Municipal Price Index
2019

Economic Insights

THE CITY OF
Edmonton

Economic Forecasting and Analysis

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1.0 Executive Summary

Inflation is an increase in the level of prices of goods and services in an economy over a period of time. The City of Edmonton monitors inflation as it can have various effects on its year-to-year operations and financial decision-making that is tied to the City's budgetary process.

Consumer inflation is typically measured through the Consumer Price Index (CPI) produced by Statistics Canada. The CPI represents the purchasing patterns of an average consumer and is a generally accepted measure of inflation. The CPI, however, is not the best tool to assess inflationary pressures the City of Edmonton faces because it does not adequately represent municipal purchasing patterns.

The Municipal Price Index (MPI) serves to measure inflation for the City of Edmonton and reflects the mix of goods and services purchased by the City of Edmonton. Development of an MPI was undertaken as a means to measure inflation the City of Edmonton's operating budget faces.

Edmonton's MPI has been fluctuating between one and three per cent from 2013 to 2018. With the exception of 2014 and 2018, municipal inflation has been consistently higher than consumer inflation. The actual year-end MPI for 2018 was 2.88 per cent which was relatively similar to CPI at 2.87 per cent.

It is important to note that the City re-calculated the weighting of each expenditure category for the 2018 MPI report based on the City's 2017 operating budget. In addition, average house price changes was replaced by annual changes in the land only component of Statistics Canada's New Housing Price Index (NHPI) for Edmonton to determine historical inflation for land costs. Due to these revisions to the methodology, 2019 MPI calculations are only directly comparable to the 2018 MPI report.

In 2019, municipal inflation is forecasted to be 2.06 per cent while consumer inflation is estimated to be 2.12 per cent. The MPI is forecasted to be lower than the CPI forecast due to anticipated declines in crude oil and natural gas prices. The MPI is forecasted to rise to 3.05 per cent in 2020, largely due to anticipated increases in crude oil and natural gas prices as well as a lift in the prime lending rate. From 2021 to 2023, the MPI is forecasted to be within the 2.70 to 2.80 per cent range as the prime lending rate, as well as commodity prices, are forecasted to stabilize. Consumer inflation is forecasted to be in the 1.90 to 2.10 per cent range over 2019 to 2023.

The table below displays the actual MPI and CPI from 2013 to 2018 along with forecasts for 2019–2023.

Comparison of Municipal and Consumer Inflation Rates 2013–2023

	Actual (per cent)						Forecast (per cent)				
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Municipal Inflation	2.83	2.09	1.46	1.48	2.48	2.88	2.06	3.05	2.74	2.77	2.79
Consumer Inflation[1]	1.21	2.18	1.22	1.17	1.62	2.87	2.12	2.00	1.94	1.98	2.00
Difference (percentage points)	1.62	-0.09	0.24	0.31	0.86	0.01	-0.06	1.05	0.80	0.79	0.79

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[1] Source: Conference Board of Canada

2019 Municipal Price Index

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2.0 Introduction

2.1 Understanding Inflation

Inflation is defined as the rise in the level of prices of goods and services in an economy over a period of time and is measured as an annual percentage increase in the Consumer Price Index (CPI). In essence, inflation means that every unit of currency buys a smaller amount of goods and services over time. An upward trend in inflation causes a decline in the purchasing power of money. For example, if an item costs $100.00 in period 1 and period-to-period inflation is 2 per cent, that same item will cost $102.00 in period 2, cost $104.04 in period 3 and so forth.

Since 1991, the Bank of Canada has employed an inflation control target that aims to maintain annual consumer inflation at 2 per cent—the mid-point of a control range of 1 to 3 per cent. This inflation-targeting approach to monetary policy guides the Bank of Canada in maintaining a stable price environment over the medium term. As a result, consumer inflation as measured by the CPI has been, on average, stable at the national level.

The City of Edmonton's cost of municipal service provision also faces inflation. Due to price increases, the City requires more money in its operating budget to purchase the same mix of goods and services over time. However, because the City purchases a considerably different range of goods and services than the average Canadian consumer, the CPI is not an adequate measure of the inflation the City' operating budget experiences. Moreover, municipal costs tend to experience a higher level of inflation than average consumer costs do. Thus, a Municipal Price Index (MPI) was developed to measure the price increases the City of Edmonton's operating budget faces.

The development of the MPI necessitated the formation of steering and working committees. The steering committee comprises senior managers from the Financial and Corporate Services Department who provide direction and assign resources to the project. The working committee, that comprises representatives from most sections of the Financial and Corporate Services Department, provided direction on the composition of expenditure categories, weights and inflation factors. The City of Edmonton's MPI was also created in accordance with *The Way We Finance*, with both projects developed in close alignment.

The MPI is not a prescriptive tool that mandates operating budget expenditures to increase by a designated amount each year. Rather, the MPI is a tool that helps better inform the City's budgetary process of external economic conditions that the City will face.

3.0 CPI versus MPI

The CPI is a measure of the price changes experienced by Canadians. Produced by Statistics Canada, the CPI is calculated by comparing the cost of a fixed basket of goods and services bought by an average Canadian consumer over time. Since the basket consists of goods and services of equivalent quality or quantity, the index reflects only the price change. The CPI is the most widely used calculation of inflation for Canada, the provinces and municipalities.

The goods and services included in the CPI are grouped if they have similar end-uses, or are deemed substitutes for one another. These groups of products are joined together at different levels, and the highest level of grouping is called a major component. The major components that comprise the CPI basket of goods and services are the following: food; shelter; household operations, furnishings and equipment; clothing and footwear; transportation; health and personal care; recreation, education and reading; and alcoholic beverages and tobacco products.[2]

Major components of the CPI basket are attributed a weight in relation to spending trends by Canadian consumers. For example, the proportion of total basket that each major component comprises is based on the proportion of total consumer expenditures made on those goods and services. These proportions signify the relative importance, or weight, of a grouping of products in the basket.

The content of the CPI basket is reviewed and updated by Statistic Canada every two years to ensure that the basket of goods and services included in the CPI remains relevant. The weights of each major component are updated to reflect the spending patterns obtained from the Survey of Household Spending from a more recent period. Figure 1 shows the major CPI components and their respective weights for Alberta, based on consumer spending in 2017.[3]

The weight attributed to each major component determines the impact that a specific price change will have on the overall consumer budget. In the 2017 basket, the weight assigned to shelter was 26.26 per cent whereas the weight assigned to clothing and footwear was 5.15 per cent. This means that, a 10 per cent increase in the price of shelter will have a much greater impact on the average consumer budget than a 10 per cent increase in the price of clothing

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[2] Statistics Canada. 1996. *Your Guide to the Consumer Price Index.* Catalogue no. 62-557-XPB.

[3] The 2015 basket is the most recent update to the CPI basket and was published on March 3, 2019.

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and footwear. In an absence of weights, all goods and services would be given an equivalent degree of importance, which does not accurately represent the average consumer's expenditure basket.

Figure 1: 2017 CPI Weights of Major Components – Alberta [4]
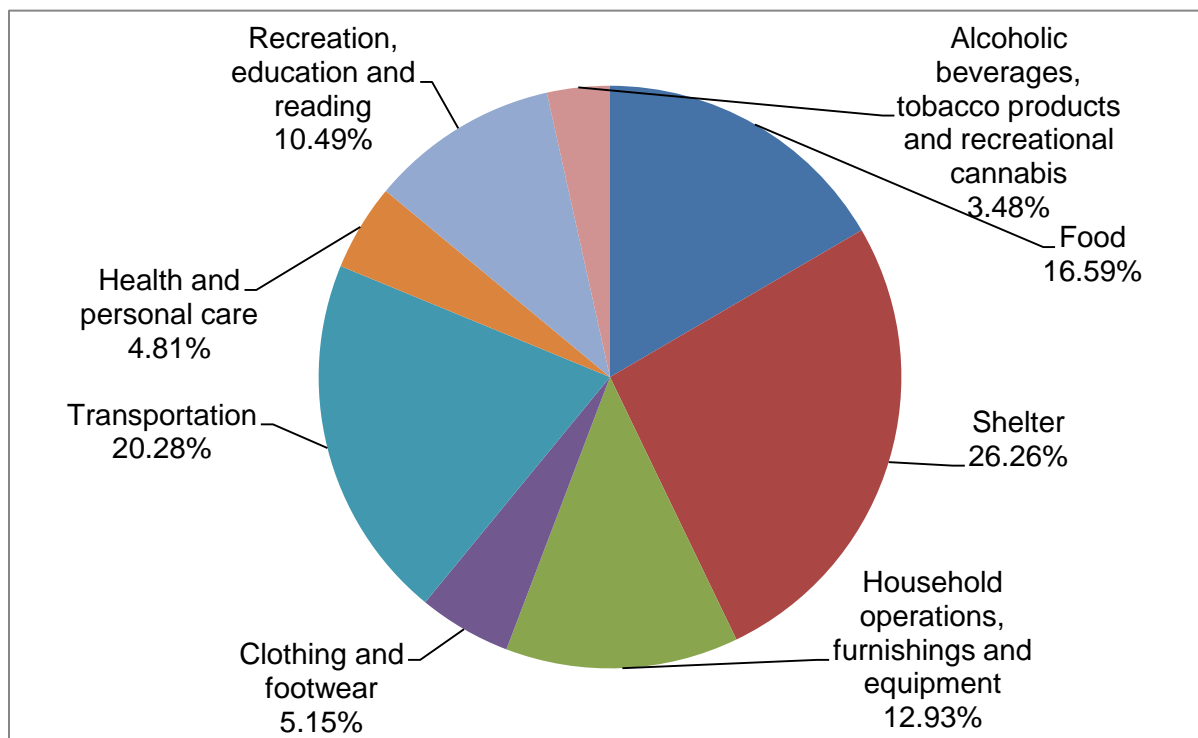
The CPI is a useful indicator of inflation because it is consistent, well known, published by a reputable independent organization and available free of charge. It is for these reasons that many municipal governments use the CPI to measure their inflation. However, the expenditure profiles of municipal governments are much different than the expenditure profile of an average Canadian consumer.

The average consumer spends money on food, housing, clothing, utilities and transportation, among other things. Municipal governments, on the other hand, build roads and pools, buy trees and buses and employ planners and firefighters. The CPI does not reflect the purchasing patterns of municipal governments and thus is not an accurate indicator of the inflationary pressures they face. To account for their unique expenditure profiles, several municipalities have opted to develop their own MPI.

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[4] Source: Statistics Canada, Table 18-10-0007-01 - Basket Weights of the Consumer Price Index.

4.0 Background to the MPI

The concept of an MPI originated in 1978 when *American City and County* began publishing what they call a Municipal Cost Index (MCI). The MCI is designed to estimate the inflation rate of the costs of municipal service provision. The MCI is a composite index—a weighted average of more detailed price indices—consisting of the Consumer Price Index, the Producer Price Index and the U.S. Department of Commerce's composite Construction Cost Indices.[5]

Using the *American City and County* price index as a foundation, several Canadian municipalities have developed their own MPIs. By tailoring an MPI to match a municipal government's expenditure profile, a municipal government is better able to monitor and react to its unique inflationary circumstances. Calgary, Ottawa, Halifax, Waterloo, Strathcona County and St. Albert have all developed an MPI.

The City of Edmonton decided to develop an MPI as part of the administration's performance measurement program. An MPI can be used by the City of Edmonton in the following ways:

1. To measure the increase in overall municipal expenditures attributed to inflation.
2. To allow managers to more closely monitor the increase in spending by expenditure category, thus making inflationary price increases or decreases more visible.
3. To provide an indication of the historical, current and future direction of prices relative to municipal expenditures.
4. To explain increased expenditures attributed to inflation when submitting annual budgets.

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[5] American City and County: americancityandcounty.com

5.0 Methodology

Of all the Municipal Price Indices (MPIs) surveyed, the City of Calgary maintains an MPI most applicable to Edmonton. In several cases, other municipal governments have adopted Calgary's methodology when developing their own MPIs. Following the methodology employed by the City of Calgary, constructing the MPI consists of two parts: 1) determining the weights of expenditure categories within the City's operating budget and 2) determining the appropriate inflation factor for each expenditure category. Once the index has been collated with these data, municipal inflation can be calculated by summing every product of weight and inflation factor.

5.1 Expenditure Categories and Weights

The City of Edmonton's 2009 operating budget was analyzed to determine expenditure categories and their respective weights in the development of the MPI. Items in the budget with similar inflationary pressures were grouped into broad expenditure categories. A total of 17 expenditure categories were formed. The weight of each category was assigned based on the percentage of the 2009 operating budget allocated to that category.

When the MPI was first developed, it was recommended that expenditure category weights be updated every five years. If the expenditure category weights are adjusted too frequently, year-to-year inflation rates become incomparable to one another.

The expenditure category weights were updated while compiling the 2018 MPI to reflect the City's 2017 operating budget. The expenditure category weights were updated previously while compiling the 2014 MPI. The decision to update the weights prior to 2019 was due to a significant shift in the weighting of expenditure categories, particularly around Wages and Salaries and Debt Service which warranted an update. Table 1 shows the updated weights for each expenditure category based on the 2017 operating budget.

Table 1: Expenditure Categories and Weights[6]

No.	Expenditure Category	Weight
1	Wages & Salaries	45.58%
2	Employee Benefits	8.93%
3	Equipment (Vehicles & Computers)	3.23%
4	Fuel	1.39%
5	Materials	3.52%
6	Natural Gas	0.38%
7	Utilities Total	2.05%
8	External Space	1.52%
9	Grants & Board Requisition	5.10%
10	Land Cost	3.33%
11	Tax Adjustments & Concessions	0.49%
12	Other Expenses	4.79%
13	Other Financing	0.24%
14	Travel & Training	0.44%
15	Contract Services	9.13%
16	Professional Services	1.17%
17	Debt Service Total	8.71%
	Total	100.0%

The most heavily weighted expenditure categories—the categories that comprise the largest share of the 2017 operating budget—are wages and salaries (45.58%), contract services (9.13%) and employee benefits (8.93%).

For illustrative purposes, Figure 2 further aggregates the 17 expenditure categories into seven broader categories. As can be seen, over half of the City's annual operating budget is allocated to wages, salaries and employee benefits.

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[6] The following items in the 2017 budget were not included in any MPI expenditure category because they do not represent budget components that undergo typical price inflation: 1) interdepartmental services, 2) amortization, 3) pay-as-you-go levy and 4) transfers to reserves.

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Figure 2: Expenditure Categories and Weights
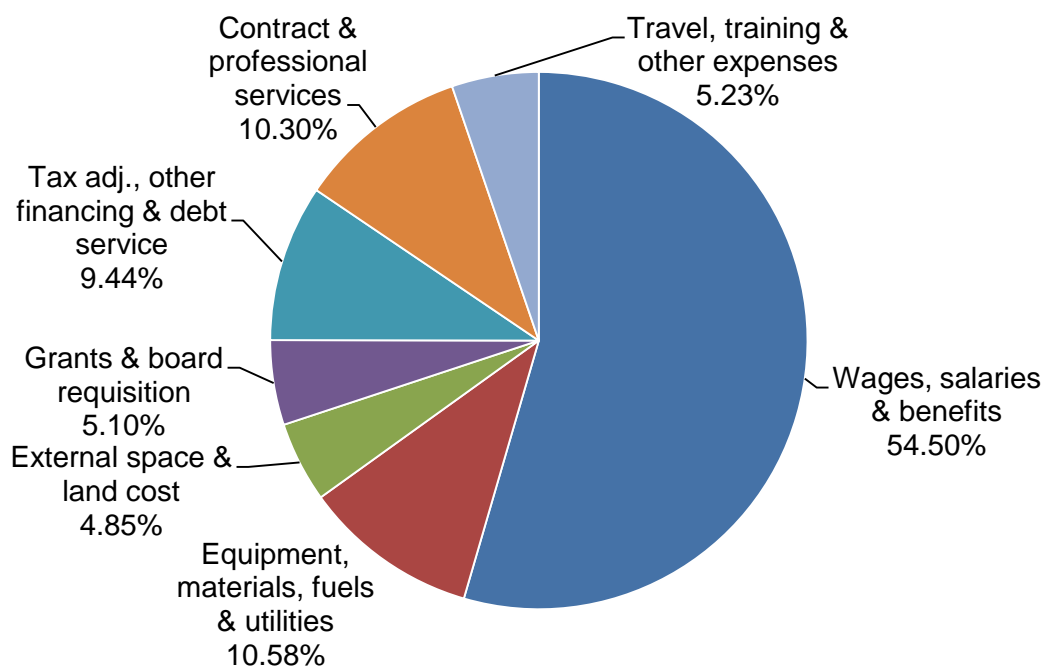
5.2   Inflation Factors

The next step in constructing the Municipal Price Index (MPI) is to assign an appropriate inflation factor to each expenditure category following the assignment of a weight to that category. The inflation factors assigned to each expenditure category are based on internal City of Edmonton sources, as well as several external sources. It is recommended that inflation factors be updated annually.[7] Doing so will ensure each year's MPI calculation is congruent with the inflationary pressures facing the operating budget for that year.

It is important to match an appropriate inflation factor to each expenditure category. For example, the Conference Board of Canada's crude oil price forecast is an appropriate inflation factor for the Fuel expenditure category. Because the costs of crude oil and fuel will likely move in the same direction at approximately the same magnitude, this inflation factor was determined to be a good fit for the Fuel expenditure category. In other cases, where a suitable fit could not be identified, the CPI was used as a default inflation factor. A table of each expenditure category, as well as the data source and publisher for each inflation factor, is listed in Appendix 1.

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[7] Inflation factors should be updated during the month of February of each calendar year.

For some expenditure categories, contracts that dictate the rate of inflation are in place. For these expenditure categories, inflation is determined by a contractual obligation to increase spending, irrespective of market forces. By far, the largest expenditure category is wages and salaries, which accounts for 45.6% of the City's operating budget. For 2014–2018, the wages and salaries increases for the City of Edmonton employees are based on actual labour settlements that extend into the future. For bargaining units where a settlement was not available, the Alberta industrial composite wage inflation rate was used. The Alberta industrial composite wage inflation forecast was used as a proxy for the years 2019 to 2023 for bargaining units where a settlement was not available.

5.3   Calculating Municipal Inflation

The calculation for the Municipal Price Index (MPI) is based on the average of expected price changes for each expenditure category weighted by their respective proportion of the operating budget spent on that category. The weights for each expenditure category indicate the importance of an item or group of items in the municipality's operating budget. Using weights to construct the MPI prevents overstating the influence of a given item in the municipal basket of goods and services. An MPI can, therefore, be calculated using the following equation:[8]

$$MPI = X_1(W_1/W) + X_2(W_2/W) + \cdots + X_n(W_n/W) \quad \text{[2]}$$

where:

MPI = Municipal price index

X_n = Price change for expenditure category n

W_n = Total expense of expenditure category n in the operating budget

W = Total expense of the City's operating budget

W_n/W = Weight of expenditure category n in the City's operating budget

Equation [2] can be rewritten as:

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[8] Walters, Patrick. 2009. *The City of Calgary Corporate Inflation Rate – 2003–2008: As measured by a municipal price index.* Corporate Economics. The City of Calgary.

$$MPI = \sum_{i=1\ldots n} X_n (W_n / W)^{[3]}$$

Equation [3] produces a single inflation rate, which is the rate of cost increases facing the City of Edmonton's operating budget for the year being examined.

6.0   The City of Edmonton MPI

The MPI is updated on an annual basis, generally during the first half of the year. The update to the MPI involves revising the previous year's estimated MPI values to reflect actual inflation figures and updating the inflation factors for the current year and the next four years with updated forecast values. This report incorporates the revisions to the previously estimated 2018 MPI values to reflect actual figures and updates to the MPI forecasts for the 2019–2023 period.

The City's municipal inflation fluctuated within the one and three per cent range between 2014 and 2018. Historically, municipal inflation has been consistently higher than consumer inflation with the exception of 2014 and 2018. In 2014, the MPI was lower than CPI while in 2018, the MPI and CPI were relatively similar. The actual year-end MPI for 2018 was 2.88 per cent while CPI stood at 2.87 per cent.

It is important to note that the City re-calculated the weighting of each expenditure category for the 2018 MPI report based on the City's 2017 operating budget. In addition, average house price changes was replaced by annual changes in the land only component of Statistics Canada's New Housing Price Index (NHPI) for Edmonton to determine historical inflation for land costs. Due to these revisions to the methodology, 2019 MPI calculations are only directly comparable to the 2018 MPI report.

In 2019, municipal inflation is forecasted to be 2.06 per cent while consumer inflation is estimated to be 2.12 per cent. The MPI is forecasted to be lower than the CPI forecast due to anticipated declines in crude oil and natural gas prices. The MPI is forecasted to rise to 3.05 per cent in 2020, largely due to anticipated increases in crude oil and natural gas prices as well as a lift in the prime lending rate. From 2021 to 2023, the MPI is forecasted to be within the 2.70 to 2.80 per cent range as the prime lending rate, as well as commodity prices, are forecasted to stabilize. Consumer inflation is forecasted to be in the 1.90 to 2.10 per cent rage over 2019 to 2023. Figure 3 shows actual and forecasted MPI and CPI from 2010 to 2022.

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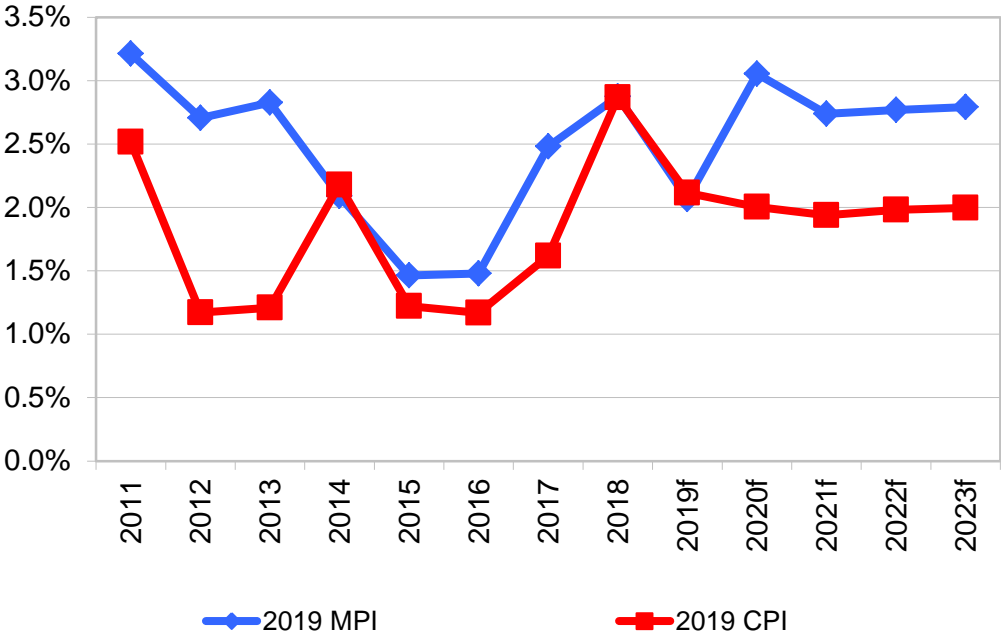**Figure 3: Municipal Price Inflation vs. Consumer Price Inflation**

Table 2 (page 16) shows the City of Edmonton's actual and forecasted MPI from 2014 to 2023. The inflation factors for years 2014 to 2018 represent actual historical inflation rates experienced in each of the expenditure categories while those for years 2019 to 2023 are forecasted inflation rates that are expected over the current year and the next four years.

Table 2: City of Edmonton Municipal Price Index

No.	Expenditure Category	Weight	Inflators For Each Expenditure Category										
			Actual (per cent)						Forecast (per cent)				
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	Wages & Salaries	45.58%	3.02	2.02	2.29	2.29	2.38	2.69	2.46	2.65	2.56	2.79	2.84
2	Employee Benefits	8.93%	3.39	1.66	3.39	2.75	2.38	2.69	2.46	2.65	2.56	2.79	2.84
3	Equipment (Vehicles & Computers)	3.23%	0.41	2.49	-0.84	-0.20	3.13	3.77	0.42	2.46	1.97	1.90	1.84
4	Fuel	1.39%	4.03	0.49	-37.97	-8.01	19.39	13.12	-21.68	23.96	6.50	0.53	0.21
5	Materials	3.52%	0.41	2.49	-0.84	-0.20	3.13	3.77	0.42	2.46	1.97	1.90	1.84
6	Natural Gas	0.38%	10.07	20.65	-16.61	-12.00	8.65	2.39	-4.30	7.05	6.82	1.37	1.04
7	Utilities Total	2.05%	9.08	1.69	5.08	1.82	1.50	1.88	2.52	1.96	1.96	2.02	1.99
8	External Space	1.52%	1.21	2.18	1.22	1.17	1.62	2.87	2.12	2.00	1.94	1.98	2.00
9	Grants & Board Requisition	5.10%	1.21	2.18	1.22	1.17	1.62	2.87	2.12	2.00	1.94	1.98	2.00
10	Land Cost	3.33%	0.50	0.32	0.83	0.16	-0.03	0.58	2.12	2.00	1.94	1.98	2.00
11	Tax Adjustments & Concessions	0.49%	1.21	2.18	1.22	1.17	1.62	2.87	2.12	2.00	1.94	1.98	2.00
12	Other Expenses	4.79%	1.21	2.18	1.22	1.17	1.62	2.87	2.12	2.00	1.94	1.98	2.00
13	Other Financing	0.24%	3.00	3.00	2.78	2.70	2.91	3.63	4.21	4.82	5.20	5.20	5.20
14	Travel & Training	0.44%	1.21	2.18	1.22	1.17	1.62	2.87	2.12	2.00	1.94	1.98	2.00
15	Contract Services	9.13%	3.91	1.77	2.28	-0.68	1.74	2.18	2.45	2.87	2.76	2.79	2.84
16	Professional Services	1.17%	3.91	1.77	2.28	-0.68	1.74	2.18	2.45	2.87	2.76	2.79	2.84
17	Debt Service Total	8.71%	3.00	3.00	2.78	2.70	2.91	3.63	4.21	4.82	5.20	5.20	5.20
		100.0%											
	Municipal Price Inflation		2.83	2.09	1.46	1.48	2.48	2.88	2.06	3.05	2.74	2.77	2.79
	Consumer Price Inflation		1.21	2.18	1.22	1.17	1.62	2.87	2.12	2.00	1.94	1.98	2.00
	Difference (percentage points)		1.62	-0.09	0.24	0.31	0.86	0.01	-0.06	1.05	0.80	0.79	0.79

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7.0   Critical Factors for Success

7.1   Use External Sources for Inflation Where Possible

Critics of the MPI argue that it can be a self-serving tool, particularly if used to justify tax increases. To alleviate this criticism, the MPI should be calculated by an independent body. The Canadian Federation of Municipalities is currently lobbying Statistics Canada to calculate and maintain MPIs for Canadian municipalities. So far, however, municipalities have been calculating these indices on their own. To mitigate the criticism that the MPI is a self-serving municipal indicator, it must be both transparent and, where possible, use external sources.

7.2   Continue to Refine the Calculation

The inflation factors should be routinely reviewed and new values should be assigned when existing ones are deemed inappropriate. Additionally, all expenditure categories should be regularly reassessed to ensure that an appropriate level of homogeneity exists within each category. This approach ensures that the correct inflation factors—ones that accurately reflect inflationary pressures—are assigned to each expenditure category.

8.0   Application of the Municipal Price Index

The MPI is a powerful tool that measures the inflationary pressures that municipal operational expenditures face. The MPI can be used by the City of Edmonton in the following ways:

- to enable managers to more closely monitor the increase in spending by expenditure category, thus making inflationary price increases or decreases more visible;

- to provide an indication of historical, current and future direction of prices relative to municipal expenditures; and

- to explain increased expenditures attributed to inflation when submitting annual operating budgets.

9.0 Appendix 1 – Sources for 2019–2023 Inflation Factors

No.	Expenditure Category	Inflation Factors	Source / Publisher
1	Wages & Salaries[9]	1) Wage & Salary Settlements; 2) Wage Inflation Forecast, Alberta: Industrial Composite	1) City of Edmonton - Human Resources; 2) Conference Board of Canada
2	Employee Benefits[10]	1) Labour Settlements; 2) Wage Inflation Forecast, Alberta: Industrial Composite	1) City of Edmonton - Human Resources; 2) Conference Board of Canada
3	Equipment (Vehicles & Computers)	Industry Product Price Index: Manufacturing	Conference Board of Canada
4	Fuel	Raw Materials Price Index: Crude Oil Forecast	Conference Board of Canada
5	Materials	Industry Product Price Index: Manufacturing	Conference Board of Canada
6	Natural Gas	Raw Materials Price Index: Natural Gas Forecast	Conference Board of Canada
7	Utilities[11]	Electricity Power Price Index	Conference Board of Canada
8	External Space[12]	CPI Forecast	Conference Board of Canada
9	Grants & Board Requisition	CPI Forecast	Conference Board of Canada
10	Land Cost[13]	CPI Forecast	Conference Board of Canada
11	Tax Adjustments & Concessions	CPI Forecast	Conference Board of Canada
12	Other Expenses	CPI Forecast	Conference Board of Canada
13	Other Financing	Prime Lending Rate	Conference Board of Canada
14	Travel & Training	CPI Forecast	Conference Board of Canada
15	Contract Services	Wage Inflation Forecast, Alberta: Industrial Composite	Conference Board of Canada
16	Professional Services	Wage Inflation Forecast, Alberta: Industrial Composite	Conference Board of Canada
17	Debt Service Total[14]	Prime Lending Rate	Conference Board of Canada

[9] Inflation factors for 2014–2018 were derived from wage and salary settlements. Where a settlement was not available, the Alberta industrial composite wage inflation rate was used. The Alberta industrial composite wage inflation forecast was used as proxy for 2019–2023 where bargaining settlement information was missing.

[10] Inflation factors for 2014–2018 were derived from labour settlements. Where a settlement was not available, the Alberta industrial composite wage inflation rate was used. For 2019–2023, the Alberta wage inflation forecast was used as proxy.

[11] The Utilities expenditure category consists of power, water, telephones, sewer and waste, but it largely comprises power. The Electricity Power Price Index is currently used as the inflation factor for Utilities. Research on alternatives continues, and this inflation factor will be replaced if a more suitable one is found. The Conference Board of Canada made some revisions to the Electricity Power Price Index in early 2013 to align this index with the structural revisions made to the Canadian System of National Accounts by Statistics Canada. As a result, the historical series has changed from the one used in estimating the 2012 MPI.

[12] The CPI forecast is currently used as the inflation factor for External Space. Research on alternatives continues, and this inflation factor will be replaced if a more suitable one is found.

[13] Inflation factors for 2014-2018 were calculated using year-over-year changes in Statistics Canada's New Housing Price Index for the land component only. The 2019–2023 forecasts do not exist, so CPI forecasts for these years were used as proxies. Research on a more suitable inflation factor is ongoing. If a better alternative is found for this expenditure category, the current inflation factors will be replaced.

[14] The movements in financing costs are expected to follow movements in the prime lending rate. Hence, the prime lending rate was used as the inflation factor for debt services. Research on a more suitable inflation factor is ongoing. If a more suitable alternative is identified, it will be replaced.