

**Calgary**



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ATTACHMENT 1  
SCHEDULE C

**The City of Calgary**

**Off-Site Levy & Community  
Services Charges  
Background Report**

**December 2015**



The City of Calgary Off-Site Levy Bylaw & Community Services Charges  
Background Report

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## EXECUTIVE SUMMARY

This Background Report forms part of the Off-Site Levy Bylaw. In addition to outlining the infrastructure included in the Bylaw, the Background Report describes how the review was undertaken and details the growth assumptions, infrastructure projects and cost estimates underpinning the levies. It offers transparency on how the levies were calculated and outlines how the levies will be used in the future.

The review of the Off-Site Levy Bylaw has been a transparent and collaborative effort between The City and Industry from the outset. This approach is consistent with the Principles and Criteria for Off-Site Levies Regulation within the *Municipal Government Act* (MGA), which requires that “calculation of the levy is to be determined in consultation with affected landowners and developers” (Alberta Regulation 48/2004).

The proposed Off-Site Levy Bylaw itemizes the new or expanded off-site infrastructure that is necessary to serve growth in the city. The following types of infrastructure are included in the Off-Site Levy Bylaw:

- Water and wastewater treatment facilities
- Water distribution and wastewater collection infrastructure
- Drainage infrastructure
- Transportation Infrastructure

The following types of infrastructure are included in the Community Services Charges resolution:

- Emergency response stations;
- Recreations centres;
- Public libraries;
- Transit buses; and
- Police district stations.

For all infrastructure projects included in the levies, analysis of benefit is determined and ensures that costs included in the levies and charges are based on the benefit allocated to growth in the development areas of the city.

Table 1 provides the proposed off-site levy rates and community services charges for growth in The City’s Greenfield Area.



**Table 1 - Proposed Off-Site Levy Rate for Greenfield Area**

Infrastructure	2016 Proposed Rate (\$/Ha)
Transportation	\$136,789
Water Resources - Water and Wastewater	\$206,434
Water Resources - Drainage by Catchment	
Nose Creek	\$11,325
Bow River	\$6,983
Pine Creek	\$16,812
Shepard	\$42,704
Fish Creek	-
Elbow River	-
Community Services	\$78,850
<b>Total</b>	<b>\$422,073 to \$464,777</b>

Table 2 summarizes the proposed off-site levy rates for growth in The City's Established Area.

**Table 2 - Off-Site Treatment Plant Levy Rate for Proposed Established Area Developments**

	Residential \$/Unit				
	Single Detached	Semi-Detached /Duplex	Multi-Residential Grade-Oriented	Multi-Residential Non Grade-Oriented (2 Bedroom or More)	Multi-Residential Non Grade-Oriented (1 Bedroom or Less)
<b>Total Treatment Off-site Levy per Unit Type</b>	<b>\$6,267</b>	<b>\$5,619</b>	<b>\$3,890</b>	<b>\$3,242</b>	<b>\$2,593</b>
<b>Commercial Development Levy Rate: \$36.62/ m<sup>2</sup> of Gross Floor Area</b>					
<b>Industrial Development Levy Rate \$17.58/ m<sup>2</sup> of Gross Floor Area</b>					
<b>Maximum Rate for Density ≥ 285 Equivalent Population/Hectare: \$615,885/Ha.</b>					

For the Established Area levy, credits at the above rates will be applied for existing or recent developments on the proposed development site that have been or will be demolished.



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## CHAPTER 1 – INTRODUCTION

### 1.1 Background

Calgary is one of the fastest growing municipalities in North America – increasing by 100,000 people in the last three years. To meet the ever-changing demands driven by growth, The City of Calgary established a collaborative cross-corporate team called *Build Calgary* in 2014. The Build Calgary team was tasked with the following two goals:

- 1) Implement a funding approach that provides the necessary infrastructure to accommodate projected growth; and
- 2) Work with partners to create a transparent approach to sustainable infrastructure funding for the orderly, economic and beneficial development of land.

The Off-Site Levy Bylaw project is one of the key initiatives of Build Calgary. In 2011, The City of Calgary approved an Off-Site Levy Bylaw and resolution to establish charges for off-site infrastructure impacts related to growth. In 2015, The City of Calgary initiated a review and major update of its transportation, water resources and community services charges for development. The need for a significant update to the Off-Site Levy Bylaw and community services charges was triggered by a number of factors, including:

- The amount of new greenfield development being driven by strong population growth;
- Demand for new infrastructure driven by anticipated growth in established areas;
- The need for a best practice approach to fund future infrastructure that balances financial impact on capital budgets, Calgary's competitive advantage, fairness to taxpayers and utility customers and impacts on affordability; and
- The levies be kept current with infrastructure needs and costs.

The proposed Off-Site Levy Bylaw itemizes the new or expanded off-site infrastructure that is necessary to serve growth in the city. The following types of infrastructure are included in the Off-Site Levy Bylaw:

- Water and wastewater treatment facilities
- Water distribution and wastewater collection infrastructure
- Drainage infrastructure
- Transportation Infrastructure

The following types of infrastructure are included in the Community Services Charges resolution:

- Emergency response stations
- Recreations centres
- Public libraries
- Transit buses
- Police district stations

The proposed off-site levy and community services charges ensure that those who will use and benefit from the infrastructure pay their share of the costs in a fair and equitable manner. The proposed off-site levy and community services charges create certainty by providing stable charges to the development industry and by allowing the orderly and timely construction of infrastructure as determined by The City.



## 1.2 Purpose of the Background Report

This Background Report forms part of the Off-Site Levy Bylaw (the Bylaw). In addition to outlining the infrastructure included in the Bylaw, this report provides the background to determine growth driven costs related to other community infrastructure not included in the Bylaw. These other community services needs are brought to Council in the form of a council resolution and are not included in the Bylaw.

The Background Report describes how the review was undertaken and details the growth assumptions, infrastructure projects and cost estimates underpinning the levies. It offers transparency on how the levies were calculated and outlines how the levies will be used in the future.

The Background Report includes the following elements:

- **Chapter 1** provides the need and purpose of the off-site levy review as well as the key guiding principles and legislative context guiding its preparation.
- **Chapter 2** describes the stakeholder engagement process adopted for the review.
- **Chapter 3** outlines the relationship of the Off-Site Levy Bylaw to other municipal documents, timeframe for the off-site levy programs, allocation of costs between existing and new development, application of the levies in different areas of the city, and the unit of charge.
- **Chapter 4** presents the growth projections and land absorption assumptions used in calculating the off-site levy.
- **Chapters 5, 6 and 7** summarize the costs of each off-site levy programs (i.e. transportation, water resources and community services) and shows how the levy rates are calculated.
- **Chapter 8** includes a summary of how and when the levies will be collected, exemptions to the off-site levy, grace periods and how the levies will be monitored and reviewed.



### 1.3 Legislative and Regulatory Background

This section outlines the legislative and regulatory framework underpinning The City of Calgary's Off-Site Levy Bylaw and Background Report. Section 648 of the *Municipal Government Act* (MGA) allows municipalities to impose a levy to help pay for the capital costs for new or improved infrastructure identified in Section 648 of the MGA that is required to service growth. When establishing an off-site levy, The City must comply with the MGA and Principles and Criteria for Off-Site Levies Regulation, (Alberta Regulation 48/2004) which provides in part:

- 3(1) In determining the levy costs, the municipality is to retain the flexibility to negotiate the levy in good faith and in a manner that recognizes the unique or special circumstances of the municipality.
- 3(2) There is to be full and open disclosure of all levy costs and payments.
- 3(3) There is a shared responsibility between the municipality and developers for addressing and defining existing and future infrastructure requirements and all beneficiaries of development are to be given the opportunity to participate in the cost of providing and installing infrastructure in the municipality on an equitable basis related to the degree of benefit.
- 3(4) Where necessary and practicable, the municipality is to coordinate infrastructure provisions and services with neighbouring municipalities.
- 3(5) There is to be a correlation between the levy and the impacts of new development.
- 3(6) The methodology for determining the levy is to be consistent across the municipality, while recognizing variations among infrastructure types.
- 3(7) The method of calculation for the levy is to be clear.
- 3(8) The information used to calculate the levy is to be kept current.
- 3(9) The calculation of the levy is to include, but is not limited to:
  - o description of the specific infrastructure facilities,
  - o description of the benefiting areas,
  - o supporting technical data and analysis, and
  - o estimated costs and mechanisms to address cost increases over time.
- 3(10) Calculation of the levy is to be determined in consultation with affected landowners and developers.
- 3(11) The levy is subject to annual reporting requirements.

Although the MGA is currently under review by the Province of Alberta, the Bylaw has been developed to adhere with current legislation.



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## CHAPTER 2 – PROJECT APPROACH AND STAKEHOLDER PARTICIPATION

### 2.1 Process for Reviewing the Off-Site Levy Bylaw

The approach to reviewing the Off-Site Levy Bylaw follows six phases. Each of the phases is described below and illustrated in Figure 1.

- **Understand/Principles Phase** – The first phase sought to understand the current assumptions around off-site levies, the current process for determining infrastructure needs and the current approach to allocating who builds, funds and finances infrastructure.
- **Options Identification Phase** – The second phase identified options for where and when growth will occur, alternate service levels and timeframes for providing infrastructure and different ways infrastructure might be built, funded and allocated. This phase included the first stakeholder engagement session.
- **Analysis and Assessment Phase** – The third phase required finalizing the growth assumptions, analysing infrastructure needs and assessing the aforementioned options from a financial and legislative perspective. This phase included the second stakeholder engagement session.
- **Calculations Phase** – The fourth phase involved developing the financial model for the new off-site levies. During this process numerous iterations were created and analysed, considering alternate methodologies.
- **Consultation and Council Process** – The fifth phase included the final stakeholder engagement session, preparing the Background Report and presenting the outcomes of the project at a Council Public Hearing.
- **Implementation Phase** – The implementation phase is on-going and ensures the processes are in place to begin charging the new levy rates and charges.



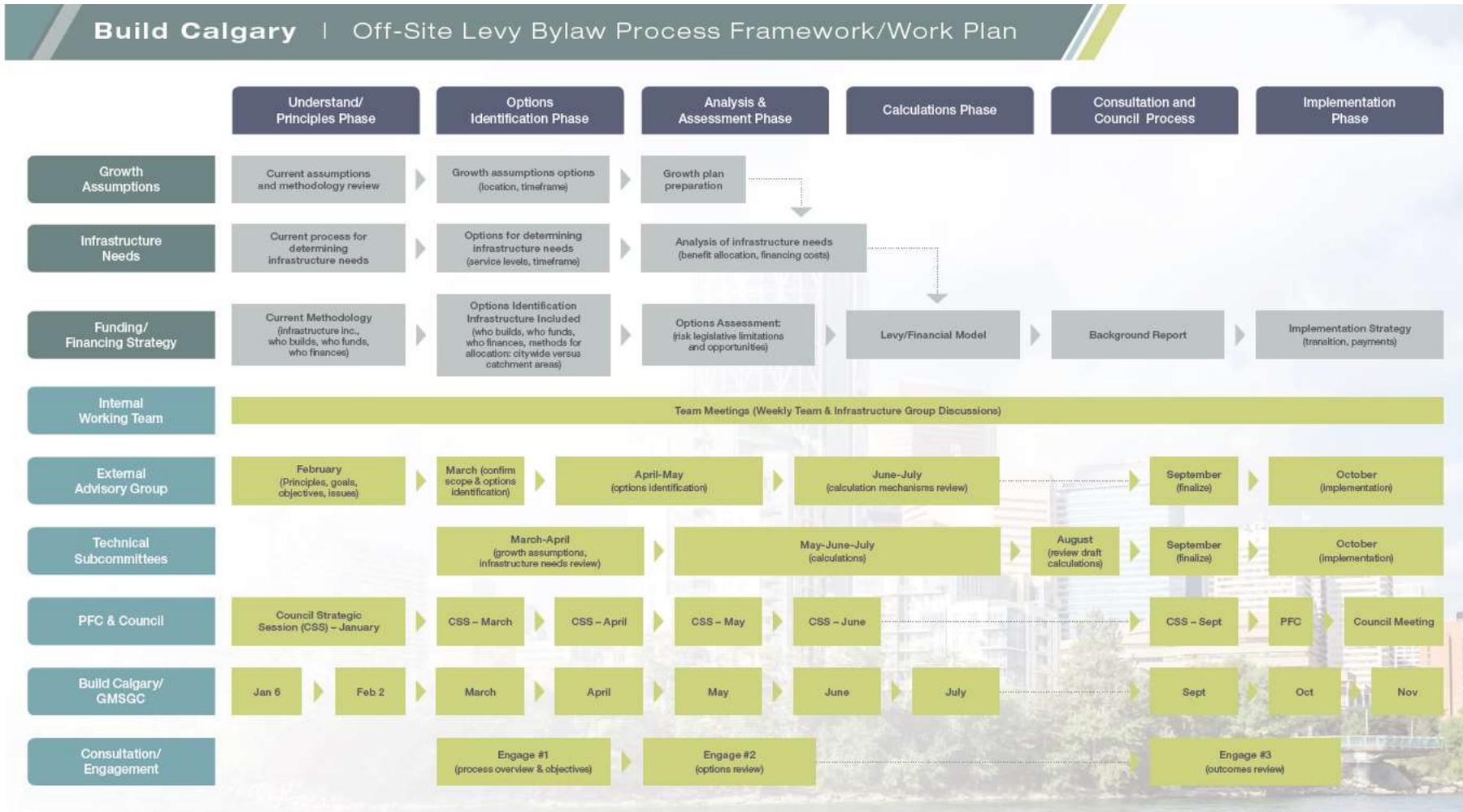
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Figure 1 - Off-Site Levy Bylaw & Community Services Charges Process





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## 2.2 Stakeholder Engagement

The review of the Off-Site Levy Bylaw has been a collaborative effort between The City and Industry from the outset. This approach is consistent with the *Principles and Criteria for Off-Site Levies Regulation* within the MGA, which requires that “calculation of the levy is to be determined in consultation with affected landowners and developers” (Alberta Regulation 48/2004).

The extent of stakeholder engagement during the Off-Site Levy Bylaw process is illustrated in Table 3. The following table provides a summary of the engagement process with further detail provided in Appendix A.

**Table 3 - Stakeholder Engagement Summary**

Engagement Group	Members	Purpose	Frequency of Meetings
Internal Working Team	Predominantly city staff from various departments	<ul style="list-style-type: none"> <li>Developed guiding principles and framework of the work plan</li> <li>Defined infrastructure projects, timing, cost estimates and options for funding</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> <li>32 meetings since Jan 29</li> </ul>
External Advisory Group	City staff and external representatives from various sectors of the development industry including greenfield, inner-city and industrial	<ul style="list-style-type: none"> <li>Acted as Industry sounding board</li> <li>Developed guiding principles for the project</li> <li>Finalized the scope of the project</li> <li>Reviewed options related to methodology, calculation of levy, funding</li> </ul>	<ul style="list-style-type: none"> <li>Every 3 weeks</li> <li>14 meetings since Mar 11</li> </ul>
Technical Subcommittee	City staff, external industry representatives and technical consultants	<ul style="list-style-type: none"> <li>Undertook technical analysis</li> <li>Finalized the methodology and calculations</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> <li>20 meetings since May 5</li> </ul>
Council	City staff and Council	<ul style="list-style-type: none"> <li>Updated on progress of project</li> <li>Receive feedback</li> </ul>	<ul style="list-style-type: none"> <li>Bi-monthly</li> </ul>
Build Calgary /MSGC/ALT	Build Calgary, General Managers Strategic Growth Committee (MSGC) and Administrative Leadership Team (ALT)	<ul style="list-style-type: none"> <li>Weekly meetings with Build Calgary and monthly updates with MSGC/ALT</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>
Stakeholder Information Sessions	Developers (Greenfield and Established Area), community leaders, consultants, various committees and interest groups	<ul style="list-style-type: none"> <li>First session - overview of the Off-Site Levy Bylaw project and its objectives.</li> <li>Second session -review of options</li> <li>Third session - review project outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly</li> <li>Sessions in Apr, Jun &amp; Oct</li> </ul>



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Established Area – Initial Group	City staff, large and small infill developers and interest groups that are related to Established Area of the city.	<ul style="list-style-type: none"> <li>• Provided status of the work plan and receive relevant feedback</li> <li>• Acted as an Industry sounding board</li> <li>• Reviewed options related to the methodology and calculation of levy unique to the established areas of the city.</li> </ul>	<ul style="list-style-type: none"> <li>• 4 meetings since June 11</li> </ul>
Established Area – Stakeholder Group	Established Area developers, consultants, and industry representatives	<ul style="list-style-type: none"> <li>• Sessions were held in November and December with attendance of 40 to 55 industry representatives</li> </ul>	<ul style="list-style-type: none"> <li>• 2 meetings since November</li> </ul>
Established Area – Working Group	Established Area developers, consultants, and industry representatives	<ul style="list-style-type: none"> <li>• Ad hoc committee of representatives of Established Area group to develop strategy for Established Area levies</li> </ul>	<ul style="list-style-type: none"> <li>• 5 meetings since November</li> </ul>
One on Ones	City staff and developers	<ul style="list-style-type: none"> <li>• City staff met with members of the development industry at various occasions to discuss the Off-Site Levy Bylaw and the process.</li> </ul>	<ul style="list-style-type: none"> <li>• At least 21 meetings since January</li> </ul>

### 2.3 Guiding Principles

An important early output from the stakeholder engagement process was a set of eleven principles to guide the preparation of the new Off-Site Levy Bylaw. The principles were jointly created by Industry and City staff to ensure the interests of stakeholders were considered throughout the project.

- **Guiding Legislation** – Understand the current legislation and risks associated with off-site levies and charges. Seek opportunities to manage or mitigate the risks and to identify opportunities for agreed upon legislative changes, whether by City Charter or amendments to the MGA, or both.
- **Certainty** – The Off-Site Levy Bylaw should contribute to overall growth management and infrastructure processes that provide cash flow, cost and infrastructure certainty. The funds collected should be used as intended.
- **Policy Alignment** – Promote achievement of goals within the Municipal Development Plan, Calgary Transportation Plan and The City of Calgary planning and financial policies.
- **Financial Sustainability** – Create an off-site levy bylaw that contributes to a sustainable financial framework for growth-related infrastructure that is in the best interest of current and future citizens of Calgary.



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- **Benefit Allocation** – Costs of off-site infrastructure should be borne by those who benefit. The benefit allocation should be determined using a defined methodology that appropriately allocates infrastructure costs to growth, existing residents and/or regional customers.
- **Fairness and Equity** – Fairness and equity will be a primary consideration when determining benefit allocation, and costs, which should be distributed equitably including considerations for existing and future development.
- **Clarity and Transparency** – Methodologies and calculations used to determine the amount of the off-site levy will be clear and transparent.
- **Accountability** – Information supporting the off-site levies will be disclosed, including annual reporting on the collection and allocation of levies.
- **Collaboration** – Opportunities for collaboration with a diverse set of stakeholders will be provided during this process and in the future.
- **Efficiency** – Strive to create an off-site levy bylaw that can be easily administered.
- **Competitiveness** – Ensure that economic competitiveness for The City of Calgary is of primary consideration, especially as it relates to competition within the Calgary region and for each type of residential, commercial and industrial development.



## CHAPTER 3 – DEVELOPING THE OFF-SITE LEVY PROGRAM

### 3.1 Relationship to Legislation and Municipal Documents

Several sources have been consulted in order to develop this off-site levy program, including the following:

- *Municipal Government Act (MGA)*
- Principles and Criteria for Off-Site Levies Regulation, (Alberta Regulation 48/2004)
- Calgary Municipal Development Plan (MDP)
- Calgary Transportation Plan (CTP)
- Route Ahead: A Strategic Plan for Transit in Calgary (Transit's 30 year Strategic Plan)
- Investing in Mobility: 10 year Transportation Infrastructure Investment Plan
- Investing in Communities: 10 year Community Services & Protective Services Infrastructure Investment Plan
- Water Infrastructure Investment Plan: 10 Year Water Resources Capital Plan
- Calgary Recreation Master Plan 2010 - 2020
- Team Spirit: Advancing Amateur Sport for All Calgarians, A 10 year Strategic Plan for Sport Facility Development and Enhancement
- Calgary Fire Department 30 Year Infrastructure Master Plan
- Calgary Fire Department Infrastructure Requirement: Proposed Plan for Growth Related Stations
- Employment Areas Growth and Change
- Calgary Public Library 2010 Library Master Facility Plan

### 3.2 Timeframe for Off-Site Levies

The timeframe or cost recovery window used for calculating the off-site levies for transportation, water resources and community services programs varies by infrastructure categories considering long-term capital planning and financing horizons for the various infrastructure types.

The timeframe for the transportation program is 60 years, while the water resources program is 10 years for all water resources infrastructure except treatment facilities. Treatment facilities levies are not tied to a fixed program timeframe, but use a cost of capacity model to allocate costs. This model considers recently constructed projects with available capacity for growth along with projects planned in the next 10 years. The community services programs are based on the average cost of facilities needed to serve development with an estimate of costs provided for 30 years. Further information on population and growth projections is provided in Chapter 4.



### 3.3 City-wide versus Area-Specific Off-Site Levies

In a city-wide off-site levy, the same levy rate is applied regardless of the location of the development. An area-specific off-site levy typically divides the community into different areas according to geographic areas or other distinctive characteristics based on technical reasons.

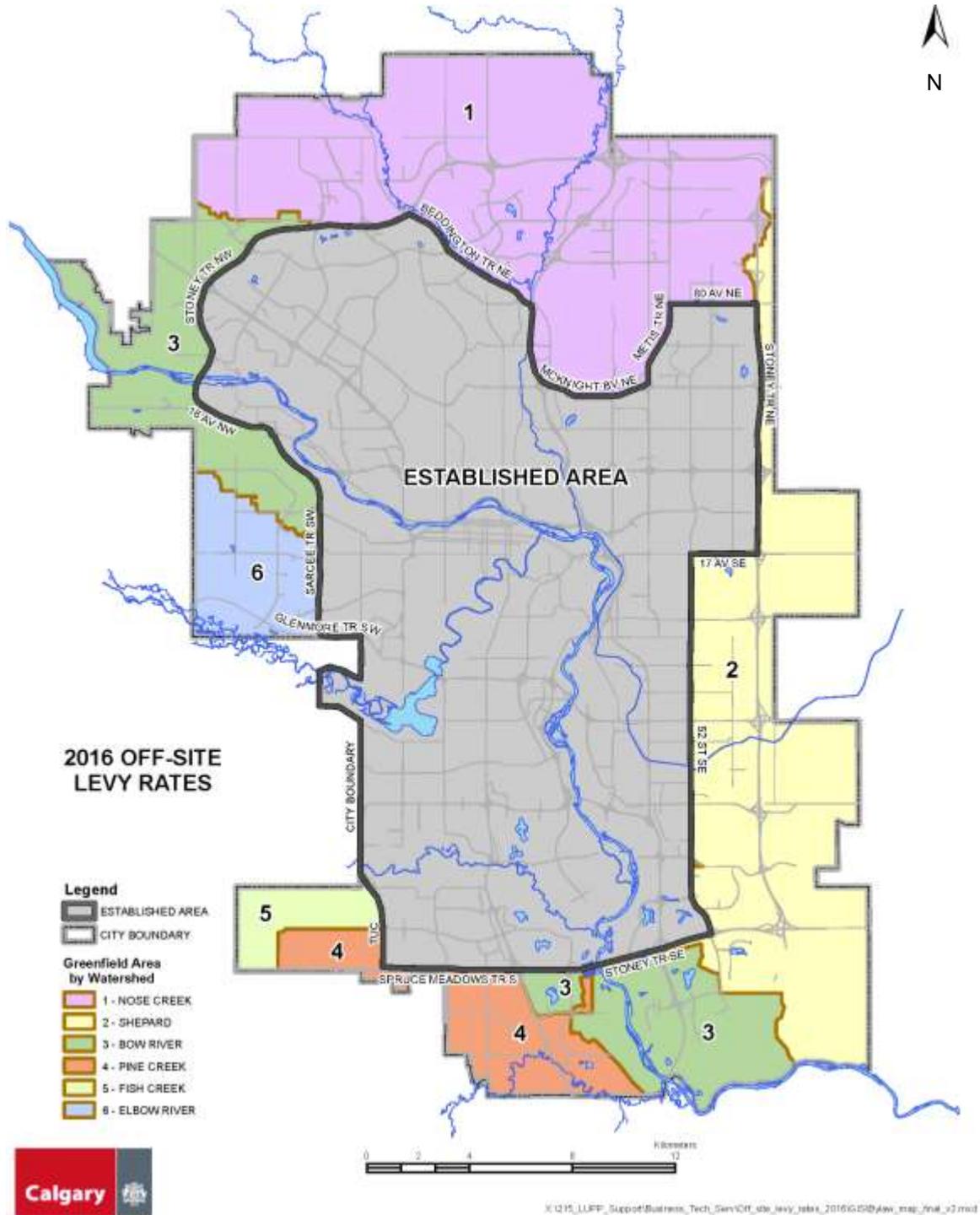
As part of the off-site levy review the impact of projected growth on infrastructure was reviewed to determine if the charges should be levied on a city-wide or area-specific basis. The following table summarizes the outcome of the review and where the levies are applied.

**Table 4 - City-wide versus Area-Specific Off-Site Levies and Community Services Charges**

Area	Infrastructure Type	City-wide or Area-Specific
<b>Greenfield Area</b>	<ul style="list-style-type: none"> <li>• Water Resources – Water Distribution &amp; Wastewater Collection</li> <li>• Transportation</li> <li>• Community Services</li> </ul>	<p><b>City-Wide (Greenfield Only)</b> The same rate is levied across the Greenfield Area as infrastructure benefits and impacts are evenly distributed.</p>
	<ul style="list-style-type: none"> <li>• Water Resources - Drainage</li> </ul>	<p><b>Area-Specific (Greenfield Only)</b> The levy for drainage is applied to specific greenfield catchments as benefits and impacts are attributed to specific catchments of the Greenfield Area.</p>
<b>Established Area &amp; Greenfield Area</b>	<ul style="list-style-type: none"> <li>• Water Resources - Water Treatment and Wastewater Treatment</li> </ul>	<p><b>City-Wide (Established &amp; Greenfield)</b> The levy rates differ by development type based on development impact. Levy is applied to all areas based on equivalent population.</p>

Figure 2 illustrates The City's Established Area and the six catchments within the Greenfield Area. Those Greenfield catchments are: Bow River, Elbow River, Fish Creek, Nose Creek, Pine Creek and Shepard.

Figure 2 - Off-Site Levy Bylaw Areas





### 3.4 Units of Charge

Off-site levy rates in The City's Greenfield Area is levied per hectare for all development types and for all infrastructure types.

In the Established Area, the off-site levy rate applied is only for water and wastewater treatment infrastructure. In order to apply the levy on a consistent basis for both Greenfield Area development and Established Area development, impact on treatment infrastructure capacity is determined based on equivalent population added for each type of development. For the Greenfield Area, the average equivalent population per hectare of development is determined and the corresponding levy per hectare calculated. For the Established Area, the equivalent population impact is determined based on the type of development proposed. For residential development in the Established Area, off-site levy rates are calculated based on equivalent population added by a single detached, semi-detached/duplex, and multi-residential units based on the incremental number of units added. For non-residential development in the Established Area, a rate is determined based on the average equivalent population (employees) added per square metre of gross floor area for non-residential development based on the amount of floor space added. For the Established Area, a credit will be applied based on the existing development that existed on the redevelopment of the site prior to the current proposed development. Details of the determination of the credit is included in Section 6.4.

### 3.5 Allocation of Benefit

For each proposed infrastructure project, costs are allocated between existing development, new growth and regional benefit. The methods to allocate the benefit of projects vary by infrastructure type and specific details are provided in the specific infrastructure sections. Considerations in determining allocation of benefit include:

- Improvement above current level of service to which all benefit
- Resolution of existing deficiencies
- Regional benefit provided
- Renewal or replacement of existing infrastructure which benefits existing users
- Capacity provided
- Projects that are required solely to accommodate new growth

The method used to determine greenfield needs for community services infrastructure is based solely on greenfield demand for libraries, fire halls, recreation centres, police district stations and transit buses. Therefore, the facilities and infrastructure costs determined through this method are 100% allocated to greenfield.

### 3.6 Determination of Carry-Forward Levy Fund Balances

When off-site levies and community services charges are updated, current account balances for the various levy funds should reflect whether expenditures, in the previous collection window, have exceeded or lagged amounts collected. If expenditures exceed collections, then the fund will have a surplus balance and if expenditures lag collections then the fund will have a deficit balance. To determine appropriate fund



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balances, expenditures should be based on the levy project actual costs and the percentage of those costs to be covered by levy funds as determined by the previous levy calculations. Often, municipalities will use other funds available to advance the levy portion of projects until sufficient levy funds are collected. As a result, the actual expenditures of levy funds may not always reflect the theoretical allocation of costs to be covered by levies.

The requirement to carry-forward surplus and deficit balances into the new levy or charge calculations depends on the model used to calculate the levies or charges. For off-site levies and charges that are calculated based on the cost of capacity or cost of facilities required to serve incremental development or population, carry-forward fund balances from previous levy programs are not credited toward the calculation. This cost of capacity method, in principle, determines the appropriate amount to charge new development for additional capacity. Any previous funds collected were collected to provide capacity for previous development or growth. For the current levy and charges calculations in this report, the cost of capacity model applies to all the community service charges and the water and wastewater treatment levies.

For all other infrastructure categories included in this report (transportation and non-treatment related water resources), calculations are timeframe based cost recovery models. These models are based on recovering identified projects costs over a defined development area determined by the timeframe for recovery. As the development timeframe advances, projects are built and levies are collected, however, these amounts are never exactly the same. Therefore, when levies are recalculated based on a new development window, the levy fund will either have a deficit or a surplus balance. Carry forward of deficit fund balances into the new levy calculation ensures that the municipality receives the total amount of projects allocated to be recovered through off-site levies. Carry forward of surplus funds ensures that development receives the benefit of amounts pre-collected for projects that remain on the project list and that surplus amount is credited toward the new levy calculation.



## CHAPTER 4 – GROWTH PROJECTIONS

This chapter provides an overview of growth projections that support the Bylaw. Growth projections are important to the process as they provide the information needed to determine the infrastructure required to support identified development windows. The growth projections also identify the benefitting population and area over which infrastructure costs are allocated. Dividing the growth infrastructure costs by the growth projection areas or the growth population equivalents produces the levy per hectare or unit amounts referenced in the Bylaw.

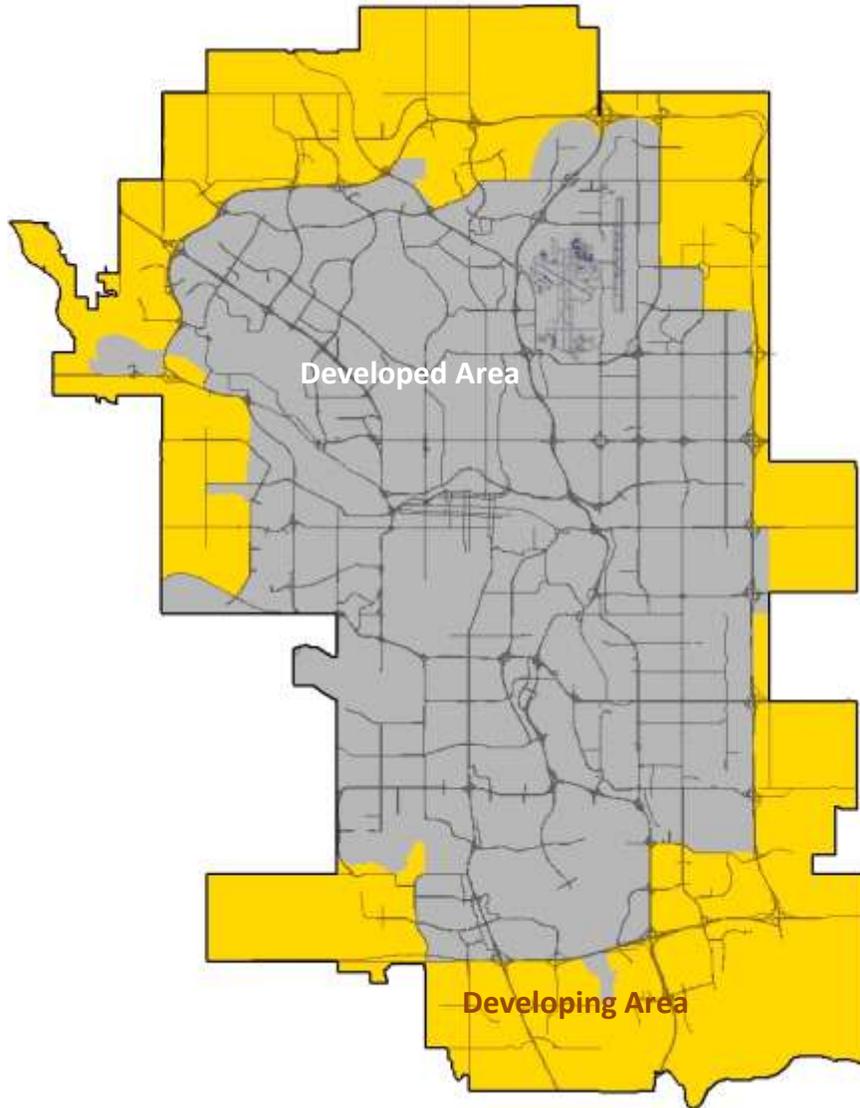
### 4.1 Projected Population Growth – Amount and Distribution

#### Projecting Based on Policy and Trend

The population growth projections used for the levies and charges are based on Calgary's MDP. Approved by City Council in 2009, this plan sets the vision for growth in the city over the next 60 years including both the amount and the location of growth. The MDP projects that Calgary's population will grow by 1.2 million people between 2006 and 2076, increasing from 1.0 million to 2.2 million. As this projection was prepared in 2009, the projection has been adjusted to meet actual socio-economic circumstances that have affected actual growth rates since 2009. The current 60 year forecast for the off-site levy calculations has been revised up by an additional 342,000 people to reflect the higher growth trend in recent years.

The MDP contains a range of policies intended to achieve the vision for the pattern of Calgary's growth over time. In particular, the MDP provides a vision for the estimated growth in the city to occur in The City's Established and Greenfield Areas at the time the MDP was prepared. The MDP refers to the Established and Greenfield areas as the Developed Area and Developing Area respectively. The Developed Area is considered to be all communities that were completely constructed prior to the approval of the MDP in 2009 and as shown in Figure 3. The Developing Area is considered to be all communities that had no or only partial urban development prior to approval of the MDP. The MDP vision includes an increasing share of growth in the Developed Area, specifically 33 percent of growth by 2039 and 50 percent of growth over the next 60 to 70 years.

**Figure 3 – The City of Calgary MDP - Developed and Developing Areas**



In addition to the MDP’s vision for the split of growth between Developed and Developing Areas, projecting the location of future growth also takes into consideration The City’s corporate forecast for population growth and development data such as the suburban lot inventory, subdivision plans and permitting activity that reflect market conditions.

In establishing a population for 2076, population growth and distribution have been projected for five year windows out to 2043. The result is a comprehensive, high resolution forecast that incorporates present day growth patterns, near term development intentions, emerging demographic trends, and the vision of the MDP. Table 5 provides the population projections for the development windows.



**Table 5 - Population Projections**

Areas (as defined in the MDP)	Total Population				
	2006 (actual census pop.)	2014 (actual census pop.)	2024	2039	2076
<b>Developed Area</b>	849,967	882,241	949,691	1,179,480	1,589,520
<b>Developing Area</b>	141,792	312,953	523,896	730,332	920,064
<b>City Total</b>	991,759	1,195,194	1,473,586	1,909,812	2,509,584

Table 5 demonstrates how the overall projection assumes that the share of growth in Developed Areas increases through the time period. Recent census data shows that the share in Developed Area growth is shifting towards this projection with 16% of population growth experienced since 2006 occurring in the Developed Areas.

## 4.2 Greenfield Growth Area Projections

Land area is the basis for allocating growth infrastructure costs for greenfield development. To determine levies and charges for greenfield development starting in 2016, the developable Greenfield Area is determined for each levy program timeframe. The developable Greenfield Area does not include areas with development agreements in place as the levies and charges have already been determined and fixed for those areas. Furthermore environmental reserve and skeletal roads are excluded from the determination of the developable Greenfield Area.

To determine the Greenfield Area, growth is categorized as follows: residential growth, non-residential growth supporting residential development and industrial growth.

### Projections for Residential Greenfield Growth

The amount and location of future growth in greenfield areas is guided by land-use patterns and intensity standards (people and jobs per hectare) in the MDP and are further refined through Area Structure Plans (ASPs) and planning applications. Greenfield development is tracked through The City's Suburban Residential Growth report which provides information on achieved densities and corresponding people and jobs per hectare.



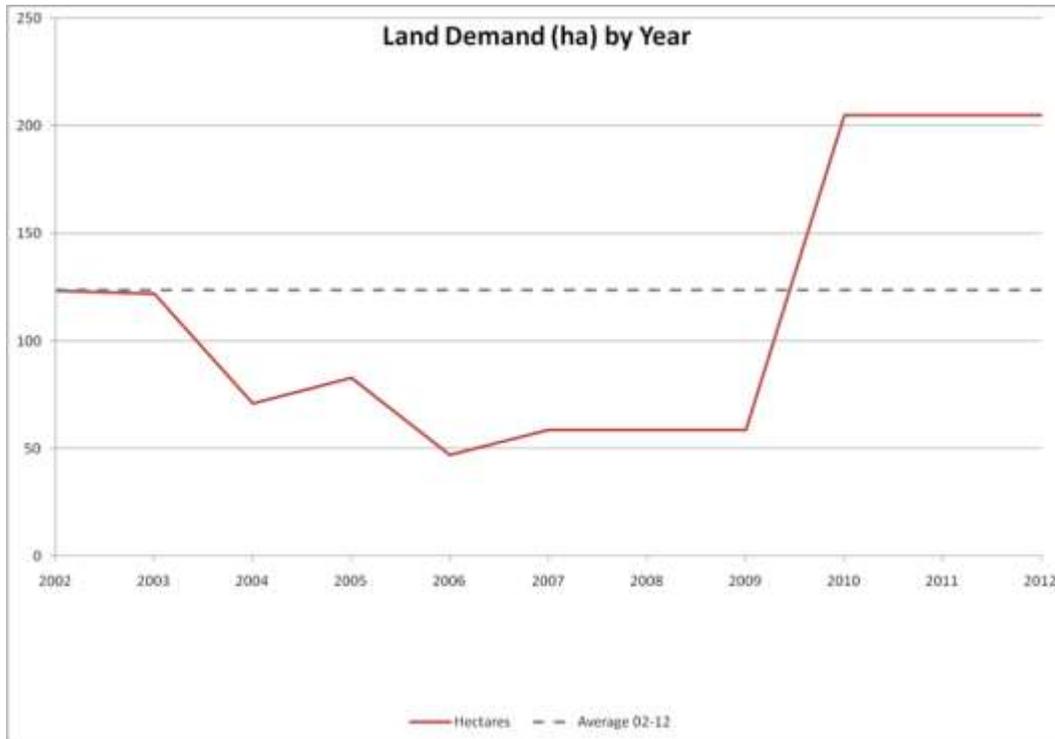
### Projections for Non-Residential Greenfield Growth Supporting Residential Growth

Supporting non-residential uses include: retail centres, institutional uses, high schools, public lakes/water bodies and regional open spaces. The amount of this type of development area is estimated at 15% to the residential greenfield growth area projection. If ASPs are available, supporting non-residential area estimates provided in the ASP are used in place of the 15% estimate.

### Projections for Greenfield Industrial Growth

Industrial greenfield development includes new development built under an industrial use in one of the city's industrial areas. The projection for industrial lands is based on the actual industrial land development experienced between 2002 and 2012. However, industrial land development is variable over time as illustrated in Table 6. The annual development of industrial land varied from a low of 50 hectares to a high of over 200 hectares per year.

**Table 6 - Historic Industrial Land Demand in Calgary by Year**



The City uses the average industrial land development over this time period of 125 hectares per year for projecting the demand for industrial land over the development window forecasts. This is a reasonable approximation over an extended timeframe of city growth.

Table 7 provides a summary of Greenfield Area projections for residential, supporting non-residential and industrial development, for the development windows used to determine the levies and charges. The numbers reflect developable land, which is total land less environmental reserve and skeletal roads.



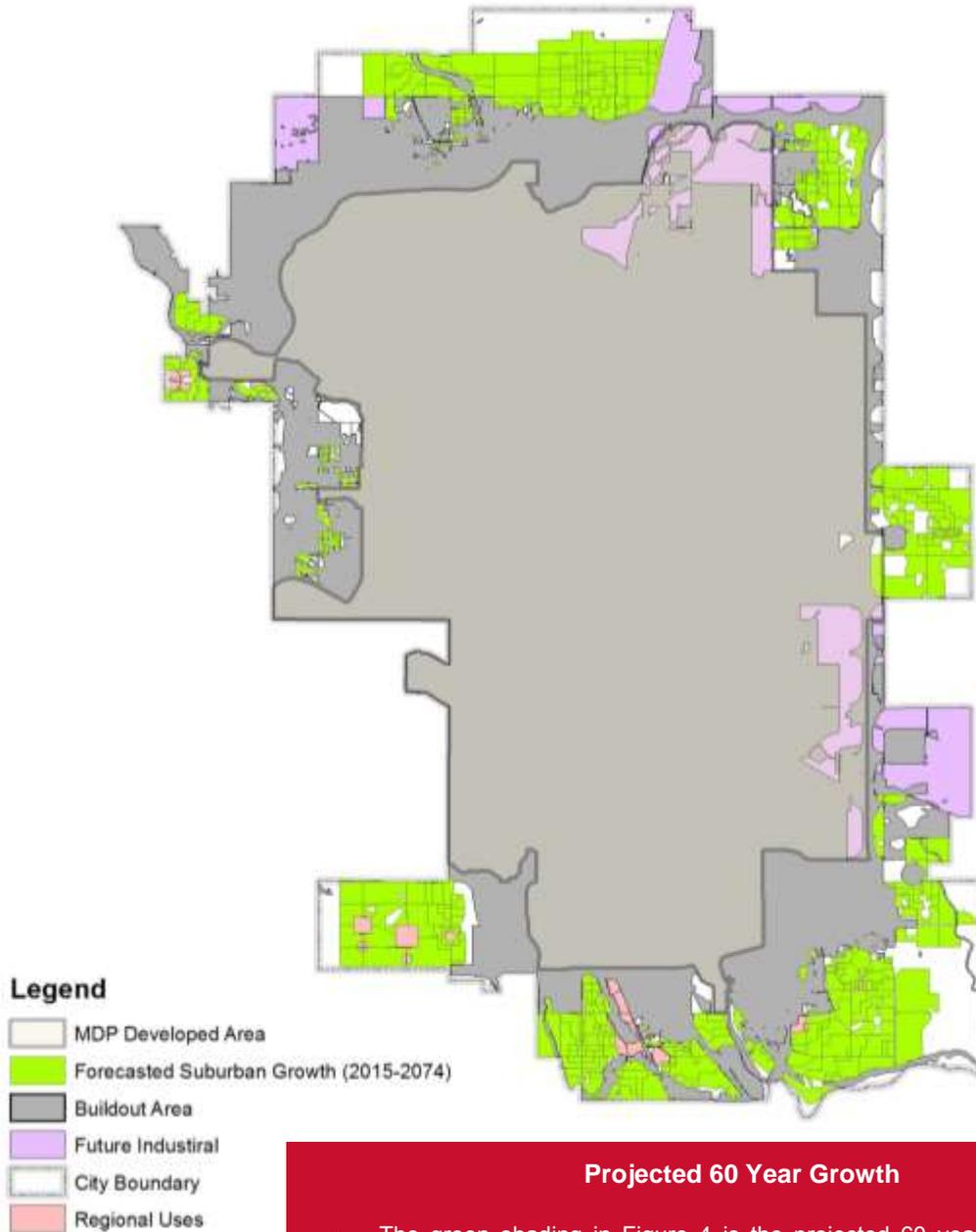
**Table 7 - Estimated Greenfield Land Development Projections**

Year	Residential (ha)	Non-Residential (ha)	Industrial (ha)	Total Greenfield Area for Levies and Charges
2016-2024 (9 years) <sup>1</sup>	2,418	70	1,125	3,613
2015-2024 (10 years)	2,687	78	1,250	4,015
2015-2044 (30 years)	6,341	371	3,750	10,462
2015-2074 (60 years)	10,307	538	7,500	18,345

*1 –9 year horizon is used in some of the utilities calculations, as Water Resources is already one year into their 2015-2024 Water Infrastructure Investment Plan (WIIP)*

Figure 4 illustrates where future growth is anticipated to occur within The City's Greenfield Area for the 60 year horizon. The size of the growth areas corresponds to the data provided in Table 7.

Figure 4 - Projected 60 Year Growth in Developing Areas



**Projected 60 Year Growth**

- The green shading in Figure 4 is the projected 60 year residential growth in The City’s Greenfield Area and represents 10,307 ha.
- The purple and pink shading represents a further 8,038 ha of land that is expected to be developed for industrial and supporting non-residential uses during the same period.
- The total levy-eligible land estimated to be absorbed for all uses over the next 60 years is 18,345 ha.



## CHAPTER 5 – TRANSPORTATION PROGRAM

### 5.1 Introduction

The City's MDP and related CTP sets out a clear framework for development over approximately a 60 year timeframe with mobility and development intrinsically linked. The future growth patterns envisioned in the plans create more compact and connected communities through a capital program which supports the increased use of active modes and transit while also maintaining auto mobility into the future. The transportation off-site levy provides a mechanism for greenfield growth to contribute to the increasing cost to provide transportation infrastructure to support the growth of the city.

The basis of the transportation levy is that future transportation infrastructure costs are levied to greenfield development based on the benefit allocated to greenfield development. As such, the benefit that existing development and growth in the Established Area will receive from future transportation infrastructure is not included in the levy.

The costs of the following types of transportation infrastructure are included in the levy

- Interchanges
- Structures over major geographic barriers (rail/creeks/ravines)
- Skeletal Roads (Expressways)
- Transportation Utility (TUC) Road connections
- Pedestrian Overpasses
- All Greenfield Traffic Signals
- Additional lanes and facilities for the purpose of Bus Rapid Transit (BRT)

Costs for operating, lifecycle or maintenance of transportation infrastructure, and roads/transit operations are not included in the levy. No costs associated with Light Rail Transit (LRT) are included in the levy.

The City of Calgary's Municipal Development Plan and Transportation Plan set out a clear framework for development growth over a 60 year timeline with associated transportation infrastructure requirements to build out the plans, as envisioned. As such, the timeframe for examining long term infrastructure needs was chosen to be 60 years.

### 5.2 Determining Transportation Infrastructure Needs

The City of Calgary's *Regional Transportation Model*, was used to determine the transportation infrastructure required to build out the growth patterns envisioned over 60 years within the CTP. In order to determine benefit to the Greenfield Area, the model was broken down into two areas: Greenfield Area (those areas without development at the time of the analysis) and Established Area (areas that have been predominantly developed already). As the travel patterns and transportation choices differ for the two areas, it is reasonable to determine infrastructure needs and benefit based on the two areas over the chosen timeframe.

The following table provides a summary of infrastructure and costs to support build out of the city over 60 years. A detailed project list and maps showing the location of the projects is included in Appendix B.



**Table 8 - Total Transportation Infrastructure Costs**

Infrastructure	Total Transportation Infrastructure Costs (\$millions)	
	Established Areas Projects	Greenfield Areas Projects
Interchanges	\$4,161.7	\$1,911.0
Greenfield Traffic Signals	\$0	\$81.4
Major Structures	\$600.0	\$263.0
Expressway/Ring Rd Connections	\$0	\$233.3
Road Widening	\$824.0	\$0
Pedestrian Overpasses	\$84.0	\$42.0
Bus Rapid Transit Infrastructure	\$392.0	\$90.0
<b>Total</b>	<b>\$6,061.7</b>	<b>\$2,620.6</b>

These costs include the capital costs of construction of new infrastructure required to support greenfield growth. Estimates are generally based on Class V cost estimates, as per the Corporate Project Management Framework definitions. For near term projects where additional design work has been undertaken and more refined cost estimates are available, these estimates are used in the calculations. Where grants or provincial highway funding are provided from other levels of government for a specific project and obtained only to be applied to that specific project, those amounts are applied to the project costs above. Should project specific funding be received, grant amounts will be taken into consideration for future calculations.

### 5.3 Allocation of Benefit

The City of Calgary's *Regional Transportation Model* (RTM) was used to determine the allocation of benefit to greenfield growth for both Greenfield and Established Area infrastructure. Within the RTM, Vehicle Kilometres Travelled (VKT) were analyzed as a reflection of use (benefit) of the various pieces of infrastructure and then broken out for traffic generated from greenfield areas and traffic generated from the Established Area on the two categories of infrastructure. Based on the Established Area in the model in 2011, the greenfield benefit of Established Area infrastructure was found to be 17% and for greenfield area infrastructure the benefit to greenfield was 67%. This analysis considers regional traffic and provides an adjustment of benefit for regional traffic.

The final percentage of benefit to greenfield growth is provided in Table 9.



**Table 9 - Allocation of Benefit**

Transportation Infrastructure Category	% Benefit to Greenfield Development
Greenfield Area Transportation Infrastructure	67%
Established Area Transportation Infrastructure	17%

The following table summarises the allocation of transportation infrastructure costs to greenfield growth.

**Table 10 - Allocation of Transportation Infrastructure Costs to Greenfield Growth**

Infrastructure	Transportation Infrastructure Costs (\$millions) Allocated to Greenfield Growth	
	Established Area Projects	Greenfield Area Projects
Interchanges	\$707.5	\$1,280.4
Greenfield Traffic Signals	\$0	\$54.5
Major Structures	\$102.0	\$176.2
Expressway/Ring Road Connections	\$0	\$156.3
Road Widening	\$140.1	\$0
Pedestrian Overpasses	\$14.3	\$28.1
Bus Rapid Transit Infrastructure	\$66.6	\$60.3
<b>Total</b>	<b>\$1,030.5</b>	<b>\$1,755.9</b>

Through development of greenfield lands since 2011, the Greenfield Area has decreased in size, while the Established Area has increased in size over the same build-out window. The allocation of benefit, therefore, needs to be adjusted to reflect the impact of growth from the smaller Greenfield Area. As of 2015, approximately 10% of the Greenfield Area growth has developed and shifted to the Established or existing development area. As a result, a reduction of 10% benefit is applied to the greenfield levy calculation provided in Section 5.5.

## 5.4 Levy Calculations

The proposed off-site levy for transportation infrastructure has been calculated according to the principles, assumptions and approach discussed in this Background Report. The basic calculation is shown in the following figure.



**Figure 5 - Transportation Off-Site Levy Calculation**

$$\text{Levy Rate} = \frac{\text{GF Area Reduction}(\%) \times [ (\text{GF Costs}(\$) \times \text{GF Benefit}(\%)) + (\text{Established Costs}(\$) \times \text{GF Benefit}(\%)) ]}{60 \text{ year GF Developable Area}(\text{Ha})}$$

$$\text{Levy Rate} = \frac{0.9 \times [ (\$2,620\text{M} \times 67\%) + (\$6,061\text{M} \times 17\%) ]}{18,345 \text{ Ha}} = \$136,789/\text{Ha}$$

## 5.5 Transportation Levy Summary

Table 11 provides a summary of the transportation levy information provided.

**Table 11 - Proposed Transportation Off-Site Levy**

Proposed Transportation Off-Site Levy	Totals
Total Growth Infrastructure Cost	\$8.68 Billion
Greenfield Area (Ha)	18,345 Ha
Greenfield Levy Allocation of Cost	\$2.5 Billion
City Allocation of Cost	\$6.18 Billion
<b>Proposed Transportation Levy (\$/Ha)</b>	<b>\$136,789</b>



## CHAPTER 6 – WATER RESOURCES PROGRAM

### 6.1 Introduction

Growth can be challenging for The City to ensure that water, sanitary and storm infrastructure requirements are met with available funding. The City endeavours to maintain service levels while supporting new development infrastructure needs. Growth related infrastructure is required to treat and distribute water to new developments, transport sewage from homes to treatment plants, and to drain storm water from the point of origin to the appropriate release point in one of our rivers in order to pre-treat storm water and prevent flooding.

The Water Resources off-site levy program is divided into the following three components:

- **Water Distribution & Wastewater Collection** – including upgrades and extensions to water distribution infrastructure and wastewater collection infrastructure.
- **Drainage Systems** – including new and upgraded drainage facilities and collection systems
- **Water and Wastewater Treatment** – including new plants, upgrades and capacity for wastewater and water treatment

The City's 10 year capital plan for water resource infrastructure is approximately \$350 million per year with half this attributable to growth related infrastructure. Treatment plants account for 60% of the growth related capital budget, with the majority of these costs related to wastewater plant upgrades and expansions. The remaining 40% of the growth related costs are associated with linear networks for infrastructure such as pipe extensions and upgrades.

The water distribution and wastewater collection projects included in the water resource off-site levy program are identified in either the Water Long Range Plan, the Sanitary Long Range Plan, or ASPs for greenfield areas and associated technical studies, such as Master Drainage Plans. Treatment plant upgrades are identified in the Water Treatment Plant Master Plan and Sanitary Long Range Plan. For near term upgrades, conceptual and/or preliminary design studies have been undertaken and are used as a basis for the costs to determine the off-site levies.

In developing the water resources levy program there were four of the Guiding Principles, as described in Section 2.3 above, that were particularly important:

- **Certainty** – A primary objective of the water resources program is to provide revenue assurance to the utilities.
- **Financial Sustainability** – Long term financial sustainability of the utilities is extremely important. There are two parts to this objective. The first is resiliency to ensure that the framework for funding and financing of growth infrastructure is responsive to changing growth levels. The second part is to manage financial risks in the business.
- **Fairness and Equity** – Fairness and equity ensures that those benefiting from the infrastructure are paying for that benefit.
- **Efficiency** – Finally, the water resources program provides an efficient levy process that is simple to administer and understand.



## 6.2 Water Distribution & Wastewater Collection

### Water Distribution & Wastewater Collection Projects & Costs

The water distribution and wastewater collection projects for the levy program are determined for a 10 year timeframe based on The City’s 10 year capital planning process. As 2016, is year two of The City’s current 10 year capital plan, the levy calculations cover the remaining nine years of that plan.

The water distribution and wastewater collection off-site levy is applied across all greenfield areas and represents trunk main and other capacity improvements required to support development. The following table summarises the new water distribution and wastewater collection projects required to accommodate The City’s nine year growth projections. Further details on costs are provided in Appendix C.

**Table 12 - Water Distribution & Wastewater Collection Infrastructure Costs**

Infrastructure	Total Future Water Distribution & Wastewater Collection Infrastructure Costs (\$millions)
Water distribution (Upgrades)	\$129.6
Water distribution (Extensions)	\$136.8
Wastewater collection(Upgrades)	\$356.9
Wastewater collection (Extensions)	\$140.1
<b>Total</b>	<b>\$763.4</b>

Cost estimates used in the levy calculation are assumed to be Class V cost estimates, as per the Corporate Project Management Framework definitions. These estimates include engineering, contingency and project administration. The cost estimates for the projects were taken from the Spending Plan, the 2015-2018 Water Infrastructure Investment Plan and the Proposed Water Infrastructure Investment Plan for 2019-2024.

### Water Distribution & Wastewater Collection Allocation of Benefit

Water distribution and wastewater collection projects are divided into two categories – upgrades and extensions. All sanitary linear extensions and water linear extensions are the extension of pipes to serve new development areas and are 100% attributable to new growth. Sanitary and water upgrades are located within the Established Area of the city and may provide some benefit to existing development or customers. The costs allocated to growth for upgrades are undertaken on a project by project basis and the detailed allocations can be found in Appendix C. For both upgrades and extensions, the costs determined to benefit growth are further allocated to established, greenfield and regional growth based on the forecasted population and jobs for these areas within the infrastructures overall catchment area. The allocation benefit is based and the Established and Greenfield Areas as of 2015 and the associated allocation of benefit determined accordingly.

Table 13 summarises the allocation of water distribution and wastewater collection infrastructure costs to greenfield growth.



**Table 13 - Greenfield Allocation of Water Distribution & Wastewater Collection Infrastructure Costs**

Infrastructure	Greenfield Water Distribution & Wastewater Collection Infrastructure Costs (\$m)
Water distribution (Upgrades)	\$16.8
Water distribution (Extensions)	\$76.7
Wastewater collection(Upgrades)	\$62.4
Wastewater collection (Extensions)	\$140.1
<b>Total</b>	<b>\$296.0</b>

### Water Distribution & Wastewater Collection Levy Calculation

The water distribution and wastewater collection levies include all infrastructure costs allocated to greenfield over the nine year timeframe. As all distribution and collection projects are debt financed, the costs to be recovered from development include all the principal and interest costs within the nine years. This includes previously constructed projects where debt payments are still outstanding and future debt payments from projects planned to be constructed in the nine year program. All forecasted projects assume financing over a 25 year debenture term which spreads the costs over a longer window of development. The rate is calculated by taking the aforementioned costs and dividing them by the forecasted developable, non-levied lands for the next nine years. The basic calculation is shown in the following figure.

**Figure 6 - Water Distribution & Wastewater Collection Off-Site Levy Calculation**

$$\begin{aligned}
 &\text{Debt Servicing for Greenfield Growth Related Capital Costs (9 yrs.)} = \text{Cost Base Future Value} \\
 &\frac{\text{Cost Base Future Value}}{(1+\text{Discount Rate})^{n1\dots n9}} = \text{Cost Base Present Value} \\
 &n=\text{timeline for capital investment} \\
 &\frac{\text{Cost Base Present Value}}{\text{Greenfield Developable Land Forecast (9 yrs.)}} = \text{Off-site Levy}
 \end{aligned}$$

**Table 14 - Proposed Water Distribution and Collection Off-Site Levy**

<b>Water Distribution</b>	
<b>Proposed Water Distribution Levy (\$/Ha)</b>	<b>\$32,325 / Ha.</b>
<b>Water Collection</b>	
<b>Proposed Wastewater Collection Levy (\$/Ha)</b>	<b>\$44,449 / Ha.</b>



## 6.3 Drainage System

### Drainage System Projects & Costs

Drainage system projects are determined for a ten year timeframe based on The City's ten year capital plan. This timeframe is the basis for the off-site levy program for drainage systems projects. As 2016, is year two of the ten year program, the levy calculations covers only nine years of the program.

The drainage system off-site levy that applies to any subject lands depending on which of the six major watershed catchments areas the subject lands are located within. Those catchments are: Bow River, Elbow River, Fish Creek, Nose Creek, Pine Creek and Shepard. The total cost of drainage system projects required to accommodate The City's nine year growth projections is \$67.9 million. Further details on costs are provided in Appendix C.

Cost estimates used in the levy calculation are assumed to be Class V cost estimates, as per the Corporate Project Management Framework definitions. These estimates include engineering, contingency and project administration. The cost estimates for the projects were taken from the 2015-2018 Spending Plan, 2015-2018 Water Infrastructure Investment Plan and the proposed Water Infrastructure Investment Plan for 2019-2024.

### Drainage System Allocation of Benefit

Projects included in the drainage system off-site levy provide benefit to both greenfield growth and growth in the established areas of The City's six major watershed catchments areas. None of the drainage projects included in the levy calculation benefit existing development or regional areas. As such drainage system costs are allocated completely to either Greenfield Area development or Established Area development in the six catchments. Drainage off-site levies are only calculated and applied in the Greenfield Area and include only the project costs determined to benefit the Greenfield Area of the drainage catchment.

### Drainage System Growth Infrastructure Needs

The following table summarises the allocation of drainage system infrastructure costs to greenfield growth and established areas growth.

**Table 15 - Allocation of Drainage System Costs to Growth**

Infrastructure	Drainage System Infrastructure Costs (\$millions)
Greenfield Area	\$44.5
Established Area	\$23.4
<b>Total</b>	<b>\$67.9</b>

### Drainage System Levy Calculation

The drainage system levies include all infrastructure costs allocated to greenfield development over the nine year timeframe. All project costs to be recovered from development may include a combination of principal and interest costs, cash funded project costs and any cash payments required under Construction Financing



Agreements (CFAs) within the nine year timeframe. This includes costs from previously constructed projects where debt payments are still outstanding and future debt payments from projects to be constructed in the nine year program. All forecasted projects assume financing over a 25 year debenture term which spreads the costs over a longer window of development.

Determining the financing option to use is driven by available funds. The following table shows the financing option applied to each catchment.

**Table 16 – Finance Option by Catchment**

Catchment	Financing Option
Nose Creek	Cash (CFAs)
Bow River	Cash/Debt
Pine Creek	Cash/Debt
Shepard	Debt

The rate is calculated by taking the aforementioned costs and dividing them by the forecasted developable lands in each catchment for the next nine years. The simplified calculation is shown in the following figure.

**Figure 7 – Drainage System Off-Site Levy Calculation**

$$\text{Debt Servicing for Greenfield Growth Related Capital Costs (9 yrs.)} = \text{Cost Base Future Value}$$

$$\frac{\text{Cost Base Future Value}}{(1+\text{Discount Rate})^{n1\dots n9}} = \text{Cost Base Present Value}$$

*n=timeline for capital investment*

$$\frac{\text{Cost Base Present Value}}{\text{Greenfield Developable Land Forecast (9 yrs.)}} = \text{Off-site Levy}$$

The proposed off-site levy for drainage systems is shown in the following table.

**Table 17 – Proposed Drainage System Levy by Catchment**

Catchment	\$ per Hectare
Nose Creek	\$11,325
Bow River	\$6,983
Pine Creek	\$16,812
Shepard	\$42,704
Fish Creek	-
Elbow River	-



## 6.4 Water & Wastewater Treatment

### Water & Wastewater Treatment Project Costs

The water and wastewater treatment off-site levy is applied to growth across The City's Greenfield and Established Areas and is based on allocating capacity costs for treatment upgrades to the expected equivalent population served. It is assumed that capital costs related to existing and future expansion will serve the expected equivalent population growth up to 2035 for wastewater and 2025 for water. The following table summarises the total costs of the water and wastewater treatment projects that are triggered in the ten year Water Infrastructure Investment Plan. Further details on costs are provided in Appendix C.

**Table 18 – Water & Wastewater Treatment Infrastructure Costs**

Infrastructure	Total Water & Wastewater Treatment Infrastructure Costs (\$millions)
Water Treatment Plants	\$97.5
Wastewater Treatment Plants	\$1,302.4
<b>Total</b>	<b>\$1,399.9</b>

Cost estimates used in the levy calculation are assumed to be Class V cost estimates, as per the Corporate Project Management Framework definitions. These estimates include engineering, contingency and project administration. The cost estimates for the projects were taken from the Spending Plan, Approved 2015-2018 Water Infrastructure Investment Plan and the Proposed Water Infrastructure Investment Plan for 2019-2024.

### Water & Wastewater Treatment Projects Allocation of Benefit

Allocation of benefit to existing customers in the city is determined on a project by project basis and include costs associated with regulatory requirements to serve the existing equivalent population. Included in the portion of the projects allocated to growth is an allocation for regional growth. The portion of water and wastewater treatment growth infrastructure that benefits the regional areas is allocated based on the forecasted population and jobs for each of those areas. Further detail on the allocation of benefit for each project is provided in Appendix C.

The following table summarises the allocation of water and wastewater treatment infrastructure costs to growth in the city including both Greenfield and Established Areas growth

**Table 19 - Allocation of Water & Wastewater Treatment Infrastructure Costs to Growth**

Infrastructure	Water & Wastewater Treatment Infrastructure Costs (\$m)
Water Treatment Plants	\$76.6
Wastewater Treatment Plants	\$941.4
<b>Total</b>	<b>\$1017.7</b>



### Water & Wastewater Treatment Levy Calculation

The approach to calculating the water and wastewater treatment off-site levy was to distribute capital costs to new and existing customers in proportion to the customer's usage of the facilities and the investment required to develop the facilities.

The result is an off-site levy that reflects the costs of providing the capacity needed by customer growth. For the purpose of the calculation, it was assumed that future capital investments are to be financed by a 10 year debt term. The financing costs for existing capacity are based on existing finance terms with debentures ranging between 15, 20 and 25 year terms.

The water and wastewater treatment off-site levy for all areas of the city is calculated by taking the aforementioned costs and dividing them by the total capacity available expressed in equivalent population to obtain a charge per equivalent population.

**Figure 8 - Calculation for Value of Capacity per Equivalent Population (EP) for Water & Wastewater Treatment Off-Site Levy**

$$\text{Debt Servicing Costs for Existing and Future Capacity Future Values} = \text{Available Capacity Future Value}$$

$$\frac{\text{Available Capacity Future}}{(1+\text{Discount Rate})^{n^1\dots n}} = \text{Present Value of Available Capacity}$$

*n=forecasted years to reach available capacity*

$$\frac{\text{Present Value of Available Capacity}}{\text{Equivalent Population (EP) Served}} = \text{Value of Capacity per EP} = \$2161/\text{EP}$$

### Greenfield Area Levy for Treatment

The Levy is applied to the Greenfield Area based on the average equivalent population density of 60 EP/hectare as this is the current average density of EP achieved in greenfield developments.

**Figure 9 - Calculation for Greenfield Water & Wastewater Treatment Infrastructure Off-Site Levy**

$$\text{Value of Capacity per EP} \times \text{Average EP per Hectare} = \text{Greenfield Off-Site Levy Present Value}$$

$$\$2161/\text{EP} \times 60 \text{ EP per Hectare} = \$129,660/\text{Hectare} = \text{Greenfield Off-Site Levy Present Value}$$



### Established Area Levy for Treatment

For the Established Area, the off-site levy is applied by dwelling type for residential development, and by gross floor area (sq.m.) for commercial and industrial developments. For residential developments, one resident or occupant is equal to one equivalent population. For non-residential developments, one employee is equal to 0.61 of an equivalent population. Equivalent population ratios are determined through analysis of system flow data.

Expected average equivalent population (EP) or occupancy per dwelling type is derived from The City of Calgary census data (2010-2014), research of comparable municipalities along with other stakeholder information provided.

**Table 20 – Residential Equivalent Population by Unit Type**

Single Detached	Semi-Detached /Duplex	Multi-Residential Grade-Oriented	Multi-Residential Non Grade-Oriented (2 Bedroom or More)	Multi-Residential Non Grade-Oriented (1 Bedroom or Less)
2.9 EP/Unit	2.6 EP/Unit	1.8 EP/Unit	1.5 EP/Unit	1.2 EP/Unit

For commercial developments, the expected average number of employees is based on the current estimated city employment intensity rate of 36 sq.m./employee. For industrial developments, the average rate of 75 sq.m./employee is derived from employment intensity assumptions in *The Guide to the MDP and CTP*. Based on these average intensities of employment for non-residential land-uses, Table 21 provides the calculation for equivalent population per square meter of gross floor area for non-residential development.

**Table 21 - Non-Residential Equivalent Population per Square Metre of Gross Floor Area**

Commercial Development	Industrial Development
$EP/employee \div m^2/employee = EP/ m^2$ $0.61 EP/employee \div 36 m^2/employee =$ <b>0.017 EP/m<sup>2</sup> gross floor area</b>	$EP/employee \div m^2/employee = EP/ m^2$ $0.61 EP \div 75 m^2/employee =$ <b>0.008 EP/m<sup>2</sup> of gross floor area</b>

Based on the above equivalent population calculations, Table 22 provides the calculation for the Established Area levy before any credit is applied for existing development.



**Table 22 - Calculation for Established Area Water & Wastewater Treatment Infrastructure Off-Site Levy**

	Single Detached	Semi-Detached /Duplex	Multi-Residential Grade-Oriented	Multi-Residential Non Grade-Oriented (2 Bedroom or More)	Multi-Residential Non Grade-Oriented (1 Bedroom or Less)
Average EP per unit	2.9 EP/Unit	2.6 EP/Unit	1.8 EP/Unit	1.5 EP/Unit	1.2 EP/Unit
Water Treatment Off-site Levy per Unit Type	\$1,137	\$1,019	\$706	\$588	\$470
Wastewater Treatment Off-site Levy Per Unit Type	\$5,130	\$4,599	\$3,184	\$2,654	\$2,123
<b>Total Treatment Off-site Levy per Unit Type</b>	<b>\$6,267</b>	<b>\$5,619</b>	<b>\$3,890</b>	<b>\$3,242</b>	<b>\$2,593</b>
<b>Commercial Development Levy Rate: \$36.62/ m<sup>2</sup> of Gross Floor Area</b>					
<b>Industrial Development Levy Rate \$17.58/ m<sup>2</sup> of Gross Floor Area</b>					

**Established Area - Credit for Existing Development**

Developments in the Established Area may have existing development to be demolished or recently demolished buildings that were previously allocated capacity for water and wastewater treatment. Where new development in the Established Area replaces previous development, a reduction in the levy will be determined based on the levy unit and floor area rates included in Table 22. The reduction will be applied if development previously existed on the site within the last 10 years and was connected to both the water and wastewater systems.

**Established Area Maximum Levy Rate For High Density Residential & Commercial Development:**

To provide incentive for high density developments, The City is setting a maximum levy rate for high density residential, mixed use or commercial development that achieve a density for the proposed development of 285 EP/Hectare or greater. The proposed development density is calculated as follows.

$$\text{Proposed Density} = \text{Proposed EP} \div \text{Site Development Area (Ha.)}$$

$$\text{Proposed EP} = [(\text{Units} \times \text{EP/Unit}) + (\text{Sq. M. Commercial Gross Floor Area} \times 0.017 \text{ EP/Sq. M.})]$$



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The maximum levy rate for developments that achieve a density of 285 EP/Hectare or greater will pay the maximum rate of \$2161/EP x 285 EP/Hectare: The levy calculation for developments achieving this density is:

$$\text{\$2161 /EP} \times \text{285 EP/Ha} \times \text{Site Development Area (Ha)} = \text{\$615,885/Ha} \times \text{Site Development Area (Ha)}$$



## 6.4 Water & Resources Levy Summary

The following table summarizes the proposed water resources off-site levy rates in The City's Greenfield Area as shown in Figure 2.

**Table 23 - Proposed Off-Site Levy Rate for Greenfield Area**

Infrastructure	2016 Proposed Rate (\$/Ha)
Water Resources - Water and Wastewater	\$206,434
Water Resources - Drainage by Catchment	
Nose Creek	\$11,325
Bow River	\$6,983
Pine Creek	\$16,812
Shepard	\$42,704
Fish Creek	-
Elbow River	-
<b>Total</b>	<b>\$206,434 to \$249,138</b>

The following table summarizes the proposed water resources off-site levy rates for growth in The City's Established Area as shown in Figure 2.

**Table 24 - Off-Site Levy Rate for Proposed Established Area Development**

	Single Detached	Semi-Detached /Duplex	Multi-Residential Grade-Oriented	Multi-Residential Non Grade-Oriented (2 Bedroom or More)	Multi-Residential Non Grade-Oriented (1 Bedroom or Less)
Water Treatment Off-site Levy per Unit Type	\$1,137	\$1,019	\$706	\$588	\$470
Wastewater Treatment Off-site Levy Per Unit Type	\$5,130	\$4,599	\$3,184	\$2,654	\$2,123
<b>Total Treatment Off-site Levy per Unit Type</b>	<b>\$6,267</b>	<b>\$5,619</b>	<b>\$3,890</b>	<b>\$3,242</b>	<b>\$2,593</b>
<b>Commercial Development Levy Rate: \$36.62/ m<sup>2</sup> of Gross Floor Area</b>					
<b>Industrial Development Levy Rate: \$17.58/ m<sup>2</sup> of Gross Floor Area</b>					
<b>Maximum Rate for Density ≥ 285 EP/Ha: \$615,885/Ha x Site Development Area (Ha)</b>					



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## CHAPTER 7 – COMMUNITY SERVICES PROGRAM

### 7.1 Introduction

Infrastructure included in the community services charges are public libraries (Calgary Public Library), emergency response stations (Calgary Fire Department), police district offices (Calgary Police Service), recreation centres (Recreation) and transit buses (Transit). The growth timeframe used to calculate the community services program costs is 30 years. This chapter presents the proposed community services charge for each infrastructure category and explains how each was calculated. A summary of the proposed charge amounts is shown in the Table 25. Further information on levels of service and infrastructure costs are provided in Appendix D.

**Table 25 - Proposed Community Services Charges**

Community Services	(\$/Ha)
Public Libraries (Calgary Public Library)	\$5,971
Emergency Response Stations (Calgary Fire Department)	\$19,545
District Offices (Calgary Police Service)	\$7,648
Recreation Centres (Recreation)	\$41,679
Transit Buses (Transit)	\$4,007
<b>Total</b>	<b>\$78,850</b>

### 7.2 Public Libraries (Calgary Public Library)

#### Growth Infrastructure Needs

The provision of new library services will be driven by growth in The City's Greenfield Areas. To meet future demand, 0.36 ft<sup>2</sup> of public library space will need to be provided per person. During this 30 year window (2015-2044), the greenfield growth population is projected to be 340,918, which would require approximately 122,730 ft<sup>2</sup> of library space, totalling an infrastructure need of \$62,469,814.

#### Charge Calculations

The proposed community services charge for public library infrastructure has been calculated according to the principles, assumptions and approach discussed in this Background Report. The details and assumptions are provided in Appendix D. The basic calculation is shown in the following table.



**Table 26 - Public Libraries: Community Services Charge Calculation**

Greenfield population (2015-2044)	340,918
Library Requirements per person (sf)	0.36
Library 2015 Costs per sf	509
Total Infrastructure Cost	62,469,814
Greenfield Area (Ha)	10,462
<b>Proposed Levy – Public Libraries (\$/Ha)</b>	<b>\$5,971</b>

### 7.3 Emergency Response Stations (Calgary Fire Department)

#### Growth Infrastructure Needs

The Calgary Fire Department has determined on average that an emergency response station will serve a greenfield development area containing 30,000 persons. During the 30 year window (2015-2044), the greenfield growth population is projected to be 340,918, which would require approximately 11.4 emergency response stations be provided, totalling an infrastructure need of \$204,480,000.

#### Charge Calculations

The proposed community services charge for fire infrastructure has been calculated according to the principles, assumptions and approach discussed in this Background Report. The details and assumptions are provided in Appendix D. The basic calculation is shown in the following table.

**Table 27 - Emergency Response Station: Community Services Calculation**

Greenfield Population	340,918
Emergency Response Station per person	30,000
Infrastructure Need / # Facilities	11.36
Cost per Emergency Response	18,000,000
Total Infrastructure Cost	204,480,000
Greenfield Area (Ha)	10,462
<b>Proposed Levy – Emergency Response Stations</b>	<b>\$19,545</b>

### 7.4 Police District Offices (Calgary Police Service)

#### Growth Infrastructure Needs

The Calgary Police Service has determined on average that a police district office will serve a catchment area containing 149,000 persons. During the 30 year window (2015-2044), the greenfield growth population is projected to be 340,918, which would require approximately 2.29 new police district offices totalling an infrastructure need of \$80,016,035.



## Charge Calculations

The proposed community services charge for police infrastructure has been calculated according to the principles, assumptions and approach discussed in this Background Report. The details and assumptions are provided in Appendix D. The basic calculation is shown in the following table.

**Table 28 - Police District Offices: Community Services Calculation**

Greenfield Population	340,918
District Office per person	149,000
Infrastructure Need / # Facilities	2.29
Cost per District Office	\$34,941,500
Total Infrastructure Cost	\$80,016,035
Greenfield Area (Ha)	10,462
<b>Proposed Levy – Police District Offices (\$/Ha)</b>	<b>\$7,648</b>

## 7.5 Recreation Centres (Recreation)

### Growth Infrastructure Needs

Identification of future regional recreation centres is guided through the development of ASPs.. The catchment for a small regional recreation facility is 63,000 people. During this 30 year window (2015-2044), the greenfield growth population from 2015- 2044 is projected to be 340,918, which would require approximately 5.4 recreation centres be provided, totalling an infrastructure need of \$435,046,000.

### Charge Calculations

The proposed community services charge for recreation infrastructure has been calculated according to the principles, assumptions and approach discussed in this Background Report. The details and assumptions are provided in Appendix D. The basic calculation is shown in the following table.

**Table 29 - Recreation Facilities: Community Services Calculation**

Greenfield Population	340,918
Average ASP Population	63,000
Infrastructure Need / # Facilities	5.41
Cost per Recreation Centre	80,600,000
Total Infrastructure Cost	436,046,000
Greenfield Area (Ha)	10,462
<b>Proposed Levy – Recreation Facilities (\$/Ha)</b>	<b>\$41,679</b>



## 7.6 Transit Buses (Transit)

### Growth Infrastructure Needs

During the 30 year window (2015-2044), the greenfield growth population is projected to be 340,918, which would require approximately 102 transit buses be provided, totalling an infrastructure need of \$41,922,000.

### Charge Calculations

The proposed community services charge for transit buses has been calculated according to the principles, assumptions and approach discussed in this Background Report. The basic calculation is shown in the following table.

**Table 30 - Transit Buses: Community Services Calculation**

Greenfield Population	340,918
Transit Buses per person	6/20,000
Infrastructure Need / # Buses	102
Cost per Bus	\$411,000
Total Infrastructure Cost	\$41,922,000
Greenfield Area (Ha)	10,462
<b>Proposed Levy – Transit Buses (\$/Ha)</b>	<b>\$4,007</b>



## 8.0 SUMMARY OF OFF-SITE LEVIES

### 8.1 Summary of Proposed Off-Site Levy Rates

The following tables summarize the proposed off-site levy rates for growth in The City's *Greenfield Area* as shown in Figure 2.

**Table 31 - Proposed Off-Site Levy Rate for Greenfield Area**

Infrastructure	2016 Proposed Rate (\$/Ha)
Transportation	\$136,789
Water Resources - Water and Wastewater	\$206,434
Water Resources - Drainage by Catchment	
Nose Creek	\$11,325
Bow River	\$6,983
Pine Creek	\$16,812
Shepard	\$42,704
Fish Creek	-
Elbow River	-
Community Services	\$78,850
<b>Total</b>	<b>\$422,073 to \$464,777</b>

The following tables summarize the proposed off-site levy rates for growth in The City's *Established Area* as shown in Figure 2.

**Table 32 - Proposed Off-Site Levy Rate for Established Area**

	Single Detached	Semi-Detached /Duplex	Multi-Residential Grade-Oriented	Multi-Residential Non Grade-Oriented (2 Bedroom or More)	Multi-Residential Non Grade-Oriented (1 Bedroom or Less)
<b>Total Treatment Off-site Levy per Unit Type</b>	<b>\$6,267</b>	<b>\$5,619</b>	<b>\$3,890</b>	<b>\$3,242</b>	<b>\$2,593</b>
<b>Commercial Development Levy Rate: \$36.62/ m<sup>2</sup> of Gross Floor Area</b>					
<b>Industrial Development Levy Rate: \$17.58/ m<sup>2</sup> of Gross Floor Area</b>					
<b>Maximum Rate for Density ≥ 285 EP/Ha: \$615,885/Ha x Site Development Area (Ha)</b>					



## 8.2 Exemptions to the Off-Site Levy

The only land area to be exempt from off-site levies payable are:

- Environmental Reserve
- Skeletal roads

## 8.5 Monitoring and Accounting

There is currently a process in place that will continue to be refined for the accounting of levy funds. Administration will continue to improve the reporting process to provide off-site levy fund annual reporting which is reconciled with *The City of Calgary Annual Report* (financial statements). Administration will continue to collaborate with industry on this work to ensure the annual Off-Site Levy Fund Report is clear and transparent on how the levy funds are collected and spent.

## 8.6 Reviewing the Off-Site Levy Bylaw and the Community Services Charges

Amendments to the Off-Site Levy Bylaw may be required from time to time to keep the calculations current. Adjusting the numbers may be necessary to account for the receipt of unanticipated specific grants, or to support changes required to facilitate developer funding arrangements, or to correct errors that may be identified. The overall methodology will not be reviewed for five years to provide certainty and minimize administrative costs. Amendments required would likely be identified at the time of the preparation of the Annual Levy Report and would be brought forward to Council at the appropriate time and as close as possible to the anniversary of the effective date of the Bylaw.



## APPENDIX A – STAKEHOLDER ENGAGEMENT

The following table provides greater detail on those who participated in the stakeholder engagement process.

**Table 33 - Stakeholder Engagement Process**

Engagement Group	Members	Purpose	Frequency of Meetings
Internal Working Team	Predominantly city staff from various departments - Kathy Dietrich, Sarah Alexander, Matthew Sheldrake, Kathy Davies Murphy, Tom Hopkins, Scott Pickles, Nazrul Islam, John Kwong, Jill Floen, Joel Armitage, Oyinola Shyllon, Mauro Ficaccio, Lesley Kalmakoff, Ed Lem, Lesia Luciuk and Lynda Cooke (Urban Systems).	<ul style="list-style-type: none"> <li>Developed guiding principles of the project</li> <li>Developed framework of the work plan and implement</li> <li>Defined infrastructure projects, timing, cost estimates and options for funding</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> <li>32 meetings since Jan 29</li> </ul>
External Advisory Group	City Staff and external representatives from various committees and interest groups of the development industry – Kathy Dietrich, Sarah Alexander, Joel Armitage, Beverly Jarvis, Chris Plosz, Colin Campbell, Grace Lui, Dennis Inglis, Jill Floen, Greg Bodnarchuk, Guy Huntingford, Jay German, John Kwong, Mike Selinger, Nazim Virani, Paul Battistella, Paul Derksen, Ryan Boyd, Robert A. Homersham.	<ul style="list-style-type: none"> <li>Acted as Industry sounding board</li> <li>Developed guiding principles for the project</li> <li>Finalized the scope of the project</li> <li>Reviewed options related to methodology, calculation of levy, funding</li> </ul>	<ul style="list-style-type: none"> <li>Every 3 weeks</li> <li>14 meetings since Mar 11</li> </ul>
Technical Subcommittee	City Staff, external industry representatives and technical consultants – Kathy Dietrich, Sarah Alexander, Amie Blanchette, Joel Armitage, Alexandra E. Burdeyney, Kathy Davies Murphy, Greg Bodnarchuk, Guy Huntingford, Tom Hopkins, Sarah Huber, Jay German, Jayden Tait, Lynda Cooke, Paul Derksen, Ryan Boyd, Tony Pasquini, Scott Pickles.	<ul style="list-style-type: none"> <li>Developed the framework and analysis of the options considered</li> <li>Undertook technical analysis</li> <li>Finalized the methodology and calculation of the Off-Site Levy Bylaw.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> <li>20 meetings since May 5</li> </ul>
Council	City Staff and Council	<ul style="list-style-type: none"> <li>Updated on progress of project</li> <li>Receive feedback</li> </ul>	<ul style="list-style-type: none"> <li>Bi-monthly</li> </ul>
Build Calgary /GMSGC/ALT	Build Calgary and General Managers Strategic Growth Committee	<ul style="list-style-type: none"> <li>Weekly meetings with Build Calgary and monthly updates with GMSGC/ALT</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>
Stakeholder Information Sessions	Attendees included: Developers and home builders from both greenfield and established areas; various financial institutions; community associations; tax watch groups; real estate and affordable housing groups	<ul style="list-style-type: none"> <li>The first session presented an overview of the Off-Site Levy Bylaw project and its objectives. The second session reviewed the available options and the third reviewed the project outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly</li> <li>Sessions in April, June &amp; October</li> </ul>



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Established Area – Initial Group	Members external to The City representing the large and small infill developers and interest groups that are related to the redevelopment areas of the city. Internal departmental representatives were brought in when appropriate –David White, Amie Blanchette, Ryan Bosa, Eileen Stan, Chris Elkey, Nazim Virani, Jayden Tait, Beverly Jarvis, Paul Battistella, Oliver Trutina, Kate Thompson, Aaron Vimy, Jennifer Dobbin, Annie MacInnis, Travis Oberg, George Trutina, Iain McCorkindale, James Robertson	<ul style="list-style-type: none"> <li>• Provided status of the work plan and receive relevant feedback</li> <li>• Acted as an Industry sounding board</li> <li>• Reviewed options related to the methodology and calculation of levy unique to the established areas of the City.</li> </ul>	<ul style="list-style-type: none"> <li>• 4 meetings since June 11</li> </ul>
Established Area – Stakeholder Group	Established Area developers, consultants, and industry representatives	<ul style="list-style-type: none"> <li>• Sessions were held in November and December with attendance of 40 to 55 industry representatives</li> </ul>	<ul style="list-style-type: none"> <li>• 2 meetings since November</li> </ul>
Established Area – Working Group	Members external to The City representing the large and small infill developers and interest groups that are related to the redevelopment areas of the city. Internal departmental representatives were brought in when appropriate –David White, Amie Blanchette, Eileen Stan, Beverly Jarvis, Paul Battistella, Oliver Trutina, Mike Brander, Chris Ollenberger, Jaydan Tait, Guy Huntingford, Josh White, Richard Morden and Paul Derksen	<ul style="list-style-type: none"> <li>• Ad hoc committee of representatives of Established Area group to develop strategy for Established Area levies</li> </ul>	<ul style="list-style-type: none"> <li>• 5 meetings since November</li> </ul>
One on Ones	City Staff and developers	<ul style="list-style-type: none"> <li>• City staff met with members of the development industry at various occasions to discuss the Off-Site Levy Bylaw and the process.</li> </ul>	<ul style="list-style-type: none"> <li>• At least 21 meetings since January</li> </ul>



## A.1 Engagement Sessions Summary

There were three city-wide engagement sessions held during the Off-Site Levy Bylaw initiative:

- The first session was on April 30. This session was attended by approximately 80 people and included a presentation on the overall process and the understand/principles phase. The principles and project deliverables were discussed. Attendees provided input by responding to questions and providing comments. The response was generally positive.
- The second session was on June 24. This session was attended by approximately 80 people and included a presentation on the progress since April 30. It started with an update of work done to that point including: guiding principles were established, issues were identified, project scope was defined, understanding of previous (2011 - current) levy regime, completion of the growth assumptions, initial list of projects and their cost estimates, weekly technical subcommittee meetings, looking at various options (options identification phase). We then described the upcoming work including the calculations phase and the scenario analysis. We also gave a high level view of how levies are calculated that included the growth assumption and initial project lists and their cost estimates. The attendees were then asked to provide general comments and ask questions. The feedback was generally positive.
- The third session was held on October 15 and attended by approximately 80 people. It was the final stakeholder session and the main focus was on presenting the proposed rates and to receive feedback on the rates and any further outstanding questions. The date of the public hearing was provided to participants and feedback from the industry was collected in the same manner as the previous sessions.



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## APPENDIX B – TRANSPORTATION PROGRAM

**Table 34 - Transportation: Infrastructure Project List**

Established Area Transportation Infrastructure List		
Category	Project Name	Total Cost (millions)
Interchanges	14 ST SW / Anderson Rd I/C	\$70.0
	Deerfoot Tr / Glenmore Tr Interchange Improvements	\$80.0
	Deerfoot Tr / Beddington Tr /11 ST NE I/C (Ultimate)	\$80.0
	Deerfoot Tr / 16 AV NE - Add 3rd Level for Through Movements and basket weaves	\$130.0
	Deerfoot Tr / Memorial Dr - ultimate	\$100.0
	Deerfoot Tr / Peigan Tr / Barlow Tr Ultimate I/C	\$100.0
	Deerfoot Tr / Glenmore Tr / Blackfoot Tr Ultimate I/C	\$130.0
	Deerfoot Tr / Anderson Rd / Bow Bottom Tr Ultimate I/C	\$100.0
	Anderson / Macleod Directional Ramps	\$80.0
	Deerfoot Tr / 17 AV SE EBL Directional and Basket weaves btw Memorial and 17 AV SE	\$150.0
	Deerfoot Tr new CD System between Glenmore Tr and Peigan Tr (Inc twin Calf Robe bridge)	\$300.0
	16 AV NE / 19 ST NE I/C (with Revisions to 16 AV NE / Barlow Tr I/C)	\$72.0
	McKnight Blvd / Aviation Blvd (12th St) I/C	\$50.0
	TCH/Bowfort Road I/C	\$71.7
	Macleod Tr / 162 AV SW I/C	\$65.0
	Sarcee Tr / Richmond Rd I/C	\$77.0
	Macleod Tr / Heritage Dr I/C	\$80.0
	Macleod Tr / Lake Fraser Gate I/C	\$50.0
	Crowchild Tr / Flanders AV I/C Upgrade	\$20.0
	Macleod Tr/25 Avenue IC	\$70.0
	Glenmore Tr: west of Ogden Road to Barlow Trail ( widening plus 2 I/C's )	\$180.0
	Glenmore Tr / 52 ST SE I/C including widening 4 - 6 lanes to 52nd St)	\$101.0
	McKnight Blvd / Barlow Tr I/C	\$70.0
	McKnight Blvd / 19th St I/C	\$50.0
	Sarcee Tr / Bow Tr I/C	\$100.0
	Shaganappi Tr / John Laurie Blvd I/C	\$70.0
	Glenmore Tr / Richard Rd I/C	\$50.0
	Anderson Rd / 24 ST SW I/C	\$70.0
	Anderson Rd / Woodpark Blvd I/C	\$70.0
	Anderson Rd / Elbow Dr I/C	\$70.0
	Anderson Rd / Bonaventure Dr I/C	\$70.0
	Anderson Rd / Acadia Dr I/C	\$70.0
	Peigan Tr / 26 ST NE I/C	\$70.0
Peigan Tr / 36 ST NE I/C	\$70.0	



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Established Area Transportation Infrastructure List		
Category	Project Name	Total Cost (millions)
	Crowchild Tr / 24 AV NW - I/C and C/D System (Inc New Bridge over University Dr)	\$150.0
	Crowchild Tr / University Dr / 16 AV NW - Upgrade/Revise I/Cs	\$150.0
	Deerfoot Tr / 32 AV NE I/C Revs (4 lanes EB to 12 ST SE (East Int), 3 thru lights, taper to 2)	\$45.0
	Deerfoot Tr / 50 AV SW I/C	\$70.0
	Deerfoot Tr / McKnight Blvd - Upgrade I/C	\$70.0
	McKnight Blvd/68th St NE	\$70.0
	26 AV SW Connector / Blackfoot Tr I/C	\$100.0
	Grade Separation at Railway Crossing: 52nd Street (23rd Ave to Hubalta Road)	\$25.0
	Grade Separation at Railway Crossing: Peigan Tr (CN)	\$25.0
	Grade Separation at Railway Crossing: 52nd Street & 50th Ave (CN)	\$25.0
	Grade Separation at Railway Crossing: Barlow at 50th Ave (CN)	\$25.0
	14 ST NW / Country Hills Blvd I/C	\$70.0
	Shaganappi Tr / Country Hills Bv I/C	\$70.0
	Shaganappi Tr / Northland Dr I/C	\$70.0
	Shaganappi Tr / Edgemont Bv I/C	\$70.0
	McKnight Blvd / 47 ST NE I/C	\$70.0
	McKnight Blvd / Falconridge Bv I/C	\$70.0
	<b>Total</b>	<b>\$4,161.7</b>
<b>Major Structures</b>	Glenmore Causeway - Widen to 8 Core Lanes with CD System	\$300.0
	Crowchild Tr - Bridge over Bow River - Widen from 6 to 8 Lanes	\$300.0
	<b>Total</b>	<b>\$600.0</b>
<b>Road Widenings</b>	Glenmore Tr - Widen from 4 to 6 Lanes - Crowchild Tr to Sarcee Tr	\$17.0
	Peigan Tr - Widen from 2 to 4 Lanes - Barlow Tr SE to Stoney Tr	\$35.0
	Anderson Road: Bonaventure Dr to Deerfoot Tr (widen EB lanes 2-3)	\$3.0
	Country Hills Blvd: Barlow Tr to Coventry Blvd (widen 4-6 lanes)	\$20.0
	McKnight Blvd - Widen from 4 to 6 Lanes - Edmonton Tr to 4 ST NW	\$37.0
	Trans Canada Highway: Crowchild Tr. To Shag Tr. (widen 4-6 lanes)	\$17.0
	16 AV NE - Widen from 4 to 6 Lanes - Barlow Tr to East Freeway	\$35.0
	Beddington Tr - Widen from 4 to 6 Lanes - CHB to Stoney Tr	\$14.0
	Anderson Rd - Widen from 4 to 6 Lanes - 24 ST SW to 14 ST SW	\$10.0
	Sarcee Tr: Glenmore to Bow Tr (widen 4-6 lanes), + major utilities	\$50.0
	Sarcee Tr: Bow Tr to TCH (widen 4-6 lanes), (due to slope stability)	\$40.0
	Barlow Tr - Widen from 4 to 6 lanes - Memorial Dr to 16 Av NE	\$15.0
	McKnight Blvd - Widen from 4 to 6 Lanes - 19th St to Barlow Tr	\$5.0
	16 AV NW - Widen 4 to 6 Lanes - Shaganappi to Sarcee, 6 lane bridge, CPR underpass	\$150.0
	Bow Tr - 37 St W to Sarcee Tr - Widen to 6 lanes	\$50.0
	50 AV SW - New 4 Lane Road from Macleod Tr to Deerfoot Tr SE	\$70.0
	14 ST SW - Widen from 2 to 4 Lanes - Anderson Rd to Canyon Meadows Dr	\$15.0
	Shaganappi Tr - Widen from 6 to 8 Lanes - Stoney Tr to Country Hills Blvd	\$10.0
	114 Avenue SE, widen 2 to 4 lanes - 52 Street to 68 Street	\$15.0



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Established Area Transportation Infrastructure List		
Category	Project Name	Total Cost (millions)
	130 Avenue SE - 4 lanes from McIvor Bv to Stoney Tr (& 2-4 lanes 52 st to McIvor Bv)	\$16.0
	Deerfoot Tr - Widen from 6 to 8 Lanes - Memorial to Stoney Tr, (major median structures)	\$200.0
	<b>Total</b>	<b>\$824.0</b>
<b>Pedestrian Overpasses</b>	Marquis of Lorne Tr, east of Macleod Tr	\$6.0
	LRT/CPR tracks, from Shalom Wy to Shawmeadows Rise SE	\$6.0
	Deerfoot Tr, 600 Douglas Woods Place SE to Douglasdale Business Park	\$6.0
	Macleod Tr, north of 25 Avenue, Erlton to LRT station	\$6.0
	16 Avenue NW, Stadium Shopping Centre to Foothills Hospital	\$6.0
	Nose Creek, 32 Avenue NE	\$6.0
	Deerfoot Tr N, at 40 Avenue NE	\$6.0
	McKnight Bv NE, west of 52 St NE	\$6.0
	Deerfoot Tr, at Beddington Tr NE	\$6.0
	Beddington Tr, from Country Hills Cl to Sandstone	\$6.0
	17 Avenue SW, from Aspen Landing to future Springbank Hill lands	\$6.0
	Anderson Station, across Macleod Tr at north end of site	\$6.0
	Chinook mall, across Macleod Tr at 61 Avenue S	\$6.0
	Canada Olympic Park, across 16 Avenue to Bowness Community	\$6.0
	<b>Total</b>	<b>\$84.0</b>
<b>BRT Infrastructure</b>	17 Avenue SE Transit way, Blackfoot Truck Stop to Stoney Trail	\$203.0
	South Crosstown	\$20.0
	North Crosstown	\$50.0
	South West Crosstown	\$40.0
	Route 305 Improvements	\$10.0
	Shaganappi HOV	\$35.0
	52 Street E, Saddleridge to Seton	\$38.0
	Connecting Westbrook to NW MAC	\$60.0
	162 Avenue SW, Shawnessy to SW Ring Road	\$75.0
	Green Trip Provincial funding for BRT Projects (EB1 to EB4)	-\$139.0
	<b>Total</b>	<b>\$392.0</b>
<b>Established Area Transportation Infrastructure List: TOTAL</b>		<b>\$6,061.7</b>



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Greenfield Transportation Infrastructure List		
Category	Project Name	Total Cost (millions)
<b>Interchanges</b>	Métis Tr / Airport Tr I/C	\$70.0
	Airport Tr / Stoney Tr NE (Ultimate)	\$60.0
	Macleod Tr / 194 AV SE I/C	\$70.0
	Macleod Tr / 210 AV SE I/C	\$70.0
	West 22X/53 St SW Interchange	\$70.0
	West 22X/ 85th St W Interchange	\$70.0
	West 22X/69 St W interchange	\$70.0
	Deerfoot Tr / 212 AV SE I/C	\$16.0
	104 St / Marquis of Lorne (Fly Over) SE	\$30.0
	120 St / Marquis of Lorne I/C SE	\$70.0
	East Freeway/130th Ave SE I/C (To/from the North)	\$40.0
	East Freeway/106th Ave Trail Fly Over	\$30.0
	Glenmore Tr / 68 ST SE I/C	\$70.0
	Glenmore / Garden Rd SE	\$70.0
	Glenmore / 116th E I/C Se (Second Structure and Upgrade requirements)	\$70.0
	Peigan Tr / 52 ST NE I/C	\$70.0
	Peigan Trail/68th St I/C	\$60.0
	East Freeway / Memorial Dr Flyover	\$30.0
	16 AV NE / 68 ST NE I/C	\$70.0
	East Freeway/ 32 AV NE Flyover	\$30.0
	64 Ave / East Freeway Flyover	\$30.0
	Airport Trail/36th St NE I/C	\$40.0
	Airport Trail/60th St NE I/C	\$75.0
	Métis Tr / 64 AV NE I/C	\$70.0
	Metis Trail/128th Ave NE I/C	\$70.0
	60 St / Stoney Tr I/C NE	\$50.0
	Deerfoot Tr / 128 AV NE I/C	\$60.0
	Deerfoot Tr / Country Hills Blvd I/C (second structure)	\$30.0
	Deerfoot Tr/Airport Trail Ultimate	\$50.0
	160 Ave / Hwy 2 NE (second structure and upgrade requirements)	\$30.0
11th Street/Stoney Trail I/C	\$50.0	
Centre St / Stoney Tr (second structure and upgrade requirements)	\$15.0	
14 St / Stoney I/C	\$40.0	
Shaganappi Tr/Stoney Tr (second structure and upgrade requirements)	\$15.0	
Centre St / Hwy 566 I/C	\$80.0	
Crowchild Tr / 12 Mile Coulee Rd I/C	\$70.0	
	<b>Total</b>	<b>\$1,911.0</b>



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Greenfield Transportation Infrastructure List		
Category	Project Name	Total Cost (millions)
<b>Road Structures over Rail/Creek</b>	CP Rail at 194th Ave SW	\$25.0
	CP Rail at 210th Ave SW	\$25.0
	210 Ave SW at Pine Creek	\$20.0
	Pine Creek Crossing in South Macleod	\$25.0
	CP Rail at 114th Ave SE	\$25.0
	WID Canal Crossing at Glenmore Trail SE	\$20.0
	144th Ave at West Nose Creek	\$25.0
	160th Ave at West Nose Creek	\$25.0
	160th Ave at Rail and Creek Crossing (6 Lane X-section over creek, rail, service road)	\$53.0
	11th St at Nose Creek/CPR Rail Crossing	\$20.0
	<b>Total</b>	<b>\$263.0</b>
<b>Expressways</b>	Airport Tr - Barlow Tr, Airport - 19 St interchanges and widening 36 St to 60 St NE	\$83.0
	88 Street SE skeletal road extension	\$17.0
	<b>Total</b>	<b>\$100.0</b>
<b>Ring Road Connections</b>	SW and West Ring Road Connections	\$133.3
		<b>Total</b>
<b>Greenfield Traffic</b>	296 signals required	\$81.4
		<b>Total</b>
<b>Pedestrian Overpasses</b>	Stoney Tr, between Centre St and 14 St NW	\$6.0
	Stoney Tr, between Centre St and 11 St NE	\$6.0
	Airport Tr, east of Metis Tr, between Cityscape and Savannah	\$6.0
	Country Hill Bv NE, west of Stoney Trail, between North Cornerstone and South Cornerstone	\$6.0
	52 Street SE, between Auburn Bay and Mahogany	\$6.0
	Bow River, between Legacy and Cranston	\$12.0
	<b>Total</b>	<b>\$42.0</b>
<b>BRT Infrastructure</b>	162 Avenue SW, SW Ring Road to west side of Providence	\$90.0
		<b>Total</b>
<b>Greenfield Transportation Infrastructure List: TOTAL</b>		<b>\$2,620.7</b>

Figure 10 - CTP Road Interchange Infrastructure

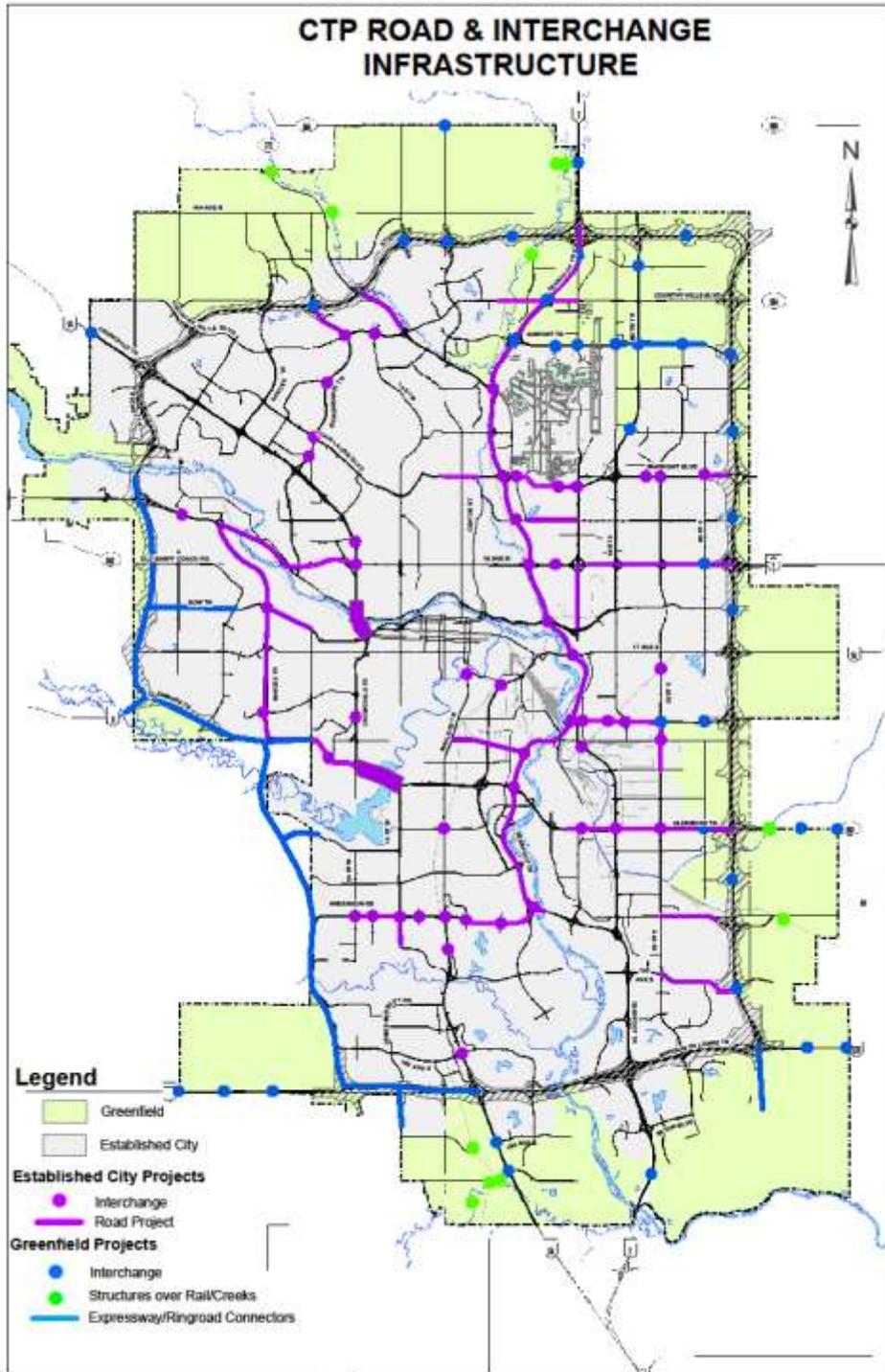
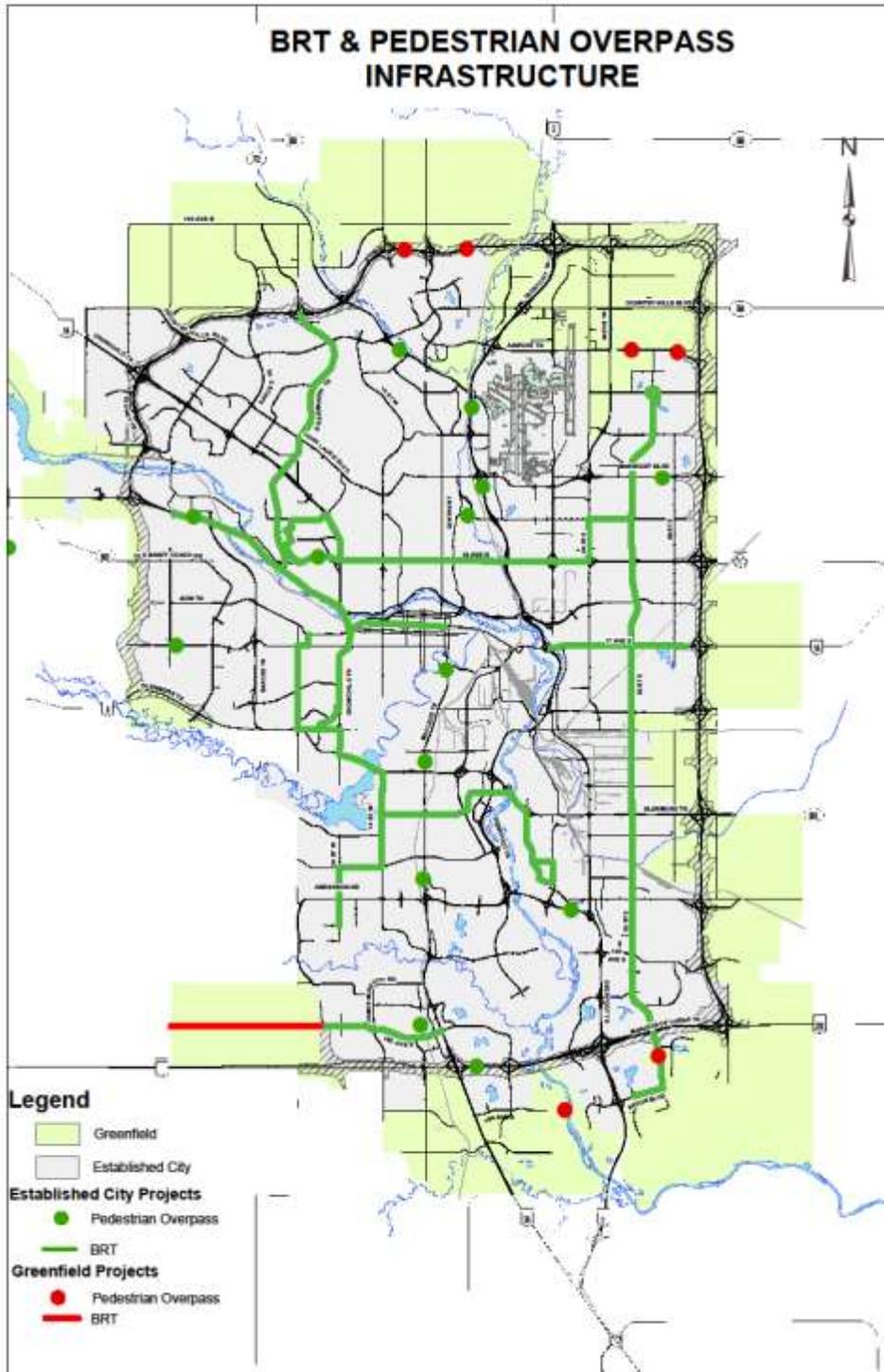


Figure 11 - BRT & Pedestrian Overpass Infrastructure





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## APPENDIX C – WATER RESOURCES PROGRAM

Table 35 - Water Resources Infrastructure Project Lists

Category	Project Name	Allocation				Total Cost (millions)
		% Growth	% Greenfield	% Established	% Regional	
<b>Water Distribution &amp; Wastewater Collection</b>						
<b>Water Linear Extension Infrastructure</b>	Ogden Feeder Main	100.0%	27.9%	55.0%	17.1%	\$38.5
	Lower Sarcee Feeder Main	100.0%	71.1%	15.7%	11.8%	\$30.9
	210 Ave SW Pump Station	100.0%	69.1%	17.8%	13.0%	\$15.0
	210 Ave Feeder Main	100.0%	69.1%	17.8%	13.0%	\$12.0
	East McKenzie FM	100.0%	29.8%	54.6%	15.6%	\$6.4
	Northridge FM Ph 1 and 2	100.0%	83.2%	16.8%	0.0%	\$30.7
	Northridge Reservoir	100.0%	83.2%	16.8%	0.0%	\$3.2
	<b>Total</b>					
<b>Sanitary Linear Extension Infrastructure</b>	North Ridge Macdonald Trunk	100.0%	100.0%	0.0%	0.0%	\$7.1
	West Pine Creek Sanitary Trunk Ph 2	100.0%	100.0%	0.0%	0.0%	\$46.6
	Seton Tunnel Ph 1	100.0%	100.0%	0.0%	0.0%	\$31.8
	Seton Tunnel Ph 2	100.0%	100.0%	0.0%	0.0%	\$18.8
	144 Ave NE San Trunk	100.0%	100.0%	0.0%	0.0%	\$24.1
	North Beddington San Ph 2 CFA	100.0%	100.0%	0.0%	0.0%	\$8.9
	Beddington Creek II East Leg	100.0%	100.0%	0.0%	0.0%	\$2.7
	<b>Total</b>					
<b>Sanitary Upgrade Infrastructure</b>	Redevelopment	TBD	0.0%	100.0%	0.0%	\$20.9
	Saddle Ridge Sanitary Upgrade	100.0%	46.2%	53.8%	0.0%	\$5.1
	Bowness Trunk Upgrade	87.0%	19.3%	40.5%	40.2%	\$48.6
	Shouldice Trunk Upgrade	61.0%	11.6%	69.3%	19.1%	\$24.0
	Nose Creek Trunk Upgrade	88.0%	48.4%	18.3%	33.3%	\$87.7
	Inglewood Trunk Upgrade	87.0%	24.0%	57.4%	18.7%	\$55.9
	McKenzie Siphon Upgrade	38.0%	40.5%	59.5%	0.0%	\$7.4
	17th Ave Trunk Upgrade	TBD	0.0%	100.0%	0.0%	\$4.6
	Beltline Trunk Upgrade	TBD	0.0%	100.0%	0.0%	\$1.5
	Forest Lawn LS Sewer Upgrading 1	55.0%	0.0%	100.0%	0.0%	\$6.7
	Forest Lawn LS Sewer Upgrading 2	68.0%	0.0%	100.0%	0.0%	\$6.6
	Fish Creek West Sub Trunk	TBD	0.0%	TBD	TBD	\$14.3
	Tsuu Tina Connection Upgrade	TBD	0.0%	TBD	TBD	\$9.4
	Elbow Drive Trunk Upgrade 1	TBD	0.0%	100.0%	0.0%	\$1.4
	Elbow Drive Trunk Upgrade 2	TBD	0.0%	100.0%	0.0%	\$16.1
	Penbrooke Trunk Upgrades	89.0%	0.0%	100.0%	0.0%	\$46.7
	<b>Total</b>					



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Category	Project Name	Allocation				Total Cost ( millions)
		% Growth	% Greenfield	% Established	% Regional	
<b>Water Upgrade Infrastructure</b>	Airdrie FM Tie-in and Meter Chamber Relocation	100.0%	100.0%	0.0%	0.0%	\$1.4
	Pump Station 36 Installation	100.0%	83.2%	16.8%	0.0%	\$0.2
	Redevelopment	TBD	0.0%	100.0%	0.0%	\$11.5
	South Glenmore Reservoir Basin II	60.0%	29.8%	54.6%	15.6%	\$40.4
	Bearspaw Pump Station STN012 Upgrade	37.0%	28.3%	40.6%	31.1%	\$6.6
	Bearspaw Pump Station STN020 Upgrade	37.0%	28.3%	40.6%	31.1%	\$2.0
	Nose Hill Feedermain	37.0%	28.3%	40.6%	31.1%	\$37.8
	Country Hills Blvd Uptown Feedermain	37.0%	28.3%	40.6%	31.1%	\$29.8
<b>Total</b>					<b>\$129.6</b>	
<b>Drainage Facilities &amp; Network</b>						
<b>Drainage Facilities &amp; Network</b>	North Ridge Macdonald Trunk	100.0%	100.0%	0.0%	0.0%	\$7.5
	Redevelopment	TBD	0.0%	100.0%	0.0%	\$20.8
	Priddis Storm Trunk Outfall	100.0%	100.0%	0.0%	0.0%	\$23.8
	144 Av NE Storm Trunk 4	100.0%	100.0%	0.0%	0.0%	\$0.0
	North Beddington Storm Trunk	100.0%	100.0%	0.0%	0.0%	\$1.7
	Riverbend Trunk Pond	TBD	0.0%	100.0%	0.0%	\$2.6
	Seton Storm Trunk	100.0%	100.0%	0.0%	0.0%	\$8.0
	Seton Storm Trunk Ph 2	100.0%	100.0%	0.0%	0.0%	\$3.5
<b>Total</b>					<b>\$67.9</b>	
<b>Water &amp; Wastewater Treatment</b>						
<b>Wastewater Treatment Plants</b>	BB WWTP Blower Upgrades	100.0%	44.3%	32.3%	23.5%	\$23.1
	BB WWTP 13.2&5kV System Expansion	100.0%	44.3%	32.3%	23.5%	\$44.5
	Bonnybrook Capacity Upgrade	100.0%	44.3%	32.3%	23.5%	\$128.0
	BBWWTP Plant D Expansion	100.0%	44.3%	32.3%	23.5%	\$552.0
	Power Management System	100.0%	44.3%	32.3%	23.5%	\$3.6
	Power Distribution Upgrades	50.0%	44.3%	32.3%	23.5%	\$2.6
	600V System Upgrades	50.0%	44.3%	32.3%	23.5%	\$3.1
	BB Struvite Recovery	20.0%	44.3%	32.3%	23.5%	\$20.2
	BB Dewatering Building	50.0%	44.3%	32.3%	23.5%	\$88.5
	BB Centrate / Supernatant Treatment	80.0%	44.3%	32.3%	23.5%	\$31.0
	FC WWTP Capacity Assessment	100.0%	31.5%	44.3%	24.2%	\$89.7
	South Catchment Capacity Upgrade	100.0%	31.5%	44.3%	24.2%	\$316.2
<b>Total</b>					<b>\$1,302.4</b>	
<b>Water Treatment Plants</b>	GM WTP Capacity Expansion	100.0%	56.6%	23.5%	20.0%	\$64.5
	BPWTP Capacity Upgrades	100.0%	44.8%	35.4%	19.8%	\$4.9
	Bearspaw RTF Fourth Thickener	20.0%	56.6%	23.5%	20.0%	\$2.4
	Glenmore UV Disinfection	100.0%	56.6%	23.5%	20.0%	\$22.4
	Bearspaw UV Disinfection	100.0%	44.8%	35.4%	19.8%	\$3.4
<b>Total</b>					<b>\$97.5</b>	



**Table 36 - Greenfield Allocation of Historical Debt Servicing for Water Distribution, Wastewater Collection & Drainage**

As of 2014 Dec 31 <sup>st</sup> (in million \$)	Outstanding Debt	Debt Servicing
Water Distribution	\$ 130.1	\$ 174.6
Wastewater Collection	\$ 123.1	\$ 165.3
Drainage	\$ 69.0	\$ 87.7

**Table 37 - Wastewater Treatment (Costs in Thousands \$)**

Treatment Plant	Forecasted Capital Costs (2015-2024)	Borrowing Cost	Total Forecasted Costs (Future Value)	Historical Costs	Total Costs for Available Capacity	Net Present Value	Available Capacity (Equiv. Pop.)
Bonnybrook	\$ 614,700	\$ 132,434	\$ 747,134	\$ -	\$ 747,134	\$ 567,263	321,479 EP
Pine Creek + Fish Creek	\$ 326,704	\$ 80,336	\$ 407,040	\$ 91,236	\$ 498,276	\$ 352,050	189,498 EP
Pine Creek Historical				\$ 46,369	\$ 46,369	\$ 39,287	30,830 EP
<b>TOTAL</b>						<b>\$ 958,600</b>	<b>541,807 EP</b>

**Table 38 - Water Treatment Plants (Costs in Thousands \$)**

Treatment Plant	Forecasted Capital Costs (2015-2024)	Borrowing Cost	Total Forecasted Costs FV	Historical Costs	Total Costs for Available Capacity	NPV	Available Capacity (Equiv. Pop.)
Glenmore	\$ 69,552	\$ 16,111	\$ 85,664	\$ -	\$ 85,664	\$ 64,148	
Bearspaw	\$ 7,003	\$ 1,708	\$ 8,710	\$ -	\$ 8,710	\$ 6,504	
<b>Total Future WTP</b>						<b>\$ 70,652</b>	<b>185,846 EP</b>
Historical Capacity				\$ 47,350	\$ 47,350	\$ 40,847	98,301 EP
<b>TOTAL</b>						<b>\$ 111,499</b>	<b>284,147 EP</b>

### Cash Flow Analysis and Assumptions Used

A cash flow analysis was undertaken to account for the timing of projects and receipt of off-site levies. Interest earnings or borrowing costs are, therefore, accounted for in the calculation as allowed under the MGA. Based on the development forecast, the analysis calculated the off-site levy rate that is required to finance the discounted development related capital spending plan including provisions for any borrowing. The 10 year forecast for Municipal Price Index (3.3%) was used for discounting and escalation rates. The following tables summarize the assumptions used in the calculation of the water and wastewater off-site levies.



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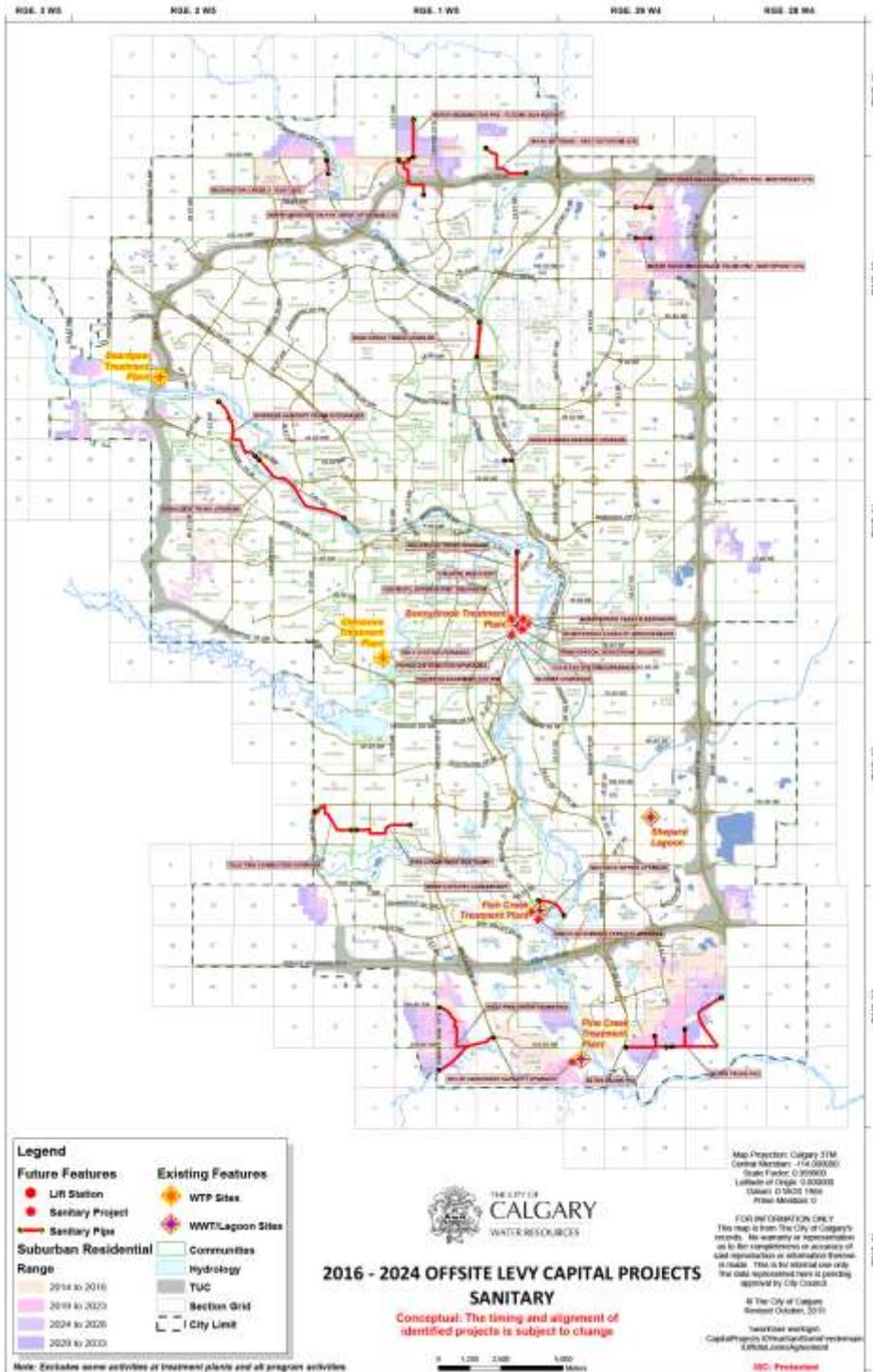
**Table 39 - Interest Rates Used**

Projected Borrowing	25 Year Term	10 Year Term
2016	3.50%	2.5%
2017	4.00%	3.0%
2018	4.50%	3.5%
2019	4.75%	3.8%
2020	5.00%	4.0%
2021	5.25%	4.3%
2022	5.50%	4.5%
2023	5.50%	4.5%
2024	5.50%	4.5%

**Table 40 - Land Forecast in Hectares**

Projected Borrowing	Residential	Industrial / Commercial	Total
2016	276	125	401
2017	276	125	401
2018	276	125	401
2019	276	125	401
2020	276	125	401
2021	276	125	401
2022	276	125	401
2023	276	125	401
2024	276	125	401

Figure 12 - Wastewater Collection Projects









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## APPENDIX D – COMMUNITY SERVICES PROGRAM

### D.1 Public Libraries (Calgary Public Library)

The key strategic document used to develop this off-site levy for public libraries was the Calgary Public Library (CPL) Master Facility Plan, Beyond the Box (2010).

#### Level of Service

There exists a number of methods to measure the amount of library service provided by municipalities to citizens. The most common method is square feet per capita which is used by The City of Calgary. Information collected by the Canadian Urban Library Council (CULC) notes the average sq ft per capita of participating members (approximately 32 Canada wide members who reported into CULC for 2013) as 0.54 sq ft per capita<sup>1</sup>.

#### *Library Trends*

Library sizes have increased as libraries have added technology and additional formats of materials to their more traditional fare. Libraries have also added more meeting and gathering space to reflect the expanding role of public libraries as centers of community life. The amount of space required by a public library depends on the unique needs of the individual community. In traditional library planning methodology, libraries use a variety of standards to calculate required building size for an area.

#### *Library Sizing*

The location and size of a library are dependent on a number of variables, including the distance to other libraries, the presence of natural or man-made travel barriers, the availability of suitable sites and the interest of complementary site partners. User penetration has been shown to decline significantly with distance. CPL combines these factors with the population of the proposed service area when determining location and size of library projects. CPL recognizes the financial benefits and end-user convenience of co-locating but it is not a requirement.

Over the last 15 years, most new libraries have been co-located with recreation amenities and have averaged nearly 18,000 sq ft. This is a size that balances operating costs for the CPL and travel distances for users in a suburban setting. Calgary and other municipalities have a great deal of similarities when it comes to programming pieces between libraries across Canada. The CULC identifies its member's average branch library size as 16,722<sup>2</sup> Sq ft.

For greenfield development areas, library infrastructure costs are based on the baseline library size of 18,000 sf and 0.36 sf of library required per capita

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<sup>1</sup> Based on 2013 Canadian Public Library Statistics, [http://www.culc.ca/cms\\_lib/2013%20CULC%20Library%20Statistics.pdf](http://www.culc.ca/cms_lib/2013%20CULC%20Library%20Statistics.pdf)

<sup>2</sup> From Canadian Urban Library Council – 2013 KPIs, [http://www.culc.ca/cms\\_lib/2013%20CULC%20Branch-Level.pdf](http://www.culc.ca/cms_lib/2013%20CULC%20Branch-Level.pdf)



## Infrastructure Costs

The following table identifies costing from a variety of co-located libraries based on budgeted (B) and actual (A) costs.

**Table 41 - Precedent Costs from a Variety of Co-located Libraries**

Library	CPL Land (acres)	Gross Library Size (per sf)	Library Development Costs			Total	Total Cost per sf
			Building Development	Furniture, Fixtures & Equipment	Site Development		
Genesis Phase 1 (2011)	1.89	18,783	\$ 5,100,000 (A)	\$ 1,165,240 (A)	\$ 1,140,000 (A)	\$ 7,405,240	\$ 394
Seton (2018)	1.45	24,100	\$ 8,630,000 (B)	\$ 2,200,000 (B)	\$ 1,820,000 (B)	\$ 12,650,000	\$ 525
Quarry Park (2016)	1.26	13,455	\$ 4,670,000 (A)	\$ 800,000 <sup>3</sup> (B)	\$ 860,000 (A)	\$ 6,330,000	\$ 470
Average	1.54	18,799	\$ 6,133,333	\$ 1,388,413	\$ 1,273,333	\$ 8,795,080	\$ 463
Contingency (10%)							\$ 46
Revised Average							\$ 509

\*\* FFE does not include costs associated with materials, books etc.

\*\*\* includes purchase cost, acreage assessment, off-site servicing, on-site servicing & improvements

The projected costing for a co-located library in 2015 is shown in the following table (rounded / priced per sf).

**Table 42 - Projected Cost for a Co-located Library in 2015**

Component	2015 Costs
Building Development	\$ 327 per sf
Furniture, Fixtures and Equipment	\$ 74 per sf
<b>Site Development (acquisition &amp; development cost) per acre</b>	<b>\$826,839 / acre</b>
<b>Total Costs per sf</b>	<b>\$509 per sf</b>

<sup>3</sup> Quarry Park FFE was reduced due to the transfer of FFE from Glenmore Square Branch in Ogden



The following tables outline the projected forecasted infrastructure costs for the Greenfield Area of the City.

**Table 43 - Greenfield Forecasted Infrastructure Costs (2015-2044)**

Sector	Population Change	Library Requirement (pop x 0.36 sf)	2015 Cost (library x \$509 sf)
Total	340,918	122,730	62,469,814

## D.2 Emergency Response Stations (Calgary Fire Department)

The key strategic document used to develop this community services charge for fire services was the Calgary Fire Department’s 30 year Infrastructure Plan (2014-2043).

### Level of Service

Identification of a need for an emergency response station is dependent on many different factors including, but not limited to, actual and forecasted incident volumes, actual and simulated response times, existing and/or proposed population sizes, geographic layout and geographic size, identified risks (existing and, if possible, proposed), and area land use zoning.

Given Calgary’s risk environment and to measure its level of preparedness to respond to emergencies, Calgary Fire Department (CFD) identified in its Service Level and Response Time Targets plan, the number of fire stations per capita would be at or near comparable Canadian cities<sup>4</sup>. The population protected per station is a rough indicator of the workload the Calgary Fire Department (CFD) can expect and is based on the resident population protected (it does not include visitors or non-resident workers).

In 2008, the fire station per capita comparisons equalled approximately 25,000 persons. CFD chose to use the population protected per station for every 30,000 persons as a measure for communities on the periphery.

<sup>4</sup> Comparable cities include but are not restricted to: Mississauga, Vancouver, Regina, Ottawa, Edmonton, Toronto and Montreal.



### Infrastructure Costs

The following table outlines the cost of providing a new facility and how this was determined.

**Table 44 - Emergency Response Station Facility Costs (Actuals)**

Component	2015 Costs	
	3-Bay Station (Seton <sup>5</sup> , 23,842 sf <sup>6</sup> )	
<b>Building Construction</b>	\$14,354,930	
Construction		11,012,623.90
Consulting		1,801,888.04
Contingency (10%)		1,281,450
Equipment (Machinery, Duty Gear, Installation)		13,412.09
FFE (i.e. furniture / equipment)		82,615.57
Misc		162,939.81
<b>Land (serviced)</b>	\$2,606,265	2.74 acres <sup>7</sup>
<b>Apparatus</b>	\$1,027,350	
Engine		840,000
Equipment		187,350
<b>Total Costs</b>	<b>\$17,988,545</b>	

### D.3 District Office (Police)

The key strategic document used to develop this community services charge for future district offices was the Calgary Police Service’s (CPS) Facilities Master Plan 2016–2025 / 2025-2035 (anticipated completion 2016).

#### Level of Service

Utilizing current information coupled with the findings from the future CPS Facilities Master Plan, it is determined that the average of 149,000 people are served by one district station

<sup>5</sup> Seton Emergency Response is shared with four City of Calgary business units. Other space allocation is as follows: Calgary Police Service (2,650 sf), Animal Bylaw Services (3,143 sf), Parks (2,230 sf), shared common (3,990 sf).

<sup>6</sup> Emergency Response specific area with their proportionate allocation of shared common.

<sup>7</sup> Total land purchase price for multi-use facility was 4.7 acres with lands allocated to Emergency Response and Corporate Properties. Price was \$950,000 acre.



## Infrastructure Costs

The following table outlines the cost of providing a new facility and how this was determined.

**Table 45 - Police District Office Costs (Projected)**

Component	2015 Costs		
	Component Cost	Size	Cost Per Unit
<b>Building Construction<sup>8</sup></b>	\$22,500,000	45,000 sf (4,180 s.m.)	\$500 / sf
<b>Consulting</b>	\$2,000,000	-	-
<b>Site Development</b>	\$2,000,000	5 acres	\$400,000 / acre
<b>Contingency (10%)</b>	\$2,650,000		
<b>Public Art (1%)</b>	\$291,500		
<b>Land</b> - Includes raw land purchase price and land servicing costs (i.e. building site, drainage, paving and landscaping)	\$5,500,000	5 acres	\$1.1 M / acre
<b>Total Costs</b>	<b>\$34,941,500<sup>9</sup></b>		

## D.4 Recreation Centres (Recreation)

The projected infrastructure needs identified in this section are guided by the 2015 Facility Development and Enhancement Study (FDES), and facilitated by on-site delivery of programs and services during community build out.

### Level of Service

The City's goal is to develop smaller regional facilities that can be built out as the community grows rather than building larger regional facilities which will take much longer to build. The provision of a recreation facility is population based. The City is using a catchment population of 40,000 to 80,000 people for a small regional recreation facility. The current average population catchment within approved/planned ASPs is 63,000 people/recreation centre. The charge will be based on average recreation centre coverage of 63,000 people.

<sup>8</sup> Building costs do not include furniture, fixture and equipment (FF&E). While FF&E is a capital cost associated with growth these expenses will be covered through operating.

<sup>9</sup> While capital costs related to Police patrol and investigative fleet have been excluded from this calculation, this capital investment required to service growth should be revisited.



## Infrastructure Costs

The following table outlines the cost of providing a new facility and how this was determined.

**Table 46 - Small Recreation Centre Costs**

Component	2015 Costs, Facility Development & Enhancement Study Proposed Baseline		
	Component Cost	Size	Cost Per Unit
<b>Building Construction</b> - includes parking; on-site servicing; project administration; consultant fees.	\$47,678,000 <sup>10</sup>	125,000 <sup>1112</sup> sf	\$380 / sf
<b>Site Development</b> - includes servicing, grading, parking etc.	3,165,000	-	-
<b>Contingency (10%)</b>	5,084,300		
<b>Soft Costs</b> - includes design, permits geotechnical testing / reports, land use etc.	6,537,653	-	-
<b>Public Art (1%)</b>	624,650		
<b>Land (serviced)</b>	\$13,200,000	12 acres	\$1.1 M / acre
<b>Furniture &amp; Equipment</b>	\$4,312,475		
<b>Total Costs</b>	<b>\$80,602,078</b>		

\* Facility costs represent baseline condition which includes aquatics, gymnasium, fitness, meeting spaces and support services (daycare and food services). Amenities beyond this level of service which provides a higher level of service include but are not limited to ice rinks, dry-land sport fieldhouses, art studios, performing art theatres, climbing walls, and youth centres.

<sup>10</sup> Variance from June 16, 2015 figure are the result of: removal of Quarry Park methane mitigation, owner internal costs, and alignment with an “optimized facility” as per the Facility Development & Enhancement Study (2015).

<sup>11</sup> The proposed 125,000 sq. ft. facility is of a size that will effectively and efficiently meet regional recreation needs while not being of a size (e.g. Rocky Ridge Regional Recreation Facility: 284,000 sq. ft.) that will require significantly more funds and thus time to construct (i.e. a smaller facility can be built in a timely manner to meet the needs of developing communities). Note: the above calculation provides 1.98 sq. ft. of facility per person in the catchment area of 63,000 people. This aligns with the FDES recommendation of 2 sq. ft. per person

<sup>12</sup> Variance from June 16, 2015 is the result of a more detailed analysis by square foot and alignment with the “optimized facility” as per the Facility Development & Enhancement Study (2015).



## D.5 Transit Buses (Transit)

### Level of Service

The need for transit buses in greenfield communities is based on existing average transit bus route coverage. Current transit bus requirement in greenfield neighborhoods is six buses per 20,000 population.

### Infrastructure Costs

The average cost of a new transit bus in 2015\$ is \$411,000.



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## GLOSSARY

<b>Area-Specific Off-Site Levies</b>	Levies determined for different areas according to geographic zones or other distinctive areas based on technical reasons
<b>Build Calgary</b>	A collaborative cross-corporate team formed by the City of Calgary
<b>Carry-Forward Levy Fund Balances</b>	Current account balances for existing levy funds incorporated into updated levy calculations.
<b>City-wide Off-Site Levies</b>	The same levy cost is applied regardless of the location of the development
<b>Commercial Development</b>	A use identified on a development permit, and any uses that are ancillary to the principal use listed on a development permit, that are neither <i>residential development</i> nor <i>industrial development</i> .
<b>Community Services Charges Resolution</b>	Council resolution that establishes the growth driven costs and charges related to community infrastructure not included in the Bylaw. Types of infrastructure included in the Community Services Charges resolution are emergency response stations, recreations centres, public libraries, transit buses and police district stations.
<b>Cost of Capacity Method</b>	Determines the appropriate amount to charge new development for additional capacity.
<b>Cottage Housing Cluster</b>	A development form as defined in the City of Calgary Land Use Bylaw 1P2007
<b>Developed Area</b>	Developed Area is identified in the MDP and is considered to be all communities that were completely constructed prior to the approval of the MDP.
<b>Developing Area</b>	The Developing Area is identified in the MDP and is considered to be all communities that had no or only partial urban development prior to approval of the MDP.
<b>Development Agreement</b>	A legal contract between The City and the Developer that sets out the terms and conditions under which development of the lands are to take place within the city including the responsibility to construct public facilities and associated financial obligations.
<b>Established Area</b>	Area of the city as shown in Figure 2 of this report to be charged the Established Area levy.
<b>Greenfield Area</b>	Area of the city as shown collectively the areas identified as “Greenfield Area by Watershed” in Figure 2 of this report to be charged the Greenfield Area levy.
<b>Gross Floor Area</b>	Development building gross floor area as defined in the Land-Use Bylaw
<b>Industrial Development</b>	A use identified on a development permit, and any uses that are ancillary to the principal use listed on a development permit, listed in the following City of Calgary Land Use Bylaw 1P2007 Schedule A Group of Uses: <ul style="list-style-type: none"> <li>a. Direct Control Uses, with the exception of the following specific uses: <ul style="list-style-type: none"> <li>i. Adult Mini-theatre,</li> <li>ii. Emergency Shelter,</li> <li>iii. Gaming Establishment – Casino,</li> <li>iv. Jail;</li> </ul> </li> <li>b. General Industrial Group;</li> </ul>



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	<ul style="list-style-type: none"> <li>c. Industrial Support Group, with the exception of the following specific uses:               <ul style="list-style-type: none"> <li>i. Artist Studio,</li> <li>ii. Health Services Laboratory – Without Clients,</li> </ul> </li> <li>d. Storage Group; or</li> <li>e. One of the following specific uses:               <ul style="list-style-type: none"> <li>i. Auction Market – Other Goods,</li> <li>ii. Auction Market – Vehicles and Equipment,</li> <li>iii. Restored Building Products Sales Yard ,</li> <li>iv. Bulk Fuel Sales Depot,</li> <li>v. Fleet Service,</li> <li>vi. Large Vehicle Service,</li> <li>vii. Large Vehicle and Equipment Sales,</li> <li>viii. Large Vehicle Wash,</li> <li>ix. Recreational Vehicle Sales, or</li> <li>x. Recreational Vehicle Service.</li> </ul> </li> </ul>
<b>Multi-Residential Grade-Oriented</b>	Development with 3 or 4 units, regardless of form OR 5 or more units, where the units are provided in a Cottage Housing Cluster, Townhouse or Rowhouse building
<b>Multi-Residential Non Grade-Oriented (1 Bedroom or Less)</b>	Development with 5 or more units, where the units are provided in a Multi-Residential Development that are not provided in a Cottage Housing Cluster, Townhouse or Rowhouse building and has 1 bedroom or less.
<b>Multi-Residential Non Grade-Oriented (2 Bedroom or More)</b>	Development with 5 or more units, where the units are provided in a Multi-Residential Development that are not provided in a Cottage Housing Cluster, Townhouse or Rowhouse Building and has 2 bedrooms or more.
<b>Non-Residential Growth</b>	Development associated with industrial, commercial and institutional land uses.
<b>Off-Site Levy Bylaw Project</b>	The Off-Site Levy Bylaw project is a review and major update of The City of Calgary’s transportation, water resources and community services charges for off-site infrastructure impacts related to growth.
<b>Residential Development</b>	A use identified on a development permit, and any uses that are ancillary to the principal use listed on a development permit, listed in the following City of Calgary Land Use Bylaw 1P2007 Schedule A Group of Uses: <ul style="list-style-type: none"> <li>a. Residential Group (except Hotel)</li> </ul>
<b>Rowhouse</b>	A development form as defined in the City of Calgary Land Use Bylaw 1P2007
<b>Semi-Detached / Duplex</b>	Development with only 2 units
<b>Single Detached</b>	Development with only 1 unit
<b>Site Development Area</b>	Area of land that is the subject of a development permit, and may be portions of, or all of one or more areas of land described in a certificate of title or described in a certificate of title by reference to a plan filed or registered in a land titles office
<b>Townhouse</b>	A development form as defined in the City of Calgary Land Use Bylaw 1P2007
<b>Watershed Catchment Area</b>	An area of land where surface water from rain, melting snow, or ice converges to a single point at a lower elevation, usually the exit of the basin, where the waters join another waterbody, such as a river, lake, reservoir, estuary, wetland, sea, or ocean.



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## ACRONYMS

<b>MGA</b>	Municipal Government Act
<b>GMSGC</b>	The City of Calgary's General Managers Strategic Growth Committee
<b>ALT</b>	The City of Calgary's Administrative Leadership Team
<b>MDP</b>	Calgary Municipal Development Plan
<b>CTP</b>	Calgary Transportation Plan
<b>LRT</b>	Light Rail Transit
<b>RTM</b>	The City of Calgary's Regional Transportation Model
<b>VKT</b>	Vehicle Kilometres Travelled
<b>CFA</b>	Construction Financing Agreement
<b>EP</b>	Equivalent Population
<b>ASP</b>	Area Structure Plan
<b>CPS</b>	Calgary Police Services
<b>CFD</b>	Calgary Fire Department
<b>CPL</b>	Calgary Public Library
<b>CULC</b>	Canadian Urban Library Council
<b>FDES</b>	Facility Development and Enhancement Study