Fiscal Impacts of Greenfield Growth Advisory Committee Report

Executive Summary

On March 22, 2016 a report, CR_2705 entitled Integrated Infrastructure Management Plan (IIMP) – Cumulative Impacts CR_2705 went to the Executive Committee for information. The report described that at build out, the Urban Growth Areas (Horse Hill, Decoteau and Riverview) will require a developer infrastructure investment of approximately $3.8 billion, as well as a capital investment by the City of approximately $1.4 billion. Additionally, the projected cumulative shortfall over the 50 year analysis period for the build out of these areas is anticipated to be in the order of $1.4 billion.

On April 5, 2016 City Council directed Administration to establish a working group with industry representatives and planning experts to collaboratively address the cumulative fiscal impacts of greenfield growth. The working group took the form of the Fiscal Impacts of Greenfield Growth Advisory Committee.

The purpose of this report is to provide an update to City Council, from the Fiscal Impacts of Greenfield Growth Advisory Committee, on progress made to respond to the Council motion.

Since June 2016, the Advisory Committee has met nine times to discern a response to the above mentioned Council motion that is informed by both Administration and Industry. In addition, technical subcommittees comprised of both Administration and Industry, have provided specialized information to the Advisory Committee.

The Advisory Committee's findings:

1. Responding to the motion involves:
    a. a comprehensive description and understanding of the cost and revenue drivers for sustainable city growth; and
    b. identification of possible approaches and potential recommended future steps to improve efficiency and effectiveness for both the public and private sectors as Edmonton grows and changes.
2. The issues outlined in the motion are complex, multifaceted and interrelated.
3. There are significant data limitations and there are various perspectives on the

available data in addressing the motion.

4. The degree of mutual understanding between Administration and external stakeholders on the costs of growth has improved.
5. The progress to date has been foundational for ongoing work on the motion.
6. Given the resource and expertise limitations, it was not possible to achieve further progress within the timeframe.

Specific to the Council motion, the following summarizes progress to date:

1. Cost drivers for both the land development industry and the City

Preliminary work was undertaken to discern the major costs borne by the City and the development industry throughout the lifecycle of the land development/operation process. To date, the Committee found the major costs borne by the City relate to transit, roads, and police service, while the highest costs borne by industry are associated with upfront infrastructure investments in drainage and roads. The City bears all operational and renewal costs and invests some initial capital, while the Development Industry bears initial capital costs and is not responsible for ongoing operations and maintenance. Cost drivers are different from costs; they are many factors that cause a change in the cost of an activity. The Advisory Committee will continue to look further into cost drivers for both parties. This will entail further analysis.

2. Assessing the downstream impacts of new growth

The Advisory Committee conducted a jurisdictional review of approaches to assess downstream financial impacts from roadway networks. The vast majority of North American cities, including Edmonton, use a Transportation Impact Assessment (TIA) to assess the downstream impacts of growth on transportation networks. The review includes a summary of the approaches by several other municipalities and a case study of Edmonton's Riverview area to illustrate how the downstream impacts of development are currently determined in Edmonton. This jurisdictional review indicates that there is no perfect way to conduct these types of assessments; they each have their limitations and challenges. Regardless of approach, it is agreed that developers should fund road infrastructure that is deemed reasonable by all parties concerned and necessary to support the development over its lifecycle, and that an equitable, consistent and transparent methodology for arriving at developer contributions is essential. In a similar fashion, further review by the Advisory Committee will be done on the drainage and parks networks.

3. Options for cost allocation tools

The Advisory Committee explored both existing funding sources and potential revenue tools available to the City, noting tools that are permitted under the Municipal Government Act and that may be permitted via potential amendments to the MGA. Further work is required in this area to discern which and how tools will be effective in the Edmonton context.

4. Evaluating the balance of residential and non-residential assessment bases

The Committee examined Edmonton's position in the region relative its tax assessment base, the potential to grow its non-residential assessment, and the potential and implications for shifting the tax burden between assessment classes. The Committee understood growing non-residential assessment is challenging, either within Edmonton alone, or relative to the Edmonton region. The committee concluded this area of discussion needs to be regional in scope and include the potential for cost and revenue sharing to better manage the costs and benefits of growth.

5. Options for increased or reduced service levels

This still needs to be explored. It is understood that service level increases or reductions are closely related to cost drivers and will need to be addressed simultaneously.

6. Providing input to Municipal Government Act revisions

The next draft of MGA regulations is expected to be released for public review and feedback in the spring of 2017. The Advisory Committee will monitor the evolving legislative environment and provide feedback as needed.

Next Steps

The Advisory Committee will review its membership to ensure the expertise and perspectives needed to further this work are present. Expected actions, culminating in recommendations to Executive Committee, include:

- Examine in detail cost drivers internal to the City and for the development industry
- Research in detail cost allocation options applicable to our enabling legislation
- Research downstream financial impacts for drainage and parks

- Examine development standards and propose revisions that can reduce costs
- Examine cost allocation practices to ensure equity for all parties
- Support the City's focus on regional planning and economic development.

1.0 INTRODUCTION

On March 22, 2016 a report entitled Integrated Infrastructure Management Plan (IIMP) – Cumulative Impacts CR_2705) went to the Executive Committee for information. The report found that at build out, over a 50-year period, the Urban Growth Areas (Horse Hill, Decoteau and Riverview) will require a developer infrastructure investment of approximately $3.8 billion, as well as a capital investment by the City of approximately $1.4 billion. Additionally, the projected cumulative shortfall over the 50 year analysis period for the build out of these areas is anticipated to be in the order of $1.4 billion. On April 5, 2016 City Council directed Administration to establish a working group with industry representatives to collaboratively address the fiscal impacts of greenfield growth:

"That Administration establish a Working Group with industry representatives and planning experts to collaboratively address the cumulative fiscal impacts of greenfield growth, including, but not limited to:

1. A fresh look at the cost drivers for both land development industry and the City.
2. A more comprehensive approach to assessing the downstream impacts of new growth, particularly on the roadway network.
3. Options for any new, proposed or revised cost allocation tools.
4. Evaluation scenarios around the balance of residential and non-residential assessment bases.
5. Options for increased or reduced service levels.
6. Ongoing collaboration to provide input to forthcoming Municipal Government Act revisions related to these matters.

and report back on key milestones."

In June 2016 the Fiscal Impacts of Greenfield Growth Advisory Committee, an integrated working group with a mandate to respond to the Council motion was established, co-chaired by Peter Ohm and Brad Armstrong. Please refer to Appendix A for a list of the people and organizations serving on the Advisory Committee.

The purpose of this report is to provide an update to City Council, from the Fiscal Impacts of Greenfield Growth Advisory Committee, on progress made to respond to the Council motion. This report is not exhaustive and does not fully answer the questions implied in the motion. Progress to date is articulated and next steps are outlined.

The City of Edmonton is Canada's fastest growing municipality of its size according to the 2016 Federal Census. This means that additional demands for new infrastructure will not abate. How Edmonton plans to fund its infrastructure is an important discussion because it is a means to safeguard Edmonton's growth while ensuring associated costs are shared equitably by beneficiaries. This Advisory Committee's discussions have also revealed regional implications; how Edmonton interacts with its regional neighbours is also a part of this exploration.

In its deliberations, the Advisory Committee has found the following:

1. Responding to the motion involves:
    a. a comprehensive description and understanding of the cost and revenue drivers for sustainable city growth; and
    b. identification of possible approaches and potential recommended future steps to improve efficiency and effectiveness for both the public and private sectors as Edmonton grows and changes.
2. The issues outlined in the motion are complex, multifaceted and interrelated.
3. There are significant data limitations and there are various perspectives on the available data in addressing the motion.
4. The degree of mutual understanding between Administration and external stakeholders on the costs of growth has improved.
5. The progress to date has been foundational for ongoing work on the motion.

The content in this report is not organized specific to each point in Council's motion, but rather organized in three primary topic areas—costs of growth, revenue sources, and assessing downstream impacts—that are necessary to explore each point. While these topic areas may not directly answer the questions outlined in the motion, they contribute to the emerging answers. The report also articulates the limitations on the analysis performed to date and next steps.

2.0 COSTS OF GROWTH

CR_2705 - The Integrated Infrastructure Management Plan (IIMP) – Cumulative Impacts involved high-level analysis that provides information about the cost of infrastructure required for land development. The IIMP's broad analysis provided a general indication of future cost implications and revenue potential. This document reviewed the cumulative impacts for the build out of the Urban Growth Areas (Horse Hill, Decoteau and Riverview) over a 30-39 year time frame, starting in 2016.

At build out, these Urban Growth Areas are expected to have a total population of 195,025 and require a developer infrastructure investment of approximately $3.8 billion, as well as a capital investment by the City of approximately $1.4 billion. Additionally, the projected cumulative shortfall over the 50 year analysis period for the build out of the Urban Growth Areas is anticipated to be in the order of $1.4 billion. The Advisory Committee's analysis looked at the costs borne by the City and those borne by the development industry, as articulated in the IIMP, and determined the following, over a 50 year window (see Figures 2.1, 2.2, and 2.3):

- Transit, roads and police are the highest costs to the City.
- Drainage and road costs (capital) are the most significant costs to the development industry (Note: these are contributed as a requirement of subdivision. Capital costs for major trunk lines, as well as operating and renewal costs for drainage infrastructure, are assumed to be completely funded through sanitary and storm-water utility rates.) .
- Operating and renewal costs are most significant to the City.
- Any impactful change to overall costs should also include examination of operational and renewal expenses as well as the initial capital costs borne by both the City and industry.

This analysis identifies the *costs* of growth, the first step in determining and analyzing cost drivers; the factors that *drive* these costs are not yet analyzed. Understanding cost drivers could identify the most significant impact to overall costs to both the City and the development industry. To determine the key cost drivers as well as potential service implications, a more comprehensive review is required at the affected department level.

The Advisory Committee also undertook an examination of the third party analysis of the IIMP conducted by Grant Thornton (Annex A), on behalf of the Urban Development Institute – Edmonton Region.The salient findings of this review, as determined by the Advisory Committee, are as follows:

- Calculations in the IIMP are generally reasonable.
- Initial capital costs account for a small proportion of all life cycle costs. For example: increasing/decreasing capital costs by 10% will increase/reduce total cost by only 2%.
- Operating costs for transit and police, and renewal costs for roads represent the largest costs for development over 50 years.
- Assumptions in the IIMP are narrow and do not include other indirect benefits and revenues.
- Additional revenues from the EPCOR Water and Wastewater Franchise Fee, and Drainage Local Access Fee should be included (an additional $256M of revenue).
- Reasonable changes to the assumptions and choices for future maintenance and renewal costs will allow the $1.4B shortfall to be covered over 50 years. (Running scenarios demonstrates that shortfall/surplus can vary greatly.)
- The IIMP expressly states that it should not be used to make policy decisions. It is a document that assists with scenario planning.

Figure 2.1 Development Costs: City Total vs. Developer Total (Includes operating, capital and renewal costs for all assets except waste and drainage, which reflect only capital costs.LRT costs are not included as they are outside the scope of an IIMP analysis.)

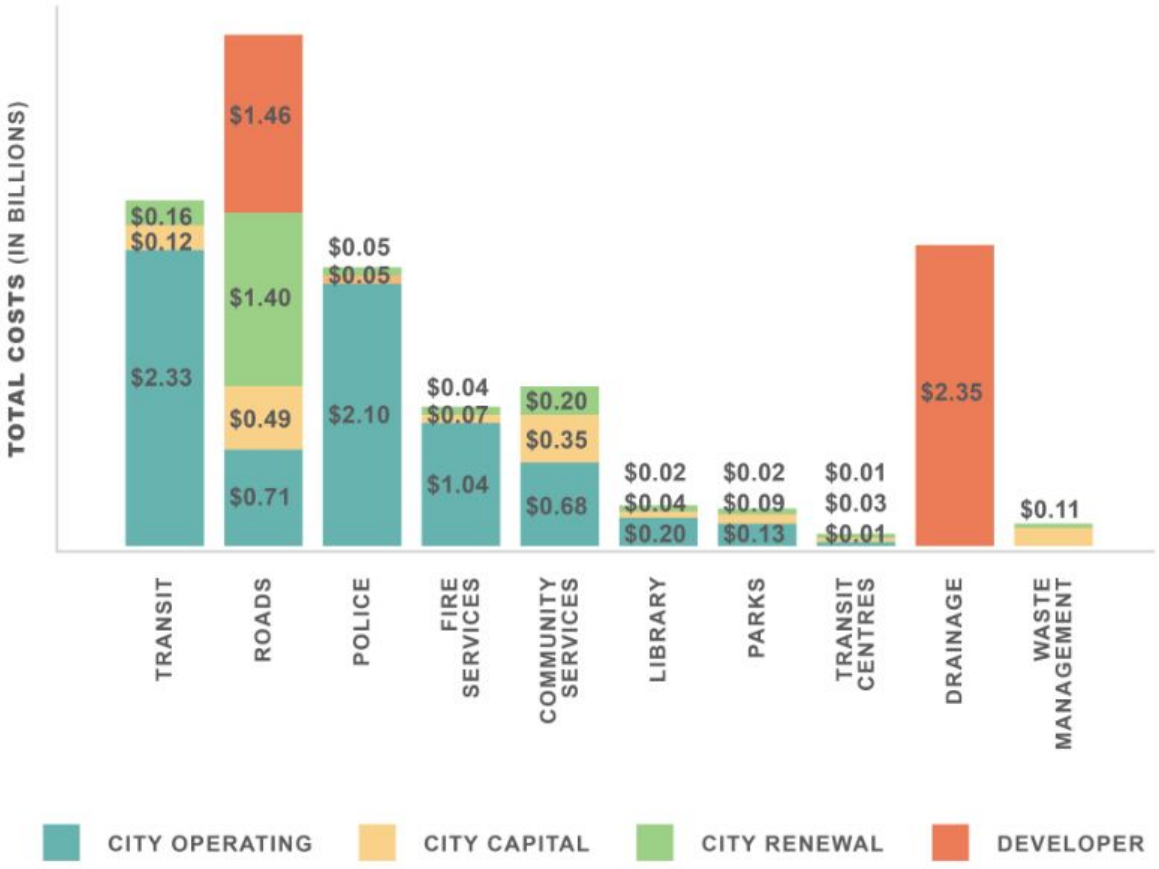


Figure 2.2 Capital Costs: City vs. Developer (Shows initial capital costs only. Renewal capital costs are borne by the City.)

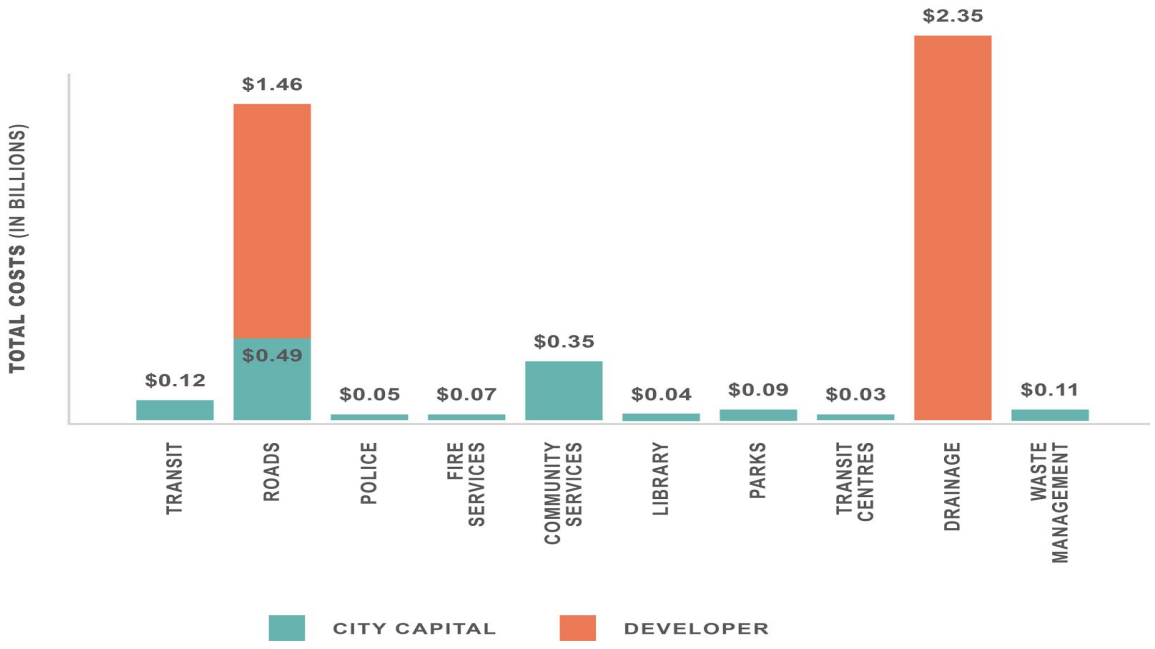
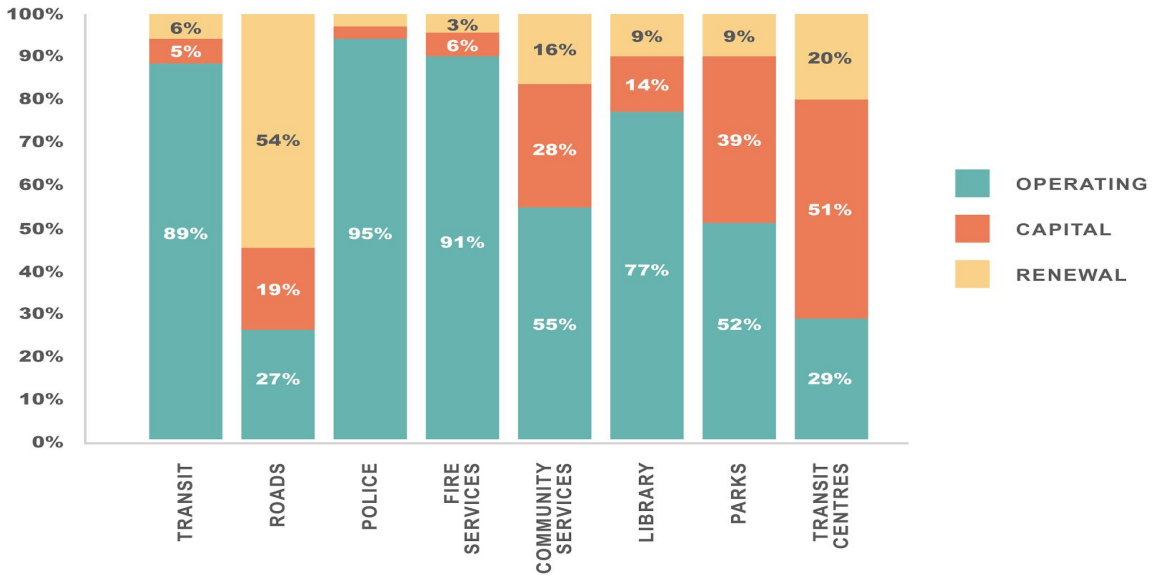


Figure 2.3 City Costs by Percentage (Shows tax supported City costs over 50 years. Not shown are drainage and waste costs. LRT costs are not included as they are outside the scope of IIMP analysis.)



3.0 REVENUE SOURCES

The Advisory Committee identified the primary, current, and potential revenue sources for the City of Edmonton to build and maintain infrastructure. It should be noted that it is not yet clear whether some of these tools are permitted under forthcoming legislation associated with MGA revisions. For an update on the MGA revision and the evolving enabling environment, please consult Appendix B.

This report specifically seeks clarity on cost allocation tools. Cost allocation tools can be regarded as the mechanisms by which capital costs are allocated across various stakeholders and beneficiaries of development. As a precursor to this work, the Advisory Committee found it necessary to explore the means by which Edmonton funds its infrastructure requirements. The Committee derived its findings from two major sources: City Capital Investment Agenda (CIA) 2012-2021 and the Capital Budget Office.

The Committee identified revenue sources and whether these sources are permitted under current legislation. Finally, the Committee also explored balance between

residential and non-residential assessment bases and whether the burden can be shifted between these classes.

3.1 Current Funding Sources

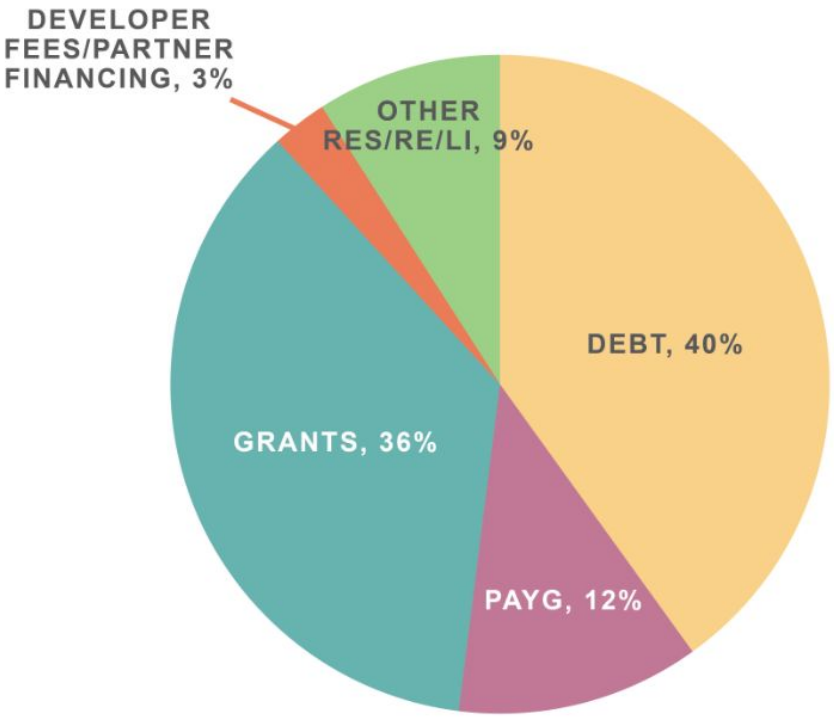
Figures 3.1 and 3.2 outline the total costs and funding sources of all identifiable residential focused growth infrastructure projects from 2004 to 2015. The time period is based on available data, and was obtained from the Capital Budget Office.

Residential growth infrastructure projects are categorized according to different funding sources. For example, Figures 3.1 and 3.2 show approximately 36% of residential growth infrastructure projects were funded by grants during this period. It should be noted that utility projects are not included in this analysis.

Figure 3.1 Funding Sources (Capital) for Residential Growth (2004-2015)

DEBT	PAYG	MSI	OTHER GRANTS	DEVELOPER FEES/PARTNER FINANCING	OTHER RES/RE/LI	TOTAL
$824,898	$238,716	$210,118	$516,507	$47,766	$510,251	**$2,348,256**

Figure 3.2 Funding Sources (Capital) for Residential Growth (2004-2015)



Debt Financing

Debt is subject to limits imposed through the MGA, and to a more conservative degree, to the parameters set by the Council-approved Debt Management Fiscal Policy (DMFP). It is important to understand that debt is a method of financing expenditure, not a funding source. There are three types of debt financing:

1. *Tax-supported debt* is used to finance current needed improvements, utilizing the tax levy to make payments over the years the benefit is enjoyed by current and future generations. A borrowing bylaw that identifies the projects to be funded with the debt must be approved by Council; once debt is identified as a source of financing for a specific project, it cannot be reallocated to another project.
2. *Self-supported tax-guaranteed debt* is used to finance capital expenditures by non-utility operations that ordinarily generate sufficient cash to fund all obligations or have a dedicated source of revenues. Any funding shortfall to repay the debt will be funded through tax levy revenues.
3. *Self-liquidating debt* is debt assumed to fund capital expenditures for self-funded activities or programs, including but not limited to Utilities and local improvements.

Pay-As-You-Go (PAYG)

Pay-as-you-go funding represents funding from the annual tax levy and from investment earnings. In some municipalities, it is also called General Financing (GF). Investment volatility influences the total amount of funding available in a given year. PAYG is a vital component of the City's funding, since it is used to pay the costs grant-funded projects incur that are not eligible for reimbursement under federal and provincial grant funding rules. It is also the most flexible of the City's capital funding sources.

Grants

Grants represent funding received from either the provincial or federal governments. There are typically two types of grants, those that are program based (provide a fixed amount of funding which a municipality applies to fund eligible projects) or application-based (municipalities apply for funding on a per project basis). Grants are not guaranteed, and present a risk to the City if it were to depend on them. Moreover grant programs do not fund ongoing operations and maintenance costs.

There are a number of provincial and federal grant funding sources that fund or have funded City projects. There are five examples of such funding sources:

1. *The Municipal Sustainability Initiative* (MSI) provides financial support to municipalities for infrastructure needs to help build and sustain strong, vibrant communities. The MSI grant has supported many City of Edmonton projects, including the Fort Edmonton Footbridge, Louise McKinney Park, the Heritage Valley Fire Station, the Animal Control Facility, and snow storage facilities.
2. *The Alberta Municipal Infrastructure Fund* (AMIP) provides financial assistance to municipalities to develop capital municipal infrastructure to maintain or enhance economic, social and cultural opportunity and well-being; while protecting and improving the quality of our environment upon which people and economies Alberta depend.
3. *The Green Transit Incentives Program* (GreenTRIP) is a one-time capital funding program that supports public transit infrastructure and technology.
4. *The Federal Gas Tax* shares gasoline tax profits through the provinces to Canadian municipalities. The program provides predictable, long-term funding for Canadian municipalities to help build and revitalize public infrastructure that achieves positive environmental results.
5. *The Building Canada Fund* supports projects designed to deliver results in three identified areas of national importance; a stronger economy, a cleaner environment and strong and prosperous communities.

Developer Fees/Partner Financing

Funds are contributed by developers or partners for specific civic infrastructure, such as buildings, parks, recreation facilities, roads and social housing.

Other Funding Sources

Other funding sources include:

1. *Reserves* are funding that has been put aside by the City to meet specific future capital expenditure costs. Reserves are typically used to ensure existing City equipment and infrastructure can be maintained.
2. *Local improvements* are projects that are of greater benefit to a specific area of the city than to the whole city and as such are paid for by the property owners who benefit from the project. If two - thirds of property owners in an area petition for a project to be undertaken or if the City initiates a project, then the local improvement process can begin. If no sufficient petition is filed by the property owners during the local improvement process then the local improvement bylaw can go forward at the City's initiation and the City can tax the benefiting property owners for the cost of the improvement. The property owners have two payment

options for local improvements:a lump sum payment (full cost, one-time payment) or Local Improvement Tax (financed over five to 20 years through an identified addition to the property tax).

3.2 New or Expanded Revenue Tools

The following tables list revenue tools; with commentary on whether these tools are permitted under current legislation (MGA); and whether they can be implemented as cost allocation tools. These tools are not sorted according to their magnitude. Revenue tools are defined as income-generating tools that a municipality uses to finance its daily operations, pay debts, and undertake capital projects. Cost allocation tools can be regarded as the mechanisms by which capital costs are allocated to specific beneficiaries/users of development.

Currently, as part of the MGA review process, all MGA - related regulations are being reviewed to ensure alignment with the amendments approved by the legislation in 2015 (Bill 20) and 2016 (Bill 21). As the enabling environment evolves with the MGA regulation development, the Committee will gain more clarity. Tools not currently enabled through revisions to the MGA may be negotiated as part of the City charter discussions. A more extensive study and a jurisdictional survey are warranted.

Figure 3.3 City-Wide Revenue Tools

Revenue Tool	Description	Can this be used as a Cost Allocation Tool?	Currently permitted by the revised MGA ?
Station Advertising	Revenue through increasing rates for advertising at transit stations	No	Yes
Station Rents	New revenue by entering into lease agreements for retail space at new transit stations	No	Yes
Hotel Tax	A tax levied on hotels. Considerations: Alberta currently levies a 4% hotel tax, with 70% of revenues allocated to Travel Alberta and 30% to the Department of Culture and Tourism.The impact of a hotel tax on regional competitiveness will depend on the tax rate established. There are further	Yes	Yes, in some ways

	implications due to competition from unregulated private rentals such as AirBNB.		
Fuel Tax	Revenue through increasing share of Gas Tax Revenue to the City	Yes	No
New Motor Vehicle Sales Tax	New revenue through issuing a special tax on new vehicle sales	Yes	No
Auto Insurance Tax	An additional fee on vehicle insurance premiums; auto insurance is mandatory in Alberta	Yes	No
Driver Licence Tax	Additional fee applied when a driver's license is renewed every five years	Yes	No
Surcharge on Electricity Use	Tax/surcharge on electricity consumption	No	No
Non-heating Electricity and Natural Gas Tax	A tax on electricity and natural gas use applied to usage above the threshold for basic living requirements	No	No
Car Rental Tax	An additional tax, daily fee, or both on vehicle and fleet rentals. Consideration: A car rental tax mainly targets tourists,and is applied in most American states at varying rates	Yes	No
Amusement Tax	A tax applied to private, for profit events such as movie tickets, sporting events, and concerts	Yes	No
Vehicle Registration Tax	A tax on vehicle registration	Yes	No
Parking (Sales) Tax	Parking sales tax on paid parking transactions	Yes	No
Land Transfer Tax	Tax on acquisition of a property or land, land transfer tax would be paid when the transaction closes. A land transfer tax is normally based on the amount paid for the land, in addition to the amount remaining on any mortgage or debt assumed as part of the arrangement to buy the land	No. If the aim is to allocate costs toward property owners, property tax should be used. Taxing the sales transaction on real estate would add unnecessary	No

		distortions in the marketplace.	

Figure 3.4 Site-Specific Revenue Tools

Revenue Tool	Description	Can this be used as a Cost Allocation Tool?	Currently permitted by the revised MGA ?
Land Value Capture	New revenue through taxing a portion of the one-time uplift in property values generated by public infrastructure investment	Potentially, depends how it is used	Yes
Directed Tax Revenue	Municipalities earmark incremental tax revenue streams generated from new development in specified areas for the purpose of funding capital improvements	Yes	Yes
Development Charges	Special development fees on new development	Yes	Yes, in some ways
Tax Increment Financing	Divert future property tax revenue associated with market value increases from within a defined area towards financing an immediate infrastructure improvement within that area	Yes	Yes, in some ways. Requires Provincial approval.
Special Tax	A municipality may choose to provide or construct a special service that will benefit a defined area within a municipality. The municipality would then levy a special tax to fund the project	Yes	Yes, but in very limited ways
Local Improvement Levy	A local improvement tax is imposed on a specific area within a municipality to fund a service or improvement applied to a particular area only. The improvement benefits that particular area rather than the municipality as a whole.	Yes	Yes, but in very limited ways
Cordon Tax	New revenue generated through charging drivers for entering or	Yes	No

	exiting "congested" areas during specific periods of the day.		
Comprehensive Development Agreements	Developers agree to provide amenities for the broader community (eg. social housing, libraries, firehall, transit station etc) in exchange for development approval	Yes	No - voluntary basis in certain cases

Figure 3.5 City-Wide or Site-Specific Revenue Tools

Revenue Tool	Description	Can this be Used as a Cost Allocation Tool?	Currently Permitted by the revised MGA ?
Density Bonusing	Developer is allowed to exceed densities set out in zoning bylaws in exchange for the provision of infrastructure or community facilities	Yes	Yes
Property Tax Dedicated to a Specific Program (i.e. Neighbourhood Renewal Tax Levy)	A property tax revenue stream that is a dedicated funding source for a specific operating or capital program	Yes	Yes
User Fees	A fee levied on direct users of a service	Yes	In certain areas
Air Rights	New revenue through selling or leasing air rights interests at new transit stations	Potentially, depends how it is used	Uncertain
Road Tolls	New revenue through levying a special toll on drivers on certain roads, tunnels, bridges and freeways within the city. Can be used as a dedicated funding tool for a specific project (i.e. a bridge).	Yes	No
High Occupancy Toll Lanes	New revenue through levying a toll on single occupant drivers to use HOT lanes. Currently HOT lanes are accessible to buses, taxis, emergency vehicles and carpools	Yes	No
Parking Space Levy	New revenue through a special	Yes	No

	levy on non-residential, off-street parking spaces		
Frontage or Area-based Property Tax	Tax based on the size of a property to encourage densification and more intensive land use.	Yes	Not directly. However,the City could potentially use Residential Subclassing as a means to do this. Requires more investigation.
Density-based Property Tax	Tax based on the size of a property to encourage densification and more intensive land use.	Yes	Not directly. However, City could potentially use Residential Subclassing as a means to do this. Requires more investigation.

3.3 Residential and Non-residential Balance

Property taxes constitute over half of the City's operating revenue. In 2016, residential properties paid 51.3% of the overall municipal property tax collected by the City, while non-residential made up the remaining 48.7%. With a 2016 municipal tax collection of just over $1.4B, each assessment class contributed approximately $700M to the municipal tax base. While each assessment class contributed similar total amounts to the tax base, the residential assessment class ($127.4B) is almost three times larger than the non-residential assessment base ($42.6B). To collect the same amount of revenue from a smaller assessment base, the non-residential tax rate is commensurately higher (with a rate ratio of 2.8 to 1).

City Council has the option of shifting the tax burden toward one class. Taking other considerations into account, if the residential contribution were increased the non-residential contribution would decrease and the tax rate ratio would shrink. If the non-residential contribution were increased, the residential contribution would decrease and the tax rate ratio would expand. It should be noted, however, that the tax rate ratio can also be impacted by market value changes if those changes occur irregularly

between assessment classes.

At present, there is no set policy on the contribution of the two classes. Without directly changing contributions, the primary factor that affects contribution is real growth, defined as new construction that adds value to a property. While the residential base makes up approximately 74% of the total assessment base, residential growth over the past six years has accounted for about 78% of all growth. This slowly slants tax contributions to the residential side.

Generally speaking, residential property drives City costs because residential properties typically utilize more City services and require more linear infrastructure. When residential grows as a proportional amount of the total tax base, greater pressure is put on the City's budget. To this end, it is generally considered important to maintain a healthy balance between residential and non-residential assessment bases. Proportionately higher growth in residential properties is a phenomenon experienced by the majority of the municipalities in the Edmonton region; put in a regional context, Edmonton has one of the highest proportions of residential property.

Figure 3.6 Regional Assessment (2014)

Municipality	Total Assessment	Residential	Non-Residential	Linear	M&E	Res	Non-Res
Edmonton	153,611,187,604	111,661,916,784	39,250,791,760	1,779,572,460	918,906,600	73%	27%
Fort Saskatchewan	5,238,958,070	2,929,957,400	975,789,660	103,784,380	1,229,426,630	56%	44%
Leduc	4,946,810,330	3,433,663,970	1,462,534,600	48,160,760	2,451,000	69%	31%
Leduc County	7,129,000,000	2,473,500,000	3,243,424,070	1,274,049,300	138,026,630	35%	65%
Parkland County	8,859,287,830	5,489,999,520	1,419,808,890	1,719,606,360	229,873,060	62%	38%
St. Albert	10,520,103,020	9,102,366,730	1,310,634,280	77,470,310	29,631,700	87%	13%
Spruce Grove	4,614,732,760	3,835,771,500	743,219,910	33,636,350	2,105,000	83%	17%
Stony Plain	2,359,234,800	2,025,556,230	309,913,120	23,141,180	624,270	86%	14%
Strathcona County	30,172,706,000	16,144,146,906	3,791,804,744	740,619,350	9,496,135,000	54%	46%
Sturgeon County	5,615,153,840	3,437,227,730	786,713,520	456,224,690	934,987,900	61%	39%
Overall	233,067,174,254	160,534,106,770	53,294,634,554	6,256,265,140	12,982,167,790	69%	30%

Specific non-residential property types, such as offices, retail and shopping centres tend to increase at a rate proportionate to residential growth, but industrial growth can often take place outside Edmonton's borders in the surrounding region. Those regional municipalities surrounding Edmonton that boast proportionality higher non-residential to residential assessment bases typically benefit from higher industrial and linear property (pipeline, transmission lines etc.) bases.

This disproportionate share of non-residential assessment is compounded by the serviceable population within each municipality. The following chart shows a breakdown of non-residential assessment value per person within the municipality. Those municipalities with higher non-residential assessment are more easily able to maintain lower tax rates.

Figure 3.7 Non-Residential Assessment by Population (2014)

Rank (Low to High)	Municipality	Non-Residential Taxable Assessment	Population (2011 Federal Census)	Non-Res Assessment per Person
1	Stony Plain	$324,176,720	15,051	$21,539
2	St. Albert	$1,388,433,290	31,466	$22,589
3	Spruce Grove	$766,566,060	26,171	$29,291
4	Edmonton	$41,030,364,220	812,201	$50,518
5	Leduc	$1,513,146,360	24,279	$62,323
6	Parkland County	$,3,369,288,310	30,568	$110,223
7	Sturgeon County	$2,177,926,110	19,051	$114,321
8	Fort Saskatchewan	$2,309,000,670	19,051	$121,201
9	Strathcona County	$14,028,559,094	92,490	$151,676
10	Leduc County	$4,655,500,000	13,541	$343,808

Addressing the disparity in industrial assessment distribution can either be achieved by competing with the region for a larger share of new industrial growth, or by entering into regional partnerships to share revenues and costs.

Limiting the focus to changes within Edmonton, questions have arisen in the past about the amount of non-residential growth that would be required to reach a 70/30 split between residential and non-residential assessment. This split is often the focus of

discussion because it is the overall split between residential and non-residential in the greater Edmonton region. Before addressing this question, it is important to note that both real growth and market changes can affect the split. Over the long term, however, market changes should theoretically even out between property tax classes.

Looking at Edmonton's total assessment in 2016, non-residential would need to grow by $10B in order to reach 30% of the total assessment base. Such growth is significant and represents a 22% increase to the existing non-residential taxable assessment base. This is equivalent to building slightly more than an additional downtown and assumes no additional residential growth. Modeling residential and non-residential growth into the future, the non-residential figure would be substantially higher and over and above Edmonton's current non-residential growth. Without putting a projected end goal on the value, the City could generally aim for 30% non-residential growth as a percentage of the total growth over time. If the City met this target every year, it would take more than 100 years to reach the 70/30 split. Measuring non-residential growth as a percentage of overall growth could be considered as an indicator of the City's economic health.

3.4 A Regional Perspective

In September 2015, the Metro Mayors Alliance asked respected regional leaders with deep knowledge of this region representing a range of backgrounds to provide some advice on how to position the Edmonton Metro Region to compete and succeed in today's global realities.

In their report entitled "Be Ready, or Be Left Behind" the Panel found that currently municipalities compete with each other for infrastructure funding from the provincial and federal governments, and that they do not define joint projects that would strengthen benefits for the region as a whole. The panel recommended that a Metro Mayors Alliance establish a structure with the capacity and authority to facilitate and act upon regional land use planning and regional infrastructure development.

The panel articulated the complex linkages that exist between municipalities within the confines of a city-region, It confirmed that the critical infrastructure that underlies the regional economy doesn't reside within a single municipality. It concluded that many services funded and delivered by the City of Edmonton (e.g. transit, an integrated road system etc.) support economic growth beyond the city's boundaries. No municipality can attribute its success solely to its own actions, and as a result, it should share a portion of the benefits it enjoys with the greater region that made it possible.

Also, giving the example of a manufacturer in Edmonton, the panel concluded that Edmonton also relies on adjacent municipalities to enable success. The panel brought forward the inter-municipal cooperation as a means of more efficient infrastructure investment, advocating for cost and revenue sharing.

They cited the example of Minneapolis-St. Paul, where each municipality contributes 40 percent of its annual growth in commercial industrial tax revenues to a pool of investment dollars that is distributed to participating municipalities based on local capacity. The Panel advocated that municipalities in the Metro Region should adopt its own “shared investment, shared benefit” model, one that reflects the particular circumstances and interdependence of this region.

They also recommended that the Metro Mayors provide for a Joint Committee on Infrastructure to identify and support regionally significant infrastructure projects. This committee would determine regionally significant priorities and support regional goals across the “triple bottom line.” Additionally, it would seek funding from other orders of government, public authorities and the private sector.

The report concluded that the Metro Region is better served with a collaborative voice on significant regional infrastructure priorities, representing over one million people and presenting a united case to other orders of government on the infrastructure funding priorities for the Edmonton Metro Region. The proposed Municipal Government Act amendments call for a renewed regional Growth Management Board that would ensure such collaboration through land-use planning, servicing of growth, regional service delivery, cost sharing, and dispute resolution. This change will foster good governance and promote efficient land use and infrastructure planning.

Eventually, investment dollars for regional infrastructure may be pooled and leveraged for optimal regional benefit. Municipalities will act with a “shared investment, shared benefit” philosophy to make capital investments in regionally significant infrastructure that supports the Metro Region becoming globally competitive. The pooling of investment dollars enables greater “bang for the buck,” providing benefits to Metro Region taxpayers.

4.0 ASSESSING DOWNSTREAM IMPACTS

New development brings additional traffic to roads and can negatively impact congestion levels on roads and quality of life for residents if the transportation infrastructure needed to support the development is not in place.

4.1 Edmonton's Current Practice

Currently, transportation infrastructure requirements for development in new growth areas are assessed through a Transportation Impact Assessment (TIA) completed in association with new development. The TIA includes analysis of anticipated transportation operations based on forecasts of travel demand for a particular area. This practice is typical across North America.

Population Assumptions in Edmonton Regional Travel model

A neighbourhood TIA is analyzed for the full build out of a neighbourhood, using the City's long-term Regional Travel Model to account for background traffic and the cumulative effects from other developments. The City maintains and operates the Regional Travel Model to provide analytical support to infrastructure projects and to test transportation policies. The Regional Travel Model uses travel behavior and travel patterns observed from household travel surveys, population and employment growth assumptions and road and transit infrastructure improvement projects as outlined in Transportation Master Plan to forecast estimated traffic volumes throughout the transportation network.

The scope of analysis for each TIA typically includes analysis of the operations of key intersections within the plan area as well as adjacent interchanges used to access the plan area. Also included are additional roadway intersections adjacent to, but outside, the plan area, that are anticipated to be impacted by the proposed development.

The TIA assessment is utilized for the Arterial Roadway Assessment (ARA) program to adequately capture infrastructure costs that can be attributed to a particular development. Those costs are assigned to developers in an area. The Arterial Roads for Development Bylaw defines the obligations of landowners to cost share arterial road construction at the time of subdivision or when obtaining the development permit. The MGA provides the guidance and limitations for collection of levies. Current practice under the ARA policy and procedure is to require that developers cost share the first

four lanes of arterial roadways and associated traffic signals within a developing area and the right-of-way along the arterials to accommodate the equivalent of six lanes. Land for transit centres is also included within the ARA but LRT and freeway right-of-way is not included. In some cases, developers of a basin have agreed to include a contribution towards a nearby interchange; this is not standard practice.

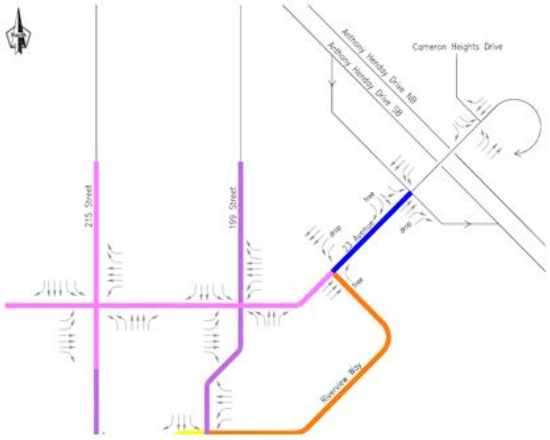
4.2 Case Study of Riverview

The Riverview Area Structure Plan (ASP) and first three Neighbourhood Structure Plans (NSPs) provide a good case study of how the downstream costs of development are currently determined in Edmonton.

Riverview ASP Location

With the preparation of the first three NSPs in the Riverview ASP (The Uplands, River's Edge and Stillwater), a TIA that analyzed the traffic impacts of full development of the entire ASP area was completed. The TIA looked at the roadway network internal to the ASP as well as traffic impacts on two intersections.

The full build out analysis identified the need for upgrades to the existing Cameron Heights / Anthony Henday Drive interchange, including recommendations on the ultimate configuration for the interchange as well as the need for the construction of portions of 215 Street and 23 Avenue to a six-lane divided arterial standard. However, based on the limitations of Edmonton's ARA bylaw and policy, the City cannot require developers to contribute to interchange construction or improvements, nor can the City require developers to construct arterial roads beyond a four-lane divided arterial cross section.

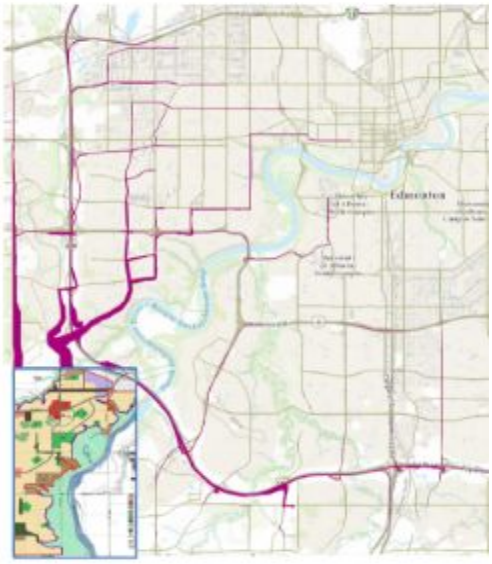


Recommended Arterial Roadway Geometry for Riverivew ASP

As part of the review process, the City undertakes high-level estimates for work which would fall outside the ARA bylaw. In the case of Riverview, the largest associated costs are the upgrades to the interchange, which may range from $15 million to $45 million depending on the magnitude of upgrades required at the Wedgewood Creek bridge and the North Saskatchewan River bridge.

Subsequent discussions with area developers resulted in a voluntary $10 million contribution being included in the ARA bylaw for the Riverview ASP. However, widening of 23 Avenue and 215 Street to a six lane cross-section, while necessary to accommodate development, will fall on the City to complete.

The Riverview TIA also analyzed the development threshold when the interchange upgrades may be necessary. This analysis allows the City to initiate a planning study to determine the interchange configuration and the timeframe when the interchange upgrades should be considered for capital funding.



Anticipated Downstream Impacts of Riverview (50% Build-out)

The current approach ensures that arterial roadways are constructed within developing areas, generally funded by landowners within the areas. However impacts of the project on the greater transportation system are not fully addressed. For example, based on a high level population and employment growth, and network assumptions, the exhibit shows the anticipated downstream impacts on transportation network during morning peak hour when Riverview will be 50% build out.

4.3 Approach of Other Jurisdictions

A Transportation Impact Assessment (TIA) is a commonly used tool in North American cities to assess the downstream impacts of growth on the transportation network. Typically, a TIA provides an assessment of the potential number of vehicle trips generated by a development, but may also include an evaluation of trip generation for other modes, including transit, pedestrians, and cyclists. TIAs may vary in scope and complexity depending on the type and size of the proposed development, which may

range from a specific project with a single development permit to a large neighbourhood plan. In general, the study area for a TIA should extend far enough to contain all municipal, regional, and provincial roadways that will be noticeably affected by the travel generated by the proposed development.

The practices of many North American jurisdictions and Western Australia have been researched and are summarized below:

1. *Calgary*: Similar to Edmonton, a TIA, based on the full build out of the development, is required for all development types, including land use amendments and outline plans; the requirements of the TIA also include the identification of off-site improvements necessary to support the development.

2. *Lethbridge*: The area of influence for a TIA includes all roads, ramps, and intersections where the development contributes 5% or more of the overall traffic using the roadway and where the traffic demand is approaching the capacity of the roadway or intersection; the assessment horizon is based on the full build out of the development (from 10 to 30 years).

3. *British Columbia*: Development Cost Charges (DCCs) allow monies to be pooled from many developers so funds can be raised to construct the necessary services in an equitable manner; the municipality can be considered the coordinator of the capital program and administrator of the funds collected. DCCs may be area-specific (each area has its own set of DCC projects with a distinct charge for a particular type of land use within the defined area) or municipal-wide (the same DCC rate is applied for a particular type of land use deemed to generate a similar capital cost burden throughout the municipality, regardless of the location of any specific development). The recommended best practice for the extent of application for road charges is to establish road DCCs on a municipal-wide basis, in accordance with the municipality's Transportation Master Plan; this approach serves to reduce administrative effort, facilitate cash flow and provide funding flexibility. The time horizon for application of a DCC may defined as either build out (20 to 25 year horizon) or revolving (based on a defined time period, typically five to 10 years), and the cost calculation may be predicated on a lot, or dwelling unit basis (either by area or number of units). DCC bylaws require ministerial approval.

4. *San Diego, California*: The area of influence for a new development is based on

an analysis of the incremental increase in demand which varies in accordance with existing congestion levels; for example, up to a 10% increase in demand due to the site-generated traffic is acceptable for a roadway with very little existing congestion, whereas only a 2% increase in demand is allowable on roadways which are currently experiencing mild to severe congestion.

5. *State of Oregon*: Study area size for a TIA is based on size of development, ranging from site accesses and adjacent intersections for small developments, to all major intersections and state highways within one mile for large or multi-phase developments; horizon years also vary with development type, but are based on opening year rather than build out.

6. *States of Florida and Washington*: "Concurrency Analysis" is a growth management concept that ensures necessary public facilities and services are available concurrent with the impacts of development. Local governments define what constitutes an adequate level of service and determine whether the service needs of a new development exceed existing capacity (including any scheduled capital improvements). If adequate capacity is not available the developer must provide the necessary facility or service improvements to proceed, a monetary contribution toward such improvements. Otherwise, the development is deferred until local and/or state governments provide the necessary improvements.

7. *Broward County (Fort Lauderdale), Florida*: Transportation concurrency is addressed with two types of concurrency districts: Transit-oriented Concurrency Districts and Standard Concurrency Districts. A Transit-oriented Concurrency District is a compact geographic area with an existing network of roads where multi-modal choice is available for common trips, whereas a Standard Concurrency District is an area where roadway improvements are anticipated to be the dominant form of transportation enhancement. For a proposed development project in a Transit-oriented Concurrency District, the County charges an assessment which is used to fund enhancements to the County transit program.

8. *Austin, Texas*: Employing the concept of "rough proportionality," developers are required to provide contributions for physical improvements to the transportation network. However, these contributions are not confined to any specific project, but rather an identified set of transportation improvements. One limitation of this approach is that it is often difficult for jurisdictions to guarantee the remaining

funds necessary to construct the specified improvements. Collected fees, if unused, are required to be refunded after a certain amount of time. Some jurisdictions address this issue by requiring the developer to fully fund an improvement in lieu of other payments for other improvements where the cost of the funded improvement is roughly proportional to the impact of the development. Fees are typically calculated on a per unit basis (number of dwelling units, area in square feet, or trips generated).

9. *Other U.S. states*: Some states use Transportation Impact Fee Programs (a form of rough proportionality) based on capital improvement programs (CIPs) which identify transportation needs of the surrounding area; fees are collected from every development, regardless of their specific impacts, in proportion to the overall costs attributable to growth. For example, some cities calculate fees as a cost-per-vehicle trip generated, and have used cost calculations based on average costs per vehicle mile. Under this method of fee collection, jurisdictions take a larger view of their transportation network, including plans for transit and active modes, as well as specific area or corridor plans. It is worth noting that fees cannot be collected to resolve existing traffic issues, but only costs attributable to growth.

10. *Western Australia (including Perth*): Development contributions cover the "standard" infrastructure needs for a development (roads, drainage, utilities, reserve for parks and schools). In addition, developers can be asked to contribute to the capital costs (including administration, land, design and construction costs) associated with "community infrastructure" (which includes recreational facilities, libraries and other cultural facilities, etc.). The community infrastructure plan for an area must identify the facilities and services required over the next five to 10 year as well as the methodology to be used to proportion "growth" costs to developers, as documented by a Development Contribution Plan (DCP) within a defined Development Contribution Area (DCA). DCPs require justification for the required infrastructure and its associated DCA, appropriate costs of the infrastructure and a commitment to providing the infrastructure within a reasonable time period. DCPs require ministerial approval. In cases where the DCP identifies infrastructure required with the first development in a DCA or where that infrastructure is primarily located on a single developer's land, the local government may mandate that this work is undertaken in its entirety. In this case, a credit may be granted to the developer to offset future contributions or the developer is reimbursed over time by other

developers.

Each municipality is unique in its circumstances; the above examples illustrate that there is no single method to assess downstream impacts of growth. The examples demonstrate, however, that there are various options for consideration, in the Edmonton context, to determine developer contributions.

4.4 Key Themes

Edmonton's requirements for developer contributions to roadways are similar in principle to many other jurisdictions. Regardless of development size, a TIA is typically used to determine the number and type of trips generated by the development in order to estimate the influence of the additional transportation demand on the transportation system. Most often, the horizon year for assessment is based on the full build out and occupancy of the development.

Infrastructure costs should be paid by those who will use and benefit from the infrastructure improvements. The allocation of infrastructure costs to address the downstream impact of growth must consider the equity between existing taxpayers and developers / newcomers attracted by development as well as the impact on housing affordability and/or the possibility of stifling development.

Applying the concepts of municipal-wide development cost charges, rough proportionality or a transportation impact fee approach can ensure a jurisdiction's vision of a wider transportation network, featuring all modes of travel and serving both existing and future travel demands, will be realized. It is notable that whenever developer responsibility for infrastructure extends beyond the immediate development area, the infrastructure improvements are clearly defined beforehand, in a five- to 10-year capital plan. Regardless of approach, it is generally agreed that developers should only fund the infrastructure that is reasonable and necessary to support the development over the life of the development, and that an equitable, consistent, and transparent methodology for arriving at developer contributions is essential.

5.0 LIMITATIONS

The task of responding to Council's motion involves two things: describing

comprehensively the cost and revenue drivers for sustainable city growth, and recommending future steps to improve efficiency and effectiveness for both the public and private sectors as Edmonton grows and changes. Examination of the issues outlined in the motion reveals a complex degree of interrelationships that results in five primary limitations on progress to date:

1. There are significant data limitations—at this point in time—to examine the matter at an appropriate level of complexity. The data is limited to the Urban Growth Areas when the appropriate scale of study is the city and region.
2. There are limited human resources available to compile the data needed to examine the cumulative impacts of growth at the scale of the city and region.
3. The scale of study needed will take more time than has elapsed to date.
4. Analysis to date is broad in nature and does not involve the depth required to understand the interconnectivity between the components of the motion. (For example, examination of cost drivers cannot take place separate from examination of service levels.)
5. The timing of the Advisory Committee's work did not align with opportunities to inform the provincial review of the Municipal Government Act.

6.0 NEXT STEPS

In conducting its work, the Advisory Committee tested assumptions and actively explored various ways of looking at data. Progress to date has been foundational for ongoing work on assessing the cumulative fiscal impacts of growth in Edmonton.

The Advisory Committee will review its membership to ensure the expertise and perspectives needed to further this work are present. Expected actions, culminating in recommendations to Executive Committee, include:

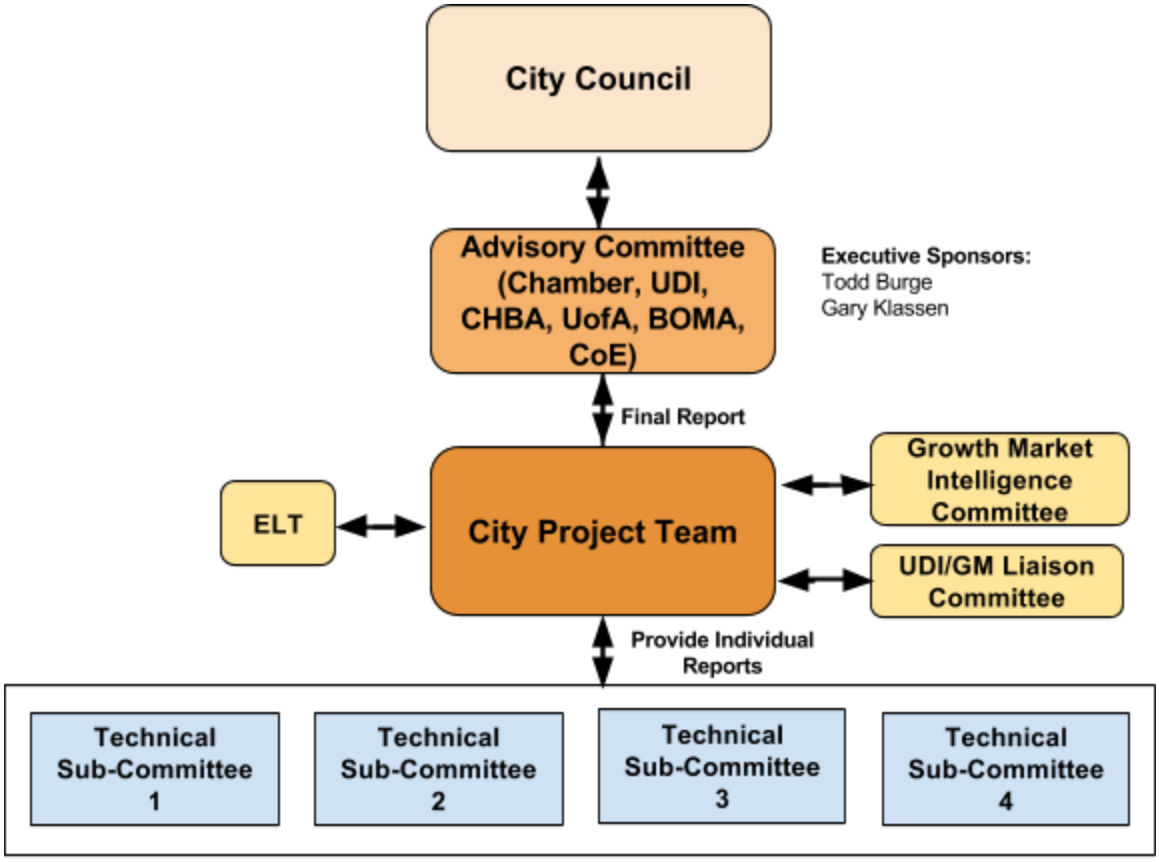
- Examine in detail cost drivers internal to the City and for the development industry
- Research in detail cost allocation options applicable to our enabling legislation
- Research downstream financial impacts for drainage and parks
- Examine development standards and propose revisions that can reduce costs
- Examine cost allocation practices to ensure equity for all parties
- Support the City's focus on regional planning and economic development
- Consider the costs of growth beyond the three growth areas, out to the city

region.

APPENDIX A: Committee Composition and Structure

To respond to April 5, 2016 Council motion, Administration established an Advisory Committee composed of administration, the development and building industry, academia and financial institutions. The Advisory Committee and City Project Team is supported by several technical committees. Each committee met on an ad-hoc basis depending on the expertise of members in relation to the issues discussed.

Committee and Subcommittee Structure



**The number and subject of Sub-committees, as well as representation (internal and external), will be determined as required to support the various themes pertaining to the report and motion.*

Advisory Committee Membership

Name of Representatives	Branch/Department/ Organization
Brad Armstrong	Urban Development Institute Edmonton Region
Todd Burge	Chief Financial Officer and Treasurer, Deputy City Manager, Financial and Corporate Services
Jason Fjeldheim	Urban Development Institute Edmonton Region
Bard Golightly	Christenson Group of Companies (CHBA)
Ryan Kelly	Deputy Chief of Staff, Office of the Mayor
Gary Klassen	Deputy City Manager, Sustainable Development
Real Lafrance	Brookfield (CHBA)
Bradley Leeman	Director, Lifecycle Management, Integrated Infrastructure Services
Mel McMillan	Professor Emeritus, University of Alberta
Peter Ohm	Chief Planner and Branch Manager, City Planning, Sustainable Development
Janet Riopel[1]	President and CEO, Edmonton Chamber of Commerce
Rod Risling	Branch Manager, Assessment and Taxation, Financial and Corporate Services
Paul Ross	Branch Manager, Economic and Environmental Sustainability, Sustainable Development
Percy Woods	President and Chief Staff Officer, Building Owners and Managers Association

[1] *Edmonton Chamber of Commerce withdrew as the presence of its partners UDI, CHBA and BOMA adequately represents the interests of the Edmonton Business Community for the purposes of this work*

	(BOMA) Edmonton
Todd Wyman	Director, City Planning, Sustainable Development

Technical Committee Composition

Name	Organization
Khalid Aziz	City of Edmonton
Arun Bhowmick	City of Edmonton
Kenneth L.Cantor	PRIMAVERA Development Group Inc.
Sandeep Datla	City of Edmonton
Russell Dauk	Rohit Group of Companies
Gilbert Davis	City of Edmonton
Dan Hanson	IMPACT Consulting
Steve Jensen	City of Edmonton
Audra Jones	City of Edmonton
Shaffin Khirani	City of Edmonton
Michael Kohl	Brookfield Residential
Thomas Lumsden	City of Edmonton
Mel McMillan	University of Alberta
Timothy Morrison	13 Ways
Anthony Patenaude	Humford Management Inc.
Milap Petigara	City of Edmonton
Larry Semeniuk	G3 Development Services Inc.
Patrick Shaver	Avillia Developments Ltd.

Anton Szabo	City of Edmonton
Rhonda Toohey	City of Edmonton
Dan-Christian Yeung	City of Edmonton
Adil Virani	City of Edmonton
Alannah Webb	City of Edmonton
Jim Wood	City of Edmonton

City Working Group

Lara Arjan	Senior Planner - City Planning (Urban Analysis)
Barnali Banerjee	Infrastructure Policy Advisor- Infrastructure Planning and design
Lindsey Butterfield	Acting Executive Director - Regional Planning
Shaffin Kherani	Acting Corporate Infrastructure Manager-
Bradley Leeman	Director, Lifecycle Management, Integrated Infrastructure Services
Tom Lumsden	Director-City Planning (Subdivision and Development Coordination)
Milap Petigara	Principal Advisor- Financial Strategies and Budget
Paul Ross	Branch Manager - Economic and Environmental Sustainability
Hande Roy	Senior Policy Advisor - Intergovernmental and External Affairs
Adiba Sanjana	Principal Planner - City Planning (Urban Analysis)
Anton Szabo	Principal Policy Advisor - Assessment and Taxation
Rhonda Toohey	Director- City Planning (Policy Development)

Todd Wyman	Director-City Planning (Network Integration)

APPENDIX B: UPDATE ON THE LEGISLATIVE FRAMEWORK

The Municipal Government Act (MGA) guides how municipalities govern, plan and fund their operations. The MGA focuses on three areas: governance and administration, planning and development, and assessment and taxation. Given that the last major consolidation of the MGA took place in 1994, the Government of Alberta embarked on a province-wide consultation process to seek feedback on the MGA in 2014. On April 10, 2017, the Minister of Municipal Affairs introduced *Bill 8: An Act to Strengthen Municipal Government in the Legislature*. The proposed amendments follow consultation with municipalities and stakeholders on the MGA Discussion Guide released by the provincial government in November 2016.

The Government of Alberta formally started the MGA review process in 2014. Changes to the MGA have been introduced through three Bills: Bill 20, Municipal Government Amendment Act, 2015; Bill 21, Modernized Municipal Government Act; and Bill 8, An Act to Strengthen Municipal Government. Subject to the provincial legislative process, it is anticipated that Bill 8 will receive Royal Assent prior to the end of the Spring Session, and will, along with the remaining provisions of Bill 20 and 21, come into force prior to the next general election.

As part of the MGA Review process, all MGA regulations were reviewed to ensure alignments with the amendments made by Bill 20 (2015) and Bill 21 (2016). City Administration participated actively in the review and development of the MGA regulations and provided feedback on the regulations that will impact the City.

In January 2017, the Government of Alberta released the first bundle of draft MGA regulations for 60-day public review and feedback. Administration reviewed the regulations in the first bundle and have no significant concerns regarding their impact on the City. The next round of draft regulations is expected to include a larger number of regulations and is scheduled for public release in late spring 2017. Administration will continue to participate in the review process and will prepare an official submission for Council's approval at that time. All amendments to the MGA, including regulations, are expected to come into force before the 2017 municipal elections.

Edmonton has evolved into a complex modern corporation and has taken on bigger and more important roles including homelessness, social housing, poverty issues and delivery of major infrastructure needs such as transit. Understanding the unique challenges and opportunities Alberta's largest cities—Edmonton and Calgary—faces every day, the Government of Alberta signed an agreement in October 2014 to develop City Charters that provides unique approaches to delivering the services citizens need and expect.

Throughout 2016, the City of Edmonton, along with the City of Calgary and Government of Alberta, continued to work on developing draft policy proposals for the City Charter on administrative and government efficiency, community well-being, community planning, environmental stewardship and fiscal matters. Public engagement sessions were held in October 2016 to share the results of the above work.

The final work involves developing a financial framework that will support the needs and challenges of the two cities and the Province. A fiscal framework would include revenue sources that align with potential shifts in roles and responsibilities. This could enable the two cities to use a mix of tools over time that are responsive to changing economic circumstances.

ANNEX A: GRANT THORNTON: THIRD PARTY ANALYSIS: INTEGRATED INFRASTRUCTURE MANAGEMENT PLAN

Integrated Infrastructure Management Plan (IIMP)

Third Party Analysis

Grant Thornton
An instinct for growth™

Urban Development Institute
EDMONTON REGION

Project Intent

Grant Thornton LLP (Grant Thornton) was retained by Urban Development Institute-Edmonton Region (UDI-ER) to perform a third party review of the City of Edmonton's (the City) "Integrated Infrastructure Management Plan - Cumulative Impacts" February 2016 Report (IIMP Report), with the intent to fully identify and review the assumptions, methodology and scope of the IIMP Report.

Findings

1. Initial capital costs account for a small proportion of all life cycle costs: Of the total costs borne by the City across all three Urban Growth Areas (UGAs) examined in the IIMP Report, a small proportion (12%) is accounted for by capital costs, while over two-thirds of the total costs (70%) are represented by operational expenditures over the 50 year forecast period. As such, a scenario which increased/decreased all capital costs by 10%, only increased/decreased total costs by 2%.

2. Operating cost for busses and police, and renewal costs for roads represent the largest areas of costs: The operating costs for bus operations across the three UGAs accounts for the largest proportion of all costs at $2.33 billion, representing 23% of all capital, operating, and renewal costs borne by the City ($10.34B). Likewise, the operating cost forecast for police facilities and equipment is $2.10 billion. The renewal costs for roads and interchanges described in the IIMP Report are $1.4 billion, or 14% of all City borne costs.

3. Additional revenues from the EPCOR Water and Wastewater Franchise Fee, and Drainage Local Access Fee are required: These are viewed to be as obtainable as the franchise fees paid by ATCO Gas and EPCOR Electric, which are included in the IIMP Report. As such an additional $256M in revenues are estimated to be added given the growth in residential and commercial customers.

Scenario Analysis

In addition to the scenario which added revenues from EPCOR and the Drainage Utility, scenarios which included a +/- 10% change in capital costs and +/- 5% change in operating costs for public infrastructure investment were selected. These were determined collaboratively with City staff given that much of the costing analysis presented in the IIMP Report is high-level in nature, and specific assets have no/little project definition. Furthermore, given the magnitude of the roadway renewal costs ($1.4 billion in renewal costs, or 14% of all City borne costs), a scenario was selected to test these costs by extending the timing of reconstruction to 36 years, rather than 26 years (keeping resurfacing at 18 years after original construction).

Collectively, the scenario analysis revealed that these reasonable input variable changes can have major impacts to the original shortfall for public infrastructure costs. The original shortfall of approximately $1.35 billion may be as high as $1.61 billion (combined worst-case scenario) or may be as low as a positive $37 million (i.e. a $37 million surplus; combined best-case scenario). As such, this large range in potential outputs reiterates that the IIMP Report can be accompanied by further work from industry and the City (such as the work being undertaking by the Cost of Growth Advisory Committee) to refine an approach to determine the costs and revenues of growth in the City.

Observations

1. The analysis presented in the IIMP Report appears to be generally reasonable provided that outputs are interpreted as stated in the IIMP Report (i.e. **to provide high-level analysis for information, and not to be used for policy making on a stand-alone basis**).

2. While described in the IIMP Report, it is important to recognize that the shortfall includes the costs and revenues associated with the primarily residential UGAs, but **it does not quantify the value created for the City from revenue generating, off-site areas such as commercial or business employment centers**.

3. **The IIMP does not take into consideration the terminal value of any costs and revenues after the end of the 50 year forecast period.** While operating and renewal costs would continue to accrue, revenues at full build-out across all UGAs (anticipated to be $299M annually starting in forecast year 2054, year 39 of the forecast) are likely to remain in the future. Furthermore, the methodology employed in the IIMP Report does not account for the time value of money (a best practice for life cycle costing whereby the value of money today and money that will be spent in the future are not equal).

Grant Thornton

An instinct for growth™

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Final Report

Integrated Infrastructure Management Plan (IIMP)

Third Party Analysis

Urban Development Institute – Edmonton Region

October 24, 2016

Confidential

Contents

1 Executive Summary

1.1 Project Overview

In June 2016, the Urban Development Institute-Edmonton Region (UDI-ER) retained consulting firm Grant Thornton LLP (Grant Thornton) to perform a third party review of the City of Edmonton's (the City) "Integrated Infrastructure Management Plan - Cumulative Impacts" February 2016 report (IIMP Report). The objective of this project is to fully identify and review the assumptions, methodology and scope of the IIMP Report before policy direction is set by the City.

1.2 Background

The IIMP Report presents high-level analysis on the cumulative cost and revenue impacts of three selected greenfield Urban Growth Areas (UGAs) located within, but near the parameters of City boundaries: Decoteau (southeast), Horse Hill (northeast), and Riverview (southwest).

Integrated Infrastructure Management Planning (IIMP) and its accompanying Development Infrastructure Impact Model (DIIM or "Model") are the two key components of the IIMP Report. IIMP is a "process for gathering, synthesis, presentation and use of data related to the provision of infrastructure to the three [UGAs]". The intent of IIMP "is to provide [Edmonton City] Council with information about the infrastructure required for the Urban Growth Areas' development, how it relates to existing infrastructure, timing, and the implications to the City's operations"[1]. While the IIMP is process focused, the DIIM is the Microsoft Excel-based 50 year model designed to forecast future costs and revenue potential for the City. The IIMP Report presents the combined results of the independent Models created for the three UGAs.

The cumulative IIMP for the three UGAs over the 50 year forecast horizon results in the following approximate values[2]:

Funding Source	2016 Dollar Values
Developer Funded Infrastructure Investment	$3.81 billion
City/Province/Other Sources Infrastructure Capital Investment	$1.22 billion
City/Province/Other Sources Operations, Maintenance, Renewal Investment	$9.10 billion
Total City/Province Infrastructure Investment	**$10.32 billion**
Revenues Expected	$8.97 billion
Shortfall	**$1.35 billion**

[1] IIMP Report, Attachment 1, Page 1 of 20.
[2] Slight variances from figures noted in IIMP Report, confirmed with City on August 7, 2016.

As noted in the previous table, on a combined basis, the three UGAs are noted to result in a shortfall of $1.4B over the 50 year forecast period equivalent to $27 million per year.

1.3 Project Approach

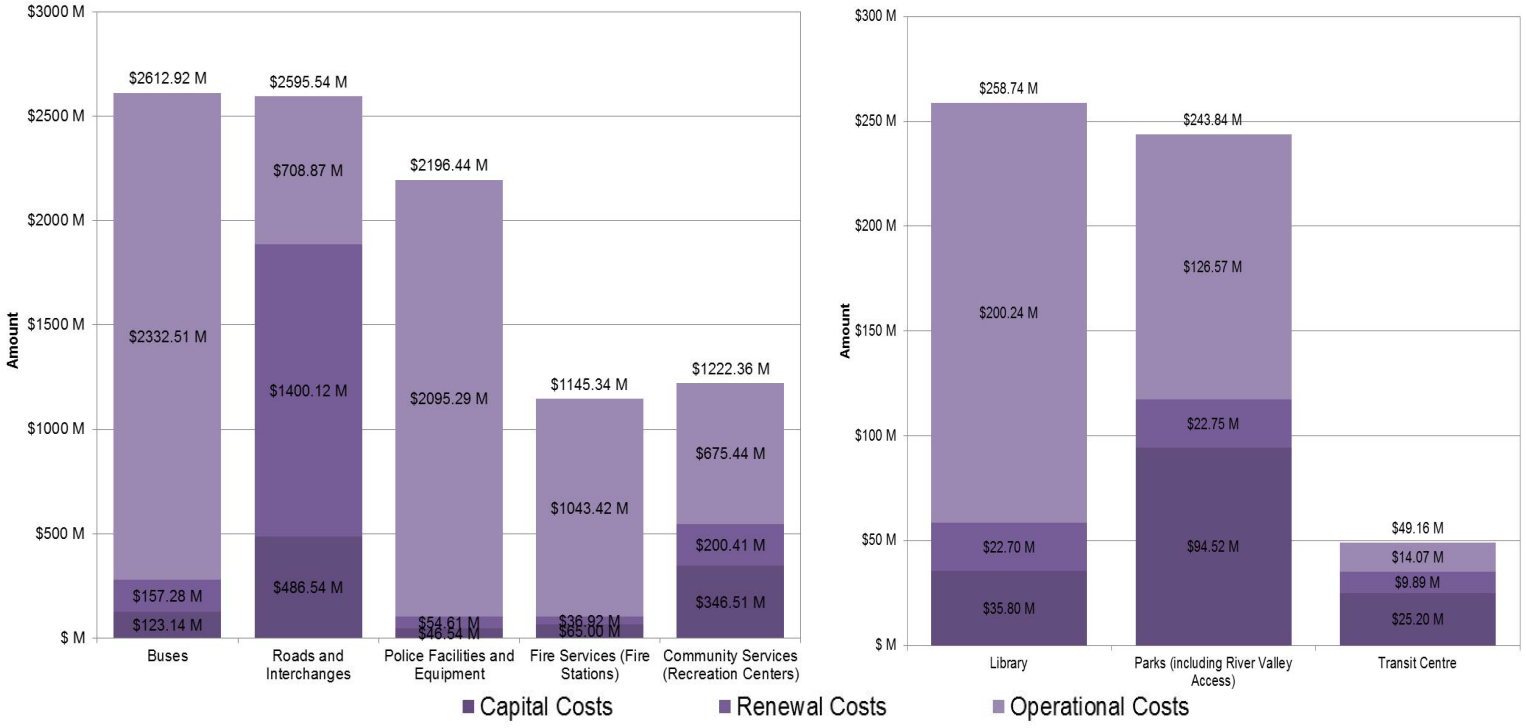
Grant Thornton implemented a four phased approach to undertake this project. This included significant consultation and collaboration with City staff as well as with UDI-ER.

1.4 IIMP & DIIM Review

As with all forecast models, input assumptions are required to calculate cost and revenue outputs. Section 3 details the methodology, input assumptions, and outputs of the DIIMs used for the three UGA that form the basis for the IIMP Report. The following table provides a breakdown of the output costs borne by the City across all three UGAs. Note that of the total costs borne by the City, a small proportion (12%) is accounted for by capital costs, while over two-thirds of the total costs (70%) are represented by operational expenditures over the 50 year period.

Cost Category	Millions 2016$	Percentage
Capital Costs	$1,223M	12%
Renewal Costs	$1,905M	18%
Operational Costs	$7,196M	70%
Total	**$10,324M**	**100%**

The following graphs illustrate the relative ranking of infrastructure asset categories by their total costs. The graph on the left illustrates infrastructure asset categories with greater than one billion in total costs over the 50 year forecast period, while the graph on right illustrates those infrastructure asset categories with less than one billion in total costs. Note the differences in the vertical axis values for both graphs.



As shown in the above graphs,

1.5 Scenario Analysis

Multiple scenarios were analyzed based on output data provided by the City. The scenarios and their resulting impacts are displayed in the following table.

Scenarios	Impact to City Costs / Revenues
Inclusion of EPCOR Water and Wastewater Franchise Fee, and Drainage Local Access Fee	+ $256M in revenues
+/- 10% Capital Costs for Public Infrastructure Investment	+/- $162M in costs
+/- 5% Operating Costs for Public Infrastructure Investment	+/- $354M in costs
Change in Roadway Reconstruction Timing from 26 to 36 Years	- $618M in costs

Based on the scenario analyses, the original shortfall of approximately $1,353M may be as high as $1,613M (combined worst-case scenario) or may be as low as a positive $37M (i.e. a $37M surplus; combined best-case scenario)[3]. It is important to note that this analysis is limited to the scenarios analyses and should not be considered to be a complete analysis of all factors that can influence the shortfall. The scenarios analyzed represent the outcomes of a small sample of potential factors that may increase or decrease the shortfall. Therefore, further sensitivity and scenario analysis should be considered to show ranges in the shortfall that fully incorporate major influencing factors.

1.6 Observations

Based on the information provided by the City, we have described a number of observations in relation to the IIMP and DIIM in Section 5 of this report. These observations are summarized below:

1. Based on the information provided by the City as well as the consultation program conducted, the analysis conducted and presented in the IIMP Report appears to be generally reasonable provided that outputs are interpreted as recommended in the IIMP Report (with few alternatives for consideration stated below). Specifically, the IIMP Report notes that its intent is to provide high-level analysis to provide information. It is not intended to be used for policy making on a stand-alone basis, nor is it to be classified as economic of feasibility analysis.

2. While the quantitative analysis conducted in the DIIMs for each UGA provides a comprehensive perspective of the revenues and costs associated with the primarily residential UGAs, it does not quantify the value created for the City from revenue generating, off-site areas such as commercial or business employment centers. This is however, described in the IIMP Report. When included as part of the analysis, off-site non-residential revenues eliminate the combined shortfall (note that the costs associated with these off-site non-residential areas were not included as part of the analysis presented in the IIMP Report).
3. The produced DIIMs are highly influenced and dependent on the timing and magnitude of costs and revenues. Of the total forecast costs borne by the City across all UGAs, 12% are

[3] The scenario that includes revenues from the EPCOR Water and Wastewater franchise fees, and the Drainage Utility's local access fee is viewed to be as obtainable as the franchise fees paid by ATCO Gas and EPCOR Electric, which are included in the DIIMs. As such, these additional revenues reduce the shortfall for both the combined worst case, as well as the combined best cases.

accounted for by capital costs, 18% are accounted for by renewal costs, and over two-thirds of the total costs (70%) are represented by operational expenditures over the 50 year period. More specifically, the operating costs for buses across the three UGAs accounts for the largest proportion of all costs at $2.33 billion, representing 23% of all capital, operating, and renewal costs borne by the City. The 50 year forecast model does not take into consideration the terminal value of any costs and revenues after the end of the forecast period. While operating and renewal costs would continue to accrue, revenues at full build-out across all UGAs (forecast to be $299M per year starting in forecast year 2054) are likely to remain in the future.

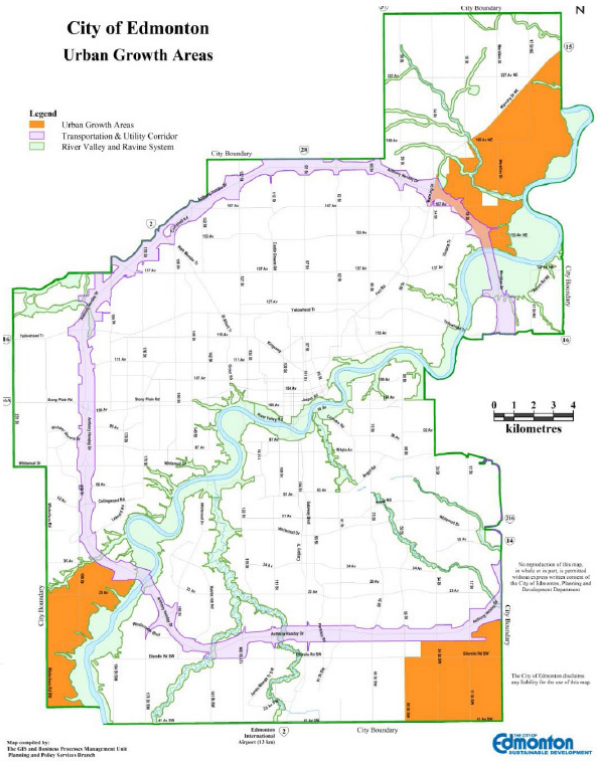
4. The methodology employed in the DIIMs do not account for the time value of money. According to best practices for life cycle costing, costs and revenues that occur at different points in the forecast cannot be compared directly due to the varying time value of money. They must be discounted back to their present value through the appropriate equations (further described in Section 5).

5. While the focus of this engagement was to better understand the costs and revenues attributable to the City, it was noted during the consultation program that developer funded infrastructure noted in the IIMP Report did not include developer contributions for water mains, earthmoving, parks, planning, as well as required contributions of lands for the City (i.e. municipal reserve lands).

2 Introduction

2.1 Project Background

In response to a motion passed by the City of Edmonton (the City) Executive Committee on July 8, 2015, City Administration has prepared a report outlining the cumulative impacts that relate to the Growth Strategy Implementation initiatives within the City's greenfields. The report prepared by City Administration is the "Integrated Infrastructure Management Plan - Cumulative Impacts" March 2016 Report (referred to as the IIMP Report, provided in Appendix A). The IIMP report identifies the costs and revenues of growth in the three priority Urban Growth Areas (UGAs) established by The Way We Grow, Edmonton's Municipal Development Plan. The three selected greenfield UGAs are located within, but near the outer parameters of City boundaries: Decoteau (southeast), Horse Hill (northeast), and Riverview (southwest) as shown in the figure below[4].



[4] Edmonton's Growth Impact Tool, Bradley Leeman Sustainable Communities Conference Presentation, Feb 9, 2016. Note that a full description of each UGA is provided on page 3 of 20 of Attachment 1 to the IIMP Report.

Integrated Infrastructure Management Planning (IIMP) is the methodology used in the IIMP Report. IIMP is a high-level and broad-based analysis that provides information about the infrastructure required for development as well as a general indication of the future cost implication and revenue potential. IIMP is therefore a process to gather, analyze, and present data related to infrastructure requirements in the UGAs. The Development Infrastructure Impact Model (DIIM) is the Microsoft Excel-based tool that enables the IIMP process to analyze gathered data by forecasting future infrastructure costs and associated area revenues. The IIMR Report presents the IIMP analysis and the combined results of the independent DIIM models created for the three UGAs.

Based on the analysis with the DIIM models, the IIMP Report states that over the 50 year forecast period, the three UGAs result in the following approximate values:

Funding Source	2016 Dollar Values
Developer Funded Infrastructure Investment	$3.81 billion
City/Province/Other Sources Infrastructure Capital Investment	$1.22 billion
City/Province/Other Sources Operations, Maintenance, Renewal Investment	$9.10 billion
Total City/Province Infrastructure Investment	**$10.32 billion**
Revenues Expected	$8.97 billion
Shortfall	**$1.35 billion**

While the IIMP Report identifies developer funded infrastructure development, it focuses on the revenues and costs attributable to the City. Therefore, the IIMP Report can also be interpreted as a starting point to answer the question: "does growth pay for growth" (i.e. do the incremental revenues to the City associated of greenfield development offset the additional infrastructure costs borne by the City to service the new areas?).

According to the table above, the IIMP Report states that when viewed in isolation from other areas in the City, the three UGAs collectively generate lower City revenues than their capital, operating and renewal infrastructure costs borne by the City over a 50 year forecast period (i.e. the UGAs do not pay for themselves).

On April 5, 2016 (subsequent to the delivery of the IIMP Report to Council), City Council passed the following motion[5]:

That City Administration establish a Working Group with industry representatives and planning experts to collaboratively address the cumulative fiscal impacts of greenfield growth, including, but not limited to:

1. A fresh look at the cost drivers for both land development industry and the City.
2. A more comprehensive approach to assessing the downstream impacts of new growth, particularly on the roadway network.
3. Options for any new, proposed or revised cost allocation tools.

[5] City of Edmonton, Addressing Fiscal Impacts of Greenfield Growth, Draft Project Charter

4. Evaluation scenarios around the balance of residential and nonresidential assessment bases.
5. Options for increased or reduced service levels.
6. Ongoing collaboration to provide input to forthcoming Municipal Government Act revisions related to these matters.

The Working Group is called the Addressing Fiscal Impacts of Growth Advisory Committee and is composed of project sponsors, senior administrators, industry representatives, academics, etc. Technical sub-committees have also been established to provide technical advice and recommendations.

2.2 Project Overview and Objective

In June 2016, the Urban Development Institute-Edmonton Region (UDI-ER) retained consulting firm Grant Thornton LLP (Grant Thornton) to perform a third party review of the City's IIMP Report. The objective of this project is to fully identify and review the assumptions, methodology and scope before policy direction is set by the City. A particular focus was to better understand and test the costs and revenues attributable to the City from the UGAs[6].

2.3 Project Approach

This review was undertaken in phased approach as shown in the tables below.

Phase 1 – Project Initiation
Description of Activities
■ We met with UDI-ER Project Team members to discuss aspects central to the review's execution during a project kick-off meeting. This also included a brief white-boarding session to discuss specific areas of focus pertaining to the IIMP Report. ■ We reviewed all pertinent background documents provided as well as those found in the public domain. ■ After meeting with the City staff to gain initial perspectives on the DIIM, the forecasting methodology used, and input variable sources, we provided a high-level list of initial inquires for City staff to gather additional detail on the Model (including further detail on input assumptions and their sources).

Phase 2 – Consultation Program
Description of Activities
■ We planned for and held individual interviews with selected UDI-ER members. The purpose of this consultation was to gather further feedback on the IIMP Report to focus our review efforts. ■ As we consolidated the outcomes of the consultation program with our review of the initial data provided by the City, we met with City staff to gain further perspective on the DIIM inputs and methodology. All feedback to date was consolidated and an updated inquires list was prepared. This was used to facilitate a meeting with the City and UDI-ER to address questions identified in the inquires list. Where required, additional information was gathered from City staff to augment initial data analyzed. ■ As required and requested, interim project updates were held with UDI-ER staff.

[6] A detailed review of the DIIM functionality was not completed; it is assumed that the City Models are functionally sound. Note that Grant Thornton did not receive the City's active Excel-based DIIMs, nor did we verify the integrity of DIIM outputs provided. Any changes made to the DIIMs subsequent to information being provided to Grant Thornton were not taken into consideration. Capital, operating, and renewal cost estimates have been provided by the City and have not been audited or otherwise validated by Grant Thornton.

Phase 3 – Alternative Analysis
Description of Activities
■ Based on feedback and consultation with the City, we confirmed and documented references and methodologies used for key input assumptions used in the DIIM (see Section 3 of this report). ■ City staff provided alternative output scenarios of the combined DIIMs for the three UGAs based on mutually agreed upon test scenarios. These are presented and discussed in Section 4 of this report.

Phase 4 – Observations, Improvements, and Reporting
Description of Activities
■ We have produced observations based on our analysis of the data provided. Additional observations are provided to identify forecast methodologies of the DIIM that appear to be reasonable and are supported by a proven evidence base, as well as those that can have alternative approaches. These are discussed in Section 5.1 of this report. ■ In addition, a number of related questions and topic areas were brought to our attention that are related to the IIMP Report. While out of scope of the review, these are noted in Section 5.3 of this report for the consideration of the UDI-ER.

2.4 Acknowledgements

This engagement involved significant effort from many staff from the City and UDI-ER. We would like to acknowledge the following individuals who contributed their time, expertise, and support for this project:

City Staff:

- Bradley Leeman, Director, Infrastructure & Funding Strategies
- Shaffin Kherani, Infrastructure Policy Advisor, Financial and Corporate Services
- Xuan Sun, Infrastructure Policy Advisor, Financial and Corporate Services

UDI-ER Board Members:

- Brad Armstrong, Vice President, Community Development - Northern Alberta Qualico Communities
- Jason Fjeldheim, Vice President - Northern Alberta, Melcor Developments Ltd.
- Laurie Scott, Vice President, Cameron Development Corp.
- Rudy Roopnarine, Vice President, Development Cameron Development Corporation

UDI-ER Staff:

- Rick Preston, Executive Director
- Laura Bruno, Coordinator, Communications & Marketing
- Anand Pye, Coordinator, Research & Regulatory Affairs (past position)

3 IIMP & DIIM Review

This section details the methodology, input assumptions, and outputs of the DIIMs used for the three UGA that form the basis for the IIMP Report.

3.1 IIMP Methodology

The process for gathering, analyzing and presenting information as part of the IIMP was completed and facilitated by the City's Infrastructure and Funding Strategies group, which worked closely with various City Departments and development proponents. City Departments including transportation, fire services, police services, community services, parks, etc. provided an indication of infrastructure capital, operating and maintenance costs. City Departments also provided the approximate timing for new infrastructure requirement based on existing levels of service for new areas (e.g. population per new library or recreation/community facility), as well as Departmental master plans for the City.

Build-out and population forecasts were provided by area developers as part of their Area Structure Plan (ASP) and/or Neighbourhood Structure Plan (NSP) submissions, and were aligned with City build-out forecasts. Based on the information provided in ASPs and NSPs, each UGA had a forecast total build-out between 30 to 39 years starting in 2016[7]. For the purposes of the DIIM, residential units and commercial lands are absorbed as they are developed (i.e. residents occupy units and population in each UGA grows accordingly). As part of the IIMP, the City has previously engaged members of UDI-ER and other key stakeholders[8].

Given that land developers front-end the cost of transportation and drainage infrastructure directly associated with the new area development, capital costs for developed funded infrastructure are based on the information provided in development submission. Based on the information provided in development submissions and by City Departments, a DIIM was produced to forecast costs and revenues attributable to the City for each UGA. The DIIM uses a 50 year forecast horizon (2016 to 2065), which extends beyond the full build out for all UGAs. In most cases, costs and revenues are forecast in the year in which they are predicted to occur in the Model (in some cases, cost are amortized to smooth the cost impact over time). All costs and revenues are based on 2016 dollar values. Therefore, the cash flows are nominal, and are not adjusted for inflation or other cost increases/decreases. Timing of costs and revenues

[7] The IIMP Report (Attachment 1, page 4 of 20) notes that there are a number of factors that can change the forecast time to full build out, including market (i.e. demand), and non-market (e.g. natural and topographical) challenges that may prevent lands from being expeditiously serviced and developed). For the purposes of the DIIM, the selected UGAs, Decoteau, Horse Hill, and Riverview are forecast to fully build out in 39 years (forecast year 2054), in 36 years (forecast year 2051), and in 30 years (forecast year 2045), respectively.
[8] IIMP Report, Page 4 of 4. Grant Thornton has not reviewed the pervious scope of consultation conducted by the City.

within each individual forecast year is assumed to be equal. Results for each DIIM are based on the summation of revenues (positive figures) and costs (negative figures) across all forecast years with no discounting to account for the time value of money. Additionally, no interest or borrowing costs are included in the DIIM. The IIMP Report presents the consolidated outputs of the three DIIMs prepared for each UGA.

3.2 Assumptions

As noted, the IIMP Report provides broad-based analysis to provide a general indication of future cost implications and revenue potential in the three selected UGAs. The DIIM is the forecast tool used to calculate and produce revenue and cost outputs. As with all forecast models, input assumptions are required on which the DIIM calculates cost and revenue outputs. The sections below augment the description of infrastructure costs and sources of revenues presented in the IIMP Report.

3.2.1 Cost Input Assumptions

Detailed cost inputs are provided in Appendix B. Cost are divided in the following categories:

- **Capital Costs:** total costs for design, construction and fit-up of infrastructure assets.
- **Operating and Maintenance Costs:** costs for staffing, materials, services, utilities, and on-going upkeep of infrastructure.
- **Renewal Costs:** also referred to as sustaining capital costs, and include for example major facility repairs, bus replacement, etc.

3.2.1.1 Recreation Centres/Community Facilities

Recreation Centre/Community Facility Inputs Costs	Per facility / Annual
Capital Costs	$125,000,000
Operating and Maintenance Costs (annual)	$8,519,000
Renewal Costs (annual)	$2,500,000 *(equivalent to 2% of capital costs, 50 year life assumed)*

One recreation centre is forecast to be required in each UGA. They are modeled to be required when the population in each UGA reaches 50% of total build out. Each recreation centre is forecast to take three years to be fully completed. The following table represents when each recreation centre is forecast to be completed in each area. Note that for Riverview, 77% of capital, operating and maintenance, and renewal costs for the recreation centre are included for its costs given that the proposed recreation centre is anticipated to be shared with Edgemont neighbourhood[9].

UGA	Population at Completion	Completion Forecast Year
Decoteau	35,936	2041
Horse Hill	35,435	2032
Riverview	23,137	2035

[9] 77% is calculated in the DIIM for Riverview by determining the proportion of the total population in both Riverview (50,422) and Edgemont (14,883) at total build-out that would benefit from the recreation center.

3.2.1.2 Edmonton Public Library

Edmonton Public Library Facility Inputs Costs	Per facility / Annual
Capital Costs	$15,500,000 (Riverview) $20,300,000 (Horse Hill)
Operating and Maintenance Costs (annual)	$1,100,000 (Riverview) $1,300,000 (Horse Hill)
Renewal Costs (annual)	$310,000 (Riverview) $406,000 (Horse Hill) *(equivalent to 2% of capital costs, 50 year life assumed)*

One library is forecast to be required in Horse Hill and Riverview. A library is not forecast to be required in Decoteau over the forecast horizon, as Decoteau's area residents will be served by the Meadows Library[10]. The future libraries are planned to be integrated within the respective recreation centres in Horse Hill and Riverview. Therefore, timing of each library's construction is relational to the recreation centres in Horse Hill and Riverview.

3.2.1.3 Fire Stations

Fire Station Inputs Costs	Per facility / Annual
Capital Costs	$13,000,000
Operating and Maintenance Costs (annual)	$7,608,000
Renewal Costs (annual)	Included as part of operating and maintenance costs

One fire station is forecast to be required in Decoteau, while Horse Hill and Riverview and forecast to require two fire stations over the forecast period. Each fire station is forecast to take three years to be fully completed. The following table represents when each fire station is forecast to be completed in each area.

UGA	Population at Completion	Completion Forecast Year
Decoteau	29,530	2039
Horse Hill	Fire Station 1: 35,435 Fire Station 2: 55,868	Fire Station 1: 2029 Fire Station 2: 2041
Riverview	Fire Station 1: 18,575 Fire Station 2: 40,105	Fire Station 1: 2033 Fire Station 2: 2041

[10] No proportional or other library costs are forecast for Decoteau.

3.2.1.4 Police Facilities and Equipment

Police Facilities and Equipment Inputs Costs	Per facility, Vehicle, or Staff / Annual / Years
Capital Costs of Divisional Station	$40,000,000
Operating and Maintenance Costs for Divisional Station (annual)	$1,600,000 *(estimated at 4% of capital costs)*
Renewal Costs (annual)	$800,000 *(equivalent to 2% of capital costs, 50 year life assumed)*
Lease and Operating and Maintenance Costs for Community Station (annual)	$150,000
Capital Costs of Police Vehicle	$65,000
Operating and Maintenance Cost for Police Vehicle (annual)	$11,000
Renewal of Police Vehicles	6 years
Police Sworn Staff Salary (annual)	$155,000
Civilian Staff Salary (annual)	$90,000

Police facilities and equipment are forecasted differently as compared to recreation centers or libraries. Each UGA is assigned a divisional and community police stations independently based on their population projections as well as information provided from Edmonton Police Services. As noted in the IIMP Report, divisional stations are required to serve areas populations of 150,000 to 160,000 people. Therefore, the proportional share of the capital, operating and maintenance, as well as renewal costs for the required divisional stations are based on the build-out populations in each UGA relative to the total population a divisional station can serve (i.e. 150,000 people). It requires approximately four years to construct a divisional station. Community stations are assumed to be leased with a total lease and operating cost of $150,000 per year. No renewal costs are required given that these stations are leased.

The number of sworn police staff and civilian staff are based on a ratio to the population defined individually for each UGA as shown in the table below. In addition, it is assumed that one police vehicle is required for every three sworn police members.

UGA	Population per Sworn Staff	Population per Civilian Staff	Police staff per Civilian Staff
Decoteau	556	1308	2.4
Horse Hill	523	1751	3.4
Riverview	525	1739	3.3

Decoteau is forecast to require one divisional station to be developed in forecast year 2028. Given that the population at build-out is forecast to be 74,565, 50% of the costs associated with the divisional station is applied to Decoteau[11]. In addition, Decoteau is forecast to require one community station to be leased in forecast year 2025. At full build-out in forecast year 2054, Decoteau is predicted to have 134 sworn police staff, 57 civilian staff, and 45 police vehicles.

Horse Hill is forecast to require one divisional station to be developed in forecast year 2051. Given the population at build-out is forecast to be 70,038, 47% of the costs associated with the divisional station is applied to Horse Hill[12]. No community station is forecast to be required in

[11] Decoteau's build-out population of 74,565 represents approximately 50% of 150,000, the total population served by a divisional station.
[12] Horse Hill's build-out population of 70,038 represents approximately 47% of 150,000, the total population served by a divisional station.

Horse Hill. At full build-out in forecast year 2051, Horse Hill is predicted to have 134 sworn police staff, 40 civilian staff, and 44 police vehicles.

Riverview is not anticipated to require its own divisional or community station. However, the costs for staff and vehicles are applied to Riverview based on its population forecast. At its full build-out, which occurs in forecast year 2045, Riverview is predicted to have 96 sworn police staff, 40 civilian staff, and 32 police vehicles.

3.2.1.5 Parks

Parks Input Costs	$/ha / Annual
Capital Costs:	
District Park	$216,581 to $267,290
School/Park	$243,017 to $280,744
Urban Village Park	$243,805 to $295,061
Pocket Parks	$235,840 to $314,188
Natural Areas	$23,877 to $28,846
Operating Costs (annual $/ha):	
District Park	$9,183
School/Park	$8,224
Urban Village Park	$10,980
Pocket Parks	$15,671
Natural Areas	$460

As stated in the IIMP Report, the three UGAs will include a total of 396 hectares of park space, categorized by the type of park noted in the table above. Developers are responsible for providing land for parks (and other municipal reserve space) as part of the land development process. The DIIM models assumes that the City bears all costs associated with signage, turf establishment, trees, parking, and annual costs for parks (unless it is known that developers are paying for some parks). Each UGA's DIIM model forecasts capital costs for each type of park separately, resulting in a range of capital costs per hectare of park space. The IIMP Reports states that park amenities such as trails, playground equipment or special facilities (such as washrooms) are not included with the capital cost estimates.

3.2.1.6 Transportation - Transit Centres

Transit Centre Inputs Costs	Per facility / Annual
Capital Costs	$8,400,000
Operating and Maintenance Costs (annual)	$210,000
Renewal Costs (on year after development):	
Year 10	$257,870
Year 15	$622,446
Year 20	$358,356
Year 25	$150,424
Year 30	$7,112,992
Year 40	$150,424
Year 45	$539,273
Year 50	$1,398,013

Bus transit centres typically include a bus terminal building as well as bus ways and platforms. It is assumed that it takes approximately three years to develop a transit centre. No transit centers are planned for Decoteau, as it is anticipated that the transit center / park and ride facility in the Walker Neighbourhood will service the Decoteau area. Two transit centres are forecasted for Horse Hill, and are anticipated to be developed in forecast years 2031 when the population is 33,024, and 2061 when the forecast population is 70,037. One transit centre is forecast for Riverview to be developed in forecast year 2036 when the forecast population is 26,015. Note that the costs associated with Edmonton's LRT system or its expansion are not included as part of the DIIM.

3.2.1.7 Transportation – Buses

Bus Input Costs	Per Bus / Annual
Capital Costs	$592,000
Operating and Maintenance Costs (annual)	$285,670
Renewal Costs (on year after purchase):	
Year 10 (mid-life service)	$90,000
Year 20 (full-life replacement)	$592,000

The number of busses required in each UGA was determined based on population, average round trip time, peak hours trips, downstream service travel time, etc.[13] Annual operating costs per bus are based on a formula to account for total hourly operating costs (e.g. labour, fuel, on-going maintenance, etc.) and the number of hours of operations per week (assuming full utilization of 52 weeks per year)[14]. Renewal costs for each bus includes a mid-life service after 10 years, and it is assumed that each bus is replaced after 20 years of service. The table below details the total number of busses required in each UGA across the 50 year forecast horizon. This includes busses originally purchased, and those that are replaced after 20 years of service. Note that these costs do not take into account voluntary developer funded transit services, whereby developers fund transit services in new areas, where a no-cost route extension of an existing Edmonton Transit route is not feasible[15].

UGA	Total Number of Buses Required *(includes buses purchased and replaced)*
Decoteau	125
Horse Hill	158
Riverview	144

[13] The number of buses required based on this methodology in each forecast period were provided by the City.
[14] Operating cost formula per bus is $96.38 per hour * 57 hour per week * 52 weeks per year.
[15] Upon the developer's approval of the introduction of transit service to a new area, an agreement is signed by the City and the developer, which includes the cost for each year, the route map, and route schedule developed by the City. The annual cost for each route is approximately $130,000, depending on the route schedule. (Developer Funded Transit Service Overview, UDI-ER, Provided Aug 5, 2016).

3.2.1.8 Transportation – Roadways

Roadway Inputs Costs	$ per lane km / Annual
Capital Costs:	$40,000,000
Arterial Road Widening	Independently estimated by City
Interchange and Flyover Improvements	Independently estimated by City
Operating Costs (annual $ per lane km):	
Local Road	$4,360
Collector Road	$18,500
Arterial Road	$45,020
Renewal Costs ($ per lane km):	
Local Road:	
Resurface Cost (occur in the 18th year after construction)	$142,500
Reconstruction Cost (occur in the 26th year after construction)	$613,000
Collector Road:	
Resurface Cost (occur in the 18th year after construction)	$235,500
Reconstruction Cost (occur in the 26th year after construction)	$938,000
Arterial Road:	
Resurface Cost (occur in the 18th year after construction)	$192,750
Reconstruction Cost (occur in the 26th year after construction)	$815,000

Developers fund transportation infrastructure associated with new greenfield areas, including the costs of constructing local roads, collector roads, arterial roads, shared use paths, as well as the known developer contribution to interchange construction or improvement currently included in the Arterial Roads for Development Bylaw. According to the IIMP Report, this amounts to $1.455 Billion across all three UGAs.

The City is assumed to fund all arterial road costs above those that are included in the Arterial Roads for Development Bylaw[16]. A total of 56 lane km of arterial road widening is included across all UGAs, with costs determined by the City included the cost for intersection improvements (per the bylaw) and specific infrastructure components (e.g. creek crossing bridges) which are customized and have varied costs. As such, the City did not use a general per unit rate to calculate its costs for arterial roads. Similarly, the capital costs for interchanges and flyover improvements were calculated individually for each UGA by the City, taking into account locations and anticipated area traffic volumes. These costs are summarized in the following table. The City's proportionate share for each UGA is based on the City's approximation of the amount of cost for the interchange and/or flyover improvement that should be applied to each area (i.e. some are interchanges and flyover improvements benefit more than one area). It also takes into account known developer contributions for interchanges and flyover improvements.

[16] The DIIM is consistent with Bylaw pertaining to arterial roads, in that the developer would fund the first four lanes of a four to six land road, and the first five lanes of a five to seven lane road.

UGA	Total Cost for Interchanges and Flyover Improvement ($M)	City Proportionate Share for UGA ($M)
Decoteau	$175M	$78M
Horse Hill	$386M	$259M
Riverview	$40M	$30M
Total	$601M	$367M

Annual operating cost (e.g. snow clearing, street cleaning, on-going maintenance, etc.) for roadway categories are based on unit costs per lane km. Renewal costs for local, collector, and arterial roads are included in two phases: resurfacing of roads, which occurs 18 years after original construction, and reconstruction, which occurs 26 years after original construction. The DIIM includes amortized amounts of resurfacing and reconstruction costs in each forecast year after original construction.

3.2.1.9 Drainage

The capital costs associated with storm and sanitary sewers, service connections, stormwater management facilities, pump stations, outfalls, etc. are assumed to be entirely borne by area developers. The IIMP Report states that developers are expected to invest $2.351 Billion in drainage infrastructure across the three UGAs. Capital costs for major trunk lines, as well as operating and renewal costs for drainage infrastructure are assumed to be completely funded through sanitary and stormwater utility rates[17]. Therefore, these costs are not included in the DIIM analysis.

3.2.1.10 Waste Collection

The cost for waste collection vehicles, facility expansion, bins, and new eco-stations are not included in the DIIM analysis as they are assumed to be funded entirely by utility rates and user fees[18].

3.2.1.11 Other Utilities

Capital, operating and renewal costs associated with other utilities such as EPCOR Water and Wastewater Treatment, and ATCO Electric are not assumed to be borne by the City for the purposes of the IIMP. The City's municipally owned or operated utilities are governed by fiscal policies which require each utility to charge sufficient rates to recover all operating costs and repay capital debt[19]. EPCOR Water is responsible for the cost of the design and construction of all water mains 500mm in diameter and larger. The cost of water mains 450mm and smaller are incurred by land developers, however, through the EPCOR Water Main Cost Sharing Program, EPCOR funds, on a sliding scale, a portion of the costs of water mains between 300mm and 450mm in diameter[20]. The costs associated with water mains that are funded by developers are not included on Table 2 in the IIMP Report.

[17] Land developers also contribute to the Sanitary Servicing Strategy Fund (SSSF), which is a mechanism to finance major sanitary trunk constructions.
[18] While $105M of waste collection costs are listed in Table 3 in the IIMP Report, the City has confirmed that all costs associated with waste collection have not been included in the DIIM, given they are anticipated to be fully funded via utility rates.
[19] 2015 City of Edmonton Annual Report, Page 43.
[20] Cost Sharing Program for Water Mains, February 21, 2007
http://www.epcor.com/builders-developers/Documents/CostSharingProgramBackgroundLetter.pdf.

3.2.2 Revenue Input Assumptions

To offset the above noted costs borne by the City, the IIMP Report notes the following revenue sources. Some revenues, such as property taxes are assessed irrespective of incremental population growth of the City. Other revenues, such as user fees, assume that the forecast population growth in the UGAs comes from outside of the City (i.e. does not assume that existing City residents are moving into UGAs).

3.2.2.1 Residential Property Tax

As population and residential units grow in the forecast Models, the taxes paid for by these units are accounted for. Based on area information supplied in each UGA's ASP and/or NSP, the number of hectares of land assigned to various categories of residential housing as well as areas for commercial and business employment activity is determined. As shown in the table below, the DIIM makes an assumption of the number of units per hectare based on the housing category. The City then forecasts an average assessment value for each housing category in each UGA. Tax rates are then applied using 2015 City of Edmonton mill rates[21]. As residential units are forecast in the DIIMs, additional annual residential property taxes are collected. The City's property tax rate used includes funding for neighbourhood renewal, which in combination with provincial funding and cost-sharing with property owners, funds the reconstruction of selected neighbourhoods across the City. Note that the IIMP excludes property taxes from undeveloped lands.

Residential Housing Type	Population per Unit	Units per ha	Mill Rate
Single/Semi-detached	2.8	25	0.0055434
Row Housing	2.8	45	0.0055434
Low-rise/Medium Density Housing	1.8	90	0.0055434
Medium to High Rise Housing	1.5	225	0.0055434

3.2.2.2 Non-Residential Property Tax

As noted in the IIMP Report, while residential and non-residential classes each contribute half of the overall property taxes, the non-residential class pays approximately 2.5 to 3 times more per assessment dollar than the residential class. As such, commercially zoned areas (e.g. strip malls, grocery stores, etc.) and business employment areas form important lands to contribute to the City's tax base. A 2015 mill rate of 0.0151319 is used to calculate non-residential property taxes along with average assessment values for commercial and business employment areas.

UGA	Commercial Area (ha)	Business Employment Area (ha)	Commercial and Business Employment Area as % of All Residential and Commercial Area
Decoteau	53.1	100.0	15.1%
Horse Hill	92.4	0.0	10.0%
Riverview	47.0	39.6	12.2%

[21] The mill rate is the amount of annual residential tax per $1,000 of the assessed value of property; when multiplied by 1,000 it is the tax rate. Note that the tax rates used exclude Provincial education taxes collected which are also collected from municipal property taxes.

3.2.2.3 User Fees

The IIMP Report also accounts for users fees charged by individual City departments and business units. These include revenues from transit fees, recreation centre fees, and parking meters. User fees are modeled based on population growth in each UGA, based on an amount of $290 per capita. This is based the City's calculation of total user fee revenue from each relevant area as stated in the 2016 City Operating Budget, and applying this amount against the 2016 population. Note that the IIMP excludes fees from land developers for inspections, application reviews, etc., as these are assumed to cover costs associated with land development, and do not generate surplus revenues for the City.

3.2.2.4 Per Capita Grant Revenue

Incremental Provincial and Federal grants are modeled base on proportionate increases in population based in the UGAs. A per capita revenue allocation of $94 per capita was developed by the City based on existing grants and applied within the model. Provincial grants are primarily comprised of the Municipal Sustainability Initiative[22]. Federal grants include the Building Canada Fund (BCF) and the Federal Gas Tax. While greenfield infrastructure such as new recreation centres, libraries, and interchanges are historical recipients for Provincial and Federal grant funding, the IIMP takes into consideration incremental grant revenues based solely on population increases rather than the type of infrastructure being constructed in the UGAs.

3.2.2.5 Franchise Fees

The City receives revenue from utility operators (gas, electric, power distribution, water and wastewater) for the exclusive right to provide utility services within the city as well as for access to City lands to construct, maintain and operate related assets. In addition, the City charges the Drainage Utility a local access fee for the use of public rights of way and in lieu of property taxes. The IIMP includes revenues from ATCO Gas and EPCOR Electric franchise fees per residential and commercial unit as shown in the table below[23]. Note that the IIMP does not include franchise and local access fee from EPCOR Water, EPCOR Wastewater Treatment, and the Drainage Utility (these are discussed later as a scenario analyzed in Section 4.1).

Utility / Unit Type	Annual Franchise Fee (per unit)
ATCO Gas Residential	$140
ATCO Gas Commercial	$580
EPCOR Electric Residential	$41
EPCOR Electric Commercial	$181

[22] While not quantifed, Green TRIP Provincial Grant is assumed to be primarily earmarked for Edmonton's LTR expansion.
[23] Assumes 1.5 units per hectare for commercial lands.

3.3 IIMP Outputs

Based on the IIMP methodology and cost and revenue inputs described above, the following table summarizes capital, operating and maintenance, and renewal costs borne by the City, as well as associated revenues to the City from the UGAs over the 50 year forecast period.

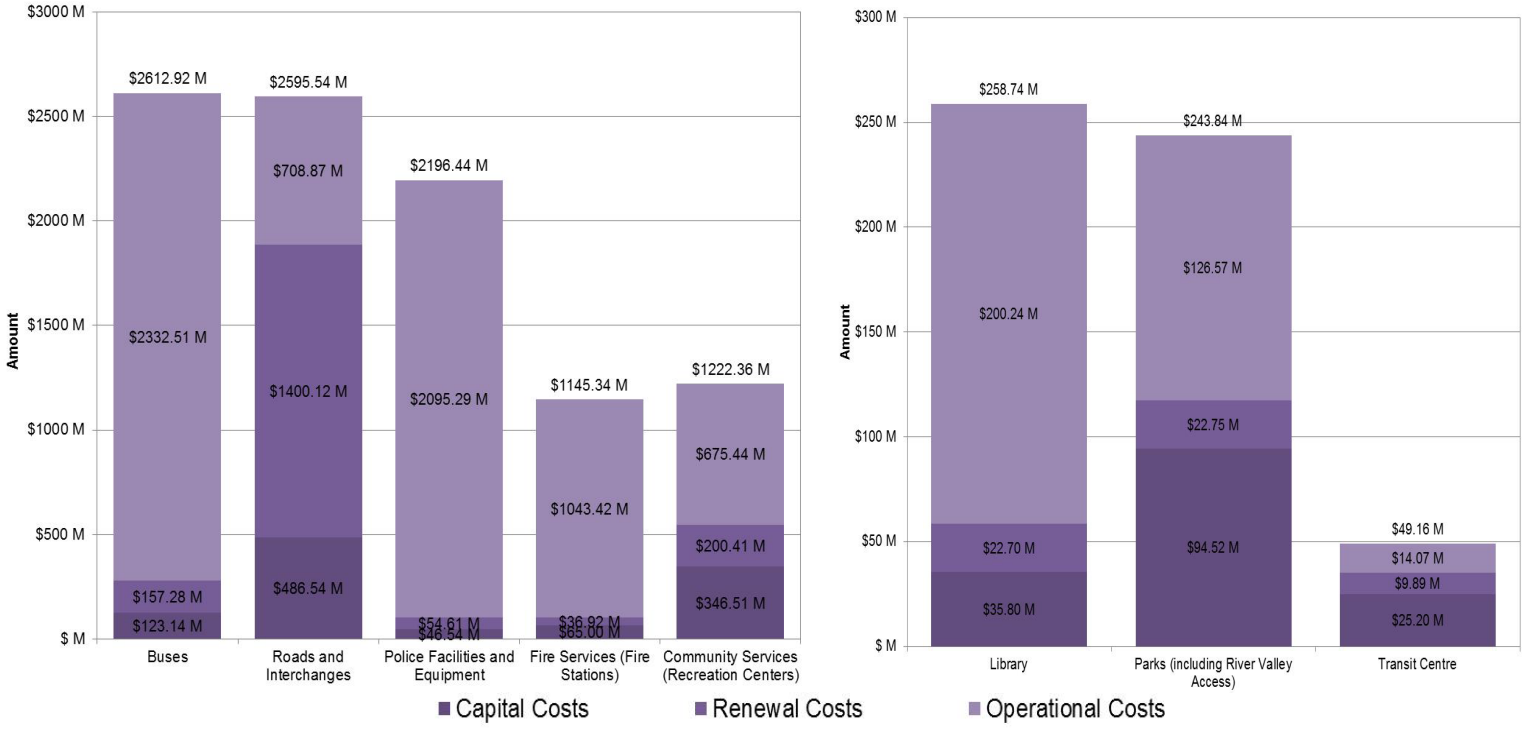
	Millions 2016$
Public Capital Investment	$1,223M
Public Renewal and O&M Investment	$9,101M
Total Public Infrastructure Investment	$10,324M
Total Public Revenues	$8,971M
Shortfall	$1,353M

3.3.1 Output Cost Breakdown

The following table provides a breakdown of costs borne by the City (and or/Province, as noted in Table 3 in the IIMP Report) across all three UGAs. Note that of the total costs borne by the City, a small proportion (12%) is accounted for by capital costs. Over two-thirds of the total costs (70%) are represented by operational expenditures over the 50 year period.

Cost Category	Millions 2016$	Percentage
Capital Costs	$1,223M	12%
Renewal Costs	$1,905M	18%
Operational Costs	$7,196M	70%
Total	**$10,324M**	**100%**

The following graphs illustrate the relative ranking of infrastructure asset categories by their total costs. The graph on the left illustrates infrastructure asset categories with greater than one billion in total costs, while the graph on right illustrates those infrastructure asset categories with less than one billion in total costs. Note the differences in the vertical axis values for both graphs.



As shown in the above graphs, the operating costs for bus operation in the three UGAs accounts for the largest proportion of all costs at $2.33 billion, representing 23% of all capital, operating, and renewal costs borne by the City.

4 Scenario Analysis

As part of our engagement, we worked with the City to produce various output scenarios based on mutually agreed upon input alternatives. This section presents the outputs of these scenarios.

4.1 Revenue Scenarios

We requested one revenue scenario to be provided by the City.

4.1.1. Inclusion of EPCOR Water and Wastewater Franchise Fee, and Drainage Local Access Fee

As noted in the IIMR Report, the City generates franchise fees from utilities for the exclusive right to provide utility services within the City as well as for access to City lands to construct, maintain, and operate related assets. This scenario adds the franchise fee forecast to be provided from EPCOR for the provision of services related to water and wastewater, as well as the local access fee provided from the City's Drainage Utility (Sanitary Utility)[24]. The following table shows additional incremental revenues from the baseline DIIM outputs for this scenario. On a combined basis, this is forecast to bring an additional $256M of revenues over the 50 year forecast period.

UGA	Drainage Local Access Fee	EPCOR Water Franchise Fee	EPCOR Wastewater Franchise Fee
Decoteau	$24.2M	$39.5M	$19.0M
Horse Hill	$30.2M	$49.3M	$23.8M
Riverview	$20.3M	$33.3M	$16.0M
Total	**$74.7M**	**$122.1M**	**$58.8M**

4.2 Cost Scenarios

Four mutually agreed-upon cost scenarios were requested to be provided by the City. Their outputs are described below.

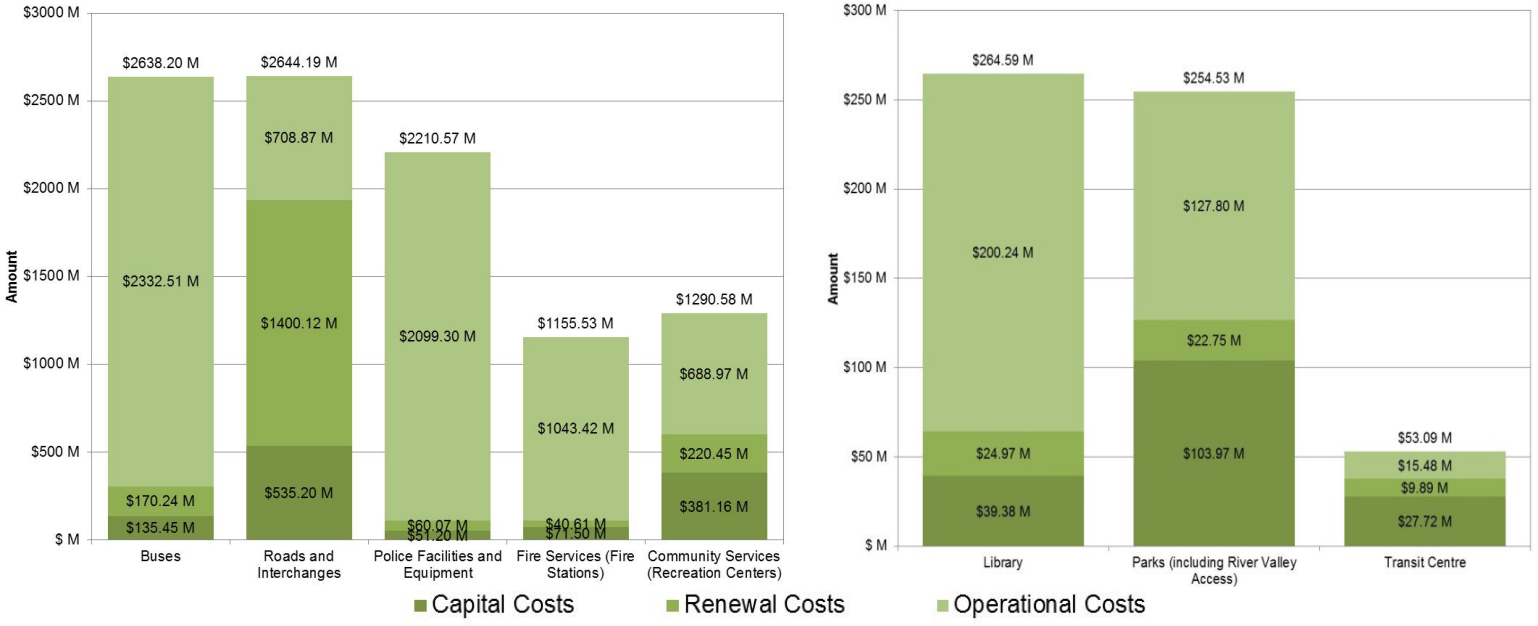
4.2.1 +/- 10% Capital Costs for Public Infrastructure Investment

Given that much of the costing analysis presented in the IIMP Report is high-level in nature, and specific assets have no/little project definition, there are bound to be a range of capital costs realized(and subsequently renewal costs for some infrastructure assets). To provide a

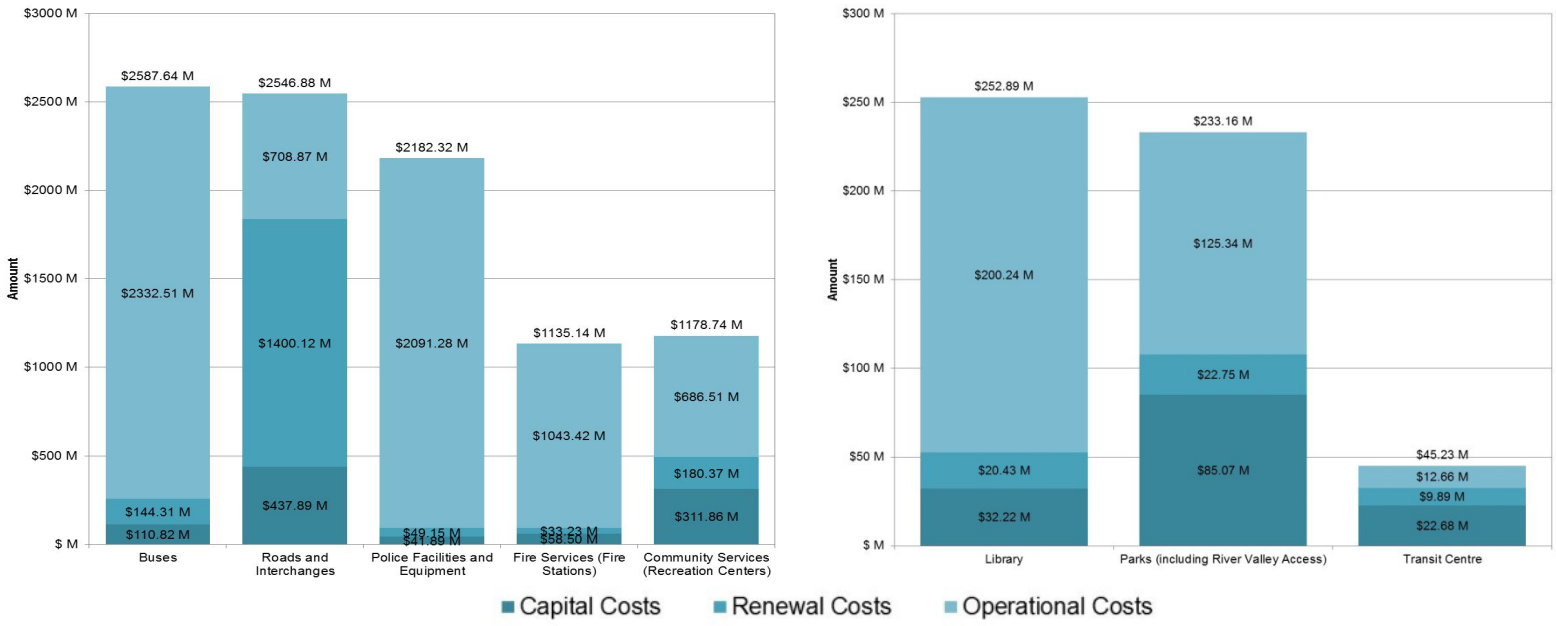
[24] Note that the City's Waste Management Utility does not provide a franchise or local access fee to the City.

balanced perspective, the City provided two scenarios: one in which all City funded infrastructure capital costs was 10% higher (in green), and one in which capital costs were 10% lower (in light blue). The scenario in which capital costs are 10% higher results in total costs increasing to $10.51 Billion, which 2% higher than the baseline scenario. When capital costs are assumed to be 10% lower, total costs decrease to $10.16 Billion, or 2% lower than the baseline scenario. This disproportional increase and decrease in costs (i.e. capital costs decrease by 10%, but total costs decrease by only 2%) is largely because capital costs represent a small portion of total costs (i.e. operating costs continue to represent the largest area of costs).

Capital Cost +10%:



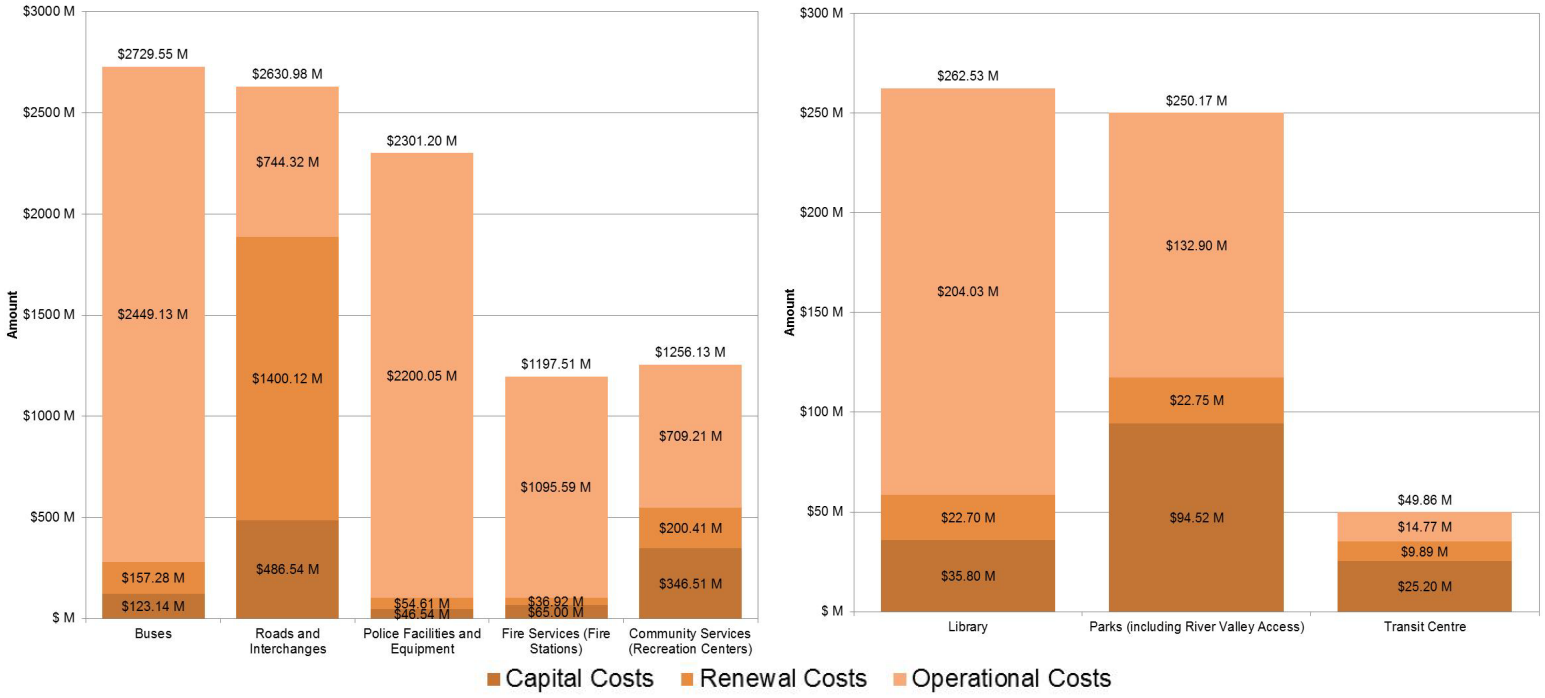
Capital Cost -10%:



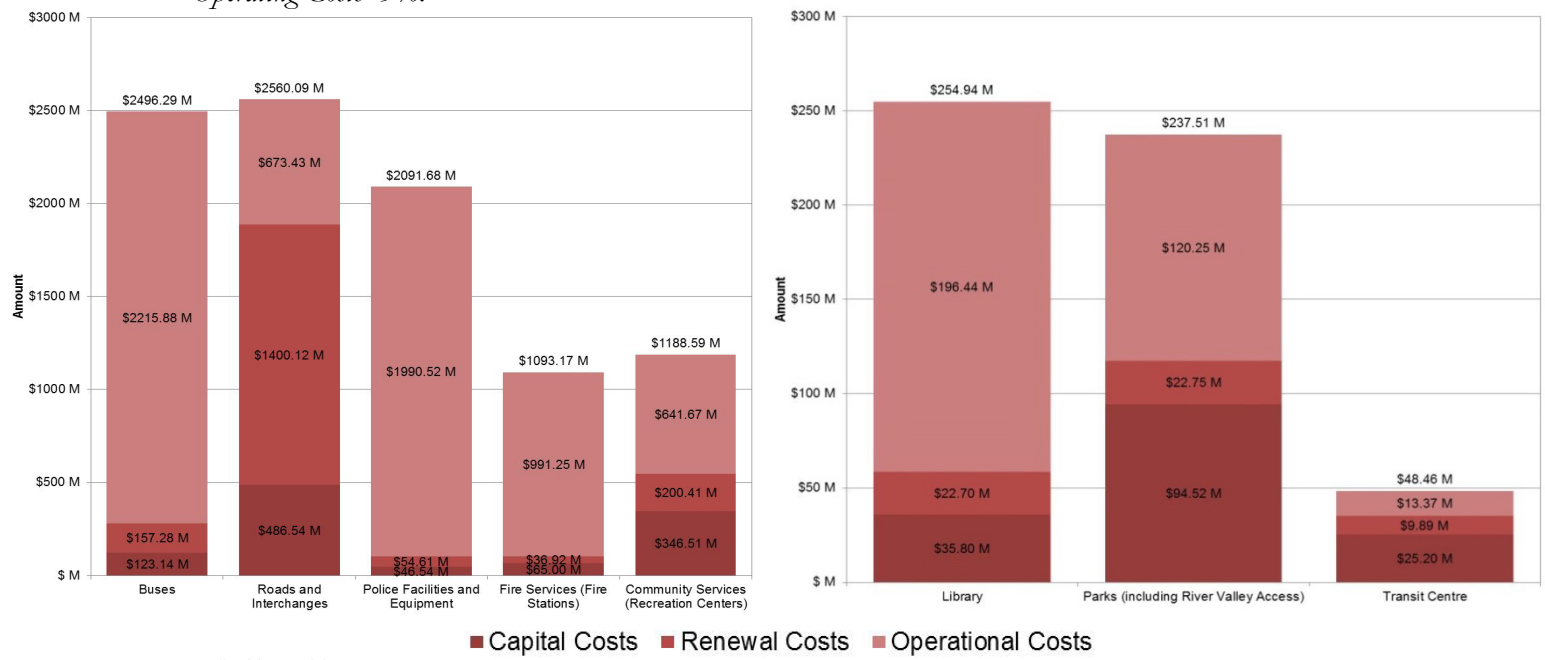
4.2.2 +/- 5% Operating Costs for Public Infrastructure Investment

The next scenarios examined the impacts of increasing/decreasing operating costs by 5%. As noted earlier, because operating costs represent a larger proportion of all costs, the changes to total costs are anticipated to be more proportionate with the change in operating costs. The scenarios are presented below: the first (in orange) represents the scenario in which all City infrastructure has 5% higher operating costs, and the second (in red), represents the scenario in which all City infrastructure has 5% lower operating costs. These scenarios vary from the baseline scenario by +/- $363.6M or approximately 3.4%.

Operating Costs +5%:



Operating Costs -5%:



4.2.3 Change in Roadway Reconstruction Timing from 26 to 36 Years

As noted in Section 3.2.1.8, local, collector, and arterial roads in the UGAs are forecast to be resurfaced 18 years after construction and reconstructed 26 years after construction. This totals to $1.4B in renewal costs, or 14% of all City borne costs. This scenario tests these costs by extending the timing of reconstruction to 36 years, rather than 26 years (keeping resurfacing at 18 years after original construction). Note that this assumes that the unit cost identified for reconstruction after 26 years is equivalent to the cost for reconstruction after 36 years.

As shown in the table below, by charging reconstruction timing to 36 years after original construction, roadway renewal costs decrease by 44% to $783M.

Roadway Renewal	Baseline Costs *(reconstruction after 26 years)*	Scenario Costs *(reconstruction after 36 years)*
Local Roads	$700M	$391M
Collector Roads	$322M	$175M
Arterial Roads	$378M	$217M
Total Costs	**$1,400M**	**$783M**

4.3 Shortfall Ranges

The table below represents the combined impacts to the original shortfall to the City based on the six scenarios analyzed. The baseline shortfall increases with higher costs, and decreases with lower costs and higher revenues (i.e. these are subtracted from the baseline shortfall). The scenario that includes revenues from the EPCOR Water and Wastewater franchise fees, and the Drainage Utility's local access fee is viewed to be as obtainable as the franchise fees paid by ATCO Gas and EPCOR Electric, which are included in the DIIMs. As such, these additional revenues reduce the shortfall for both the combined worst case, as well as the combined best case shown in the table below. Based on these additional revenues from utility operators and the other scenarios, the original shortfall of approximately $1,353M may be as high as $1,613M or may be as low as a positive $37M (i.e. a $37M surplus).

Baseline Shortfall: ($1,353M)		
Impacts from Tested Scenarios	**Increases to Shortfall** *(combined worst case)*	**Decreases to Shortfall** *(combined best case)*
Additional Revenue from Utilities	+$256M	+$256M
+/-10% Capital Costs	($162M)	+$162M
+/-5% Operating Costs	($354M)	+$354M
Roadway Reconstruction after 36 Years		+$618M
Total Estimated Impacts Net of Adjustments	**($1,613M)**	**+$37M**

It is important to note that this analysis is limited to the scenarios analyzed and should not be considered to be a complete analysis of all factors that can influence the shortfall. The scenarios analyzed represent the outcomes of a small sample of potential factors that may increase or decrease the shortfall. Therefore, further sensitivity and scenario analysis should be considered to show ranges in the shortfall that fully incorporate major influencing factors.

5 Observations and Conclusions

5.1 Observations

Based on the information provided by the City, we have noted a number of observations in relation to the IIMP and DIIM below.

5.1.1 Reasonable Analysis

Based on the information provided by the City as well as the consultation program conducted, the analysis conducted and presented in the IIMP Report appears to be reasonable provided that outputs are interpreted as stated in the IIMP Report. Specifically, the IIMP Report notes that its intent is to provide high-level analysis to provide information. It is not intended to be used for policy making on a stand-alone basis, nor is it to be classified as economic of feasibility analysis. Given that long range forecasting and modeling often involves much subjectivity, the interpretation and use of outputs from the IIMP must follow the limitation of its analysis. As shown by the scenario analysis conducted for this engagement, there is a broad range of potential shortfalls that can be determined given various input assumption alternatives. Generally, the IIMP methodology used by the City appears sound (with few alternatives for consideration stated below). Readers are suggested to read the IIMP Report in its entirety to fully understand its intent, limitations and outcomes.

5.1.2 Scope of Review

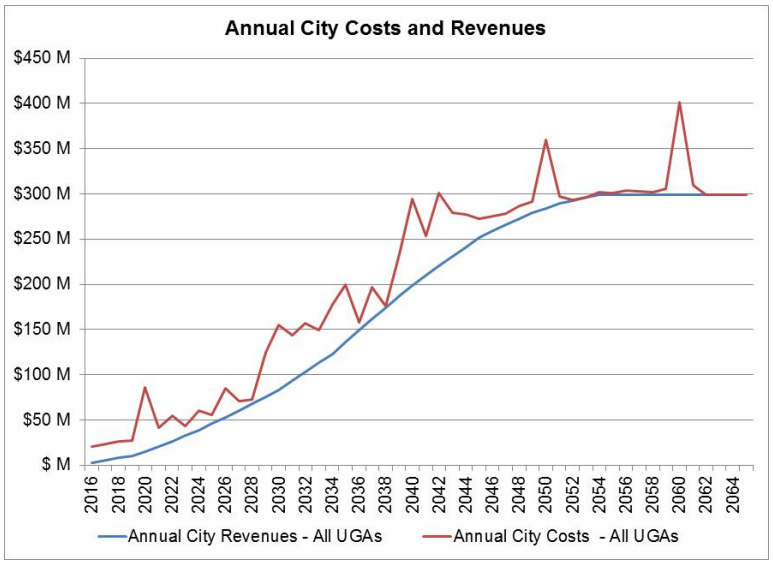
While the quantitative analysis conducted in the DIIMs for each UGA provides a comprehensive perspective of the revenues and costs associated with the primarily residential UGAs, it does not quantify the value created for the City from revenue generating, off-site areas such as commercial or business employment centers (which may be where some UGA residents are employed). The IIMP Report makes note of this by stating that "no neighbourhood (or group of neighborhoods) is a microcosm, or true representation, of the entire city", and that "the tax revenue of an individual neighbourhood does not exclusively pay for municipal programs and services associated with that neighbourhood"[25]. To support the quantification of these statements, the IIMP also includes off-site non-residential revenues that have the potential to be created should the City's current non-residential to residential assessment ratio be maintained[26]. When included as part of the analysis, these off-site non-residential revenues eliminate the combined shortfall. However, it should be noted that the costs associated with these off-site non-residential areas are not included as part of the analysis.

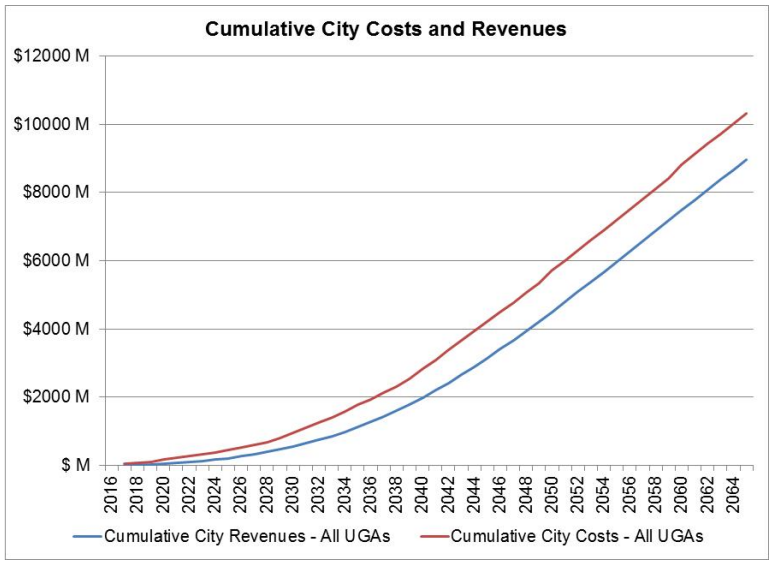
[25] IIMP Report, Page 1 of 4.
[26] IIMP Report, Attachment 1, Page 16 of 20 (Figure 11).

5.1.3 Timing of Costs and Revenues

The produced DIIMs are highly influenced and dependent on the timing and magnitude of costs and revenues. As noted earlier, of the total forecast costs borne by the City across all UGAs, 12% are accounted for by capital costs, 18% are accounted for by renewal costs, and over two-thirds of the total costs (70%) are represented by operational expenditures over the 50 year period. The scenario analyses has also demonstrated potential impacts should the magnitude of capital and operating costs change, however the timing of large costs can also be observed in the Model. While most costs and revenues are proportional to the growth in population, and residential and commercial absorption in each UGA, there may need further consideration of the sustainable revenues created at full build-out of the areas (as well as the potential acceleration of complete build-out to allow the City to collect tax and other revenues faster). To illustrate this further, the following graphs show the annual (left) and cumulative (right) City revenues and costs across all UGAs. The cumulative graph show a clear gap between costs and revenues throughout the forecast period. However, as revenues increase and then remain constant when the last UGA, Decoteau, reaches full build-out in forecast year 2054, the annual deficit amounts narrow, as shown in the annual graph[27].

Moreover, the 50 year forecast model does not take into consideration the terminal value of any costs and revenues after the end of the forecast period. While operating and renewal costs would continue to accrue, revenues at full build-out across all UGAs (forecast to be $299M per year starting in forecast year 2054) are likely to remain in the future.





5.1.4 Time Value of Money

The methodology employed in the DIIMs do not account for the time value of money (i.e. the analysis presented sums cost and revenue streams over the 50 year period without any adjustments for value over time). The concept referred to as the "time value of money" means the value of money today and money that will be spent in the future are not equal. Time value of money results from two factors: (1) inflation, which is erosion in the value of money over

[27] Note that the visible increase in forecast year 2060 annual expenses is largely due to a $100M interchange anticipated in Horse Hill.

time, and (2) opportunity cost. For cash, existing capital, and tax revenue, opportunity cost is equivalent to the benefit the cash could have achieved had it been spent differently or invested. For borrowed money, opportunity cost is the cost of borrowing that money (e.g. the loan rate). Therefore, costs and revenues that occur at different points in the forecast cannot be compared directly due to the varying time value of money. According to best practices for life cycle costing, they must be discounted back to their present value through the appropriate equations[28].

As noted earlier, the DIIMs do not use inflation (i.e. all costs and revenues are represented in 2016 dollar values). This is an acceptable practice to use current values to forecasts cash flows. This way an estimate of the future behavior of inflation rates can be avoided. However, it is best practice to return future cash flows to present values using the following formula to factor out inflation:

$$REAL = \frac{1 + NOMINAL}{1 + INFLATION} - 1$$

By using the City's average long-term borrowing rate of 4.0%, and inflation rate of 3.0% stated in the City's 2015 Annual Report[29], a calculated real rate of 0.97% can be determined. By applying this real discount rate across the stream of annual surpluses/deficits for the base case, the total shortfall in 2016 present value terms is $1.11 Billion, compared to $1.35 Billion when summing surpluses/deficits across forecast years. Note that financing costs are to be explicitly excluded when discounting future values since they are already reflected in the discount rate[30].

5.1.5 Developer Investment

While the focus of this engagement was to better understand the costs and revenues attributable to the City, it was noted during the consultation program that developer funded infrastructure noted in the IIMP Report did not include developer contributions for water mains, grading/earthmoving for overland drainage, parks, planning, as well as implicit contributions of lands for the City (i.e. municipal reserve lands). Some developers also noted that they provide operations and maintenance services to their developed lands where the developers' service level expectations are not being met be the City (e.g. boulevard maintenance, playground development, etc.). In many cases however, these costs are voluntary and funded by developers to enhance the attraction of their neighbourhoods.

5.2 Conclusion

This report respond to UDI-ER's objective to fully identify and review the assumptions, methodology and scope of the IIMP Report before policy direction is set by the City. The City has undertaken considerable efforts to prepare the IIMP Report and accompanying analysis from the DIIMs for three UGAs. Generally, the analysis conducted by the City is sound, after taking into account the intentions and limitations of the IIMP documented in IIMP Report.

Greater details on all inputs assumptions have been provided in this report. Resulting output analysis demonstrates that operating and renewal costs account for the largest amounts of all

[28] Guidelines for Life Cycle Cost Analysis, Stanford University, Oct 2005.
[29] City of Edmonton 2015 Annual Report, Page 73.
[30] Chartered Financial Analyst Curriculum, Level 2, Volume 3, Corporate Fiannce, Page 8, 2013.

costs borne by the City over the 50 year forecast period. Specifically, operating costs for bus transit is the largest contributor among all capital, operating or renewal costs (accounting for 23% of all costs in the baseline scenario).
The scenario analysis revealed that when including additional revenues from utility franchise fees, as well as savings from reduced capital and operating costs, the shortfall for City borne costs can drop significantly. As such, this large range in potential outputs reiterates that the IIMP Report can be accompanied by further work by industry and the City to refine an approach to determine the costs and revenues of growth in the City.

5.3 Out of Scope Inquires

A number of out of scope inquiries were brought to our attention during the course of the engagement. These have been documented below to benefit the continued work of the City and UDI-ER:

1. Full understanding and quantification of Edmonton's downtown/arena area development's tax and economic benefit to the City.

2. Full understanding and quantification of the costs associated with infill development in relation to the City's 25% infill development target.

3. Compare how institutional density development needs to change as residential density continues to increase.

4. Review infrastructure requirements for land developers compared to the City as it relates to the overdevelopment/oversizing of infrastructure.

5. Full understating of the speed of development approvals and inspections from City impact to developers, and cost to lot purchasers.

6. Benchmarking of how other municipalities are dealing with costs associated with greenfield and infill growth (note that Calgary and Regina undertook a process to update their development charges in 2015).

6 Authorship and Limitations

This report is prepared by Grant Thornton LLP (Grant Thornton) for Urban Development Institute-Edmonton Region (UDI-ER). This report is based on information and documentation that was made available to Grant Thornton. Specifically, Grant Thornton's findings are based upon information provided by the City of Edmonton's (City) staff, UDI-ER staff, and consulted developers. As such, Grant Thornton assumes no responsibility and makes no representations with respect to the accuracy or completeness of any information provided to us[31]. We are not guarantors of the information which we have relied upon in preparing our report, and except as stated, we have not audited or otherwise attempted to verify any of the underlying information or data contained in this report.

Readers of this report should consider the document in its entirety. Selection of, or reliance on, certain elements of the report may result in misinterpretation of information provided. Grant Thornton will not accept liability for such interpretations. Comments in this report are not intended, nor should they be interpreted, to be legal advice or opinion. It is understood and agreed that all decisions in connection with the implementation of recommendations and next steps identified by Grant Thornton in this report and during the course of this engagement shall be the responsibility of, and be made by UDI-ER.

Grant Thornton reserves the right, but will be under no obligation, to review and/or revise all findings, calculations and recommendations referred to herein, if we consider it necessary in light of further information that becomes known to us after the date of this report.

[31] A detailed review of the DIIM functionality was not completed; it is assumed that the City Models are functionally sound. Note that Grant Thornton did not receive the City's active Excel-based DIIMs, nor did we verify the integrity of DIIM outputs provided. Any changes made to the DIIMs subsequent to information being provided to Grant Thornton were not taken into consideration. Capital, operating, and renewal cost estimates have been provided by the City and have not been audited or otherwise validated by Grant Thornton.

Appendices

Appendix A IIMP Report

Integrated Infrastructure Management Plan - Cumulative Impacts

Recommendation:

That the March 22, 2016, Sustainable Development report CR_2705, be received for information.

Report Summary

This report responds to the costs and revenues of greenfields within a larger framework of Growth Coordination Strategy. The report grounds the cumulative impacts within the context of a more comprehensive perspective, identifies the costs and revenues of growth in the three priority urban growth areas established by *The Way We Grow*, Edmonton's Municipal Development Plan, and establishes a framework to build Administration's capacity to model policy impacts on growth and associated costs.

Previous Council/Committee Action

At the July 8, 2015, Special Executive Committee meeting, the following motion was passed:

> That Administration prepare a report outlining the Integrated Infrastructure Management Plan cumulative impacts that relate to the Growth Strategy Implementation initiatives within the City's greenfields.

Report

Context and Broader Implications

The cumulative impacts of the city's greenfield growth is a complex question which should be examined through a more comprehensive approach to understand the full spectrum of considerations.

The direct revenue from both residential and non-residential taxes in specific areas do not give a complete assessment of the value of city development. The picture of city-wide growth cannot be easily represented as no neighbourhood (or group of neighborhoods) is a microcosm, or true representation, of the entire city.

The tax revenue of an individual neighbourhood does not exclusively pay for municipal programs and services associated with that neighbourhood. All neighbourhoods benefit from shared resources, infrastructure and services provided by the municipality, such as, pipes, roads and parks.

Broader economic benefits are accrued from activities spurred by the development of new neighbourhoods, such as, new employment and the purchase of locally produced

goods and services. Secondary benefits accrue from the expenditures of those individuals deriving income directly or indirectly from the development industry.

New residential development leads to lower housing prices and more diverse choices for citizens in support of growing up, in and out. With more housing options for citizens, Edmonton will be more able to attract and retain a skilled and talented work force.

Furthermore, higher incomes and revenues for business tend to boost revenues available to higher orders of government through taxes on income, sales and other business activities.

To advance improved research and analysis for Council to guide planning and support decision-making, Administration will develop a growth modelling framework based on best practices. The tool will enable Council to look at costs and revenues from a city-wide perspective and assess financial and policy impacts of growth.

Integrated Infrastructure Management Planning Cumulative Impacts
Integrated Infrastructure Management Planning is a high-level analysis that provides Council with information about the infrastructure required for development. The broad-based analysis provides a general indication of future cost implications and revenue potential.

At this time, Administration has completed a cumulative Integrated Infrastructure Management Planning analysis for the City's Urban Growth Areas, see Attachment 1.

The Integrated Infrastructure Management Planning review was completed for the build-out of the Urban Growth Areas over a 30 to 39 year time frame, starting in 2016. At build out, these areas are expected to have a total population of 195,025. Based on the information available at this time, the review generally shows that the Urban Growth Areas will require a developer infrastructure investment of approximately $3.8 billion as well as a capital investment by the City and/or the Province and/or other sources of funding of approximately $1.4 billion.

As is typical for residential focused neighbourhoods whose primary function is to provide housing and community amenities, the Urban Growth Areas anticipated combined cumulative revenue over the 50 year analysis period is expected to be lower than the required combined capital, operating and life cycle costs the City is expecting to expend. Therefore, the City will need to continue its efforts to promote greater density, more effective utilization of infrastructure, and grow the industrial and commercial sectors in order to balance the City's overall assessment base.

At this time, the detailed impacts of development of the City's developing areas are not available. The Development Infrastructure Impact Model and the Integrated Infrastructure Management Planning process were introduced to assess greenfield areas, such as the Urban Growth Areas, prior to the start of comprehensive development taking place. A new approach and/or modification to the Development

Infrastructure Impact Model will be required as well as a considerable amount of data collection in order to be able to determine the impacts of completing the partially developed greenfield areas within the city.

Growth Strategy Implementation Program
Administration has identified a means to frame future calculations within the larger Growth Coordination Strategy Implementation context. The Growth Modelling Framework forms part of the larger Growth Coordination Strategy Program as defined in *The Way Ahead* Implementation Plan.

Implementing the Growth Coordination Strategy will identify and manage future public obligations and accommodate expected growth through monitoring, reporting, coordination and communication. It will align growth opportunities with investment decisions as outlined in the City's Municipal Development Plan *(The Way We Grow).* This will support decision making with respect to funding decisions and priorities by monitoring and forecasting the city's growth and change from a local and regional perspective and through collaboration with neighbours as metropolitan Edmonton evolves over the next 50 years. There are already a number of initiatives that are already undertaken by Administration in this regard, such as, the Integrated Infrastructure Management Planning, Growth Monitoring and Growth Coordination Committees.

Growth Modelling Framework
The Framework will build Administration's capacity to predict and model growth and anticipate future costs and revenues through the creation of a dynamic predictive model that takes into consideration multiple factors impacting growth in the City. Administration has established a multi-disciplined project team, to create high level cost impact reports from a comprehensive growth coordination strategy implementation perspective. The proposed project contains four phases starting in 2015 and to be concluded in 2019. Please see Attachment 2 for more details. Progress to date includes:

- establishing a steering committee;
- identifying all supporting information, data and documentation required for the project scope;
- seeking input from external and internal stakeholders;
- connecting with other areas in Administration who forecast growth and its impacts; and
- identifying a short-term action plan.

There are a number of growth forecasting tools currently used in the City to serve specific data and forecasting needs of business areas. Administration is working collaboratively across business areas to ensure that the Growth Modelling Framework integrates the current models being used. The Growth Coordination Strategy will promote an overarching model at a corporate level which will help guide capital funding decisions.

Policy
The Way We Grow, Edmonton's Municipal Development Plan:

- Section 3.1.1: Manage future public obligations and growth opportunities through a long term growth coordination strategy.
- Section 3.2: Accommodating Growth.

Public Consultation

Administration has consulted with both internal and external stakeholders, and will continue to engage them throughout program implementation. Key stakeholders in this process include: the Growth Market Intelligence Committee comprising the Urban Development Institute, the Infill Development Edmonton Association, School Boards, EPCOR, and ATCO.

Attachments

1. Integrated Infrastructure Management Planning
2. Growth Modelling Framework

Others Reviewing this Report

- T. Burge, Chief Financial Officer and Treasurer, and General Manager, Financial and Corporate Services

Integrated Infrastructure Management Planning

Executive Summary

This report is provided in response to the Executive Committee's motion for an update on the Integrated Infrastructure Management Plan (IIMP) cumulative impacts. It includes the updated cumulative impacts of the three Urban Growth Areas: Decoteau, Horse Hill and Riverview.

Integrated Infrastructure Management Planning is a high-level analysis that provides Council with information about the infrastructure required for development. The broad-based analysis provides a general indication of future cost implications and revenue potential.

The IIMP review was completed for the build-out of the Urban Growth Areas over a 30 to 39 year time frame, starting in 2016. Based on the information available at this time, the review generally shows that the Urban Growth Areas will require a developer infrastructure investment of approximately $3.8 billion as well as a capital investment by the City and/or the Province and/or other sources of approximately $1.4 billion.

As is typical for residentially focused areas, whose primary function is to provide housing and community amenities, the Urban Growth Areas' anticipated combined cumulative revenue over the 50 year analysis period is expected to be lower than the required combined capital, operating and life cycle costs the City is expecting to expend. The projected cumulative shortfall over the 50 year analysis period for the build-out of the Urban Growth Areas is anticipated to be in the order of $1.4 billion.

In order to manage this shortfall, the City will need to continue its efforts to promote greater density and more effective utilization of infrastructure as well as grow the industrial and commercial sectors to balance the City's overall assessment base. Alternatively or in addition, the City may also need to consider increasing residential contributions which better reflect the costs of the City's current built-form, consider reviewing alternate means of paying for residential infrastructure in concert with an MGA review and/or consider reducing levels of service to citizens in some or all areas.

Purpose

Integrated Infrastructure Management Planning is a process for the gathering, synthesis, presentation and use of data related to the provision of infrastructure to the three Urban Growth Areas. Information in this document is based on original information related to the Urban Growth Areas that was gathered in 2012 to 2015 and updated information gathered in 2015 and 2016.

The intent of Integrated Infrastructure Management Planning is to provide Council with information about the infrastructure required for the Urban Growth Areas' development, how it relates to existing infrastructure, timing, and the implications to the City's operations.

This report outlining Integrated Infrastructure Management Planning cumulative impacts is provided in response to an Executive Committee motion from the July 8, 2015, meeting. It includes the compilation and analysis of the combined development of the three Urban Growth Areas: Decoteau, Horse Hill, and Riverview.

At this time, the detailed impacts of development of the city's developing areas are not available. The Development Infrastructure Impact Model and the Integrated Infrastructure Management Planning process were developed to assess greenfield areas prior to the start of comprehensive development taking place, such as the Urban Growth Areas. A new approach and modification to the Development Infrastructure Impact Model will be required as well as a considerable amount of data collection in order to be able to determine the impacts of completing the partially developed greenfield areas within the city. Administration will be working to develop this new approach and model as part of the Growth Strategy Modelling Framework.

Integrated Infrastructure Management Planning Background

The tax revenue generated by new residential areas is not meant to pay for the municipal programs and services associated with those neighbourhoods. Property taxation is a tax on wealth as represented by the assessment of residential and non-residential properties under regulations set by the Province.

Residential neighbourhoods exist to provide for housing and community amenities. Other areas of the city, such as industrial areas and commercial nodes, exist to provide employment and wealth generation. The amount of revenue the City needs from property taxation is determined for the City as a whole and takes into consideration the balance between residential and non-residential assessment. A residential neighbourhood is not a microcosm of the entire city and property taxes are not calculated on a neighbourhood basis.

It is difficult to capture all of the indirect costs and benefits that are attributable in whole or in part to new residential neighbourhoods. For example, the City collects dividends from EPCOR, earnings from its investments, and a substantial amount of non-residential tax revenue from dense commercial nodes including West Edmonton Mall, the Downtown core, and South Edmonton Common. These sources all help fund services provided to all neighbourhoods, but are difficult to include in a neighbourhood or area specific analysis. Additionally, secondary benefits accrue from the expenditures of those individuals deriving income directly or indirectly from the development industry. Economic impacts can be estimated by calculating expenditure multipliers. An expenditure multiplier estimates the final value of an incremental dollar spent once the direct and follow-on effects are

included. By way of illustration, Alberta's economic multiplier for construction is 1.6.[1] This means that a dollar of construction activity generates a gross gain of $1.60 of economic activity for Alberta once direct and follow-on impacts are included. For the Urban Growth Areas, this equates to approximately $8.3 billion over the construction time of the development, based on a $5.2 billion investment in public infrastructure (See Tables 2 and 3). Private investment in housing and commercial areas is over and above this.

The challenges facing the City are to balance development costs with the strategic benefits of sustainable growth, to achieve an appropriate balance of residential to commercial/industrial development. Although the City of Edmonton has achieved some success in diversifying its revenue base, property tax remains the largest component of City revenue. The long term sustainability of cities in Canada will depend on a combination of smart, resource efficient growth mixed with a progressive form of revenue generation that provides for the services being enjoyed by the citizenry in the long term, without providing undue burden to any particular stakeholder.

Area Structure Plan Background Information

Decoteau, Horse Hill, and Riverview make up the City's Urban Growth Areas as identified on the Land Development Concept Map of the City's Municipal Development Plan, *The Way We Grow.* The areas are located at the extremities of the City in three quadrants: Southeast (Decoteau), Southwest (Riverview), and Northeast (Horse Hill).

The *Decoteau Area Structure Plan* is bounded by Anthony Henday Drive to the north, the City limits (41 Avenue SW) to the south, 50 Street SW to the west, and the City limits (Meridian Street SW) to the east. The area encompasses approximately 1,960 hectares and is expected to have a population of 74,565 people.

The *Horse Hill Area Structure Plan* is located north of Anthony Henday Drive and east of Manning Drive. The Area Structure Plan has a gross area of 2,793 hectares and is expected to have a population of 70,038 people.

The *Riverview Area Structure Plan* is bordered by Wedgewood Creek and Anthony Henday Drive to the north, the North Saskatchewan River to the east, and the City's boundary to the south and west. The Area Structure Plan has a gross area of 1,435 hectares and is expected to have a population of 50,422 people.

All three Area Structure Plan areas currently include existing uses that are being retained as-is, including existing country residential development, agricultural land, utilities, pipelines, and/or natural areas. These existing uses are not included in the Area

[1] Alberta Economic Multipliers 2006, Open Model Direct and Indirect Multipliers, pg 14. Edmonton, 2010

Structure Plan land use statistics as developable land and are also not included in this Integrated Infrastructure Management Planning analysis.

The Urban Growth Areas are planned to include variety of low to high density residential housing, district park sites with recreation centres, parks and natural areas, libraries, police facilities, fire stations, schools, commercial and mixed use sites, and/or business employment areas.

Methodology
Integrated Infrastructure Management Planning is typically conducted by working closely with City departments, utilities, and development proponents. In this Integrated Infrastructure Management Planning update, Infrastructure and Funding Strategies used information included in the initial analyses and supplemented it with updated information from various City departments.

The Integrated Infrastructure Management Planning review was completed for the build-out of the individual Urban Growth Areas over a 30 to 39 year timeframe (Decoteau – 39 years, Horse Hill – 36 years, Riverview – 30 year), starting in 2016. This build-out time frame matches the timelines submitted by area developers at the time of the Area Structure Plan and/or Neighbourhood Structure Plan submissions and is in line with the City's build-out forecasts for the areas. However, it should be noted that the build-out time frame is not necessarily based on future market demands for new housing. Additionally, there may be local challenges that may prevent these lands from being expeditiously serviced and developed. These challenges include non-participating landowners refusing to allow services be installed on their properties to facilitate development on other properties; local natural and topographical features that may require the infrastructure to be installed from a direction not typical of orderly contiguous growth. An example of the latter would be having Decoteau grow from a southwest to east/northeast direction due to the requirement to install an off-site sanitary trunk line that would connect Decoteau at 50 Street SW and 41 Avenue SW in order to service approximately two-thirds of the area.

Fully built-out refers to all forms of development being built within a given area. New neighbourhood growth in greenfield areas typically begins with low density housing with some medium density housing in the form of row housing. The other forms of housing plus commercial and employment activity are usually built later once the area has been established. Notwithstanding the non-market factors mentioned above, low density housing could be fully built-out as soon as five to ten years prior to other uses being fully developed.

Scenario Analysis
The Integrated Infrastructure Management Planning analysis includes the cumulative impacts related to the development of Decoteau over a 39 year time horizon, Horse Hill over a 36 year time horizon, and Riverview over a 30 year time horizon. Construction within these areas is anticipated to begin in 2016.

This section provides data resulting from the analysis of the development build-out scenario. The next section, Building Perspective, provides context to the data.

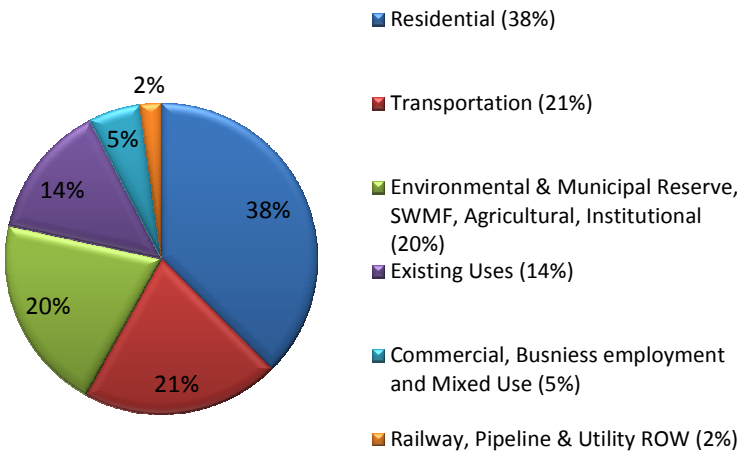
General Area Information

Information included in the approved Area Structure Plans and Neighbourhood Structure Plans was used to complete this analysis and includes land use, population projections, and residential unit information. This information forms the basis for the calculations and justifications for required infrastructure in the proposed communities. Complementing this base data, current service standards in combination with long term planning and consideration for the capacity of existing facilities nearby contribute to the infrastructure projections.

Gross Area Breakdown

The land use breakdown of the Urban Growth Areas is shown in Figure 1. Out of a total area of approximately 6187 hectares, approximately 38% (2320 hectares) is allocated for the development of residential units, 21% (1306 hectares) is allocated to existing and future road allowances and future transit centres, 20% (1260 hectares) is allocated to environmental reserve, municipal reserve, institutional, agricultural and stormwater management facilities, 14% (866 hectares) is allocated to existing uses, 5% (332 hectares) is allocated to commercial, business employment and mixed use developments, and the remaining 2% (102 ha) is allocated to railway, pipeline and utility rights-of-way.

Figure 1 – Land Use Breakdown



Net Residential Area Breakdown

There are four different residential housing types planned for the Urban Growth Areas; including single and semi-detached housing, row housing, low-rise to medium-rise apartments up to 4 stories, and medium to high rise apartments (which includes buildings 5 stories and higher). Figures 2, 3 and 4 provide additional information on the residential breakdown by area of the different residential housing types (Figure 2), by the number of units in each housing type (Figure 3), and by population associated with each housing type (Figure 4).

Figure 2 – Residential Split by Land Area

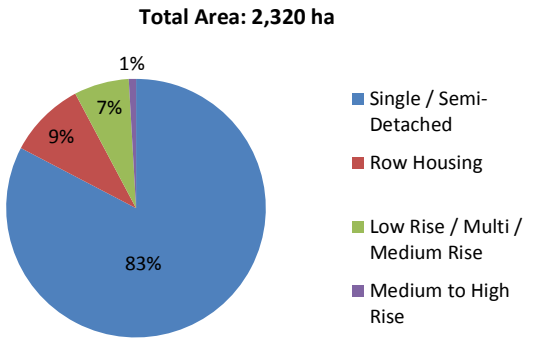


Figure 3 – Residential Split by Number of Units

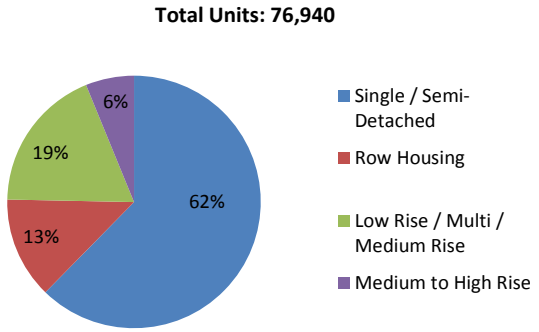
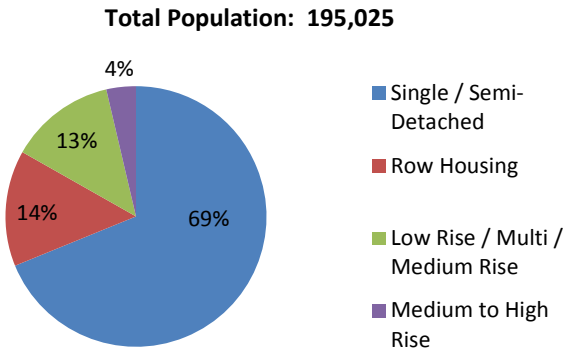


Figure 4 – Residential Split by Population



The average residents per unit and average units per hectare are detailed in Table 1.

Table 1 – Residential Land Uses

	Area (ha)	Units per hectare	Number of Units	% of Net Residential Area	People per Unit	Population	Average Market Value
Single / Semi-Detached	1918	25	47,941	82.7%	2.8	134,233	424,908
Row Housing	223	45	10,015	9.6%	2.8	28,042	327,841
Low Rise / Multi / Medium Rise	158	90	14,240	6.8%	1.8	25,634	338,339
Medium to High Rise	21	225	4,744	0.9%	1.5	7,116	334,177
Business Employment/Commercial	332						7,039,494
TOTAL (Residential Only)	**2320**		**76,940**	**100%**		**195,025**	

Infrastructure Breakdown

The amount of infrastructure to be built by the developer, the City of Edmonton and/or the Province is a function of many things, including the design of the community, the service standards provided, the amount and density of population served, and the presence of existing infrastructure.

Table 2 and 3 summarize the infrastructure required for the three Urban Growth Areas, their approximate costs in 2016 dollars, and the party responsible for their construction.

Table 2 – Developer Funded Infrastructure

Infrastructure Type	Cost (2016$)
Drainage Infrastructure	$2,351,000,000
Transportation Infrastructure	$1,455,000,000
TOTAL	**$3,806,000,000**

Table 3 – City/Province Funded Infrastructure

Infrastructure Type	Quantity	ASP Cost (2016$)
Recreation Centre (#)	3	$347,000,000
Library (#)	2	$36,000,000
Police Facilities and Equipment		$47,000,000
Fire Station (#)	5	$65,000,000
Parks (ha)	396	$95,000,000
Transit		$148,000,000
Roads and Interchanges		$519,000,000
Waste Collection		$105,000,000
TOTAL		**$1,362,000,000**

Qualifications for Tables 2 and 3

The following additional information is provided to help qualify the quantities and costs in Tables 2 and 3:

Community Facilities
It is anticipated that a Community Recreation Facility will be constructed in each of the three Urban Growth Areas. The facilities are anticipated to be constructed when the area population reaches approximately 50% build-out. The facilities may include an aquatic centre, arena and/or indoor sports component, as well as other multi-purpose components. The actual timing of the construction of the facility is contingent on funding availability, site land assembly, infrastructure, and population.

Table 3 includes the full cost of the Recreation Centres in Decoteau and Horse Hill. The Recreation Centre proposed in the Riverview is anticipated to serve both Riverview and Edgemont and as such, Table 3 includes only Riverview's proportional share of the Recreation Centre based on area population.

Drainage Services
Drainage costs are anticipated to include storm and sanitary sewers, service connections, stormwater management facilities, pump stations, outfalls, etc. These costs are expected to be entirely borne by the area developers.

The capital costs for the storm and sanitary systems included in Table 2 are based on the initial quantities and costs provided by the developers at the time the original Integrated Infrastructure Management Plans were prepared, updated unit cost information, and Area Master Plan information.

Edmonton Public Library
Edmonton Public Library identified requirements for a library facility in Horse Hill and in Riverview. The future libraries are planned to be integrated within the respective Recreation Centres and as such timing of the facilities is relational to the recreation facilities.

Edmonton Public Library has stated that a library will not be located in the Decoteau area. The area residents will be served by the Meadows Library as well as a future library to be developed west of the Decoteau area in the longer term.

Edmonton Police Services
Planning for Edmonton Police Service facilities considers the City as a whole. Divisional stations are typically required to serve area populations of 150,000 to 160,000 people. Edmonton Police Services anticipates that development of Decoteau and other areas on the south side as well as the development in Horse Hill and its surrounding area will each result in the need for an additional divisional station. The proportional share of the costs of the new divisional stations for the Urban Growth Areas is included in Table 3. The capital costs related to the purchase of new police vehicles to service these three Urban Growth Areas as also included in the table.

Parks
The Urban Growth Areas will include a total of 396 hectares of park space. It is anticipated that the park space includes District Activity Parks, school/park sites, urban

village parks, pocket parks, greenways, and natural areas. The City's capital cost for area park space development included in Table 3 is anticipated to be made up of signage, turf establishment, trees, parking, and servicing costs. The development timing of the park spaces is contingent on several factors including the area development pace, population, funding availability, land assembly, school board prioritization, and community involvement.

For the purpose of Integrated Infrastructure Management Planning analysis at the Area Structure Park level, park amenities such as trails, playground equipment or special facilities (such as washrooms) are not included in the costing. Therefore, the capital expenditures for parks may actually be higher than indicated in Table 3.

Transportation - Roadways
The developer funded transportation infrastructure in Table 2 include the costs of constructing local roads, collector roads, arterial roads, shared use paths, as well as the developer contribution to interchange construction or improvement currently included in the Arterial Roads for Development Bylaw.

For analysis purposes only, it is assumed that all arterial costs over and above the costs that are or are anticipated to be included in the Arterial Roads for Development Bylaw will be City funded. It is further assumed for analysis purposes only that any interchange or flyover construction or improvement required for development of the Urban Growth Areas, over the developer contribution, will be City funded. The arterial, interchange and flyover costs are included in Table 3.

Costs for interchange and flyover improvements were apportioned to the Urban Growth Areas based on discussions with Transportation, taking into account the developer contribution, the facility location, and the anticipated area traffic volumes.

LRT costs were not included in the analysis.

Transportation- Transit
Bus service requirements have been identified for the Urban Growth Areas and include the requirements for the provision of bus service within proposed areas as well as required transit centres.

Two transit centres are planned for the Horse Hill and one is planned for Riverview. The Decoteau area will not require a transit centre as its buses will make use of the planned transit centre / park and ride facility in the Walker Neighbourhood.

Waste Management
The cost of additional infrastructure for Waste Management Collection Services is included in Table 3. The cost includes collection vehicles, facility expansion, bins, and the areas proportional share of an Eco-Station, as applicable.

A new Eco-Station is anticipated to be required in the Horse Hill area to provide service to areas in north-east Edmonton. It is anticipated in the short to medium term that the Ambleside Eco-Station will accommodate the Decoteau and Riverview areas. In the longer term, with additional development in south Edmonton, an additional Eco-station may be required.

Demographic Based Cost and Revenue Projections

Forecasting financial impacts into the future is a speculative exercise. The following analysis projects costs and revenues for the proposed development out for 50 years, 11 years past the projected total build-out period of the Urban Growth Areas. These projections are based on assumptions, which in a large part consist of what is known of the development at the present time, the current costs for the provision of service and infrastructure, and the length of time required to build both the overall development, as well as the individual components (commercial centres, high density residential projects, etc.) that make it up. The use of the results of this analysis should take this, and the context of the City as a whole, into consideration. The major assumptions used on the analysis are detailed in the end of this report.

The analysis completed considers one build-out development scenario for each of the three Urban Growth Areas. The build-out of Decoteau is anticipated to occur over a 39 year time frame, Horse Hill over a 36 year time frame, and Riverview over a 30 year time frame.

As any projection is just that, a projection based on defendable assumptions, it is important to consider that the eventual build-out of the areas may well be different than that shown in this analysis. The analysis examines the build-out of the three Urban Growth Areas according to the proposed Area Structure Plans and does not consider alternative land use concepts, different development guidelines or patterns, or different densities.

Scenario Demographics

Under the proposed development scenario, the total population of the proposed Urban Growth Areas of 195,025 people would be achieved in approximately 39 years as is shown in Figure 5.

Figure 5 – Population Build-Out

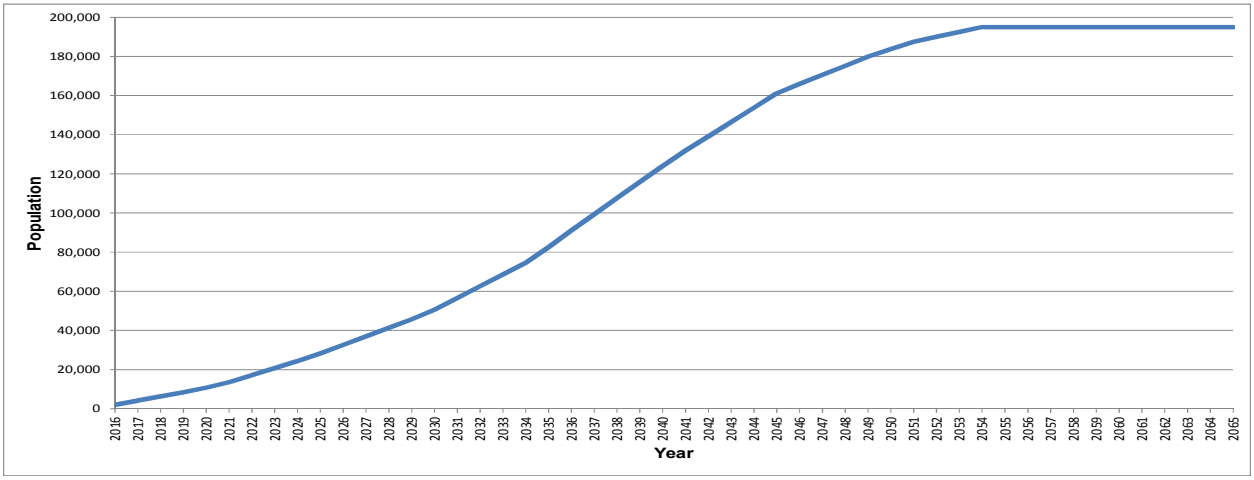
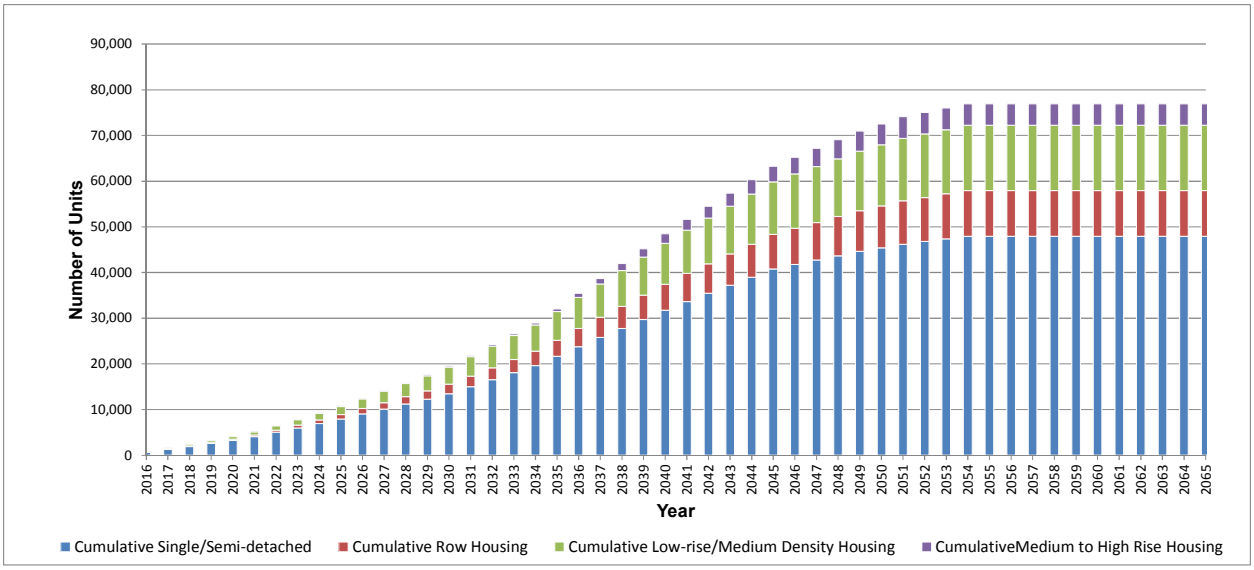


Figure 6 depicts how the projected population growth in Figure 5 translates into housing units of different types. It is cumulative, and shows the relative distribution over time.

Figure 6 – Residential Unit Build-Out

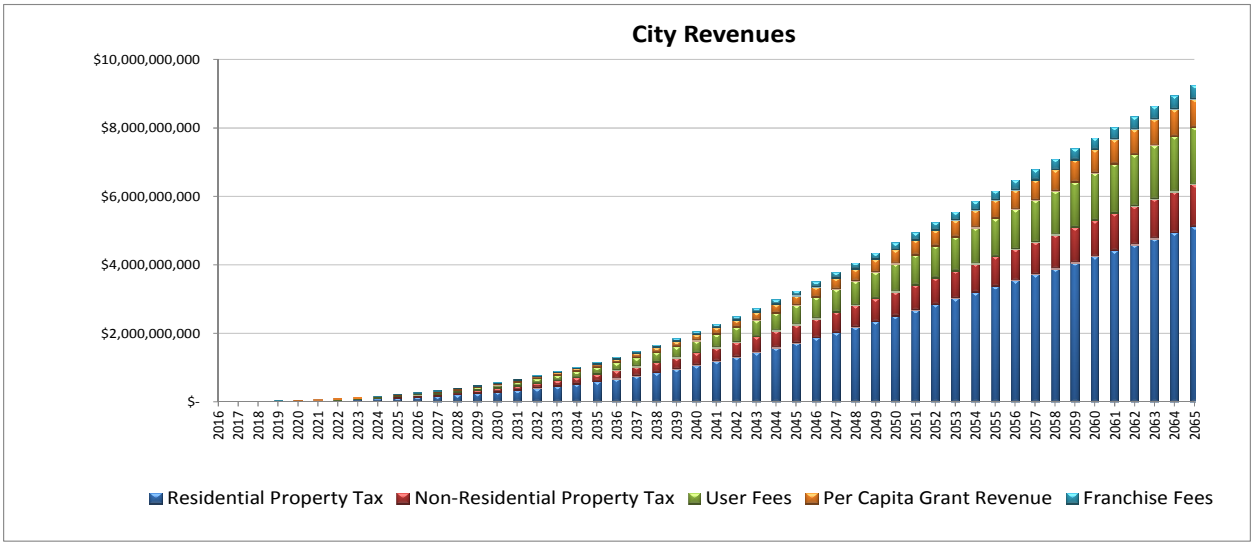


Revenue Expectations

City revenues come from a variety of sources. In this analysis, those revenues resulting from the proposed community directly were considered. Indirect revenues, such as EPCOR dividends are not included in this analysis. Figure 7 depicts the expected revenues over 50 years and identifies revenues by one five sources:

1. Franchise Fees: The City receives revenue from Atco Gas and EPCOR Electric customers for the use of public road allowances for their distribution networks.
2. Per Capita Grant Revenue: The City of Edmonton relies on provincial and federal grants for a portion of its capital program. Without them, the City is not sustainable given its limited revenue generation options and increasing obligations and service expectations. Although it is difficult to model Grant funding as it varies by program, a general observation is that it increases proportionately with population. A per capita revenue allocation was developed based on existing grants and applied within to the model.
3. User Fees: Individual City departments and business units may charge fees for the service they provide. Examples include transit fees, recreation centre fees, and parking meters.
4. Non-Residential Property Tax: Commercially zoned areas like strip malls, convenience stores, and grocery stores help form complete communities and provide employment and critical services. They also contribute to the City's tax base, and therefore projected revenues from those areas that are within the Urban Growth Areas are included.
5. Residential Property Tax: All residential units pay municipal tax based on the current year's mill rate and the assessed value of the property. As residential units are created in the model based on population growth, the taxes paid by these units are accounted for.

Figure 7 – Cumulative Revenues

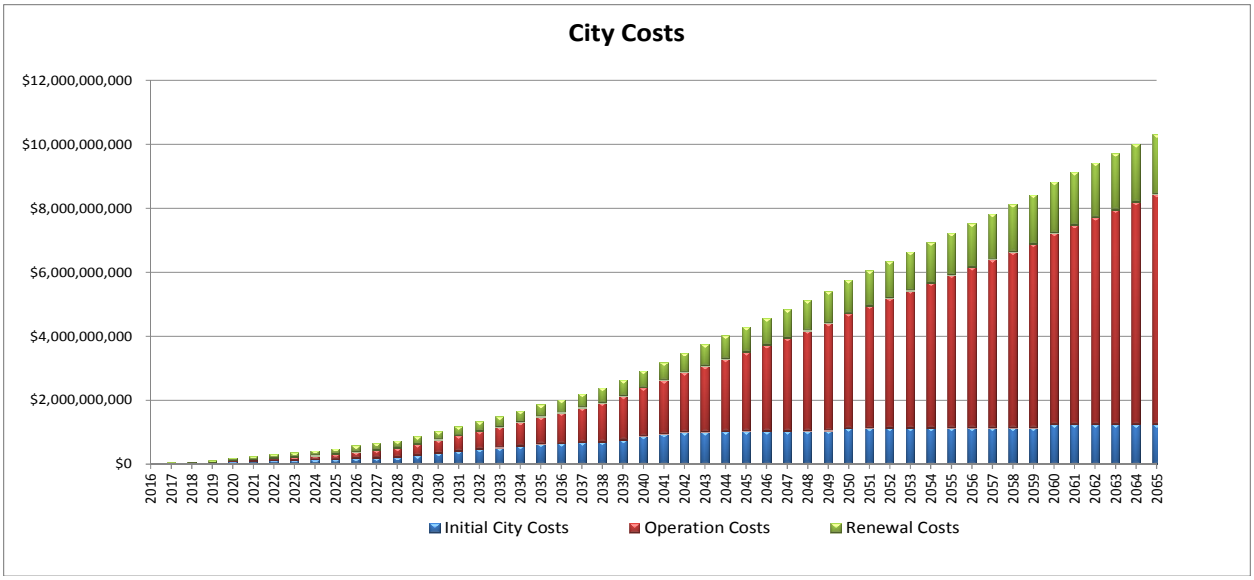


City Expenditure Expectations

City expenditures are attributable to the provision of a mix of services in the community, building new infrastructure required to provide that service, and maintaining and renewing infrastructure in the community that provides the service the community needs, and enjoys. Figure 8 depicts city costs over a 50 year time span. The expenditure is attributed to three categories:

1. Initial City Costs: This represents infrastructure built and funded by the City, and includes police and fire stations and equipment, community facilities, parks, as well as transportation and transit facilities. Initial City Costs are funded via the City's capital budget.
2. Renewal Costs: Renewal costs represent the reinvestment required to keep the community's infrastructure to an accepted physical standard. These costs are derived from the infrastructure built by both the developer and the City, and include rehabilitative actions throughout the life of the assets, as well as replacement costs at the end of the expected life of the asset within the 50 year timeframe of the model. The costs shown calculate the renewal costs at the expected time of expenditure (i.e. not amortized throughout the life of the asset), and therefore some replacement costs for long lived infrastructure such as sewers are not represented in the scope of the analysis. Renewal Costs are funded via the City's capital budget.
3. Operating Costs: Operating costs represent the set of on-going activities and expenses that allow the use of an asset for its intended function. These costs include those required for the use of the asset (e.g. electricity, fuel) and those costs required for the provision of the service provided (e.g. labour). Operating costs are funded via the City's operating budget.

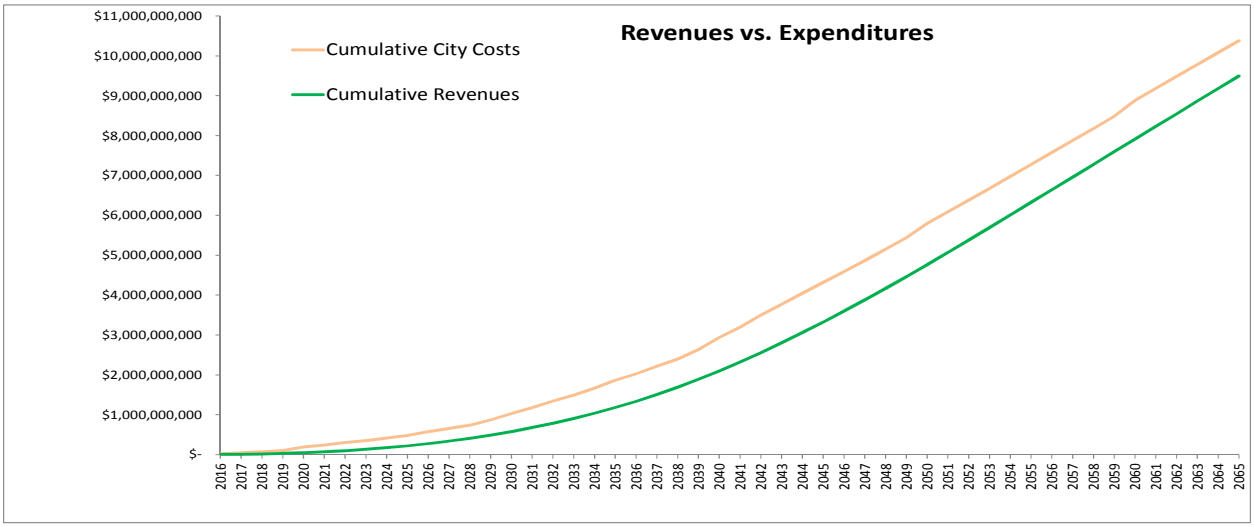
Figure 8 – Cumulative City Costs of Area Build-Out



Summary of Revenues and Expenditures

Figure 9 shows the difference between the City's revenues and expenditures for the proposed Urban Growth Areas over a projected 50 year period. At year 50, the projected cumulative shortfall resulting from the build-out of the Urban Growth Areas is $1.4 billion.

Figure 9 – Urban Growth Areas Revenues and Expenditures



Building Perspective

Infrastructure Planning

The Urban Growth Areas are anticipated to require approximately $1.4 billion in capital investment by the City. Major infrastructure needs to be carefully planned, timed and funded to meet the needs of the development.

As the Urban Growth Areas are located on the boundary of the City and will require improvements along Provincial roadways, development of the areas will require collaboration with adjacent counties and/or the Province to properly plan and upgrade the required infrastructure to serve the development area.

As Area Structure Plans are high level plans, some assumptions were made that will be reworked at the Neighbourhood Structure Plan Stage. It is anticipated that the information presented in this report will change as planning in the areas progresses and more is known. The Integrated Infrastructure Management Planning Framework calls for further analysis at the Neighbourhood Structure Plan level, presenting more refined information while placing the proposed neighbourhood in context with the Area Structure Plans and surrounding City development. So far, the approved Neighbourhood Structure Plans in the Urban Growth Areas have generally resulted in

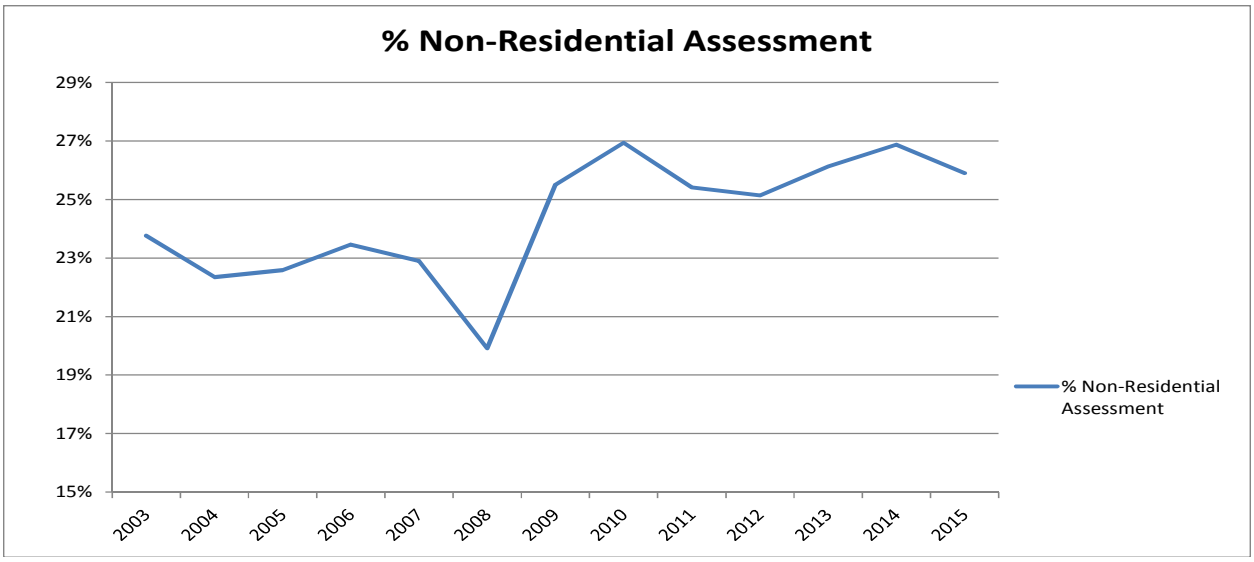
higher densities than expected in the original Area Structure Plans and therefore better revenue to cost ratios.

Sustainability through Balanced Growth

The overall balance of residential and non-residential land in the City of Edmonton is important in a number of ways. Residential areas provide places for people to live and build community. Non-residential areas provide employment, services, and amenities among other things. Both contribute to and are an essential part of the fabric of the City. Maintaining a healthy balance between them is critical.

It is therefore important to consider how proposed development, in any form, contributes to the overall balanced growth of the City of Edmonton. Figure 10 indicates the percentage of non-residential assessment out of the total assessment value of all property in the City since 2003. It shows that non-residential assessment made up approximately 26% of the total assessment base of the City in 2015.

Figure 10 – Non-Residential Assessment



How does the proposed development of the Urban Growth Areas affect this balance? Generally, residential areas have less than 25 % of their assessment base as non-residential, and the proposed Urban Growth Areas are projected to have between 6.5% (Horse Hill and Riverview) and 8.3% (Decoteau) of their assessment as non-residential.

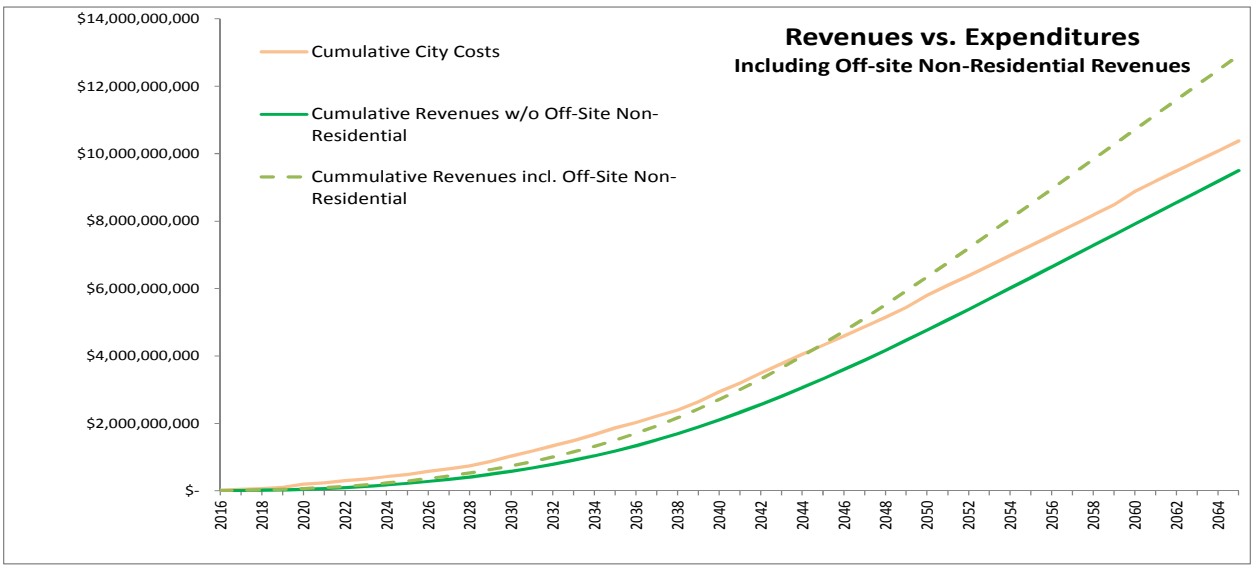
As the City grows its residential areas, it must also grow its non-residential areas to maintain balanced growth. Conversely, the City must grow its residential areas to balance growth in non-residential areas. In other words, for the City as a whole to maintain the current ratio, there needs to be approximately $5 billion of non-residential assessment for every $20 billion in residential assessment growth.

Currently in Edmonton, the residential and non-residential classes each contribute approximately 50 percent to the overall tax requisition. As the residential assessment base is approximately three times larger than the non-residential assessment base, the tax rate ratio varies between the two classes and the non-residential class pays approximately 2.5 to 3 times more per assessment dollar than the residential class. It should be noted that the trend in Edmonton over the last few years has been an increasing burden shifting towards the residential tax payer as the residential class takes on a greater proportion of the total assessment base. The residential share of property taxes has increased from 48.7% in 2005 to 50.8% in 2015.

Figure 10 shows that there is some volatility in the percentage of non-residential assessment over the 12 year period. Of particular note is the dip in 2008, which occurred as a result of a significant increase in residential assessments during the same year. It should be noted however, that the City of Edmonton has a budget-based approach to tax rates, the City's tax levy is unaffected by changing market conditions and fluctuations between the residential and non-residential assessment percentages. Given the City's approximately even split between residential and non-residential contributions however, different property types within an assessment class may experience significant increase in their tax burden as assessment values decrease or increase to maintain the overall tax requisition.

Figure 11 illustrates the importance of balanced growth and the benefit of maintaining the current non-residential assessment ratio.

Figure 11 – Urban Growth Areas Revenues and Expenditures (including off-site non-residential revenues)



The above figure is identical to Figure 9; however it also shows the effect on the revenue outlook by including off-site non-residential assessments. The premise in this

figure is that if the City maintains its current balance of approximately 25% non-residential assessment, by developing commercial and industrial areas throughout the City, this additional revenue helps to offset the fiscal imbalance indicated by looking at the Urban Growth Areas by themselves.

Based on the analysis completed, in order to maintain 25% non-residential assessment ratio, the Urban Growth Areas would require an additional $8.3 billion in non-residential assessments throughout the City of Edmonton, over and above the commercial and business employment areas planned within the Urban Growth Areas. It is uncertain at this point whether this magnitude of non-residential assessments can be achieved within the City's existing industrial areas and may be largely dependent on the timing and type of development to be constructed in the Edmonton Energy and Technology Park. A review of the City's Industrial Land Strategy is currently underway and its findings will inform the City's future industrial outlook. The findings of this strategy review are expected this summer.

Should this level of non-residential assessment not be achieved over the build-out of the Urban Growth Areas, the City may need to consider changing the current residential to non-residential tax split from an even split to a higher percentage from the residential area, which would increase residential contributions and better reflect the costs of the City's current built-form. Alternatively, the City may need to consider decreasing levels of service in some or all areas and/or looking to alternate funding mechanisms that permit the tax levy to be supplemented, such as those sought with changes to the MGA. For example, if the City had the ability to charge a levy for all of the required infrastructure currently considered to be City and/or Provincial costs within the Urban Growth Areas ($1.4 billion), this would make up the expected funding shortfall between revenues and costs over the 50 year analysis time horizon.

Committed Infrastructure

With both an aging and growing city, balancing investment choices between renewal and growth is a significant challenge. As infrastructure ages, more maintenance and rehabilitation is required to ensure that it is performing well and continuing to meet the needs of citizens. At the same time, demands arise for new infrastructure to support growth. The 2012-2014 Capital Budget allocated 54% to growth projects and 46% to renewal projects. The approved 2015-2018 Capital Budget allocates 58% for growth and 42% for renewal.

Table 4 shows the existing commitment and financial obligations associated with the City's developing neighbourhoods. The Capital Cost indicated in Table 4 is for funding new infrastructure and does not include cost related to infrastructure renewal, maintenance, or operations.

Table 4 – Approved Neighbourhoods and Area Structure Plans

Sectors	Capital Construction Costs ($ Million)		Population Demographics		
	Current Funded	Future Funded	NSP Projected	2014 Population	% Complete
North	$190	$530	238,898	86,239	36%
South	$90	$1,460	392,595	91,437	23%
West	$60	$980	169,582	32,377	19%
Total	**$340**	**$2,970**	**801,075**	**210,053**	**26%**

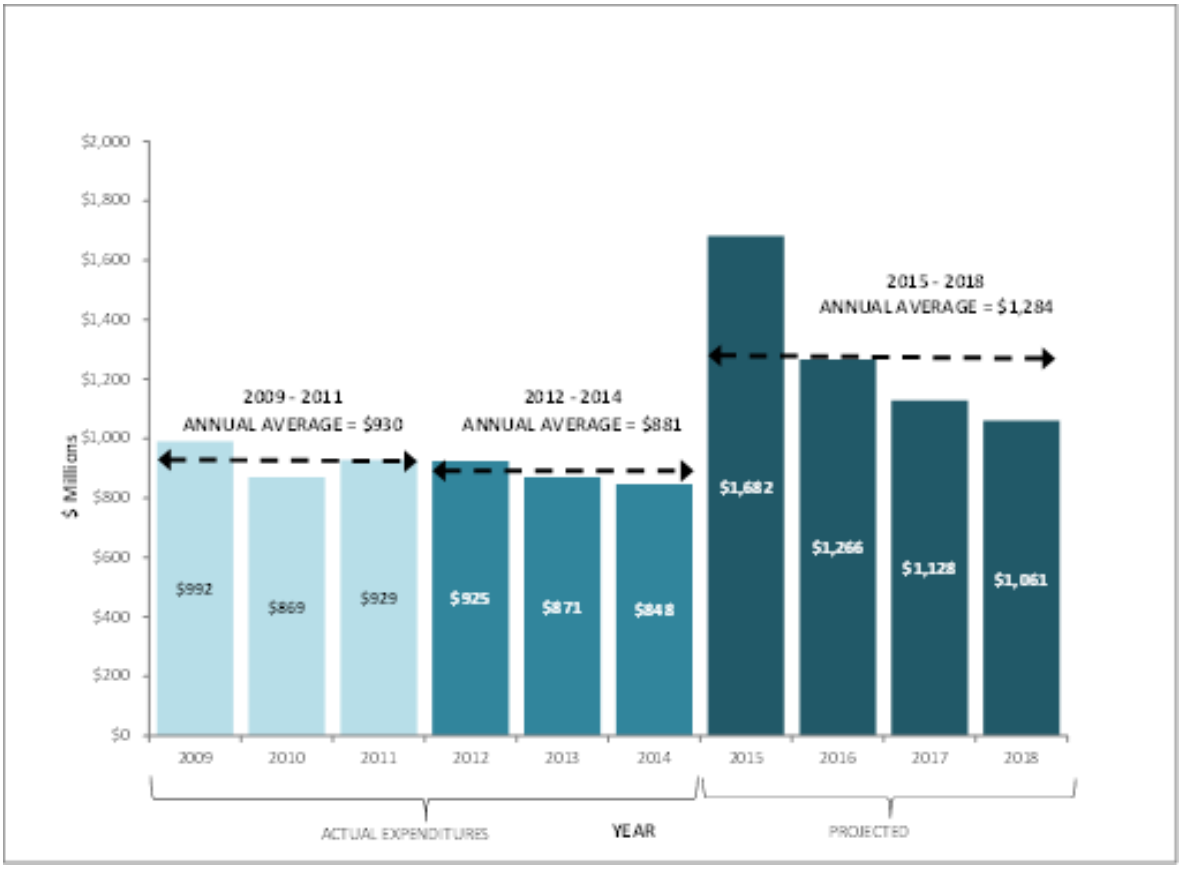
The infrastructure represented in the current funded column is either currently under construction, or will be in the not too distant future. The future funded column represents the balance of infrastructure required to complete the city's developing residential neighbourhoods, including the future neighbourhoods within the Urban Growth Areas. The current and future funded columns include City-funded infrastructure associated with neighbourhood development but do not include infrastructure with a city-wide or regional benefit such as LRT or interchanges.

In some cases, the neighbourhoods may take between 20 and 40 years to complete. This should be considered when putting these costs into context. Long term planning for infrastructure requirements in new growth areas involves understanding how the area will build out and how quickly it will build out, giving planners an idea of what is required now versus what will be required in the future.

During the capital budgeting process, City departments evaluate infrastructure needs in new areas and make recommendations for funding to Council.

The costs listed in Table 4 are significant, but the City commitment to its capital expenditure is even more significant. Figure 12, from the proposed 2015-2018 Capital Budget, shows historical and projected funding levels/breakdowns from 2009 to 2018. Administration makes funding and budget recommendations on a City-wide basis. Prioritization considers all capital requirements throughout the City, and incorporates the strategy and objectives of The Way Ahead.

Figure 12 – 2009-2018 Average Yearly Expenditures per Budget Period



Assumptions

The analysis presented in this report involves the combination of modelling using the Development Infrastructure Impact Model, coupled with area and sector specific analysis performed by the business units responsible for both the infrastructure and the provision of service. The gathering and analysis was performed by the Infrastructure and Funding Strategies Section with assistance of Sustainable Development, Integrated Infrastructure Services, Citizen Services, City Operations, Edmonton Public Library, Edmonton Police Services, and Financial and Corporate Services.

Area Specific Assumptions

With respect to the area being analyzed, the following was assumed:

1. The population was modeled to fill out independently of neighbourhoods. The model started area build-out in 2016.
2. Assessment averages were calculated using 2015 residential and commercial data.
3. Other area specific assumptions are identified in the qualifications following Table 2 and Table 3 in the report.

Assumptions for the Development Infrastructure Impact Model

As with any analytical procedure, the results of a model are dependent on the accuracy of the input data, and the strength of its underlying assumptions. In order to achieve a consistent corporate approach, certain assumptions were made to ensure that all area development-related infrastructure is compared on the same basis. The following describes some of the assumptions used in the Development Infrastructure Impact Model:

1. Area Structure Plans do not typically include specific infrastructure quantities, rather general land areas for road right-of-ways and municipal reserve. In the original Integrated Infrastructure Management Plans completed in support of Area Structure Plans approval, Administration worked with the developers' consultants to ascertain certain quantities in addition to those typically found in Area Structure Plans document. Those same quantities were vetted with the appropriate City department and updated as required then used in the updated analysis. Given that an Area Structure Plans represents a high level design for the area and is subject to change, the resulting quantities, costs and revenues are also subject to change. It is expected that more detail and accuracy can be achieved as the neighbourhood planning progresses within the plan area.
2. The timing for the areas' residential, business employment and commercial developments was initially provided by the developer's consultant at the time the initial Integrated Infrastructure Management Planning work. For Horse Hill and Riverview areas, the original timelines were used but they were adjusted to reflect a 2016 development start.
3. An assumption was made with respect to when all of the required infrastructure within an area would be completed and in service. For modelling purposes, it was assumed that when an area structure plan reaches 100% of its ultimate population, all City and developer built infrastructure would be in place.
4. Operation and Maintenance as well as Service Delivery Costs are calculated based on the City of Edmonton 2016 Operating Budget specific to each Asset as follows:
   Linear assets (roads and drainage) - $ per kilometer
   Parks - $ per hectare
   All Others - $ per capita
5. Major rehabilitation and renewal costs are asset specific and are based on typical lifecycle costs and timetables.
6. Tax rates and average assessments for both residential and commercial uses are based on the 2015 tax year.

Prepared by: Infrastructure and Funding Strategies
February 2016

Appendix B DIIM Input Cost Assumptions

A. Cost Assumptions: Area/Infrastructure Type	Description/Cost	Additional Comments
1. City Funded Infrastructure		
Library		
Decoteau	A library will not be located in the Decoteau. The area residents will be served by the Meadows Library as well as a future library to be developed west of the Decoteau area in the longer term.	
Horse Hill	1 library in conjunction with the recreation center in Horse Hill	
Capital costs:	$20,300,000	
Operating costs (annual):	$1,300,000	includes library materials, staffing, maintenance
Renewal costs (annual reserve):	$406,000	2% of construction costs (i.e. 50 year life assumed)
Timing:	Relational to recreation center in Horse Hill (i.e. when build out population reaches 50%)	
Construction start year:	2030	
Construction completion year:	2032	
Construction period (# of years):	3	
Population at completion year:	35,435	
Riverview	1 library in conjunction with the recreation center in Riverview	
Capital costs:	$15,500,000	
Operating costs (annual):	$1,100,000	includes library materials, staffing, maintenance
Renewal costs (annual reserve):	$310,000	2% of construction costs (i.e. 50 year life assumed)
Timing:	Relational to recreation center in Riverview (i.e. when build out population reaches 50%)	
Construction start year:	2033	
Construction completion year:	2035	
Construction period (# of years):	3	
Population at completion year:	23,137	
Community Services (Recreation Centers)		
Decoteau	1 rec center would be constructed in Decoteau.	
Capital costs:	$125,000,000	
Operating costs (annual):	$8,519,000	including staffing, material and services, utility costs
Renewal costs (annual reserve):	$2,500,000	2% of construction costs (i.e. 50 year life assumed)
Timing:	When built out population reached approx. 50%	
Construction start year:	2039	
Construction completion year:	2041	
Construction period (# of years):	3	
Population at completion year:	35,936	
Horse Hill	1 rec center would be constructed in Horse Hill.	
Capital costs:	$125,000,000	
Operating costs (annual):	$8,519,000	including staffing, material and services, utility costs
Renewal costs (annual reserve):	$2,500,000	2% of construction costs (i.e. 50 year life assumed)
Timing:	When built out population reached approx. 50%	
Construction start year:	2030	
Construction completion year:	2032	
Construction period (# of years):	3	
Population at completion year:	35,435	
Riverview	1 rec center would be constructed in Riverview.	
Population in Riverview	50,422	
Population in Edgemont	14,883	
% cost allocation to Riverview	77%	
Capital costs:	$96,512,447	Represents Riverview's proportion of costs based on build-out populations.
Operating costs (annual):	$6,577,516	including staffing, material and services, utility costs
Renewal costs (annual reserve):	$1,930,249	2% of construction costs (i.e. 50 year life assumed)
Timing:	When built out population reached approx. 50%	
Construction start year:	2033	
Construction completion year:	2035	
Construction period (# of years):	3	
Population at completion year:	23,137	
Fire Services (Fire Stations)		
Decoteau	1 fire station would be constructed in Decoteau.	
Capital costs:	$13,000,000	
Operating costs (annual):	$7,608,000	includes all costs, as well as renewal costs.
Renewal costs (annual reserve):	N/A	
Timing:	When built out population reached approx. 30,000	
Construction start year:	2037	
Construction completion year:	2039	
Construction period (# of years):	3	
Population at completion year:	29,530	
Horse Hill	2 fire station would be constructed in Horse Hill.	1 fire station would be located in N2
Capital costs:	$13,000,000	for each station
Operating costs (annual):	$7,608,000	includes all costs, as well as renewal costs.
Renewal costs (annual reserve):	N/A	
Timing:	First When built out population reached approx. 30,000; second when build-out pop reaches 80%	
Station 1:		
Construction start year:	2027	
Construction completion year:	2029	
Construction period (# of years):	3	
Population at completion year:	28,200	
Station 2:		
Construction start year:	2039	
Construction completion year:	2041	
Construction period (# of years):	3	
Population at completion year:	55,868	
Riverview	2 fire station would be constructed in Riverview.	1 fire station would be located in N2, the other one would be in N5
Capital costs:	$13,000,000	
Operating costs (annual):	$7,608,000	includes all costs, as well as renewal costs.
Renewal costs (annual reserve):	N/A	
Timing:	First When built out population reached approx. 20,000; second when build-out pop reaches 80%	
Station 1:		
Construction start year:	2031	
Construction completion year:	2033	
Construction period (# of years):	3	
Population at completion year:	18,575	
Station 2:		
Construction start year:	2039	
Construction completion year:	2041	
Construction period (# of years):	3	
Population at completion year:	40,105	

Police Facilities and Equipment

Decoteau	1 divisional station (costs shared) and one leased community station.	Development in south area (including Annexation) may require an additional divisional station
Divisional Station:		
Population in Decoteau	74,565	
Threshold pop for new divisional station	150,000	
% cost allocation to Decoteau	50%	
Capital costs:	$20,000,000	Represents Decoteau's proportion of cap costs ($40M).
Operating costs (annual):	$800,000	estimated at 4% of capital costs (does not include staff salaries or vehicle)
Renewal costs (annual reserve):	$400,000	2% of construction costs (i.e. 50 year life assumed)
Timing:		
Construction start year:	2025	
Construction completion year:	2028	
Construction period (# of years):	4	
Population at completion year:	6,053	
Community Station:		
Operating costs (annual):	$150,000	lease and o&m costs for community station.
Timing:	lease	Community station needed 10 years after area development starts
Lease start year:	2025	
Population in lease year:		
Staff:		
Police sworn staff salary (annual)	$155,000	
Civilian staff salary:$90k/year	$90,000	
Total number of police sworn staff	134	
Total number of civilian staff	57	
Population per police sworn staff	556	Calculated based on total staff figures provided and decoteau build-out population.
Population per civilian staff	1308	Calculated based on total staff figures provided and decoteau build-out population.
Vehicles:		
Capital costs (per vehicle):	$65,000	
Operating costs (annual, per vehicle):	$11,000	
Renewal timing (years, per vehicle)	6	
Police sworn staff per vehicle	3	
Total number of vehicles	45	
Horse Hill	1 divisional station (costs shared).	A Division station needed for overall growth in north Edmonton on either side of Henday and to complement the existing Northeast Division. May locate in Horse Hill area.
Divisional Station:		
Population in Horse Hill	70,038	
Threshold pop for new divisional station	150,000	
% cost allocation to Horse Hill	47%	
Capital costs:	$18,676,800	Represents Horse Hill's proportion of cap costs ($40M).
Operating costs (annual):	$750,000	estimated at 4% of capital costs (does not include staff salaries or vehicle)
Renewal costs (annual reserve):	$373,536	2% of construction costs (i.e. 50 year life assumed)
Timing:		
Construction start year:	2048	
Construction completion year:	2051	
Construction period (# of years):	4	
Population at completion year:	70,038	
Community Station:	No community station in Horse Hill.	
Staff:		
Police sworn staff salary (annual)	$155,000	
Civilian staff salary:$90k/year	$90,000	
Total number of police sworn staff	134	
Total number of civilian staff	40	
Population per police sworn staff	523	Calculated based on total staff figures provided and decoteau build-out population.
Population per civilian staff	1751	Calculated based on total staff figures provided and decoteau build-out population.
Vehicles:		
Capital costs (per vehicle):	$65,000	
Operating costs (annual, per vehicle):	$11,000	
Renewal timing (years, per vehicle)	6	
Police sworn staff per vehicle	3	
Total number of vehicles	44	~44.7 for Horse Hill.
Riverview	No divisional or community station needed in Riverview.	
Population in Riverview	50,422	
Staff:		
Police sworn staff salary (annual)	$155,000	
Civilian staff salary:$90k/year	$90,000	
Total number of police sworn staff	96	
Total number of civilian staff	40	
Population per police sworn staff	525	Calculated based on total staff figures provided and decoteau build-out population.
Population per civilian staff	1261	Calculated based on total staff figures provided and decoteau build-out population.
Vehicles:		
Capital costs (per vehicle):	$65,000	
Operating costs (annual, per vehicle):	$11,000	
Renewal timing (years, per vehicle)	6	
Police sworn staff per vehicle	3	
Total number of vehicles	32	

Transit

Decoteau	No transit centers are planned for Decoteau. It is anticipated that the transit center / park and ride facility in the Walker Neighbourhood, located at corner of Ellerslie Road and 50 Street, will service the Decoteau area	

Horse Hill	2 transit center needed in Horse Hill area.	
Capital costs:	$8,400,000	
Operating costs (annual):	$210,000	
Renewal costs (by forecast year):	Include mid life refurbishment and end of life replacemen	
Timing:		
Station 1:		
Construction start year:	2029	
Construction completion year:	2031	
Construction period (# of years):	3	
Population at completion year:	33,024	
Station 2:		
Construction start year:	2059	
Construction completion year:	2061	
Construction period (# of years):	3	
Population at completion year:	70,037	

Riverview	1 transit center needed in Riverview area.	
Capital costs:	$8,400,000	
Operating costs (annual):	$210,000	
Renewal costs (by forecast year):	Include mid life refurbishment and end of life replacemen	
Timing:		
Construction start year:	2034	
Construction completion year:	2036	
Construction period (# of years):	3	
Population at completion year:	26,015	

Buses

All Areas		
Capital costs (per bus):	$592,000	
Operating costs (per bus, annual)	$285,670	$96.38 per hour * 57 hour per week * 52 weeks per year
Renewal costs (midlife, every 10 years):	$90,000	
Renewal costs (full life, every 20 years):	$592,000	
Population per bus	The bus numbers were determined by population, average round trip time, peak hours trip gen rate, downstream service travel time, etc.	

Parks

All Areas		See parks tabs (on city spreadsheet) for detailed estimates.
Capital Costs ($/ha):		
District Park	$216,581 to $267,290	
School/Park	$243,017 to $280,744	
Urban Village Park	$243,805 to $295,061	
Pocket Parks	$235,840 to $314,188	
Natural Areas	$23,877 to $28,846	
Operating Costs ($/ha, annual):		
District Park	$9,183	
School/Park	$8,224	
Urban Village Park	$10,980	
Pocket Parks	$15,671	
Natural Areas	$460	

Roads and Interchanges

All Areas		
Capital Costs:		
Arterial Road Widening ($/Lane km)	$1,539,000 to $2,366,000	Developers provide their capital cost estimates in their ASPs/NSPs.
Interchange and Flyover Improvements	See interchange/flyover tab	
Operating Costs (annual):		
Local Road ($/Lane km)	$4,360	
Collector Road ($/Lane km)	$18,500	
Arterial Road ($/Lane km)	$45,020	
Shared Use Path ($/km)	Not considered	
Interchange Contribution	Considered part of arterial road	
Renewal Costs (annual):		
Local Road ($/Lane km)		
Resurface Cost (occur in the 18th year after construction)	$142,500	
Reconstruction Cost (occur in the 26th year after construction)	$613,000	
Collector Road ($/Lane km)		
Resurface Cost (occur in the 18th year after construction)	$235,500	
Reconstruction Cost (occur in the 26th year after construction)	$938,000	
Arterial Road ($/Lane km)		
Resurface Cost (occur in the 18th year after construction)	$192,750	
Reconstruction Cost (occur in the 26th year after construction)	$815,000	
Shared Use Path ($/km)	Not considered	
Interchange Contribution	See interchange/flyover tab	

Drainage

All Areas

Assumes that any capital, renewal and operating costs borne for Drainage is 100% cost recovered from sanitary and storm water utility rates.

Waste Management

All Areas

Assumes that any capital, renewal and operating costs borne for Drainage is 100% cost recovered from waste management utility rates.

Appendix C DIIM Input Revenue Assumptions

B. Revenue Assumptions:

Revenue Type

Property Tax

Decoteau

	Area (ha)	Units per Hectare	Number of Units	% of Net Residential Area	People per Unit	Population	Average Market Value	Mill Rate	Cumulative Tax Revenue at Build-Out
Single/Semi-detached	677.6	25	16,939	78.6%	2.8	47,429	$412,989	0.0055434	$528,593,334
Row Housing	120.0	45	5,400	13.9%	2.8	15,120	$313,135	0.0055434	$146,349,317
Low-rise/Medium Density Housing	56.5	90	5,081	6.5%	1.8	9,147	$392,839	0.0055434	$193,523,424
Medium to High Rise Housing	8.5	225	1,913	1.0%	1.5	2,869	$444,176	0.0055434	$70,418,503
Commercial	53.1						$8,505,085	0.0151319	$166,766,992
Business Employment	100.0						$5,981,349	0.0151319	$162,463,969
Total (Residential only)	**862.6**		**29,333**	100.0%		**74,565**			$1,268,115,540
Commerical %	15.07%								

Horse Hill

	Area (ha)	Units per Hectare	Number of Units	% of Net Residential Area	People per Unit	Population	Average Market Value	Mill Rate	Cumulative Tax Revenue at Build-Out
Single/Semi-detached	700.5	25	17,514	84.0%	2.8	49,039	$371,350	0.0055434	$768,050,449
Row Housing	67.1	45	3,020	8.0%	2.8	8,456	$345,603	0.0055434	$106,938,035
Low-rise/Medium Density Housing	56.4	90	5,075	6.8%	1.8	9,135	$274,321	0.0055434	$139,117,868
Medium to High Rise Housing	10.1	225	2,272	1.2%	1.5	3,408	$214,496	0.0055434	$27,330,087
Commercial	92.4						$8,505,085	0.0151319	$221,810,530
Business Employment	0.0						$5,981,349	0.0151319	$0
Total (Residential only)	**834.1**		**27,881**	100.0%		**70,038**			$1,263,246,969
Commerical %	10.0%								

Riverview

	Area (ha)	Units per Hectare	Number of Units	% of Net Residential Area	People per Unit	Population	Average Market Value	Mill Rate	Cumulative Tax Revenue at Build-Out
Single/Semi-detached	539.5	25	13,488	86.6%	2.8	37,766	$509,420	0.0055434	$393,227,666
Row Housing	35.4	45	1,595	5.7%	2.8	4,466	$343,996	0.0055434	$47,499,149
Low-rise/Medium Density Housing	45.4	90	4,084	7.3%	1.8	7,351	$350,086	0.0055434	$111,889,543
Medium to High Rise Housing	2.5	225	559	0.4%	1.5	839	$444,176	0.0055434	$24,501,641
Commercial	47.0						$8,505,085	0.0151319	$111,807,758
Business Employment	39.6						$5,981,349	0.0151319	$66,256,789
Total (Residential only)	**622.7**		**19,726**	100.0%		**50,422**			$755,182,545
Commerical %	12.20%								

Franchise Fee

All Areas		**Description/Reference**
Franchise Fee (per unit):		
ATCO Gas Residential	$140	
ATCO Gas Commercial	$580	Assume 1.5 units/Ha
EPCOR Electric Residential	$41	
EPCOR Electric Commercial	$181	Assume 1.5 units/Ha
Drainage	$0	As discussed

Grant Revenue

All Areas		**Description/Reference**
Provincial and Federal Grants (per capita):	$94	

User Fees:

All Areas (per unit)		**Description/Reference**
Single/Semi-detached	$814.2	$290.79
Row Housing	$814.2	$290.79
Low-rise/Medium Density Housing	$523.4	$290.79
Medium to High Rise Housing	$436.9	$291.27

Appendix D Cost Scenario Outputs

City Cost Calculations												
1. City Funded Infrastructure	Baseline		Capital Cost +10%			Capital Cost -10%		Operating Cost +5%		Operating Cost -5%		18/36 years roadway renewal scenario
Library												
Capital Costs	$35,800,000	14%	$39,380,000	15%	0%	$32,220,000	13%	$35,800,000	14%	$35,800,000	14%	
Operational Costs	$200,238,966	77%	$200,238,966	76%	2%	$200,238,966	79%	$204,033,966	78%	$196,443,966	77%	
Renewal Costs	$22,698,000	9%	$24,967,800	9%	0%	$20,428,200	8%	$22,698,000	9%	$22,698,000	9%	
Total Costs	$258,736,966	100%	$264,586,766	100%		$252,887,166	100%	$262,531,966	100%	$254,941,966	100%	$258,736,966
Community Services (Recreation Centers)												
Capital Costs	$346,512,447	28%	$381,163,692	30%	3%	$311,861,203	26%	$346,512,447	28%	$346,512,447	29%	
Operational Costs	$675,438,590	55%	$688,968,590	53%	7%	$686,508,590	58%	$709,210,520	56%	$641,666,661	54%	
Renewal Costs	$200,407,468	16%	$220,448,215	17%	2%	$180,366,722	15%	$200,407,468	16%	$200,407,468	17%	
Total Costs	$1,222,358,506	100%	$1,290,580,497	100%		$1,178,736,514	100%	$1,256,130,435	100%	$1,188,586,576	100%	$1,222,358,506
Fire Services (Fire Stations)												
Capital Costs	$65,000,000	6%	$71,500,000	6%	1%	$58,500,000	5%	$65,000,000	5%	$65,000,000	6%	
Operational Costs	$1,043,416,000	91%	$1,043,416,000	90%	10%	$1,043,416,000	92%	$1,095,586,800	91%	$991,245,200	91%	
Renewal Costs	$36,920,000	3%	$40,612,000	4%	0%	$33,228,000	3%	$36,920,000	3%	$36,920,000	3%	
Total Costs	$1,145,336,000	100%	$1,155,528,000	100%		$1,135,144,000	100%	$1,197,506,800	100%	$1,093,165,200	100%	$1,145,336,000
Police Facilities and Equipment												
Capital Costs												
Divisional Station	$38,676,800	2%	$42,544,480	2%	0%	$34,809,120	2%	$38,676,800	2%	$38,676,800	2%	
Vehicles	$7,865,000	0%	$8,651,500	0%	0%	$7,078,500	0%	$7,865,000	0%	$7,865,000	0%	
Total Capital	$46,541,800		$51,195,980			$41,887,620		$46,541,800		$46,541,800		$46,541,800
Operational Costs												
Facilities, etc.	$46,250,000	2%	$50,260,000	2%	0%	$42,240,000	2%	$48,562,500	2%	$43,937,500	2%	
Vehicle	$39,754,000	2%	$39,754,000	2%	0%	$39,754,000	2%	$41,741,700	2%	$37,766,300	2%	
Staff	$2,009,285,000	91%	$2,009,285,000	91%	19%	$2,009,285,000	92%	$2,109,749,250	92%	$1,908,820,750	91%	
Total Operational	$2,095,289,000		$2,099,299,000			$2,091,279,000		$2,200,053,450		$1,990,524,550		$2,095,289,000
Renewal Costs												
Facilities, etc.	$20,029,504	1%	$22,032,454	1%	0%	$18,026,554	1%	$20,029,504	1%	$20,029,504	1%	
Vehicle	$34,580,000	2%	$38,038,000	2%	0%	$31,122,000	1%	$34,580,000	2%	$34,580,000	2%	
Total Renewal	$54,609,504		$60,070,454			$49,148,554		$54,609,504		$54,609,504		
Total Costs	$2,196,440,304	100%	$2,210,565,434	100%		$2,182,315,174	100%	$2,301,204,754	100%	$2,091,675,854	100%	$2,196,440,304
Transit Centre												
Capital Costs	$25,200,000	51%	$27,720,000	52%	0%	$22,680,000	50%	$25,200,000	51%	$25,200,000	52%	
Operational Costs	$14,070,000	29%	$15,477,000	29%	0%	$12,663,000	28%	$14,773,500	30%	$13,366,500	28%	
Renewal Costs	$9,891,184	20%	$9,891,184	19%	0%	$9,891,184	22%	$9,891,184	20%	$9,891,184	20%	
Total Costs	$49,161,184	100%	$53,088,184	100%		$45,234,184	100%	$49,864,684	100%	$48,457,684	100%	$49,161,184
Buses												
Capital Costs	$123,136,000	5%	$135,449,600	5%	1%	$110,822,400	4%	$123,136,000	5%	$123,136,000	5%	
Operational Costs	$2,332,506,114	89%	$2,332,506,114	88%	23%	$2,332,506,114	90%	$2,449,131,420	90%	$2,215,880,808	89%	
Renewal Costs	$157,278,000	6%	$170,242,800	6%	2%	$144,313,200	6%	$157,278,000	6%	$157,278,000	6%	
Total Costs	$2,612,920,114	100%	$2,638,198,514	100%		$2,587,641,714	100%	$2,729,545,420	100%	$2,496,294,808	100%	$2,612,920,114
Parks (including River Valley Access)												
Capital Costs	$94,518,482	39%	$103,970,330.48	41%	1%	$85,066,634.03	36%	$94,518,482	38%	$94,518,482	40%	
Operational Costs	$126,574,843	52%	$127,804,843	50%	1%	$125,344,843	54%	$132,903,585.15	53%	$120,246,100.85	51%	
Renewal Costs	$22,750,000	9%	$22,750,000	9%	0%	$22,750,000	10%	$22,750,000	9%	$22,750,000	10%	
Total Costs	$243,843,325	100%	$254,525,173.48	100%		$233,161,477.03	100%	$250,172,067	100%	$237,514,583	100%	$243,843,325
Roads and Interchanges												
Capital Costs:												
Interchanges	$367,000,000	14%	$403,700,000	15%	4%	$330,300,000	13%	$367,000,000	14%	$367,000,000	14%	
Arterial Road Widening	$119,541,000	5%	$131,495,100	5%	1%	$107,586,900	4%	$119,541,000	5%	$119,541,000	5%	
Total Capital	$486,541,000		$535,195,100			$437,886,900		$486,541,000		$486,541,000		$486,541,000
Operating Costs:												
Local Road	$90,374,801	3%	$90,374,801	3%	1%	$90,374,801	4%	$94,893,541	4%	$85,856,061	3%	
Collector Road	$128,365,791	5%	$128,365,791	5%	1%	$128,365,791	5%	$134,784,081	5%	$121,947,501	5%	
Arterial Road	$456,969,523	18%	$456,969,523	17%	4%	$456,969,523	18%	$479,817,999	18%	$434,121,047	17%	
Street Lights	$33,162,418	1%	$33,162,418	1%	0%	$33,162,418	1%	$34,820,539	1%	$31,504,297	1%	
Total Operating	$708,872,533		$708,872,533			$708,872,533		$744,316,160		$673,428,906		$708,872,533
Renewal Costs:												
Local Road	$700,134,754	27%	$700,134,754	26%	7%	$700,134,754	27%	$700,134,754	27%	$700,134,754	27%	$390,627,126
Collector Road	$321,725,093	12%	$321,725,093	12%	3%	$321,725,093	13%	$321,725,093	12%	$321,725,093	13%	$174,990,129
Arterial Road	$378,265,066	15%	$378,265,066	14%	4%	$378,265,066	15%	$378,265,066	14%	$378,265,066	15%	$216,650,684
Total Renewal	$1,400,124,913		$1,400,124,913			$1,400,124,913		$1,400,124,913		$1,400,124,913		$782,267,940
Total Costs	$2,595,538,446	100%	$2,644,192,546	100%		$2,546,884,346	100%	$2,630,982,073	100%	$2,560,094,819	100%	$1,977,681,473
TOTAL CITY COST	$10,324,334,845		$10,511,265,115			$10,162,004,575		$10,677,938,199		$9,970,731,491		$9,706,477,872
			101.81%			98.43%		103.42%		96.58%		94.02%

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