# VERTICAL EQUITY REVIEW OF RESIDENTIAL ASSESSED VALUES

March 2022



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## INTRODUCTION

#### **Executive Summary**

Vertical Equity describes equity amongst property assessments across the spectrum of market values. When vertical equity is achieved, property owners are each assessed an equitable share of the property tax burden, regardless of the market value of their property.

When vertical equity is not achieved, assessments may show a tendency towards progressivity or regressivity. Progressivity in assessed values means that, as market values of property increase, property owners are assessed at proportionately higher levels. Conversely, regressivity in assessments means that as market values increase, property owners are assessed as proportionately lower levels.

The implication of regressivity is that it can contribute to property owners with the least ability to pay (i.e. owners of lower valued properties) carrying a heavier tax burden than owners of higher valued properties.

Since property assessments are used to distribute tax burden by using property values as a proxy for measuring a taxpayer's ability to pay, achieving vertical equity is essential to providing an equitable base for property taxation to the Province and Municipalities of Ontario. The Price Related Bias (PRB) is the performance metric recommended by the International Association of Assessing Officers (IAAO) to measure and evaluate vertical equity.

The provincial Residential vertical equity study completed by the OQSC based on 2016 current value assessments found that the PRB is well within industry standard.

The provincial PRB does indicate a mild tendency towards regressivity. This is typical of an assessment ratio study of this magnitude and raises no concern of systemic vertical inequity in residential assessments in Ontario.

However, based on the relatively few observations of localized vertical inequity, opportunity for improvement exists through the implementation of policy and procedures to guide staff in identifying vertical equity risks.

This review has resulted in three recommendations, that have all been accepted for implementation by the business. A summary is listed in the chart on page 17.

#### Objective

The objective of this review is to determine the extent to which vertical equity is achieved in the assessment of residential properties in Ontario.

#### Scope

In order to evaluate whether vertical equity is achieved, a ratio study was conducted in accordance with the IAAO Standard on Ratio Studies (the "Standard") and based on the following parameters:

- Assessed values that were returned on the 2016 assessment roll for 2017 taxation. The valuation date is January 1, 2016.
- Sales that occurred between January 1, 2015, and December 31, 2017. Sales prices are time adjusted to reflect the valuation date of January 1, 2016.
- Residential properties as defined for MPAC's Service Level Agreement with the Municipalities of Ontario are included in the study.
- Results are stratified by Municipality and District (in Northern Ontario) for the purpose of evaluation.
- The Price Related Bias (PRB) is the measure that was relied upon to evaluate vertical equity.

# Measuring Assessment Performance at MPAC

MPAC has made a commitment to provide transparent, evidence-based opinions of value. In an assessment update year, the Office of the Quality Service Commissioner (OQSC) is responsible for:

- Performing reviews to certify the fitness for use of the assessment roll
- Contributing Assessment Quality results to MPAC's public-facing Corporate Performance Report
- Measuring against the four Assessment Accuracy service levels set out in the Service Level Agreement (SLA) between MPAC and Municipalities (one each for Residential, Farm, Commercial/Industrial and Multi-residential)

The Assessment Roll Quality (ARQ) analysis was designed to accomplish these objectives.

The ARQ is a set of ratio studies. A ratio study is a generic term for sales-based studies designed to measure mass appraisal performance.

The (IAAO) maintains a Standard on Ratio Studies (the "Standard") that provides guidance on data preparation and the calculation of performance metrics. Data preparation includes taking steps to select a sample of open market, arms length sales transactions where both the sale and assessed value reflect the same property state and condition. Creating a Time Adjusted Sales Price by adjusting each sales price by market factors to reflect the consideration that would have been exchanged on the valuation date is also a significant element of preparing ratio study data.

Once the data is prepared, a Time Adjusted Sales Ratio (TASR) is created for each property transaction that is included in the analysis by dividing the assessed value by the Time Adjusted Sales Price (and, for this review, multiplying by 100%). A TASR of 100% indicates that a property has been assessed at 100% of the market value indicated by the sales price.

Once the TASRs are established, a variety of performance metrics can be calculated. The three primary metrics relied on to gauge assessment performance in the ARQ are the:

- Median TASR which measures the Level of Assessment
- Coefficient of Dispersion (COD) which measures Uniformity
- Price Related Bias (PRB) which measures Vertical Equity

The IAAO maintains a Standard on Ratio Studies (the "Standard") that sets out ranges of acceptability for each of the three metrics evaluated in the ARQ. The OQSC evaluates the ARQ ratio study results against the ranges in the Standard to reach conclusions about whether the accuracy, uniformity and equity of assessed values meet-the standard.

Generally, when measuring assessment performance, it is necessary to consider all three metrics to fully understand the quality of assessed values. For this review, which is specifically focussed on vertical equity, the Price Related Bias is the metric of interest.

#### **FINDINGS**

#### Provincial Ratio Study Statistics

The provincial ratio study is predicated on the 2016 current value assessment as returned for the 2017 taxation year. The ratio study is comprised solely of residential properties. The study sale date range is from January 1, 2015, to December 31, 2017. A total of 1,215,523 sales occurred during the period of study, of which 624,244 were considered valid sales for analysis. Extraction of sale data information occurred on February 23, 2021. The ARQ script (version dated September 28, 2021in Insight) was customized to generate ratio study results offline.

#### Provincial Ratio Study Sale Criteria

Ontario has 414 local municipalities comprising of 173 single-tier municipalities and 241 lower-tier municipalities. Ratio studies were conducted on all Ontario municipalities with 10 or more valid residential sales. Valid sales are defined as sale transactions that meet the ARQ filtering criteria established by the OQSC.

Across Ontario, a total of 11 municipalities did not meet the minimum valid sale count and 403 municipalities had 10 or more valid sales. The 403 municipalities form the basis of the provincial ratio study.

#### Provincial Price Related Bias Results

The ratio study results indicate that 380, or 94% of the municipalities in Ontario have PRB statistics that fall within the acceptable range set out in the Standard. This leads to the conclusion that vertical equity meets standard in these municipalities. Standard was not achieved in 23 municipalities where the indicated PRB failed to meet the threshold set out in the Standard.

The IAAO Standard on Ratio Studies states that:

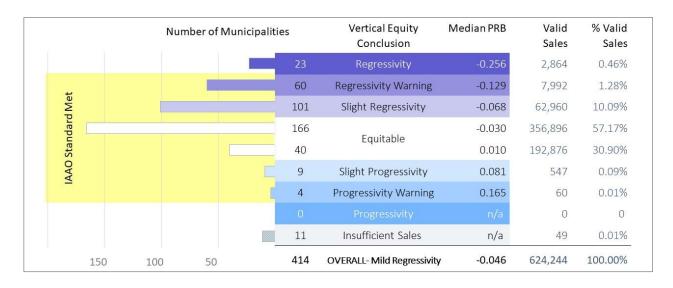
 "As a general matter, the PRB coefficient should fall between -0.05 and 0.05...PRBs for which 95% confidence intervals fall outside of the range of -0.10 to 0.10 indicate unacceptable vertical inequities"  If the calculated PRB (and associated 95% confidence interval) falls outside the range of -0.10 to 0.10, then it is concluded that vertical equity has not been achieved for those strata

A PRB and 95% confidence interval was calculated for each municipality. The 95% confidence interval represents the lower and upper limits that the PRB for the entire population would be expected to fall within 19 times out of 20. Not meeting standard requires that the calculated PRB <u>and</u> its associated confidence interval are both outside of the IAAO recommended range of -0.10 to 0.10.

In order to evaluate and describe the vertical equity results provincially, the results for each municipality were categorized based on their PRB results:

PRB Results	IAAO Standard Met	Vertical Equity Conclusion
PRB and Confidence Interval both less than -0.10	No	Regressivity
PRB less than -0.10 <u>but</u> Confidence Interval within Standard	Yes	Regressivity Warning
PRB between -0.10 and -0.05	Yes	Slight Regressivity
PRB between -0.05 and 0	Yes	Equitable
PRB between 0 and 0.05	Yes	Equitable
PRB between 0.05 and 0.10	Yes	Slight Progressivity
PRB greater than 0.10 but Confidence Interval within Standard	Yes	Progressivity Warning
PRB and Confidence Interval both greater than 0.10	No	Progressivity
Insufficient Sales	n/a	Inconclusive

Below is a provincial summary of the categorized PRB results:



Overall, the provincial PRB testing revealed mildly regressive results. The provincial median PRB of -0.0455 meets the Standard (with a mild indication of regressivity). The indication of mild regressivity within industry tolerance levels raises no concern of systemic vertical inequity amongst residential property assessments in Ontario.

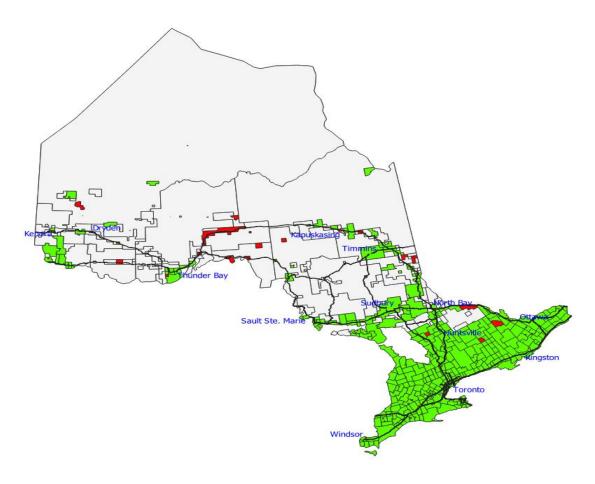
The PRB and Confidence Interval for 23 municipalities lay outside the acceptable range set out in the Standard. All 23 municipalities of concern are considered regressive in nature. As a group, those municipalities generate a median PRB of -0.2558. A regressive PRB of -0.2558 suggests that when market values double, the Level of Assessment decreases by 25.58%.

#### Facts on municipalities of concern:

- Geographically, the 23 municipalities of concern are not urban in nature.
- 10 of 23 municipalities of concern have low valid sale counts supporting the PRB calculation.
- 13 of 23 municipalities of concern have strong valid sale counts supporting the PRB calculation.
- The 13 municipalities of concern with strong valid sale counts show signs of vertical inequity.

#### Discussion of Provincial Results

The following map illustrates the municipal results geographically. Those municipalities that are green indicate that the PRB meets standard, and therefore, vertical equity is achieved. Those municipalities that are red identify where the PRB has not met standard. (Grey areas represent municipalities with insufficient sales and non-municipal territory.)



Estimated or predicted values will always differ from actual sale values. The mass appraisal modelling process, however, is designed to achieve the highest possible reliability, meaning freedom from random error.

As discussed earlier in the ratio results section, there are various statistics that are used to measure the quality of mass appraisals and the scope of this report is to evaluate whether vertical equity has been achieved amongst residential property assessments across the spectrum of market values.

The Standard states that the best indicator available to measure if a vertical inequity exists is the Price Related Bias (PRB) statistic. To further assist with visualizing the extent to which vertical equity is achieved in the assessment base, bar graphs illustrating the Level of Assessment by sale price decile were generated for each MPAC Zone and are included in Appendix A.

A review of the findings will be reported in two steps. First, we will review the findings at the Provincial Level across each of the 7 zones (Macro Level). Secondly,

we will look closer at any zones that have localized issues with areas that have not met International Standards for the PRB statistic (Micro Level).

A review of the Provincial results (Macro Level) shows that all 7 zones met the IAAO Standard for the PRB statistic.

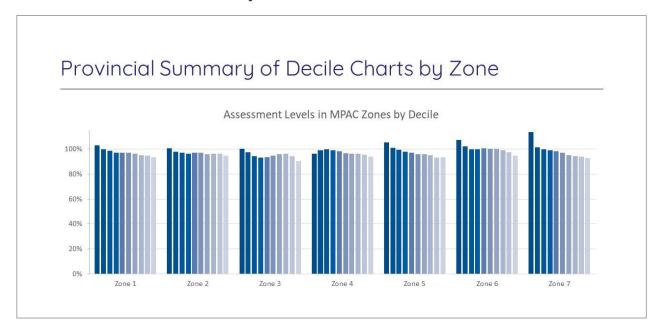
Based on the statistical results, there is indication that vertical equity is achieved and that the mass appraisal process is resulting in reasonably equitable predictions of sale prices for residential properties. There is no evidence of a systemic issue.

However, the Decile Bar Graphs included in Appendix A suggest a consideration worth noting.

To prepare the Decile Bar Graphs, the data for each Zone was divided into deciles sorted by sale price. This allows for visual comparison of the levels of assessment across the range of market values.

In descriptive statistics, a decile is used to categorize large data sets from the highest to lowest values, or vice versa. While quartiles are three data points that divide an observation into four equal groups or quarters, a decile consists of nine data points that divide a data set into 10 equal parts. Each decile contains 10% of the observations in the data set.

Detailed Decile Bar Graphs for each Zone are included in Appendix A. For ease of comparison, below is a summary slide illustrating the patterns observed amongst the deciles for each zone side by side.



Although the results all meet the vertical equity standard, there is a mild tendency towards regressivity. In Zones 1, 2, 3, 5, 6 and 7 the Level of Assessment in the first decile is consistently the highest. It is most pronounced in Zone 7 which is Northern Ontario. Zone 4 is the City of Toronto and differs from the other zones in that the first decile indicates the lowest Level of Assessment. The reason for this is explained later in the report in the micro level analysis of East York.

This tendency will be monitored in future base years. In order to ensure accurate results, it is necessary to have confidence that all sales included in the ratio study represent open market, arms length transactions. Given the pattern presented, it would be prudent for valuation staff to apply diligence in reviewing the sales at the lower end of the market so that vertical equity is achieved and reliably demonstrated.

Recommendation 1	Prioritize the sales of properties at the lower and higher
	extremes of the market for review and vetting by
	valuation staff.

When analyzing the results at a micro level, there are some localized areas that do not meet the standard for the PRB metric.

This may be attributed the lack of homogeneity amongst the sales data.

An example of this can be found in Northern Ontario, Zone 7 which has the majority of municipalities that fail to meet the PRB standard.

Specifically, areas serviced by Region 32 Thunder Bay, where 11 of the 23 municipalities are located. The largest concentration of properties is located northeast of Thunder Bay along Hwy 11 from Orient Bay to Longlac. There is a smaller concentration near Terrace Bay area. These areas have a high mix of waterfront properties and recreation properties.

Although properties in Northern Ontario urban centers may exhibit homogeneity, this is not the case in rural and remote centers. These areas can have a larger mix of property types leading to a lack of homogeneity. This contrasts with the property mix that can be found in urban centers and in Southern Ontario. This unique mixture of property types can result in data variability that can cause wider variations between sales data and assessed values. Other regions that have small,

localized areas that did not meet standard are Region 29 Timmins and Region 4 Pembroke. These areas do not exhibit the same lack of homogeneity that Region 32 does.

Since the regressivity is localized, review and possible attention by valuation experts in the local assessment office during the Post Valuation Review process is recommended to ensure accurate and equitable assessments.

Recommendation 2	Consistent with the corporate Valuation Documentation
	Framework, provide guidance to valuation staff outlining
	how industry appraisal standards regarding vertical equity
	are to be applied during the valuation process.

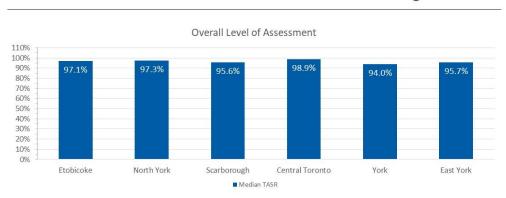
Recommendation 3	Educate valuation staff to identify vertical inequities and
	equip them to address those concerns during the Analytic
	and Post Valuation Review process.

#### Discussion of Toronto Results

Although the results in Toronto (Zone 4) met standard, the residential assessed values in Toronto were further stratified to examine if there was any evidence of systemic price related bias observed within the municipal boundaries.

Below is a chart of the Level of Assessment indicated by the Median TASR for the six boroughs that make up the City of Toronto.

#### Overall Level of Assessment in Toronto Boroughs



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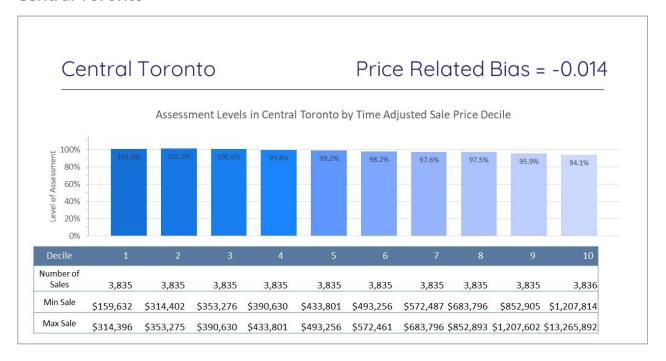
In order to visualize the extent to which vertical equity was achieved in the assessment base, Decile Bar Graphs were also generated for the former boroughs in Toronto. The full set is included in Appendix B.

A visual review of the six boroughs shows that only Central Toronto shows a trend towards regressivity however, the PRB result is excellent, and all overall levels of assessment are within tolerance.

#### PRB Results for the 6 Boroughs

Etobicoke	0.009	Central Toronto	-0.014
York	0.029	North York	-0.009
Scarborough	0.018	East York	0.050

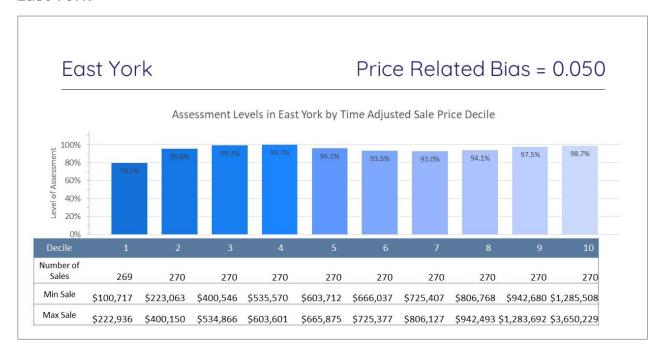
#### **Central Toronto**



The overall PRB results do not indicate regressivity however, a mild trend is apparent when reviewing the Decile Bar Graph for Central Toronto. Although the results visually show mild regressivity, the median TASR lies between 90% and 110% (which is the acceptable range set out in the IAAO Standard) for all deciles. The overall Central Toronto PRB results are very good and well within IAAO standards. This result is worth monitoring for future base years to determine if this trend is an anomaly specific to the base year under review.

Also of note, is that the first 5 deciles are comprised solely of condominium sales and single-family dwellings are not present until after the 5<sup>th</sup> decile in this borough.

#### **East York**



A review of the results for East York shows that there is no sign of regressivity. The PRB result is good, and the overall level of assessment (median TASR) for 9 of the 10 deciles meets the Standard. The first decile does not meet industry standard and required further investigation.

Upon review, it was learned that the sales in the first decile are comprised solely of condominium sales. This is true for most of the boroughs in the City of Toronto.

A detailed review of the sales from the first decile shows that all the sales occurred in one condominium complex known as Crescent Town. This development has rental units located on Crescent Town and Condominium units known as Massey Square.

A review shows that 246 sales of the 269 sales that occurred in the first decile were in the Massey Square complex.

There are 1,420 units located at 1, 3, and 5 Massey Square that are spread over three high rises and three townhouse complexes.

Massey Square condos do not have any of the usual amenities that most condominiums have and are considered Common Element Condominiums.

Through discussions with local office management, it was discovered that this area was not identified for attention during the 2016 Assessment Update Post Valuation

Review process. The assessment was completed in June 2015. Unique characteristics of the buildings such as their ages circa 1970's, and the fact that they were undergoing extensive renovations to the interior and exterior at the time the assessment was created in 2015 may explain the lower assessed values at that time. This review is retrospective and its important to note that some sales included were registered after the assessed values were struck, so that evidence would not have been available to valuation staff.

Post Valuation Review process improvements implemented since 2016 and the tools that are now available enable the local assessment office to monitor the assessments in this complex for future valuation dates. Specifically, the Local Area Knowledge Review (LAKR) process has enabled the local assessment office to record this finding and flag for review during the next assessment update.

## CONCLUSION

Overall, the provincial PRB testing revealed mildly regressive results, which is typical of an assessment ratio study of this magnitude. The provincial median PRB of - .0455 is well within international standard. The slight indication of regressivity raises no alarms of systemic vertical inequity in the residential assessments in Ontario.

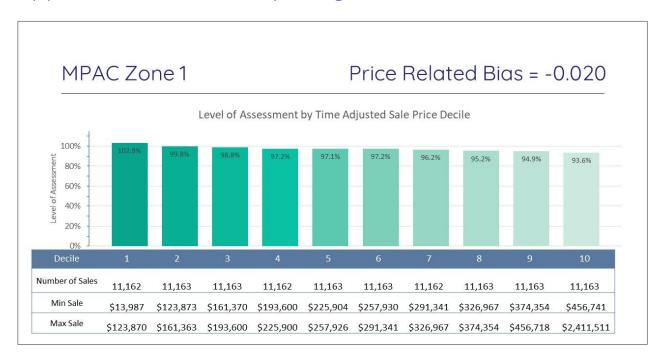
Based on the relatively few observations of localized vertical inequity, opportunity for improvement exists through the implementation of policy and procedures to guide staff in identifying vertical equity risks so that they may be addressed during the Post Valuation Review process. In addition, diligence in vetting sales at the lower end of markets would improve MPAC's ability to measure and monitor vertical equity.

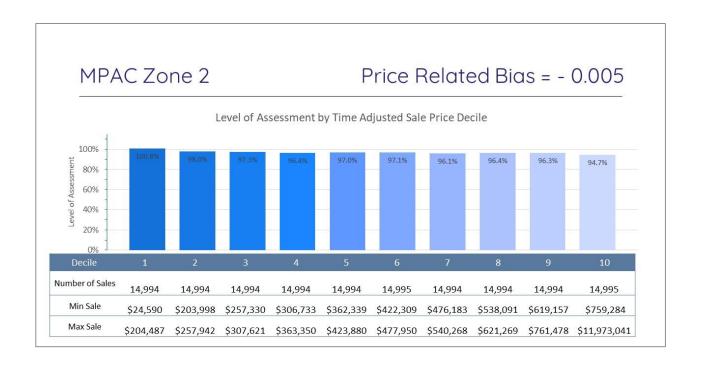
# RECOMMENDATIONS AND MANAGEMENT RESPONSE

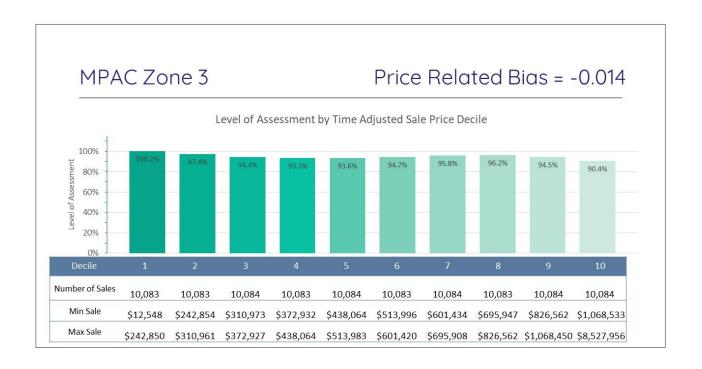
QSC Recommendation	Business Owner	Management Response	Completion Date
1. Prioritize the sales of properties at the lower and higher extremes of the market for review and vetting by valuation staff.	Valuation & Customer Relations (VCR)	Management agrees with the recommendation. Will update "Sales Verification and Adjustment Standard" to provide guidance on review of sales for properties meeting this criteria. be provided	Q2 2022
2. Consistent with the corporate Valuation Documentation Framework, provide guidance to valuation staff outlining how industry appraisal standards regarding vertical equity are to be applied during the valuation process.	Valuation & Assessment Standards (VAS)	Management agrees with the recommendation. Guidance for staff on addressing vertical equity issues will be incorporated into the Valuation Documentation Framework.	Q2 2022
3. Educate valuation staff to identify vertical inequities and equip them to address those concerns during the Analytic and Post Valuation Review process.	Valuation & Customer Relations (VCR)	Management agrees with the recommendation and the requirement to measure vertical inequity during the analytical and PVR valuation processes	Q2 2022

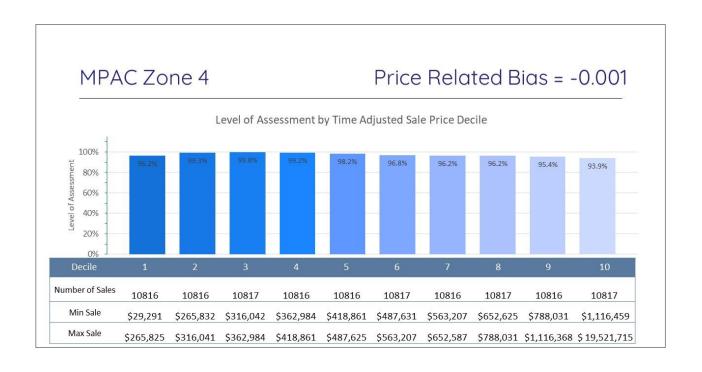
# **Appendices**

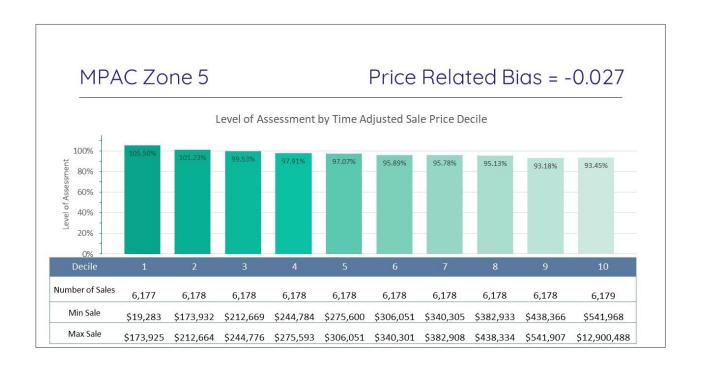
## Appendix A: Decile Graphs by MPAC Zone

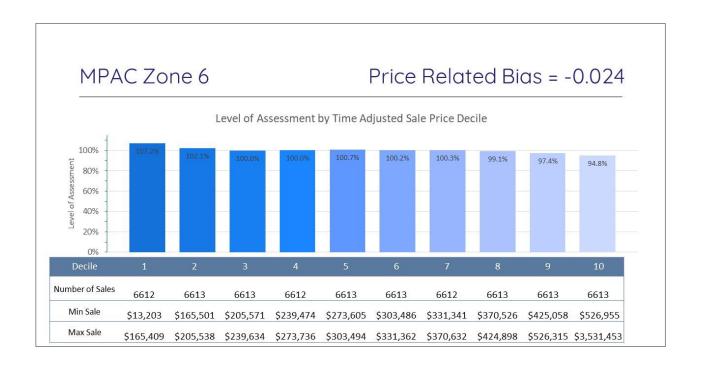


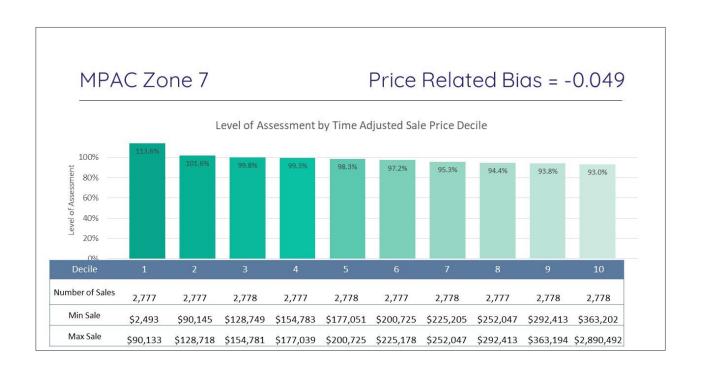












# Appendix B: Decile Graphs by Former Toronto Borough

