527,850	237,150
Additional ITS/Annunciators for Growth Buses	2023-2027	1,065,000	32%	340,800			340,800	724,200	499,698	224,502
Automated Q-straint	2018-2022	1,500,000	32%	480,000			480,000	1,020,000	703,800	316,200
Automated Q-straint	2023-2027	1,420,000	32%	454,400			454,400	965,600	666,264	299,336
Smart Technology Upgrades	2018-2022	1,438,000	32%	460,160			460,160	977,840	674,710	303,130
Smart Technology Upgrades	2023-2027	1,250,000	32%	400,000			400,000	850,000	586,500	263,500
Trapeze for Specialized Buses	2018-2027	79,000	32%	25,280			25,280	53,720	37,067	16,653
Subtotal		**12,715,000**		**4,068,800**	**-**	**-**	**4,068,800**	**8,646,200**	**5,965,878**	**2,680,322**
Total		**215,800,000**		**69,056,000**	**13,694,000**	**-**	**82,750,000**	**133,050,000**	**91,804,500**	**41,245,500**

Table 4-4
Durham Region-Wide Calculation
Cash Flow Calculation of the 2018 Residential Transit Development Charge

Year	DC Reserve Fund Opening Balance	Dev't Related Expenditures		SDE per Year	DC Rates w. Inflation (3%/Yr)	Anticipated Revenues	Revenues minus Expenditures	Interest Earnings (2.5%) / Costs (5%)	DC Reserve Fund Closing Balance after Financing
		Nominal	Inflated (3%/Yr)						
2018	$ 12,730,000	$ 4,482,924	$ 4,482,924	4,930	$ 1,143	$ 5,634,420	$ 1,151,495	$ 332,644	$ 14,214,139
2019	$ 14,214,139	$ 4,930,541	$ 5,078,458	6,070	$ 1,177	$ 7,145,427	$ 2,066,970	$ 381,191	$ 16,662,299
2020	$ 16,662,299	$ 29,190,996	$ 30,968,728	6,070	$ 1,212	$ 7,359,790	$ (23,608,938)	$ 34,613	$ (6,912,026)
2021	$ (6,912,026)	$ 4,930,541	$ 5,387,736	6,070	$ 1,249	$ 7,580,584	$ 2,192,848	$ (290,780)	$ (5,009,958)
2022	$ (5,009,958)	$ 5,496,396	$ 6,186,243	8,380	$ 1,286	$ 10,779,415	$ 4,593,172	$ (135,669)	$ (552,454)
2023	$ (552,454)	$ 16,843,529	$ 19,526,267	8,025	$ 1,325	$ 10,632,452	$ (8,893,814)	$ (249,968)	$ (9,696,237)
2024	$ (9,696,237)	$ 4,234,248	$ 5,055,914	8,025	$ 1,365	$ 10,951,426	$ 5,895,512	$ (337,424)	$ (4,138,149)
2025	$ (4,138,149)	$ 4,264,746	$ 5,245,100	8,025	$ 1,406	$ 11,279,969	$ 6,034,868	$ (79,745)	$ 1,816,975
2026	$ 1,816,975	$ 5,113,529	$ 6,477,666	8,025	$ 1,448	$ 11,618,368	$ 5,140,702	$ 109,683	$ 7,067,360
2027	$ 7,067,360	$ 12,317,046	$ 16,070,952	5,980	$ 1,491	$ 8,917,405	$ (7,153,547)	$ 86,187	$ -

	Single /Semi Detached	Medium Density Multiple	Apartment 2 Bedroom+	Apartment 1 Bedroom
DC ($/Unit)	**$ 1,143**	**$ 919**	**$ 664**	**$ 431**

Table 4-5
Durham Region-Wide Calculation
Cash Flow Calculation of the 2018 Non-residential Transit Development Charge

Year	DC Reserve Fund Opening Balance	Dev't Related Expenditures		Non-Residential GFA (m^2) per Year	DC Rates w. Inflation (3%/Yr)	Anticipated Revenues	Revenues minus Expenditures	Interest Earnings (2.5%) / Costs (5%)	DC Reserve Fund Closing Balance after Financing
		Nominal	Inflated (3%/Yr)						
2018	$ 2,900,000	$ 2,014,068	$ 2,014,068	705,114	$ 5.78	$ 4,077,675	$ 2,063,608	$ 98,295	$ 5,061,903
2019	$ 5,061,903	$ 2,215,171	$ 2,281,626	705,114	$ 5.96	$ 4,200,005	$ 1,918,380	$ 150,527	$ 7,130,810
2020	$ 7,130,810	$ 13,114,796	$ 13,913,487	705,114	$ 6.14	$ 4,326,006	$ (9,587,481)	$ 27,718	$ (2,428,953)
2021	$ (2,428,953)	$ 2,215,171	$ 2,420,577	705,113	$ 6.32	$ 4,455,779	$ 2,035,203	$ (70,568)	$ (464,318)
2022	$ (464,318)	$ 2,469,396	$ 2,779,326	705,114	$ 6.51	$ 4,589,459	$ 1,810,133	$ 5,215	$ 1,351,030
2023	$ 1,351,030	$ 7,567,383	$ 8,772,671	626,836	$ 6.70	$ 4,202,361	$ (4,570,310)	$ (63,594)	$ (3,282,874)
2024	$ (3,282,874)	$ 1,902,344	$ 2,271,498	626,836	$ 6.91	$ 4,328,432	$ 2,056,934	$ (112,720)	$ (1,338,660)
2025	$ (1,338,660)	$ 1,916,046	$ 2,356,494	626,836	$ 7.11	$ 4,458,285	$ 2,101,790	$ (23,927)	$ 739,203
2026	$ 739,203	$ 2,297,383	$ 2,910,256	626,836	$ 7.33	$ 4,592,033	$ 1,681,778	$ 39,502	$ 2,460,483
2027	$ 2,460,483	$ 5,533,746	$ 7,220,283	626,836	$ 7.55	$ 4,729,794	$ (2,490,489)	$ 30,006	$ -

DC ($/m2)	**$ 5.78**
DC ($/sq.ft.)	**$ 0.54**

5. Transit D.C. Comparisons

5.1 Comparison with Transit Charges in Other Municipalities

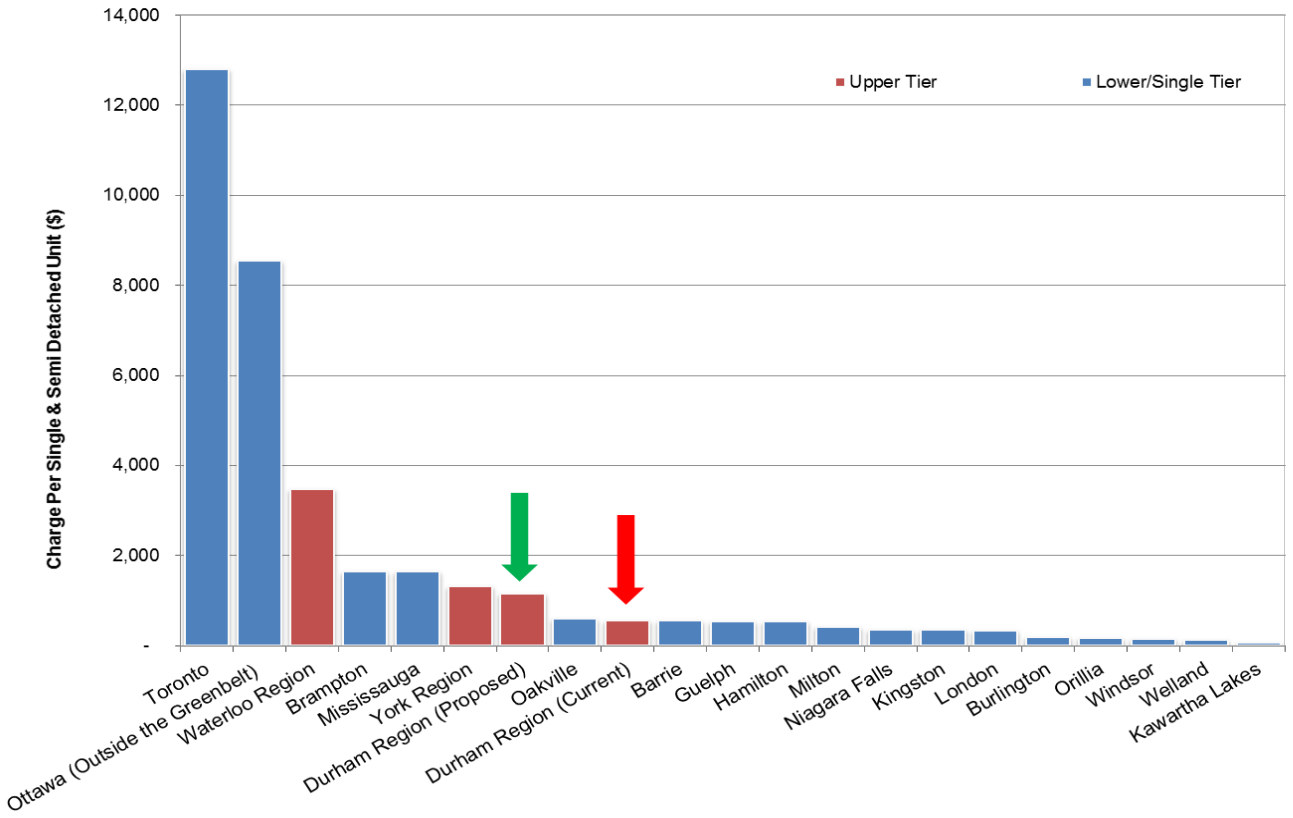
Figure 5-1 sets out the residential development charges imposed for transit purposes across the GTA and in many other urban centres across Southern Ontario where significant transit service is provided, as of September 11, 2017.

Durham's proposed rate of $1,143 for a single / semi-detached unit would place the Region in the mid-range of the comparator municipalities. Charges in Toronto, Ottawa and Waterloo Region are much higher, at $3,465 – $12,811 per single detached unit, reflecting their substantial investment in rapid transit. Charges are also higher in York Region ($1,309), Mississauga ($1,637) and in Brampton ($1,653) per residential single detached unit.

Figures 5-2 and 5-3 presents a similar picture for non-residential charges for commercial retail and industrial uses respectively.

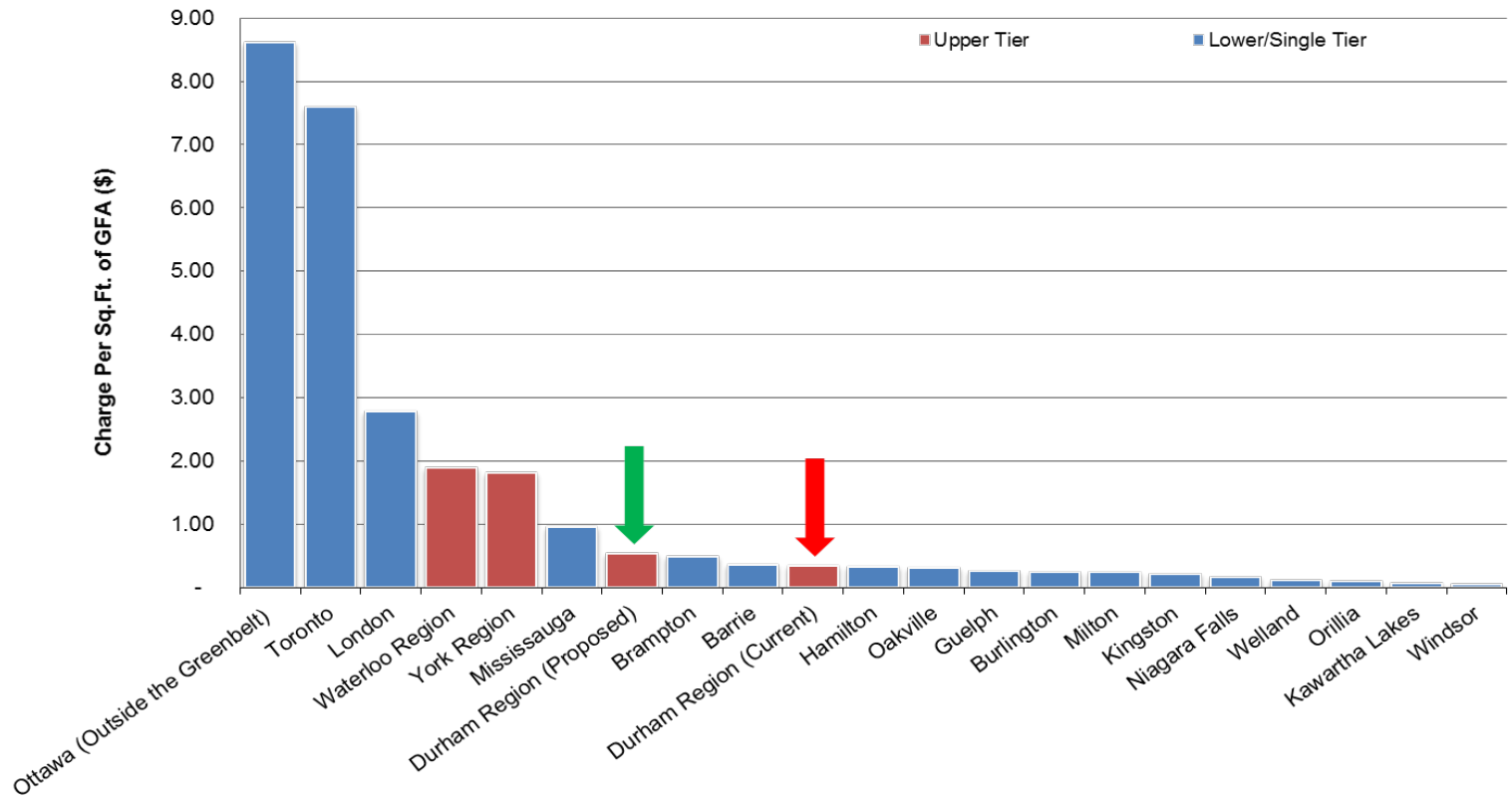
To date, the municipalities of Ottawa, Waterloo, York Region, Milton, and Welland have updated their Transit D.C. Background Studies and By-law under the new D.C.A. and regulatory changes. Once the other municipal transit systems update their Transit D.C. Background Study and By-laws, the relative comparison of Durham's proposed new Transit D.C. rate to other municipal transit systems may change.

Figure 5-1
Transit Residential D.C.s Comparison per Single & Semi Detached Unit
Durham Region and Selected Municipalities that Impose Transit D.C.s



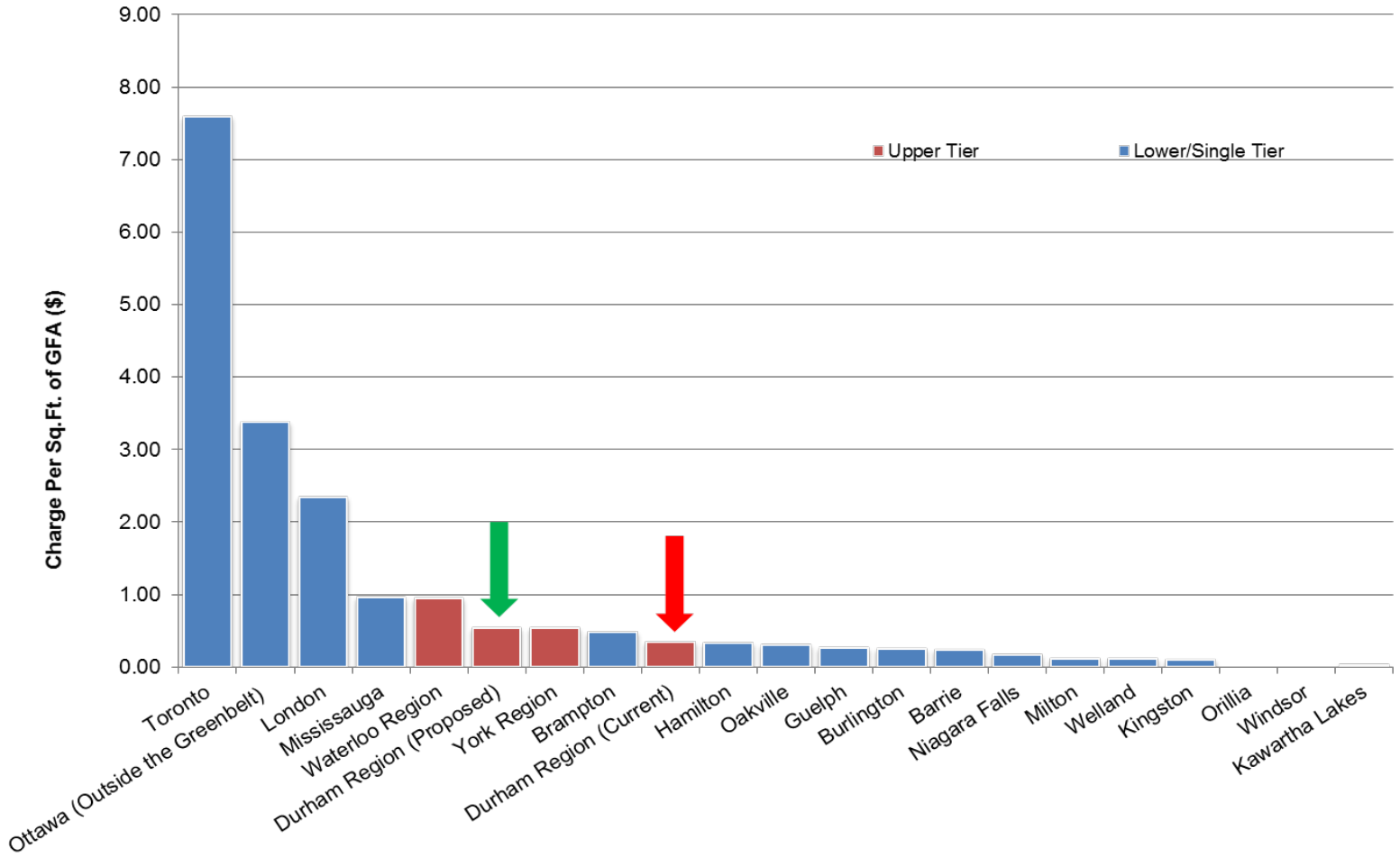
By-laws passed after Janueary 1, 2016 (Amendment to the *Development Charges Act*):
City of Ottawa, Waterloo Region, York Region Town of Milton, City of Welland

Figure 5-2
Transit Non-Residential D.C.s Comparison per sq.ft. of Retail Gross Floor Area
Durham Region and Selected Municipalities that Impose Transit D.C.s



By-laws passed after Janueary 1, 2016 (Amendment to the *Development Charges Act*):
City of Ottawa, Waterloo Region, York Region Town of Milton, City of Welland

Figure 5-3
Transit Non-Residential D.C.s Comparison per Industrial sq.ft. of Gross Floor Area
Durham Region and Selected Municipalities that Impose Transit D.C.s



By-laws passed after Janueary 1, 2016 (Amendment to the *Development Charges Act)*:
City of Ottawa, Waterloo Region, York Region Town of Milton, City of Welland

6. Long Term Capital and Operating Cost Examination

As a requirement of the D.C.A., 1997 under subsection 10(2)(c), an analysis must be undertaken to assess the long-term capital and operating cost impacts for the capital infrastructure projects identified within the D.C. As part of this analysis, it was deemed necessary to isolate the incremental operating expenditures directly associated with these capital projects.

In addition to the operational impacts, over time the initial capital projects will require replacement. This replacement of capital is often referred to as lifecycle cost. By definition, lifecycle costs are all the costs which are incurred during the life of a physical asset, from the time its acquisition is first considered, to the time it is taken out of service for disposal or redeployment.

Table 6-1 depicts the annual operating impact resulting from the proposed gross capital projects at the time they are all in place. It is important to note that, while municipal program expenditures will increase with growth in population, the costs associated with the new infrastructure (i.e. facilities) would be delayed until the time these works are in place.

Table 6-1
Operating and Capital Expenditure Impacts for Future Capital Expenditures

Estimated Incremental Operating Cost Impacts	Gross Cost At Year 10	Sources of Financing at Year 10			Annual Average Property Tax Required Per Year
		Farebox Revenue	Property Tax	Development Charges	
Estimated Operating Costs (at Year 10)					
Proposed Service Enhancements	$55,691,942	$9,950,888	$45,741,054		$4,574,105
Incremental New Bus Maintenance Costs	$10,150,341		$10,150,341		$1,015,034
Incremental New Facilities Maintenance Cost	$4,116,541		$4,116,541		$411,654
Incremental New System Improvements Maintenance Costs	$265,714		$265,714		$26,571
Incremental New Debt Payments	$10,327,990		$3,304,957	$7,023,033	$330,496
Total	**$80,552,528**	**$9,950,888**	**$63,578,607**	**$7,023,033**	**$6,357,861**

Estimated Incremental Capital Cost Impacts	Gross Cost	Sources of Financing			Annual Average Property Tax Required Per Year
		Development Charges	Property Tax	Debenture	
Capital Cost Forecast (2018 to 2027)					
Total Growth Related Capital	$215,800,000	$67,151,000	$31,599,000	$117,050,000	$3,159,900
Total Growth Related Capital	**$215,800,000**	**$67,151,000**	**$31,599,000**	**$117,050,000**	**$3,159,900**

Estimated Property Tax Impact	Total Property Tax Requirement	Estimated Annual Property Tax Requirement	Estimated Annual Property Tax Increase Required
Estimated Operating Costs	$63,578,607	$6,357,861	0.8%
Growth Related Capital	$31,599,000	$3,159,900	0.4%
Total	$95,177,607	**$9,517,761**	**1.2%**

7. Consideration of Area Rating

Bill 73, the *Smart Growth for Our Communities Act, 2015*, amended the D.C.A. and introduced two new sections where Council must consider the use of area specific charges:

1. Section 2(9) of the D.C.A. requires a municipality to implement area-specific D.C.s for specific prescribed services and/or for specific municipalities which are to be regulated.

2. Section 10(2)c.1 of the D.C.A. requires that "the development charges background study shall include consideration of the use of more than one development charge by-law to reflect different needs for services in different areas"

In regard to the first item, there are no services or specific municipalities presently prescribed in the regulations which must be area rated. The second item, requires Council to consider the use of area rating.

Presently, the Region's D.C. policy is to apply charges on a uniform Region-wide basis. The only exception to this policy is for area-specific D.C.s imposed in the Seaton and Carruthers Creek areas for Water Supply and Sanitary Sewerage services to reflect their unique water supply and sanitary sewer servicing needs and to facilitate the related front-ending agreements as approved by Regional Council to enable these developments.

The use of area rating within the Transit Services D.C. Background Study have been considered. However the use of area specific development charges for transit services are not recommended for several reasons:

1. Typically, Regional services provided (e.g. transit, roads, police, emergency services, etc.) are not restricted to one specific area and are available for use by all residents. The Region's practice to impose Transit Service D.C.s on a uniform Region-wide basis reflects an integrated transit network that provides availability of service for use and access to places of work by urban and rural residents, and as such should have a D.C. funding attribution. Moreover the attribution to the rural transit area is in keeping with the property tax funding of components of public transit services. In addition, transit investments considered through the Region's Transportation Master Plan will provide more services to rural users.

2. An area charge could potentially cause equity issues in transitioning from a Region-wide approach to an area-specific approach. For example, if all services were now built (and funded) within area A (which is 75% built out) and this was funded with some revenues from areas B and C, moving to an area rating approach would see Area A contribute no funds to the costs of services in Areas B and C. This may result in distortions between receipts and the level of service in each area.

3. General municipal D.C. practice reflects the use of uniform municipal-wide transit development charges. This reflects the benefits of an integrated network to a municipality as a whole even where service is not directly provided and the broader indirect benefits to unserviced areas arising from the economic growth, intensification and reduced emissions resulting from public transit investments as well as access to services in the southern area of the Region.

For the reasons noted above, it is recommended that Council continue to calculate and impose development charges for Transit Services on a uniform Region-wide basis.

8. D.C. Policy Recommendations and D.C. By-Law Rules

This chapter outlines the D.C. policy recommendations and proposed by-law rules. The proposed rules provided are based on past Region practice and a review of current development and Council priorities.

s.s.5(1)9 states that rules must be developed:

> "...to determine if a D.C. is payable in any particular case and to determine the amount of the charge, subject to the limitations set out in subsection 6."

Paragraph 10 of subsection 5(1) goes on to state that the rules may provide for exemptions, phasing in and/or indexing of D.C.s.

s.s.5(6) establishes the following restrictions on the rules:

1. the total of all D.C.s that would be imposed on anticipated development must not exceed the capital costs determined under 5(1) 2-8 for all services involved;
2. if the rules expressly identify a type of development, they must not provide for it to pay D.C.s that exceed the capital costs that arise from the increase in the need for service for that type of development; however, this requirement does not relate to any particular development;
3. if the rules provide for a type of development to have a lower D.C. than is allowed, the rules for determining D.C.s may not provide for any resulting shortfall to be made up via other development; and
4. with respect to "the rules," subsection 6 states that a D.C. by-law must expressly address the matters referred to above re s.s.5(1) para. 9 and 10, as well as how the rules apply to the redevelopment of land.

8.1 D.C. By-law Structure

It is recommended that:

1. the Region impose a uniform municipal-wide D.C. calculation for all transit services; and
2. one stand-alone D.C. by-law be used for transit services.

8.2 D.C. By-law Rules

The following sets out the recommended rules governing the calculation, payment and collection of D.C.s in accordance with subsection 6 of the D.C.A., 1997.

It is recommended that the following provides the basis for the D.C.s:

8.2.1 Payment in any Particular Case

In accordance with the D.C.A., 1997, s.2(2), a D.C. be calculated, payable and collected where the development requires one or more of the following:

a) the passing of a zoning by-law or of an amendment to a zoning by-law under Section 34 of the Planning Act;

b) the approval of a minor variance under Section 45 of the Planning Act;

c) a conveyance of land to which a by-law passed under Section 50(7) of the Planning Act applies;

d) the approval of a plan of subdivision under Section 51 of the Planning Act;

e) a consent under Section 53 of the Planning Act;

f) the approval of a description under Section 50 of the Condominium Act; or

g) the issuing of a building permit under the Building Code Act in relation to a building or structure.

8.2.2 Determination of the Amount of the Charge

The following conventions be adopted:

1. Costs allocated to residential uses will be assigned to different types of residential units based on the average occupancy for each housing type constructed during the previous decade. Costs allocated to non-residential uses will be assigned to non-residential uses based on the gross floor area constructed.

2. Costs allocated to residential and non-residential uses are based upon the attributions described in Section 4 herein.

8.2.3 Application to Redevelopment of Land (Demolition and Conversion)

If a development involves the demolition and replacement of a building or structure on the same site, or the conversion from one principal use to another, the developer shall be allowed a credit equivalent to:

1. the number of dwelling units demolished/converted multiplied by the applicable residential D.C. in place at the time the D.C. is payable; and/or

2. the gross floor area of the building demolished/converted multiplied by the current non-residential D.C. in place at the time the D.C. is payable.

The redevelopment credit is provided if the land was improved by occupied structures, if the last use of the building being demolished would be subject to D.C.s under the Region's By-law and if the demolition permit related to the site was issued less than 10 years prior to the issuance of a building permit. The credit can, in no case, exceed the amount of D.C.s that would otherwise be payable.

8.2.4 Exemptions (full or partial)

Statutory exemptions

1. Industrial building additions of up to and including 50% of the existing gross floor area (defined in O.Reg. 82/98, s.1) of the building; for industrial building additions which exceed 50% of the existing gross floor area, only the portion of the addition in excess of 50% is subject to D.C.s (s.4(3));
2. Buildings or structures owned by and used for the purposes of any Region, local board or Board of Education (s.3); and
3. Residential development that results in only the enlargement of an existing dwelling unit, or that results only in the creation of up to two additional dwelling units (based on prescribed limits set out in s.2 of O.Reg. 82/98).

Although not identified in the Durham Region's DC By-laws, Colleges established under the Ontario Colleges of Applied Arts and Technology Act, 2002 and Universities pursuant to the Crown Agencies Act are agents of the Crown, therefore they are exempt from paying D.C.s under the DCA when they construct buildings for their own use. The UOIT Act goes one step further and provides additional exemptions from D.C.s. If a private developer constructs a building to be leased by UOIT, D.C.s will not be paid to the Region for that development.

Non-statutory exemptions that are in keeping with the Region-wide D.C. By-law as approved by Regional Council.

1. agricultural uses and farm buildings;
2. places of worship;
3. public hospitals receiving aid under the Public Hospitals Act R.S.O. 1990, c. P.40, excluding such buildings or structures or parts thereof used, designed or intended for use primarily for or in connection with a commercial purpose;
4. any part of a building or structure used for the parking or loading of motor vehicles; and
5. free standing roof-like structures and canopies that do not have exterior walls.

8.2.5 Phase in Provision(s)

No provisions for phasing in the D.C. are provided in the proposed D.C. by-law.

8.2.6 Timing of Collection

The D.C.s for all services are payable upon issuance of a building permit for each dwelling unit, building or structure, subject to early or late payment agreements entered into by the Region and an owner under s.27 of the D.C.A., 1997.

8.2.7 Indexing

All D.C.s will be subject to mandatory indexing annually on July 1st, in accordance with provisions under the D.C.A.

8.2.8 D.C. Spatial Applicability

In accordance with the D.C.A., the Region gave consideration to area specific rating (refer to section 7).

8.3 Other D.C. By-law Provisions

8.3.1 Categories of Services for Reserve Fund and Credit Purposes

It is recommended that the Region's D.C. collections be contributed into one (1) reserve funds for Regional transit services.

8.3.2 By-law In-force Date

The proposed by-law under D.C.A., 1997 will come into force on the January 1, 2018.

8.3.3 Minimum Interest Rate Paid on Refunds and Charged for Inter-Reserve Fund Borrowing

The minimum interest rate is the Bank of Canada rate on the day on which the by-law comes into force (as per s.11 of O.Reg. 82/98).

8.4 Other Recommendations

It is recommended that Council at its meeting on December 13, 2017, undertake the following actions:

> "Approve the capital project listing set out in the D.C. Background Study for Transit Services dated September 26, 2017, subject to further annual review during the capital budget process;"
>
> "Approve the D.C. Background Study for Transit Services dated September 26, 2017;"
>
> "Determine that no further public meeting is required;" and
>
> "Approve the D.C. By-law as set out in Appendix D."

9. By-law Implementation

9.1 Public Consultation

This chapter addresses the mandatory, formal public consultation process (subsection 9.1.1), as well as the optional, informal consultation process (subsection 9.1.2). The latter is designed to seek the co-operation and involvement of those involved, in order to produce the most suitable policy. Section 9.2 addresses the anticipated impact of the D.C. on development, from a generic viewpoint.

9.1.1 Public Meeting of Council

Section 12 of the D.C.A., 1997 indicates that before passing a D.C. by-law, Council must hold at least one public meeting, giving at least 20 clear days' notice thereof, in accordance with the Regulation. Council must also ensure that the proposed by-law and background report are made available to the public at least two weeks prior to the (first) meeting.

Any person who attends such a meeting may make representations related to the proposed by-law.

If a proposed by-law is changed following such a meeting, the Council must determine whether a further meeting (under this section) is necessary. For example, if the by-law which is proposed for adoption has been changed in any respect, the Council should formally consider whether an additional public meeting is required, incorporating this determination as part of the final by-law or associated resolution. It is noted that Council's decision, once made, is final and not subject to review by a Court or the O.M.B.

9.1.2 Other Consultation Activity

The Region Staff have contacted the local development industry, the local business community and the area municipalities prior to the Public Meeting to offer to meet and discuss the proposed development charge by-law for Transit. Regional staff are meeting with the Durham Homebuilders Association and the Building Industry and Land Development Association (BILD) on September 28, 2017. Copies of the proposed By-law and Background Study will be forwarded to representatives of the Durham Homebuilders Association and the Building Industry and Land Development Association (BILD), as well as the local Chambers of Commerce and Boards of Trade.

The Region also placed notices in the Toronto Star and the local Metroland newspapers throughout the Region and on the Regional web-site to advise of the date, time, location and purpose of the Statutory Public Meeting and the date and contact for the release of the proposed By-law and Background Study.

9.2 Implementation Requirements

Once the Region has calculated the charge, prepared the complete Background Study, carried out the public process and passed a new by-law, the emphasis shifts to implementation matters.

These include notices, potential appeals and complaints, credits, subdivision agreement conditions and finally the collection of revenues and funding of projects.

The following provides an overview of the requirements in each case.

9.2.1 Notice of Passage

In accordance with s.13 of the D.C.A., when a D.C. by-law is passed, the municipal clerk shall give written notice of the passing and of the last day for appealing the by-law (the day that is 40 days after the day it was passed). Such notice must be given not later than 20 days after the day the by-law is passed (i.e. as of the day of newspaper publication or the mailing of the notice).

Section 10 of O.Reg. 82/98 further defines the notice requirements which are summarized as follows:

1. Notice may be given by publication in a newspaper which is (in the Clerk's opinion) of sufficient circulation to give the public reasonable notice, or by personal service, fax or mail to every owner of land in the area to which the by-law relates;
2. s.s.10 (4) lists the persons/organizations who must be given notice; and
3. s.s.10 (5) lists the eight items which the notice must cover.

9.2.2 By-law Pamphlet

In addition to the "notice" information, the Region must prepare a "pamphlet" explaining each D.C. by-law in force, setting out:

1. a description of the general purpose of the D.C.s;

2. the “rules” for determining if a charge is payable in a particular case and for determining the amount of the charge;
3. the services to which the D.C.s relate; and
4. a general description of the general purpose of the Treasurer’s statement and where it may be received by the public.

Where a by-law is not appealed to the O.M.B., the pamphlet must be readied within 60 days after the by-law comes into force. Later dates apply to appealed by-laws.

The Region must give one copy of the most recent pamphlet without charge, to any person who requests one.

9.2.3 Appeals

Sections 13 to 19 of the D.C.A., 1997 set out requirements relative to making and processing a D.C. by-law appeal and an O.M.B. Hearing in response to an appeal. Any person or organization may appeal a D.C. by-law to the O.M.B. by filing a notice of appeal with the municipal clerk, setting out the objection to the by-law and the reasons supporting the objection. This must be done by the last day for appealing the by-law, which is 40 days after the by-law is passed.

9.2.4 Complaints

A person required to pay a D.C., or his agent, may complain to Municipal Council imposing the charge that:

1. the amount of the charge was incorrectly determined;
2. the credit to be used against the D.C. was incorrectly determined; or
3. there was an error in the application of the D.C.

Sections 20 to 25 of the D.C.A., 1997 set out the requirements that exist, including the fact that a complaint may not be made later than 90 days after a D.C. (or any part of it) is payable. A complainant may appeal the decision of Municipal Council to the O.M.B.

9.2.5 Credits

Sections 38 to 41 of the D.C.A., 1997 set out a number of credit requirements, which apply where a Region agrees to allow a person to perform work in the future that relates to a service in the D.C. by-law.

These credits would be used to reduce the amount of D.C.s to be paid. The value of the credit is limited to the reasonable cost of the work which does not exceed the

average level of service. The credit applies only to the service to which the work relates, unless the Region agrees to expand the credit to other services for which a D.C. is payable.

9.2.6 Severance and Subdivision Agreement Conditions

Section 59 of the D.C.A., 1997 prevents a Region from imposing directly or indirectly, a charge related to development or a requirement to construct a service related to development, by way of a condition or agreement under s.51 or s.53 of the Planning Act, except for:

- "local services, related to a plan of subdivision or within the area to which the plan relates, to be installed or paid for by the owner as a condition of approval under Section 51 of the Planning Act;"
- "local services to be installed or paid for by the owner as a condition of approval under Section 53 of the Planning Act."

It is also noted that s.s.59(4) of the D.C.A., 1997 requires that the municipal approval authority for a draft plan of subdivision under s.s.51(31) of the Planning Act, use its power to impose conditions to ensure that the first purchaser of newly subdivided land is informed of all the D.C.s related to the development, at the time the land is transferred.

In this regard, if the Region in question is a commenting agency, in order to comply with subsection 59(4) of the D.C.A., 1997 it would need to provide to the approval authority, information regarding the applicable municipal D.C.s related to the site.

If the Region is an approval authority for the purposes of Section 51 of the Planning Act, it would be responsible to ensure that it collects information from all entities which can impose a D.C.

The most effective way to ensure that purchasers are aware of this condition would be to require it as a provision in a registered subdivision agreement, so that any purchaser of the property would be aware of the charges at the time the title was searched prior to closing a transaction conveying the lands.

Appendix A – Background Information on Residential and Non-residential Growth Forecast

Appendix A – DURHAM REGION ANTICIPATED GROWTH FORECAST

The growth forecasts included herein were derived based on the growth directions contained in Durham Regional Official Plan Amendment No. 128, updated as per the 2016 Statistics Canada Census (where available) and recent residential and non-residential development activity.

Table A-1 summarizes the forecasted growth in terms of total residential dwelling units and population, for the relevant mid-year time periods 2017 - 2022 and 2022 - 2027. The time period for each year represents the end of May to coincide with Census enumeration.

Table A-2 provides the residential dwelling unit growth forecast by year for the 10-year period between 2017 and 2027.

Table A-3 shows the calculation of the standard equivalent units which are used for calculating the residential development charge. Standard equivalent units represent total annual anticipated residential development expressed as single detached units, based on an average number of persons per unit for low-density households.

Table A-4 provides the allocation of DC recoverable costs between residential and non-residential development. The residential and non-residential cost allocation was based on the ratio of forecast population growth in Table A-1 to population plus employment growth (Table A-5) for the same period.

Table A-5 provides the projected employment and non-residential floor space forecasts, gross floor area (GFA) in square metres, for the 2017 – 2027 period by major employment category. Annualized non-residential floor space estimates for the 10-year forecast period are used to calculate the non-residential development charge. Work at home and no fixed place of work employment was excluded from the GFA calculation as it does not generate floor space.

Table A-6 provides historical population and employment for the census years (1991 – 2011). It is noted that the employment figures provided in Table B-6 exclude work at home and no fixed place of work employment.

Table A-7 provides the historical population and employment for 2007-2017.

Table A-1

Residential Dwelling Unit and Population Growth Forecast		
Period	**Dwelling Unit**	**Population Growth**
2017-2022	36,573	84,064
2022-2027	46,230	90,270
2017-2027	82,803	174,334

Table A-2

Residential Dwelling Annual Unit Forecast	
Period	**Annual Forecast**
2017-2018	5,720
2018-2019	7,044
2019-2020	7,044
2020-2021	7,044
2021-2022	9,721
2017 - 2022	**36,573**
2022-2023	9,742
2023-2024	9,742
2024-2025	9,742
2025-2026	9,742
2026-2027	7,262
2022-2027	**46,230**
2017-2027	**82,803**

Table A-3

Standard Equivalent Units										
Period	Residential Dwelling Unit Forecast (All Types of Units)	Residential Dwelling Unit Forecast (by Type of Unit)				Standard Equivalent Units (by Type of Unit)				Std. Equivalent
		Single /Semi Detached	Medium Density Multiple	Apartment		Single/Semi Detached	Medium Density	Apartment		Total
				2 Bedroom+	1 Bedroom	(100%)	(80.4%)	2 Bedroom+ (58.1%)	1 Bedroom (37.7%)	
2017-2018	5,720	3,320	1,320	700	380	3,320	1,060	405	145	**4,930**
2018-2019	7,044	4,090	1,625	860	470	4,090	1,305	500	175	**6,070**
2019-2020	7,044	4,090	1,625	860	470	4,090	1,305	500	175	**6,070**
2020-2021	7,044	4,090	1,625	860	470	4,090	1,305	500	175	**6,070**
2021-2022	9,721	5,640	2,245	1,190	645	5,640	1,805	690	245	**8,380**
2022-2023	9,742	4,635	2,670	1,580	850	4,635	2,150	920	320	**8,025**
2023-2024	9,742	4,635	2,670	1,580	850	4,635	2,150	920	320	**8,025**
2024-2025	9,742	4,635	2,670	1,580	850	4,635	2,150	920	320	**8,025**
2025-2026	9,742	4,635	2,670	1,580	850	4,635	2,150	920	320	**8,025**
2026-2027	7,262	3,455	1,990	1,180	635	3,455	1,600	685	240	**5,980**
2017 - 2022	**36,573**	**21,225**	**8,435**	**4,475**	**2,430**	**21,225**	**6,785**	**2,600**	**915**	**31,525**
2023-2027	**46,230**	**21,995**	**12,675**	**7,510**	**4,040**	**21,995**	**10,195**	**4,360**	**1,525**	**38,075**
2017-2027	**82,803**	**43,225**	**21,115**	**11,980**	**6,470**	**43,225**	**16,975**	**6,960**	**2,440**	**69,600**

Table A-4

Residential and Non-Residential Cost Allocation			
10-year Population Increase	174,334	Table A-1	69%
10-year Employment Increase	77,035	Table A-5	31%
	251,369		

Table A-5

Employment and Non-Residential Floor Space and Forecasts by Sector, 2017 to 2027

Period	Population	Employment						Floor Space (m^2)			
		Industrial	Commercial	Institutional	Primary	Work at Home	Total	Industrial	Commercial	Institutional	Total
2017	673,560	49,740	84,435	52,545	1,970	22,095	210,785	5,916,107	3,340,751	3,227,383	12,484,241
2022	757,624	74,865	94,625	55,285	1,970	24,590	251,335	8,869,175	3,739,835	3,400,798	16,009,808
2027	847,894	97,055	104,905	56,815	1,970	27,075	287,820	11,504,222	4,142,824	3,496,943	19,143,989
Growth											
2017-2022	84,064	25,125	10,190	2,740	-	2,495	40,550	2,953,068	399,084	173,415	3,525,567
2022-2027	90,270	22,190	10,280	1,530	-	2,485	36,485	2,635,047	402,989	96,145	3,134,181
2017-2027	174,334	47,315	20,470	4,270	-	4,980	77,035	5,588,115	802,073	269,560	6,659,748

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2018-2027
Employment	8,110	8,110	8,110	8,110	8,110	7,297	7,297	7,297	7,297	7,297	77,035
Floor Space (m2)	705,114	705,114	705,114	705,113	705,114	626,836	626,836	626,836	626,836	626,836	6,659,749

Table A-6

Historical Population and Employment and Activity rates By Sector										
Period	Population [1]	Primary	Industrial		Commercial		Institutional		Total	
			Jobs	Activity Rate	Jobs	Activity Rate	Jobs	Activity Rate	Jobs	Activity Rate
1991	422,970	2,125	63,615	0.150	45,695	0.108	31,410	0.074	142,845	0.338
1996	471,360	1,775	54,670	0.116	48,700	0.103	30,125	0.064	135,270	0.287
2001	526,990	1,475	59,175	0.112	62,225	0.118	34,235	0.065	157,110	0.298
2006	584,360	1,545	59,860	0.102	70,550	0.121	39,615	0.068	171,570	0.294
2011	633,130	1,395	48,288	0.076	73,293	0.116	47,080	0.074	170,056	0.269

Notes:

1.Population for 2003 -2011 is provided in Commissioner's Report No. 2012-P-61, dated September 25, 2012

Table A-7

Historical Population and Employment			
Year	Population [1,2]	Employment [3,4]	Total
2007	599,955	171,319	775,083
2008	611,390	171,003	790,076
2009	621,865	170,688	804,109
2010	626,110	170,372	811,911
2011	633,130	170,056	822,695
2012	639,655	173,158	832,572
2013	646,985	176,260	847,237
2014	651,945	179,363	859,532
2015	658,175	182,465	873,097
2016	663,460	185,567	885,717
2017	673,560	188,690	903,160

Notes:

1.Population for 2003 -2011 is provided in Commissioner's Report No. 2012-P-61, dated September 25, 2012

2. Population for 2012 -2016 is provided in the Report #2016-INFO-33 dated October 26, 2016.

3. Employment does not include jobs related to 'Work at Home' or 'No Fixed Place of Work (NFPOW)'.

4. The 2007-2017 employment figures are interpolated from the 2006 and 2011 census employment figures reported in Table A-6 and the estimated employment figures for 2017 in Table A-5.

Appendix B – Regional Transit Service Development Charge Background Study, IBI Group

Report

Regional Transit Service Development Charge Background Study

Prepared for Durham Region
by IBI Group
September 25, 2017

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1 Introduction

The Region of Durham is updating its Regional Transit Service Development Charge (DC) By-law. The previous background study for the Regional Transit Service DC was completed in 2012.

This report documents the component of the background study addressing the transit service requirements for the DC update, including the growth-related transit program, approach to deductions, allocations and costs for the transit-related capital program.

2 Population and Employment Forecast

Updated population and employment projections by traffic zone for 2017, 2022, 2027 and 2031 were provided by the Region. The projections were updated to reflect the current development in Durham Region and the anticipated growth over the next 10 years.

While the 2031 population and employment projections are consistent with the projections assumed in the Transportation Master Plan (TMP) and the provincial Growth Plan, these latest projections reflect a number of updates that reflect the current rate of development in recent years. The population projections are shown in Exhibit 1.

Exhibit 1: Population

MUNICIPALITY	DC POPULATION FORECASTS		
Ajax	125,700	133,350	136,000
Brock	11,800	12,250	13,100
Clarington	97,000	109,250	125,500
Oshawa	163,300	173,900	178,800
Pickering	95,900	130,100	171,950
Scugog	22,300	23,800	22,150
Uxbridge	21,800	22,200	23,200
Whitby	135,800	152,700	177,150
Durham	**673,550**	**757,600**	**847,900**

While residential development has been growing rapidly in Durham Region, the rate of non-residential development has been slower to materialize. The employment projections for the DC study anticipate a slower growth in the interim years than was previously anticipated in the Transportation Master Plan (Durham Draft TMP June 2017). However, the employment development is assumed to catch up by 2031 to meet Official Plan and Growth Plan targets.

The employment projections for this DC study are shown in Exhibit 2. It is noted that for the purposes of the travel demand model, “no-fixed-place-of-work” employment is not included at the traffic zone level and, thus, are not included in Exhibit 2.

Exhibit 2: Employment

MUNICIPALITY	DC EMPLOYMENT FORECASTS[1]		
Ajax	30,750	36,400	40,750
Brock	3,900	4,200	4,450
Clarington	23,700	28,900	33,250
Oshawa	58,450	66,650	75,950
Pickering	35,050	47,250	55,950
Scugog	8,100	8,350	8,550
Uxbridge	7,850	8,000	8,150
Whitby	43,000	51,450	60,400
Durham	**210,750**	**251,200**	**287,500**

1. Does not include ‘No Fixed Place of Work’ employment

The assessment of transit needs for this DC background study has been undertaken consistent with the travel demand modelling approach and high-level network assumptions of Durham Region’s 2017 TMP (Durham Draft TMP June 2017). The Durham Draft TMP assessed transportation needs to 2031. It is noted that the effect of the lower rate of employment growth in the region has resulted in changes to the traffic pattern as forecast in the Durham Region Transportation Planning Model. In the interim years of 2022 and 2027, there is a higher proportion of out-commuting (that is, Durham residents who commute outside of Durham for employment) and a higher transit share (for example, commute trips to Toronto have a higher propensity to use transit including GO Transit and DRT to access GO Transit). Over time, as employment growth catches up, the travel patterns and transit share consistent with the Durham Draft TMP will re-emerge.

3 Transit Services Network Assumptions and Service Demands

3.1 Travel Demand Model

The future transit demand in Durham Region was projected using the Durham Region Transportation Planning Model (Durham Model) for the AM peak period. The Durham Model was developed in 2014 and calibrated to 2011/2012 conditions for the purposes of the TMP. For the Regional Transit Service DC background study, a 2017 base year was developed and the transit estimates were validated against Durham Region Transit passenger boarding data for an

average weekday in October 2016. The October counts are typically used by DRT to represent the average daily passenger volume for any particular year.

3.2 Network Assumptions

The 2017 transit network was coded based on the existing transit network using routing and schedule information from the DRT website (as of July 2017). Headways and route speeds were estimated based on the current schedule.

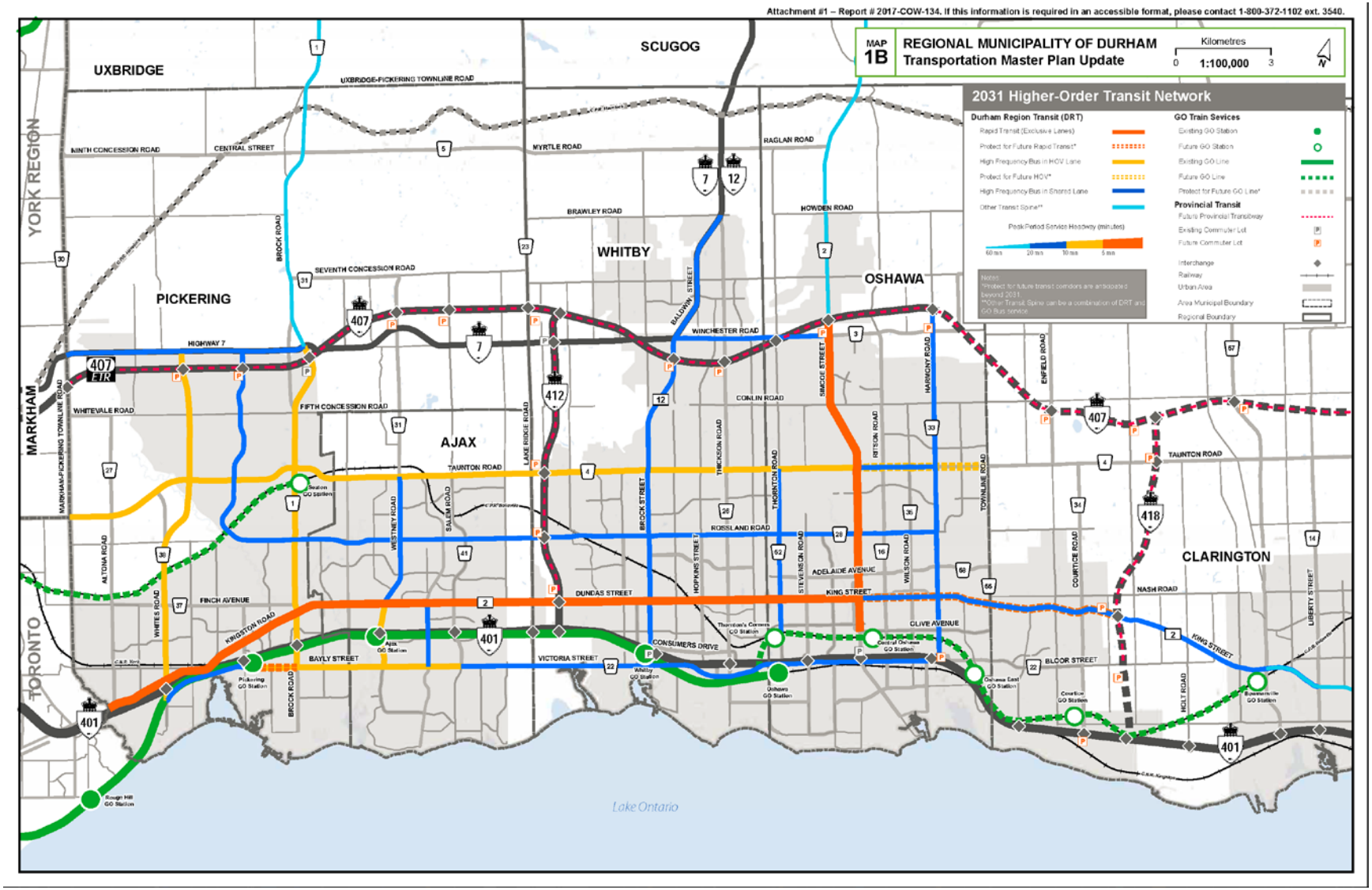
The 2022 transit network was developed based on the approved DRT Five-Year Service Strategy (2016). The evolvement of the transit network includes extensions of existing routes to new development areas in northern areas of Pickering, Ajax, Whitby and Oshawa, new routes to serve Seaton as it develops, and new routes connecting Bowmanville and Newcastle. Routes were assumed to have frequencies based on DRT's recommended service design guidelines for service frequency (DRT Five-Year Service Strategy, 2016, Appendix B) where grid and local routes have at 30-minute headways or better in the weekday peak and rural routes have a 120-minute headway.

The 2027 transit network was developed building upon the 2022 transit network with the additions and modifications to grid and local routes to move the network in the direction of the recommended 2031 transit network identified in the Durham Draft TMP as shown in Exhibit 3. Transit routes were added and/or extended to further serve developing areas of Seaton, north Whitby, and north Oshawa, and to provide access to the future GO stations in Oshawa and Clarington. Service frequencies on the high-frequency network were increased to 15-20 minute headways.

By 2027, the 900 PULSE route is assumed to operate as Bus Rapid Transit (BRT) with a 5-minute headway between Simcoe Street in Downtown Oshawa and Scarborough Centre in Toronto. Dedicated bus lanes are assumed to be in place between the Toronto-Durham boundary and Highway 412 (with exceptions in Pickering Village). Further expansion of dedicated bus lanes from Highway 412 to Simcoe Street are assumed to be completed beyond the planning period for this DC (between 2027 and 2031).

The Simcoe Street service is also assumed to operate as BRT with a 5-minute headway in 2027. Dedicated bus lanes are assumed in the one-way sections of Simcoe Street and Centre Street between Adelaide Avenue and Olive Avenue, and operating in mixed traffic on the remainder of the corridor.

Exhibit 3: Durham Draft TMP 2031 Transit Network



It is noted that the transit routes coded in the model, especially for future years, are intended to represent future routes based on the information available and are not intended to be a detailed service planning exercise. DRT undertakes service planning on an annual basis to optimize transit routes to accommodate changing transit demands, provide service to new development areas, connect schools and post-secondary institutions, changing GO schedules, and so forth. The intent of the transit routes coded in the model is to provide sufficient network coverage and capacity to meet the needs of existing and future population, as well as the service standards for transit in the 2016 Five-Year Service Strategy.

Exhibit 4 and Exhibit 5 summarize the key transit and road network assumptions for each horizon year.

Exhibit 4: Network Assumptions - Transit

Transit	2017	2022	2027
DRT Routes (conventional)	• Existing Service	• Changes to service consistent with Five-Year Service Strategy • New transit service to Seaton, north Oshawa (Kedron), Bowmanville and Newcastle	• Expansion of transit service to new growth areas • Increased frequencies (15-20 minute headways) on higher-order transit routes, moving towards the transit network identified in the Draft TMP • Additional transit service to Seaton, north Whitby (Brooklin), and new GO stations.
Hwy 2 BRT	• 900 PULSE service with dedicated transit lanes in select segments as currently exists, operating at 7.5 minute headways.	• 900 PULSE service with dedicated transit lanes as currently planned (Hwy 2 EA), operating at 7.5 minute headways.	• 900 PULSE as BRT with dedicated transit lanes in most sections, but assumes mixed-traffic operation in Pickering Village, Downtown Whitby and Downtown Oshawa. Route extension to Scarborough Centre. Operating at a 5 minute headways.
Simcoe BRT	• Conventional bus route.	• Increased frequency as service moves towards BRT service.	• BRT service with dedicated lanes in the one-way sections of Simcoe Street and Centre Street (take away lane from Olive to Adelaide) providing service to Central Oshawa GO station. Assumes operation in mixed traffic lanes on the remainder of corridor. Operating at a 5 minute headway.

Transit	2017	2022	2027
GO Rail	• Existing service	• Existing service	• GO RER service to Oshawa. Expansion of GO Rail to Bowmanville.
Other Transit	• no major expansions in east Toronto, east York Region	• no major expansions in east Toronto, east York Region	• Scarborough Subway Extension is not included • Eglinton Crosstown LRT and Sheppard East LRT (both committed projects) are included.

Exhibit 5: Network Assumptions - Roads

Road	2017	2022	2027
Arterial roads	• Existing conditions	• Road network modifications as identified in the Draft TMP.	• Road network modifications as identified in the Draft TMP.
Highway 401	• Existing conditions.	• Existing conditions.	• Hwy 401 widening to 10 lanes from Salem Road east to Simcoe Street interchange, tapering to 8 lanes between Simcoe Street and Ritson Road ramps, and then tapering to 6 lanes east of the proposed eastbound off ramp and westbound on-ramps at Ritson Road. • Interchange improvements at Lake Ridge Road, Brock Street, Simcoe Street, and Harmony Road. Interchange configuration as per Hwy 401 EAs.
Highway 407	• Existing conditions (Hwy 407 to Harmony Road)	• Hwy 407 - extension east of Harmony to Highway 35/115	• Same as 2022
Highway 412	• Existing conditions	• Same as 2017	• Same as 2022
Highway 418	• n/a	• Hwy 418 connection between Hwy 407 and Hwy 401	• Same as 2022

3.3 Ridership Forecasts

For the purposes of this analysis, transit ridership is defined as a linked transit trip, meaning that a single transit trip could include boardings on multiple transit routes. The forecast transit ridership for the 2017 base year, 2022 and 2027 are presented in Exhibit 6.

The transit forecasts are in line with the forecasts in the Durham Draft TMP. As noted previously, there is a higher-proportion of out-commuting in the 2022 and 2027 interim years, and these trips have a higher propensity to use transit. This leads to steady growth in transit demand due to the overall growth in population and employment and continued improvements to the transit system.

Exhibit 6: Transit Ridership Forecasts (AM Peak Period)

	2017	2022	2027
Total Trips (auto + transit)	280,050	314,700	352,650
Local transit (DRT) share	4.8%	5.2%	5.5%
Local transit (DRT) trips	**13,430**	**16,290**	**19,520**
Growth (5-year period)	-	21%	20%

4 Planned Level of Service

The planned level of transit service in Durham Region is identified in the DRT Five-Year Service Strategy, DRT North Service Strategy, and Durham Draft TMP. Measures of service include frequency, coverage and service hours.

Service Frequency

The DRT Five-Year Service Strategy outlines service frequency guidelines for the shorter term. For example, Exhibit 7 presents the design guidelines for service frequency for routes type and time of day. Additionally, the Durham Draft TMP, as shown in Exhibit 3, identified a network of higher-frequency routes that provide a service at 10-20 minutes or better and a higher-order rapid transit network with service at 5 minutes or better by 2031.

Exhibit 7: DRT Five-Year Service Strategy Service Design Guidelines – Service Frequency

Route Type	Time	Currently Approved Guideline
Bus Rapid Transit	Weekday Peak	7.5 minutes
	Weekday Midday	15 minutes
	Weekday Evenings	30 minutes
	Saturday Daytime	15 minutes
	Saturday Evenings	60 minutes
	Sunday Daytime	30 minutes
	Sunday Evenings	60 minutes
Grid	Weekday	30 minutes
	Saturday / Sunday	60 minutes
Local	Peaks	30 minutes
	Midday	60 minutes
	Evenings / Weekends	60 minutes
Rural / Community	All Periods	120 minutes

Source: DRT Five-Year Service Strategy, 2016.

Service Coverage

The Region has committed to providing transit service options for residents and workers in Durham Region. As documented in the Durham Draft TMP, DRT aims to provide service to as many urban residences and workplaces as possible within a 400-metre (5 minute) walking distance. Area coverage is measured using a 400 metre distance from peak transit stops. 400 metres represents a five minute walk at an average walking speed. As density in the urban area increases, it becomes easier to efficiently provide service coverage to a larger proportion of residents and workers.

In new development areas, the aim is to introduce transit service as early as possible to provide new residents with a transit option to encourage and support transit usage as the community develops.

The current and projected service coverage is presented in Exhibit 8. Service coverage is approximately 81% of population and 74% of employment in 2017 and coverage for population remains steady but dips slightly for employment in 2022. With growth and intensification within the existing urban area, the service coverage area increases to 84% of population and 80% of employment by 2027.

Exhibit 8: Service Coverage Area

	2017	2022	2027
Total Population	673,550	757,600	847,900
Service Area Population (<400 m from a transit route)	545,420	609,900	709,400
% of population within service area	81%	81%	84%
Total Employment	210,750	251, 200	287,480
Service Area Employment (<400 m from transit route)	156,560	179, 270	228, 800
% of employment within service area	74%	71%	80%

Service in North Durham

The DRT North Service Strategy outlines the service plan for the Townships of Brock, Scugog, and Uxbridge. The levels of service coded into the transportation model in North Durham are in accordance with the North Service Strategy. This includes fixed routes operating at 120 minute service frequency during all periods, per the service design guidelines, and provision of On-Demand services. On-Demand service is a request service operating in low density areas. It provides connections from pre-determined geographic areas to and from a fixed route at a designated transfer point.

Revenue Service Hours

As the transit network continues to develop and become more mature, with incremental increases to service frequencies on a network of frequent routes to serve growing demand, AM peak service hours are planned to increase as shown in Exhibit 9.

Exhibit 9: AM Peak Service Hours

	2017	2022	2027
AM Peak Service Hours	138.9	182.8	236.8

5 Increase in Need for Service

The transit capital required to provide the transit network described in Section 3 summarized below for conventional fleet, specialized fleet and new transit stops.

5.1 Fleet

Route distances from the Durham Model were used to estimate the number of vehicles needed to provide service at the desired service frequency. The estimated fleet requirements for 2022 and 2027 are summarized in Exhibit 10. As a validation, the Durham Model estimated overall fleet needs that closely matched DRT's existing fleet at a region-wide level.

The primary components of the increase in fleet requirements are the extension of service to provide service to new development areas and increasing frequencies on existing routes to meet the transit network envisioned in the DRT Five-Year Service Strategy and the Durham Draft TMP.

As an additional confirmation of fleet needs, the modelled average maximum passenger load per route was compared against DRT's loading guideline of 38 persons per vehicle to ensure sufficient route capacity was provided. The average maximum passenger loads is an average of each vehicle on the route over the 3-hour peak period. A loading standard of 38 passengers per vehicle is

a reasonable threshold to confirm that the fleet per route can accommodate the average maximum load over a 3-hour period. In 2027, two routes were identified to have average maximum loads that exceed DRT's vehicle loading standard and additional vehicles were assigned to those two routes (increasing service frequency) to bring down the maximum loads within the loading standard.

Exhibit 10: Fleet Requirements

Area	Estimated		
BRT Routes Fleet	18	18	42
Conventional Routes Fleet	136	198	233
Subtotal	**154**	**216**	**275**
Spares	37	50	62
Total	**191**	**266**	**337**

Note – the current 900 PULSE is considered BRT in all years. Simcoe is a regional route in 2017 and 2022, but considered BRT in 2027.

The rate of increase in fleet by 39% (75 vehicles) by 2022 and 27% (71 vehicles) by 2027 is comparable to the projected increase in transit passenger boardings of 31% and 24% for each 5-year period, respectively.

5.2 Specialized Fleet

DRT Specialized Services provides accessible transit service for persons unable to use conventional services to use a fleet of specialized transit vehicles.

DRT currently has a fleet of 30 specialized vehicles. Based on findings by DRT staff, it is assumed that the specialized fleet will grow proportionately with population growth to meet future demands for specialized transit service. On average, one additional specialized transit vehicle will be required per year as shown in Exhibit 11. This is a conservative estimate as the aging population may require an increase in service per capita.

Exhibit 11: Specialized Fleet Requirements

	2017	2022	2027
Specialized Fleet	30	35	40

5.3 Transit Stops

New transit stops will be required along new routes and route extensions in greenfield areas. Currently, DRT has 2,393 transit stops within the urban service area (Pickering, Ajax, Whitby, Oshawa and Courtice). These stops service approximately 305 km^2 (based on the total area of the traffic zones that are served by the transit stops) resulting in a transit stop density of approximately

7.8 stops per km^2 of serviced urban area. The Bowmanville and Newcastle (Durham East) service areas are currently considered emerging urban areas.

Looking forward, approximately 56.8 km^2 of new land area will be developed and serviced by transit by 2027. These lands are predominantly in Seaton, Bowmanville and Newcastle in new areas not currently served by existing services, with some smaller pockets in north Whitby, north Oshawa and Courtice. Assuming the new areas will have the same stop density as the existing urban area, an estimated 450 transit stops are required at a rate of 45 stops per year.

6 Deductions

6.1 Benefit to Existing

Transit system expansions, improvements and efficiencies not only benefit the new development growth that will occur in Durham, but also the existing residents and workers who will be able to utilize a more convenient, effective and competitive transit system whether or not they are currently transit riders today.

To estimate this benefit to existing residents and workers, the Durham Model estimates of existing and future transit mode share in Durham were relied upon. The change in mode share for the existing residents and workers would represent the incremental increase in transit trip making by existing development. Mode share is estimated to increase from 4.8% in 2017 to 5.5% in 2027. This change in mode share equates to an additional 1,970 transit trips made by existing residents and workers, which is 32% of the total increase in transit trips over the period as shown in Exhibit 12.

A benefit to existing allocation of 32% was applied.

Exhibit 12: Benefit to Existing based on mode share

Durham total trips (auto + transit)	280,070	352,630
Transit trips (all transit)	13,430	19,520
Transit mode share (all transit)	4.8%	5.5%
Existing development transit trips based on future transit share	15,400 [280, 070 x 5.5%]	
Increase in existing development transit trips	1,970	
Share of total new transit trips	32% [1,970 / (19,520-13,430)]	

6.2 Post-period Benefit

A post-planning period deduction is applied if there is anticipated excess capacity at the end of the DC period.

In general, transit systems rarely have “excess” capacity. In many cases, transit routes and service frequencies can be adjusted to accommodate higher or lower demands. However, to meet minimum guidelines for service frequency, a set number of transit vehicles are required even if the passenger boardings do not reach vehicle capacities over the course of the route. Reducing frequencies below the service guidelines would have a detrimental effect on transit ridership as transit would become increasingly inconvenient and uncompetitive for riders.

The Region’s vision as shown in the Five-Year Service Strategy and the Durham Draft TMP is to provide a transit system that is attractive, competitive, and encourages the use of transit as a sustainable alternative to the private passenger vehicle. The transit network assumed in the DC background study reflects an incremental increase over existing service levels towards the 2031 service levels.

At present, the average maximum load for all DRT routes is 11.5 passengers per vehicle. The projected average maximum loads for all future DRT routes are estimated to be 12.5 and 12.4 passengers/vehicle, respectively. The forecast passengers per vehicle are higher than existing conditions indicating that the utilization of the transit system has increased and that transit demand has increased more than transit supply. As excess capacity has not been provided under 2027 conditions, a post-planning period deduction has not been applied.

The capital plan includes the expansion of an indoor bus storage and servicing facility in 2027. A post-period benefit provided by this expansion has been calculated through consideration of the excess storage capacity the facility will have at the end of the forecast period, and the building cost of that excess capacity. The post period benefit has been calculated to be $13,694,000 of the $37,300,000 expansion.

6.3 Grants, Subsidies, and Contributions

Deductions for grants, subsidies and contributions are project-specific and applied only where funds from the province, federal or local municipal governments, or area developers are anticipated to be collected.

At this time, no specific grants or contributions have been assumed.

6.4 Allocation of DC Eligible Capital Costs by Development Type

The growth-related costs for transit projects area share between residential and non-residential uses based on the proportion of the residential and non-

residential growth projected through the DC planning period as shown in Exhibit 13. The proportion of growth is 69% residential and 31% non-residential.

Exhibit 13: Anticipated Residential and Non-Residential Growth

DC Horizon Year	Population (Residential)	Employment (Non-residential)	Total
2017	673,550	210,750	884,300
2022	757,600	251,200	1,008,800
2027	847,900	287,500	1,135,350
Growth 2017-2027	**174,350**	**76,750**	**251,050**
Allocation	69%	31%	100%

7 DC Eligible Capital Costs

The capital expenditure plan for the proposed transit projects to the year 2027 is summarized in Exhibit 14.

Exhibit 14: Capital Cost

FLEET and BUS STOPS										
Buses - BRT	2018-2022	0	32%	0			0	0	0	0
Buses - BRT	2023-2027	17,400,000	32%	5,568,000			5,568,000	11,832,000	8,164,080	3,667,920
Buses – Conventional	2018-2022	40,125,000	32%	12,840,000			12,840,000	27,285,000	18,826,650	8,458,350
Buses – Conventional	2023-2027	22,470,000	32%	7,190,400			7,190,400	15,279,600	10,542,924	4,736,676
Specialized Bus Expansion	2018-2022	1,000,000	32%	320,000			320,000	680,000	469,200	210,800
Specialized Bus Expansion	2023-2027	1,000,000	32%	320,000			320,000	680,000	469,200	210,800
Non-revenue Service Vehicle	2018-2022	35,000	32%	11,200			11,200	23,800	16,422	7,378
Transit stops in new development areas - hard surface pad	2018-2022	1,710,000	32%	547,200			547,200	1,162,800	802,332	360,468
Transit stops in new development areas - hard surface pad	2023-2027	1,710,000	32%	547,200			547,200	1,162,800	802,332	360,468
Transit stops in new development areas - shelter	2018-2022	292,500	32%	93,600			93,600	198,900	137,241	61,659
Transit stops in new development areas - shelter	2023-2027	292,500	32%	93,600			93,600	198,900	137,241	61,659
FACILITIES										
New Bus Storage/Servicing Facility – Phase 1	2018-2022	54,750,000	32%	17,520,000			17,520,000	37,230,000	25,688,700	11,541,300
Expansion to Bus Storage/ Servicing Facility – Phase 2	2023-2027	37,300,000	32%	11,936,000	13,694,000		25,630,000	11,670,000	8,052,300	3,617,700
New Facility in Seaton	2023-2027	25,000,000	32%	8,000,000			8,000,000	17,000,000	11,730,000	5,270,000
SYSTEMS										
Additional PRESTO for Growth Buses	2018-2022	1,050,000	32%	336,000			336,000	714,000	492,660	221,340
Additional PRESTO for Growth Buses	2023-2027	994,000	32%	318,080			318,080	675,920	466,385	209,535
Additional Fareboxes/Radios For Growth Buses	2018-2022	1,425,000	32%	456,000			456,000	969,000	668,610	300,390
Additional Fareboxes/Radios For Growth Buses	2023-2027	1,349,000	32%	431,680			431,680	917,320	632,951	284,369

Growth Related Capital	Phase	Gross Capital Cost	Benefit to Existing		Post Period	Grants,				
Additional ITS/Annunciators for Growth Buses	2018-2022	1,125,000	32%	360,000			360,000	765,000	527,850	237,150
Additional ITS/Annunciators for Growth Buses	2023-2027	1,065,000	32%	340,800			340,800	724,200	499,698	224,502
Automated Q-straint	2018-2022	1,500,000	32%	480,000			480,000	1,020,000	703,800	316,200
Automated Q-straint	2023-2027	1,420,000	32%	454,400			454,400	965,600	666,264	299,336
Additional PRESTO for Specialized Buses	2018-2022	10,000	32%	3,200			3,200	6,800	4,692	2,108
Additional PRESTO for Specialized Buses	2023-2027	10,000	32%	3,200			3,200	6,800	4,692	2,108
Trapeze for Specialized Buses	2018-2022	39,500	32%	12,640			12,640	26,860	18,533	8,327
Trapeze for Specialized Buses	2023-2027	39,500	32%	12,640			12,640	26,860	18,533	8,327
Smart Technology Upgrades	2018-2022	1,438,000	32%	460,160			460,160	977,840	674,710	303,130
Smart Technology Upgrades	2023-2027	1,250,000	32%	400,000			400,000	850,000	586,500	263,500
Total		215,800,000		69,056,000	13,694,000	0	82,750,000	133,050,000	91,804,500	41,245,500

Appendix C – Durham Region Transit Asset Management Plan

The Regional Municipality of Durham
Transit Services
Asset Management Plan

September 26, 2017

Contents

1. Introduction

1.1 Overview

The Region of Durham (Region) has developed an updated Asset Management Plan in conjunction with undertaking a Development Charge (D.C.) Background Study for Transit Services. This plan was prepared with input from the 2017 Asset Management Plan, 2017 Durham Region Transit (DRT) Servicing and Financing Study, Durham Transportation Master Plan 2017, DRT Five-Year Service Strategy, Rural – North Service Strategy and the Regional D.C. Transit Background Study prepared by IBI Group.

The requirements for including Transit Services within a D.C. Background Study are more prescriptive than for other services under the *Development Charges Act, 1997, as amended* (D.C.A.). Regulation to the D.C.A. (O.Reg. 82/98) sets out specific requirements, including the preparation of an Asset Management Plan. The Asset Management Plan requirements for transit services are set out in Table 1-1.

The main objective of an Asset Management Plan is to use a Region's best available information to develop a comprehensive long term plan for capital assets. In addition, the plan should provide sound methodologies and support in order to improve the accuracy of the plan on a go forward basis. It is intended to be a tool for Regional staff to use during various decision making processes, including the annual budgeting process, business and financial planning, capital forecasts, the broader corporate asset management plan and future capital grant application processes. This plan is a refinement of the 2017 Asset Management Plan approved by Regional Council in June 2017 and will serve as a road map for future sustainable infrastructure planning.

The Region's goals and objectives with respect to their capital assets relate to the levels of service being provided to Regional residents and businesses. Services should be provided at expected levels, as defined within this Asset Management Plan. Capital assets should be maintained at condition levels that provide a safe and functional environment for constituents.

The Region's current plan as it relates to transit services encompasses facility and fleet assets, and is summarized in the following chapters of this report for the four main requirements of an Asset Management Plan (state of local infrastructure, proposed level of service, asset management strategy, and financial strategy).

Table 1-1
Transit Services D.C. Background Study Asset Management Planning Requirements

Ontario Regulation 82/98, as amended subsection 8(3) Requirements
1. A section that sets out the state of local infrastructure and that sets out, i. the types of assets and their quantity or extent, ii. the financial accounting valuation and replacement cost valuation for all assets, iii. the asset age distribution and asset age as a proportion of expected useful life for all assets, and iv. the asset condition based on standard engineering practices for all assets.
2. A section that sets out the proposed level of service and that, i. defines the proposed level of service through timeframes and performance measures, ii. discusses any external trends or issues that may affect the proposed level of service or the municipality's ability to meet it, and iii. shows current performance relative to the targets set out.
3. An asset management strategy that, i. sets out planned actions that will enable the assets to provide the proposed level of service in a sustainable way, while managing risk, at the lowest life cycle cost, ii. is based on an assessment of potential options to achieve the proposed level of service, which assessment compares, A. life cycle costs, B. all other relevant direct and indirect costs and benefits, and C. the risks associated with the potential options, iii. contains a summary of, in relation to achieving the proposed level of service, (not defined clearly) A. non-infrastructure solutions, B. maintenance activities, C. renewal and rehabilitation activities, D. replacement activities, E. disposal activities, and F. expansion activities, iv. discusses the procurement measures that are intended to achieve the proposed level of service, and v. includes an overview of the risks associated with the strategy and any actions that will be taken in response to those risks.
4. A financial strategy that, i. shows the yearly expenditure forecasts that are proposed to achieve the proposed level of service, categorized by, A. non-infrastructure solutions, B. maintenance activities, C. renewal and rehabilitation activities, D. replacement activities, E. disposal activities, and F. expansion activities, ii. provides actual expenditures in respect of the categories set out in sub-subparagraphs i A to F from the previous two years, if available, for comparison purposes, iii. gives a breakdown of yearly revenues by source, iv. discusses key assumptions and alternative scenarios where appropriate, (see associated text) and v. identifies any funding shortfall relative to financial requirements that cannot be eliminated by revising service levels, asset management or financing strategies, and discusses the impact of the shortfall and how the impact will be managed.

2. State of Local Infrastructure

2.1 Scope and Process

This section of the plan provides an opportunity to develop a greater understanding of the capital assets for Transit Services owned by the Region. The Region's state of local infrastructure analysis includes:

- An asset inventory documenting asset types, sub-types including quantities, materials and other similar asset attributes (e.g. age distribution and asset age as a proportion of expected useful life);
- Financial accounting valuation;
- Replacement cost valuation;
- Asset condition information and analysis;
- Data Verification and Asset Condition policies; and
- Documentation of assumptions made in creating the asset inventory.

The following section details the state of local infrastructure from the Region's 2017 Asset Management Plan.

2.2 Capital Asset Inventory, Valuation and Condition

The Region presently owns and manages capital assets for the provision of Transit Services including DRT facilities and related assets, and fleet. The following reviews each of these capital asset components.

2.2.1 Transit Facilities and Related Assets

Tables 2-1 and 2-2 summarizes the Region's current inventory and valuation of DRT facilities and related assets (e.g. pads, shelters, stops, etc.).

Table 2-1
DRT Facilities and Related Inventory as of December 2016

Facilities	DRT Westney Maintenance Facility (sq.ft.)	68,448	50	34	68%
	DRT Raleigh Maintenance Facility (sq.ft.)	57,504	50	0	0%
	DRT Hard Surface Stops (items)	2,164	20	17.3	85%
	DRT Shelters (items)	508	15	12.2	85%

Table 2-2
DRT Facilities and Related Valuation and Condition Rating as of December 2016

Facilities	DRT Westney Maintenance Facility	$33.9	$15.7	$11.9	-	B
	DRT Raleigh Maintenance Facility	$12.2	$0.03	$0.02	-	B
	DRT Hard Surface Stops	$6.5	$6.3	$5.2	4.21	-
	DRT Shelters	$3.3	$3.2	$2.7	4.23	-
	Total	$55.9	$25.23	$19.82		

Not included in the facility inventory is the new Oshawa Facility at 715 Farewell St., Oshawa. This facility was placed in operation in mid-2017, with a gross floor area of 61,945 sq.ft. and a construction cost of approximately $27.0 million. Moreover, a portion of the Raleigh Facility at 710 Raleigh Ave., Oshawa is expected to be demolished and removed from service in 2018. The net floor area to be demolished is estimated at 10,694 sq.ft. The remaining Raleigh Bus Storage Facility is being refurbished in 2017/18 at a cost of $2.0 million. The change in assets will be reflected in the asset registry in 2017/18 and has been incorporated into the asset management plan strategy and financing strategy forecast to 2027. DRT also leases facility space to provide room for crews at the Oshawa Centre. The facility space occupied by DRT is 470 sq.ft. This facility is not included in the Region's asset registry, as the Region has no capital lease obligations. However the annual lease costs have been incorporated into the asset management plan strategy and financing strategy forecast to 2027.

Table 2-3 summarizes the Building Condition Assessment (BCA) classifications. The Region has completed condition assessments for DRT transit facilities based on the age, soundness, functionality and maintenance cost of the facilities. On this basis the condition of the two facilities is rated good or "B" as noted in the Region's 2017 Asset Management Plan (Report 2017-COW-147).

Table 2-3
Building Condition Assessment Ranking Criteria

		Sound	As intended	Well within normal level	New
		Sound	As intended	Acceptable, but increasing	Within mid-range of expected life
		Signs of deterioration	Lower than intended	Exceeding acceptable levels & increasing	Later stage of expected life
		Significant deterioration	Much lower than intended	Significantly above normal levels	Approaching end of expected life

The condition of the Oshawa Facility is expected to improve with the scheduled improvements to the existing storage facility in 2017.

A full BCA is being completed for the Westney Maintenance Facility (in the Town of Ajax) in 2017. This will provide a detailed assessment of the substructures, shells, and interior (i.e. major building elements). Initial results from the BCA for the Westney Maintenance Facility confirmed the "B" rating of this facility. The condition of the Westney Maintenance Facility is expected to remain "good" over the forecast period of the asset management plan. This Assessment will also identify future capital needs for the next 10 years.

Condition assessments for DRT pads, stops and shelters are based on assets' remaining useful life. A condition assessment summary is provided on a scale of 5 to 1, with a rating of 5 being Very Good and a rating of 1 being Poor.

In addition to the facility inventory, the regional transit system includes other assets as follows:

- 233 radios (estimated 2016 replacement value of $1.4 million);
- 188 fare boxes on conventional buses and 30 fare boxes on specialized buses (estimated 2016 replacement values of $2.3 million);
- Small vehicles and equipment (estimated 2016 replacement value of $1.56 million);
- Presto equipment and software (estimated 2016 replacement value of $3.55 million); and
- Information Technology equipment and furniture (estimated 2016 replacement value of $1.91 million.

2.2.2 Transit Fleet Assets

Table 2-4 and 2-5 summarizes the Region's current inventory and valuation of DRT fleet assets.

Table 2-4
DRT Fleet Inventory as of December 2016

Asset Type	Asset Component	Inventory (items)	Expected Asset Life (Years)	Remaining Life	Remaining Life as a % of Expected Asset Life
Fleet	Conventional	188	12.0	5.6	47%
	Specialized	31	7.0	4.0	58%
	Supervisory	14	5.0	1.3	26%

Table 2-5
DRT Fleet Valuation and Condition Rating as of December 2016

Asset Type	Asset Component	Replacement Value ($ millions)	Accounting (Historic Cost) ($ millions)	Net Book Value ($ millions)	Condition Assessment Rating (Age Based, 5-1)
Fleet	Conventional	$91.4	$80.2	$36.1	2.53
	Specialized	$3.6	$2.8	$1.6	3.13
	Supervisory	$0.9	$0.5	$0.1	1.71
	Total	$95.9	$83.5	$37.8	

Condition assessments for DRT conventional, specialized and supervisory vehicles is based on the replacement value weighted average of remaining useful life. The condition assessment is provided on a scale of 5-1, with a rating of 5 being very good and a rating of 1 being poor.

2.3 Data Accuracy and Completeness

An important element of Asset Management Plans is ensuring that tools and procedures are in place to maintain accuracy and completeness of the asset data and calculations. As time passes, assets are used, maintained, improved, disposed of, and replaced. All of these lifecycle events can trigger changes to the asset database used within the Asset Management Plan. Therefore, tools and procedures are essential to ensure the asset data remains accurate and complete. The Region's methodology to work towards a more complete database is detailed below:

Refinements to data collection, condition ratings and replacement cost methodologies are ongoing, as asset management staff work towards a more comprehensive and consistent asset database. To date staff have made significant progress in improving

and standardizing corporate asset management data and related protocols. Significant levels of collaboration also result in shared best practice and improved data and analytics across all program areas. The 2017 Asset Management Plan established consistent asset management policy and data protocols as an important step.

Replacement values can be affected by cost escalation, service level increases and data collection improvements. Asset upgrades mandated by more stringent regulatory requirements also result in higher replacement cost values. Staff review values individually and as a group to maximize accuracy and consistency. Annual and forecast expenditures, revenues, risks and uncertainties are reviewed within the Transportation and DRT Servicing and Financing Studies which address challenges and opportunities identified through the asset management plan as part of a continuous business planning cycle.

Standardized results are provided for evaluation across identified asset classes. Table 2-6 below summarizes the framework to assess and provide data related to each asset class.

Table 2-6
Asset Class Framework

Infrastructure Measure	Description
Inventory	The inventory of assets included within the asset class. Inventory changes occurring year-over-year are identified and analyzed with rationale provided as required.
Replacement Costs	Asset replacement costs. Significant changes are further assessed, and confirmed with rationale provided.
Condition Assessment Ratings	Condition ratings are assigned for assets within each asset class. Where ratings trend up or down, rationale is provided.
Remaining Useful Life	The useful lives assigned to various assets within an asset class relative to their lifespan.

The Region is currently working towards implementing an Enterprise Maintenance Management Solution (EMMS) to improve, streamline and standardize asset maintenance business processes, rationalize technology systems and align business processes with leading practices. The system is intended to improve integration and information sharing across the organization and provide support for effective data analysis for strategic decisions pertaining to preventative asset maintenance, repairs and replacements.

3. Expected Levels of Service

3.1 Scope and Process

A levels of service (LOS) analysis gives the Region an opportunity to document the levels of service that are currently being provided in each area and compare them to the levels of service that are expected, including goals and objectives identified through the Region's Strategic Plan 2015 to 2019 and other supporting strategic planning documents. This can be done through a review of current practices and procedures, an examination of trends or issues facing the Region, or through an analysis of performance measures and targets that staff can use to measure performance.

Expected LOS can be impacted by a number of factors, including:

- Legislative requirements;
- Strategic planning goals and objectives;
- Resident or Council expectations and resulting direction; or
- Financial or resource constraints and or risk events.

Knowledge of the Region's state of local infrastructure including asset inventory and condition, and maintenance of current asset management policies and principles assists in ensuring the sustainability of the Region's asset infrastructure. The LOS analysis utilizes asset management information to assess the impact of asset service level targets; document an expected LOS that is realistic to the Region; consider risks associated with LOS; and balance both level of investment and associated risk to the Region.

3.2 Levels of Service and Performance Measurement

LOS statements are measures or relevant indicators that reflect service performance goals and are used to set targets and assess asset-related performance. Whether technical, strategic, operational, qualitative and/or quantitative, they can be used to enhance information and improve accountability and transparency through more effective reporting and analysis. A number of technical and non-technical performance measures are utilized by the Region to gauge progress toward program and broader corporate goals and objectives. Moreover, the performance measures vary by capital asset type (i.e. facilities or vehicles) or asset purpose (i.e. service enhancement/ expansion, capital replacement, capital maintenance).

One objective of asset management is to continuously improve long-term capital plans, address priority areas and risk, and ensure the sustainability of Regional assets and

the services they support. The Region's asset-related service levels are defined through a number of sources, including:

A. Approved strategic planning documents and service standards;
B. Regulatory compliance requirements; and
C. Other performance expectations as defined through Regional policy, best practice and Council direction.

Asset performance targets and/or relevant benchmark indicators are set prior to actual performance measurement. Performance indicators assist staff in targeting areas for improvement and can be used to demonstrate improved efficiencies and/or effectiveness from the successful implementation of initiatives or other program changes. Regional staff use performance measures to:

A. Track performance and ensure achievement of required levels of service;
B. Enhance accountability;
C. Permit time-based comparisons within a program; and
D. Compare performance and best practice information with municipal peers.

Measures utilized include those that track service delivery performance, physical condition of assets, current versus target investment levels and energy fuel usage and climate mitigation goals. A goal of Durham's asset management plan overall is to improve the level of service documentation and identify and document asset-related goals and objectives considered "SMART" (specific, measurable, achievable, realistic and time-related). Asset-related goals and objectives will be adjusted as required to ensure they are aligned with the broader goals and objectives of the Region.

Key performance measures are reviewed at least annually as part of the Region's Asset Management Plan and the Transportation and DRT Servicing and Financing Study processes. The following sections describe the Region's level of service and performance measurement as it pertains to DRT facilities and fleet. These sections have been organized by capital asset type (i.e. facilities or vehicles) and asset purpose (i.e. service enhancement/ expansion, capital replacement, capital maintenance).

3.3 Transit Facilities and Related Assets

There are many factors that feed into the LOS for Regional facilities including transit facilities, including:

- Compliance with Provincial and Federal legislation including Building Code;
- Support of the Durham Region's Strategic Plan and corporate by-laws, plans and policies;

- Allow for the delivery of services that meets the needs of staff and the public; and
- Ensure a life cycle investment to ensure state of good repair investments.

The objective is to achieve and maintain an acceptable condition standard for all Regional facilities that will meet the needs and established service level of the core user groups of each facility. This will be achieved by optimizing Regional investment and providing maintenance services necessary to achieve this objective. The Region's target is to have zero per cent of facilities rated as either poor or critical by 2023.

Overarching goals related to Regional facilities are to:

1. Support the coordination of growth with the provision of both hard and soft infrastructure and services;
2. Plan, supervise and implement building/ office design and/or staff relocations in a timely and professional manner with minimal effect on staff and the delivery of their programs;
3. Ensure a life cycle asset management approach to prioritize capital investment, ensuring 'state of good repair' investments;
4. Support diverse facility requirements, including maintenance and property needs based upon clientele and utilization (e.g. Maintenance and DRT Depots); and
5. Maintain the security of all facilities, including access control, parking management, emergency prevention, planning, security and response.

<u>Facilities: Sample Compliance Requirements</u>

- Ontario Building Code Standards;
- *The Green Energy Act;*
    A. Ontario Regulation 397/11
- Ministry of Labour worker safety/training requirements;
- Accessibility for Ontarians with Disabilities Act (AODA);
- Environmental Assessment; and
- Ontario Fire Code Requirements.

The Federal Government also establishes regulations related to facilities management, including:

- *Canadian Environmental Assessment Act; and*
- *The Canadian Environmental Protection Act, 1999*

Regional Bylaws, plans, policies, standards and partnerships also guide the operation of the Region's facilities, including:

- Corporate Safety Policies;
- Health and Safety Program;
- Durham Region Official Plan;
- Design Standards and Specifications (American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standards);
- Local Building Code Standards; and
- Regional Facilities Design Standards and Specifications (based on ASHRAE).

3.3.1 Capital Maintenance and Replacement

The Region has identified key asset-related performance measures utilized to ensure lifecycle sustainability for DRT facilities, and define investments in asset maintenance and replacement activities. These performance measures include building condition assessment ranking and asset useful life.

Building condition assessment ranking performance measurement establishes a target of zero per cent of facilities rated as either Poor or Critical by 2023. This measure is an indicator of relative facility condition and its elements where facility condition index (FCI), defined as the ratio of current maintenance cost to the current replacement value of the facility, is taken from a recent building condition assessment (within past five years). It is recognized that the baseline measure may shift as BCAs are completed and FCI ratings are updated to reflect more current information. The Region's overall measure for all Regional facilities was 4.3 per cent.

Transit facilities have an average useful life estimate of 50 years. At year-end 2016, the assets exhibit an average remaining useful life of approximately 25 years.

3.3.2 Service Enhancement/Expansion

The Region identified key service delivery related performance measures utilized to enhance and expand transit services, and determined new and expanded DRT facilities would be a prudent long-term investment. These performance measures include:

- Bus route expansions, informed by:
    - Service frequency;
    - Service coverage; and
    - Service hours.

Service frequency is based on DRT's recommended service design guidelines (i.e. the DRT Five-Year Service Plan, 2016, Appendix B) to 2022, which include 30 minute frequencies during peak period. Service frequency is also identified through

the Transportation Master Plan to 2031. This includes higher frequency Bus Rapid Transit service (five minute frequency) along Highway 2 and Simcoe Street by 2031.

Area coverage is measured using a 400-metre distance from peak transit stops. 400 metres represents a five minute walk at an average walking speed. In addition to area coverage, the following characteristics of the built up area influence transit service design:

- Demographic considerations- the demographic makeup of the subject area may or may not generate a notable increase in ridership.
- Impact on existing riders - the routing change to expand service coverage may have positive or negative impacts to existing riders—both new and existing riders need to be considered.
- Road network characteristics – the nature of the road network (e.g. suburban curvilinear streets versus permeable street grid) will affect how direct transit routes could operate.
- Residential and employment density – the residential and employment density of a given community has a profound impact on the degree of ridership a route would generate.
- Socio-economic characteristics – the general socio-economic conditions of a community (e.g. household income, household car ownership) have an impact on the degree of ridership a route would generate.
- Pedestrian accessibility – a community with a permeable and well maintained sidewalk provides the ability for passengers to easily access transit stops.
- Financial feasibility – the proposed expansion of service coverage needs to consider its financial cost implications.

Transit services should be available within a reasonable walking distance, defined as approximately 400 metres (approximately a five minute walk). This is achieved by encompassing approximately 80 percent of residences and workplaces in the urbanized areas of Durham Region and taking into account development patterns and pedestrian links. Another 10 to 15 per cent of these residences and workplaces will be within 600 to 800 metres of walking distance to transit services, respectively.

The Region aims to introduce service as early as possible to provide new residents with a transit option to encourage and support transit usage as the community develops, consistent with the goals of the TMP and Durham Region Strategic Plan.

3.3.3 External Trends or Issues

Changing compliance, building and energy codes, modernization and return on investment are considered including potential impacts to operational and lifecycle performance measures. Levels of service will be continually assessed and modified

considering performance measurements targets, the effectiveness of ongoing strategies and financing availability.

3.4 Transit Fleet Assets

DRT manages its own fleet, consistent with common goals that span across the Region's fleet management divisions, including:

1. Maintain fleets in a state of good repair, meeting or exceeding industry standards and manufacturers' requirements, and minimizing vehicle downtime while capturing warranty claims on new equipment;
2. Provide sufficient vehicles and equipment in a safe, reliable and adequate condition to meet service requirements and adapt to changes in business needs;
3. Manage and optimize parts inventories to minimize costs through procedures and guidelines that ensure competitive bidding, cost effective purchasing practices, and inventory control processes in accordance with Regional policies and the Purchasing By-Law;
4. Maintain an orderly fleet turnover process, ensuring cost-effective fleet operations and participate in joint procurement projects where appropriate and beneficial; and
5. Ensure where possible a consistent approach to operations, maintenance, asset management and procurement as related to energy efficiency and improve the quality of energy / fuel data to better understand variations in consumption and performance over time.

Provincial compliance requirements related to the Region's fleets in addition to the *Municipal Act, 2001* include the following examples:

<u>Fleet: Sample Compliance Requirements</u>

- Highway Traffic Act;
- Motor Vehicle Inspection Station Licencing & Standards;
- Motor Vehicle Repair Standards;
- Trade Code Certification Standards;
- Truck and Bus National Safety Code;
- Commercial Vehicle Operators Registration (CVOR) Program;
- Ministry of Health/Emergency Medical Services Accreditation (RDPS);
- Provincial approved fleet replacement schedule (RDPS); and

- Ministry of Transportation PMCVI (Periodic Mandatory Commercial Vehicle Inspection).

The Federal Government also establishes regulations related to fleet management and pollution prevention. Important federal legislation related to fleet management include:

- National Safety Code; CSA - National Standard of Canada; and
- CAN/CSA M225-M88 (2000) Vehicle Mounted Aerial Devices.

Regional Bylaws, plans, policies, standards and partnerships also guide the operation of the Region's fleets, including the:

- Corporate Safety Policies; and
- Health & Safety program.

3.4.1 Capital Maintenance and Replacement

The Region has identified key asset-related performance measures utilized to ensure lifecycle sustainability for Transit Facilities, and define investments in asset maintenance and replacement activities. These performance measures include:

- Asset useful life;
- Vehicle kilometers;
- Operating costs; and
- Fuel economy.

Transit conventional vehicles are expected to have a useful life of approximately 12 years with regular maintenance. The Region targets to retire its conventional buses after 12 years of service, unless they have received a mid-life refurbishment in which retirement after 18 years of service is targeted. Staff are currently investigating the potential impacts of undergoing mid-life refurbishment on the anticipated useful life of buses as part of the asset management planning. Other factors that may impact the lifecycle of a vehicle (i.e. condition and mileage) are taken into account for any retirement decisions.

Table 3-1 summarizes the average remaining life for each vehicle type. This reflects the aggressive bus replacement program the Region has implemented over the last number of years.

Table 3-1
DRT Fleet Average Age

Asset Type	Asset Component	2016 Inventory (items)	2016 Average Vehicle Age (years)
Fleet	Conventional	188	6.4
	Specialized	31	2.8
	Supervisory	14	4.4

The preventative maintenance schedule for DRT's fleet is based on the original equipment manufacturers (OEM's) recommended best practice and the semi-annual vehicle safety inspection process as regulated by the Ontario Ministry of Transportation (MTO), Commercial Vehicle Safety Requirements and National Safety Code 11, Part B (NSC11B).

Preventative maintenance is scheduled when vehicle kilometres have accumulated to the prescribed target. The kilometres from each bus are manually input by service lane employees during the refueling process. Service lane employees visually review the kilometres on the hubodometre and enter the data into the fueling station. The data from the fueling station forms a report that is reviewed by Maintenance Clerks, and the total kilometres and litres of fuel are entered into the work order system. The maintenance work order system provides a report that is reviewed by the Maintenance Supervisors and indicates which buses have reached the specified kilometres. Buses are scheduled for preventative maintenance based upon these standards and analysis.

The recommended preventative maintenance schedules vary slightly by OEM.

New Flyer Industries			
A Inspection	Every 10,000km	**A Inspection**	Every 10,000km
B Inspection	Every 20,000km	**B Inspection**	Every 24,000km
C Inspection	Every 40,000km	**C Inspection**	Every 48,000km
D Inspection	Every 80,000km	**D Inspection**	Every 100,000

Semi-annual MTO Commercial Vehicle Safety Inspections are based on the date of the previous inspection, plus 6 months. This is a mandatory inspection subject to review by an agent of the MTO at any time. When a bus manufacturer is introducing a new model, or significant changes to an existing model, or if a new manufacturer enters the North American market, the bus must undergo rigorous testing by the

Altoona Bus Research and Testing Centre. Tests include but are not limited to:

- Safety;
- Reliability;
- Performance;
- Maintainability;
- Structural integrity and durability;
- Noise;
- Fuel economy; and
- Emissions.

Tests are conducted by manufacturers for a twelve year lifecycle for consideration in maintenance and lifecycle programs related to the DRT fleet. Beyond twelve years a bus can require extensive structural refurbishment as major components begin to wear. As a result, maintenance costs may increase while bus reliability decreases. Eventually the bus becomes a 'spare' in the fleet and is used when necessary.

Diesel engine technology continues to evolve. Newer engines are designed to reduce emissions, and meet more stringent greenhouse gas and fuel efficiency standards.

A complete mid-life refurbishment carries a cost of approximately $180,000 - $200,000 per bus and can extend the life of the bus by five to seven years if the refurbishment takes place during the optimal stage in the bus lifecycle.

For a full bus refurbishment to be performed, a bus must be taken out of service. As DRT's spare ratio is 18 per cent (slightly below the industry average for a transit fleet of DRT's size), and given the increased frequency of preventative maintenance and shorter lifecycle of major components, major refurbishments are not completed on all DRT vehicles.

3.4.2 Service Enhancement/Expansion

As discussed in section 3.3.2, the Region has identified key service delivery related performance measures utilized to enhance and expand transit services, and as a result will invest further in Regional Fleet, including service frequency, service coverage and service hours. The extent of any specific enhancement and or expansion is reviewed annually through the capital forecast updates in the annual business planning cycle.

3.4.3 External Trends or Issues

Changing compliance, accessibility and environmental regulations, climate change

(e.g. increased storm events, freeze-thaw events), modernization and return on investment are considered with impacts to both operational and lifecycle performance measures. These factors play an integral part in establishing levels of service and performance measure targets. As such, levels of service will be continually assessed and modified as required.

4. Asset Management Strategy

4.1 Scope and Process

The asset management strategy should provide the recommended course of actions required to move towards a sustainable asset funding position while moving towards delivering the expected levels of service discussed in the previous section. The course of actions, when combined together, will form a long-term operating and capital forecast that includes:

a) Non-infrastructure solutions: reduce costs and/or extend expected useful life;
b) Maintenance activities: regularly scheduled activities to maintain existing useful life levels, or repairs needed due to unplanned events;
c) Renewal/Rehabilitation: significant repairs or maintenance planned to increase the useful life of assets;
d) Replacement/Disposal: complete disposal and replacement of assets, when renewal or rehabilitation is no longer an option; and
e) Expansion: given planned growth or other expansion or due to the introduction of new services.

4.2 Objectives

Regional staff establish short and long-term asset management strategies which are reviewed annually through the business planning cycle to:

A. Ensure infrastructure assets continue to perform at required service level standards;
B. Balance requirements for maintenance, repairs, rehabilitation and replacements;
C. Minimize life-cycle costs and asset-related risk;
D. Ensure assets will meet Regional growth requirements; and
E. Ensure limited available resources are targeted to the areas of highest priority.

4.3 Risk and Criticality Assessment

Priority (or criticality) identification becomes an important process during the asset management strategy development. Priorities should be determined based on assessment of the overall risk of asset failure, which is determined by looking at both the probability of an asset failing, as well as the consequences of failure. This

has to be taken into consideration, with the overall objective of reaching sustainable levels while mitigating risk.

Types of impacts can include the following:

- **Cost Impacts:** the cost of failure to the Region (i.e. capital replacement, rehabilitation, fines and penalties, damages, etc.);
- **Social impacts:** potential injury to residents or Region staff;
- **Environmental impacts:** the impact of the asset failure on the environment;
- **Service delivery impacts:** the impact of the asset failure on the Region's ability to provide services at desired levels; and
- **Location impacts:** the varying impact of asset failure based on the asset's location within the Region.

The following subsections include the risk assessment provided for in the Region's plan.

4.3.1 Risk Management

The Region proactively identifies and manages organizational risk through its enterprise risk management program. Resources are identified and allocated through the business planning process to achieve risk management objectives and reflect risk tolerance and capacity.

Asset management includes consideration of potential impacts to infrastructure due to environmental hazards, external technical failures (e.g. power outage) and other technical, human-caused or environmental hazards. In asset management, risks also relate to an inability to meet service level objectives e.g. reliability and service quality impacts. Mitigation strategies include efforts to ensure effective and coordinated response to risk events, ensure business continuity objectives and address service interruption and quality issues.

The current focus in Asset Management Planning is to update risk assessments related to each broad asset class and rank assets and major sub-components based upon criticality. While all assets are considered important, the criticality of a particular asset or sub-component can be influenced by several factors, including: capacity utilization, redundancies, serviceability, the availability of contingencies and business continuity requirements.

The asset management and enterprise risk management programs are currently collaborating to reassess asset-related vulnerabilities and risks and establish criticality rankings for the Region's broad asset classes which can inform:

A. Preventative maintenance and replacement priorities;
B. Inventory management;
C. Redundancy planning;
D. Business continuity and emergency planning;
E. Climate adaptation planning; and,
F. Contingency planning.

Risks identified related to Regional assets will continue to be refined and addressed through the business planning process and updated on an annual basis within individual asset class reports.

Integration of Climate Change Considerations

The Region's condition assessments, comprehensive audits and other technical assessments formally consider climate risk as well as corporate energy and water efficiency objectives, which, based upon business case and life-cycle analysis, will be considered as plans for asset repairs, retrofits and replacements are developed.

A number of plans, proposed improvements, capacity expansions and other infrastructure initiatives approved for the budget and included in the forecast period will enhance the Region's adaptive capacity and mitigate climate impacts resulting from greenhouse gases identified within the Region's carbon footprint.

4.3.2 Transit Facilities

Regional staff investigates potential risks on an ongoing basis, considering probability of occurrence and the potential consequence, as well as the suitability of existing risk mitigation controls. Table 4-1 includes a sample of identified risks to facilities, continually reviewed and assessed, with mitigation controls implemented as required through the annual business planning processes.

Table 4-1
DRT Facilities and Related - Risk Mitigation Strategies

Potential Risk	Mitigation Goal	Risk Type
Increased demands for maintenance, repairs, replacements, preventative de-icing and post-storm clean-up, due to an increase in winter freeze-thaw cycles, increased storms at or near 0ºC and extreme storms affecting DRT facilities and sites.	Formally expand asset management planning to consider and address risk, including climate risk, and optimize asset life cycles ensuring DRT facilities, sites continue to operate safely and effectively. Condition audit and inspection programs to identify and prioritize work including risk assessments. Facility site activities including salting, snow removal, backflow prevention and energy management; and, Facility design and construction, including considerations for climate adaptation as part of design development (e.g. energy and water efficiencies, green opportunities, storm water management, erosion control and standby power management etc.).	Environmental /climate
Power outages	Maintain effective and up-to-date emergency plans for natural and human-cause emergencies. Ensure adequate standby power at Regional facilities.	Environmental /climate /human caused or technical

4.3.3 Transit Fleet

Table 4-2 includes a sample of identified risks to fleets with mitigation controls addressed through annual business planning process.

Table 4-2
DRT Fleet - Risk Mitigation Strategies

Potential Risk Impact	Mitigation Goal	Risk Type
Increased demands for maintenance, repairs, replacements and preventative de-icing due to increased freeze thaw cycles and winter temperatures near zero degrees Celsius.	Proactive fleet maintenance. Vehicle storage and pre-heating options (e.g. block heating) to ensure adequate service readiness.	Environmental /climate

4.4 Long-term Forecast

Based on the level of service requirements, the Asset Management Strategy identifies long-term asset requirements, in terms of:

- non-infrastructure solutions;
- maintenance activities;
- renewal and rehabilitation needs;
- replacement activities;
- disposal activities; and
- expansion requirements.

The following table compares anticipated costs for the Region to expand its asset inventory to meet future needs and to maintain its existing asset inventory (replacement and maintenance activities) plus the additional maintenance costs related to the new assets acquired over the 10-year forecast period. Option #1 in the table below assumes that assets are simply replaced when they reach the end of their useful life as identified in the Region's asset registry. Under this scenario, only the age of assets is considered when making its retirement decisions, without consideration of condition. The result is significant asset replacement cost variances from year-to-year.

Option #2 is a refinement of Option #1 and reflects the application of asset management and planning strategies, based on experience and current practise, which result in reduced asset replacement cost variances from year-to-year.

Table 4-3
Comparison of Costing Options

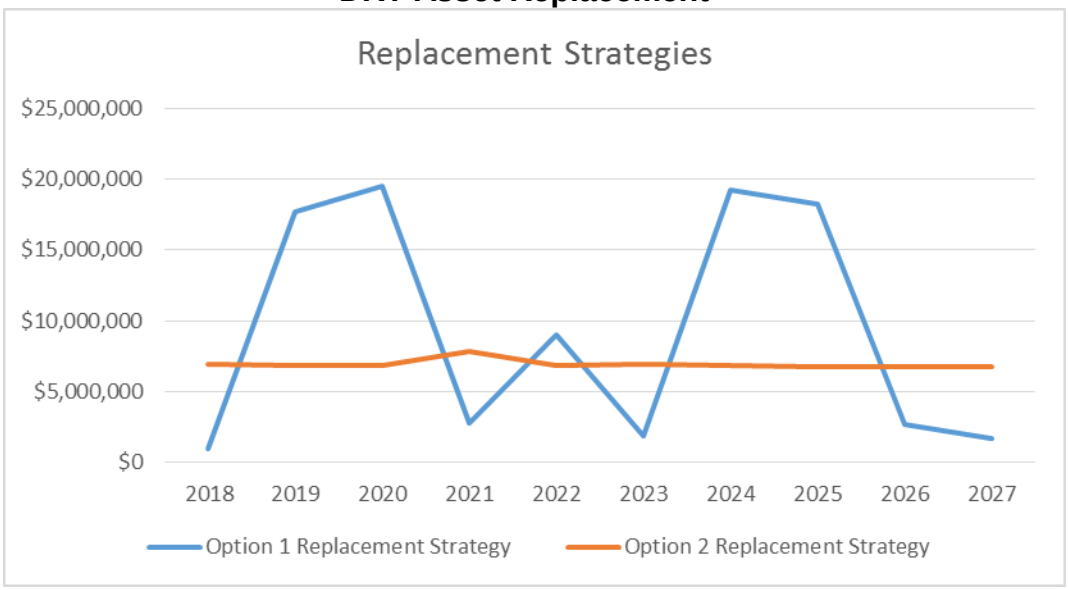
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
OPTION 1 - ASSET LIFECYCLE											
Annual Expenditures											
Non-Infrastructure Solutions	55,000	38,000	20,000	2,738,000	2,520,000	2,291,000	3,301,000	2,950,000	2,581,000	2,194,000	18,687,000
Maintenance Activities	17,905,000	19,042,000	20,314,000	23,774,000	25,047,000	26,184,000	28,116,000	29,049,000	30,185,000	31,118,000	250,733,000
Renewal/Rehabilitation Activities	1,092,000	4,362,000	1,092,000	1,092,000	1,092,000	1,092,000	1,092,000	1,092,000	1,092,000	1,092,000	14,190,000
Replacement Activities (1)	964,000	17,650,000	19,516,000	2,740,000	9,025,000	1,915,000	19,260,000	18,190,000	2,675,000	1,711,000	93,647,000
Disposal Activities	-	-	-	-	-	-	-	-	-	-	-
Expansion Activities	9,554,000	10,508,000	62,214,000	10,508,000	11,714,000	35,898,000	9,024,000	9,089,000	10,898,000	46,389,000	215,800,000
Total Annual Expenditures	29,570,000	51,600,000	103,157,000	40,852,000	49,398,000	67,380,000	60,793,000	60,370,000	47,432,000	82,505,000	593,057,000
OPTION 2 - PHASED-IN ASSET LIFECYCLE											
Annual Expenditures											
Non-Infrastructure Solutions	55,000	38,000	20,000	2,738,000	2,520,000	2,291,000	3,301,000	2,950,000	2,581,000	2,194,000	18,687,000
Maintenance Activities	17,905,000	19,042,000	20,314,000	23,774,000	25,047,000	26,184,000	28,116,000	29,049,000	30,185,000	31,118,000	250,733,000
Renewal/Rehabilitation Activities	4,237,000	6,027,000	2,757,000	2,757,000	2,757,000	2,757,000	2,757,000	2,757,000	2,757,000	2,757,000	32,320,000
Replacement Activities (2)	6,962,000	6,804,000	6,844,000	7,833,000	6,844,000	6,897,000	6,816,000	6,791,000	6,791,000	6,791,000	69,373,000
Disposal Activities	-	-	-	-	-	-	-	-	-	-	-
Expansion Activities	9,554,000	10,508,000	62,214,000	10,508,000	11,714,000	35,898,000	9,024,000	9,089,000	10,898,000	46,389,000	215,800,000
Total Annual Expenditures	38,713,000	42,419,000	92,149,000	47,610,000	48,882,000	74,027,000	50,014,000	50,636,000	53,213,000	89,249,000	586,913,000

Option #2 provides a more predictable budget and is managed by an effective maintenance program for vehicles and facilities, complemented by the completion of BCAs to identify condition and future needs. For example, a BCA is currently being completed for the Westney facility to identify 10-year capital needs. Future capital works at this facility are not based on age, but on condition and risk assessment.

While the costs are comparable, the second option is more sustainable from a budgeting and financing perspective, and is anticipated to reduce lifecycle costs.

Figure 4-1 illustrates the two scenarios' year-to-year asset replacement costs, and differences in variability.

Figure 4-1
DRT Asset Replacement



4.5 Procurement Measures

The Region has a purchasing by-law approved by Regional Council to ensure competitive and transparent business processes while continuing to adhere to strong fiscal policies and budgetary practices. The by-law applies to all operations of the Regional Corporation including DRT.

In addition, the Region also considers alternative service delivery options to implement capital projects where appropriate, and has undertaken successful partnerships both with neighbouring municipalities, provincial agencies and through public private partnerships. For example, DRT and GO Transit/Metrolinx continue to have a long-standing relationship with different types of successful partnerships that have benefited both organizations. DRT is also part of the Metrolinx led Joint Bus Procurement

initiative, which is a group of municipal transit systems that purchases buses in bulk thereby providing cost savings.

5. Financing Strategy

5.1 Scope and Process

The financing strategy should outline the suggested financial approach to funding the recommended asset management strategy outlined in the asset management strategy. This section of the Asset Management Plan should include:

- Annual expenditure forecasts broken down by:
    A. Non-infrastructure solutions;
    B. Maintenance activities;
    C. Renewal/rehabilitation activities;
    D. Replacement/disposal activities; and
    E. Expansion activities.
- Actual expenditures in the above-named categories for the last 2 years;
- A breakdown of annual funding/revenue by source;
- Identification of the funding shortfall, including how the impact will be managed; and
- All key assumptions documented.

The financing strategy forecast (including both expenditure and revenue sources) should be prepared, consistent with the Region's departmental budget structure, so that it can be used in conjunction with the annual budget process.

5.2 Potential Funding Options

A wide range of financing options are and will continue to be considered in addressing infrastructure financing requirements, including some specifically earmarked to address the Region's asset management needs.

Funding for asset management primarily comes from Durham property tax, grant funding and user rate payers. Table 5-1 provides a summary of potential infrastructure financing options and related policy and strategy initiatives employed recently by the Region for DRT services.

Table 5-1
Infrastructure Financing Options and Financial Strategy

Financing Options	Description	Financial Strategy
Provincial Gas Tax Revenues	Provincial gas tax funds are provided to municipalities in Ontario to help improve public transit.	In Durham, provincial gas tax funds have been used to fund the DRT bus replacement program, allowing the Region to reduce the average age of the bus fleet from 13 years to 7 years since the upload of transit services in 2006.
Development Charges	Growth-related capital works can be funded through development charges as permitted under the *Development Charges Act* (DCA) legislation. Development charges are imposed on new development to recover the cost of capital for providing services related to transit (GO and DRT) services, on a uniform Region-wide basis.	The Region charges residential and non-residential development charges for all major asset classes to maximize recoveries related to growth infrastructure.
Transit Fares	Transit fares are collected through the sale of fare media including monthly passes, U-Passes, tickets and PRESTO fare media. Transit riders are also able to pay cash fare.	On an annual basis, transit fare revenues have been applied to transit operational expenses.
Property Taxes	Property taxes are levied to support property tax programs on a uniform Region-wide basis.	A portion of property tax revenues are utilized to finance upgrades, rehabilitation and the replacement of infrastructure assets for transit. Property tax revenues are also applied to operational expenses, including maintenance activities.
Debt Financing	The Region utilizes debt financing where appropriate to fund major capital requirements.	For large-scale capital projects, which may require significant up-front financing over a shorter time horizon, debt financing options provide the ability to distribute the costs over a longer time horizon and to current and future users who will benefit from use of the infrastructure asset.

5.3 DRT Financing Strategy

The following table provides the financing strategy to support the 10-year growth related capital program and the cost to replace, rehabilitate and maintain the existing infrastructure plus the incremental costs to maintain the new assets as part of the 10-year capital program. This includes additional financing from development charges to reflect the increase in both the residential and non-residential development charge quantum.

Debt financing will be required for the facilities only. The business plans and budgets re-examines and reprioritizes the capital program on an annual basis to address funding challenges and to leverage any potential grant funding to meet the future needs of the residents and businesses within Durham.

As well, DRT staff undertakes service planning on a regular basis to optimize transit routes to accommodate changing transit demands and provide service to new development areas which can serve to reduce the expansion requirements and future related on-going costs.

Figure 5-1
Asset Management Plan Financing Strategy

	Actual		Budget	Forecast										
Financial Strategy	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2018 - 2027 Total**
Expenditures														
Non-Infrastructure Solutions	94,000	83,000	170,000	55,000	38,000	20,000	2,738,000	2,520,000	2,291,000	3,301,000	2,950,000	2,581,000	2,194,000	18,687,000
Maintenance Activities	15,010,000	15,940,000	15,016,000	17,905,000	19,042,000	20,314,000	23,774,000	25,047,000	26,184,000	28,116,000	29,049,000	30,185,000	31,118,000	250,733,000
Renewal/Rehabilitation Activities	1,660,000	890,000	9,241,000	4,237,000	6,027,000	2,757,000	2,757,000	2,757,000	2,757,000	2,757,000	2,757,000	2,757,000	2,757,000	32,320,000
Replacement Activities	4,620,000	540,000	7,562,000	6,962,000	6,804,000	6,844,000	7,833,000	6,844,000	6,897,000	6,816,000	6,791,000	6,791,000	6,791,000	69,373,000
Disposal Activities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Expansion Activities	4,680,000	18,660,000	2,586,000	9,554,000	10,508,000	62,214,000	10,508,000	11,714,000	35,898,000	9,024,000	9,089,000	10,898,000	46,389,000	215,800,000
Total Expenditures	26,064,000	36,113,000	34,575,000	38,713,000	42,419,000	92,149,000	47,610,000	48,882,000	74,027,000	50,014,000	50,636,000	53,213,000	89,249,000	586,913,000
Financing														
Property Taxes			16,270,000	20,894,000	25,791,000	25,201,000	30,121,000	30,721,000	31,576,000	33,151,000	33,967,000	35,565,000	35,795,000	302,782,000
Development Charges-Residential			23,000	2,489,000	4,931,000	5,496,000	6,215,000	6,679,000	6,189,000	5,783,000	5,649,000	6,325,000	5,294,000	55,049,000
Development Charges-Non Residential			13,000	1,118,000	2,215,000	2,469,000	2,792,000	3,001,000	2,780,000	2,598,000	2,538,000	2,841,000	2,379,000	24,732,000
Ontario Gas Tax Revenue			5,409,000	9,962,000	9,482,000	8,482,000	8,482,000	8,482,000	8,482,000	8,482,000	8,482,000	8,482,000	8,482,000	87,300,000
Debentures			3,725,000	4,250,000	-	50,500,000	-	-	25,000,000	-	-	-	37,300,000	117,050,000
Other			9,136,000	-	-	-	-	-	-	-	-	-	-	-
Total Financing			34,575,000	38,713,000	42,419,000	92,149,000	47,610,000	48,882,000	74,027,000	50,014,000	50,636,000	53,213,000	89,249,000	586,913,000
Funding Shortfall			-	-	-	-	-	-	-	-	-	-	-	-

6. Conclusions

6.1 Region Asset Management Plan Conclusions

Business planning and budget documentation establishes clear links between the management of assets and:

A. Approved Regional Council guidelines, goals and strategies;
B. Compliance standards and community expectations regarding levels of service;
C. Growth demand projections and growth planning policies;
D. Asset life-cycle management;
E. Operating and maintenance programs; and,
F. Annual and long-term financial plans.

The prudent acquisition, construction, maintenance, rehabilitation and replacement or disposal of corporate assets over time enhances asset and financing efficiencies and effectiveness and promotes greater sustainability. Moreover, the plan demonstrates that all the assets are financially sustainable over their full life cycle.

Appendix D - Proposed Durham Transit D.C. By-Law

BY-LAW NUMBER *

OF

THE REGIONAL MUNICIPALITY OF DURHAM

being a by-law regarding development charges for transit services

WHEREAS section 2(1) of the *Development Charges Act, 1997*, provides that council of a municipality may by by-law impose development charges against land to pay for increased capital costs required because of increased needs for services arising from development of the area to which the by-law applies if the development requires one or more of the approvals identified in section 2(2) of the *Development Charges Act, 1997*;

AND WHEREAS a development charge background study has been completed in support of the imposition of development charges;

AND WHEREAS the Council of The Regional Municipality of Durham has given notice and held a public meeting on October 11, 2017, in accordance with section 12(1) of the *Development Charges Act, 1997*;

AND WHEREAS the Council of The Regional Municipality of Durham has permitted any person who attended the public meeting to make representations in respect of the proposed development charges;

NOW THEREFORE THE COUNCIL OF THE REGIONAL MUNICIPALITY OF DURHAM HEREBY ENACTS AS FOLLOWS:

PART I

INTERPRETATION

Definitions

1. In this By-law,

   (a) "Act" means the *Development Charges Act, 1997*, or a successor statute;

   (b) "agricultural use" means lands, buildings or structures, excluding any portion thereof used as a dwelling unit or for a commercial use, used or designed or intended for use for the purpose of a *bona fide* farming operation including, but not limited to, animal husbandry, dairying, livestock, fallow, field crops, removal of sod, forestry, fruit farming, greenhouses, horticulture, market gardening, pasturage, poultry keeping, and equestrian facilities;

(c) “apartment building” means a residential building, or the residential portion of a mixed-use building, other than a triplex, semi-detached duplex, semi-detached triplex, townhouse or stacked townhouse, consisting of more than 3 dwelling units, which dwelling units have a common entrance to grade;

(d) “apartment” means a dwelling unit in an apartment building;

(e) “area municipality” means a lower-tier municipality that forms part of the Region;

(f) “bedroom” means any room used, or designed or intended for use, as sleeping quarters;

(g) “commercial use” means land, buildings or structures used, or designed or intended for use for either or both of office and retail uses as defined in this by-law;

(h) “Council” means the Council of the Regional Municipality of Durham;

(i) “development” includes redevelopment;

(j) “development charges” means charges in regard to transit services imposed pursuant to this By-law in accordance with the Act;

(k) “duplex” means a building comprising, by horizontal division, two dwelling units;

(l) “dwelling unit” means a room or suite of rooms used, or designed or intended for use by one person or persons living together, in which culinary and sanitary facilities are provided for the exclusive use of such person or persons;

(m) “existing industrial building” means a building used for or in connection with,

(i) manufacturing, producing, processing, storing or distributing something,

(ii) research or development in connection with manufacturing, producing or processing something,

(iii) retail sales by a manufacturer, producer or processor of something they manufactured, produced or processed, if the retail sales are at the site where the manufacturing, production or processing takes place,

(iv) office or administrative purposes, if they are,

(A) carried out with respect to manufacturing, producing, processing, storage or distributing of something, and

(B) in or attached to the building or structure used for that manufacturing, producing, processing, storage or distribution;

(n) “farm building” means a building or structure used, or designed or intended for use in connection with a *bona fide* agricultural use and includes barns, silos, and similar structures but excludes a building or structure used, or designed or intended for use for residential or commercial uses;

(o) “garden suite” means a one-unit detached, temporary residential structure containing bathroom and kitchen facilities that is ancillary to an existing residential structure and that is designed to be portable;

(p) “gross floor area” means (except for the purposes of sections 9 and 15), in the case of a non-residential building or structure or the non-residential portion of a mixed-use building or structure, the aggregate of the areas of each floor, whether above or below grade, measured between the exterior faces of the exterior walls of the building or structure or from the centre line of a common wall separating a non-residential and a residential use, and, for the purposes of this definition, the non-residential portion of a mixed-use building is deemed to include one-half of any area common to the residential and non-residential portions of such mixed-use building or structure;

(q) “local board” means a local board as defined in the *Municipal Affairs Act*, other than a board defined in subsection 1(1) of the *Education Act*;

(r) “medium density multiples” includes plexes, townhouses, stacked townhouses, and all other residential uses that are not included in the definition of “apartment building”, “apartment”, “garden suites’, “mobile homes”, “retirement residence units”, “single detached”, “single detached dwelling” or “semi-detached dwelling”;

(s) “mixed-use” means land, buildings or structures used, or designed or intended for use, for a combination of non-residential and residential uses;

(t) “mobile home” means any dwelling that is designed to be made mobile, and constructed or manufactured to provide a permanent or temporary residence for one or more persons, but does not include a travel trailer or tent trailer or trailer otherwise designed;

(u) “non-residential use” means lands, buildings or structures or portions thereof used, or designed or intended for use for other than residential use;

(v) “office use” means lands, buildings or structures used or designed or intended for use for the practice of a profession, the carrying on of a business or occupation or the conduct of a non-profit organization and, for greater certainty, but without in any way limiting the generality of the foregoing, shall include but not be limited to the office of a physician, lawyer, dentist, architect, engineer, accountant, real estate or insurance agency, insurance company, veterinarian, surveyor, appraiser, financial institution, consumer loan company, employment agency, advertising agency, consulting firm, business service, investment company, security broker, mortgage company, medical clinic, contractor, builder, land developer;

(w) “place of worship” means a building or structure or part thereof that is used primarily for worship and is exempt from taxation as a place of worship under the Assessment Act;

(x) “plex” means a duplex, a semi-detached duplex, a triplex or a semi-detached triplex;

(y) “Region” means the Regional Municipality of Durham;

(z) “residential use” means lands, buildings or structures used, or designed or intended for use as a home or residence of one or more individuals, and shall include, but is not limited to, a single detached dwelling, a semi-detached dwelling, a townhouse, a plex, a stacked townhouse, an apartment building, a mobile home, a retirement residence and a residential dwelling unit accessory to a non-residential use;

(aa) “retail use” means lands, buildings or structures used or designed or intended for use for the sale or rental or offer for sale or rental of goods or services for consumption or use and, for greater certainty, but without in any way limiting the generality of the foregoing, shall include, but not be limited to, food stores, pharmacies, clothing stores, furniture stores, department stores, sporting goods stores, appliance stores, garden centres, automotive dealers, automotive repair shops, gasoline service stations, government owned retail facilities, private daycare, private schools, private lodging, private recreational facilities, sports clubs, golf courses, skiing facilities, race tracks, gambling operations, medical clinics, funeral homes, motels, hotels, rooming houses, restaurants, theatres, facilities for motion picture, audio and video production and distribution, sound recording services, self-storage mini warehouses and secure document storage;

(bb) “retirement residence” means a residential building or the residential portion of a mixed-use building which provides accommodation for persons of retirement age, where common facilities for the preparation and consumption of food are provided for the residents of the building, and where each unit or living accommodation has separate sanitary facilities, less than full culinary facilities and a separate entrance from a common hall;

(cc) “retirement residence unit” means a unit within a retirement residence;

(dd) “rooming house” means a detached building or structure which comprises rooms that are rented for lodging and where the rooms do not have both culinary and sanitary facilities for the exclusive use of individual occupants;

(ee) “semi-detached duplex” means one of a pair of attached duplexes, each duplex divided vertically from the other by a party wall;

(ff) “semi-detached dwelling” means a building divided vertically (above or below ground) into and comprising 2 dwelling units;

(gg) “semi-detached triplex” means one of a pair of triplexes divided vertically one from the other by a party wall;

(hh) “service” means the service designated in section 7 of this by-law;

(ii) “single detached dwelling” and “single detached” means a building comprising 1 dwelling unit;

(jj) “stacked townhouse” means a building, other than a plex, townhouse or apartment building, containing at least 3 dwelling units; each dwelling unit separated from the other vertically and/or horizontally and each dwelling unit having a separate entrance to grade;

(kk) “townhouse” means a building, other than a plex, stacked townhouse or apartment building, containing at least 3 dwelling units, each dwelling unit separated vertically from the other by a party wall and each dwelling unit having a separate entrance to grade;

(ll) “triplex” means a building comprising 3 dwelling units.

2. In this by-law where reference is made to a statute or a section of a statute such reference is also deemed to be a reference to any successor statute or section.

PART II

APPLICATION OF BY-LAW — RULES

Circumstances Where Development Charges are Payable

3. Development charges shall be payable in the amounts set out in sections 8 and 13 of this by-law where:

   (a) the lands are located in the area described in subsection 4(1); and

   (b) the development of the lands requires any of the approvals set out in subsection 5(1).

Area to Which By-law Applies

4. (1) Subject to subsection 4(2), this by-law applies to all lands in the Region.

4. (2) This by-law shall not apply to lands that are owned by and used for the purposes of:

   (a) the Region or a local board thereof;

   (b) a board as defined in subsection 1(1) of the *Education Act*; and

   (c) an area municipality or a local board thereof in the Region.

Approvals for Development

5. (1) Development charges shall be imposed upon all lands, buildings or structures that are developed for residential or non-residential uses if the development requires,

   (a) the passing of a zoning by-law or of an amendment thereto under section 34 of the *Planning Act*;

   (b) the approval of a minor variance under section 45 of the *Planning Act*;

   (c) a conveyance of land to which a by-law passed under subsection 50(7) of the *Planning Act* applies;

   (d) the approval of a plan of subdivision under section 51 of the *Planning Act*;

   (e) a consent under section 53 of the *Planning Act*;

   (f) the approval of a description under section 9 of the *Condominium Act*; or

   (g) the issuing of a permit under the *Building Code Act, 1992* in relation to a building or structure.

5. (2) Council has determined that the development of the land to which this by-law applies increases the need for the service designated in section 7.

6. (1) No more than one development charge for the service designated in section 7 shall be imposed on land to which this by-law applies even though two or more of the actions described in subsection 5(1) are required before the land can be developed.

6. (2) Notwithstanding subsection 6(1), if two or more of the actions described in subsection 5(1) occur at different times, additional development charges shall be imposed, if the subsequent action has the effect of increasing the need for services.

Designation of Services

7. (1) The category of service for which development charges are imposed under this by-law is transit.

7. (2) The components of the service designated in subsection 7(1) are described on Schedule "A".

Amount of Development Charges

Residential

8. (1) The development charges described in Schedule "B" to this by-law shall be imposed upon residential uses of lands, buildings or structures, including a dwelling unit accessory to a non-residential use and, in the case of a mixed use building or structure, upon the residential uses in the mixed use building or structure, according to the type of residential unit.

Exemptions

9. (1) In this section,

(a) "gross floor area" means the total floor area, measured between the outside of exterior walls or between the outside of exterior walls and the centre line of party walls dividing the building from another building, of all floors above the average level of finished ground adjoining the building at its exterior walls;

(b) "other residential building" means a residential building not in another class of residential building described in this subsection;

(c) "semi-detached or row dwelling" means a residential building consisting of one dwelling unit having one or two vertical walls, but no other parts, attached to another structure;

(d) "single detached dwelling" means a residential building consisting of one dwelling unit and not attached to another structure.

9. (2) Subject to subsections 9(3) and 9(4), development charges shall not be imposed in respect to:

(a) the issuance of a building permit not resulting in the creation of an additional dwelling unit;

(b) the enlargement of an existing dwelling unit;

(c) the creation of one or two additional dwelling units in an existing single detached dwelling;

(d) the creation of one additional dwelling unit in a semi-detached dwelling, a row dwelling, or any other residential building.

9. (3) Notwithstanding subsection 9(2)(c), development charges shall be imposed in accordance with section 8 if the total gross floor area of the additional one or two dwelling units in the existing single detached dwelling exceeds the gross floor area of the existing dwelling unit.

9. (4) Notwithstanding subsection 9(2)(d), development charges shall be imposed in accordance with section 8 if the additional dwelling unit has a gross floor area greater than:

(a) in the case of a semi-detached or row dwelling, the gross floor area of the existing dwelling unit; and

(b) in the case of any other residential building, the gross floor area of the smallest dwelling unit already contained in the residential building.

Garden Suite

10. (1) The development charges imposed upon a garden suite under section 8 shall be payable at the rate applicable to a one-bedroom apartment.

10. (2) The development charges paid in regard to a garden suite shall be refunded in full to the then current owner thereof, upon request, if the garden suite is demolished or removed within ten years of the issuance of the building permit relating thereto.

10. (3) The onus is on the applicant to produce evidence to the satisfaction of the Region, acting reasonably, which establishes that the applicant is entitled to the refund claimed under this section.

Mobile Home

11. (1) The development charges imposed upon a mobile home under section 8 shall be payable at the rate applicable to an apartment of two bedrooms or larger.

11. (2) The development charges paid in regard to a mobile home shall be refunded in full to the then current owner thereof, upon request, if the mobile home is removed within ten years of the issuance of the building permit relating thereto.

11. (3) The onus is on the applicant to produce evidence to the satisfaction of the Region, acting reasonably, which establishes that the applicant is entitled to the refund claimed under this section.

Retirement Residence Unit

12. The development charges imposed on a retirement residence unit under section 8 shall be payable at the rate applicable to an apartment of one bedroom and smaller.

Non-Residential Uses

13. The development charges described in Schedule "C" to this by-law shall be imposed upon non-residential uses of lands, buildings or structures, and, in the case of a mixed use building or structure, upon the non-residential uses in the mixed use building or structure, according to the gross floor area of the non-residential use.

Exemptions

14. (1) Notwithstanding section 13 of this by-law, development charges shall not be imposed upon non-residential development if the development does not have the effect of creating gross floor area of non-residential development or of increasing existing gross floor area of non-residential development.

14. (2) Notwithstanding the provision of this by-law, development charges shall not be imposed in regard to:

(a) agricultural uses and farm buildings;
(b) places of worship;
(c) public hospitals receiving aid under *the Public Hospitals Act* R.S.O. 1990, c. P.40, excluding such buildings or structures or parts thereof used, designed or intended for use primarily for or in connection with a commercial purpose;
(d) any part of a building or structure used for the parking or loading of motor vehicles;
(e) free standing roof-like structures and canopies that do not have exterior walls.

Exemption for Enlargement of Existing Industrial Building

15. (1) Despite any other provisions of this by-law, if a development includes the enlargement of the gross floor area of an existing industrial building, the amount of the development charge that is payable in respect of the enlargement shall be calculated as follows:

(a) if the gross floor area is enlarged by fifty percent or less, the amount of the development charge in respect of the enlargement is zero;

(b) if the gross floor area is enlarged by more than fifty percent the amount of the development charge in respect of the enlargement is the amount of the development charge that would otherwise be payable multiplied by the fraction determined as follows:

(i) determine the amount by which the enlargement exceeds fifty percent of the gross floor area before the enlargement; and

(ii) divide the amount determined under paragraph (i) by the amount of the enlargement.

15. (2) For the purposes of subsection 15(1) the following provisions apply:

a. the gross floor area of an existing industrial building shall be calculated as it existed prior to the first enlargement of such building for which an exemption under subsection 14(1) was sought;

b. the enlargement of the gross floor area of the existing industrial building must be attached to such building;

c. the enlargement must not be attached to the existing industrial building by means only of a tunnel, bridge, passageway, shared below grade connection, foundation, footing or parking facility, but must share a common wall with such building.

15. (3) In this section “gross floor area” means the total floor area, measured between the outside of exterior walls or between the outside of exterior walls and the centre line of party walls dividing the building from another building, of all floors above the average level of finished ground adjoining the building at its exterior walls.

Reduction of Development Charges For Redevelopment

16. (1) Despite any other provision of this by-law, where, as a result of the redevelopment of land, a building or structure existing on the land within ten years prior to the date of payment of development charges in regard to such redevelopment was, or is to be demolished, in whole or in part, or converted from one principal use to another, in order to facilitate the redevelopment, the development charges otherwise payable with respect to such redevelopment shall be reduced by the following amounts:

a. in the case of a residential building or structure, or in the case of a mixed-use building or structure, the residential uses in the mixed-use building or structure, an amount calculated by multiplying the applicable development charge under section 8 of this by-law by the number, according to type, of dwelling units that have been or will be demolished or converted to another principal use; and

b. in the case of a non-residential building or structure or, in the case of a mixed-use building or structure, the non-residential uses in the mixed-use building or structure, an amount calculated by multiplying the applicable development charges under section 13 of this by-law by the gross floor area that has been or will be demolished or converted to another principal use;

provided that such amounts shall not exceed, in total, the amount of the development charges otherwise payable with respect to the redevelopment.

16. (2) The ten year period referred to in subsection 16(1) of this by-law shall be calculated from the date of the issuance of the first demolition permit.

16. (3) Development charges shall not be reduced under this section where the building or structure that is to be demolished or has been demolished or converted from one principal use to another was, or would have been, exempt from development charges under this by-law.

16. (4) The onus is on the applicant to produce evidence to the satisfaction of the Region, acting reasonably, which establishes that the applicant is entitled to the reduction in the payment of development charges claimed under this section.

PART III

ADMINISTRATION

Timing of Payment of Development Charges

17. Development charges, adjusted in accordance with section 21 of this by-law to the date of payment, are payable in full on the date on which a building permit is issued with respect to each dwelling unit, building or structure.

18. Notwithstanding section 17, Council, from time to time, and at any time, may enter into agreements in accordance with section 27 of the Act which provide for all or any part of a development charge to be paid before or after it would otherwise be payable.

Payment by Services

19. Notwithstanding the payments required under section 16, the Region may, by agreement pursuant to section 38 of the Act, permit an owner to provide services in lieu of the payment of all or any portion of a development charge. The Region shall give the owner who performed the work a credit towards the development charge in accordance with the agreement subject to the requirements of the Act.

Front-Ending Agreements

20. Council, from time to time, and at any time, may enter into front-ending agreements in accordance with the Act.

Indexing

21. Development charges imposed pursuant to this by-law shall be adjusted annually, without amendment to this by-law, as of the 1st day of July, 2019, and on each successive July 1st date in accordance with the Statistics Canada Quarterly, *Construction Price Statistics*, catalogue number 62-007, for the most recently available annual period ending March 31.

Schedules

22. The following schedules to this by-law form an integral part thereof:

Schedule "A"	—	Components of Service Designated in section 7
Schedule "B"	—	Residential Development Charges
Schedule "C"	—	Non-Residential Development Charges

Date By-law in Force

23. This by-law shall come into force on January 1, 2018.

Date By-law Expires

24. This by-law will expire five years from the date it comes into force, unless it is repealed at an earlier date by a subsequent by-law.

Registration

25. A certified copy of this by-law may be registered on title to any land to which this by-law applies.

Severability

26. In the event any provision, or part thereof, of this by-law is found by a court of competent jurisdiction to be *ultra vires*, such provision, or part thereof, shall be deemed to be severed, and the remaining portion of such provision and all other provisions of this by-law shall remain in full force and effect.

Short Title

27. This By-law may be cited as the Regional Municipality of Durham Transit Development Charges By-law, 2017.

BY-LAW read and passed this 13th day of December 2017.

Roger Anderson, Regional Chair and CEO	Ralph Walton, Regional Clerk / Director of Legislative Services

SCHEDULE "A"

DESIGNATED REGIONAL SERVICE AND SERVICE COMPONENTS THEREUNDER

CATEGORY OF REGIONAL SERVICE	**SERVICE COMPONENTS**
Transit	• Conventional and specialized buses and non-revenue vehicles expansion and related equipment (e.g. fareboxes, radio's, Presto, etc.) • New facilities, transit hubs, control centres, lands, buildings and related equipment • On road amenities (e.g. hard surface stops and shelters) • System improvements • Studies

SCHEDULE "B"

RESIDENTIAL DEVELOPMENT CHARGES EFFECTIVE JANUARY 1, 2018 — $ PER DWELLING UNIT BY TYPE

			APARTMENTS	
SERVICE CATEGORY	**SINGLE DETACHED & SEMI-DETACHED DWELLINGS**	**MEDIUM DENSITY MULTIPLES**	**TWO BEDROOMS & LARGER**	**ONE BEDROOM & SMALLER**
Regional Transit	$1,143	$919	$664	$431

NOTE: The development charges described above shall be adjusted annually pursuant to section 21 of this By-law.

SCHEDULE "C"

NON-RESIDENTIAL USE DEVELOPMENT CHARGES
EFFECTIVE JANUARY 1, 2018
$ PER SQUARE FOOT OF GROSS FLOOR AREA

SERVICE CATEGORY	Non-Residential Use
Regional Transit	$0.54

NOTE: The development charges described above shall be adjusted annually pursuant to section 21 of this By-law.