MUNICIPAL PROPERTY ASSESSMENT CORPORATION

Sample Reassessment Base Year Residential Valuation Overview

Prepared by: Property Values

MUNICIPAL PROPERTY ASSESSMENT CORPORATION

NOTICE

The information contained in this report was compiled prior to the return of the current year's assessment roll. Value changes resulting from the Corporation's ongoing finetuning efforts and adjustments made through the amended notice period and the reconsideration process are not reflected in this report. All estimates of current value included in this report are as of January 1, 20NN, as required by Section 19.2 of the *Assessment Act R.S.O. 1990.*

Any questions concerning the information contained in this report may be addressed to the local Municipal Property Assessment Corporation office at NNNNNN-NNNN or toll free at N-NNN-NNN-NNNN.

Sales Comparison Approach to Value

In establishing current values for residential, recreational and condominium properties in the Regional Municipality of Sample, MPAC has applied the ***sales comparison approach***, typically considered the best valuation method for residential, recreational and condominium properties by the appraisal industry. It is the approach recommended by the International Association of Assessing Officers (IAAO), the Appraisal Institute of Canada (AIC), and the Uniform Standards of Professional Appraisal Practice (USPAP). USPAP is published by the Appraisal Foundation in the United States.

The sales comparison approach to value estimates the current value of a subject property by adjusting the sale price of comparable properties for differences between the comparable properties and the subject property. This approach to value has been used in many major jurisdictions across North America, including Chicago, Denver and Boston. The cities of Calgary, Edmonton and Winnipeg have also implemented this approach to value in their jurisdictions.

To apply the sales comparison approach to value in mass appraisal, a statistical tool known as ***Multiple Regression Analysis (MRA)*** is utilized to develop property valuation models, which seek to explain or predict the current values of properties from real estate data compiled by MPAC. Property valuation models must be based on sound economic and appraisal theory and market analysis in order to produce understandable, fair and defensible value estimates.

Note: In areas where there are few sales or inadequate data information, the sales comparison approach may not necessarily have been used and another approach to value would be utilized.

Model Specification

There is a two-step process when developing value estimates under the sales comparison approach and MRA. The first step is to design the type of model to build. This is commonly referred to as ***model specification***. This step also involves selecting which property characteristics typically influence value. Approximately 85% of the current value of a property can be attributed to the following five characteristics: location, building area, quality, age and land (lot size or frontage and depth).

An *additive* model was developed to estimate the current value of properties in the Regional Municipality of Sample.

Additive Models

Additive models have been applied to all residential, recreational and condominium properties. The structure of this model includes the development of a base value. Each property begins with this base value and the valuation model will add or deduct value, based on the property characteristics for each property. These adjustments are usually in the form of a dollar rate-per-square-foot, dollar rate-per-unit or a flat dollar-amount.

An example of an additive model is as follows:

CV = 86,934 + 60.14 x QU_AREA1 + 44.19 x QUAREA23 + 384.12 x SQRT_LS + 17.09 x BSMTAREA + 4.24 x BSMTFINA - 0.33 x EFFSQFT + 5281 x AIRCOND + 4991 x BATHS + 3526 x FIREPLCS + 9976 x ATT_GAR + 6889 x POOL – 10273 x HEAT_EL – 4260 x TRAFFIC – 8690 x NB030 – 6929 x NB026 + 9869 x NB028

where	CV	=	Estimate of Current Value
	QU_AREA1	=	Quality Adjusted First Floor Area
	QUAREA23	=	Quality Adjusted Second and Upper Floor Area
	SQRT_LS	=	Square Root of Lot Size
	BSMTAREA	=	Total Basement Area
	BSMTFINA	=	Finished Basement Area
	EFFSQFT	=	Effective Age x Total Area (Depreciation)
	AIRCOND	=	Property has Air Conditioning (Yes/No)
	BATHS	=	Number of Baths (Full and Part)
	FIREPLCS	=	Number of Fireplaces
	ATT_GAR	=	Number of Attached Garage Spaces
	POOL	=	Property has an Inground Pool (Yes/No)
	HEAT_EL	=	Property has Electric Baseboard Heating (Yes/No)
	TRAFFIC	=	Property abuts a Major Street (Yes/No)
	NB030	=	Property located in Neighbourhood 30
	NB026	=	Property located in Neighbourhood 26
	NB028	=	Property located in Neighbourhood 28

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Sample Calculation

Property Characteristic	Subject	Adjustments	Value
Base Value			$86,934
Location	NB027	$0	$0
Square Root of Lot Size	79.486	$384.12	$30,532
Class 7.0 1st Floor Area	1259 sq ft	$60.14	$75,716
Class 7.0 2nd Floor Area	1088 sq ft	$44.19	$48,078
Basement Area	1088 sq ft	$17.09	$18,593
Finished Basement Area	540 sq ft	$4.24	$2,289
Age (Depreciation)	24 yrs x 2347 sq ft	-$0.33	-$18,588
Air Conditioning	Yes	$5,281	$5,281
Baths	2 full +2 half	$4,491	$13,473
Fireplaces	1	$3,526	$3,526
Attached Garage Spaces	2	$9,976	$19,952
Pool	No	$0	$0
Electric Baseboard Heat	No	$0	$0
Traffic	No	$0	$0
TOTAL			$285,786
Rounded to			$285,000

Model Calibration

The second step in the sales comparison approach using MRA is *model calibration*. Simply stated, model calibration is the development of the adjustment amounts used in the sales comparison approach.

Model calibration is a three-step process.

1. The first step is to determine the different *market areas* within the jurisdiction of the local Assessment Office. For valuation purposes, one multiple regression model will be developed for each market area. Market areas are geographic areas which are subject to the same economic influences. Properties in a market area tend to move up or down in value together. They are usually, but need not be, geographically contiguous. A market area typically will have several thousand residential parcels. For residential and recreational properties in the Regional Municipality of Sample there are 5 different market areas. An additional model is used to value townhouse and high-rise condominiums.

   Within each market area, *locational neighbourhoods* are established which reflect the locational desirability of neighbourhoods within a market area. Properties are combined into the same neighbourhood whenever lots of a given size and site amenities would command similar value. Neighbourhoods typically consist of several hundred homes. In condominium valuation models, each condominium plan is typically considered its own locational neighbourhood, although condominium plans may be combined in cases where there are insufficient sales.

2. The second step is to group these market areas into *global areas* and develop a global model. These are *'super'* models which cover broad geographic areas and encompass several market areas. They are used to research and resolve which property characteristics are needed in valuation models, the transformations which produce the best estimates of value , how variables should be linearized, and which coefficients should be applied to property characteristics which don't occur very often. Global models facilitate modeling and promote consistency.

Note: Global models are only built every several years or when significant changes have occurred in the market.

3. The third step in the model calibration process is the development of the *market area models* to value the property within that market area. Typically, the following characteristics account for approximately 85% of the value within each market model: location, building area, quality, age and land (lot size or frontage and depth).

Sales Ratio Study

Once each valuation model has been developed, it is tested to ensure equity, accuracy and uniformity, using a *sales ratio study*. The study is the primary tool used to measure mass appraisal performance. This ratio is calculated by dividing the current value by its sale price. For example, if a property sold for $310,000 and was valued at $300,000, the assessment to sale ratio (ASR) would be 0.97.

Note: Sale prices may be adjusted for time in instances where the market is in a state of inflation or deflation. This allows us to more accurately reflect market conditions as of the valuation date. In these instances, the ratio study is calculated using the time adjusted sale price.

MPAC has developed objectives for sales ratio studies. These objectives are listed below, along with the international standards for comparison. The international standards have been developed by the International Association of Assessing Officers (IAAO) and are accepted as the industry standard throughout the world.

The objective of the reassessment is to value all property at 100% of its January 1, 20XX current value. The range for the level of assessment, as measured by the median ASR, is set between 0.98 and 1.02 (98% to 102%). This goal exceeds IAAO standards, which set the range for level of assessment between 0.90 and 1.10 (90%-110%).

The objectives for assessment uniformity and equity, as measured by the Coefficient of Dispersion (COD) and Price Related Differential (PRD) respectively, are the same as the IAAO standards. With respect to assessment uniformity, markets that tend to be heterogeneous or mixed in nature will generally have a higher COD than markets that are homogeneous or uniform in nature, simply because a uniform market is more predictable.

Before a valuation model is deemed "fit for use" to value property, the overall performance indicators must meet or exceed these objectives.

Note: In cases where there are a significant number of low value sales or an exceptionally wide range in sale prices, assessment to sale ratios can become skewed and additional tests are required to determine fitness for use.

MPAC SALES RATIO OBJECTIVES

Type of Property	*Mean*	*Median*	*COD*	*PRD*
Newer Residential Area	0.98-1.02	0.98-1.02	< 10.00	0.98-1.03
Older Residential Area	0.98-1.02	0.98-1.02	< 15.00	0.98-1.03
Condominiums	0.98-1.02	0.98-1.02	< 10.00	0.98-1.03
Recreational Waterfront	0.95-1.05	0.95-1.05	< 20.00	0.98-1.03
Urban S. Ontario Vacant Land	0.95-1.05	0.95-1.05	< 20.00	0.98-1.03
Other Vacant Land	0.95-1.05	0.95-1.05	<25.00	0.98-1.03
3 to 6 Plexes	0.95-1.05	0.95-1.05	< 15.00	0.98-1.03

INTERNATIONAL SALES RATIO STANDARDS

Type of Property	*Mean*	*Median*	*COD*	*PRD*
Newer Residential Area	0.90-1.10	0.90-1.10	< 10.00	0.98-1.03
Older Residential Area	0.90-1.10	0.90-1.10	< 15.00	0.98-1.03
Condominiums	0.90-1.10	0.90-1.10	< 10.00	0.98-1.03
Recreational Waterfront	0.90-1.10	0.90-1.10	< 20.00	0.98-1.03
Residential Vacant Land	0.90-1.10	0.90-1.10	< 20.00	0.98-1.03
3 to 6 Plexes	0.90-1.10	0.90-1.10	< 20.00	0.98-1.03

Equity Analysis

The second aspect of the sales ratio study is to ensure that equity has been achieved across all major property characteristics. For example, values are tested to ensure that older and newer homes are fairly assessed, smaller and larger homes are fairly assessed, lower and higher valued homes are fairly assessed and each locational neighbourhood is fairly assessed. This part of the ratio study is conducted using a *stratification report*.

A stratification report is simply a detailed assessment to sales ratio study report whereby property characteristics are stratified by category, (e.g., heat type, air conditioning, basement finish type, quality, etc.) or by some grouping scheme (e.g., homes built before 1900, 1901-1939,1940-1959,etc.).

The following is an example of a stratification report for vacant land and improved properties within a market area.

SALES RATIO STUDY FOR: PROPTYPE

		SALES	MIN	MAX	MEAN	WTMEAN	MEDIAN	LCL	UCL	SDEV	COV	COD	PRD
PROPTYPE Propert	1.00 Urban Improved	3383	.61	1.58	1.01	1.00	1.00	1.00	1.00	.10	10.29	7.77	1.01
Type	2.00 Urban Vacant Lar	689	.56	1.71	1.02	1.00	1.01	1.00	1.02	.14	13.74	10.48	1.02

The stratification report identifies the number of sales in each group (SALES), the minimum ratio (MIN), the maximum ratio (MAX), the mean ratio (MEAN), the weighted mean (WTMEAN), the median ratio (MEDIAN), the lower 95% confidence interval for the median (LCL), the upper 95% confidence interval for the median (UCL), the standard deviation (SDEV), the coefficient of variation (COV), coefficient of dispersion (COD) and the price related differential (PRD).

The stratification report identifies all the important statistics for a group of properties with similar characteristics and allows one to ensure equity between these groups. The overall market area standards for the market area should not be applied against each individual grouping, particularly in groups where limited sales information exist. Where sufficient sales exist, each grouping's level of appraisal should be within 5% of the overall level of appraisal and the range for the lower and upper confidence levels should include 1.00.

Finetuning of Values

Once the statistical testing has been completed, and the valuation model for each market area has been deemed *'fit for use'* it is applied to all the applicable properties in the market area. Valuation staff then begin the important process of reviewing the estimates of current value, commonly referred to as *finetuning*.

The purpose of this exercise is to reconcile the value estimates to ensure that a fair and equitable assessment has been placed on each property. The finetuning of values continues up until the assessment roll is returned.

This process is further aided by valuation staff discussing the value estimate with property owners via telephone inquiries, visits to the local Assessment Office and field visits/inspections. If a value is changed, an amended notice of property valuation is issued with the revised assessment. Values changes may be made after the amended notice period and throughout the taxation year through the Request for Reconsideration (RFR) process.

Market Model Index

The following table lists all valuation model(s) applied within the jurisdictional boundaries of the local Assessment Office.

Market Area	Model Number	Applicable Municipalities or Areas
Urban	99UR010	Downtown City of Sample
Urban	99UR020	City of Sample Suburbs
Urban	99UR030	Sampleton and West Sampleton
Rural	99RR010	Rural Sample Region
Recreational Waterfront	99WF010	Lake Sample Waterfront
Condominiums	99CO010	Sample Region Condominiums

Glossary of Terms

Mean - The arithmetic mean (or average) is obtained by adding the values of all the items and dividing the total by the number of items. The average (arithmetic mean) is sensitive to extreme values.

Median - The median of a group of numbers is the middle number after they have been sorted from lowest to highest. If you have an odd number of cases, the median is the middle value. If you have an even number of cases, the median is the value midway between the two middle values. The median, in comparison to the mean, is less sensitive to extreme values.

Coefficient of Dispersion (COD) - The coefficient of dispersion is a measure of the uniformity of the population. The lower the COD, the more uniform the population. In an assessment update, the COD is calculated for the ratio of the assessment to the sale price for the sales used in the analysis. The COD is the average deviation from the median ratio, expressed as a percentage of the median ratio. As market activity decreases or as the complexity of properties increase, the COD will usually increase.

Price Related Differential (PRD) – The price related differential is a measure of bias; it is used to determine assessment progressivity and regressivity. This ratio is calculated by dividing the mean sales ratio by the weighted mean sales ratio.

A PRD of less than 0.98 indicates assessment progressivity, which indicates that high-value properties are appraised proportionately higher than low-value properties. A PRD above 1.03 indicates assessment regressivity, which indicates that high-value properties are appraised proportionately lower than low-value properties.

Note: ***Due to the nature of the real estate market and sales data, the median sales ratio and the COD are the more reliable measures of level of appraisal and uniformity, respectively.***

The standards for the PRD are not absolute when sales samples are small or when wide variations in sale prices exist. In this case, other tests for assessment progressivity or regressivity may be required.