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REPORT
Meeting Date: 2017-10-26
Regional Council

For Information

DATE: October 12, 2017

REPORT TITLE: **FINANCIAL POLICY & TECHNICAL INPUTS FOR 2041 GROWTH BASED DEVELOPMENT CHARGES BY-LAW UPDATE**

FROM: Stephen VanOfwegen, Commissioner of Finance and Chief Financial Officer

OBJECTIVE

The objective of this report is to give Council an update on the review of financial policy and technical inputs that will be used to inform the next Development Charge By-law for growth to 2041.

REPORT HIGHLIGHTS

- This report provides an update on the financial policy and technical inputs for the Region of Peel's (Region) 2041 growth based Development Charges (DC) By-law. The financial elements discussed in this report are one component of the Region's Growth Management Strategy program established to implement an integrated approach to planning, servicing and financing growth in consultation with key stakeholders including local municipalities and representatives of the building industry.
- Positive progress has been made through the Growth Management Strategy in identifying financial efficiencies related to updated water and waste water design criteria, growth scenarios that efficiently utilize existing infrastructure and the earlier collection of development charges resulting in expected reductions and deferrals of over $0.5 billion in growth related costs.
- Since the enactment of the Region's 2015 DC By-law, the Province has made amendments to the *Development Charges Act (Act)* which, combined with Regional Council's Growth Management Strategy objectives, are driving the need to review financial policies and technical inputs related to future DC rate calculations and by-law updates.
- As required by the *Act*, analysis was undertaken to allow consideration of the use of area rating techniques for the next DC By-law update. The analysis indicated that area rating would have several disadvantages and not generate any more overall revenue for the Region.
- The preliminary area rate analysis also indicated that, there would be a rate increase of approximately 6% for residential development in greenfield areas, and a rate decrease of 4% in built boundary areas. That would shift approximately $182 million in cost from built boundary residential development onto greenfield residential development over the 25 year planning horizon.

- Based on this analysis it is staff's intent to continue the current use of municipal wide DC rating techniques as the basis of the next DC By-law update. This will be included in the Background Study that supports the next DC By-law.
- In addition to a consideration of area rating, approximately 15 other technical and financial items have been the subject of ongoing review and discussions with representatives of the local municipalities and the development industry through the Growth Management Strategy work.
- Common ground regarding an approach for the next DC rate calculation and Bylaw update has been identified for a number of these technical and financial items and dialogue on the remaining items will continue over the coming months. The scope of these discussions to date and possibly going forward has been partially restrained pending the ongoing appeal to the Ontario Municipal Board of the 2015 DCs By-law.
- Based on the proposed direction on area rating and the results of the ongoing review of the other technical and financial items, work will continue towards the update of the DC Background Study and By-law in coordination with the planning and servicing elements of the Growth Management Strategy.

DISCUSSION

1. Background

Peel Growth Management Program and Term of Council Priority

This report provides an update on the financial policy and technical inputs for Peel's 2041 growth based DC By-law. The financial elements discussed in this report are one component of the Region's Growth Management Strategy program. The Region's Growth Management Committee was established in the Fall of 2013 to address the key issues regarding managing growth in Peel. Staff from the Planning, Water and Wastewater, Transportation and Corporate Finance divisions have been working together to achieve the Program's objectives. Key aspects to the new approach include:

i) The Region needs to reduce the growth cost-revenue gap;
ii) The Region needs to integrate financing and servicing considerations into planning decisions early in the process;
iii) Together with the local municipalities and the development sector, the Region needs to be more agile in its approach to the changes and uncertainty that accompany growth and development; and,
iv) The Region needs to adopt a growth-focused, risk-based financing strategy.

The endorsement by the Growth Management Committee of this new approach and its milestones and timelines transitioned the Growth Management Program to be more internally and externally collaborative, integrated, transparent, and agile. It has become known as the new approach to growth management.

The new approach to growth management has been implemented through formal working groups established with local municipal staff and the development industry; and an interdisciplinary Growth Management Core Team which includes Regional staff representation from Corporate Finance, Water and Wastewater, Planning, and Transportation divisions.

Growth Management and the Evolution of Financial Strategy

The Growth Management Program and Term of Council Priority were initiated partly in response to growing concerns about financial risk to the Region associated with substantial growth related infrastructure debt accumulated in recent years. Prior to 2010 the Region was able to finance its growth related capital plan on a "pay as you go basis", based on the collection of DCs and using excess capacity that existed in the Regions infrastructure. Due to the legislative requirements underpinning the DC rate calculations, the use of this excess capacity resulted in lower DC rates. This historical excess capacity has now been completely utilized and DC rates have subsequently increased. Since 2010 the Region has required external borrowing to maintain overall corporate liquidity while dealing with the timing gap between DC collections and growth infrastructure driven capital requirements.

This gap has come to be referred to as the "cost–revenue gap". Managing and eliminating this gap over the planning horizon is a key outcome of the Growth Management Term of Council Priority. Projections generated as part of the DC By-law updates prepared in 2012 and 2015 forecast that this cost-revenue gap would increase to almost $2 billion over the planning horizon to 2031.

At the end of 2016 the cost-revenue gap was $1.15 billion. This amount represents the current cumulative net debt position of the growth management program. The details of this amount are included in the following table.

Cost Revenue Gap Components	**Dollars in billions**
Gross Debt Issued for Growth Related Expenditures	$1.42
Less : Principal Reductions Already Made on Debt Issued	$0.17
Net Remaining Growth Related Debt	$1.25
Less: Cash Balance of DC Reserves	$0.10
2016 Cost Revenue Gap	**$1.15**

This 2016 cost-revenue gap is approximately $0.6 billion lower than forecast in the 2012 DC Background Study for 2016. This improvement was a result of changes made to the Regions financial approach under the direction of the Growth Management Committee and Council. These changes have been guided by the principles ensconced in the Regions Long Term Financial Planning Strategy and Integrated Planning Framework. Active management of the cost–revenue gap will continue as part of the new approach to Growth Management.

Some examples of positive financially impactful changes that have been made include:

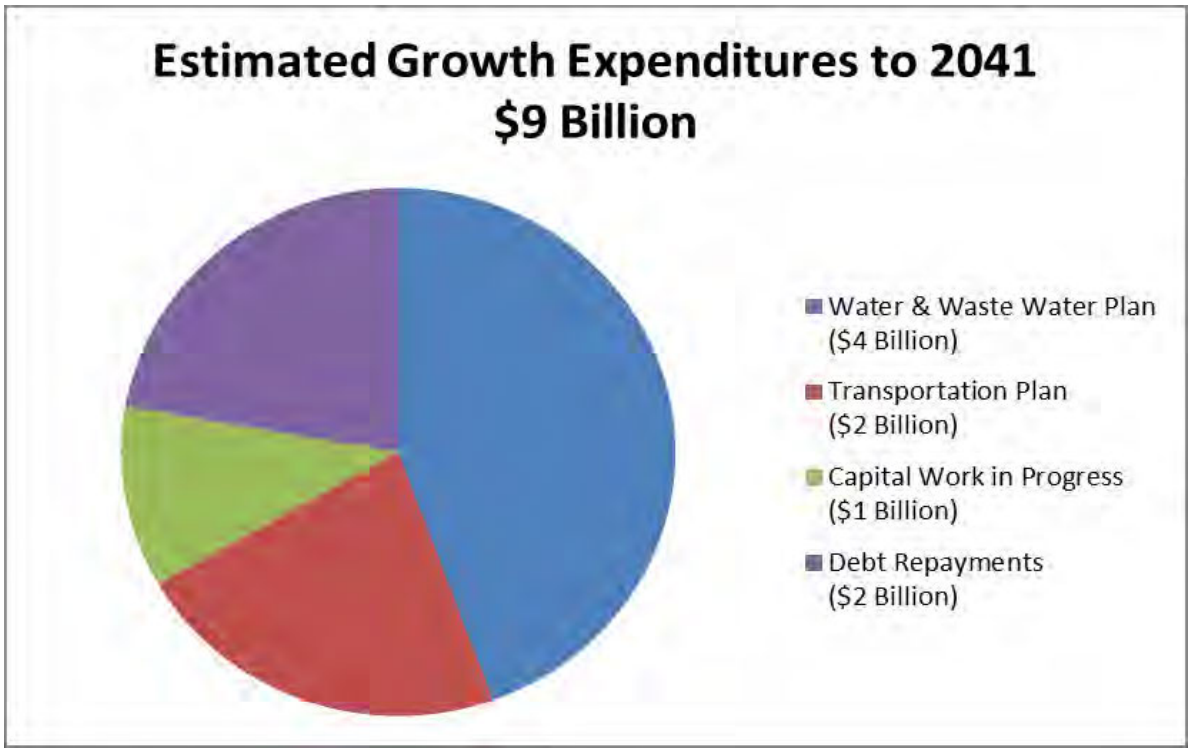
- Earlier collection of most residential DCs at time of subdivision agreement instead of building permit issuance (Reduction to cost revenue gap of $0.1 billion)
- Enhanced expenditure management (Reduction in cost-revenue gap from 2012 forecast of $0.5 billion)

- Annual DC Rate adequacy monitoring to trigger by-law updates when a 20 per cent rate increase is anticipated (DC Rate increases since 2012 have generated $0.5 billion)

Better integration of the planning, servicing and financial considerations of growth are paramount to the success of the Growth Management Term of Council Priority. The work of the Growth Management Strategy has revealed that changes made to financial strategies in isolation cannot achieve a significant reduction in the cost-revenue gap. Earlier integration of the planning process with servicing cost analysis is necessary to ensure that potential financial efficiencies resulting from the more efficient use of existing and planned Regional infrastructure can be identified.

The consideration of different growth scenarios and their associated capital cost as inputs into determining, with stakeholders, the growth allocation early on in the process is an example of where improvements in integration are already occurring.

The preliminary cost estimates for these different growth scenarios varied, but all were in excess of $9 billion. The following chart gives an approximation of the capital costs that the Region will have to incur to provide growth related services based on the Provincial growth allocations to 2041.



While the final cost estimates will directly impact the ultimate cost-revenue gap and debt forecast, the financial policy and technical inputs that are the subject of this report will also have impacts on the expected cost-revenue gap. Some of them will not change the cost-revenue gap expected for the Region but could redistribute the costs of development between land owners in different areas and between categories of development.

2 Consideration of Area Rating for Development Charges

In 2015 the Province enacted several changes to the *Act* that came into force on January 1st, 2016. One of these changes was a requirement for Council to consider the use of DC area rating prior to enacting a new DC By-law. The final decision on whether or not to apply DC area rates still rests with Council. The *Act* outlines that municipalities can collect DCs on either a municipal wide or area specific basis, or a combination of the two.

Since these changes to the *Act* were enacted reports and presentations on the impacts of area rating have been made to Regional Council and the Growth Management Committee. There have also been discussions about area rating with the development community and the local municipalities. The input from these groups was taken into account in this review. The following is a brief description of the main characteristics of area rating.

Municipal-Wide Development Charges (current approach)

With the municipal-wide approach, the overall cost of growth infrastructure in the municipality is pooled and the cost is recovered by applying a uniform development charge rate for services provided anywhere in the municipality. Based on factors such as the distance of service/infrastructure from planned development, the cost of servicing some areas in the municipality may be higher compared to other areas in the jurisdiction.

The majority of Ontario municipalities have established uniform, municipal-wide development charges. This approach provides more flexibility to funding growth-related capital projects. In addition, the risks of specific projects varying from budget and or timelines is spread across the entire region. This is useful since it is challenging to accurately estimate costs years in advance given the many factors that change from initial cost estimation to project completion. The Region has always applied uniform, municipal-wide development charges rates with some limited exceptions for police services in the Town of Caledon.

Area-Specific Development Charges (now required to be considered)

With the area specific approach, the capital costs of specific services are attributed to the planning areas that will be serviced by the infrastructure. This facilitates the recovery from specific areas of a more accurate representation of the cost of providing a service or services to those areas. Area specific development charges (ASDCs) are most often considered if costs to service a specific area are known to be materially higher in one area than in the rest of the region.

To support this approach, separate reserves are set up for the defined areas and DC rates are calculated to correspond to the relative cost of providing infrastructure to service that area. This results in a more specific distribution of costs among developers, compared to the municipal-wide approach. The overall amount that the Region can collect through DCs is restricted by the *Act* to a certain set of expense types for a defined group of services. The total amount collected through either municipal wide or area specific DCs cannot exceed this overall amount, therefore using ASDCs will not generate more funds overall for the Region. ASDCs simply shift the financial burden between different areas in the municipality and groups of developers, resulting in some paying more and some paying less based on an understanding of costs at a point in time.

Area rating is sometimes considered to support more efficient land use and intensification. It is generally thought that higher DC rates in greenfield development would discourage this type of development. How much of an impact this would have on development patterns is difficult to quantify however and conclusive evidence in this regard is not available.

Analysis of Area Rating in the Peel Context

Any area rating approach that is potentially implemented must be defensible as it will be subject to external stakeholder scrutiny and appealable at the Ontario Municipal Board (OMB). With this in mind the water and waste water capital plan for infrastructure required to 2041 has been analysed for potential area rating. The water and waste water capital plan is the largest component of the growth capital program and by its nature it is easier to assign its benefits to specific areas in a defensible manner. This is different from the roads network that is essentially open, which makes it very difficult to assign the benefit of infrastructure to specific areas in a defensible manner. Given this, transportation costs and costs for projects that have already been approved and are underway with region-wide financing would continue to be collected for on a region-wide basis.

Several alternative approaches to area rating the water and waste water capital plan to 2041 were considered. In the end an approach similar to what has been used by the Region of Halton to segregate the charges for water and waste water between greenfield development and development within the built boundary was selected for further analysis. This preliminary work included mapping different potential areas for rate analysis. This work was done with input from GM BluePlan Engineering Limited (BluePlan) who have experience in area rating for other clients including the Region of Halton.

It should be emphasized that this analysis was undertaken using preliminary draft growth allocations and the preliminary water and waste water capital cost estimates associated with that growth allocation. This analysis indicated that there would be a higher charge for greenfield development if area rating was applied to the water and waste water capital plan to 2041, but the per unit variance is relatively small. The potential area rating approach would result in greenfield rates that are approximately six (6) per cent higher, and built boundary rates that are four (4) per cent lower, than the current municipal wide approach.

The following table summarizes the financial impact from the analysis. Full details of the analysis are included in Appendix I.

Illustration of Potential Area Rating Impact on Development Charges

Based on Single/Semi Detached Charge in Thousands

	Municipal Wide (Current Approach)	Greenfield (Potential Area Rate approach)	Built Boundary (Potential Area Rate Approach)
Development Charge per Unit	**$50**	**$53**	**$48**

It should be emphasized that this analysis is not attempting to calculate what the new total development charge will be once all the information related to the 2041 growth forecast is known and finalized. It is meant to show the relative magnitude of the expected difference between greenfield and built boundary area rates using the existing DC rates as a base to provide a sense of scale.

Based on the potential reduction to DC rates from the analysis it is anticipated that the lower rates could decrease DCs charged to residential development in the built boundary area by approximately $182 million, or an approximate 10% shift, over the 25 year planning horizon. These costs would be shifted to residential development in the greenfield development areas. There would be no overall impact on the Regions total DC collections as a result.

The issue of an area rating verses a municipal wide Regional rate have been included in the discussions with the Local Municipalities, and BILD. The policies in the Provincial Growth Plan will direct the balance between greenfield and intensification growth over the next 25 year planning period, and would not be materially enabled by adopting an area rating Peel's next DC Background Study and By-law update. The following items were taken into consideration in coming to this decision:

- The per unit dollar variance for higher DC's outside of the built boundary is not anticipated to discourage greenfield development and limit sprawl;
- Area rating will not generate any more DC revenue for the Region in the aggregate;
- Area rating could limit the Region's future financial flexibility to absorb cost fluctuations across the entire development base;
- A switch to area rating could result in unintended consequences given the complexity of the systems potentially being altered after decades of use on a municipal wide basis;
- It could expose the Region to more OMB appeals based on the new assumptions behind any new area rating system; and,
- It is not expected that any per unit DC rate reductions in the built boundary areas would result in lower housing prices.

Continuing to use municipal wide DC rating as part of Peel's next DC Background Study and By-law update would not preclude Council from choosing to implement area rating in subsequent DC updates, should circumstances change.

A "one-off" or "stand-alone" area rating by-law could also be considered in the future if it is strategically desirable in dealing with specific development applications. This would include development applications that require infrastructure that was not included in the infrastructure plan being prepared to support the proposed growth allocations. This would be a part of potential development exception management in the future.

Technical Inputs and Financial Policy Review Process

In addition to the consideration of area rating that was mandated by the Province several other technical input and financial policy items are in different stages of review. These items would all have a direct or indirect impact on the next DC update process. A full listing of these items is included as Appendix II.

These items are grouped into three broad categories as follows:

- Parked Items from 2015 DC Background Study;
- New DC Act Requirements Resulting From Bill 73; and,
- Other Optional Technical and By-law considerations.

Parked Items From 2015 DC Background Study

These items were all raised by BILD in the 2015 DC Background Study review process. As they were complicated matters that needed more review than time allowed in 2015 the Region committed to having further discussions about these items prior to the next DC By-law update.

To this end policy papers for these items have been developed with the assistance of Watson and Associates Ltd. These papers are attached as Appendix III.

Some of the items in this group are the subject of an appeal of the Regions 2015 DC Bylaw at the OMB. While BILD did not appeal the 2015 DC By-law it was appealed by individual land owners. A final decision on this appeal is not expected until sometime in 2018. This has limited the exchange of information that can occur between BILD and the Region for these technical items that are the direct subject of the OMB hearings being held. Discussions on these items will continue with these restrictions in mind.

New *Development Charge Act* Requirements Resulting From Bill 73

These items are all mandated by the Province as a result of legislation enacted in 2015 that came into force January 1, 2016. One of these items is the mandatory consideration of area rating that has already been discussed earlier in this report.

Details on the new *Act* Requirements are included in Appendix II.

Other Optional Technical and By-law Considerations

The items in this category have come to the attention of staff since the passing of the last DC By-law in 2015 as matters that are best addressed through updates to the DC By-law and Background Study. Details of these items are included in Appendix II.

RISK CONSIDERATIONS

The task of providing the infrastructure to allow the Region to grow to a population of nearly two million by 2041 will cost the Region more than $9 Billion according to preliminary estimates. In many cases the investment in infrastructure will come before the collection of DCs intended to pay for this spending. Through the growth management work to date great attention has been applied to analysing the connection between potential growth patterns that could be used to achieve the provincial growth targets and the corresponding infrastructure investment plans. This was done with the intention of assuring that through the efficient use of existing infrastructure and the phasing and staging of future infrastructure construction the cost-revenue gap for growth could be minimized.

Given the inter-relation of the growth patterns and the financial plans, risks to achieving the growth targets can easily manifest themselves as risks to the financial plans associated with growth. Recent trends in development at the Region that could represent risks to the growth Plan to 2041 include:

- Slower than anticipated non-residential development (primarily industrial) influenced by changes to the nature of employment; and,
- Slower than anticipated high density development (apartment construction).

Recent DC revenue has come primarily from ground level residential greenfield development. The proposed growth allocation in the Growth Management Regional Official Plan Amendment (ROPA) that Council is now considering assumes that over the planning horizon there will be a shift and the majority of development that will occur will be infilling, primarily in apartment construction, and that the jobs targets established in the growth plans will be met.

One item where staff and BILD representatives have not reached consensus is the concept that a part of the costs related to supplying the capital infrastructure for growth be funded by sources other than DCs. Specifically that infrastructure to support growth that may be at risk of not materializing within the planning horizon (i.e. a portion of planned employment growth) be paid for from property taxes and utility rates. BILD representatives have made this suggestion through the Development Industry Workgroup. Staff are not suggesting that Council follow the approach proposed by BILD to have specific costs of growth funded from non-DC sources. This would be counter to the long standing Regional principle that growth should pay for growth.

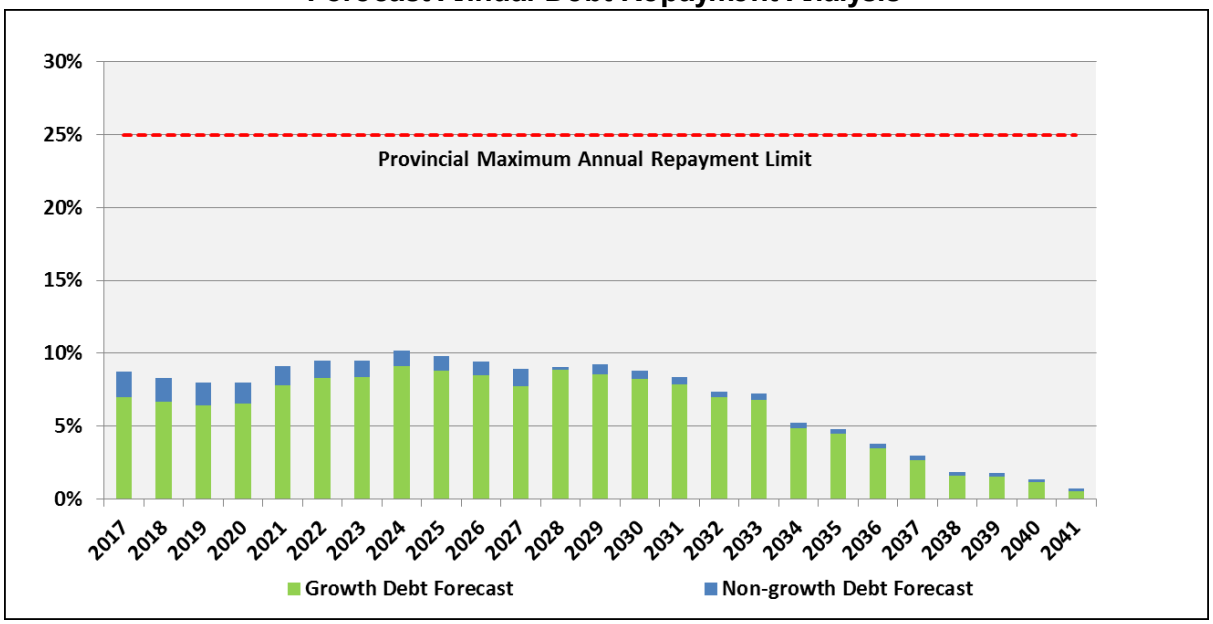
Ultimately if there is a shortfall in DC collections that results in a stranded debt, then that debt would have to be serviced by non-DC sources. However, it is not certain that this will occur, so taking steps to have existing tax and rate payers begin paying for growth is premature. Strategies on fostering employment and high density development, including future transportation requirements are underway to help ensure that such a shortfall does not occur. Staff will continue to explore strategies with BILD such as strategically planning infrastructure costs and timing to reduce risk of stranded debt. In addition, an ongoing monitoring program to continuously evaluate growth, infrastructure and financial progress and plans will be fundamental to managing such risk.

Preliminary Debt Forecast

Based on the proposed growth allocations being considered as part of the ROPA, and the preliminary cost estimates provided for water, waste water and transportation services benchmarked against recent DC spending trends, a preliminary debt forecast has been developed.

A key benchmark for municipal debt is the provincially legislated Annual Repayment Limit (ARL). The Province has legislated that no municipality may incur debt that creates annual repayment requirements in excess of 25 per cent of its own source revenue without the approval of the Province. As at 2016 the Region's annual debt repayments were eight (8) per cent of its own source revenue. Current projections are that the maximum repayment level would be 10 per cent of the Regions projected own source revenue and be well under the Provincial benchmark. Based on the preliminary debt forecast data the maximum growth related annual debt repayments over the planning horizon would be $210 million in 2029. Details of the annual debt repayment forecast are shown in the following chart:

Forecast Annual Debt Repayment Analysis



Since this analysis is based on preliminary costings, and the exact timing of these projects has not yet been determined, this forecast will be subject to updating once final servicing plans with more accurate costing and timing have been developed. This updated analysis will be available when Council gives consideration to the final servicing master plans expected to occur in 2018.

The underlying debt profile that drives this ARL analysis assumes that the gross growth related debt would increase from $1.4 billion to $2.5 billion by 2029. The net debt and cost-revenue gap would not actually reach the gross amount of $2.5 billion since payments for principal reductions would occur in the years leading up to 2029.

FINANCIAL IMPLICATIONS

Some of the technical inputs discussed in this report have no impact on how much the Region will collect from development charges in total. These include the items around area rating and the methodologies to allocate growth costs between different sectors, such as residential and non-residential. Decisions around these items will shift the development related costs between different land owners and developers.

Other technical inputs under review could result in a higher portion of the costs being borne by the Region through property tax and utility rates than by the development community through development charges. An example of this is the benefit to existing methodology technical discussion.

The most significant financial implication of the growth program however would not come from items that shift the burden of cost between the Region and the development industry, or within different sectors of the development industry. The most significant impact would be if a material portion of the debt taken on by the Region that was intended to be paid for through the collection of development charges had to be paid for through non-development charge sources

such as the property tax or utility rate bases. If this occurs the financial impact could be significant.

The annual repayment amount, including principal and interest, for existing growth related debt is $107 million. If sufficient development charges were not available to pay for this debt then these amounts would have to be funded from other sources. The Region has limited revenue sources so the eventual impact would likely be absorbed by the property tax or utility rate bases. To avoid this it will be necessary to continue the work that has begun to develop a strategy to promote economic growth in the Region, with transportation and transit being key components to support both economic growth and denser high rise development in the future.

Next Steps

Based on Council direction, the ongoing discussions with BILD, and the results of the OMB hearing on the 2015 DC By-law, work will continue towards the timelines of the Growth Management Strategy. Assuming all other elements of the Growth Management Strategy occur on schedule then a new DC By-law could be considered by Regional Council in July of 2018.

The capital plan associated with the servicing master plans for water, waste water and transportation will be informed by the technical items parked from the 2015 DC Bylaw update approaches as described in this report.

The remaining technical inputs will be the subject of ongoing discussions with the area municipalities and development industry leading up to the next DC By-law update.

Development Monitoring and Exception Control

To fully realize the benefits of the work done to date as part of the Growth Management Strategy it will be necessary to enhance the Region's approach to the ongoing monitoring of development and the managing of development requests that deviate from the plans underlying the growth allocations to 2041.

The development cycle, from the establishment of provincial policy direction to the actual building out of developments, is long and complicated. There are several checkpoints in this cycle that will generate opportunities to collect data on how and when growth is expected to proceed. This monitoring will be multi-faceted and serve many purposes including, cash flow revenue estimating, detecting trends that could change the timing of infrastructure spending and monitoring the Regions progress towards reaching targets in the Provincial Growth Plans and the Regional Official Plan.

Monitoring already occurs at the Region, however for the purpose of more closely understanding how the growth forecast and subsequent DC revenue are materializing, it needs to be strengthened. A more consolidated and rigorous approach could be developed.

It should be noted that the Region relies on the local municipalities for much of its development related data. For this enhanced monitoring initiative to be successful the Region will need to build on, and improve existing data sharing from the local municipalities.

This enhanced monitoring will also help to identify development applications that could cause changes to the Regions infrastructure plans that increase overall spending or accelerate the

need to spend for growth related infrastructure. Applications such as this could cause increases to the cost-revenue gap that work against the desired outcome of the Growth Management Term of Council Priority.

To help control the impact of these potential plan exceptions strengthened wording has been added to the Official Plan through the Growth Management ROPA to make clear Councils intent to consider the use of financial tools to mitigate any negative financial impacts or to simply deny such applications based on their specific planning characteristics. The financial tools to be considered would include front end financing, and area rating for specific circumstances.

This approach to handling future development applications that could deviate from the approved infrastructure plan represents a "Made in Peel" solution. The approach to servicing development that has been used by Peel has resulted in a flexible and efficient water and waste water system, as evidenced by the low user rates that the Region has for its water and waste water clients. This approach to reviewing future development requests will enable the continuation of this efficient development of the Region.

CONCLUSION

To respond to changing legislative and administrative requirements it is necessary to review several technical inputs and financial policy items related to the DC Background Study and DC By-law. This review is well underway and is being done in conjunction with external stakeholders including BILD.

Stephen VanOfwegen, Commissioner of Finance and Chief Financial Officer

Approved for Submission:

D. Szwarc, Chief Administrative Officer

APPENDICES

Appendix I - Area Specific Development Charge Sensitivity Analysis
Appendix II - Table of Technical Inputs and Financial Policies Under Review
Appendix III - Discussion Paper for Consultation with the DIW & IMW

For further information regarding this report, please contact Adrian Smith, Acting Director Growth Management Strategy, ext. 4047, adrian.smith@peelregion.ca.

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APPENDIX I
DC TECHNICAL & POLICY UPDATE

Area Specific Development Charge Sensitivity Analysis

August 2, 2017

Area Specific DC Options – Summary Memo

Approach 1 – Single Region-Wide DC

The Region of Peel currently applies a single Region-wide DC. There is currently no further calculation for separate DCs by geographic area or type of development other than within residential and non-residential categories. On this basis, the calculation for servicing costs is completed for the entire system and not further analyzed for area specific costs. The current Region-wide DC is considered Approach 1.

Other Options have been considered for area specific DC calculations as noted below:

Approach 2 – Greenfield/Intensification

Approach 2 Area Specific DC calculation has been developed based on 2 separate area charges: 1.) Greenfield; 2.) Intensification.

To support this approach, key elements of the capital program review are as follows:

1. Provide DC program categorized:
    a. Capacity – system-wide
    b. Distribution/Collection Greenfield
    c. Distribution/Collection Intensification
2. For Area 1 Greenfield, the DC rates would be based on the capital program related to a + b
3. For Area 2 Intensification, the DC rates would be based on the capital program related to a + c

a. Capacity

This component includes projects that are related to City-wide needs of water supply/treatment and wastewater treatment. This category also includes projects that support the transfer/conveyance of capacity and the deferral/elimination of the need for critical treatment plant expansions.

Projects included in this definition are:

- Studies
- Projects related to plants
- Plant expansions

- Major pumping and storage facilities servicing broader service areas
- Major transmission and collection trunk pipes servicing broader service areas
- Wet weather program and system upgrades and control

b. Distribution/Collection – Greenfield

This component includes projects that are directly related to support growth outside the current Urban Built Boundary and within the Region of Peel Approved Urban Boundary (2041).

Projects within this category include:

- Infrastructure located in Greenfield service areas
- Infrastructure located within the built boundary that convey flow from/to future growth areas

The type of infrastructure in this category includes, but is not limited to pipes, pumping stations and storage facilities.

c. Distribution/Collection – Built Boundary

This component includes projects that are related to support growth within the current Urban Built Boundary only as defined under the Places to Growth process. This includes growth out to 2041 associated with infill within the Urban Built Boundary as well as intensification within specific areas such as the Urban Growth Centres (UGCs) and growth corridors.

Projects within this category include:

- Infrastructure located within the Urban Built Boundary
- Infrastructure servicing only infill growth and intensification within the Urban Built Boundary
- Infrastructure identified under the Urban Growth Centres (UGCs) and corridors servicing reviews

Approach 3 – Clusters

Approach 3 is a slightly more detailed version of Approach 2. Approach 3 was developed in order to recognize the increases in costs associated with servicing growth in different geographic areas. In general, as growth extends further from Lake Ontario, the costs to service that growth may escalate. This is due to the need for more infrastructure to move water/wastewater a longer distance from/to the treatment facilities. There are also unique servicing considerations that can increase costs for a given area (e.g. establishing a new water pressure zone or trunk main replacement within a built-up area).

For water servicing, this approach accounts for a portion of the upstream infrastructure costs (e.g. growth in Zone 7 will pay a portion of costs for any growth related upgrades within Zone 1 through 6. Similarly, for wastewater servicing, the approach accounts for a portion of the

downstream infrastructure costs (e.g. trunk sewer twinning, SPS upgrades, WWPT upgrades, etc.). The same approach is applied to a given cluster regardless of whether the growth is classified as "intensification" or "greenfield". Examples of the cluster locations are:

- Bolton
- Northwest Brampton
- Northeast Brampton
- Mayfield West
- Mississauga City Centre

Approach 4 – Zone Boundary

Approach 4 is a variation of the geographically based calculation of the charge. Within this approach the charge is calculated relative to each water pressure zone boundary. The Region is made up of several pressure zones, some of which are projected to have little to no growth, others will experience significant growth. The servicing costs for Approach 4 can be calculated based on the infrastructure required by zone. A similar approach can be taken for wastewater by WWTP drainage area.

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Other Considerations

- All other DC policy such as Post Period Benefit (Out of Bylaw) and Benefit to Existing would still apply
- For the Distribution/Collection – Built Boundary projects, the Benefit to Existing would have application given that most of these projects are within the existing service area and are to be coordinated with existing infrastructure.

Approach	Advantages	Disadvantages
Option 1: Region-wide	• Simple and efficient calculations • Recognizes integrated nature of the servicing systems	• Does not recognize subtleties of servicing and costs in different areas • Requires that DC consider any incentives as part of policy and specific applications
Option 2: Greenfield and Intensification	• Relatively simple categories for calculation • Still recognizes integrated nature of the servicing systems • More clearly identifies separate costs related to Greenfield and Intensification • Incentives could be applied to specific categories within the calculation	• Creates an offset for costs between categories (if one cost is lower, the other is higher)
Option 3: Clusters	• Can more accurately capture the true infrastructure costs for servicing growth in a given area • Could result in increased intensification due to potential lower cost of servicing	• Complex and time consuming calculations • May be cost prohibitive to service certain areas with extensive infrastructure needs • Historically, all areas shared the total cost which enabled relatively inexpensive extension of infrastructure to the north. This approach may prevent growth in planned greenfield growth areas and over emphasize intensification
Option 4: Zone Boundary	• Similar advantages as Option 3	• Similar disadvantages as Option 3

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The Region is currently reviewing Approach 2 in further detail. The tables below show the preliminary cost breakdown for the water and wastewater capital programs based on the Provisional Scenario (a.k.a. January Scenario, a.k.a. Scenario 10 version 2)

The current draft capital program consists of projects required to service the scenario 10 population and employment to 2041. The following tables summarize the draft cost estimates for water and wastewater by category:

Table 1: Water Cost Breakdown

	Total Cost	DC Cost	Pop (Res + Employment)	Cost per Pop	DC Cost per Pop
1 – Capacity	$816M	$655M	803,000	1016.19	815.69
2 – Greenfield	$621M	$589M	386,000	1608.81	1525.91
3 – Built Boundary	$383M	$355M	417,000	918.47	851.32
Total	**$1.820B**	**$1.598B**	**803,000**	**2,266.50**	**1,990.04**

Table 2: Wastewater Cost Breakdown

	Total Cost	DC Cost	Pop (Res + Employment)	Cost per Pop	DC Cost per Pop
1 – Capacity	$1.437B	$962M	803,000	1789.54	1198.01
2 – Greenfield	$331M	$310M	386,000	857.51	803.11
3 – Built Boundary	$162M	$77M	417,000	388.49	184.65
Total	**$1.931B**	**$1.349B**	**803,000**	**2,404.73**	**1,698.63**

APPENDIX I
DC TECHNICAL & POLICY UPDATE

High Level[1] Impact of Estimated Area Rates for Water and Wastewater Capital Plan to 2041

A) Greenfield (GF) Charges

Area	$ DC Per Capita (or Employee)			$ DC Per Unit [2]		$ DC Per s.m. [3]	
	Water	Wastewater	Sub-total	Single/Semi	Large Apartment	Industrial	Commercial
Common Capacity	$ 816	$ 1,198	$ 2,014	$ 8,357	$ 5,115	$ 30.06	$ 30.06
Greenfield-Distribution/Collection	$ 1,526	$ 803	$ 2,329	$ 9,665	$ 5,916	$ 34.76	$ 34.76
Greenfield Total				$ 18,022	$ 11,031	$ 64.82	$ 64.82

B) Built Boundary (BB) Charges

Area	$ DC Per Capita (or Employee)			$ DC Per Unit [2]		$ DC Per s.m. [3]	
	Water	Wastewater	Sub-total	Single/Semi	Large Apartment	Industrial	Commercial
Common Capacity	$ 816	$ 1,198	$ 2,014	$ 8,357	$ 5,115	$ 30.06	$ 30.06
Built Boundary-Distribution/Collection	$ 851	$ 185	$ 1,036	$ 4,299	$ 2,631	$ 15.46	$ 15.46
Built Boundary Total				$ 12,656	$ 7,746	$ 45.52	$ 45.52

C) Comparison to Current Charges - Percentage

	$ DC Per Unit		$ DC Per s.m.	
	Single/Semi	Large Apartment	Industrial	Commercial
Area Rate Difference (GF - BB)	$ 5,366	$ 3,284	$ 19.30	$ 19.30
Current DC (July 2017)	$ 50,392	$ 30,842	$ 139.26	$ 206.88
% Change to Current	10.6%	10.6%	13.9%	9.3%

Example of Charge Breakdown

	Greenfield	Built Boundary
Region-Wide	$ 35,053	$ 35,053
Area-Rated	$ 18,022	$ 12,656
Total	**$ 53,075**	**$ 47,709**

D) Illustration of Dollar Impact on DC Rates

	$ DC Per Unit		$ DC Per s.m.	
	Single/Semi	Large Apartment	Industrial	Commercial
Current Rate (Blended)	**$ 50,392**	**$ 30,842**	**$ 139.26**	**$ 206.88**
Potential Greenfield Rate	**$ 53,075**	**$ 32,484**	**$ 148.91**	**$ 216.53**
Potential Built Boundary Rate	**$ 47,709**	**$ 29,199**	**$ 129.61**	**$ 197.23**

Assumptions

[1] P.P.U.'s are assumed to be the same in each area. Residential/non-residential allocations are also assumed to be the same for capacity and distribution/collection costs.

[2] $ DC per capita X p.p.u. from 2015 DC Background Study. 4.15 for singles & semis, and 2.54 for apartments larger than 750 sq.ft.

[3] $ DC per employee X FSW factor (1/67 s.m. per employee) from 2015 DC Background Study.

DC TECHNICAL & POLICY UPDATE

AREA RATING ANALYSIS BUILT BOUNDARY & GREENFIELD AREA ILLUSTRATION

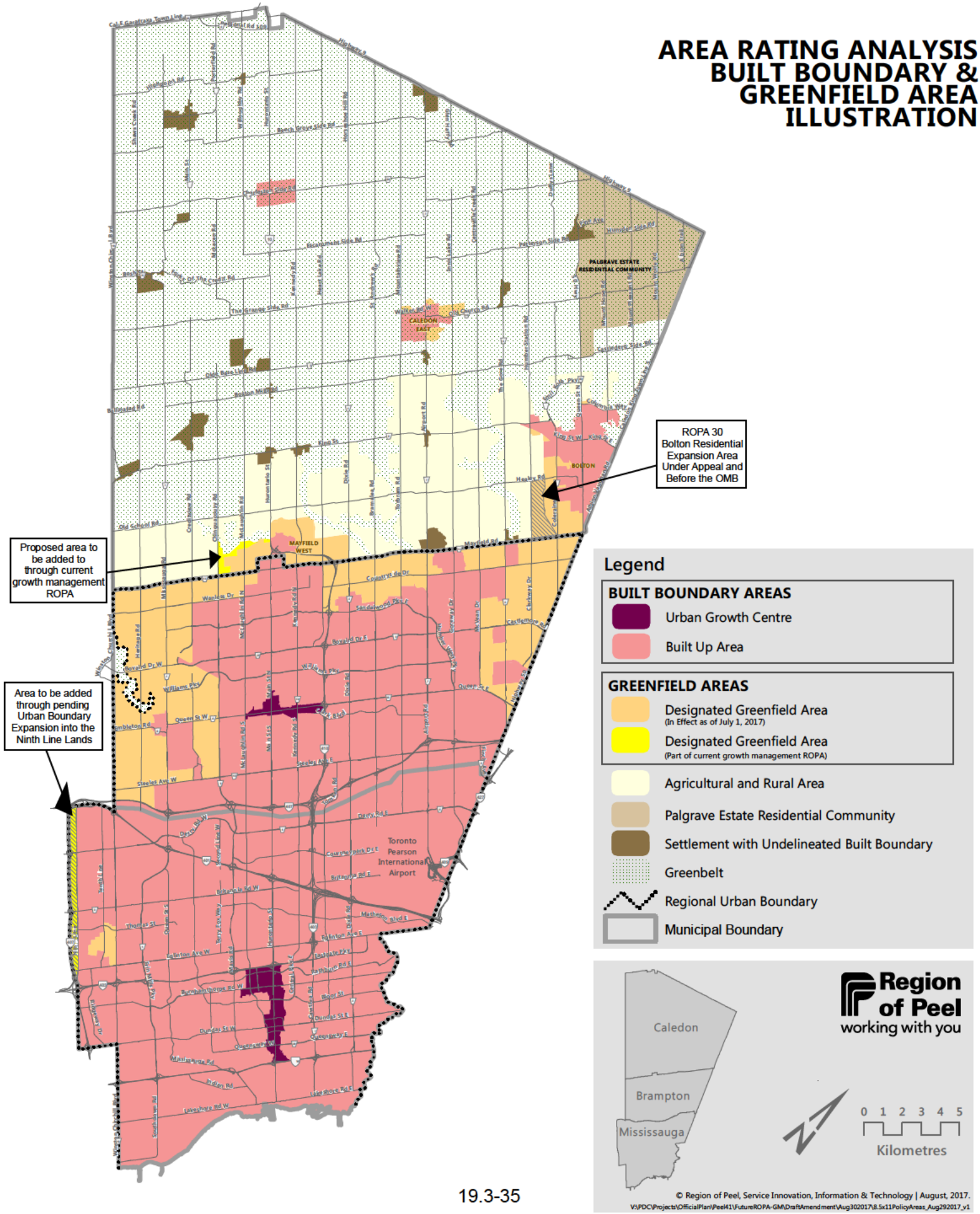

Table of Technical Inputs and Financial Policies under Review

Parked Issues From 2015 DC By-law Update (Details in Appendix III)

Description of item	Commentary	BILD Input	Status
Treatment of no fixed place of work and work from home employment	Current approach is to exclude NFPOW and WFH from non-residential rate calculations. Staff have considered adding 50% to residential water and waste water calculation.	BILD agree in principle to review the removal of NFPOW from FSW and DC calculations with the objective of avoiding the overbuilding of infrastructure	Staff and BILD will further explore the concepts in conjunction with other items pending resolution of current OMB appeal.
Allocation methodologies	No impact on Region's share of growth costs. Could change share of costs between residential and non-residential This item is under appeal at OMB	BILD has proposed changes in approach	Staff continue to consider new proposed approaches, but will maintain current approach pending results of OMB hearing
Benefit to existing methodologies	Could impact Region's share of growth costs This item is under appeal at OMB	Limited input from BILD due to OMB appeal status	Staff continue to consider new proposed approaches, but will maintain current approach pending results of OMB hearing
Impacts of office intensification	Impacts reflected in growth and servicing estimates. Staff are considering different options to treat in rate calculations.	Detailed discussions have not occurred with BILD on this topic yet.	Awaiting input from BILD
Terms of debt issuance	This item was reviewed at meetings with development industry	No further questions or concerns on this item	No further review anticipated

New DC Act Requirements resulting from Bill 73

Description of item	Commentary	BILD Input	Status
Consideration of Area Rating (details are provided in main body of the report)	No impact on the Regions share of growth costs but would impact individual land owners	BILD expressed that they support continuing with the existing municipality wide DC rating techniques	Staff performed analysis and found no material impact on rates due to area rating. Staff are recommending that the Region continues to use municipality wide rate approach
Waste management as an eligible service	New service expected to increase DC rates by 1%	Details have not been reviewed with BILD to date.	Waste management costs to be included in next DC By-law update
Asset management requirements	No direct impact on DC rates. New administrative requirement	Details have not been reviewed with BILD to date.	Description of asset management analysis included in next DC Background Study
Continuation of TransHelp Service Level Approach	No material impact on Regions DC rates	Details have not been reviewed with BILD to date.	Analysis of impacts included in next DC Background Study

Other Optional Technical & By-law Considerations

Description of item	Commentary	BILD Input	Status
Apartment definition updates	Changes suggested to help minimize confusion between townhome and apartment construction for DC rate purposes	Details have not been reviewed with BILD to date.	Potential definition changes to be developed and proposed for next DC By-law. To be reviewed with BILD.
Industrial definition updates	Changes suggested to better align industrial definition with current market realities	Details have not been reviewed with BILD to date.	Potential definition changes to be developed and proposed for next DC By-law. To be reviewed with BILD
Demolition credit requirement updates	Changes to tighten definitions for demolition credits in line with approach of other municipalities	Details have not been reviewed with BILD to date.	Potential definition changes to be developed and proposed for next DC By-law. To be reviewed with BILD

Secondary units in new homes	Proposed new provincial legislation could have negative financial impacts and increase cost revenue gap	Details have not been reviewed with BILD to date.	New exemption could be reflected in next DC By-law if legislation proceeds, but provincial legislation would supersede the Region's By-law in any case. To be reviewed with BILD
Use of DCs for third party operated Long Term care facilities	Similar logic in applying DC's towards capital component of third party operations when appropriate	Details have not been reviewed with BILD to date.	Language similar to what was included in 2015 DC Background Study for affordable housing will be prepared for potential inclusion in next DC Background Study to signal intent. To be reviewed with BILD
Non-residential category review	Consideration could be given to having only one consistent non-residential DC rate. This is also being considered by staff at Mississauaga and Brampton. Caledon already has one non-residential rate.	Details have not been reviewed with BILD to date.	Changes to rate categories required to be identified if to be considered in next DC Background Study and By-law. To be reviewed with BILD
Delegate authority for deferrals for properties being transferred to the Region to staff.	Situations arise where at building permit stage properties meant to be transferred to the Region are in private ownership. This was the subject of an OMB appeal of the 2015 DC By-law which was withdrawn prior to the hearing.	Details have not been reviewed with BILD to date.	Language could be added to DC By-law to delegate authority to the CFO to defer DC collection until after ownership is transferred to the Region. To be reviewed with BILD.

Technical Inputs for the 2018 Development Charges By-Law Update:

Discussion Paper for Consultation with the Development Industry Workgroup and The Inter-Municipal Workgroup Growth Management Project

The Region of Peel
August 2018

Table of Contents

Acknowledgements

In the development of this report for the new approach to planning and managing growth, we wish to acknowledge the contributions and expert recommendations of the following individuals and organizations.

Specifically we would like to acknowledge the Core Team and the Inter-Municipal Workgroup staff including:

Core Team:

Chair: Gayle Bursey	Director, Growth Management	Finance, Region of Peel
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Inter-Municipal Workgroup:

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David Waters	Director, Policy Planning	City of Brampton
Haiqing Xu	Former Manager of Policy & Sustainability	Town of Caledon

We wish to extend thanks to Gary Scandlan, Watson & Associates who consolidated the available evidence and stakeholder input to develop a strong reference document to guide Development Charges decision-making going forward.

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Development Industry:	**Development Industry Affiliate Members:**
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Steering Committee:	**Advisory Committee:**
Lorraine Graham-Watson - Commissioner, Corporate Services Janette Smith – Commissioner, Public Works Stephen VanOfwegen – Commissioner, Finance & CFO	Andrew Farr – Executive Director, Water & Wastewater Dave Bingham – Director, Corporate Finance Gary Kocialek – Director, Transportation Arvin Prasad – Director, Planning Andrea Warren – Director, Development Services

About this Report: Background to the Integrated Growth Management Strategy

Purpose

The Region of Peel Council directed that staff take a new approach to planning and managing growth that was:

1) **Integrated** across the fields of planning, water and transportation servicing and finance in terms of how servicing is paid for and

2) **Collaborative** with stakeholders including municipal staff in planning, transportation and finance as well as with the development industry.

This is a discussion document developed using an integrated and collaborative approach. It provides background on possible alternative approaches to certain components of the Development Charge calculation. This document includes technical and policy recommendations as well as feedback received from the Growth Management Development Industry Workgroup ongoing.

Context

Municipalities' growth planning efforts face several pressures favouring expansion of the development footprint in response to market demands. These include rapid population growth, including the echo boom generation entering the housing market, land availability, affordability concerns and the interests of private developers. In contrast, a multitude of factors favour intensification with the development of complete communities that reflect increased density, mixed uses and greater access to stores, services and transit.

These factors include the desire for transportation and environmental sustainability, protection of agricultural lands and heritage sites, reduced infrastructure costs, promoting health and responding to the needs of an aging population. Balancing these many factors have been both a challenging and rewarding experience as through hard work to date over $600 million worth of deferred cost and savings has been identified.

We would like to thank the many municipal and regional staff; expert consultants and stakeholders from the development community who have provided their valuable perspectives regarding development charges, technical inputs, related policy issues; and broader impacts on land use and infrastructure planning issues.

Inter-Municipal Workgroup

Development Industry Workgroup

We recognize the hard work of these partners to develop this Development Charges Technical Input document to use as a reference in decision making in this Development Charges By-law update and others in the future.

We thank all partners for their commitment to implement an integrated collaboration approach to growth management that ultimately will create a vibrant progressive community.

APPENDIX III
DC TECHNICAL & POLICY UPDATE

Chapter 1: Water & Wastewater: Inputs for the Development Charges By-Law Update

1 Water

1.1 Benefit to Existing

1.1.1 Description of current approach
1.1.2 Description of the options available for consideration (capacity based)
1.1.3 Pros and cons of the approaches

1.2 Residential vs. Non-Residential

1.2.1 Description of Current Approach
1.2.2 Description of the options available for consideration
1.2.3 Pros and cons of the approaches

1.3 Non Residential – Industrial/Non-Industrial Split

1.3.1 Description of Current Approach
1.3.2 Description of the options available for consideration and Pros/Cons

1.4 No Fixed Place of Work, Work from Home and Intensification

1.4.1 Description of Current Approach
1.4.2 Description of the options available for consideration and Pros/Cons

1.5 Out of By-Law (OBL) – Water and Wastewater

1.5.1 Description of Current Approach
1.5.2 Description of the options available for consideration
1.5.3 Pros and Cons of the approaches

2 Wastewater

Chapter 2: Transportation Inputs for the Development Charges By-Law Update

1 Roads

1.1 BTE

1.1.1 Description of Current Approach
1.1.2 Commentary of Alternative Options available

1.2 Residential vs. Non-Residential

1.2.1 Description of Current Approach
1.2.2 Shares Based on Population to Employment
1.2.3 Commentary of Alternative Options available and reasons they were not considered

1.3 No Fixed Place of Work, Work at Home & Intensification

1.3.1 Description of Current Approach
1.3.2 Alternative Options

Appendix I

- Calculation of the weighted trip rate per person
- Calculation of the non-residential weighted trip rate per person

Chapter 3: Forecast Office Intensification in Existing Buildings

Peel Region DC - Water & Wastewater

Inputs for the Next DC By-law Update

Stakeholder Discussion Document

August 11, 2017

This document is for discussion purposes. It provides background on possible alternative approaches to certain components of the DC calculation. From this document, a subsequent Region of Peel policy document will be developed. This document will include policy recommendations and will be provided for circulation to the Development representatives.

To date, this policy document has been circulated to BILD members without any recommendations. The purpose was to seek their initial comments so that the Peel staff and consultants can consider their feedback as part of this evolving DC process. These comments have been included in this document for each policy section.

Summary Policy Information

1 Water

1.1 Benefit-to-Existing (BTE)

1.1.1 Description of Current Approach

The benefit-to-existing (BTE) represents the non-growth benefits of a project. Some projects that are proposed to address growth may also provide inherent benefit to existing service areas or existing deficient infrastructure.

Section 5(1)6 of the DCA provides that "The increase in the need for service must be reduced by the extent to which an increase in service to meet the increased need would benefit existing development". The general guidelines used by Watson & Associates to consider Benefit for Existing development include the following:

- the repair or unexpanded replacement of existing assets that are in need of repair;
- an increase in average service level of quantity or quality (compare water as an example);
- the elimination of a chronic servicing problem not created by growth;
- providing services where none previously existed (generally considered for water or wastewater services

The BTE components are also associated with upgrades to the existing systems or facilities necessary to maintain service levels to existing residential and non-residential users.

For water infrastructure, benefits to the existing service area could consist of any combination of increase to transmission/distribution capacity, water main network connectivity (looping), pressure zone connectivity or addressing infrastructure age/condition. The Master Plan capital program has typically included infrastructure projects that address both growth and existing needs or deficiencies.

The current approach for application of BTE in the Region of Peel is based on a project-by-project review to estimate the main drivers for the project and the approximate benefit, if any, of new projects to the existing users.

Currently, the Region of Peel applies BTE in the range of 15% - 50% to select projects. The projects are reviewed based on the anticipated growth that the individual water main will service and the anticipated degree to which a given project benefits an existing serviced area. Given that BTE can be derived by several different means (e.g., replacement of an old pipe, improvement to supply security, lower risk) which can be difficult to quantify, the BTE calculation is an informed approximation.

Two examples of the BTE split with current projects from the 2015 DC By-law Update:

Example 1: Williams Parkway Sub-Transmission Main
900-mm sub-transmission main provides inter-zone connectivity and added flexibility for Pressure Zones 5C and 5W to optimize water transmission to the north into growth areas. There is a minor benefit to existing users in that the existing system has improved connectivity and looping and overall system security. Benefit to existing users is approximated to be 15% - *Predominantly services growth.*

Example 2: Bloor Street and Cawthra Road Sub-Transmission Mains
900-mm/1050-mm sub-transmission main provides capacity from the Silverthorn Pumping Station into Pressure Zone 2C. This main provides additional capacity to support growth within Pressure Zone 2C and improves connectivity and security of supply. The benefit to existing users is approximated to be 50 per cent.

Theoretical Example 3: Pipe Replacement
An existing watermain is replaced with a larger watermain to support additional growth demands. There is a portion of the cost to replace the watermain with the same diameter may be considered BTE while the cost to increase the size is considered DC eligible.

1.1.2 Description of the options available for consideration (capacity based)

Several options exist for calculating the BTE of a given project. However, the appropriateness of each option varies depending on the type of existing benefit that is achieved and type and magnitude of existing deficiency that is being addressed. Potential options for calculating the BTE are as follows:

Option 1: Structured Approximation (Refined Current Approach)

This approach is similar to the current policy adopted by the Region of Peel and supported by the development community. Fixed BTE categories with defined BTE percentages would be established. Each project would be evaluated to determine under which BTE category it falls. The recommended categories are as follows:

BTE1	50% BTE	These projects equally provide additional capacity for growth as well as enhance level of service in existing service areas. These projects address known existing deficiencies but also improve servicing conditions including security of supply/service.
BTE2	20% BTE	These projects are driven by growth but will address some known existing deficiencies potentially related to operational issues or significant level of service, age, condition or performance.
BTE3	10% BTE	These projects are driven by growth but are likely to address some existing deficiencies potentially related to level of service, age, condition or performance.
BTE4	0% BTE	These projects are entirely growth driven. These project are predominantly located in greenfield areas and support servicing for new growth only.

Option 2: Population & Employment Based

This option would determine for each project the ratio of existing benefitting users relative to the total existing and growth-related benefitting users. The rationale for this approach is based on the concept that all existing users are deriving benefit from the new project. This approach would not further consider application of the project, age or performance of existing infrastructure among other considerations.

$$\text{BTE} = \text{Number of existing benefitting users serviced by a water main} \,/\, (\text{Number of existing benefitting users serviced} + \text{Number of projected new customers from growth})$$

Option 3: Demand Based

This option would determine for each project the ratio of the existing water demands of the benefitting service area relative to the total water demands of the existing and growth-related benefitting service areas. This approach would look to demonstrate the level of existing uses compared to the total capacity needed for the project.

This approach could also take into consideration whether there is an existing capacity deficiency or not.

$$\text{BTE} = \text{Existing demand serviced by existing infrastructure} / (\text{Existing Demand} + \text{Future Demand})$$

**Assuming no existing capacity deficiency, improvement to security or connectivity only*

$$\text{BTE} = \text{Existing Capacity Deficiency} / (\text{Growth Demand} + \text{Existing Deficiency})$$

**Assuming existing capacity deficiency*

Option 4: Capacity Based

In lieu of using population or demands, this option would determine the ratio of existing capacity in the infrastructure relative to the future capacity of the new infrastructure. This approach would not further consider application of the project, age or performance of existing infrastructure among other considerations.

$$\text{BTE} = \text{Existing Capacity} / \text{Future Capacity}$$

**Assuming no existing capacity deficiency, improvement to security /connectivity or replacement of pipe*

Option 5: Calculated Age

In the case of where growth infrastructure is replacing existing infrastructure, the age of the existing infrastructure (essentially representing condition), would be used to determine BTE. This option may not have application across the full capital program.

$$\text{BTE} = \text{age of existing pipe} / \text{expected service life}$$

1.1.3 Pros and cons of the approaches

Approach	Advantages	Disadvantages
Option 1: Structured Approximation	• Enables the Region to use best judgement to approximate the BTE • Simple and efficient calculations • Flexible; provides the opportunity to adjust BTE according to multiple, concurrent benefits that are difficult to quantify • A reasonable attribution	• Approximate; generally not derived from calculated values, but based on an approximation for a type of improvement
Option 2: Population Based	• Calculation methodology uses values to derive exact percentage	• Inputs into the calculation are not straightforward to quantify • Peel water system is a network in which areas can be supplied by multiple water mains, i.e., each pipe does not have a perfectly defined service area; as such, defining the existing number of benefitting users of a given water main is complex and can result in a range of values. • The actual benefit provided to existing users may be vary from location to location and cannot be measured simply by number of users. • Existing users will not see an equal benefit as a new user. i.e., a new user gains a significant benefit of obtaining water service, an existing user may only gain a marginal benefit of added security or reduced risk of water outage.
Option 3: Demand Based	• Calculation methodology uses values to derive exact percentage	• The actual benefit provided to existing users may be vary from location to location and cannot

		be measured simply by existing and future demand. • Existing users will not see an equal benefit as a new user. I.e. a new user gains a significant benefit of obtaining water service, an existing user may only gain a marginal benefit of added security or reduced risk of water outage. • Existing capacity deficiency for water network may be variable and could be measured in several ways (flow, pressure, head loss, etc.) and does not account for other inherent benefits such as looping. • Does not enable any informed flexibility based on system knowledge or approximate service areas
Option 4: Capacity Based	• Calculation methodology uses values to derive exact percentage	• Existing capacity may not directly correlate to the degree to which existing users will benefit from an upgrade or twinning • Does not enable any informed flexibility based on system knowledge or approximate service areas
Option 5: Calculated Age	• Ensures existing users receive credit for amount of time they used the infrastructure in relation to the total infrastructure life • Incorporates lifecycle costing • infrastructure age is exact	• There may be other benefits to the existing service beyond renewing the infrastructure • Does not enable any informed flexibility based on system knowledge or approximate service areas • Does not account for project rationale – i.e. project trigger

1.2 Residential vs. Non-Residential

1.2.1 Description of Current Approach

The current approach for the Region of Peel residential/non-residential share of the DC-eligible Capital Implementation Plan is based on the percentage of the total flow generated by each class of development. For water, maximum day flows are used.

The Residential / Non-Residential (Res/Non-Res) split is currently calculated using a historical approach which uses past billing data to determine the demand of the residential uses relative to the non-residential uses.

The split is calculated as follows:

- Residential = Residential Demand / Total Demand
- Non-Residential = Non-Residential Demand / Total Demand

1.2.2 Description of the options available for consideration

Option 1 – Historical Flows - Current Approach

The current approach utilizes historical flows to determine the split as follows:

$$\text{Residential Split (\%)} = \text{Residential Demand / Total Demand}$$

$$\text{Non Residential Split (\%)} = \text{Non Residential Demand / Total Demand}$$

Option 2 – Projected Flows

This option would utilize the projected flows to establish the split. Projected flows would represent the growth from current day to end of the planning period. The projected flows would be consistent with the flows used to derive the capital program. The split would be determined as follows:

$$\text{Residential Split (\%)} = \text{Projected Residential Demand /Total Projected Demand}$$

$$\text{Non Residential Split (\%)} = \text{Projected Non Residential Demand /Total Projected Demand}$$

Option 3 – Projected Population & Employment Based

This option would use population in persons and employment in jobs in relation to the total people and jobs to derive the split. Under this option, if the design criteria, including consumption and peaking factors, were the same for residential and employment, the derived split would be the same as Option 2.

Residential Split (%) = Projected Residents / Total Projected People and Jobs

Non Residential Split (%) = Projected Employees / Total Projected People and Jobs

Option 4 – Assumed Split

Historically, the res/non-res splits for the Region of Peel are generally within a narrow range. For the Region of Peel, large swings in percentages from year to year have not been experienced.

This approach would provide the Region of Peel with a straight forward approach to manage the res/non-res split and would fairly treat both residential and non-residential development. There would be protection from swings in percentages should either component lag in rate of development.

This approach would result in an assumed split derived from historical review (i.e.: Residential Split 75%, Non-Residential Split 25%)

1.2.3 Pros and cons of the approaches

Approach	Advantages	Disadvantages
Option 1: Historical Flows - Current Approach	• Split is calculated using accurate, measurable data that represents existing usage	• Does not account for future potential reduction in per capita demand or future changes to res/non-res split
Option 2: Projected Flows	• Split could consider potential reduction in per capita water usage • Better reflects the future res/non-res split and subsequent drivers for projects within the program	• Based on projected per capita criteria and demand which may change over time and may never be achieved.

Option 3: Projected Population & Employment Based	• Splits represent the best available planning data • Better reflects the future res/non-res split and subsequent drivers for projects within the program	• Does not reflect usage
Option 4: Assumed Split	• Easily established and managed on a go forward basis	• May not reflect usage • approximated

1.3 Non Residential – Industrial/Non-Industrial Split

1.3.1 Description of Current Approach

The Region of Peel currently proportions all employment costs equally across all employment land use types. Within the non-residential (employment) uses, there are several definitions of employment including industrial categories and non-industrial categories including commercial, retail, and institutional.

The Region may want to consider a breakdown of non-residential costs into sub-categories. This breakdown would be considered to provide a better understanding of infrastructure costs related to these categories.

However, given that the Region of Peel represents non-residential as a single category, any consideration to further breakdown of the category would require identification of the amount, location and criteria related to each category across the Region. This would start with the planning data and projections.

The current approach in utilizing an overall non-residential category provides flexibility for infrastructure planning and costing. At a Master Plan level, it can be difficult to project use across each land parcel. Actual development could result in high or low infrastructure capacity requirements. Actual development could result in changes in sub-categories. Using an overall category and associated criteria provides a reasonably accurate approach and averages across all these uses.

1.3.2 Description of the options available for consideration and Pros/Cons

The following are the potential approaches to address different Non-Residential categories:

1. No Split (current approach)– Maintain current practices and keep the Non-Res as a single use

2. Detailed Split – Split Non-Res costs into Industrial / Non-Industrial by using a detailed land use analysis and design criteria
3. Estimated Split – Split Non-Res costs into Industrial / Non-Industrial separately based on global approximation of water use / wastewater generation or number of employees

Approach	Advantages	Disadvantages
Option 1: No Split – current approach	• Reasonable approach easiest for implementation • Maintains consistent approach with past DC	• May not recognize cost discrepancies with respect to changing employment uses *i.e. Industrial uses may occupy large floor space but employ few people and use little water (warehousing)*
Option 2: Detailed Split	• Could provide a more accurate cost allocation to different employment uses	• Requires significant planning and w/ww detail and effort to calculate. e.g. a separate industrial and non-industrial design criteria, de-lineation of SGUs and capital program would be required to accurately split the uses • Exact "Industrial" and "Non-Industrial" definitions will be required as they relate to anticipated employment growth
Option 3: Estimated Split	• Could provide a simple approach to split cost more accurately to the different employment uses	• Will require agreement to the general/average split percentage used • Criteria and methodology to determining the global split will need to be agreed • Requires judgement
Option 4: Cost Per Employee divided by SF per employee	• Could provide a simple approach to split cost • All capital costs for non-residential are divided by the Sq. Ft. per employee assumptions within the growth forecast to derive a different cost per sq. ft. DC	• Cost per employee aligns with assumptions for forecasting future flows • Sq. Ft. per capita for different types of employment are included within the growth forecast

1.4 No Fixed Place of Work, Work from Home and Intensification

1.4.1 Description of Current Approach

"Persons who worked at various work locations or job sites and did not report to a headquarters or depot before starting work each day," are recorded as having employment with no fixed place of work. "Persons who report to a headquarters or depot each day, before going to various work locations or job sites", are recorded with an address of place of work.

For the purposes of section 1.4, the following definition is provided for "No Fixed Place of Work":

No-fixed-place-of-work (NFPOW) and work-from-home (WFH) are employment categories whereby the employees in these categories are included in the total employment data.

It is Peels perspective that NFPOW would most likely contribute to water demands in both residential and employment properties but should not reflect new water demands already projected across residential and employment lands. It is also Peels perspective that WFH employees generate water use already accounted for in the overall residential use. The water use from these categories should not be double counted.

For NFPOW employees, the need for water and wastewater services related to these employees has largely been included in the employment forecast by usual place of work (i.e., employment and gross floor area (GFA) in the retail and accommodation sectors generated from NFPOW construction employment). Since these employees have no fixed work address, they cannot be captured in the non-residential GFA calculation.

In terms of projecting water and wastewater demands, the design criteria has equally accounted for the NFPOW and WFH in the criteria calculation and applied the criteria to the planning projections appropriately. There is no need to adjust the water and wastewater flow projection methodology.

However, to appropriately account for the NFPOW and WFH categories, adjustment can be made at the Residential/Non-Residential split within the DC calculation process.

As a separate issue, Intensification is a fundamental component of the growth plan. The additional residential and employment use in the built areas will create additional water demands. In some cases, the water system will have sufficient capacity to support intensification. In other cases, the water system capacity will be deficient and will require capacity upgrades. The cost for infrastructure required for intensification capacity should be recovered through DCs.

1.4.2 Description of the options available for consideration and Pros/Cons

Options	Advantage	Disadvantage
1. Current Approach- Exclusion of WAH and NFPOW employment	• Prevents escalating home prices by keeping Residential DC rates lower	• Does not favour commercial development • May require adjustment to the level of detail provided in SGUs
2. *50% of NFPOW employment assigned to Residential growth, WFH assigned to Residential growth	• Better approximates actual servicing use • Reduces Non-Residential share thereby making commercial development more attractive • Does not require adjustment to the level of detail provided in SGUs	• Increase in Residential rate may cause increase in home prices paid by end-user

*the 50% is to acknowledge that NFPOW contributes to servicing needs in both residential and employment locations.

1.5 Out of By-Law (OBL) – Water and Wastewater

Several projects within the Master Plan and Development Charges update have been strategically oversized to support future growth beyond the planning horizon. Typically, linear infrastructure that may serve a larger long term service area may have strategically increased diameter to provide additional capacity. Additionally, facilities may be sized in capacity increments (i.e.: 50 MLD treatment increments or 20 ML storage increments), which may inherently provide more capacity than is required to meet the planning horizon. It is understood that there is an increase in cost associated with providing this increased capacity. In order to account for this additional cost, OBL costs are removed from the DC eligible costs.

1.5.1 Description of Current Approach

There are several methods of calculating the OBL component depending on the type of infrastructure.

In general, the OBL component is determined based on comparison of the infrastructure required to meet the needs of the current planning horizon versus the recommended infrastructure sizing which meets longer term servicing needs.

The current approach to calculating the OBL component for linear works is the difference in cost between the needed and selected pipe diameter.

Example - Linear:

- A 400 mm pipe at a cost of $600,000 is required to service a particular growth area within the 2041 planning boundary.
- In order to service a future growth area beyond the planning horizon, a 600 mm pipe will be required at a cost of $1,000,000
- The OBL Cost is calculated to be the difference in *cost* between the infrastructure *provided* and the infrastructure required *within period*:
  $1,000,000 - $600,000 = $400,000 OBL

Calculation of OBL costs for facilities can be more complex. Capacity needs for treatment, storage and pumping may be calculated with a high level of precision, however, upgrades are typically completed in increments as described above. The OBL in these cases is typically calculated as follows:

Example - Facility:

- Treatment upgrade is triggered in 2035 and additional 8.5 MLD treatment capacity is required to meet 2041 needs
- Since it is not efficient or practical to install only 8.5 MLD of treatment, 50 MLD is installed. Additionally, it is not practical to calculate cost estimates for smaller, irregular increments of treatment capacity
- The OBL is calculated to be the difference in *capacity* provided within period and out of period:
  (50-8.5) / 50 = 83% OBL

1.5.2 Description of the options available for consideration

Option 1 – Difference between Required in Period and Recommended (Cost or Capacity) - (Current Approach)

This approach requires sufficient analysis to determine the infrastructure sizing within period in comparison to the recommended sizing.

Option 2 – Informed Approximation

This option could be considered across all projects or for unique cases that lack specific information. In some cases, there may be a requirement for calculation of the OBL by approximation. In the case where an upgrade or expansion of a facility with multiple

components is completed with an undefined quantity (cost or capacity) of post period needs, a general percentage may be applied to the project cost to determine OBL component. Examples include a WWTP upgrade that builds only some components or processes to larger capacity than required in order to facilitate future expansion or a site optimization to facilitate future expansions.

OBL1	50% OBL	These projects are strategically sized for additional future capacity. These projects are located in areas with constraints for additional capacity. These projects may also provide cost effective additional capacity.
OBL2	20% OBL	These projects are driven by growth within the bylaw planning period but will provide some additional capacity to support additional growth beyond the bylaw planning period. These projects are predominantly located in and/or support areas with likely future growth potential.
OBL3	10% OBL	These projects are driven by growth within the bylaw planning period but are likely to provide some marginal additional capacity to support additional growth beyond the bylaw planning period.
OBL4	0% OBL	These projects are entirely growth driven but sized for growth within the bylaw planning period only. These project are predominantly located in areas with defined built out boundaries.

1.5.3 Pros and Cons of the approaches

Options	Advantage	Disadvantage
Option 1: **Current Approach** - Calculate marginal cost for increased size	• Utilizes MP cost estimate approach for in period, and out of period costs	• Applied better for linear infrastructure • Not all projects have the same detail available • Not all projects have defined, exact post period needs
Option 2: **Structured Approximation**	• Consistent with BTE Option 1 • Can be applied across all projects • Flexible and easy for implementation • Utilizes engineering best judgement	• Approximate, generally not derived from calculated values

2 Wastewater

The policies regarding BTE, Residential/Non-Residential Splits, NFPOW, WFH and OBL can be applied consistently between water and wastewater.

These policies generally have equal application to wastewater as they do water given that the approach to developing, sizing and implementing water and wastewater infrastructure is the same.

Differences in the application of the policies are highlighted as follows:

- Where maximum day demands are used for water, average day flows are used for wastewater
- Peaking factors for wastewater flows are not used for DC purposes

Peel Region DC - Roads

Inputs for the Next DC By-law Update

Stakeholder Discussion Document

August 11, 2017

This document is for discussion purposes. It provides background on possible alternative approaches to certain components of the DC calculation. From this document, a subsequent Region of Peel policy document will be developed. This document will include policy recommendations and will be provided for circulation to the Development representatives.

To date, this policy document has been circulated to BILD members without any recommendations. The purpose was to seek their initial comments so that the Peel staff and consultants can consider their feedback as part of this evolving DC process. These comments have been included in this document for each policy section.

For the purposes of section 1.3, the following definition is provided for "No Fixed Place of Work":

> "Persons who worked at various work locations or job sites and did not report to a headquarters or depot before starting work each day," are recorded as having employment with no fixed place of work. "Persons who report to a headquarters or depot each day, before going to various work locations or job sites", are recorded with an address of place of work.

Summary Policy Information

2 Roads

3.1 BTE

2.1.1 Description of Current Approach

Currently, the Region of Peel applies a benefit-to-existing share to road projects in the range of 10%-15% depending on the nature of the road works (BTE can go as high as 50% for traffic signal upgrades and planning studies). However, in the 2015 Peel DC, this benefit was only applied to the curb-to-curb cost of road construction and was decided on a project-by project basis. For a summary of the benefit-to-existing shares assigned during the 2015 Peel DC study, please see **Table 1**. Unlike York Region, Peel does not combine all costs of a project under single project expenditure, opting to keep them separate in Categories such as Construction, Streetscaping, Traffic Signals, Street Lights, Bridges, Property acquisition, and Utilities.

Table 1: Benefit-to-existing allocations used in the 2015 Peel DC Update

	Peel (2015)
CAPACITY IMPROVEMENTS	
RURAL	
Resurface and widen from 2 to 4 lanes Resurface and widen from 2 to 5 lanes Resurface and widen from 2 to 6 lanes	0-15%
URBAN	
Resurface and widen from 2 to 4 lanes Resurface and widen from 2 to 5 lanes Resurface and widen from 2 to 6 lanes Resurface and widen from 3 to 5 lanes Resurface and widen from 4 to 6 lanes	0-15%

	Peel (2015)
Resurface and widen from 5 to 6 lanes	
Resurface and widen from 5 to 7 lanes	
Grade Separation; Widening	0-15%
Intersection Improvements	0-15%
NEW REGIONAL INFRASTRUCTURE	
New Arterial Road Link	0%
Missing Arterial Road Link	0%
Grade Separation; New Structure	0%
CONTRIBUTION TO INFRASTRUCTURE	
400-Series Interchange	-
Reconstruction to Regional standard; Growth Areas	0-15%
Reconstruction to Regional standard; Other Areas	-
STREETSIDE IMPROVEMENTS	
Sidewalks	0%
Street lighting	0%
Bike Paths	0%
Landscaping	0%
Traffic Signals	50%
Noise walls	-
MISCELLANEOUS POLICIES AND PROGRAMS	
Programs and Studies	50%

2.1.2 Commentary of Alternative Options available

To help inform this study, a review of the approaches used to derive BTE allocations was conducted for other GTA municipalities, including Halton, York, Hamilton, Durham, Brampton and Mississauga. A capacity based approach was also examined from Thurston County in the U.S.

Through this review, four unique methodologies were identified:

a) Cost ratio approach

This approach compares the cost of maintaining a road segment in its current form to the cost of performing the growth-related road works according to the following formula:

$$BTE\ \% = \frac{Cost\ of\ resurfacing\ existing\ segment}{Cost\ of\ improvement}$$

Where
Cost of Resurfacing Existing Lanes = Benchmark resurfacing cost ($/km) x project length (km)

The cost ratio approach is a quantitative method that is tailored for road segment BTE calculations and cannot be used to estimate benefit-to-existing shares for intersection upgrades and other streetside improvements. Therefore, this approach was not preferred but its results will help inform the recommended tabulated approach entries.

b) Used value approach

Under this method used by Halton Region, the BTE of resurfacing and widening a road is derived by examining the Used Value of the pavement to be resurfaced to its original (unused) condition. In simplest terms, the used value approach is a reworked version of the cost ratio approach and allows to account for the depreciation of the road asset as well as for the road's stage in its life cycle.

$$BTE\ \% = \%\ \text{Used Value x}\ \frac{Cost\ of\ resurfacing\ existing\ segment}{Cost\ of\ improvement}$$

The existing lanes' Used Value factor is calculated based on the net book value remaining in the road asset, using cumulative linear depreciation to the proposed year of construction. Because the Used Value factor will always be less than 1, benefit-to-existing shares obtained through this approach are often smaller than those obtained using the cost ratio method. Despite certain benefits, the Used Value approach suffers of the same drawbacks as the cost ratio approach. Moreover, it would require extensive data about the condition of roads in Peel Region. Therefore, the Used Value approach was not found to be the practical course of action for the allocation of benefit-to-existing shares.

c) Capacity or level of service based approach

The capital costs are assigned a BTE percentage based on the present and future demand imposed on the transportation system. For road expansion projects, the amount of the project benefiting existing users was calculated using existing roadway traffic volumes, existing roadway capacity and future capacity provided by the proposed road project. The BTE is the amount of the planned increase in capacity that will be consumed by the existing traffic volume.

$$\%BTE = \frac{Existing\ Excess\ Traffic}{Existing\ Excess\ Traffic + New\ Traffic}$$

Thurston County, in the U.S, employed this approach in its 2012 Transportation Impact Fee Study to calculate the benefit-to-existing share of road and intersection improvements. Generally, the Thurston study's BTE values ranged between 3% and 40% for roadway segment projects and 10%-50% for intersection improvements. It is noted that in the case where existing traffic does not exceed the current capacity, the BTE would be 0%. Indeed, the resulting BTE is a function of the level of additional traffic anticipated on the roadway.

Though sound from an engineering perspective, this approach is more problematic regarding the generation of yearly D.C updates. Because traffic levels are subject to change year-to-year, shifting calculations will cause changes in a project's benefit-to-existing share over time. For this reason, the qualitative, policy-based tabulated approach was preferred over the capacity calculation to assigning BTEs.

2.2 Residential vs. Non-Residential

2.2.1 Description of Current Approach

Since 2007, Peel Region has determined the residential/non-residential share of eligible growth-related capital expenditures based on anticipated incremental growth in total population and employment growth.

2.2.2 Shares Based on Population to Employment

This approach has been used in Peel Region for the past 10 years. This method has been widely used by many municipalities in their DC studies however it is not clear whether that selection is a clear policy decision or whether based on a limited amount of information being available. Nevertheless, this approach assumes that residential and non-residential growth will have the same impact on trip generation and on the transportation infrastructure.

Error! Reference source not found. below presents the residential and non-residential share of growth related capital expenditures:

Table 2: Residential/Non-Residential shares for the 2017 Peel DC Study using the incremental population/employment approach.

Year	Population	Employment	Population Growth	Employment Growth	Residential	Non-Residential
2015	1,443,000	754,600	527,000	215,400	71.0%	29.0%
2041	1,970,000	970,000				

*Recent population and employment data was collected from Peel Region's data center while forecasts to 2041 were retrieved from the 2013 Amendment of the Places to Grow Act.

2.2.3 Commentary of Alternative Options available and reasons they were not considered

The following are supplementary residential and non-residential apportioning methods that were considered to inform the recommendation:

a) Shares based on Trips Associated with New Residents and Employment

Under this option, growth-related DCs are allocated between residential and non-residential land uses based on trips attributed to population and employment growth.

Trip generation rates are used to estimate the number of trips generated by specific types of travel characteristics.

Trip rates for different land uses can be retrieved from the transportation demand forecasting model, as was done in the 2012 Halton Region DC study. Alternatively, trip rates can also be extracted from the Institute of Transportation Engineer's (ITE) Trip Generation Manual.

Horizon	Population Growth	Employment Growth	Residential ITE trip rate (per person)	Non-Residential ITE trip rate (per person)	Total trips generated by population growth	Total Trips generated by employment growth	Res	Non-Res
2015-2041	527,000	215,400	0.291	0.462	152,800	99,100	61%	39%

shows the residential and non-residential shares calculated using the trip allocation approach for the 2017 Peel DC study.

Table 3: Residential/Non-Residential shares for the 2017 Peel DC Study using trip allocation

Horizon	Population Growth	Employment Growth	Residential ITE trip rate (per person)	Non-Residential ITE trip rate (per person)	Total trips generated by population growth	Total Trips generated by employment growth	Res	Non-Res
2015-2041	527,000	215,400	0.29[1]	0.46[2]	152,800	99,100	61%	39%

[1] Weighted average of residential land use trip rates. Weights based on trips generated by land use types with codes 210, 220, 230 (ITE Trip Generation Manual). Please see Appendix **Table 4** for more calculation details.
[2] Weighted average of employment land use trip rates. Weights based on trips generated by land uses with codes 130, 710 (ITE Trip Generation Manual). Please see Appendix **Table 5** for more calculation details

The residential trip rate is a weighted average of the trip rates for Single Family Homes, Apartments and Condominiums. The weighting factors were developed by first examining the respective increase in dwelling units, as per the 2015 Peel DC study forecast. The associated trips generated by different unit types were then used to weigh the trip rates and thus calculate an overall residential trip rate. The calculations are provided in **Table 4** of the Appendix.

Meanwhile, the non-residential trip rate is an aggregate of trip rates for industrial and non-industrial land uses, which have been weighted based on the anticipated increase in trips generated by employment growth in those uses. The calculations are provided in **Table 5** of the Appendix.

Accordingly, each new resident generates 0.29 vehicle trips in the PM peak period and each new employee generates 0.457 vehicle trips. Using these trip rates and the 2041 growth projections, a 61%-39% residential and non-residential split was produced.

b) Shares based on Incremental Population-Employment Growth with Non-Residential Distribution using trips generated

Under this approach, the non-residential DC share is computed through the incremental population-employment growth analysis (**Error! Reference source not found.**), with the non-residential land uses being further divided into sub-types to reflect the differences in associated trip-making behavior. The non-residential DC share is distributed among different land use types based on the trips. As part of this analysis, industrial and non-industrial (office) uses were identified and specific shares were computed for them. The results of this analysis are shown in **Table 2.**

Table 2: Incremental approach with additional Non-Residential distribution based on trips

	Incremental employment growth[1] 2015-2031 period	Share of employee growth	Employment growth (2015-2041 period)	Trip rate[3] per employee	Trips	Share of non-residential trips generated	Share of Res and Non-Res
Industrial	40,300	27%	57,800	0.45[4]	26,000	26%	8%
Non-industrial	109,900	73%	157,600	0.46[5]	72,500	74%	21%
Total	150,200	100%	215,400[2]	-	98,500	100%	29%
						Total Non-Residential	29%
						Total Residential	71%

[1] Extracted from 2015 Peel DC, 2015-2031 employment growth forecast.

[2] Total employment growth forecast retrieved from the 2013 Amendment of the Places to Grow Act.

[3] Trip generation rates per employee for each land use were retrieved from the ITE Trip Generation Manual for the PM Peak

[4] ITE Trip Generation Manual, 9th Edition, code 130, page 140.

[5] ITE Trip Generation Manual, 9th Edition, code 710, page 1254.

2.3 No Fixed Place of Work, Work at Home & Intensification

2.3.1 Description of Current Approach

As of the 2015 Peel D.C update, the general approach with respect to “work-at-home” (WAH) employees is to exclude them from the non-residential growth forecast. The rationale for their omission is that WAH employees’ impact on municipal services from work has already been included in the population forecast. Accordingly, WAH employees have been removed from the D.C.A. employment forecast and calculation.

Regarding those with no fixed place of work (NFPOW) Statistics Canada defines them as "persons who do not go from home to the same work place location at the beginning of each shift". Such persons include building and landscape contractors, travelling salespersons and independent truck drivers. As with their WAH counterparts, NFPOW employees were omitted because their impacts on municipal services have largely been accounted for in the employment forecast by usual place of work. This is explained through the employment and floor area in the retail and accommodation sector generated from off-site employees in the construction and warehousing and transportation sectors. Furthermore, since these employees have no fixed work address, they cannot be captured in the non-residential TFA calculation.

For these reasons, in previous DC updates, the impact of WAH and NFPOW employment has been excluded from the capital needs. Like the 2015 Peel DC update, Halton and York Regions’ DC updates follow this approach.

However, the question remains as to whether NFPOW does generate added traffic. To that end, HDR used the Transportation Tomorrow 2011 Survey to retrieve and analyze trip generation for different occupation types. Due to the limitation of TTS, it was necessary to assume that Manufacturing, Construction and Trade jobs represent No Fixed Place of Work. This is consistent with the assertions made in other DC reports which identify off-site employees to be primarily in the construction, warehousing and transportation sectors. The research, summarized in **Table 3**, showed that, in both Peel Region and in the GTA, NFPOW employees have similar trip rates than their counterparts, implying that they do not produce additional trips.

Table 3: A comparison of trip rates for different occupation types in Peel Region and the GTA (TTS 2011)

Peel Region	Trips	Population	Trip Rate
No fixed Place of Work (Manufacturing/Construction/Trades)	280,795	107,877	2.60
Office, Retail/Service, Professional	1,487,099	531,385	2.79
GTA	**Trips**	**Population**	**Trip Rate**
No fixed Place of Work (Manufacturing/Construction/Trades)	1,005,463	384,225	2.62
Office, Retail/Service, Professional	7,211,888	2,627,208	2.75

1.3.2 Alternative Options

Options	Advantage	Disadvantage
1. Current Approach- Exclusion of WAH and NFPOW employment	• Prevents escalating home prices by keeping Residential DC rates lower	• Does not prioritize commercial development
2. *50% of NFPOW employment assigned to Residential growth	• Reduces Non-Residential share thereby making commercial development more attractive	• Increase in Residential rate may cause increase in home prices paid by end-user

* The 50% is to acknowledge the uncertainty in the degree of impact exerted by employees with NFPOW on the transportation infrastructure.

Appendix

Table 4: Calculation of the weighted residential trip rate per person

	Incremental growth[1] (# units)	Persons per dwelling[2]	Person growth per dwelling	Trip rate per person	Trips generated	Growth Share of trips by each dwelling type	Weighted trip rate
SFH	37,000	3.5	129,500	0.28[3]	36,260	64%	0.18
Condo	21,400	2	42,800	0.24[4]	10,272	18%	0.04
Apartment	12,500	2	25,000	0.40[5]	10,000	18%	0.07
Total	70,900	-	197,300	-	56,532	100%	**0.29**

[1] Peel Region 2015 DC anticipated growth in housing units for the 2015-2031 period (Schedule 2).
[2] Based on professional judgement, informed by 2011 TTS average persons per household of 3.13 in Peel Region.
[3] ITE Trip Generation Manual, 9th Edition, Page 307, Code 210.
[4] ITE Trip Generation Manual, 9th Edition, Page 405, Code 230.
[5] ITE Trip Generation Manual, 9th Edition, Page 344, Code 220.
[6] Weighted average trip rate based on growth share of dwelling type.

Table 5: Calculation of the Non-residential weighted trip rate per person

	Incremental growth[1] 2015-2031 period	Share of employee growth	Employment growth 2015-2041 period	Trip rate per employee	Trips generated	Share of trips generated	Weighted trip rate
Industrial	40,300	27%	57,800	0.45[3]	26,000	26%	0.119
Non-industrial	109,900	73%	157,600	0.46[4]	72,500	74%	0.339
Total	150,200	100%	215,400[2]	-	98,500	100%	**0.457**

[1] Extracted from 2015 Peel DC, 2015-2031 employment growth forecast.
[2] Total employment growth forecast retrieved from the 2013 Amendment of the Places to Grow Act.
[3] ITE Trip Generation Manual, 9th Edition, code 130, page 140.
3 ITE Trip Generation Manual, 9th Edition, code 71

APPENDIX III
DC TECHNICAL & POLICY UPDATE

Chapter 3

Forecast Office Intensification in Existing Buildings

Issue:

An observation was made by members of BILD regarding a portion of the non-residential growth (i.e. employment) forecast being accommodated by intensification within existing buildings. A request was made to assess this and consider the implication within the development charge.

Background:

A review of both office and industrial intensification in existing buildings were assessed by reviewing a sample of existing office and industrial buildings within the City of Mississauga and the City of Brampton. Limited time series data is available for the Town of Caledon with respect to employment trends in office and industrial buildings. As such, the Town of Caledon was not included in the analysis.

Consideration was given to industrial and office trends in existing buildings however employment intensification/de-intensification within existing retail and institutional buildings was not assessed. Employment levels within the existing office buildings sampled in the Cities of Mississauga and Brampton increased by approximately 6% between 2009 and 2014. On the other hand, industrial employment levels in existing buildings remained relatively constant within the buildings sampled in Mississauga and Brampton during the 2009 to 2014 time period. Over the 2015 to 2031 forecast period, it is reasonable to expect a steady level of continued office employment intensification in existing buildings in Mississauga and Brampton, as the office market continues to strengthen in Peel Region. Notwithstanding this conclusion, it is important to address a few issues when considering future office employment intensification potential in Peel Region. These include:

1. **Impacts of 2008/2009 Economic Downturn** – When analyzing historical employment trends in Peel Region during the 2009 and 2014 period, it is important to recognize the influence of the 2008/2009 global economic downturn. As a result of the strong contraction in Peel Region's existing office employment base between 2007 and 2010, it is concluded that a portion of the observed employment increase in existing buildings in the Cities of Mississauga and Brampton does not reflect "true intensification", but rather a return to existing pre-recession office employment levels.
2. **Historical Time Period Reviewed** – The historical time period reviewed (2009 to 2014) represents a unique economic period in Peel Region which included a major economic downturn followed by a gradual economic recovery. It is possible that consideration of a longer-term historical period (e.g. 10 years) would generate different results with respect to office employment intensification in existing buildings. Continued monitoring of recent office employment trends in existing buildings would also provide useful insight with respect to long-term office intensification trends.
3. **Diminishing Opportunities for Continued Office Employment Intensification** – Over the long term, the rate of employment intensification in existing buildings may slow given that a large

portion of the Region's older office space inventory has less opportunity for employment intensification compared to newer buildings. Furthermore, there is an upward limit to which the Region's existing office space can, or will likely, intensify over the long term.

Based on the discussion above, the employment forecast should have regard for the employees returning to buildings (i.e. original building may have been built for 200 people however 20% were laid off during the recessions and will return in more buoyant economic times) and true intensifications of buildings resulting in lower sq. ft. per worker with more workers being accommodated in the existing building. As these returning or new employees do not generate new square footing of building space, consideration as to how to treat them in the DC calculations must be undertaken.

Water - Commentary of Alternative Options available

Consideration of existing building intensification needs to be made for both linear and vertical infrastructure. For linear (i.e. mains), the intensification of individual buildings is not expected to have an impact on the linear servicing needs for existing areas. Overtime, in most built up areas, water use declines as a result of diminishing population in the neighborhoods along with marginal excess capacity in the mains due to standardize main sizing.

In regard to vertical (facility) infrastructure, capacity needs generally increases commensurate with overall population and employment growth (i.e. as the population and employment grows, so does the amount of water usage). However, that being said, over time the usage for constructed buildings (both residential and non-residential) will fluctuate upward or downward for a variety of reasons. For example:

- New houses generally have a higher persons per unit (ppu) in the first five years of being built. Overtime, the ppu declines and correspondingly, water use for those homes decreases
- Reduced residential water use is also occurring due to new water efficient appliances (upon replacement), low-flow toilets and showerheads (upon renovation), increased water pricing, conservation education, etc.
- Similarly, commercial, institutional, office and retail buildings are reducing water use due to new water efficient machines or appliances, low-flow toilet and urinal replacements, increased water pricing, etc.
- Industries using water for cooling or cleaning are replacing machinery with water recycling technology
- Intensification of an existing building or laid off employees will have upward impact on water use

Consideration of the above should be given as part of the forecast of water capacity needs over the planning period. The following methods are considered:

1. **Consider the increase water use as part of the forecast water capacity needs and commit part of the existing excess capacity for this.**

When undertaking the forecast of water needs historic trends are usage trends are considered downward adjustments are made to reflect conservation or reduced overall use. As an offset to this, an allocation for potential increased use in existing buildings should be made thus reducing the amount of excess capacity. In the DC calculation, the forecast employment for this will be removed (note that no sq. ft. of building space would be provided for either as no new building space would be added)

2. **Do not adjust uncommitted excess capacity but include the employment growth within existing buildings as part of the forecast water capacity needs.**
   This option would increase the existing uncommitted excess capacity and would include the associated flows as part of the growth needs. While the employment would be included in the forecast for calculation purposes, the would be no corresponding new building space thus increasing the development charge for non-residential.

Wastewater - Commentary of Alternative Options available

Similar observations and options as Water are provided for wastewater

Roads - Commentary of Alternative Options available

Similar to the observations for Water, capacity needs generally increases commensurate with overall population and employment growth (i.e. as the population and employment grows, so does the amount of trips per day). However, that being said, over time the usage for constructed buildings (both residential and non-residential) will fluctuate upward or downward for a variety of reasons. For example:

- New houses generally have a higher persons per unit (ppu) in the first five years of being built. Overtime, the ppu declines and correspondingly, potential trips generated per home will decrease
- Reduced residential and employment road use will also reduce with increases in transit infrastructure
- Similarly, industrial, commercial, institutional, office and retail buildings will vary their traffic generation with changes in the economy. As the economy cools, reductions in the sale of goods and the number of staff will impact on the number of trips generated per building.
- Intensification of an existing building or laid off employees will have upward impact on trips generated

Consideration of the above should be given as part of the forecast of road capacity needs over the planning period. The following methods are considered:

APPENDIX III
DC TECHNICAL & POLICY UPDATE

1. **Consider the increase traffic generated as part of the forecast road capacity needs and commit part of the existing excess capacity for this.**

   Similar to water, an allocation of existing excess capacity in the road system would be made for potential increased use in existing buildings. In the DC calculation, the forecast employment for this will be removed (note that no sq. ft. of building space would be provided for either as no new building space would be added)

2. **Do not adjust uncommitted excess capacity of the road network but include the employment growth within existing buildings as part of the forecast road capacity needs.**
   This option would not adjust the existing uncommitted excess capacity and would include the all new employment growth as part of the forecasted trip generation. While the employment would be included in the forecast for calculation purposes, the would be no corresponding new building space thus increasing the development charge for non-residential.