



*Office of the Auditor General / Bureau du vérificateur général*

**AUDIT OF THE MUNICIPAL PRICE INDEX**

**2007**

**Chapter 15**

**VÉRIFICATION DE L'INDICE DES PRIX AUX MUNICIPALITÉS**

**2007**

**Chapitre 15**



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## Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>i</b>
<b>RÉSUMÉ .....</b>	<b>ii</b>
<b>1 INTRODUCTION.....</b>	<b>1</b>
<b>2 BACKGROUND .....</b>	<b>1</b>
<b>3 AUDIT OBJECTIVE AND SCOPE.....</b>	<b>1</b>
<b>4 KEY FINDINGS .....</b>	<b>1</b>
<b>4.1 General comments .....</b>	<b>1</b>
<b>4.2 Basket of Expenditures .....</b>	<b>2</b>
<b>4.3 Index Values .....</b>	<b>3</b>
<b>4.4 Errors in preparing the index.....</b>	<b>3</b>
<b>5 OVERALL MANAGEMENT RESPONSE .....</b>	<b>4</b>
<b>6 CONCLUSION.....</b>	<b>9</b>
<b>7 ACKNOWLEDGEMENT .....</b>	<b>10</b>



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## **EXECUTIVE SUMMARY**

### **Introduction**

This audit was conducted as a result of a motion adopted by Ottawa City Council on September 26, 2007, requesting that the City Treasurer prepare a Municipal Price Index (MPI) for the 2008 budget; and that the methodology and appropriateness be reviewed by the Auditor General.

### **Key Finding and Recommendation**

Given the numerous errors made in preparing the 2006 and 2007 indexes and the limited information available for the 2008 projected index, it is our opinion that the indexes should be used with extreme caution.

An independent, specialized third party should validate the City model.

#### **Management Response**

Management does not support the majority of the comments provided within the Audit of the Municipal Price Index. However, Financial Services would support an external review and would welcome an opportunity to refine the MPI based on further discussion and input from Council as to the potential use.

### **Acknowledgement**

We wish to express our appreciation for the cooperation and assistance afforded the audit team by management.

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## RÉSUMÉ

### Introduction

La présente vérification a été effectuée à la suite d'une motion adoptée par le Conseil municipal d'Ottawa le 26 septembre 2007 pour demander que la trésorière municipale prépare un indice des prix aux municipalités (IPM) pour le budget de 2008 et que le vérificateur général examine la méthode employée pour son élaboration et évalue la qualité de cet outil.

### Principale constatation et recommandation

Vu les nombreuses erreurs commises dans la préparation des indices de 2006 et de 2007 et compte tenu des renseignements restreints dont on dispose pour l'indice prévu pour 2008, nous croyons que l'Indice des prix aux municipalités doit être utilisé avec grande circonspection.

En outre, le modèle utilisé par la Ville devrait être validé par une tierce partie spécialisée.

#### **Réponse de la direction**

La direction est en désaccord avec la majorité des commentaires formulés dans le rapport de vérification de l'Indice des prix aux municipalités. Néanmoins, Services financiers appuierait un examen externe et serait ravi d'avoir l'occasion de peaufiner l'IPM en fonction de commentaires émis par le Conseil si celui-ci venait à discuter à nouveau de son utilisation potentielle.

### Remerciements

Nous tenons à remercier la direction de sa bienveillante collaboration et de l'aide qu'elle a apportée à l'équipe de vérification.

## 1 INTRODUCTION

This audit was conducted as a result of a motion adopted by Ottawa City Council on September 26, 2007, requesting that the City Treasurer prepare a Municipal Price Index (MPI) for the 2008 budget; and that the methodology and appropriateness be reviewed by the Auditor General.

## 2 BACKGROUND

This report is based on the final MPI rates provided to our Office on November 27, 2007. This was the final of three versions submitted to our office by Financial Services and the version we audited. As noted below the Treasurer provided a fourth version to Council on November 26, 2007.

Our Office was provided with detailed calculations of the 2006 and 2007 index rates, which we reviewed. For the 2008 projected index rates we only received very limited supporting documentation.

### MPI Rates of Inflation (Per Management)

Year	Nov 16/07 Version	Nov 23/07 Version	Nov 26/07** Version	Nov 27/07 Version
	%	%	%	Final %
2006	6.11	4.6	4.6	4.56
2007	4.03	3.51	3.5	3.15
2008 Projected Value	Not provided	Not provided	3.6	3.94

\*\*Version submitted to City Council by the City Treasurer.

## 3 AUDIT OBJECTIVE AND SCOPE

The objective was to review the methodology and appropriateness of the Municipal Price Index for the 2008 budget. Due to timelines available we have not reviewed all index values and all calculations. We have however reviewed a sample of index values and calculations.

## 4 KEY FINDINGS

### 4.1 General comments

The Office of the Auditor General has found that:

- The Municipal Price Index is not a standard index and there is not an established or recognized model for its calculation. Therefore, we cannot comment on whether or not the model is valid.

- The Municipal Price Index is not common practice in municipalities across Canada and Ontario. For example, the City of Toronto does not use a Municipal Price Index. The City of Waterloo established an MPI of 3.45% for its 2007 budget year.
- From the sources referenced in the memo to Councillors, provided by the City Treasurer on November 26, 2007, the MPI was presented as a theoretical exercise that can be an important management tool but that should be used with caution and should not be used to incorporate inflation into the budget process.
- This index was created by the City using its own methodology.
- Complete supporting documentation, source documentation and rationale for underlying decisions in constructing the Municipal Price Index made were not documented or provided.

## **4.2 Basket of Expenditures**

- Base year was established as October 2004 to September 2005 to coincide with the City's budget preparation as opposed to the City's fiscal year.
- Expenditures were determined by taking 25% of 2004 and 75% of 2005 but there was no impact or sensitivity analysis provided comparing the split 2004/2005 year to the full 2005 year to ensure that there were no anomalies in the expenditure patterns or when applying the index based on a split year to the fiscal year.
- Total expenditure numbers were inconsistent from one document to the other and within the same document. For example, they ranged from \$934 million for compensation to \$794 million and although were identified as excluding Ottawa Police Service some of the documents appeared to include them.
- There were expenditures excluded but a definition for eligible spending had not been included.
- All expenditures should be accounted for, even those not affected by inflation.
- There was at least \$47 million in compensation related items and \$12 million in materials, supplies and purchased services excluded that should have been reflected as part of the basket and consideration given to the impact on the price indices.
- Overtime was allocated based on total compensation by union affiliation and not overtime expenditure patterns and included an allocation to the management group even though this group is exempt.
- The City excluded transfers to reserves and reserve funds except for Pay-as-you-go (PAYG), which are transfers to reserve funds for use for capital projects. As the index being created is for the operating budget and not the capital budget we believe the PAYG contributions should not be included in the index. The price index values initially applied for 2006 and 2007 for this specific expenditure were

120% and 125.5%, later modified by staff to 111% and 117%, and should be further modified to 105.9% and 111.3%. This results in an estimated impact of .53% and .58% on the overall price indices for 2006 and 2007 resulting in an estimated index of 3.11% for 2007. Excluding the \$128 million PAYG from the basket, which we recommend, would result in an estimated reduction to the MPI rate for 2007 from 3.15% to 2.86%.

### **4.3 Index Values**

- Index values were not applied consistently against the various activities that comprise the categories of expenditures. Estimates based on actual contracts were used negating the advantage of an index to ensure objectivity and consistency. There was also an example where an index was forecast for 2006 and 2007 based on prior year indices.
- The Consumer Price Index and other index values are historical indexes whereas the MPI is essentially a projection as it is based on incomplete year data and not the calendar year using historical index values.
- Financial Services based the index value used for benefits on budget information from May 2007. As we identified in our 2007 Audit of Compensation Budgets, the benefits budget was higher than the actual benefit costs. Therefore, this index value should be reviewed, as it appears to be high.
- Although the Construction Buildings and Materials Capital Expenditure index value was reduced from 1.04 and 1.06 to 1.01 and 1.01 it does not match the index tables provided.

### **4.4 Errors in preparing the index**

- Numerous arithmetical errors in the original draft resulted in revisions to the numbers for 2006 from 106.11 to 104.6 to 104.56 and for 2007 from 110.34 to 108.26 to 107.85 for an MPI, which changed from 4.03% to 3.51% to 3.15%.
- There were nine further examples of incorrect or inappropriate index values, which would reduce the MPI for 2007 by a further .2% to .22%. These changes combined with excluding PAYG in the expenditures would result in a revised MPI for 2007 of 2.66%. This should not be accepted as the final MPI as it does not reflect the impact of other issues noted in the report.
- Other errors we also found included:
  - Specific parameters for reports generated were not provided and were not retained.
  - Supporting documents used to compile the expenditures and the index values were not available.
  - The spreadsheets provided, as support for the expenditures, did not match the numbers used and an explanation of the difference was not provided.

- The rationale for the use of some index values was not provided in order to determine their appropriateness. For example, the index value applied to the expenditures for licenses and permits was the “primary metal manufacturing rates” of 1.13 and 1.36 for 2006 and 2007. This rate does not relate to the cost of the administrative service to provide permits and should not have been used.
- The rationale for the inclusions and exclusions for eligible spending was not provided.
- Emails provided by departmental staff with contract information which was used to compile index values was not compared to source documents and percentages were accepted and did not appear to be questioned or challenged.
- The compilation of data for the Municipal Price Index is a manual process using Excel spreadsheets, which by their nature are labour intensive and prone to error.

## 5 OVERALL MANAGEMENT RESPONSE

At the meeting of Council 26 September 2007, the following motion was passed:

*That the City Treasurer prepare a municipal price index for the 2008 budget; and  
That the methodology and appropriateness be reviewed by the Auditor General.*

Financial Services received this audit end of day 5 December with the request to respond by Monday 10 December. Upon review, staff identified factual inaccuracies and contacted the OAG, although some further detail was provided by the OAG, there was not adequate time to discuss the findings prior to responding. A detailed response is presented in Appendix 1, however, there are some fundamental flaws contained within the Audit of the 2007 Municipal Price Index that should be noted.

In order to meet the compressed deadlines associated with the 2008 budget, Financial Services engaged the Office of the Auditor General (OAG) early in the process so that they could be well informed and their comments could be addressed as part of the development of the MPI. Work continued to refine the data sets and calculations to provide 2006 and 2007 MPIs. The first 3 versions of the MPI referenced in the OAG’s report were as a result of this ongoing discussion and refinement. In fact, the results provided to the OAG on 23 November and Council on 26 November are the same. However, the memo provided to Council on 26 November included a projected MPI for 2008.

On 27 November, staff provided the background information related to the projected 2008 MPI that had been distributed on 26 November, including the spreadsheet of final MPIs. Unfortunately, this spreadsheet had been used for sensitivity analysis, and was inadvertently provided with an analysis scenario still active. This was not intended as a restatement of the MPIs and the MPIs presented in the report

distributed to Council on 26 November remain valid. The OAG has conducted this audit based on unsupported MPI values in error; however, this has no impact on the appropriateness of the Methodology.

The conclusion provided within the audit states the following:

Given the numerous errors made in preparing the 2006 and 2007 indexes and the limited information available for the 2008 projected index it is our opinion that the indexes should be used with extreme caution.

An independent, specialized third party should validate the City model.

Management does not agree that the indexes should be used with extreme caution. Management is of the opinion the Methodology was appropriate and does not agree that numerous mistakes were made in preparing the 2006 and 2007 indexes. The adjustments provided were made during development and do not impact the presented MPIs. The MPIs represent an order of magnitude and if all of the suggested changes were adopted, the result would remain within the original range. The value of this information does not diminish its ability to inform discussion, and should be used with a certain degree of caution, as would be practise with any projection.

Management is in agreement that a specialized third party could be retained to validate the appropriateness of the "City" model. However, it should be noted that the model used is an accepted, published model and although not currently used widely in Canada, it is used extensively across the United States. The appropriateness of application to the City of Ottawa was vetted, although informally, with a well respected industry expert\* and received a favourable response.

In conclusion, Management does not support the majority of the comments provided within the Audit of the Municipal Price Index. However, Financial Services would support an external review and would welcome an opportunity to refine the MPI based on further discussion and input from Council as to the potential use.

#### **4.1 General Comments**

The Office of the Auditor General has found that:

- *The Municipal Price Index is not a standard index and there is not an established or recognized model for its calculation. Therefore, we cannot comment on whether or not the model is valid.*

Management Disagrees: The index follows a method that's accepted and used by all statistical agencies. The technique is fully documented in the report provided to the OAG on 20 November and in the revised report distributed to Council on 26 November.

- *The Municipal Price Index is not common practice in municipalities across Canada and Ontario. For example, the City of Toronto does not use a Municipal Price Index. The City of Waterloo established an MPI of 3.45% for its 2007 budget year.*

Management Agrees. Staff have constructed and provided the MPI as requested by Council.

- *From the sources referenced in the memo to Councillors, provided by the City Treasurer on November 26, 2007, the MPI was presented as a theoretical exercise that can be an important management tool but that should be used with caution and should not be used to incorporate inflation into the budget process.*

Management Disagrees. As with any estimate, it should be used with some caution. The potential usage of the MPI has not been proposed by staff. Please indicate the reference noted above.

- *This index was created by the City using its own methodology.*

Management Disagrees. The index follows a method that's accepted and used by all statistical agencies. The technique is fully documented in the report provided to the OAG on 20 November and in the revised report distributed to Council on 26 November.

- *Complete supporting documentation, source documentation and rationale for underlying decisions in constructing the Municipal Price Index made were not documented or provided.*

Management Disagrees. Staff provided all supporting information and is unaware of outstanding requests.

#### **4.2 Basket of Expenditures**

- *Base year was established as October 2004 to September 2005 to coincide with the City's budget preparation as opposed to the City's fiscal year.*

Management Disagrees. The choice of a base year is related to the availability of published data from independent sources and is unrelated to the City fiscal year. For example, the CPI, which has been used to measure price changes in the City and consumer expenditures, is also unrelated to the City's fiscal year.

- *Expenditures were determined by taking 25% of 2004 and 75% of 2005 but there was no impact or sensitivity analysis provided comparing the split 2004/2005 year to the full 2005 year to ensure that there were no anomalies in the expenditure patterns or when applying the index based on a split year to the fiscal year.*

Management Disagrees. SAP was queried to generate a 12-month rolling year of expenditures. In doing this, the possibility of anomalies was avoided and there was no need for sensitivity analysis.

- *Total expenditure numbers were inconsistent from one document to the other and within the same document. For example, they ranged from \$934 million for compensation to*

*\$794 million and although were identified as excluding Ottawa Police Service some of the documents appeared to include them.*

Management Disagrees. Police expenditures were excluded from all expenditures. In addition, a reconciliation of all expenditures, including compensation expenditures was provided upon request. The \$934 million was the total compensation expenditures while the \$794 million represented only the relevant expenditures.

- *There were expenditures excluded but a definition for eligible spending had not been included.*

Management Disagrees. Although not presented as a definition, a discussion of expenditures is included in the report and all of the elements of eligible spending were provided.

- *All expenditures should be accounted for, even those not affected by inflation.*

Management Disagrees. Only expenditures that are representative and relevant are included. The premise of an index is to apply weighted base year expenditures to price changes. In the absence of price change (inflation) information the index is not appropriate.

- *There was at least \$47 million in compensation related items and \$12 million in materials, supplies and purchased services excluded that should have been reflected as part of the basket and consideration given to the impact on the price indexes.*

Management Disagrees. A fixed weight index weighs the price changes of relevant groups of goods and services by their relative importance in the total eligible expenditures. The index is driven by market forces on these relative expenditures. Expenditures were excluded because they fell below the 99% threshold and in almost all cases they were not explicitly determined by transactions in the marketplace.

- *Overtime was allocated based on total compensation by union affiliation and not overtime expenditure patterns and included an allocation to the management group even though this group is exempt.*

Management Disagrees. Although overtime was allocated across the bargaining units, the actual total overtime was used in the construction of the MPI. In addition, the overtime allocation to the Management group was rectified prior to the 23 November MPI numbers as part of the development process and is not included within the scope of this audit.

### **4.3 Index Values**

- *Index values were not applied consistently against the various activities that comprise the categories of expenditures. Estimates based on actual contracts were used negating the advantage of an index to ensure objectivity and consistency. There was also an example where an index was forecast for 2006 and 2007 based on prior year indexes.*

Management Disagrees. Indexes were chosen which reflect the underlying expenditure. Where there were no indexes to represent the expenditure, the general index was applied. In no case was a different index applied to the same expenditure

item. Compensation indexes were not applied but rather the actual rate increase settled with the City unions were applied. It is appropriate because market forces influenced the outcome through the bargaining process. In the absence of an up-to-date index, forecasts of the time series were carried out using rigorous methods, as is a standard practice in economics and statistics.

- *The Consumer Price Index and other index values are historical indices whereas the MPI is essentially a projection as it is based on incomplete year data and not the calendar year using historical index values.*

Management Disagrees. The 2006 and 2007 MPI estimates are not projections. The calculation methods use actual data for expenditures and for the indexes.

- *Financial Services based the index value used for benefits on budget information from May 2007. As we identified in our 2007 Audit of Compensation Budgets, the benefits budget was higher than the actual benefit costs. Therefore, this index value should be reviewed, as it appears to be high.*

Management Disagrees. The MPI was based on actual benefit values.

- *Although the Construction Buildings and Materials Capital Expenditure index value was reduced from 1.04 and 1.06 to 1.01 and 1.01 it does not match the index tables provided.*

Management Disagrees. The final values provided and used for the construction of the MPI do match the tables provided.

#### **4.4 Errors in preparing the index**

- *Numerous arithmetical errors in the original draft resulted in revisions to the numbers for 2006 from 106.11 to 104.6 to 104.56 and for 2007 from 110.34 to 108.26 to 107.85 for an MPI, which changed from 4.03% to 3.51% to 3.15%.*

Management Disagrees. Revisions were made to the MPI calculation as new information became available during development and were provided to the OAG. No further revision has been made to the values proved to Council on 26 November.

- *There were nine further examples of incorrect or inappropriate index values, which would reduce the MPI for 2007 by a further .2% to .22%. These changes combined with excluding PAYG in the expenditures would result in a revised MPI for 2007 of 2.66%. This should not be accepted as the final MPI as it does not reflect the impact of other issues noted in the report.*

Management Disagrees: Management is not in agreement with all of the 9 examples provided by the OAG, however, if the cumulative affect of .22 is applied, the resulting MPI for 2007 would change from 3.5 to 3.3. In addition, management is not in agreement that PAYG should be excluded from the expenditures.

- *Other errors we also found included:*
  - *Specific parameters for reports generated were not provided and were not retained.*

Management disagrees. The parameters are standard and will generate the same results no matter how many times they are applied. A specific parameter reports could be generated for review upon request.

- *Supporting documents used to compile the expenditures and the index values were not available.*

Management Disagrees. All supporting documents for compiling expenditure values including e-mails documenting staff consultations were provided. Also, supporting documents relating to index values from Statistics Canada have been provided.

- *The spreadsheets provided, as support for the expenditures, did not match the numbers used and an explanation of the difference was not provided.*

Management Disagrees: Staff provided source documentation and reconciliation.

- *The rationale for the use of some index values was not provided in order to determine their appropriateness. For example, the index value applied to the expenditures for licenses and permits was the “primary metal manufacturing rates” of 1.13 and 1.36 for 2006 and 2007. This rate does not relate to the cost of the administrative service to provide permits and should not have been used.*

Management Agrees. A more appropriate index will be substituted. However, the weight of this index is 0.14% of the total and the relative impact on the MPI provided is minimal.

- *The rationale for the inclusions and exclusions for eligible spending was not provided.*

Management Disagrees. The rationale for inclusion or exclusion was to determine a representative basket of expenditures in the base year as described within the report.

- *Emails provided by departmental staff with contract information, which was used to compile index values was not compared to source documents and percentages were accepted and did not appear to be questioned or challenged.*

Management agrees. Staff considered information supplied by other City staff to be reliable.

- *The compilation of data for the Municipal Price Index is a manual process using Excel spreadsheets, which by their nature are labour intensive and prone to error.*

Management Disagrees. Staff relied extensively on well-known spreadsheet software such as Excel, EViews, SPSS and Access to minimise the potential for spreadsheet errors.

## 6 CONCLUSION

Given the numerous errors made in preparing the 2006 and 2007 indexes and the limited information available for the 2008 projected index, it is our opinion that the indexes should be used with extreme caution.

An independent, specialized third party should validate the City model.

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## **7 ACKNOWLEDGEMENT**

We wish to express our appreciation for the cooperation and assistance afforded the audit team by management.