City of Edmonton

Municipal Price Index Backgrounder (2023 update)

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TABLE OF CONTENTS

1. Understanding Inflation

Inflation is defined as the rise in the level of prices of goods and/or services in an economy over a period of time. Inflation for individual consumption is measured as an annual percentage increase in the Consumer Price Index (CPI). In essence, inflation means every unit of currency buys a smaller amount of goods and/or services over time. For example, if an item costs $100.00 in period 1 and period-to-period inflation is two per cent, that same item will cost $102.00 in period 2, $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[1] at two per cent—the midpoint of a control range of one to three 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 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, consumer inflation is not an adequate measure of inflation faced by the City. Thus, a Municipal Price Index (MPI) was developed to estimate price increases faced by the City for operating expenditures.

The development of the MPI necessitated the formation of steering and working committees. The steering committee included senior managers from the Financial and Corporate Services Department (FCS), who provided direction and assigned resources to the project. The working committee, made up of representatives from most sections of FCS, provided direction on the composition of expenditure categories, weights and inflation factors.

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 may be exposed to.

[1] Bank of Canada, "Understanding inflation targeting," 13 August 2020.

2. CPI versus MPI

The CPI is a measure of the price changes experienced by Canadian consumers. Produced by Statistics Canada, the CPI is calculated by comparing the cost of a fixed basket of goods and services bought by Canadian consumers 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 weighted in relation to spending trends by Canadian consumers. For example, the proportion of the total basket that each major component accounts for 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.

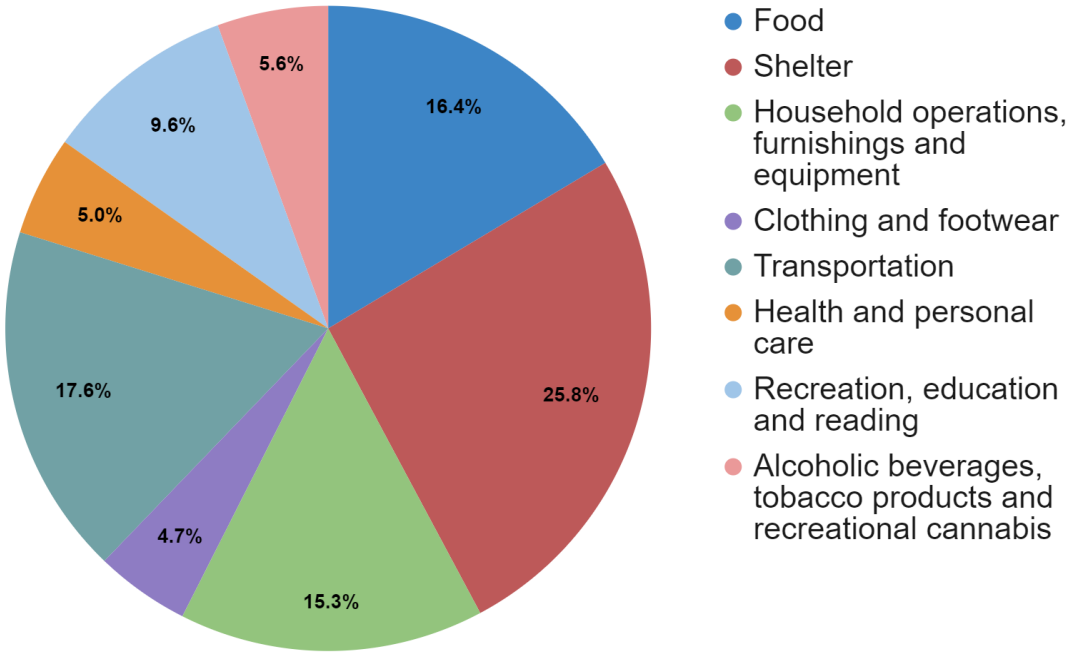
The content of the CPI basket has typically been reviewed and updated by Statistics Canada every two years to ensure the basket of goods and services included in the CPI remains relevant. During the COVID-19 pandemic, due to substantial changes in spending patterns, Statistics Canada updated weights in both 2020 and 2021. 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 2021.[3]

The weight attributed to each major component determines the impact a specific price change will have on the overall consumer budget. In the 2021 basket, the weight assigned to shelter was 25.77 per cent, whereas the weight assigned to clothing and footwear was 4.73 per cent. This means 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 and footwear. In an absence of weights, all goods and services would be given an equivalent

[2] Statistics Canada. 2023. *The Canadian Consumer Price Index Reference Paper*. Catalogue no. 62-553-X.
[3] The 2021 basket is the most recent update to the CPI basket and was published on 15 June, 2022.

degree of importance, which does not accurately represent Canadian consumers' expenditure basket.

Figure 1. 2021 CPI Weights of Major Components - Alberta[4]



Source: Statistics Canada

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 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 Canadian consumers.

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.

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

3. 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, some 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, Strathcona County and St. Albert have all developed an MPI.

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.

4. 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 expenditures and 2) determining the appropriate inflation factor for each expenditure category. Once this data has been sourced and compiled, municipal inflation can be calculated by summing every product of weight and inflation factor.

[5] American City and County:

4.1 Expenditure Categories and Weights

The first iteration of the City of Edmonton's MPI was developed using the 2009 operating budget to determine expenditure categories and their respective weights. Items in the budget with similar inflationary pressures were grouped into broad expenditure categories. A total of 17 expenditure categories were created. 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 2023 MPI to reflect the City's 2022 actual operating expenditures. The expenditure category weights were updated previously while compiling the 2009, 2014 and 2018 MPI, though weights were based on the City's prior year operating budget. The decision to update the weights in 2018, which was one year ahead of its next scheduled update in 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 on the following page shows the updated weights for each expenditure category based on the 2022 operating budget.

Table 1. City of Edmonton MP Expenditure Categories and Weights[6]

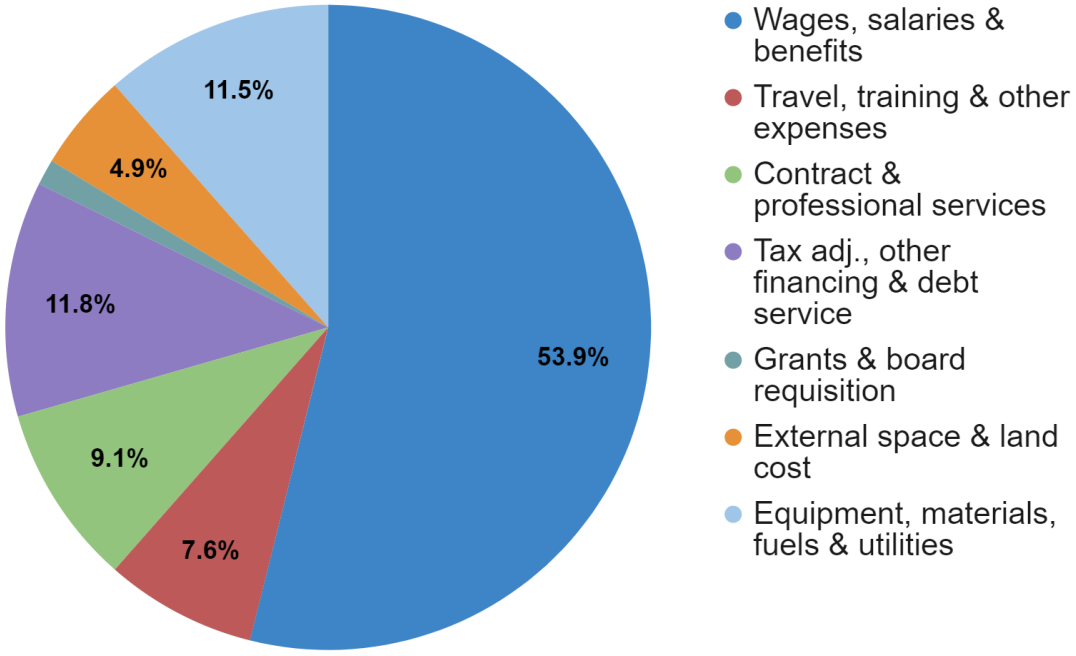
Expenditure Category	2009	2022
Wages & Salaries	43.93%	45.48%
Employee Benefits	11.55%	8.41%
Equipment (Vehicles and Computers)	3.58%	3.77%
Fuel	1.61%	1.88%
Materials	3.77%	3.26%
Natural Gas	0.64%	0.57%
Utilities[7]	2.06%	-
Electricity	-	1.38%
Utilities (excl. Natural Gas & Electricity)	-	0.62%
External Space	1.13%	1.34%
Grants & Board Requisition	8.23%	1.29%
Land Cost	2.70%	3.54%
Tax Adj. & Concessions	1.29%	0.57%
Other Expenses	3.86%	7.44%
Other Financing	0.25%	0.02%
Travel & Training	0.52%	0.16%
Contract Services	8.25%	7.84%
Professional Services	1.19%	1.21%
Debt Services Total	5.44%	11.22%
Total	**100.0%**	**100.0%**

The most heavily weighted expenditure categories—the categories that comprised the largest share of the City's 2022 operating expenditure basket—were: wages and salaries (45.48%); debt services (11.22%); and employee benefits (8.41%). With the 2023 MPI update, the utilities expenditure category was separated into electricity and utilities (excl. natural gas and electricity), increasing the number of expenditure categories from 17 to 18. This was deemed advantageous due to the identification of more appropriate individual inflation factors for historical estimates for the subcategories of utilities and the different historical inflation experiences of the subcategories.

[6] The following items 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.
[7] The utilities expenditure category was separated into two expenditure categories - electricity and utilities (excl. natural gas and electricity) - when expenditure category weights were recalculated for the 2023 MPI calculation.

For illustrative purposes, Figure 2 further aggregates the 18 expenditure categories into seven broader categories. As can be seen, over half of the City's annual operating expenditures is allocated to wages, salaries and employee benefits.

Figure 2. City of Edmonton MPI Expenditure Categories and Weights, 2022



4.2 Inflation Factors

The next step in constructing the MPI is to assign an appropriate inflation factor to each expenditure category. The inflation factors assigned to each expenditure category are based on internal City of Edmonton sources and external sources. Inflation factors are updated annually to reflect realized inflation factors for historical estimates and to incorporate updated forecasts for inflation factors. Doing so will ensure each year's MPI calculation is congruent with the inflationary pressures facing City operating expenditures.

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 as the costs of crude oil and fuel will likely move in the same direction at approximately the same magnitude. In other cases, where a suitable fit could not be identified, the CPI was used as a default inflation factor. It is also important to identify specific inflation factors for each expenditure category because the use of common inflation factors effectively reduces the number of expenditure categories as the

weight attributed to the common inflation factor is the sum of all the expenditure categories it is applied to. A table of each expenditure category, as well as the data source for each inflation factor, is listed in Appendix 1.

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 45.48 per cent of the City's operating expenditure basket. Wage and salary increases for City of Edmonton employees are based on actual labour settlements that extend into the future. For bargaining units where a settlement was not available, earnings and wage data from external sources are used instead, specifically Statistics Canada's Alberta public administration average weekly earnings inflation rate is used for historical estimates and the Conference Board of Canada's Alberta industrial composite wage inflation rate is used for forecasted years.

4.3 Calculating Municipal Inflation

The calculation for the MPI is based on the average of expected price change for each expenditure category, weighted by the respective proportion of operating expenditures on that category. The weights for each expenditure category indicate the importance of an item or group of items in the municipality's operating expenditures. Using weights to construct the MPI reduces over or understating the influence of a given item in the municipal basket of goods and services. An MPI can, therefore, be calculated using the following equation:

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

Where:

MPI= Municipal price index

X_n = Price change for expenditure category *n*

W_n = Total expense of category *n* in operating expenditures

W = Total of the City's operating expenditures, excluding interdepartmental services, amortization, pay-as-you-go levy and transfers to reserves

W_n/W = Weight of category *n* in the City's operating expenditures

Equation [2] can be rewritten as:

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

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

5. Critical Factors for Success

5.1 Use External Sources for Inflation Where Possible

Critics of the MPI argue it can be a self-serving tool, particularly if used to justify tax increases. To mitigate the criticism that the MPI is a self-serving municipal indicator, it must be both transparent and, where possible, use external sources.

5.2 Continue to Refine the Calculation

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

6. Appendix 1 - Sources for MPI Inflation Factors

Expenditure Category	Inflation Factor(s)	Historical Estimates Source(s)	Forecast Source(s)
Wages & Salaries[8]	Wage & Salary Settlements (e); Public Admin. AWE Inflation, Alberta (e); Industrial Composite Wage Inflation Forecast, Alberta (f)	City of Edmonton - Employee Services Statistics Canada	Conference Board of Canada
Employee Benefits[9]	Wage & Salary Settlements (e); Public Admin. AWE Inflation, Alberta (e); Industrial Composite Wage Inflation Forecast, Alberta (f)	City of Edmonton - Employee Services Statistics Canada	Conference Board of Canada
Equipment (Vehicles & Computers)	Industry Product Price Index, Manufacturing, Canada (e,f)	Statistics Canada	Conference Board of Canada
Fuel	Raw Materials Price Index, Crude Oil and Bitumen, Canada (e,f)	Statistics Canada	Conference Board of Canada
Materials	Industry Product Price Index, Manufacturing, Canada (e,f)	Statistics Canada	Conference Board of Canada
Natural Gas	Raw Materials Price Index, Natural Gas, Canada (e,f)	Statistics Canada	Conference Board of Canada
Electricity	Electricity Power Selling Price Index (>5,000kw), Alberta (e); Electricity Power Price Index, Canada (f)	Statistics Canada	Conference Board of Canada
Utilities (excl. Natural Gas & Electricity)	Consumer Price Index, Water, Alberta (e); Consumer Price Index, Communications, Alberta (e); Electricity Power Price Index, Canada (f)	Statistics Canada	Conference Board of Canada
External Space	Commercial Rent Services Price Index, Edmonton CMA (e); Consumer Price Index, Edmonton CMA (f)	Statistics Canada	Conference Board of Canada
Grants & Board Requisition	Implicit Price Index, Non-Profit Institutions Serving Households, Alberta (e); Consumer Price Index, Edmonton CMA (f)	Statistics Canada	Conference Board of Canada

[8] Inflation factors were derived from wage and salary settlements. Where a settlement was not available, inflation in Alberta public administration average weekly earnings (excluding overtime) was used for historical estimates and the Alberta industrial composite wage inflation rate was used for forecasted years.

[9] Inflation factors were derived from wage and salary settlements. Where a settlement was not available, inflation in Alberta public administration average weekly earnings (excluding overtime) was used for historical estimates and the Alberta industrial composite wage inflation rate was used for forecasted years.

Expenditure Category	Inflation Factor(s)	Historical Estimates Source(s)	Forecast Source(s)
Land Cost	New Housing Price Index, Land Only, Edmonton CMA (e); Consumer Price Index, Edmonton CMA (f)	Statistics Canada	Conference Board of Canada
Tax Adj. & Concessions	Consumer Price Index, Edmonton CMA (e,f)	Statistics Canada	Conference Board of Canada
Other Expenses	Consumer Price Index, Edmonton CMA (e,f)	Statistics Canada	Conference Board of Canada
Other Financing	Chartered Bank Prime Lending Rate, Canada (e,f)	Bank of Canada	Conference Board of Canada
Travel & Training	Consumer Price Index, Education & Reading, Travel Services, Inter-City Trans., All-Items, Alberta (e); Consumer Price Index, Edmonton CMA (f)	Statistics Canada	Conference Board of Canada
Contract Services	Public Admin. AWE Inflation, Alberta (e); Industrial Composite Wage Inflation Forecast, Alberta (f)	Statistics Canada	Conference Board of Canada
Professional Services	Public Admin. AWE Inflation, Alberta (e); Industrial Composite Wage Inflation Forecast, Alberta (f)	Statistics Canada	Conference Board of Canada
Debt Service	Chartered Bank Prime Lending Rate, Canada (e,f)	Bank of Canada	Conference Board of Canada

Note: “e” = estimate; “f” = forecast.