

# Background Report

## 2024 Off-site Levies Bylaw





**Publishing Information**

Title: 2024 Off-site Levies Bylaw - Background Report

Author: The City of Calgary

Contact: 311

ISC: Unrestricted

SR: 20-0006524-ADV-24112

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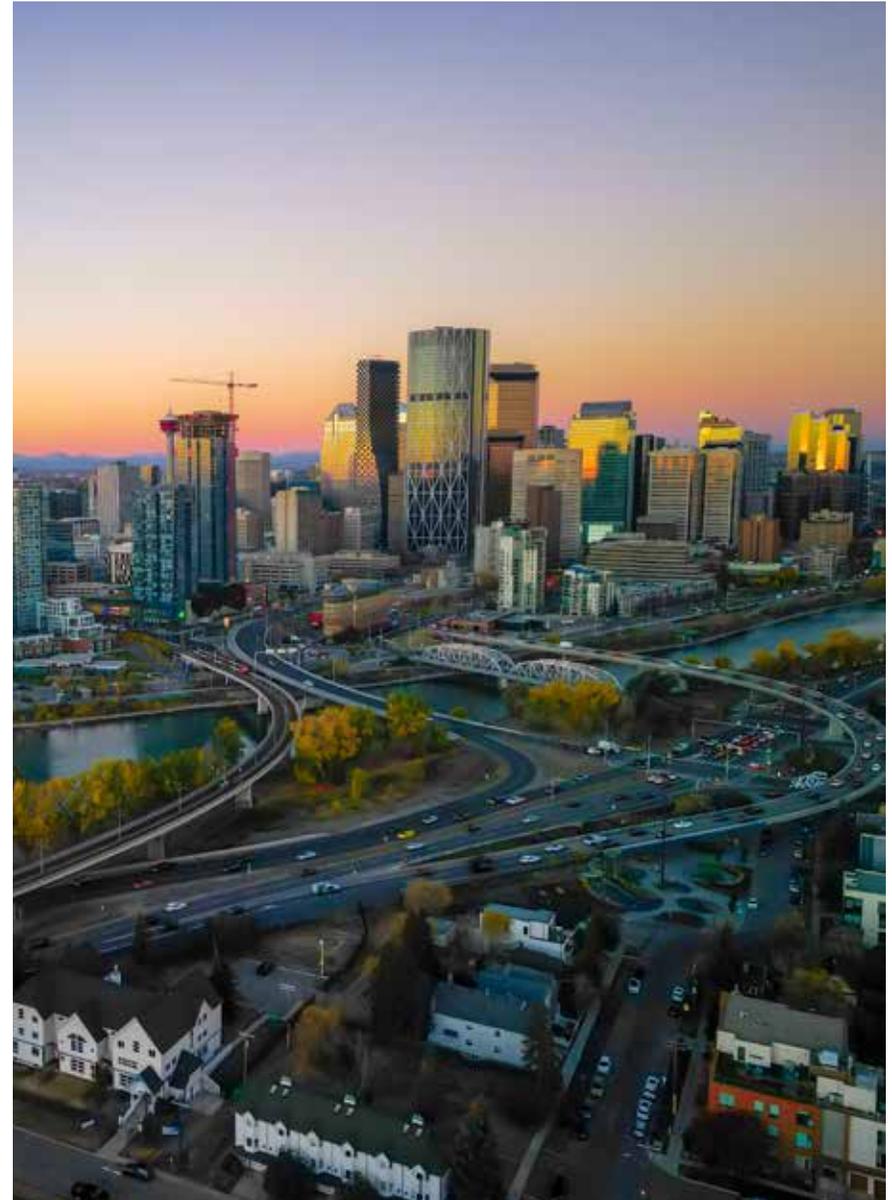
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# Executive Summary

The purpose of this Background Report is to outline the Off-site Levies Bylaw rate calculation methodology and detail the growth assumptions, infrastructure projects and cost estimates underpinning the off-site levies (“levy” or “levies”). This offers transparency on how levy rates were calculated and outlines how levy funds are expected to be used in the future.

The City of Calgary (“The City”) is permitted to collect off-site levies for infrastructure through the Municipal Government Act (MGA) and City of Calgary Charter. Calgary uses off-site levies to secure a portion of the funding for the capital infrastructure that supports new growth and development. This enables the right investments at the right time so that, as Calgary grows, residents and businesses have access to the following ten essential needs for homes and businesses:

1. Clean and safe drinking water
2. Flush toilets, drain sinks and bathtubs
3. Storm drainage to remove rain and snow melt, avoid flooding
4. Pathways and bikeways
5. Buses
6. Streets
7. Fire and emergency response
8. Police protection
9. Libraries
10. Recreation



The City started reviewing the Calgary Off-site Levies Bylaw (2M2016) in June 2020, a process that has included extensive consultation with interested parties. The City consulted on the inputs, assumptions and methodology used in levy rate calculations. This focused on the land targeted for development to accommodate population growth, the infrastructure required to support that growth, the degree to which the infrastructure benefits new growth areas and existing areas (allocation of benefit), and the calculation of the levy rates.

Table 1: Off-site levy rates provides the 2024 off-site levy rates in the city's Greenfield and Established Areas. Only water and wastewater treatment levies apply to the Established Area. Levies in the Established Area will be applied on the additional treatment plant capacity needed to support the redeveloped form, with a credit provided to account for the unit type and the gross floor area (GFA) in the existing development.

**Table 1: Off-site levy rates**

Infrastructure	2024 off-site levy rates
<b>Greenfield Area (cost per hectare)</b>	
Emergency response	\$ 17,069
Police	\$ 7,438
Library	\$ 5,801
Recreation	\$ 52,510
Transportation	\$ 156,386
Transit buses	\$ 19,597
Stormwater	\$ 20,869
Water distribution	\$ 82,666
Water collection	\$ 70,083
Water treatment	\$ 32,580
Wastewater treatment	\$ 144,060
<b>Greenfield Area Total</b>	<b>\$ 609,059</b>
<b>Established Area – Water and Wastewater Treatment</b>	
<b>Residential (cost per unit) \$</b>	
Single detached	\$ 8,538
Semi-detached / duplex	\$ 7,654
Multi-residential grade-oriented	\$ 5,299
Multi-residential non-grade-oriented (2 bedrooms or more)	\$ 4,416
Multi-residential non-grade-oriented (1 bedroom or less)	\$ 3,533
<b>Non-residential (cost per square metre of gross floor area (GFA))</b>	
Commercial development	\$ 49.88
Industrial development	\$ 23.94
Maximum rate for density $\geq$ 285 equivalent population/hectare	\$ 839,040/ha

# Introduction

## Background

Calgary is experiencing tremendous growth – predicting 2.3 million people and 1.4 million jobs by 2076. Enabling development to accommodate this many people and businesses requires The City to plan for and fund many home and business essentials expected by all residents. To provide these essential services, support complete and vibrant communities, and achieve financial sustainability, balanced citywide growth, The City requires a mix of funding tools.

Off-site levies are an important tool for funding growth in Calgary. Off-site levies enable investment in home and business essentials to keep pace with demand or Calgary’s growth would be constrained. Off-site levies enable costs to be appropriately shared by those who benefit from infrastructure, while allowing The City to accommodate the growing number of people and businesses that are choosing Calgary as home. In many cases, off-site levies pay a portion of the cost, with the remainder coming from other City sources of funding as it becomes available.

The City charges off-site levies when a new greenfield development subdivision is approved, or when a Development Permit is approved in the Established Area. Per the MGA, off-site levies are collected and accounted for by infrastructure type and cannot be used for another type of infrastructure; for example, funds collected for transit buses must be spent on transit buses and cannot be used to pay for wastewater infrastructure.

The City of Calgary collects levies for infrastructure to support ten essential community services for homes and businesses:

**Table 2: Home and business essential services supported by levies**

Home and business essentials	Supporting off-site levies
1. Clean and safe drinking water	Water distribution, water treatment
2. Flush toilets, drain sinks and bathtubs	Wastewater collection, wastewater treatment
3. Storm drainage to remove rain and snow melt, avoid flooding	Stormwater
4. Pathways and bikeways	Transportation
5. Buses	Transit buses, transportation
6. Streets	Transportation
7. Fire and emergency response	Emergency response
8. Police protection	Police
9. Libraries	Library
10. Recreation	Recreation

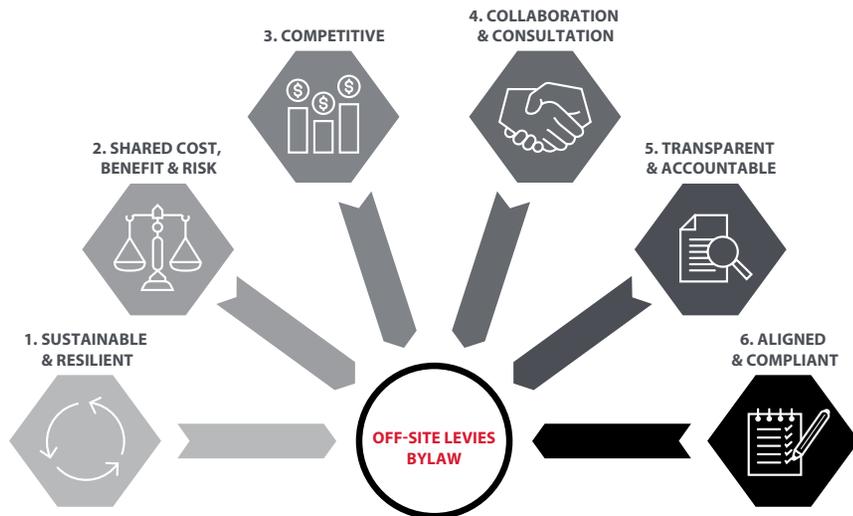
## Modernizing Calgary’s Off-site Levies Bylaw

Calgary’s context has changed since enacting its previous Calgary Off-site Levies Bylaw (2M2016), necessitating an update to the current bylaw that enables The City to continue to fund home and business essentials now and into the future.

On 2021 January 18 (PFC2021-0035) Council acknowledged a new approach to the Off-site Levies Bylaw was needed that would enable Calgary to more sustainably fund and invest in growth that advances our city vision; maintain Calgary’s affordability in terms of taxes, housing and utilities rates; and continue to position Calgary as an attractive place to invest, live and do business.

The new bylaw relies on the principles in Figure 1 as a strategic foundation, as directed by Council through PFC2021-0035 (described in more detail in Attachment 2).

**Figure 1: Principles for a new off-site levy**



The Off-site Levies Bylaw sets out the off-site levy rates based on what infrastructure is being levied for, how much it will cost, and the proportion for which new growth benefits. Changes incorporated into the 2024 bylaw include:

1. The collection of off-site levies necessary to fund infrastructure commitments already made by Council through previous new community growth decisions.
2. The ability to make more timely and frequent updates, allowing collection of off-site levies at the time Council approves new growth applications.
3. Alignment to updated policies and service levels as approved by Council (e.g., Municipal Development Plan (MDP)/Calgary Transportation Plan (CTP) and RouteAhead approvals in 2021 and 2023 respectively).
4. Current and anticipated future costs, which have changed significantly since the Calgary Off-site Levies Bylaw (2M2016) was approved in 2016.

## Legislative Authority

The City is required to comply with the MGA and the Off-site Levies Regulation, both as modified by the City of Calgary Charter, 2018 Regulation. Creating an Off-site Levies Bylaw that complies with this legislation was a primary focus of The City throughout the bylaw review process. Administration continually considered legislative requirements, including when:

- Defining the infrastructure for which an off-site levy will be imposed.
- Establishing a methodology used to determine the degree to which the land is to be subdivided, developed or redeveloped; the benefits from each type of infrastructure identified; and the calculations on which rates are based.
- Consulting in good faith with interested parties.
- Making publicly available the calculations and current information upon which it uses and relies on.
- Drafting the bylaw.

# Off-site Levy Development

## Calculation Overview

Off-site levy rates are determined and collected by infrastructure type, per the governing legislation. Off-site levy calculations are based on three primary inputs:

1. The land area to be levied.
2. The infrastructure required to service the new homes and businesses that will be added to that land.
3. The degree to which the land area benefits from the infrastructure.

These inputs are outlined in more detail through this Off-site Levy Development section, as well as Off-site Levies – Details for each infrastructure type.

The levy rate for future greenfield growth is calculated by distributing growth's portion of the cost of infrastructure over the amount of land in the benefiting area. In the Established Area, the rate is based on the net change in density resulting from redevelopment (see following section on Land Area and Benefit).

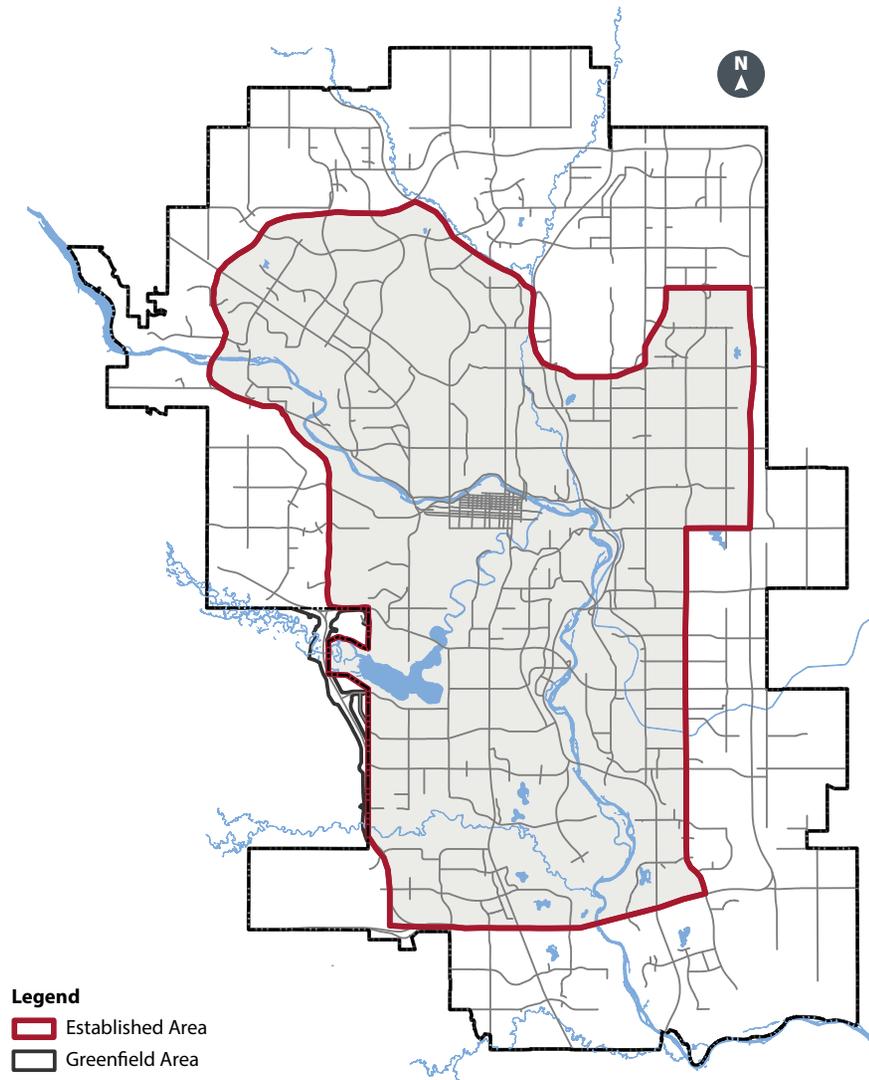
Detailed levy rate calculations and data for various infrastructure components (emergency response, police, library, recreation, transportation, stormwater, water distribution, wastewater collection, water and wastewater treatment) can be found in the 2024 Levy Rate Models, available at the following link: [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).

## Land Area

For the purpose of the Off-site Levies Bylaw, the city is divided into two areas: the Greenfield Area (where many lands have not yet signed a development agreement (DA) or paid off-site levies) and the Established Area. To accommodate population growth, Calgary is expected to grow in both the Established Area and the Greenfield Area. The nature and size of the required infrastructure is different for each area, and these differences require unique estimates, calculations and rates specific to infrastructure types and location.

In the Established Area, the off-site levies are collected for water and wastewater treatment. In the Greenfield Area, the off-site levies are collected for emergency response, police, library, recreation, transportation, transit buses, stormwater, water distribution, wastewater collection, water and wastewater treatment. One notable change is that The City is transitioning from a catchment-based stormwater rate to a citywide approach. The Established Area and Greenfield Area boundaries are illustrated in Map 1.

**Map 1:** Established Area and Greenfield Area boundaries

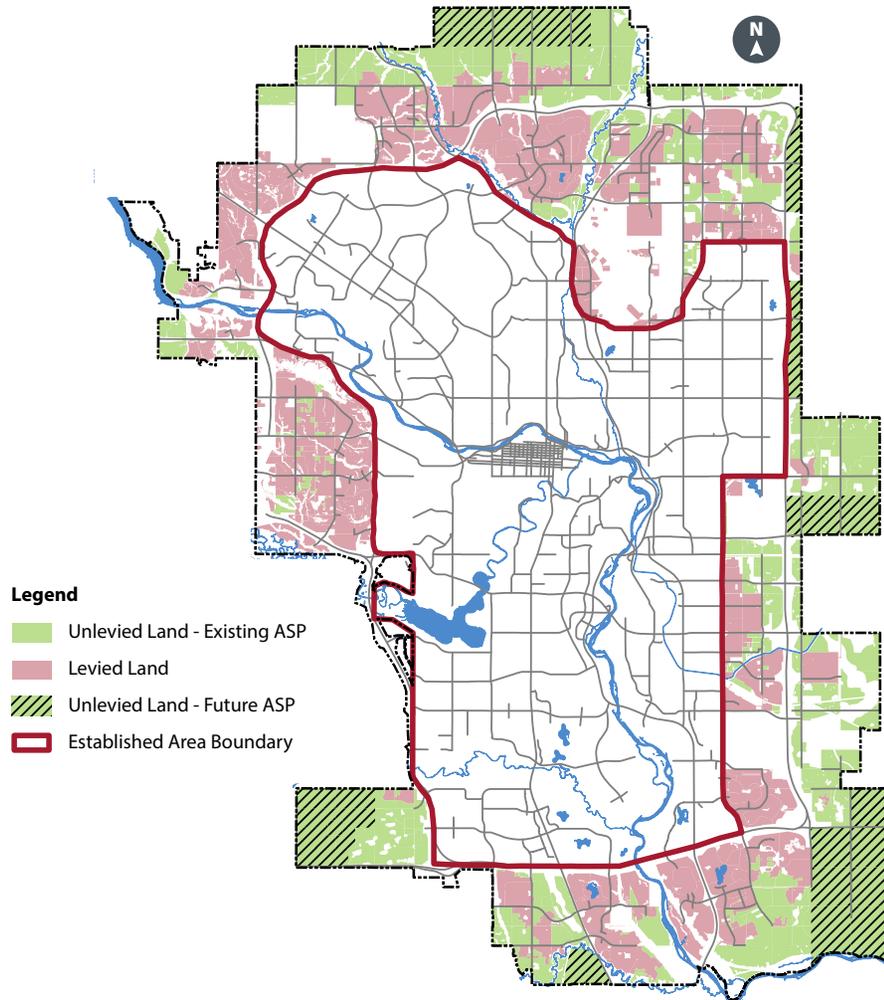


## Growth Forecast and Benefit

Calgary is predicting 2.3 million people and 1.4 million jobs by 2076. The City uses a growth forecast to determine infrastructure needs, timing, benefitting area and assess the degree of benefit for essentials included in the Off-site Levies Bylaw. The growth forecast used in preparing the Off-site Levies Bylaw assumes all lands within Calgary’s existing boundaries will be fully developed by 2076, following current growth trends and using the city’s current borders without expansion or annexation during the forecast period. Most population growth is expected to occur in Greenfield Areas, as outlined in the report, “Calgary Next 20: Population, Employment, and Housing Projections, 2021,” authored by Applications Management Consulting Ltd. as part of the 2020 update to the MDP and CTP. This report can be found online at [calgary.ca/offsitelevy](http://calgary.ca/offsitelevy).

Map 2 shows the planning and levy status of lands within Calgary’s existing boundaries.

**Map 2: Estimated greenfield land development**



Using The City’s growth forecast, unlevied lands in an existing Area Structure Plan (ASP) are anticipated to accommodate an additional 416,991 people and 76,748 jobs over 9,359 hectares of land, by 2055. Unlevied lands in future ASPs are forecast to accommodate an additional 302,024 people and 1,552 jobs over 4,852 hectares of land, by 2076.

**Table 3: Estimated greenfield land development projections**

Greenfield land type	Growth horizon	Area (hectare)	Population at buildout	Jobs
Levied	2022	13,147	531,212	238,428
Unlevied – existing Area Structure Plans (ASPs)	2055	9,359	416,991	76,748
Unlevied – future Area Structure Plans (ASPs)	2076	4,852	302,024	1,552
<b>Total</b>	<b>N/A</b>	<b>27,358</b>	<b>1,250,228</b>	<b>316,728</b>

Infrastructure requirements are determined based on anticipated pace and patterns of growth and strategic capital planning to align with legislation, policy, service level standards and Council direction. Details for each infrastructure type can be found in the 2024 Off-site Levies – Details section of this report.

Benefit is allocated proportionally to levied and unlevied lands based on a benefit measure that is appropriate for each infrastructure type, typically using population, a combination of population and jobs, or land area. It is important to note that off-site levies cover only the portion of capital costs that can be attributed to future growth. Additional funding from other sources is needed to supplement off-site levies.

Table 4 summarizes the frameworks used to develop each off-site levy rate.

**Table 4: Summary of off-site levy frameworks**

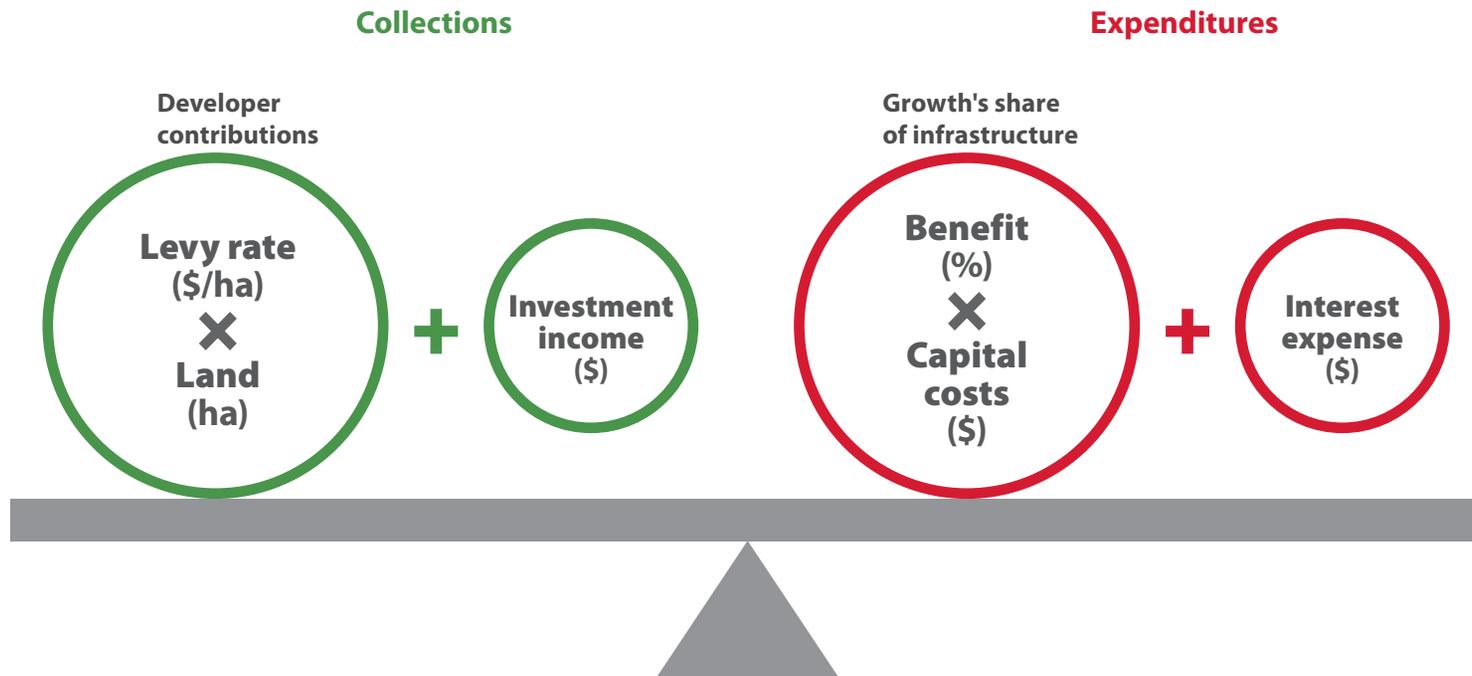
Levy	Infrastructure types	Benefiting area	Benefit measure	Forecast horizon	Charge applied
Stormwater	Pipes, outfalls, and drainage projects.	New and actively developing communities (within existing ASPs).	Land	2048	Greenfield
Water distribution & wastewater collection	Water feeder mains, wastewater trunks, pump stations, lift stations, reservoirs, and other infrastructure.		Equivalent population (EP)		
Water & wastewater treatment	Water and wastewater treatment plants.	New and actively developing communities, and redevelopment in the Established Area.	Greenfield and Established Areas		
Library	Public libraries	Unlevied land - Existing ASPs	Population	2055	Greenfield
Police	Police district offices				
Recreation	Recreation centres				
Transit buses	Transit buses				
Emergency response	Emergency response stations				
Transportation	Interchanges, road widenings, structures over rail or creeks, Bus Rapid Transit (BRT) infrastructure, 5A Network routes, pedestrian overpasses, and greenfield traffic signals.	Existing and future ASPs in the Greenfield Area.	Population and jobs	2076	

## Levy Rate Calculation

This section describes the concepts and steps used to calculate levy rates and indicate how the amount of the levy was determined. To fully understand the calculations, the levy rate models must be reviewed. These can be found online at: [calgary.ca/offsitelevy](http://calgary.ca/offsitelevy).

As shown in Figure 2, levies are calculated to ensure that growth's share of the future cost of infrastructure being levied for (expenditures) matches with the funding collected from growth (collections). This is achieved by matching the timing of service need (expenditures) and levy payments through development approvals (collections) to result in a fair, equitable, financially sustainable rate where expenditures and collections net to zero at the end of the forecast period.

**Figure 2:** Balancing levy collections and expenditures

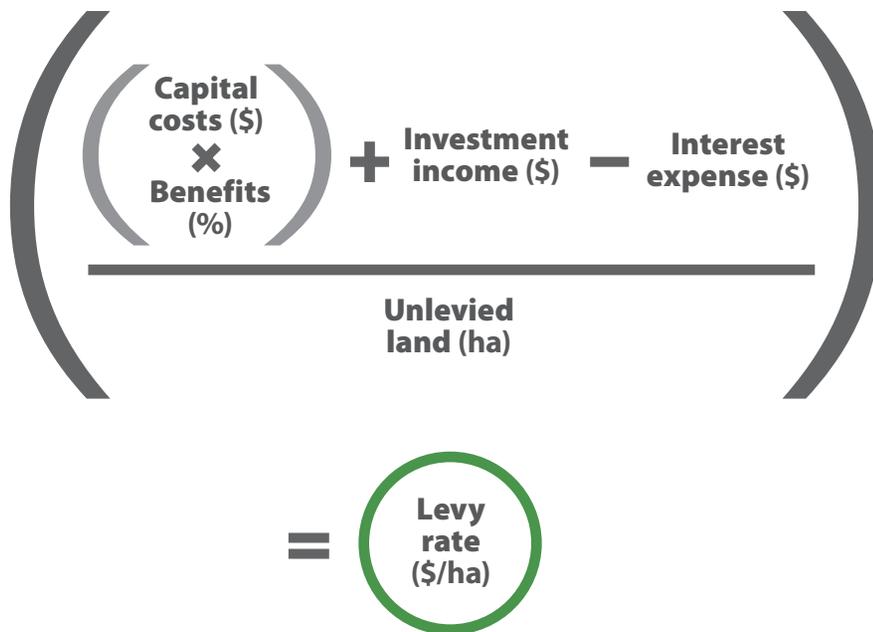


This balance is achieved using a model that compares and balances levy-related inbound and outbound cash flows over the growth forecast period. Inputting the correct levy rate to the model results in a levy fund balance of zero dollars at the end of the model period, which guards against over or under collection.

Two methods are used to calculate levies, depending on where the levy is applied:

- **Greenfield Area levy calculation:** used for levies charged only in Greenfield Areas.
- **Greenfield and Established Areas calculation:** used for levies charged in both Greenfield and Established Areas.

**Figure 3:** Simplified conceptual greenfield levy calculation



### 1. Greenfield Area levy calculation

This calculation applies to levies that are only charged in Greenfield Areas, which includes the levies for: emergency response, police, library, recreation, transit buses, transportation, stormwater, water distribution and wastewater collection. It is shown conceptually in Figure 3. Growth’s share of the cost of the infrastructure being levied for is distributed over the amount of unlevied land, which produces a cost-per-hectare levy rate.

The actual calculation in the levy rate model is more complex than what is depicted in Figure 3, and relies on the following inputs:

- The amount of unlevied land to be included in the model.
- The total costs being levied, which is based on:
  - The capital cost of projects.
  - The degree to which projects being levied for benefit the unlevied land.
  - The timing of expenditures, with an escalation rate applied to capital costs to account for inflation related to construction.
  - Any interest expense. Interest may be incurred if there are insufficient levy funds available, and debt is incurred to advance construction.
- Collections, which incorporates:
  - The timing of absorption for all hectares of unlevied lands.
  - The payment schedule for off-site levies.
  - Any investment income returned from investments made using the off-site levy fund balance.
- A discount factor, or investment rate of return, is used to calculate:
  - Investment income.
  - Interest expense.
  - The net present value (NPV) of future costs.

Steps for determining the levy rates that are only applied in Greenfield Areas are as follows:

1. Determine the number of hectares of unlevied land to be included in the model.
2. Forecast the annual absorption of unlevied land through the model period.
3. Set the levy payment schedule.
  - a. 30 per cent of levies are paid after year one, 30 per cent after year two, and 40 per cent after year three.
4. Identify the capital infrastructure and costs to be levied for, including any remaining deficits from prior periods or debt obligations for completed projects.
5. Determine the degree to which the infrastructure serves unlevied lands (allocation of benefit).
  - a. The capital cost being levied is the sum of capital costs multiplied by benefit allocations.
6. Forecast expenditures through the model period.
  - a. Set expenditure timing.
  - b. Account for future cost increases using an escalation rate.
  - c. Calculate the amount needed in today's dollars using a discount rate.
7. Calculate the off-site levy rate and input it into the model. This step finalizes the calculations for collections from levy payments, interest expenses, and investment income.
  - a. Levy payment collections are calculated based on the levy rate, the land absorption forecast, and the levy payment schedule; escalated using the discount factor.

- b. Annual levy fund closing balances can now be calculated based on the prior year's balance, subtracting in-year expenditures, and adding in-year collections.
  - i. Investment income is added to levy collections if the levy fund balance is positive.
  - ii. Interest expenses are added to levy expenditures if the levy fund balance is negative.

When the levy rate has been calculated correctly, the levy fund balance at the end of the model period will be zero dollars.

## 2. Greenfield and Established Areas calculation

This calculation applies to levies that are charged in both the Greenfield Area and in the Established Area, which includes the following levy: water and wastewater treatment. It is shown conceptually in Figure 4. The methodology allocates capital costs to both Greenfield Areas and Established Areas in proportion to their allocated benefit.

**Figure 4:** Simplified conceptual water and wastewater treatment levy calculation

$$\left( \frac{\text{Capital costs (\$)} \times \text{Benefits (\%)}}{\text{Equivalent population (EP)}} \right) = \text{Levy rate (\$/EP)}$$

The diagram shows a conceptual equation for calculating the levy rate. On the left, a large right-facing curly bracket encloses the fraction: the numerator is 'Capital costs (\$)' with 'NPV of forecast principal and interest costs' written below it, followed by a multiplication symbol 'X' and 'Benefits (%)'. The denominator is 'Equivalent population (EP)'. To the right of the bracket is an equals sign, followed by a green circle containing the text 'Levy rate (\$/EP)'.

This calculation assigns the cost of growth-related water and wastewater treatment capacity to the expected equivalent population (EP), or combination of population and jobs of:

- a. Greenfield land, assuming 60 EP per hectare, which is the minimum threshold set in the MDP for ASPs in Greenfield Areas.
- b. The net difference in EP between existing Established Area development form and the redeveloped form (i.e., the cost for net additional treatment capacity required per type of unit). The rates per unit included in Table 1 include both water treatment and wastewater treatment.

It uses:

- The total costs being levied, which is based on:
  - Consideration of current and future water and wastewater treatment capacity.
  - The total estimated equivalent population (EP) added for each project to represent the cost per capita.
  - The net present value of past and future principal and interest payments for all projects on the off-site levy list.
  - The timing of expenditures, with an escalation rate applied to capital costs to account for inflation related to construction.
- Collections, which incorporates:
  - An estimated maximum day water consumption rate per capita
  - The average cost to provide water and wastewater treatment per capita.
  - For Established Area calculations, levies are solely based on the net-new EP added by redevelopment projects.
- A discount factor, or investment rate of return, is used to calculate the net present value of future costs.

Steps for this calculation are as follows:

1. Identify the capital infrastructure and costs to be levied.
2. Determine the degree to which the infrastructure serves unlevied lands (allocation of benefit).
  - a. The capital cost being levied is the sum of capital costs multiplied by benefit allocations.
3. Forecast debt servicing expenditures through the model period.
  - a. Set capital expenditure timing.
  - b. Forecast interest rates required to fund expenditures.
4. Calculate previous debt servicing payments that funded current capacity available.
5. Determine the present value of growth-related water and wastewater treatment costs.
6. Calculate the total current capacity built and forecast future capacity built to service growth.
7. Determine the unit of capacity (\$/EP) for current capacity and forecast future capacity built.
  - a. Determine the total available current capacity, plus the total value of forecast future capacity built.
  - b. Determine the total value of available and future capacity.
  - c. Determine the average unit of capacity available independently for water treatment and wastewater treatment.
  - d. An average EP density of 60 EP/hectare is assumed for development in the Greenfield Area. This is the minimum planned density required in Calgary's greenfield development.

## Escalation and discount rates

The escalation rate used in all levy calculations is based on historical data from 1981-2022 in Statistics Canada's non-residential building construction price index (NRBCPI) for the Calgary region, with specific considerations for smoothing inflation over time. The average escalation rate over the forecast period is calculated as 3.58 per cent.

The discount rate used in the levy calculations for stormwater, water distribution and wastewater collection, and water and wastewater treatment, is the same as the escalation rate, 3.58 per cent. These levies use debt as their primary financing tool, and there is no investment income generated.

The discount rate used in the levy calculations for the emergency response, library, police, recreation, transit bus, and transportation levies reflects The City's expected long-term rate of return based on the asset mix in which the off-site levy balances are typically invested, shown in Table 5. The average discount rate over the forecast period is calculated as 4.29 per cent.

The expected rate of return for each asset class is determined by reviewing the long-term market predictions from institutional investors and adjusting them for cash inflows/outflows and expected gains. The portfolio's expected rate of return is calculated as the sum of the expected rate of return for each asset class multiplied by their respective weight within the portfolio.

**Table 5:** Asset mix for invested off-site levy balances

Asset mix for off-site levy balances	%
Money market	0%
Short term fixed income	25%
Canadian fixed income	25%
Global fixed income	25%
Real assets	15%
Equity	10%
<b>Total</b>	<b>100%</b>

## 2024 Off-site Levy Rates

Table 6 provides a summary of the off-site levy rates for all infrastructure types.

Off-site Levy rates are expected to be periodically updated through bylaw amendments to reflect changes to any inputs including infrastructure inclusions, cost estimates, land absorption, discount rates, and escalation rates. The levy rates will be automatically adjusted annually on January 1, according to the discount rates set in the Off-site Levies Bylaw.

The 2024 levy rate models are available online at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy)

**Table 6:** Off-site levy rates for Greenfield Area and Established Area

Infrastructure	2024 off-site levy rates
<b>Greenfield Area (cost per hectare)</b>	
Emergency response	\$ 17,069
Police	\$ 7,438
Library	\$ 5,801
Recreation	\$ 52,510
Transportation	\$ 156,386
Transit buses	\$ 19,597
Stormwater	\$ 20,869
Water distribution	\$ 82,666
Wastewater collection	\$ 70,083
Water treatment	\$ 32,580
Wastewater treatment	\$ 144,060
<b>Greenfield Area Total</b>	<b>\$ 609,059</b>
<b>Established Area – Water and Wastewater Treatment</b>	
<b>Residential (cost per unit)</b>	
Single detached	\$ 8,538
Semi-detached / duplex	\$ 7,654
Multi-residential grade-oriented	\$ 5,299
Multi-residential non-grade-oriented (2 bedrooms or more)	\$ 4,416
Multi-residential non-grade-oriented (1 bedroom or less)	\$ 3,533
<b>Non-residential (cost per square metre of gross floor area (GFA))</b>	
Commercial development	\$ 49.88
Industrial development	\$ 23.94
Maximum rate for density $\geq$ 285 equivalent population(EP)/hectare:	\$ 839,040/ha

# 2024 Off-site Levies – Details

The following section outlines details of each off-site levy by infrastructure type, including a description of the levy, infrastructure need, rationale, costs, and specific growth assumptions and benefit allocation.

## Emergency Response

### 1. Introduction

The emergency response levy is required to provide emergency response in greenfield communities. Details for the emergency response levy infrastructure and methodology are outlined below.

Emergency response infrastructure included in the levy is required to:

- Provide emergency response services for an additional 261,000 people and 5,300 jobs across 9,359 hectares of unlevied land.
- Enable an additional eight emergency response stations to meet the needs of future population forecast through 2055.

The total cost of this infrastructure is \$160.2 million, of which \$147.4 million will be collected through the off-site levy, based on benefit allocation of 92 per cent for the cost of infrastructure in the Greenfield Area. The exact construction timing and location will be refined based on the pace of land area development.

Additional details of the infrastructure types, need, cost, assumptions and calculation are outlined below and in more detail in the Emergency Response Levy Rate Model 2024 Off-site Levies, available at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).



## 2. Infrastructure types

The emergency response infrastructure type included in the levy is:

**Emergency response station.** An emergency response station serves as a central hub for all hazard emergency response services, such as the Calgary Fire Department (CFD) and Alberta Health Services (from where medical personnel are stationed and deployed), as well as for public safety infrastructure, and, sometimes, a hazardous waste drop-off point.

## 3. Infrastructure need

Infrastructure needs (including type, cost and benefit) included in the emergency response levy are listed in Appendix A, Table C1 and Table C2.

Identifying whether an emergency response station is needed depends on factors including:

- Actual and forecast incident volumes.
- Actual and simulated response times.
- Existing or proposed population sizes, geographic layout, community size and deployment considerations.

Response time is based on the Council-mandated Service Level and Response Time Targets for First-in Unit and Effective Response Force (CPS2008-03).

The emergency response levy methodology includes infrastructure benefiting greenfield growth. The need for the emergency response infrastructure is based on the factors described above and is set out in the ASPs which guide the growth of new greenfield communities from undeveloped land to a complete community. It has been determined that eight emergency response stations will be required to meet the needs of future population in greenfield communities.

## 4. Infrastructure costs

Historical construction costs from the most recent permanent station inform emergency response infrastructure cost estimates. Current City contracts for engine life-cycling or purchases inform apparatus and aerial engine costs. Land size estimates are based on CFD's requirements per station.

Emergency response station capital costs include:

- Construction costs (includes any building construction and site development materials, labour costs, furniture and equipment, interior fixtures, design and planning, administrative costs, insurance, and other fees).
- Project contingencies and cost escalation.
- Land acquisition cost.

Areas experiencing growth have varying population (residents and jobs/workers) forecasts. Population growth will determine whether a two-bay or more emergency response station is needed.

Recent actual expenditures inform the baseline price index and then costs were re-calculated using current observed increases. This ensures infrastructure cost estimates are current and reflect any recent inflationary increases. Estimated costs assume infrastructure is delivered through City-administered design-build contracts.

Infrastructure costs are included in Appendix: Table C1, C2 and Map A1.

### 5. Growth assumptions and benefit allocations

New emergency response stations provide a similar service level to beneficiaries across all existing ASPs in the Greenfield Area and 100 per cent of benefit is allocated to those areas.

No benefit is allocated to the Established Area. All emergency response stations included in the emergency response levy are located in existing ASPs in the Greenfield Area and will provide similar reliability, quality, and service levels as in the Established Area while maintaining and not otherwise affecting reliability, quality and service levels in those areas.

The CFD operates within Calgary’s boundaries and collaborates with jurisdictional partners when required. No regional benefit has been assigned to calculate the benefit allocation.

Benefit of emergency response infrastructure is allocated based on the share of forecast population and jobs in existing ASPs:

- Population and jobs are key factors driving the demand for emergency response services and are being used to measure benefit.
- Levied and unlevied land ratios for all transportation zones within each primary service area are applied to forecast future population and jobs to determine the benefit allocation:

$$\text{Benefit \% allocations} = \frac{\text{Forecast of population and jobs in the unlevied lands of primary service area}}{\text{Forecast of total population and jobs in primary service area}}$$

- The benefit is calculated as the sum of benefits for all primary service areas adjusted for the future population ratio in the unlevied lands of primary service area as follows:

$$\text{Total Benefit} = \text{Sum of} \left( \text{Benefit for each primary service area} \times \frac{\text{Forecast of population in the unlevied lands of primary service area}}{\text{Forecast of total population in primary service area}} \right)$$

The summary of benefit allocation to unlevied lands in existing greenfield ASPs for the emergency response levy is shown in Appendix A Table 2. Eight per cent of benefit is allocated to levied lands and 92 per cent of benefit is allocated to unlevied lands.

Map A1 of Appendix A illustrates the city’s Established Area and Greenfield Area levied and unlevied lands, and future emergency response station locations.

# Library

## 1. Introduction

The library levy rate is required to provide public library service to greenfield communities. Details for the library levy infrastructure and methodology are outlined below.

Library infrastructure included in the levy is required to:

- Provide library services for an additional 417,000 people across 9,359 hectares of unlevied land.
- Enable an additional eight libraries of 15,519 sq. ft. each (generally co-located with recreation centers) required to meet the needs of future population forecast through 2055.

The total cost of this infrastructure is \$116.8 million, of which \$51.4 million will be collected through the off-site levy, based on benefit allocations of 44 per cent for the cost of infrastructure in the Greenfield Area. The exact construction timing and location will be refined based on the pace of land area development. Delivery of library infrastructure as part of multi-service opportunities will be reviewed as projects develop.

Additional details of the infrastructure types, need, cost, assumptions and calculation are outlined below and in more detail in the Library Levy Rate Model 2024 Off-site Levies Bylaw, available at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).



## 2. Infrastructure types

The library infrastructure type included in the levy is:

**Library.** A library is a vibrant community hub that provides access to resources and learning while fostering connection, belonging and empowerment among Calgarians.

A population-based approach is used to calculate the service requirements to meet the population's needs in growth communities. Eight public libraries will be required to meet the needs of future population in greenfield communities.

## 3. Infrastructure need

Infrastructure needs (including type, cost and benefit) included in the library levy are listed in Appendix Table C3.

The library levy methodology includes infrastructure benefitting greenfield growth. Library infrastructure need is typically set in the ASPs which direct specific land use, subdivision and development decisions that collectively determine what form the plan area will take. This includes deciding on land use, transportation systems, population and jobs, pace and sequence of development, and essential services and infrastructure provisions. Furthermore, the service level for the Greenfield Area is targeted to match the service level currently provided in the Established Area (i.e., 0.3 square feet of library space per person).

As per Table 7, eight public libraries will be required to meet the needs of future population in greenfield communities with existing ASPs:

**Table 7: Library infrastructure needs calculation**

Item	Units
Forecast total future population	946,835
Existing population served	533,003
Additional population to be served	413,832
Service level	0.3 sq. ft. per person
Infrastructure required	8 libraries

## 4. Infrastructure costs

The library infrastructure cost estimate described in Appendix Table C3 is based on third-party Class 4 estimates developed for future infrastructure in the Greenfield Area. Internal analysis of recent land acquisitions forms the basis of land acquisition cost estimates.

Library infrastructure capital costs include:

- Construction costs (including any building construction and site development materials, labour costs, furniture and equipment, interior fixtures, design and planning, administrative costs, insurance and other fees).
- Project contingencies and cost escalation.
- Land acquisition cost.

Infrastructure costs are included in Appendix: Table C1, C2 and Map A1.

<sup>1</sup> A Class 4 estimate is a project cost estimate process used for feasibility study, concept evaluation and preliminary budget approval. It is based on limited information and has a wide accuracy range of +50 per cent to -30 per cent.

### 5. Growth assumptions and benefit allocation

The benefit allocation calculation assumes the following:

- All libraries included in the library levy are located in the Greenfield Area and will provide it with similar reliability, quality, and service levels provided in the Established Area while maintaining and not otherwise affecting the current reliability, quality and service level in the Established Area. Therefore, no benefit is allocated to the Established Area.
- One hundred per cent of the benefit is allocated between unlevied and levied lands in existing ASPs in Greenfield Area, on the basis of the forecast population in each:

- Primary users of the libraries are assumed to be Calgary residents. No regional benefit is allocated.

The benefit allocated to unlevied lands in ASPs is calculated as follows:

$$\text{Benefit \% allocations} = \frac{\text{Sum of forecast of population in all unlevied lands in the Greenfield Area}}{\text{Sum of forecast of total population in the Greenfield Area}}$$

**Table 8:** Library benefit allocation

Type of land	Population	Benefit allocation
Levied greenfield lands	529,843	56%
Unlevied greenfield lands	416,991	44%
<b>Total</b>	<b>946,834</b>	<b>100%</b>

56 per cent of benefit is allocated to levied lands and 44 per cent of benefit is allocated to unlevied lands. The benefit percentage allocated to unlevied lands is used to calculate the library infrastructure levy rate.

Map 2 illustrates The City’s Established Area and Greenfield Area levied and unlevied lands.

# Police

## 1. Introduction

The police levy is required to provide police protection to greenfield communities. Details for the police levy infrastructure and methodology are outlined below.

Police infrastructure included in the levy is required to:

- Provide police services for an additional 417,000 people across 9,359 hectares of unlevied land.
- Enable an additional four police district offices required to meet the needs of future population forecast through 2055.

The total cost of this infrastructure is \$148.6 million, of which \$65.4 million will be collected through the off-site levy, based on benefit allocations of 44 per cent for the cost of infrastructure in the Greenfield Area. The exact infrastructure construction timing and location will be refined based on the pace of land development.

Additional details of the infrastructure types, need, cost, assumptions and calculation are outlined below and in more detail in the Police Levy Rate Model 2024 Off-site Levies Bylaw, available at [calgary.ca/offsitelevy](http://calgary.ca/offsitelevy).



## 2. Infrastructure types

The police infrastructure type included in the levy is:

**Police district office.** A police district office serves as police headquarters for a particular district; a location from which assigned members are deployed and return to at shifts' end.

A population-based approach is used to calculate the number of police district offices required to service community needs. Four police district offices will be required to meet the needs of future population in greenfield communities.

## 3. Infrastructure need

Police infrastructure need is driven by population growth. Infrastructure needs (including name, cost and benefit) included in the police levy are listed in Appendix C, Table C4.

The service level for the Greenfield Area is targeted to match the service level currently provided in the Established Area (i.e., one police district office is required to meet the needs of 149,000 future residents). As per Table 9, four police district offices are required to meet the needs of the future population in greenfield communities with existing ASPs:

**Table 9: Police infrastructure needs calculation**

Item	Units
Forecast total future population	946,835
Existing population served	372,509
Addition population to be served	574,335
Service level	one police district office for 149,000 residents
Infrastructure required	3.85 or approx. 4 stations

## 4. Infrastructure costs

The police infrastructure cost estimate described in Appendix Table C4 is developed using internal Class 4 estimates developed for future infrastructure in the Greenfield Area. Land acquisition cost estimate is based on internal analysis of recent land acquisitions.

Police infrastructure capital costs include:

- Construction costs (includes any building construction and site development materials, labour costs, furniture and equipment, interior fixtures, design and planning, administrative costs, insurance, and other fees).
- Project contingencies and cost escalation
- Land acquisition cost.

Police infrastructure costs are included in Appendix Table C4.

### 5. Growth assumptions and benefit allocation

The benefit allocation calculation assumes the following:

- All police district offices included in the police levy are located in the Greenfield Area and will provide it with similar reliability, quality, and service levels as provided in the Established Area, while maintaining and not otherwise affecting the current reliability, quality, and service levels in the Established Area. Therefore, no benefit is allocated to the Established Area.
- 100 per cent of the benefit is allocated between levied lands and unlevied lands in existing greenfield ASPs, on the basis of the forecast population in each:

- The Calgary Police Service operates within Calgary’s boundaries and will collaborate with jurisdictional partners when required. No regional benefit is allocated.

The benefit allocated to unlevied lands in ASPs is calculated as follows:

$$\text{Benefit \% allocations} = \frac{\text{Sum of forecast of population in all unlevied lands in the Greenfield Area}}{\text{Sum of forecast of population in the Greenfield Area}}$$

**Table 10:** Police benefit allocation

Type of land	Population	Benefit allocation
Levied greenfield lands	529,843	56%
Unlevied greenfield lands	416,991	44%
<b>Total</b>	<b>946,834</b>	<b>100%</b>

56 per cent of benefit is allocated to levied lands and 44 per cent of benefit is allocated to unlevied lands. The benefit percentage allocated to unlevied lands is used to calculate the police infrastructure levy rate.

Map 2 illustrates the city’s Established Area and Greenfield Area levied and unlevied lands in existing and future ASPs.

# Recreation

## 1. Introduction

The recreation levy is required to provide recreation centres for greenfield communities. Details of for the recreation levy infrastructure and methodology are outlined below.

Recreation infrastructure included in the levy is required to:

- Provide recreation services for an additional 417,000 people across 9,359 hectares of unlevied land.
- Enable an additional eight recreation centres required to meet the needs of future population forecast through 2055.

The total cost of this infrastructure is \$1,035.2 million, of which \$455.5 million will be collected through the off-site levy, based on benefit allocations of 44 per cent for the cost of infrastructure in the Greenfield Area. The exact infrastructure construction timing and location will be refined based on the pace of land development. Where feasible and appropriate, recreation infrastructure will generally be co-located with municipal infrastructure, including libraries.

Additional details of the infrastructure need, cost, assumptions and calculation are outlined below and in more detail in the Recreation Levy Rate Model 2024 Off-site Levies Bylaw, available at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).



## 2. Infrastructure types

The recreation infrastructure type included in the levy is:

**Recreation centre.** A recreation facility offers a wide variety of activities and services. It provides at least one indoor pool and a combination of gymnasium, fitness, meeting spaces and support services (such as daycare and food services). Outdoor amenities (e.g., outdoor fields) may also be part of the facility.

A population-based approach is used to calculate the number of recreation infrastructure required to service population needs. Eight recreation centres will be required to meet the needs of future population in greenfield communities.

## 3. Infrastructure need

Infrastructure needs (including type, cost and benefit) included in the recreation levy are listed in Appendix D, Table C5.

The recreation levy methodology includes greenfield growth infrastructure benefits. The recreation infrastructure need is set in the ASPs which guide the specific land use, subdivision and development decisions that collectively determine what form the plan area will take. This includes guidance on land use, transportation systems, population and jobs, pace and sequence of development, and essential services and facilities provisions.

The service level for the Greenfield Area is targeted to match the service level currently provided in the Established Area. The typical catchment for a recreation centre is 63,000 - 75,000 residents. As per Table 11, eight recreation centres will be required to meet the needs of the future population in greenfield communities with existing ASPs:

**Table 11: Recreation infrastructure needs calculation**

Item	Units
Forecast total future population	946,835
Existing capacity	354,886
Addition capacity required	591,949
Service level	75,000 residents per recreation centre
Infrastructure required	7.9 or approx. 8 recreation centres

#### 4. Infrastructure costs

The recreation infrastructure cost estimate described in Appendix Table C5 is developed using the average escalated costs of the three most recent recreation centres built by The City within the communities of Seton, Quarry Park and Rocky Ridge. Recreation centre capital costs include:

- Construction costs (includes any building construction and site development materials, labour costs, furniture and equipment, interior fixtures, design and planning, administrative costs, insurance, other fees).
- Project contingencies and cost escalation.
- Land acquisition cost.

Costs estimated in prior years were adjusted for inflation to 2024 using Statistics Canada’s NRBCPI and City of Calgary estimates. This ensures infrastructure cost estimates are current and reflect recent inflationary increases.

Recreation infrastructure costs are included in Appendix D, Table C5.

#### 5. Growth assumptions and benefit allocations

The benefit allocation calculation assumes the following:

- All recreation centres included in the recreation levy are located in the Greenfield Area and will provide it with similar reliability, quality, and service levels provided in the Established Area, while maintaining or not otherwise affecting the current reliability, quality and service levels in the Established Area. Therefore, no benefit was allocated to the Established Area.
- 100 per cent of the benefit is allocated between levied lands and unlevied lands in existing greenfield ASPs, on the basis of the forecast population in each:

**Table 12: Recreation benefit allocation**

Type of land	Population	Benefit allocation
Levied greenfield lands	529,843	56%
Unlevied greenfield lands	416,991	44%
<b>Total</b>	<b>946,834</b>	<b>100%</b>

- The primary users of the recreation centre are assumed to be Calgary residents. No regional benefit is allocated.

The benefit allocated to unlevied lands in existing ASPs is calculated as follows:

$$\text{Benefit \% allocations} = \frac{\text{Sum of forecast of population in all unlevied lands in the Greenfield Area}}{\text{Sum of forecast of total population in the Greenfield Area}}$$

56 per cent of benefit is allocated to levied lands and 44 per cent of benefit is allocated to unlevied lands. The levy rate calculation for the recreation infrastructure is determined by the benefit percentage allocated to unlevied lands.

Map 2 in the Appendix illustrates The City's Established Area and Greenfield Area levied and unlevied lands.

## Transit buses

### 1. Introduction

The transit bus levy is required to specifically provide transit buses that will allow for public transit service to be introduced or increased in greenfield communities. Details for the transit bus levy infrastructure and methodology are outlined below.

Transit buses included in the levy are required to:

- Provide public transit as a high priority mobility option for an additional 417,000 people across 9,359 hectares of unlevied land.
- An additional 237 transit buses will be required to meet the needs of future population in greenfield communities. It is expected that unlevied lands will be built out by 2055.

The total cost of these additional buses is \$173.5 million, and this will be collected entirely through the off-site levy, based on benefit allocation of 100 per cent to future populations in existing greenfield ASPs. Operating budget increases not included in the off-site levy will also be needed to put these additional buses into service, as each bus needs drivers, maintenance, fuel, etc.

Additional details of the infrastructure types, need, cost, assumptions and calculation are outlined below and in the Transit Buses Levy Rate Model 2024 Off-site Levies Bylaw, available at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).



## 2. Infrastructure types

The infrastructure types included in the levy are:

- **12-metre standard transit buses:** This model is the preferred option for delivering weekday rush hour transit service.

## 3. Infrastructure need

Infrastructure needs (including number of buses needed, and total cost) included in the transit bus levy are listed in Appendix E, Table C6.

The buildout of new greenfield communities adds demand for both community bus routes and primary transit service to connect communities with key destinations like activity centres, employment zones, and major public open spaces (see Maps 1 and 2 in Calgary’s MDP for additional information <https://www.calgary.ca/planning/municipal-development-plan.html>). Public transit services to support new residents require a larger fleet to extend existing routes to greenfield communities and to implement new routes without decreasing service in existing communities.

The number of additional buses needed to service growth is assessed using the forecast population in unlevied lands in existing ASPs, and the ratio of city population to the number of buses in the transit fleet. This provides a simple and repeatable measure of infrastructure needs at the network level.

While Calgary’s population changes annually, new transit buses are not purchased every year, so the ratio changes depending on the year selected. To address this, the number of buses in the transit fleet and the population of Calgary were averaged over three years, per Table 13, below:

**Table 13: Transit bus fleet and population of Calgary, three-year average**

Item	Off-site levy calculation	Actuals		
		2016	2019	2022
Number of buses (12m standard bus only)	739	732	744	742
Population of Calgary	1,303,238	1,235,171	1,285,344	1,389,200
Number of people per bus	1,763	1,687	1,728	1,872
Forecast population in unlevied lands in existing ASPs	416,991			
Infrastructure need (# buses)	237			

#### **4. Infrastructure costs**

The current cost of purchasing a new 12-metre standard transit bus is \$732,000. The total cost of the 237 buses needed to support future growth in existing greenfield ASPs is \$173.5 million.

Costs associated with electric buses, shuttle buses, and articulated buses are not currently included in the levy calculation.

#### **5. Growth assumptions and benefit allocations**

The growth forecast assumes that all lands in existing ASPs will be developed by 2055, following current growth trends. Net-new buses needed to service greenfield growth is allocated as 100 per cent benefit to the new population in unlevied lands in existing greenfield ASPs. Areas with existing transit service do not benefit from the net-new buses because those areas are serviced by pre-existing fleet, and reliability of service remain unchanged.

As of 2022 year-end, there were 9,359 hectares of unlevied land in existing greenfield ASPs, which is forecast to be 9,069 hectares by end of 2023. Council approval of new ASPs is one of the triggers for transit bus levy rate recalculation.

# Transportation

## 1. Introduction

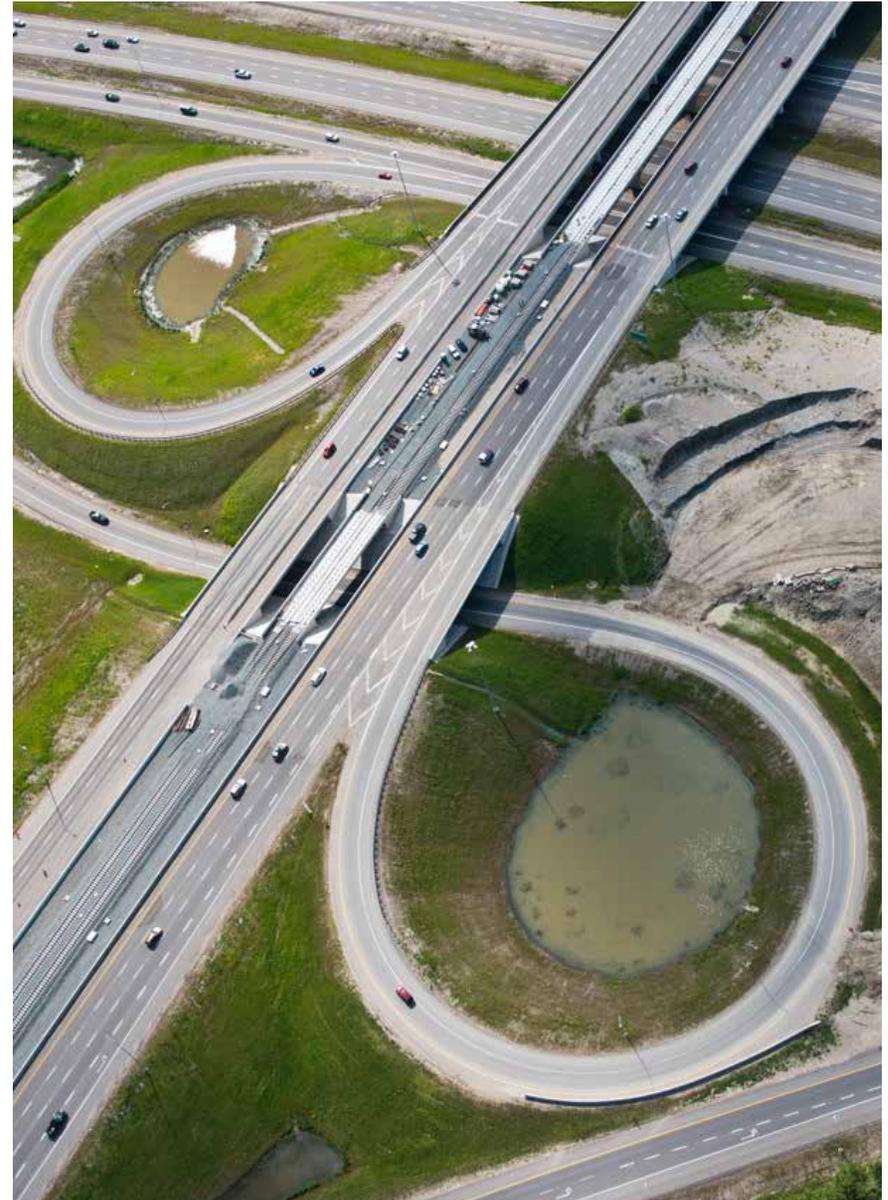
The transportation levy is required to provide pathways, bikeways and streets to greenfield communities. Details for the transportation levy infrastructure and methodology are outlined below.

Transportation infrastructure included in the levy is required to:

- Provide pathways, bikeways and streets for an additional 719,000 people and 79,000 jobs, across 13,921 hectares of unlevied land.
- Enable additional greenfield services for Calgary to full buildout, within Calgary's existing boundaries, without expansion or annexation, through 2076.

The total cost of this infrastructure is \$5,324.8 million, of which \$2,257.6 million will be collected through the off-site levy, based on benefit allocations of 50.9 per cent for greenfield projects and 21.4 per cent for shared benefit projects.

Additional details of the infrastructure types, need, cost, assumptions and calculation are outlined below and in the Transportation Levy Rate Model 2024 Off-site Levies Bylaw, available at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).



## 2. Infrastructure types

The transportation infrastructure types included in the levy are:

- **Interchanges:** provide grade-separated connections for community and industrial traffic to the skeletal road network (see the 2020 CTP, Map 7. <https://www.calgary.ca/planning/transportation.html>). This includes corridors such as Stoney Trail, Macleod Trail south of Anderson Road, Glenmore Trail, Sarcee Trail S.W., Airport Trail and strategic connections on the Primary Goods Movement Network (such as Metis Trail N.E. and 128 Ave. N.E.). Interchanges support free-flow conditions along a primary corridor and minimize the travel delays and traffic conflicts that occur with at-grade intersections.
- **Road widening:** adds capacity and eliminates pinch points to growing traffic volumes. This reduces traffic congestion caused by new demand and changes in traffic patterns resulting from new developments (such as Country Hills Blvd. from Barlow Trail to Coventry Hills Blvd., or Airport Trail from 60 St. N.E. to 68 St. N.E.).
- **Structures over rail lines or creeks:** provide direct connections to reduce traffic delays and back-ups caused by congestion and geographic barriers impacting safety (such as 210 Ave. S.W. under CPKC railway).
- **Bus rapid transit (BRT) infrastructure:** includes improvements such as dedicated bus lanes, transit priority systems at traffic signals, and MAX transit stations. BRT is a cost-effective approach to providing a high-quality transit service at a fraction of the construction cost of light rail transit (LRT). BRT routes have fewer stops than a regular bus route so they can cover more ground, more quickly, providing direct connections to major destinations and LRT stations. Transit bus costs are in a separate levy specific to them.
- **The Always Available for All Ages and Abilities (5A) Network:** an extensive walking and wheeling network that includes multi-use pathways and bikeways.
- **Pedestrian overpasses:** key links in the 5A Network that provide safe grade-separated connections across barriers as well as complete separation from vehicle traffic.
- **Greenfield traffic signals:** provide controls for traffic flow, improving intersection safety. Traffic signals in the Established Area will be funded from sources other than off-site levies.

## 3. Infrastructure need

Infrastructure needs (including name, type, cost and benefit) included in the transportation levy are listed in Appendix F, Table C7, while infrastructure not included in the transportation levy is shown in the Appendix G, Table C8.

The transportation levy methodology distinguishes among infrastructure solely benefiting greenfield growth, infrastructure benefiting greenfield growth and providing a shared citywide benefit, and infrastructure downstream of growth in the Established Area not included in the levy. The following criteria determines infrastructure selected for the transportation levy:

1. Aligned to long-term plans and strategies (e.g., the CTP, ASPs, or RouteAhead).
2. Located in or providing connections for greenfield development, including:
  - New or actively developing communities.
  - Industrial and employment lands.
  - Future ASP lands.
3. Providing connections from growing communities to some of the land-use typologies and primary transit shown in Maps 1 and 2 in Calgary's MDP (see <https://www.calgary.ca/planning/municipal-development-plan.html>):
  - Greater downtown
  - Major activity centers
  - Employee-intensive zones
  - Primary transit network
  - Major public open spaces

Some network upgrades and expansions are planned and not included in the transportation levy (i.e., costs are not included in the levy rate calculation). These include some infrastructure that meets the criteria above, such as LRT infrastructure in the greenfield and projects in the Established Area less directly aligned with greenfield growth areas.

#### 4. Infrastructure costs

Transportation infrastructure cost estimates were primarily provided by or developed in consultation with third-party consultants. The cost of infrastructure needed was assessed using the following elements:

- Removals
- Grading
- Asphalt
- Concrete
- Signage
- Streetlights
- Traffic signals
- Stormwater
- Utilities
- Landscaping
- Structures
- Land acquisition
- Transit stations (BRT only)
- Internal City costs
- Engineering work
- Contingency

Projects are at different stages of development and design and cost estimates range from (order of magnitude) Class 5 for a project identified but with limited information to Class 1 for a final, pre-tender design cost. Costs estimated in prior years were adjusted for inflation to Q2 2023 using Statistics Canada's NRBCPI. This ensures infrastructure cost estimates are current and reflect recent inflationary increases. Estimated costs assume infrastructure is delivered through City-administered design-build contracts.

Always Available for All Ages and Abilities (5A) routes may be delivered by developers as part of a new community build, or as a condition of approval, or by The City through one of its capital programs. As a result, pathways are often not delivered as a complete, continuous route. Most of the routes included in the Off-site Levies Bylaw have completed sections and some have sections likely to be delivered by developers. Transportation levy costs include only the upgrade or construction of uncompleted sections The City will deliver.

#### 5. Growth assumptions and benefit allocations

Benefit of transportation infrastructure is allocated based on the share of forecast population and jobs in different areas:

- Greenfield Areas that have already paid levies (levied lands).
- Greenfield Areas that have not yet paid levies (unlevied lands).
- The Established Area.

Population and jobs are key factors driving transportation network impact and are being used to measure benefit. This method is simpler and more repeatable than transportation modeling and does not attempt to assess travel patterns, distance traveled, or trips generated from specific land uses.

Transportation benefit is measured using a growth forecast for Calgary that assumes that all lands within Calgary's boundary will be developed by 2076 following current growth trends (i.e., a full buildout scenario). It includes all lands within Calgary's existing current boundary and does not assume any expansion or annexation during the forecast period.

Benefit is not allocated for each individual project but rather as a network because transportation infrastructure benefits large areas rather than a discrete area of land. Benefit is allocated according to the infrastructure's location within the network, either in the Greenfield Area or the Established Area:

1. **Greenfield only:** Infrastructure located in the greenfield. Transportation infrastructure located in the Greenfield Area will provide it with similar reliability, quality and service levels provided in the Established Area, while maintaining and not otherwise affecting the current reliability, quality and service level in the Established Area. No benefit was allocated to the Established Area for this levy infrastructure.

One hundred per cent of the benefit is allocated between levied lands and unlevied lands. This allocation is based on the forecast population and jobs in levied lands (where a DA has been executed and off-site levies have been paid), and unlevied lands (where no DA has been executed and no off-site levies have been paid).

**2. Shared benefit:** Infrastructure physically located in the Established Area that benefits lands outside the Established Area boundary. Transportation infrastructure located in the Established Area will accommodate capacity and direct connections from the greenfield and will provide similar reliability, quality and service levels in both the Greenfield and Established Areas. Benefit was allocated between the Greenfield and Established Areas for this levy infrastructure.

One hundred per cent of the benefit is allocated among levied lands, unlevied lands and lands in the Established Area based on the forecast population and jobs in each.

Infrastructure for each of these categories is shown in are listed in Appendix F, Table C7.

The allocation of benefit to unlevied lands in the Greenfield Area for the Transportation levy is shown below:

$$\text{1. Greenfield only benefit allocation} = \frac{\text{Sum of forecast population \& jobs in all unlevied lands}}{\text{Sum of total forecast population \& jobs in all greenfield lands}}$$

$$\text{2. Shared benefit = allocation} = \frac{\text{Sum of forecast population \& jobs in all unlevied lands}}{\text{Sum of total forecast population \& jobs city-wide}}$$

**Table 14: Transportation levy population and jobs forecast**

Type of land	Population	Jobs	Total
Established area	1,068,288	1,093,652	2,161,940
Levied greenfield lands	531,212	238,428	769,640
Unlevied greenfield lands	719,016	78,301	797,316
<b>Total</b>	<b>2,318,516</b>	<b>1,410,380<sup>2</sup></b>	<b>3,728,896</b>

<sup>2</sup> Numbers might not add up due to rounding.

Benefit for greenfield projects is assigned 100 per cent to greenfield lands, and split between levied and unlevied lands based on the proportion of forecast population and jobs in these areas.

**1. Greenfield only benefit = allocation** 
$$\frac{(719,016 + 78,301)}{(719,016 + 78,301 + 531,212 + 238,428)} = 50.9\%$$

**2. Shared benefit = allocation** 
$$\frac{(719,016 + 78,301)}{3,728,896} = 21.4\%$$

**Reflecting regional benefit**

Some infrastructure on Calgary’s periphery provides benefit to lands outside the city. This regional benefit is not assessed using its share of forecast of population and jobs. Instead, regional benefit is reflected by including only a portion of the infrastructure cost on Calgary’s periphery.

Individual projects near Calgary’s municipal boundary were assessed to identify the cost of the traffic movements and capacity needed for traffic going to or from Calgary lands. Only that cost is included in the levy rate calculation. The cost to build the movements or capacity that does not support Calgary lands is not included in the levy rate calculation (e.g., interchange ramps leading to or coming from land outside of Calgary). The City plans to pay this cost despite the lack of benefit to the Established Area because no mechanism exists to compel cost collection of this benefit from regional beneficiaries.

Infrastructure where this approach was taken is shown in Table 15 below.

**Table 15: Greenfield only and shared benefit transportation allocation**

Location	Total estimated capital cost (\$ millions)	Levied cost (\$ millions)	Costs reflecting regional benefit (\$ millions)
Stoney Trail/60 Street N.E. Interchange	47	30	17
Airport Trail/Stoney Trail N.E. Interchange (Ultimate)	52	27	25
Glenmore Trail/116 Street East Interchange	105	46	59
Glenmore Trail/Garden Road S.E. Interchange	185	71	114
Highway 22X/85 Street S.W. Interchange	56	44	12
Highway 22X/53 Street S.W. Interchange	81	66	15
Highway 22X/69 Street S.W. Interchange	95	74	21
Trans-Canada/Garden Road Interchange	90	45	45
Glenmore Trail widening from Stoney Trail to 800 metres east of 116 Street E (2-6 lanes)	97	49	48
Crowchild Trail/12 Mile Coulee Road Interchange	77	0	77
<b>Totals</b>	<b>885</b>	<b>452</b>	<b>433</b>

# Stormwater

## 1. Introduction

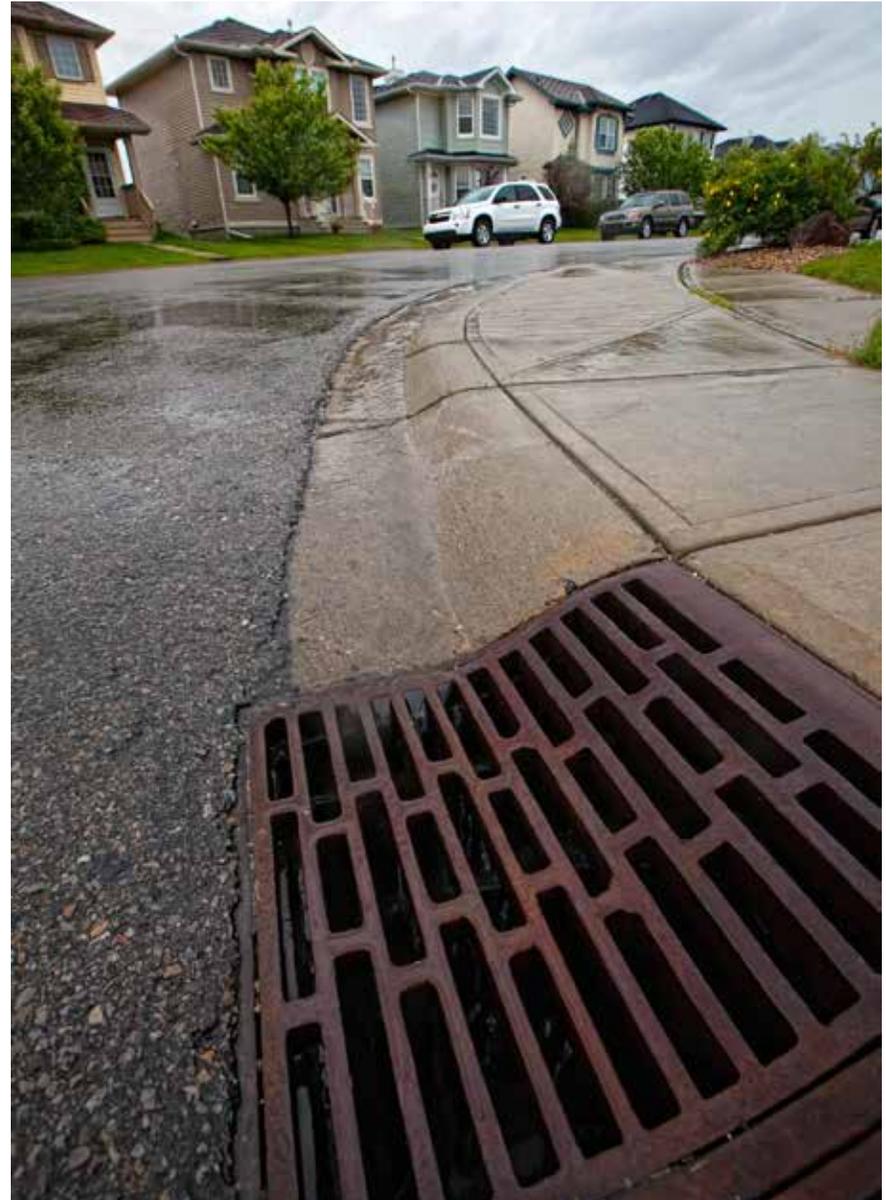
The stormwater levy is required to provide storm drainage to remove rain and snow melt to prevent flooding in greenfield communities.

The stormwater infrastructure included in the levy is required to:

- Provide storm drainage services to 129,000 new homes and businesses on more than 4,600 hectares of unlevied land.
- Enable collection of off-site levies towards existing debt and future investments that enable greenfield services for Calgary's future growth.

Since 2016, the total growth-related cost of this infrastructure is \$101.8 million, of which \$99.2 million will be collected through the off-site levy, based on benefit allocations calculated for each individual project, that varies from 30 per cent to 100 per cent allotted to the greenfield.

Additional details of infrastructure types, need, cost, assumptions and calculations are outlined below and in more detail in the Stormwater Levy Rate Model 2024 Off-site Levies Bylaw, available at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).



## 2. Infrastructure types

Stormwater: Stormwater infrastructure supports new community growth, reduces flooding impact, ensures public safety, reduces property damage, and helps keep rivers healthy. Stormwater pipes 900 millimetres or larger in size are included in the off-site levy.

## 3. Infrastructure need

Infrastructure needs (including name, type and cost) included in the stormwater levy are listed in Appendix H, Table C9.

New stormwater infrastructure is often a need identified in an ASP while infrastructure upgrade requirements are informed through master drainage plans, engineering studies, and continuous monitoring of bodies of water in the Calgary area.

The City builds stormwater infrastructure that will service lands approved for growth. Planned infrastructure necessary to serve approved lands, which is expected to be initiated by 2026, is in the 2024 Off-site Levies Bylaw. Any planned infrastructure necessary to service approved lands and/or unapproved lands triggered after 2027 has been excluded, but is anticipated to be included in the off-site levy through periodic bylaw amendments.

## 4. Infrastructure costs

Engineering consultants developed stormwater infrastructure cost estimates. Project costs are refined over time as the scope of each project is defined and the timing of the project is confirmed. Projects are at various stages of development and design, and cost estimates range from, in order of magnitude, Class 5 (for a project that has been identified but with limited information), to Class 1 (for a project in its final, pre-tender design). The latest information for each project is used in the off-site levy. Estimated costs assume infrastructure is delivered through City-administered design-build contracts.

## 5. Growth assumptions and benefit allocation

The off-site levy calculations assume all lands approved for growth will be developed in the future. A land absorption forecast provided by The City of Calgary Corporate Economics is used to calculate the off-site levy rate. The forecast looks at various historic trends and current market conditions to predict future land absorption rates.

Each capital project has expenditures allocated to growth, maintenance, regulatory compliance and service improvements. Only the growth component is considered in the off-site levy. Each project is assessed to determine how many hectares of land will benefit from the project, and the benefit is allocated among the Greenfield Area, Established Area and the region. Greenfield's portion is paid through the off-site levy and the Established Area's portion is paid through utility rates. Currently, no stormwater off-site levy projects have a regional benefit allocation.

## 6. Levy rate calculation

The City moved away from a catchment-based stormwater methodology to a citywide methodology. This shift means that the same stormwater levy rate is applied to all greenfield development. A single rate is more stable and predictable, eliminates the variation between stormwater catchments, and allows The City to be more responsive to stormwater infrastructure requirements by utilizing levies collected citywide.

## Water Distribution and Wastewater Collection

### 1. Introduction

The water distribution and wastewater collection levies are required to provide the ability to flush toilets and drain sinks and bathtubs. Water distribution and wastewater collection levy rates use the same methodology and assumptions but are each calculated independently. The infrastructure and methodology details are outlined below.

The water distribution and wastewater collection infrastructure included in the levy is required to:

- Provide clean, safe drinking water and flushing toilets and sinks to 129,000 new homes and businesses on more than 4,600 hectares of unlevied land.
- Enable collection of off-site levies towards existing debt and future investments that enable greenfield services for Calgary's future growth.

Since 2016, the total cost of growth-related water distribution infrastructure is \$714.4 million, of which \$288.8 million will be collected through the off-site levy, based on benefit allocations calculated for each individual project, that varies from 18 per cent to 100 per cent allotted to the greenfield. For wastewater collection infrastructure, the total growth-related cost is \$489.3 million since 2016, of which \$256.0M million will be collected through the off-site levy, based on benefit allocations calculated for each individual project, that varies from 7 per cent to 100 per cent allotted to the greenfield.

Additional details of infrastructure types, need, cost, assumptions and calculations are outlined below and in more detail in the Water Distribution and Wastewater Collection Levy Rate Model 2024 Off-site Levies Bylaw, available at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).



## 2. Infrastructure types

Water distribution and wastewater collection infrastructure provides an important connection between residents and businesses to water and wastewater plants. The following types of water distribution and wastewater collection infrastructure are included in the levies:

- **Water feeder mains:** convey safe, high-quality drinking water to residents and businesses from water treatment plants (WTP). Water feeder mains 500 millimetres or larger in size are included in the off-site levy. This includes feeder main extensions (extending a new feeder main from the current water distribution network to serve new lands) and feeder main upgrades (which increase the size of existing feeder mains to increase water transfer capacity).
- **Wastewater trunks:** collect wastewater from residents and businesses and transfer it to wastewater treatment plants (WWTP). Wastewater trunks 600 millimetres or larger in size are included in the off-site levy. This includes trunk extensions (extending a new trunk from the current wastewater collection network to serve new lands) and trunk upgrades (which increases the size of existing trunks to increase wastewater transfer capacity).
- **Pump stations:** pump potable water to residents and businesses. Pumping is required to deliver water at appropriate service pressures.
- **Lift stations:** pump wastewater to wastewater treatment plants. While most wastewater is gravity fed, some lift stations are required where gravity flow is not possible, such as river crossings and low-lying areas.
- **Reservoirs:** provide storage for potable water. They act as a buffer for high water demand periods and ensure water is always available for residents, businesses, and for fire protection.
- **Other infrastructure:** includes any capital projects required to serve a growing city. An example would be a relocation of a meter chamber so new growth can utilize an existing feeder main.

## 3. Infrastructure need

Infrastructure needs (including name, type and cost) included in the water distribution and wastewater collection levies are listed in Appendix I, Table C10.

Water distribution and wastewater collection infrastructure operates as an integrated network across the city. The network approach provides redundancy in the event of an unforeseen service disruption, such as a feeder main failure or wastewater transfer between catchments. Therefore, the off-site levies for both water distribution and wastewater collection infrastructure are charged as a citywide rate.

Water and wastewater infrastructure extensions are often a need identified in an ASP, while infrastructure upgrade requirements are informed through water and wastewater long-range plans, engineering studies, and continuous monitoring of the water distribution and wastewater collection networks to identify any capacity constraints.

The City builds water distribution and wastewater collection infrastructure that services lands approved for growth. Planned infrastructure necessary to serve approved lands, expected to be initiated by 2026, is included in the 2024 Off-site Levies Bylaw. Any planned infrastructure necessary to service approved lands and/or unapproved lands triggered after 2027 has been excluded but is anticipated to be included through future bylaw amendments.

#### 4. Infrastructure costs

Engineering consultants developed cost estimates for water distribution and wastewater collection infrastructure. Project costs are refined over time as each project scope is defined and the timing confirmed. Projects are at different stages of development and design, and cost estimates range from (order of magnitude) Class 5 for a project identified but with limited information, to Class 1 for a project in its final, pre-tender design. The most current information for each project is used in the off-site levy. Estimated costs assume infrastructure is delivered through City-administered design-build contracts.

#### 5. Growth assumptions and benefit allocation

The off-site levy rate calculations assume all lands approved for growth will be developed in the future. A land absorption forecast provided by The City of Calgary Corporate Economics is used to calculate the off-site levy. The forecast looks at various historic trends and current market conditions to predict future land absorption rates.

Each capital project has expenditures allocated to growth, maintenance, regulatory compliance and service improvements. Only the growth component is considered in the off-site levy.

The benefit for growth is further divided for each project, and is allocated among the Greenfield Area, the Established Area and the region. Each individual project is assessed to determine how many residents and businesses currently benefit from the specific project, and a population forecast estimates how many residents and businesses will benefit from the specific project when the benefiting lands are ultimately built out. The allocation of costs among the Greenfield Area, Established Area, and the region is proportionally determined based on where the growth is anticipated to occur. The Greenfield Area's portion is paid through the off-site levy, the Established Area's portion is paid through utility rates, and the region's portion is paid through service agreements with surrounding municipalities.

# Water and Wastewater Treatment

## 1. Introduction

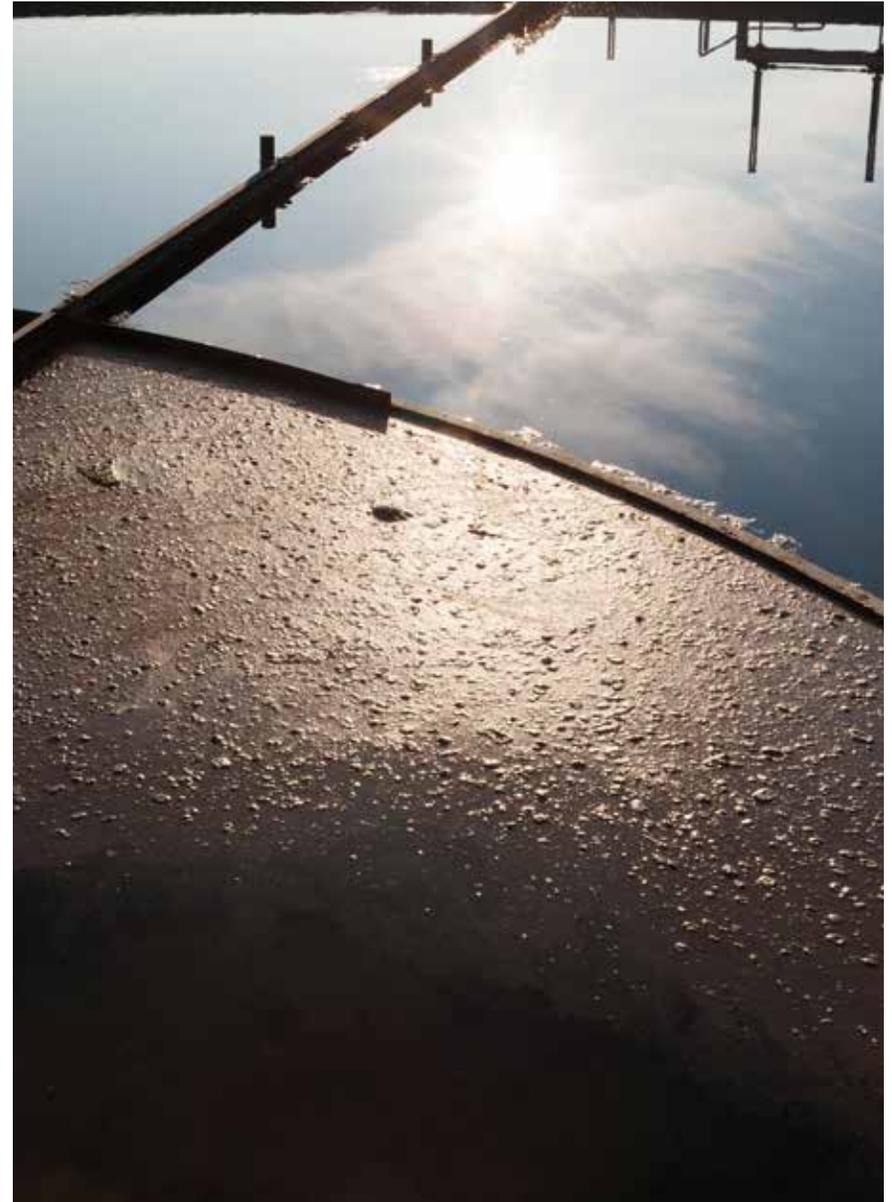
The water and wastewater treatment levies are required to provide clean and safe drinking water and sewage services for Greenfield and Established Areas. Details for the water and wastewater treatment levy infrastructure and methodology are outlined below. Water treatment and wastewater treatment levy rates use a similar methodology and assumptions but are each calculated independently.

Water and wastewater treatment projects included in the levy are required to:

- Provide clean and safe drinking water for an additional 908,000 people and environmental protection through treatment for an additional 369,000 people.
- Enable collection of off-site levies towards existing debt and future investments that enable Greenfield and Established Area services for Calgary's future growth.

Since 2016, the total growth-related cost of water treatment infrastructure is \$544.2 million, of which \$479.7 million will be collected through the off-site levy, based on benefit allocations calculated for each individual project, that varies from 3 per cent to 89 per cent allotted to the greenfield and the Established Area. For wastewater treatment infrastructure, the total growth-related cost is \$1,475.2 million since 2016, of which \$1,071.8 million will be collected through the off-site levy, based on benefit allocations calculated for each individual project, that varies from 3 per cent to 77 per cent allotted to the greenfield and the Established Area.

Additional details of infrastructure types, need, cost, assumptions and calculations are outlined below and in more detail in the Water & Wastewater Treatment Levy Rate Model 2024 Off-site Levies Bylaw, available at [calgary.ca/offsitelevy](https://calgary.ca/offsitelevy).



## 2. Infrastructure types

**Water and wastewater treatment plants:** The City operates two WTPs that produce safe, high-quality drinking water. It also operates three WWTPs which treat collected sewage before returning clean water into the Bow River.

Water and wastewater treatment process upgrades and expansion projects are planned, designed and constructed in advance to meet anticipated growth. The timing of water treatment plant upgrades and expansions may be adjusted periodically to consider water conservation efforts and changes in per capita water demand trends. These adjustments are anticipated to be incorporated in periodic updates of the Off-site Levies Bylaw.

## 3. Infrastructure need

Infrastructure needs (including name, type and cost) included in the water and wastewater treatment levies are listed in Appendix J, Table C11.

The City continuously monitors water consumption patterns and population growth projections to determine the need and timing for treatment plant expansions. Planned infrastructure related to and, in support of, water treatment and wastewater treatment process upgrades and expansions to increase treatment capacity are included in the 2024 Off-site Levies Bylaw review. Infrastructure expected to be initiated by 2026 is included, while any planned infrastructure needed to service growth triggered after 2027 has been excluded but is anticipated to be included through periodic bylaw amendments.

## 4. Infrastructure costs

Engineering consultants developed water treatment and wastewater treatment infrastructure cost estimates. Project costs are refined over time as each project scope is defined and timing is confirmed. Projects are at different stages of development and design, and cost estimates range from (order of magnitude) Class 5 for a project identified but with limited information, to Class 1 for a project in its final, pre-tender design. The latest information for each project is used in the off-site levies. Estimated costs assume infrastructure is delivered through City-administered design-build contracts.

## 5. Growth assumptions and benefit allocation

Each capital project has expenditures allocated to growth, maintenance, regulatory compliance and service improvements. Only the growth component is considered in the off-site levies.

Each capital project is assessed to determine how much additional water treatment and wastewater treatment capacity is expected to be added. Capacity is assessed based on the amount of new people it can served, determined by per capita water consumption patterns and wastewater loadings patterns.

Benefit is assessed for each project. Analysis is performed to determine where growth will occur when all added treatment capacity is utilized. Costs are allocated among the Greenfield Area, Established Area, and the region. The water treatment and wastewater treatment off-site levies are applied to the Greenfield Area and Established Area, while costs allotted to regional customers are paid through service agreements with surrounding municipalities.

## Levy Program Administration

### Annual Report

The City provides annual reporting for off-site levy collections, usage and balances in the Off-site Levy Annual Report. The Off-site Levy Annual Report ensures on-going accountability for the levy funds used to deliver infrastructure that supports growth and development in Calgary. Annual reports are available online at [calgary.ca/offsitelevy](http://calgary.ca/offsitelevy).

Annual Off-site Levy reporting serves as a valuable tool for monitoring and ensuring transparency in levy account balances, the collection and expenditure of levies, earned investment income, and provides a comprehensive list of levy-funded capital infrastructure projects. These reports provide a centralized source that communicates The City's capacity to finance future growth-related capital investments.

### Payment Schedule

The City determines the levy billing amounts based on the Off-site Levies Bylaw. For developments in the Greenfield Area, three billings are initiated when a DA is signed with The City, starting one year after the effective date set out in the DA. Developers are required to pay 30 per cent of the levies within one year of the effective date, 30 per cent within two years, and 40 per cent within three years. This payment schedule was introduced with the Calgary Off-Site Levies Bylaw (2M2016) in 2016 to mitigate carrying costs for developers and align the timing of levy payments more closely to the timing of development revenues.

Table 16 summarizes the off-site levies payment schedule for a DA.

Off-site levies in Established Area must be paid on or before the release of the Development Completion Permit or prior to occupancy, whichever is first.

**Table 16:** Development agreement (DA) off-site levies payment schedule

Year	Per cent paid	Distribution of levy payments
Year 0	0%	The DA is signed, no payment is made.
Year 1	30%	Payment covers water levies.
Year 2	30%	Payment covers remaining water levies, and approximately 20% of the transportation levy.
Year 3	40%	Payment covers remaining transportation, transit bus, emergency response, police, library and recreation levies.

## Bylaw Continuity

This bylaw includes significant changes to both the levy rate calculation methodology and the infrastructure included. Two key items must be addressed through the transition to the new bylaw:

1. The carry forward of any incurred debt or surplus.
2. The allocation of uncommitted levy balances.

### 1. The carry forward of debt or surplus

For the stormwater, water distribution and wastewater collection, emergency response, library, police, recreation, transit buses and transportation levies, any deficits or surpluses to principal and interest costs are carried forward into the new levy calculation. Water infrastructure is funded with debt, with principal and interest costs subsequently recovered from off-site levies. Some infrastructure in the emergency response, library, police, and recreation levies is also forecast to be built before there is sufficient levy funding available, and debt is expected to be used to advance these projects as well. The transit buses and transportation levies do not anticipate any debt being used to advance projects.

For water treatment and wastewater treatment, the present value of the cost to service an EP are updated, as treatment infrastructure built and unused remains available for future growth.

### 2. Allocation of uncommitted levy balances

Emergency response, library, police, recreation, transit bus, and transportation levies have uncommitted levy balances from payments made on DAs under the Calgary Off-site Levies Bylaw (2M2016). How these uncommitted balances are accounted for is the second factor considered, as they pertain to:

- The calculation of levy rates.
- The allocation of any uncommitted funds to future projects as they are approved by Council.

Levy fund balances for emergency response, library, police, recreation, transit bus, and transportation resulting from payments made for DAs signed under the Calgary Off-site Levies Bylaw (2M2016) reflect the levies paid from prior greenfield development. These lands will also benefit from the projects being levied for in the new bylaw, and those levy fund balances cover some of the benefit allocated to those prior developments (the previously levied portion of a project's capital cost).

Levy rates for the 2024 bylaw are calculated based on the benefit of infrastructure to future growth areas. Uncommitted levy fund balances are not factored into the calculation of levy rates which cover the portion of benefit allocated to future growth because they reflect the benefit to past growth.

Any uncommitted balances are allocated to greenfield infrastructure included in both the 2016 and the 2024 bylaws, as the levy funds may be used for the infrastructure listed in the bylaw in place when the funds are collected. In other words, if unconstructed infrastructure was removed from the bylaw, no levy funds would be allocated to the project.

As policies and capital plans have evolved, some new infrastructure has been identified that was not listed in the Calgary Off-site Levies Bylaw (2M2016). The levied portion of capital costs for these new projects will be paid from funds collected under the 2024 Off-site Levies Bylaw

## Off-site Levies Bylaw Updates

Historically, the Off-site Levies Bylaw has been updated approximately every five years. Looking ahead, the Off-site Levies Bylaw may undergo more frequent updates to accommodate changes in input data as new information becomes available or to align with Council approvals for new communities, new ASPs, or policies altering infrastructure requirements.

The levy rate calculation will be reviewed on a periodic basis to reflect changes to any inputs, including infrastructure inclusions, cost estimates, land absorption, discount rates and escalation rates.

# Appendix

## A. Emergency response infrastructure

**Table C1:** Cost estimates for an emergency response station

Station type	Value
<b>2 bay station</b>	
Facility size (sq. ft.) [A]	13,000
Building cost (\$/sq. ft.) [B]	1,100
Building cost per facility (\$) [A] x [B] = [C]	14,300,000
Land required for each facility (acre) [D]	1.5
Land acquisition cost (\$/acre) [E]	1,300,000
Land cost per facility (\$) [D] x [E] = [F]	1,950,000
Apparatus (units) [G]	1
Apparatus cost (\$/unit) [H]	1,100,000
Total apparatus cost (\$) [G] x [H] = [I]	1,100,000
Equipment (\$) [J]	400,000
Public art (\$) [K]	179,275
<b>Total facility cost (\$) [C] + [F] + [I] + [J] + [K]</b>	<b>17,929,275</b>
<b>Total levy eligible cost (\$) [C] + [F] + [I] + [J]</b>	<b>17,750,000</b>

**Table C1:** Cost estimates for an emergency response station – continued

Station type	Value
<b>3 bay station</b>	
Facility size (sq. ft.) [A]	15,000
Building cost (\$/sq. ft.) [B]	1,100
Building cost per facility (\$) [A] x [B] = [C]	16,500,000
Land required for each facility (acre) [D]	2
Land acquisition cost (\$/acre) [E]	1,300,000
Land cost per facility (\$) [D] x [E] = [F]	2,600,000
Apparatus (units) [G]	2
Apparatus cost (\$/unit) [H]	1,100,000
Total apparatus cost (\$) [G] x [H] = [I]	2,200,000
Equipment (\$) [J]	800,000
Public art (\$) [K]	223,210
<b>Total facility cost (\$) [C] + [F] + [I] + [J] + [K]</b>	<b>22,323,210</b>
<b>Total levy eligible cost (\$) [C] + [F] + [I] + [J]</b>	<b>22,100,000</b>

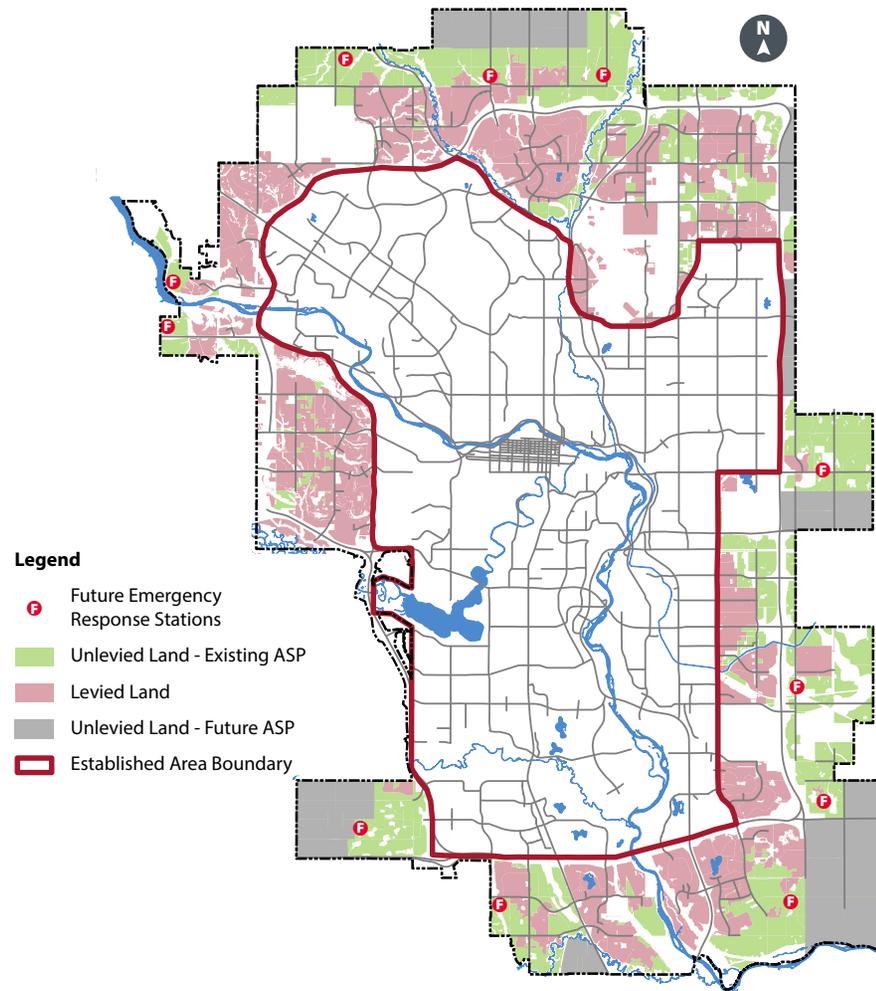
**Table C1: Cost estimates for an emergency response station – continued**

Station type	Value
<b>4 bay station</b>	
Facility size (sq. ft.) [A]	17,500
Building cost (\$/sq. ft.) [B]	1,100
Building cost per facility (\$) [A] x [B] = [C]	19,250,000
Land required for each facility (acre) [D]	2.5
Land acquisition cost (\$/acre) [E]	1,300,000
Land cost per facility (\$) [D] x [E] = [F]	3,250,000
Engine apparatus (units) [G]	2
Apparatus cost (\$/unit) [H]	1,100,000
Aerial apparatus cost (\$) [I]	1,400,000
Total apparatus cost (\$) [G] x [H] + [I] = [J]	3,600,000
Equipment (\$) [K]	1,200,000
Public art (\$) [L]	275,730
<b>Total facility cost (\$) [C] + [F] + [J] + [L]</b>	<b>27,575,730</b>
<b>Total levy eligible cost (\$) [C] + [F] + [J] + [K]</b>	<b>27,300,000</b>

**Table C2:** Levy eligible cost estimates for emergency response stations and benefit allocations

Emergency response station	Area Structure Plan	Cost (\$)	Future population/jobs		Total	Weight of unlevied land population	% x Weight
			Previously levied	Unlevied			
Belvedere Fire Station	Belvedere ASP	27,300,000	3,222	63,987	67,208	24.04%	22.84%
Glacier Ridge Fire Station	Glacier Ridge ASP	22,100,000	2,685	52,736	55,420	19.81%	18.82%
Nose Creek Fire Station	Nose Creek ASP/ Keystone Hills ASP	17,750,000	240	24,203	24,442	9.09%	9.00%
Providence Fire Station	Providence ASP	17,750,000	3,052	38,035	41,087	14.29%	13.29%
Rangeview Fire Station	Rangeview ASP/Ricardo Ranch ASP	22,100,000	12,291	49,196	61,487	18.48%	14.79%
South Shepard Fire Station	South Shepard ASP	17,750,000	872	28,216	29,088	10.60%	10.28%
West View Fire Station	West View ASP	17,750,000	28	5,370	5,397	2.02%	2.00%
Shepard Industrial Station	Shepard Industrial ASP	17,750,000	1,159	4,416	5,576	1.66%	1.31%
<b>Total</b>			<b>23,548</b>	<b>266,157</b>	<b>289,706</b>		<b>92%</b>

**Map A1:** Off-site levy Greenfield Area and Established Area boundary, with levied and unlevied lands as of the end of 2022



- Legend**
- F Future Emergency Response Stations
  - Unlevied Land - Existing ASP
  - Levied Land
  - Unlevied Land - Future ASP
  - Established Area Boundary

## B. Library infrastructure

**Table C3:** Cost estimate for a library<sup>3</sup>

Category	Value
Facility size (sq. ft.) [A]	15,519
Project cost (\$/sq. ft.) [B]	821
Project cost per facility (\$) [A] x [B] = [C]	12,740,857
Land required for each project (acre) [D]	1.55 (10,000 sq. ft. require 1 acre of land)
Land acquisition cost (\$/acre) [E]	1,200,000
Land cost per project (\$) [D] x [E] = [F]	1,862,245
<b>Total levy eligible cost (\$) [C] + [F] = [G]</b>	<b>14,603,101</b>
Public art (\$) [H]	77,594
<b>Total facility cost (\$) [G]+[H]</b>	<b>14,680,695</b>

<sup>3</sup> Numbers might not add up due to rounding.

## C. Police infrastructure

**Table C4:** Cost estimate for a police district office

Category	Value
Facility size (sq. ft.) [A]	45,000
Project cost (\$/sq. ft.) [B]	580
Project cost per facility (\$) [A] x [B] = [C]	26,100,000
Consulting, site development, contingencies (\$) [D]	7,010,000
Land required for each facility (acre) [E]	5 (9,000 sq. ft. require 1 acre of land)
Land acquisition cost (\$/acre) [F]	1,100,000
Land cost per facility (\$) [E] x [F] = [G]	5,500,000
<b>Total levy eligible cost (\$) [C] + [D] + [G]</b>	<b>38,610,000</b>
Public art (\$) [H]	386,100
<b>Total facility cost (\$) [C] + [D] + [G] + [H]</b>	<b>38,996,100</b>

## D. Recreation infrastructure

**Table C5:** Cost estimate for a recreation centre (approximately 150,000 sq. ft.)

Category	Value
Facility size (sq. ft.) [A]	150,000
Building cost (\$/sq. ft.) [B]	721
Building cost per facility (\$) [A] x [B] = [C]	108,150,000
Land required for each facility (acre) [D]	12
Land acquisition cost (\$/acre) [E]	1,200,000
Land acquisition cost per facility (\$) [D] x [E] = [F]	14,400,000
Site development cost (\$) [G]	8,611,756
Public art (\$) [K]	1,274,098
<b>Total levy eligible cost (\$) [C] + [F] + [G]</b>	<b>131,161,756</b>
<b>Total facility cost (\$) [C] + [F] + [G] + [K]</b>	<b>132,435,854</b>

## E. Transit infrastructure

**Table C6:** Transit bus infrastructure to be included in the 2024 Off-site Levies Bylaw

Item	Off-site levy calculation	Actuals		
		2016	2019	2022
Number of buses (12m standard bus only)	739	732	744	742
Population of Calgary	1,303,238	1,235,171	1,285,344	1,389,200
Number of people per bus	1,763	1,687	1,728	1,872
Forecast population in unlevied lands in existing ASPs	416,991			
Infrastructure need (# buses)	237			
Cost per bus	732,000			
<b>Total infrastructure cost</b>	<b>173,484,000</b>			

## F. Transportation infrastructure

**Table C7:** Greenfield infrastructure to be included in the 2024 Off-site Levies Bylaw

Project name	Infrastructure type	Total cost (\$ millions)	Benefit
<b>Greenfield only</b>			
5A Network (greenfield pathways and bikeways)	5A network	44	50.9%
144 Avenue North BRT route	BRT infrastructure	50	50.9%
162 Avenue S.W. BRT from S.W. Ring Road to west side of Providence	BRT infrastructure	47	50.9%
MAX 301 BRT from Aurora Park to 144 Avenue North	BRT infrastructure	9	50.9%
MAX Purple BRT from 84 Street E to City Limits	BRT infrastructure	84	50.9%
MAX Purple BRT from Hubalta to 84 Street S.E.	BRT infrastructure	51	50.9%
MAX Teal extension from Douglasdale Business Park to 68 Street S.E.	BRT infrastructure	8	50.9%
Greenfield traffic signals (539)	Greenfield traffic signals	161.7	50.9%
Airport Trail/36 Street N.E. Interchange	Interchange	49	50.9%
Airport Trail/60 Street N.E. Interchange	Interchange	141	50.9%
Airport Trail/Stoney Trail N.E. Interchange (Ultimate)	Interchange	27	50.9%
Deerfoot Trail/128 Avenue N.E. Interchange	Interchange	53	50.9%
Deerfoot Trail/Airport Trail Interchange (Ultimate)	Interchange	104	50.9%
Glenmore Trail/Stoney Trail S.E. Interchange (Ultimate)	Interchange	238	50.9%
Glenmore Trail/116 Street East Interchange	Interchange	46	50.9%
Glenmore Trail/68 Street S.E. Interchange	Interchange	111	50.9%
Glenmore Trail/Garden Road S.E. Interchange	Interchange	71	50.9%
Highway 2/Crossiron Drive Interchange (second structure and upgrade requirements)	Interchange	38	50.9%
Highway 22X/104 Street S.E. Flyover	Interchange	36	50.9%
Highway 22X/120 Street S.E. Interchange	Interchange	77	50.9%
Highway 22X/53 Street S.W. Interchange	Interchange	66	50.9%
Highway 22X/69 Street S.W. Interchange	Interchange	74	50.9%
Highway 22X/85 Street S.W. Interchange	Interchange	44	50.9%
Macleod Trail/194 Avenue S.E. Interchange	Interchange	120	50.9%
Macleod Trail/210 Avenue S.E. Interchange	Interchange	90	50.9%

**Table C7: Greenfield infrastructure to be included in the 2024 Off-site Levies Bylaw – continued**

Project name	Infrastructure type	Total cost (\$ millions)	Benefit
Metis Trail/128 Avenue N.E. Interchange	Interchange	72	50.9%
Metis Trail/64 Avenue N.E. Interchange	Interchange	65	50.9%
Metis Trail/Airport Trail Interchange	Interchange	194	50.9%
Peigan Trail/52 Street S.E. Interchange	Interchange	90.25	50.9%
Peigan Trail/68 Street S.E. Interchange	Interchange	104.25	50.9%
Stoney Trail/106 Avenue S.E. Flyover	Interchange	37	50.9%
Stoney Trail/11 Street N.E. Interchange (Ultimate)	Interchange	25	50.9%
Stoney Trail/130 Avenue S.E. Half Interchange	Interchange	42	50.9%
Stoney Trail/32 Avenue N.E. Flyover	Interchange	41	50.9%
Stoney Trail/60 Street N.E. Interchange	Interchange	30	50.9%
Stoney Trail/61 Avenue S.E. Flyover twinning	Interchange	22	50.9%
Stoney Trail/64 Avenue N.E. Flyover	Interchange	36	50.9%
Stoney Trail/Memorial Drive Flyover	Interchange	60	50.9%
Trans-Canada/133 Street Half Interchange	Interchange	50	50.9%
Trans-Canada/Garden Road Interchange	Interchange	45	50.9%
Transit/Fire/Active Modes Flyover from Valley Ridge to Greenwich	Interchange	19	50.9%
17 Avenue S.W. connecting Aspen Landing to future Springbank Hill lands	Pedestrian overpasses	9	50.9%
52 Street S.E. connecting Auburn Bay and Mahogany	Pedestrian overpasses	10	50.9%
Airport Trail east of Metis Trail, connecting Cityscape and Savannah	Pedestrian overpasses	10	50.9%
Bow River connecting Cranston and Wolf Willow/Fish Creek Park	Pedestrian overpasses	20	50.9%
Bow River connecting Legacy and Cranston	Pedestrian overpasses	23	50.9%
Bow River crossing at Bears paw	Pedestrian overpasses	22	50.9%
Bow Trail east of 85 Street S.W., connecting West Springs and Strathcona Park	Pedestrian overpasses	14	50.9%
Country Hills Boulevard N.E. west of Stoney Trail, connecting North and South Cornerstone	Pedestrian overpasses	9	50.9%
Highway 22X S.E. at canal between 104 Street S.E. and 120 Street S.E.	Pedestrian overpasses	12	50.9%
Macleod Trail south of Stoney Trail, connecting Silverado and Chaparral	Pedestrian overpasses	9	50.9%

**Table C7: Greenfield infrastructure to be included in the 2024 Off-site Levies Bylaw – continued**

Project name	Infrastructure type	Total cost (\$ millions)	Benefit
Metis Trail N.E. north of Airport Trail, connecting Cityscape and Northeast Industrial	Pedestrian overpasses	9	50.9%
Priddis Slough crossing in Silverado	Pedestrian overpasses	19	50.9%
Rail crossing at 68 Street S.E. north of 114 Avenue S.E., in East Shepard Industrial	Pedestrian overpasses	21	50.9%
Shaganappi Trail N.W. just north of Stoney, connecting Sherwood and Kincora	Pedestrian overpasses	9	50.9%
Stoney Trail at 36 Street N.E., connecting the Northeast Residual Area and Stonegate Landing	Pedestrian overpasses	13	50.9%
Stoney Trail at 69 St N.W., connecting Royal Vista and Citadel	Pedestrian overpasses	8	50.9%
Stoney Trail between Centre Street and 11 Street N.E., connecting Keystone Hills and Coventry Hills	Pedestrian overpasses	10	50.9%
Stoney Trail between Centre Street and 14 Street N.W., connecting Carrington and Panorama Hills	Pedestrian overpasses	10	50.9%
Stoney Trail between Metis Trail and 60 Street N.E., connecting the Northeast Residual Area with Redstone	Pedestrian overpasses	9	50.9%
Stoney Trail between Sarcee and Shaganappi, connecting Sherwood and Hamptons	Pedestrian overpasses	9	50.9%
114 Avenue S.E. grade separation at CP Rail	Road Structures over rail/creek	30	50.9%
130 Avenue S.E. over Shepard Canal	Road Structures over rail/creek	20	50.9%
144 Avenue N.W. at West Nose Creek - Phase 2	Road Structures over rail/creek	21.6	50.9%
160 Avenue N.E. at CP Rail and Nose Creek Crossing	Road Structures over rail/creek	73	50.9%
160 Avenue N.W. at West Nose Creek	Road Structures over rail/creek	53	50.9%
210 Avenue S.W. grade separation at CP Rail	Road Structures over rail/creek	49	50.9%
Mountain View Road over West Nose Creek	Road Structures over rail/creek	39	50.9%
Pine Creek Crossing in South Macleod	Road Structures over rail/creek	47	50.9%
Trans-Canada widening (westbound third lane over rail)	Road Structures over rail/creek	8	50.9%
114 Avenue S.E. widening from Barlow Trail to Stoney Trail (4-6 lanes)	Road widenings	35	50.9%
128 Avenue N.E. widening from Deerfoot Trail to Stoney Trail	Road widenings	150	50.9%
Airport Trail widening from 60 Street N.E. to 68 Street N.E. (2-4 lanes)	Road widenings	23	50.9%
Country Hills Boulevard N.E. widening from Barlow Trail to Coventry Boulevard (4-6 lanes)	Road widenings	125	50.9%
Glenmore Trail widening from Stoney Trail to 800 metres east of 116 Street East (2-6 lanes)	Road widenings	49	50.9%
Highway 566 widening from Range Road 15 (Panorama Road) to QEII (2-4 lanes)	Road widenings	23.5	50.9%
Metis Trail N.E. widening from Airport Trail to Stoney Trail (4-6 lanes)	Road widenings	17	50.9%

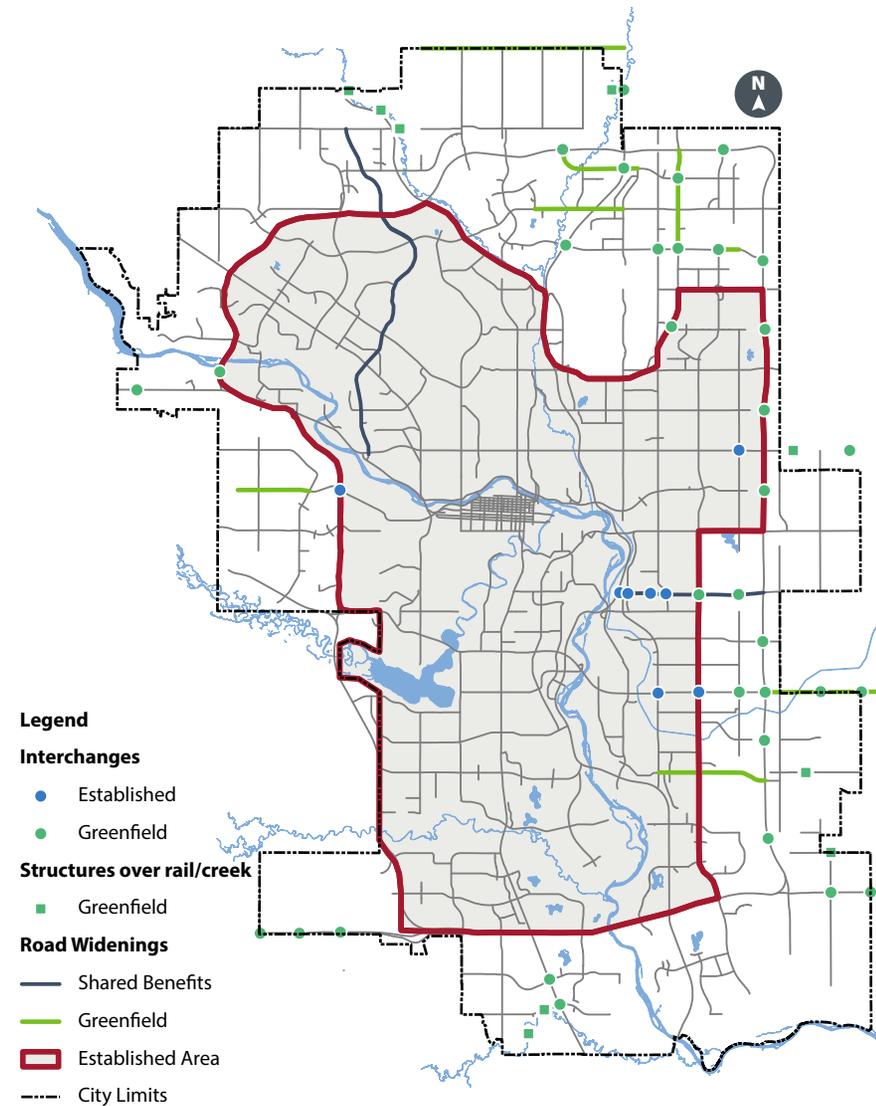
**Table C7: Greenfield infrastructure to be included in the 2024 Off-site Levies Bylaw – continued**

Project name	Infrastructure type	Total cost (\$ millions)	Benefit
<b>Shared Benefit Infrastructure</b>			
5A Network (Established Area pathways and bikeways)	5A Network	35	21.4%
162 Avenue S.W. BRT from Shawnessy to S.W. Ring Road	BRT infrastructure	65	21.4%
52 Street East BRT from Saddletowne to Seton	BRT infrastructure	71	21.4%
MAX 301 BRT from Downtown to Aurora Park	BRT infrastructure	67	21.4%
Route 305 improvements	BRT infrastructure	35	21.4%
16 Avenue N.E./68 Street N.E. Interchange	Interchange	54	21.4%
Deerfoot Trail/Peigan Trail/Barlow Trail Interchange (Ultimate)	Interchange	119	21.4%
Glenmore Trail/52 Street S.E. Interchange	Interchange	101	21.4%
Glenmore Trail/Barlow Trail S.E. Interchange	Interchange	40	21.4%
Peigan Trail/26 Street S.E. Interchange	Interchange	43.25	21.4%
Peigan Trail/36 Street S.E. Interchange	Interchange	55.25	21.4%
Peigan Trail grade separation at CN Rail Crossing	Interchange	59	21.4%
Sarcee Trail S.W./Bow Trail Interchange	Interchange	169	21.4%
Beddington Trail N.W., connecting Country Hills and Sandstone Valley	Pedestrian overpasses	12	21.4%
Deerfoot Trail connecting Douglasdale with Shepard Industrial	Pedestrian overpasses	14	21.4%
Deerfoot Trail just north of Stoney Trail S.E., connecting McKenzie Lake and McKenzie Towne	Pedestrian overpasses	18	21.4%
Deerfoot Trail north of 130 Avenue S.E., connecting Douglasdale and East Shepard Industrial	Pedestrian overpasses	19	21.4%
Deerfoot Trail south of 130 Avenue S.E., connecting McKenzie Lake and McKenzie Towne	Pedestrian overpasses	16	21.4%
LRT crossing in Martindale	Pedestrian overpasses	12	21.4%
Shaganappi Trail N.W. at Nose Hill Park	Pedestrian overpasses	8	21.4%
Shaganappi Trail N.W. connecting Hamptons and Hidden Valley	Pedestrian overpasses	7	21.4%
Stoney Trail east of Macleod Trail, connecting Chaparral and Sundance	Pedestrian overpasses	16	21.4%
WID canal crossing at 72 Avenue S.E., connecting Foothills and Ogden	Pedestrian overpasses	3	21.4%
Beddington Trail N.W. widening from Country Hills Boulevard N.W. to Stoney Trail (4-6 lanes)	Road widenings	22	21.4%
Bow Trail S.W. widening from 69 Street to Stoney Trail (4-6 lanes)	Road widenings	13	21.4%
Peigan Trail widening from Barlow Trail to Stoney Trail (2-4 lanes)	Road widenings	53	21.4%

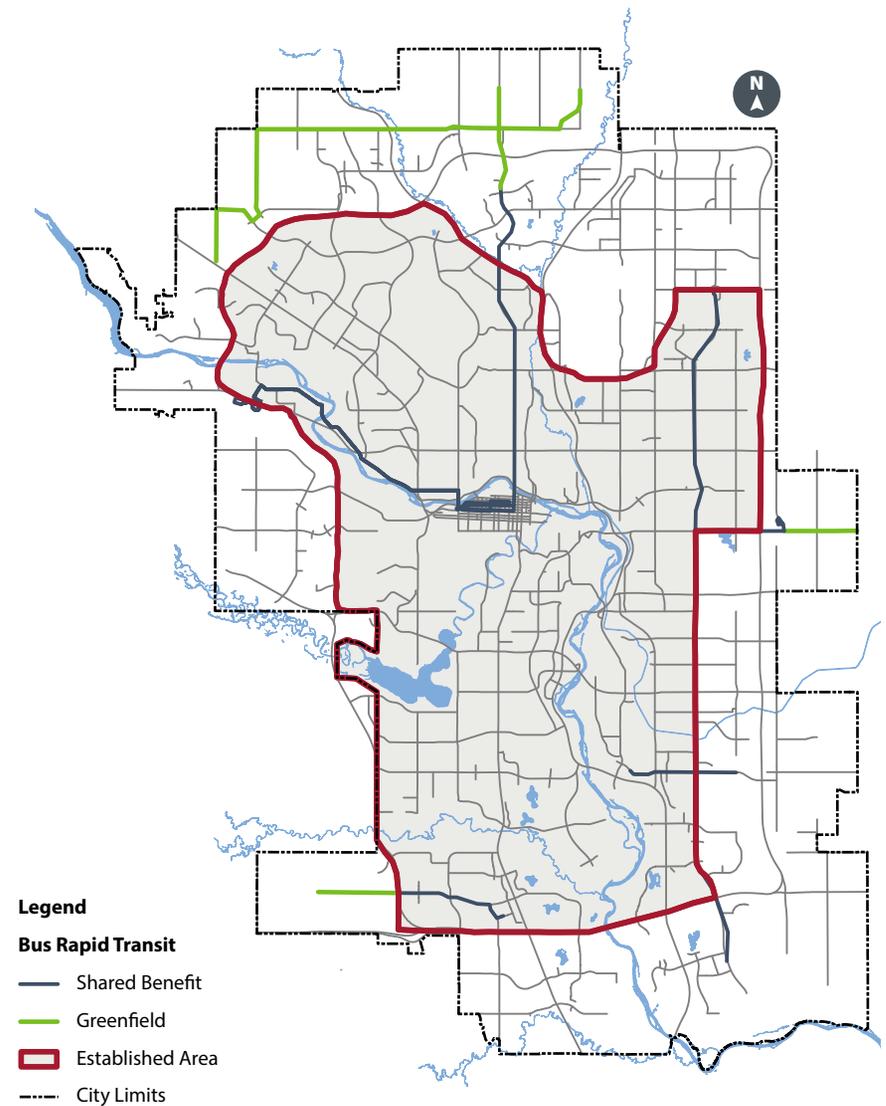
**Table C7:** Greenfield infrastructure to be included in the 2024 Off-site Levies Bylaw – continued

Project name	Infrastructure type	Total cost (\$ millions)	Benefit
Sarcee Trail S.W. widening from Bow Trail to Trans-Canada (4-6 lanes)	Road widenings	149	21.4%
Sarcee Trail S.W. widening from Glenmore Trail to Bow Trail (4-6 lanes)	Road widenings	73	21.4%
Shaganappi HOV from Bowness Road to Stoney Trail	Road widenings	179	21.4%
Shaganappi Trail N.W. widening from Stoney Trail to Country Hills Boulevard (6-8 lanes)	Road widenings	7	21.4%
<b>Total cost of infrastructure being levied for (\$ millions)</b>		<b>5,324.8</b>	

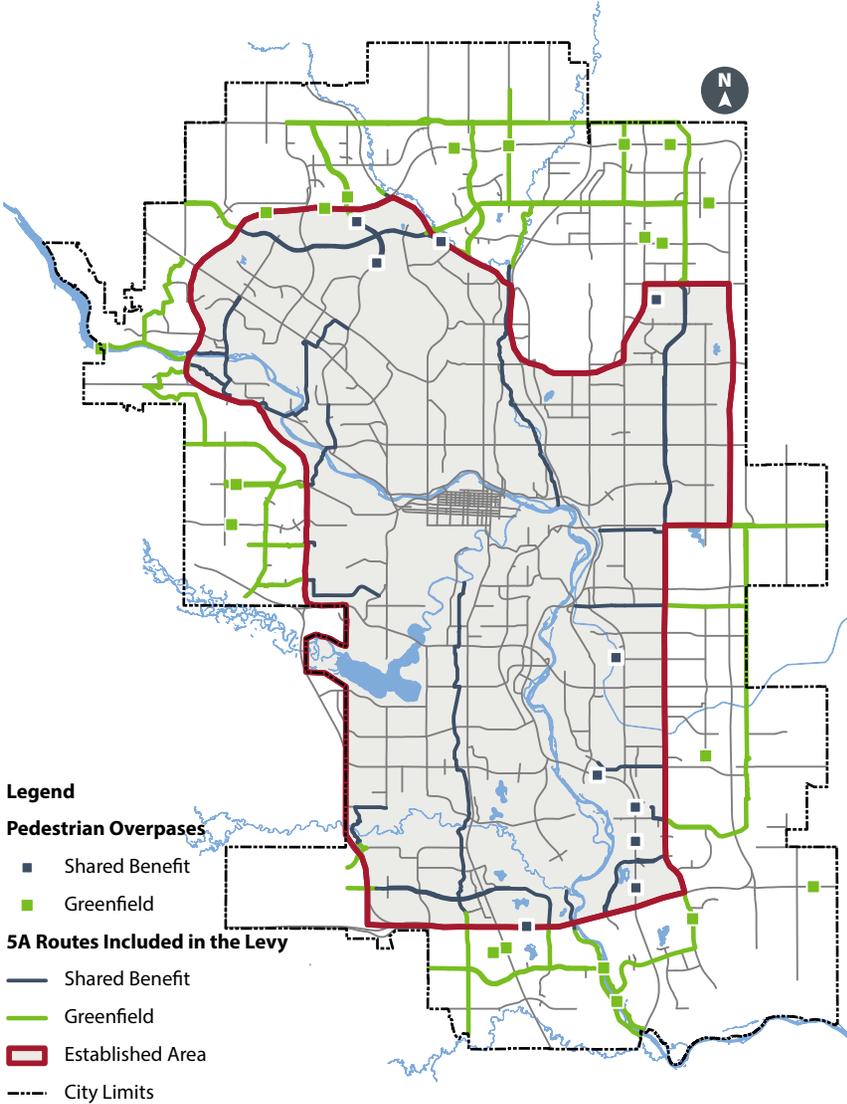
**Map A2:** Interchanges, bridges, and widenings included in the levy



**Map A3:** Bus Rapid Transit included in the levy



**Map A4:** Pedestrian overpasses and leviable 5A routes



## G. Transportation infrastructure not included

**Table C8:** Greenfield infrastructure not included in the 2024 Off-site Levies Bylaw

Project name	Infrastructure type	Total cost (\$ millions)
Westbrook to Mount Royal University Transit Connection	BRT infrastructure	345
14 Street N.W./Country Hills Boulevard Interchange	Interchange	63
14 Street S.W./Anderson Road Interchange	Interchange	103
16 Avenue N.E./19 Street N.E. Interchange (with revisions to 16 Avenue N.E./Barlow Trail Interchange)	Interchange	72
26 Avenue S.E. Connector/Blackfoot Trail Interchange	Interchange	TBD
Anderson Road/Macleod Trail directional ramps	Interchange	TBD
Anderson Road S.E./Acadia Drive Interchange	Interchange	66
Anderson Road S.E./Bonaventure Drive Interchange	Interchange	64
Anderson Road S.E./Woodpark Boulevard Interchange	Interchange	TBD
Anderson Road S.W./24 Street SW Interchange	Interchange	68
Anderson Road S.W./Elbow Drive Interchange	Interchange	127
Crowchild Trail/12 Mile Coulee Road Interchange	Interchange	77
Crowchild Trail/24 Avenue N.W. Interchange and C/D System (including new bridge over University Drive)	Interchange	TBD
Crowchild Trail/University Drive/16 Avenue N.W. - upgrade/revise Interchanges	Interchange	TBD
Deerfoot Trail/16 Avenue N.E. Interchange 3rd level	Interchange	160
Deerfoot Trail/17 Avenue S.E. EBL directional and basketweaves between Memorial and 17 Avenue S.E.	Interchange	145
Deerfoot Trail/32 Avenue N.E. Interchange revisions	Interchange	10
Deerfoot Trail/50 Avenue S.W. Interchange	Interchange	TBD
Deerfoot Trail/Anderson Road/Bow Bottom Trail Interchange (Ultimate)	Interchange	255
Deerfoot Trail/Beddington Trail/11 Street N.E. Interchange (Ultimate)	Interchange	109
Deerfoot Trail/Glenmore Trail/Blackfoot Trail Interchange (Ultimate)	Interchange	330
Deerfoot Trail/Glenmore Trail Interchange improvements	Interchange	69
Deerfoot Trail/McKnight Boulevard N.E. Interchange upgrade	Interchange	5
Deerfoot Trail/Memorial Drive Interchange (Ultimate)	Interchange	115
Deerfoot Trail CD System between Glenmore Trail and Peigan Trail (including twin Calf Robe Bridge)	Interchange	346
Glenmore Trail/Richard Road S.W. Interchange	Interchange	59

**Table C8:** Greenfield infrastructure not included in the 2024 Off-site Levies Bylaw – continued

Project name	Infrastructure type	Total cost (\$ millions)
Macleod Trail/25 Avenue Interchange	Interchange	TBD
Macleod Trail/Heritage Drive Interchange	Interchange	116
Macleod Trail/Lake Fraser Gate Interchange	Interchange	58
McKnight Boulevard N.E./19 Street Interchange	Interchange	53
McKnight Boulevard N.E./47 Street Interchange	Interchange	41
McKnight Boulevard N.E./68 Street Interchange	Interchange	60
McKnight Boulevard N.E./Aviation Boulevard (12 Street N.E.) Interchange	Interchange	48
McKnight Boulevard N.E./Barlow Trail Interchange	Interchange	64
McKnight Boulevard N.E./Falconridge Boulevard Interchange	Interchange	63
Sarcee Trail S.W./Richmond Road Interchange	Interchange	106
Shaganappi Trail N.W./16 Avenue Interchange	Interchange	126
Shaganappi Trail N.W./Country Hills Boulevard Interchange	Interchange	75
Shaganappi Trail N.W./Edgemont Boulevard Interchange	Interchange	63
Shaganappi Trail N.W./John Laurie Boulevard Interchange	Interchange	65
Shaganappi Trail N.W./Northland Drive Interchange	Interchange	50
Southland Drive Basketweave at Deerfoot Trail	Interchange	64
Route 201 Red Line LRT extension to 210 Avenue South and Maintenance Facility	LRT	819
Route 202 Blue Line LRT extension from 128 Avenue N.E. to Stonegate N.E.	LRT	160
Route 202 Blue Line LRT extension from Saddletowne to 128 Avenue N.E. Station in Redstone	LRT	132.9
Route 202 Blue Line LRT extension from 69 Street S.W. to 85 Street S.W.	LRT	263
Crowchild Trail widening bridge over Bow River (6-8 lanes)		
Crowchild Trail/5 Avenue N.W. - Flyover	Major structures	TBD
Crowchild Trail/Kensington Road N.W. - Interchange		
Glenmore Causeway widening to 8 core lanes with CD System		
Glenmore/Crowchild Interchange (Ultimate)	Major structures	TBD
Glenmore Trail/14 Street Interchange (Ultimate)		
16 Avenue N.W. connecting Canada Olympic Park to Bowness	Pedestrian overpasses	12

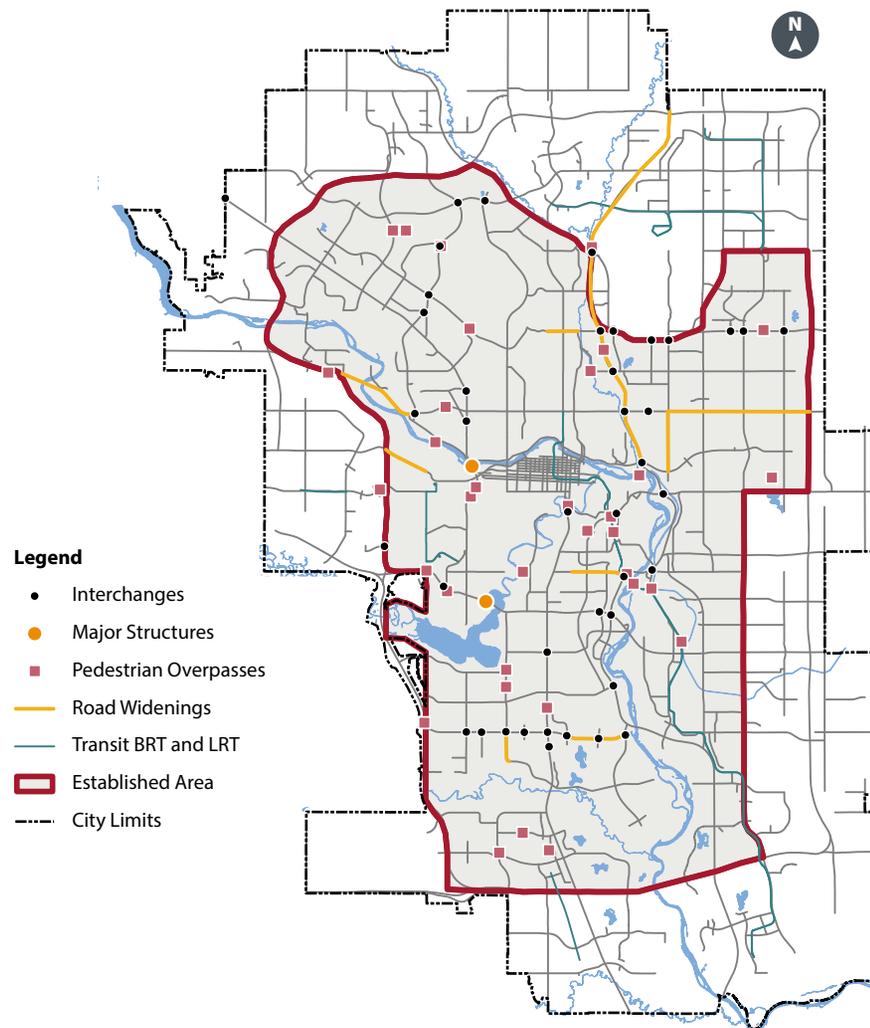
**Table C8:** Greenfield infrastructure not included in the 2024 Off-site Levies Bylaw – continued

Project name	Infrastructure type	Total cost (\$ millions)
Anderson LRT Station across Macleod Trail at north end of site	Pedestrian overpasses	10
Bow River crossing at Calf Robe Bridge	Pedestrian overpasses	TBD
Bow River crossing at Inglewood Grove S.E.	Pedestrian overpasses	TBD
Bow River crossing at Parkdale Boulevard N.W.	Pedestrian overpasses	TBD
Crossing 14 Street S.W. at 90 Avenue	Pedestrian overpasses	TBD
Crossing 14 Street S.W. at 96 Avenue	Pedestrian overpasses	TBD
Crossing 17 Avenue at Sirocco LRT	Pedestrian overpasses	TBD
Crossing 37 Street S.W. at Glenmore Trail	Pedestrian overpasses	TBD
Crossing Blackfoot Trail S.E. at 11 Street	Pedestrian overpasses	TBD
Crossing Canal/CN Rail/Ogden Road	Pedestrian overpasses	TBD
Crossing Crowchild Trail S.W. at 22A Street	Pedestrian overpasses	TBD
Crossing Crowchild Trail S.W. at Sunset Avenue	Pedestrian overpasses	TBD
Crossing Deerfoot Trail S.E. at 46 Avenue	Pedestrian overpasses	TBD
Crossing Glenmore Trail S.W. at Henwood Street	Pedestrian overpasses	TBD
Crossing James McKeivitt Road S.W.	Pedestrian overpasses	TBD
Crossing John Laurie Boulevard N.W. at Charleswood Drive	Pedestrian overpasses	TBD
Crossing McKnight Boulevard N.E. at 60 Street	Pedestrian overpasses	TBD
Crossing Rail to Dartmouth Road in Manchester	Pedestrian overpasses	TBD
Crossing Sarcee Trail N.W. at Edgeland Rise	Pedestrian overpasses	TBD
Crossing Shaganappi Trail N.W. at Edgemont Boulevard	Pedestrian overpasses	TBD
Crossing Shawnessy Blvd S.W. at Millrise Crescent	Pedestrian overpasses	TBD
Crossing Tsuut'ina Trail S.W. at Cedardale Bay S.W.	Pedestrian overpasses	TBD
Deerfoot Trail at 40 Avenue N.E.	Pedestrian overpasses	9
Deerfoot Trail at Beddington Trail N.E.	Pedestrian overpasses	12
Edgemont Ravine	Pedestrian overpasses	TBD
Elbow River crossing at 50 Avenue S.W.	Pedestrian overpasses	TBD

**Table C8:** Greenfield infrastructure not included in the 2024 Off-site Levies Bylaw – continued

Project name	Infrastructure type	Total cost (\$ millions)
LRT/CPR tracks from Shalom Way to Shawmeadows Rise S.E.	Pedestrian overpasses	17
Macleod Trail north of 25 Avenue South, Erlton to LRT station	Pedestrian overpasses	16
Nose Creek, 32 Avenue N.E.	Pedestrian overpasses	4.0
Rail crossing at 34 Avenue S.E.	Pedestrian overpasses	TBD
Rail crossing at 78 Avenue S.E. in Ogden	Pedestrian overpasses	TBD
Rail crossing at Penedo Way	Pedestrian overpasses	TBD
Airport Transit Connector - Blue Line to Airport	People mover	585
Airport Transit Connector - Green Line to Airport	People mover	750
14 Street S.W. widening from 90 Avenue to Anderson Road (4-6 lanes)	Road widenings	TBD
14 Street S.W. widening from Anderson Road to Canyon Meadows Drive (2-4 lanes)	Road widenings	17
16 Avenue N.E. widening from Barlow Trail to Stoney Trail (4-6 lanes)	Road widenings	36
16 Avenue N.W. widening from Shaganappi Trail to Sarcee Trail N.W. (4-6 lanes), with 6-lane bridge and CP underpass	Road widenings	180
50 Avenue S.W. 4-lane extension from Macleod Trail to Deerfoot Trail S.E.	Road widenings	161
52 Street E widening from 17 Avenue S.E. to McKnight Boulevard N.E. (HOV Corridor)	Road widenings	TBD
52 Street SE widening from 17 Avenue S.E. to Peigan Trail S.E. (4-6 lanes)	Road widenings	TBD
Anderson Road S.E. widening from Bonaventure Drive to Deerfoot Trail (2-3 east-bound lanes)	Road widenings	9.0
Barlow Trail N.E. widening from Memorial Drive to 16 Avenue (4-6 lanes)	Road widenings	38
Bow Trail S.W. widening from 37 Street to Sarcee Trail (6 lanes)	Road widenings	68
Deerfoot Trail widening from Memorial Drive to Stoney Trail (6-8 lanes)	Road widenings	196
McKnight Boulevard N.E. widening from Edmonton Trail to 4 Street N.W. (4-6 lanes)	Road widenings	60
<b>Total</b>		<b>7,194.9</b>

**Map A5:** Infrastructure not included in the levy

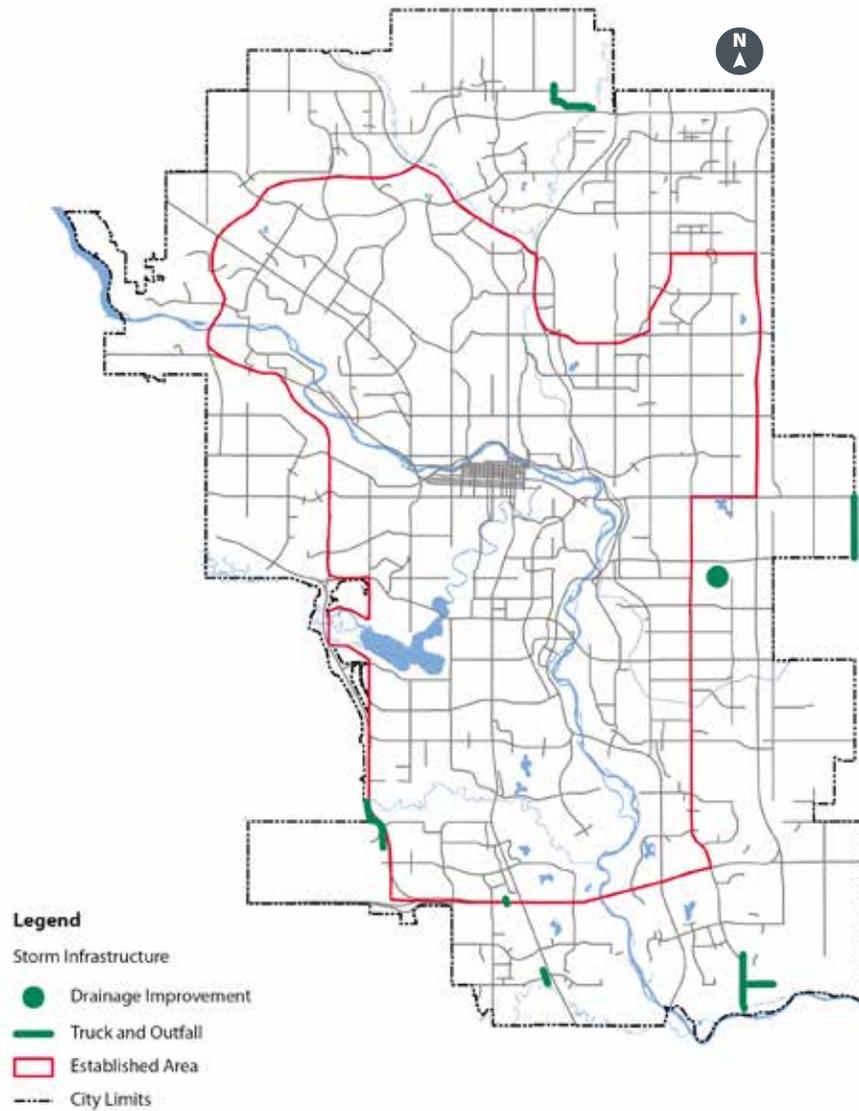


## H. Stormwater infrastructure

**Table C9:** Stormwater infrastructure to be included in the 2024 Off-site Levies Bylaw

Project name	Infrastructure type	Estimated capital (\$ millions)
Priddis Storm Trunk & Outfall	Stormwater	15.8
Shepard Land Purchase	Stormwater	0.8
North Ridge Macdonald Trunk	Stormwater	0.057
144 Avenue N.E. Storm Trunk	Stormwater	19.1
North Beddington Storm Trunk	Stormwater	1.0
Seton Storm Trunk Phase 1	Stormwater	17.3
Haskayne Storm Outfall	Stormwater	0.8
Providence Storm Trunk Phase 1	Stormwater	4.0
Providence Storm Trunk Phase 2	Stormwater	20.9
Co-operative Stormwater Management Initiative	Stormwater	17.5
Forest Lawn Creek Improvements	Stormwater	3.6
Master Drainage Plans	Stormwater	0.8

**Map A6:** Capital storm projects



## I. Water distribution and wastewater collection infrastructure

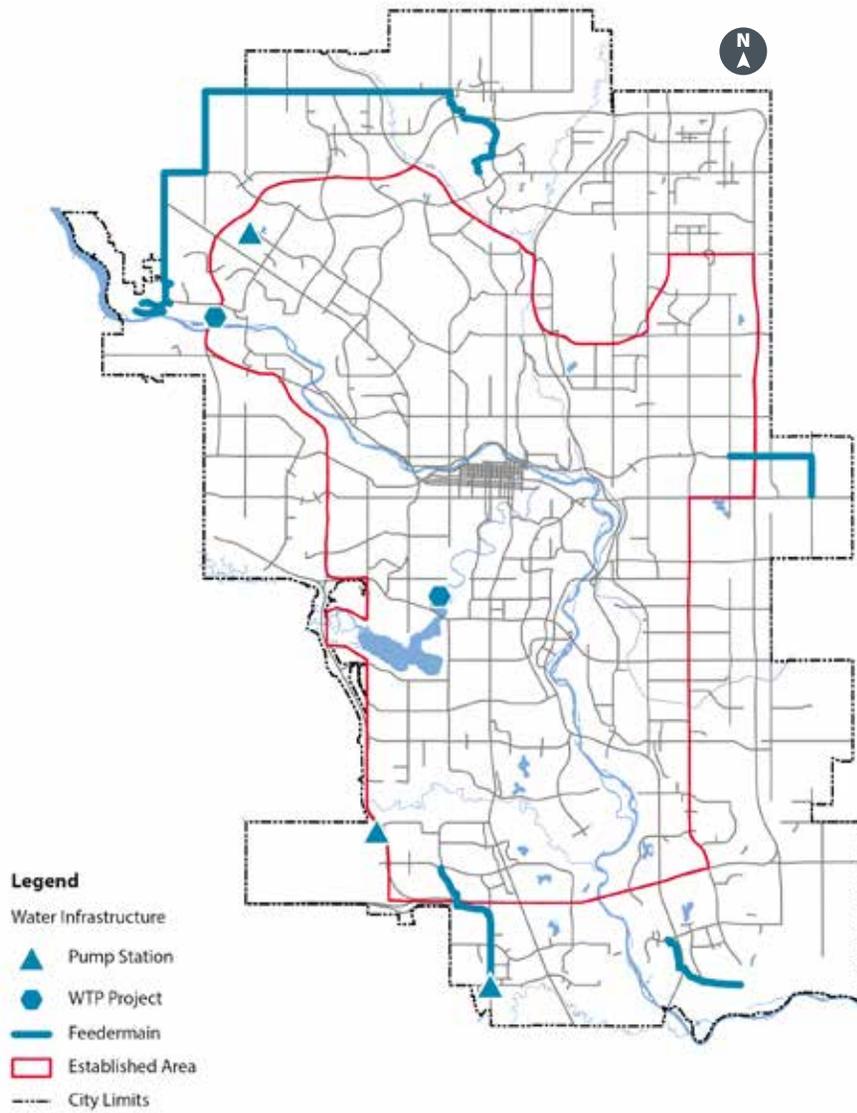
**Table C10:** Water distribution and wastewater collection infrastructure to be included in the 2024 Off-site Levies Bylaw

Project name	Infrastructure type	Estimated capital (\$ millions)
Ogden Feedermain Phase 1	Water feedermain extension	23.9
Lower Sarcee Feedermain	Water feedermain extension	36.1
210 Avenue S.W. Pump Station	Pump station	20.1
210 Avenue S.W. Feedermain	Water feedermain extension	13.2
East McKenzie Feedermain	Water feedermain extension	0.8
Northridge Feedermain Phase 1	Water feedermain extension	42.6
Northridge Reservoir (partial cost)	Reservoir	0.1
Northridge Feedermain West Leg Phases 1 & 2 (partial cost)	Water feedermain extension	0.1
Belvedere Feedermain Phases 1 & 2	Water feedermain extension	25.1
Haskayne Feedermain	Water feedermain extension	8.8
Starlight East Pump Station Phase 1	Pump station	41.9
Providence 146 Ave Feedermain (partial cost)	Water feedermain extension	5.6
Westview Reservoir (partial cost)	Reservoir	1.4
Airdrie Feedermain Tie-In & Meter Relocation	Other infrastructure	1.5
Pump Station 36 Installation	Pump station	0.5
South Glenmore Reservoir Basin II (partial cost)	Reservoir	0.048
North Water Servicing Option	Water feedermain upgrade	478.4
Mountain View Pump Station Upgrade	Pump station	4.2
Northridge Macdonald Trunk	Wastewater trunk extension	0.042
West Pine Creek Sanitary Trunk Phase 2	Wastewater trunk extension	43.1
Seton Tunnel Phase 1	Wastewater trunk extension	46.1
Seton Tunnel Phase 2 Laterals	Wastewater trunk extension	15.7
144 Ave. N.E. Sanitary Trunk	Wastewater trunk extension	7.0
North Beddington Sanitary Trunk Phase 2 (construction finance agreement)	Wastewater trunk extension	4.6
Beddington Creek II East Leg	Wastewater trunk extension	0.04

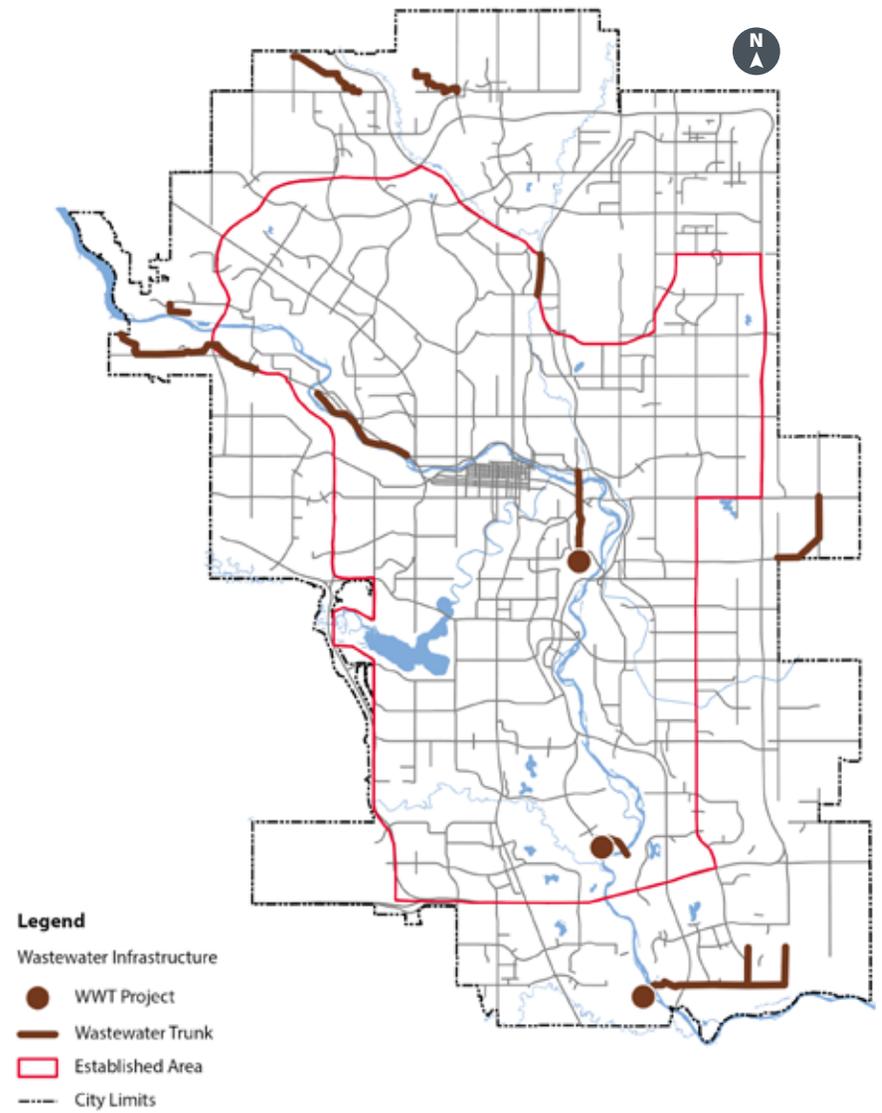
**Table C10:** Water distribution and wastewater collection infrastructure to be included in the 2024 Off-site Levies Bylaw – continued

Project name	Infrastructure type	Estimated capital (\$ millions)
Belvedere Sanitary Trunk	Wastewater trunk extension	13.6
Glacier Ridge East Basin Sanitary Trunk	Wastewater trunk extension	10.3
Glacier Ridge West Basin Sanitary Trunk	Wastewater trunk extension	19.2
Haskayne Sanitary Trunk	Wastewater trunk extension	1.7
Saddle Ridge Sanitary Trunk Upgrade	Wastewater trunk upgrade	6.0
Bowness Trunk Upgrade	Wastewater trunk upgrade	3.5
Shouldice Trunk Upgrade	Wastewater trunk upgrade	12.9
Nose Creek Trunk Upgrade	Wastewater trunk upgrade	84.5
Inglewood Trunk Upgrade	Wastewater trunk upgrade	101.2
McKenzie Siphon Upgrade	Wastewater trunk upgrade	11.1
TransCanada Sanitary Trunk Upgrade	Wastewater trunk upgrade	105.6

Map A7: Capital water projects



Map A8: Capital sanitary projects



## J. Water and wastewater treatment infrastructure

**Table C11:** Water and wastewater treatment infrastructure to be included in the 2024 Off-site Levies Bylaw

Project name	Infrastructure type	Estimated capital (\$ millions)
Bonnybrook Blower Upgrades	Bonnybrook Wastewater Treatment Plant	12.1
13.2 & 5kV System Expansion	Bonnybrook Wastewater Treatment Plant	41.1
Bonnybrook Capacity Upgrades	Bonnybrook Wastewater Treatment Plant	59.2
Bonnybrook Plant D Expansion	Bonnybrook Wastewater Treatment Plant	734.4
Power Management System	Bonnybrook Wastewater Treatment Plant	4.6
600V System Upgrades	Bonnybrook Wastewater Treatment Plant	15.4
Bonnybrook Struvite Recovery	Bonnybrook Wastewater Treatment Plant	18.5
Bonnybrook Dewatering Building	Bonnybrook Wastewater Treatment Plant	84.5
Bonnybrook Centrate/Supernatant Treatment	Bonnybrook Wastewater Treatment Plant	31.7
Fish Creek Wastewater Treatment Plant Capacity Assessment	Fish Creek Wastewater Treatment Plant	0.3
Pine Creek Wastewater Treatment Plant Stage 2 Expansion	Pine Creek Wastewater Treatment Plant	472.9
South Catchment Capacity Upgrade	Pine Creek Wastewater Treatment Plant	0.6
Bearspaw Water Treatment Plant Capacity Upgrades	Bearspaw Water Treatment Plant	18.9
Bearspaw Residuals Treatment Facility (RTF) Fourth Thickener	Bearspaw Water Treatment Plant	2.0
Bearspaw Pump Station STN012 Upgrade	Bearspaw Water Treatment Plant	3.3
New Water Treatment Plant	To be determined	520.0

# Acronyms

ASP	Area Structure Plan
BRT	Bus rapid transit
CFD	Calgary Fire Department
CPKC	Canadian Pacific Kansas City
CTP	Calgary Transportation Plan
DA	Development agreement
EP	Equivalent population
GFA	Gross floor area
LRT	Light-rail transit
MDP	Municipal Development Plan
MGA	Municipal Government Act
N/A	Not applicable
NPV	Net present value
NRBCPI	Non-residential construction price index
TBD	To be determined
WTP	Water treatment plants
WWTP	Wastewater treatment plants

## Glossary of Terms

**Discount rate:** The interest rate used to determine the present value of future cash flows.

**Equity:** Applicable to Table 5 only; represents ownership interest in a company, often in the form of stocks or shares.

**Escalation rate:** Refers to a persistent rise in the price of specific commodities, goods or services due to a combination of inflation, supply/demand, and other effects such as environmental and engineering changes.

- For the purposes of the 2024 calculations in this bylaw, the escalation factor was determined looking at the historical NRBCPI for Calgary from 1981 – 2022, 42 data points.
- Inflation was smoothed to a five-year average which gave us 37 years of 5-year average inflation.
- The data was ranked from lowest to highest inflation, excluding the four highest inflation years which were the hyper- inflationary period in Calgary from 2006-2009. This method captures approximately 90% of all occurrences.
- Calculated the average inflation for those periods and volatility of the annual inflation.
- Using a 90% confidence level the inflation projected is 3.58%.

**Global fixed income:** Applicable to Table 5 only; refers to debt securities issued by entities from various countries around the world.

**Inflation:** The rate of increase in prices over a given period of time (a decrease in the purchasing power of money).

**Interest expense:** The cost of borrowing is included in the levy rate calculation as an expense.

**Investment income:** Levy funds are invested and annual returns earned and attributed back to each infrastructure account on which it was earned.

**Levied lands:** Lands where a development agreement (DA) has been executed or where off-site levies have been paid.

**Money markets:** Applicable to Table 5 only; a financial market for short-term borrowing and lending, typically with maturities of one year or less.

**Real assets:** Applicable to Table 5 only; Tangible and physical assets such as real estate, commodities and infrastructure.

**Short-term fixed income:** Applicable to Table 5 only; refers to debt securities with maturities of five years or less

**Unlevied lands:** Lands where no development agreement (DA) has been executed or no off-site levies have been paid.

**Water distribution and wastewater collection:** Water distribution and wastewater collection infrastructure that connect residents and businesses to water and wastewater plants.

