

CHAPTER 2 MASS APPRAISAL AGENDA AND OBJECTIVES

A. PRESENTATION TOPICS

1. Definition of “Market Value” and “Mass Appraisal.”
2. Types of information needed to generate a sales file.
3. Types of information needed to generate property values.

QUIZ

4. Types of statistical analyses needed to gauge assessment levels and equity.

EXERCISE

5. Types of valuation systems for residential, commercial and industrial properties.

EXERCISE

6. The details of reassessment programs.

B. SESSION OBJECTIVES

1. Participants will understand what determines “Market Value” and how a “Mass Appraisal” is done.
2. Participants will understand what information needs to be included in the sales file.
3. Participants will understand what information is needed to generate property values.
4. Participants will understand the different types of statistical analyses and what they measure.
5. Participants will understand the differences in the types of valuation systems used to value all real property.
6. Participants will understand what is expected of them in undergoing a reassessment program.

CHAPTER 2

MASS APPRAISAL

1.0 OVERVIEW AND DEFINITIONS

1.1 Property Valuation

The primary responsibility of assessors is to value all real and personal property in their municipality each year for tax assessment purposes.

Every three years, these valuations must be reviewed by the Department of Revenue (DOR) and certified as meeting legal standards. Valuations in years between this triennial certification must also meet legal standards, but they are not certified by DOR.

1.2 Market Value

Assessors are required by Massachusetts law to assess all real and personal property at its fair cash value as of January 1 each year.¹ Fair cash value means fair market value, which is the price a willing buyer and a willing seller would settle upon in an open market transaction, *i.e.*, they expended a reasonable effort to determine a price and there are no special circumstances involved.²

To determine market value, assessors must evaluate a number of factors that impact the amount a willing buyer and seller would agree to, including:

- **Sales** – The time, volume and price of sales for the same type of property in the general area.
- **Location** – The location of the property.
- **Supply and demand** – The number of properties available for sale relative to the number of buyers seeking them.

1.3 Mass Appraisal

Mass appraisal is defined as the use of standardized procedures for collecting data and appraising property to ensure that all properties within a municipality are valued uniformly and equitably. It is the process of valuing a group of properties as of a given date, using common data, employing standardized methods and conducting statistical tests to ensure uniformity and equity in the valuations.

Assessors use mass appraisal procedures and techniques when determining the fair cash value of properties in their municipalities.

2.0 SALES DATA

2.1 Sales Information

Assessors must gather and analyze property sales data in order to conduct a mass appraisal program. The sales prices of comparable properties that sold in close proximity to the assessment date are the primary indicators of property values in a municipality.

2.2 Sales Identification

Assessors should use a variety of sources to identify all of the real property sales that occurred in the municipality.

2.2.1 Registry of Deeds

The registry of deeds generally sends to each of the communities in its jurisdiction copies of new deeds recorded each month with their book and page numbers shown on the copies. The registry information will generally list all of the real estate included in each sale and disclose the selling price.

2.2.2 Real Estate Transfer Publications

Periodicals like *Bankers and Tradesman* regularly publish information about real estate sales transactions, setting out selling prices, names of buyers and sellers and property classes and uses.

2.2.3 Newspaper Articles

Newspapers frequently contain real estate sections with information about real estate transactions.

2.2.4 Local Real Estate Brokers

Real estate brokers generally have information about property sales. Frequently, they can provide distinctive information, such as what was included in a sale.

2.2.5 Bank and Estate Appraisers

Bank and estate appraisers may also have information about a municipality's sales market.

2.3 Sales Selection

The validity of a sales analysis depends on the identification and selection of arms-length sales.

2.3.1 Arms-Length Sales

An arms-length sale is a transfer of property ownership between:

- A willing seller not under compulsion to sell, and
- A willing buyer not under compulsion to buy.

The transaction is between two unrelated parties, each of which is reasonably knowledgeable of market conditions and under no pressure to buy or sell. The property should be exposed to the market for a reasonable period of time.

A sale is not considered arms-length if there is some special situation that does not reflect market value. Examples of sales not usually considered indicative of market value include sales involving any of the following circumstances:

- **Family sales** - Sales between family members, involving reduced or nominal prices.
- **Foreclosure sales** - Sales involving properties foreclosed by a bank or another lending institution where the creditors are trying to make the best of a bad bargain and willing to sell property at whatever they can get to mitigate their loss.
- **Paper transactions** - Transfers involving businesses reassigning assets for bookkeeping purposes.
- **Donations** - Sales to charitable, educational or religious organizations that involve or are tantamount to donations.
- **Court ordered sales** – Sales ordered by a court that are tantamount to no more than the buyout price between the former co-owners, *e.g.*, a property settlement as part of a divorce.

2.3.2 **Sales Verification**

Assessors can use a number of methods to determine if a sale involved any special circumstances. These methods include:

- **Sales questionnaires** – Questionnaires are sent to new property owners asking them for details about the sale and if any special circumstances were present.
- **Property visits**– A visit can be made to the property shortly after the sale to interview the new owner about any special circumstances and to inspect the property to determine its condition at the time of the sale.
- **Interviews or phone calls** - The seller can also be interviewed in person or by phone, as can any real estate agents, appraisers or other third parties who have some knowledge of the parties to the sale and the details surrounding it.

2.3.3 Sales Database and Maps

After verifying arms-length sales, assessors should create a sales database containing information about each sale property.

The database should include a photograph of each property depicting the physical condition of the property at the time of sale.

Also included as part of the database should be a set of property maps showing the location of all arms-length sales. Sales maps are a valuable tool for identifying market trends within the municipality. The maps should provide the following information:

- Locations of sale parcels.
- Sale prices.
- Sale dates.
- Property types, *e.g.*, single family home, residential lot, etc.

3.0 TAX MAPS

3.1 Land Valuation Tool

Assessors must prepare tax maps that locate and provide essential land area information about every real property in their municipality. In mass appraisal programs, tax maps are essential to the development and application of a land valuation schedule with accurate measures of market value, such as square footage, front footage and site. The maps must be updated annually to reflect changes in parcel configurations.

3.2 Parcel Identification System

Tax maps establish a unique identification number for each parcel of real estate. Most mapping systems identify the parcels by map-lot number or map-block-lot number. Each map is numbered. If the maps also contain divisions, they are called blocks and are identified by a different number. A unique number is then assigned to each parcel.

3.3 Parcel Information

Tax maps must accurately delineate every parcel and display its land area, based on the legal description in the deed or other title document. All roadways should be displayed and identified by name.

Maps that include the following information about each parcel enable assessors to more precisely analyze market influences:

- **Frontage and depth** - Road frontages and property depth measurements on tax maps assist assessors determine conformity to zoning by-laws and development potential.

- **Zoning, improvements and topography** - Boundaries of zoning areas, diagrams or footprints of buildings and other improvements, and topographical data also assist assessors determine conformity to other land use regulations, such as wetlands protection laws and by-laws.

4.0 PROPERTY INVENTORY DATA

4.1 **Property Record Card**

Assessors must collect and maintain data on each parcel of real, and each account of personal, property. Accurate property data is essential for developing uniform valuations of comparable properties in a mass appraisal program. This data is usually referred to as a property inventory or record card.

4.2 **Real Property Descriptive Data**

Property inventories for real property parcels should include the following information about ownership and physical characteristics that may affect valuation:

- **Ownership history** – The current and prior owners, acquisition dates and title references.
- **Land information** – Acreage, frontage and other data needed to apply the land valuation system.
- **Building measurements** – The precise external measurements for each structure on the property in order to calculate usable or living areas.
- **Construction quality** – The quality of the craftsmanship of the builder and the worth and durability of the materials used in the construction of each building and other structure.
- **Story heights** - The story height of each section of all buildings in order to calculate living area above the first floor.
- **Style** -The style of the building, *e.g.*, colonial, ranch, etc.
- **Construction date** – The date of construction of each building, *i.e.*, its age.
- **Current condition** – The current physical condition of every building, *i.e.*, its degree of maintenance.
- **Other amenities** – All other amenities of a property that affect the property's market value, such as additional bathrooms, central air conditioning, garages, swimming pools, sheds and barns.

- **Moderating features** - Any features or characteristics that diminish the property's value, such as easements, nuisances and rights-of-way.

4.3 **Property Inspections**

Assessors must conduct a periodic, cyclical inspection program to continuously inspect properties to verify and update existing data. The time period depends on a number of factors, such as quality of the original data collection effort, the absence of data on certain characteristics needed to accurately measure market trends in a new valuation system, the frequency of property renovation and remodeling and the level of property reinspections. Generally, DOR certification guidelines require that all properties be inspected at least once every nine years.

4.3.1 **Community-wide Data Collection (“Full Measure and List”)**

A program to recollect all exterior and interior data at one time, *i.e.* a full measure and list program, usually takes place during a relatively short period of time, such as one calendar year. A full measure and list program is time consuming and generally requires the hiring of extra temporary staff or a revaluation company.

4.3.2 **Cyclical Data Collection**

Assessors using a cyclical program continually check their data over a set period, lasting three, six or nine years, depending on property turnover in their community and their resources. This data collection procedure spreads costs over a longer period and minimizes the need for additional staff.

4.4 **New Construction Data**

Assessors must collect data on properties that have had new construction, alterations or demolitions each year and update their property inventory records to reflect the physical status of each parcel as of January 1, or June 30 if the municipality has accepted a local option making the physical status of real property on June 30 its condition on January 1.³

4.4.1 **Building Permits**

Assessors should make arrangements to receive copies of all building and demolition permits issued in the municipality so they can identify and collect the following construction data:

- New structures.
- Additions to existing structures.
- Renovations and other remodeling.

4.4.2 **Partial Construction Valuation**

Assessors must determine the percentage of completion of any new construction on the status date. That percentage is applied to the estimated value of the structure as completed. That amount is then added to the land value to determine the property's valuation for the year.

Example

For fiscal year 1, a new house is 60% complete. The parcel's valuation equals the land value plus 60% of the full value of the house as completed.

For fiscal year 2, an additional 20% of the construction is completed. The parcel's valuation equals the land value plus 80% of the full value of the house as completed.

For fiscal year 3, the house is completed. The parcel's valuation equals the land value plus the completion value of the house.

4.5 Property Data Conversions

When a municipality changes valuation systems, assessors must include as a component of their mass appraisal program a full field review of every parcel. This is required by DOR reassessment program guidelines regardless of whether a new data collection program is being conducted or existing data is being used. *(Policy under review for FY2017). The purpose is to ensure the data has been accurately captured and the new valuations are uniform.

4.5.1 Drive-by Inspection

To perform a full field review, assessors should first conduct a drive-by inspection of all properties, checking building style, quality and condition and examining other visible data characteristics.

4.5.2 Physical Inspection

For all properties appearing to have numerous discrepancies in their visible data, assessors must conduct a physical inspection.

4.6 Data Quality Analysis

A data quality analysis is a tool to determine the quality of the existing property data and assess the scope of data collection or verification required as part of a mass appraisal program. Properties are selected at random for inspection and a complete check of all of the information in the existing database is made.

4.6.1 Sample Method and Size

The sample should consist of a randomly selected two to five percent of all properties, and should be representative of all the typical property attributes, in the municipality. The sample should include:

- **Neighborhoods** - Representative properties from all the community's typical neighborhoods.
- **Property types** - Representative properties from each of the residential, commercial and industrial property classes. Within

each class, the sample should contain buildings of all styles, types of construction and age.

4.6.2 **Property Data Comparison**

The preferred method for inspecting properties and comparing the results is to use blank property record cards and measure and list each property as if it were a new data collection.

An alternative method is to conduct a data verification inspection and mark discrepancies on the existing property record cards at the time of inspection.

4.6.3 **Sample Classification**

The first step in analyzing the results of the data quality study is to classify the reviewed properties into the following four categories:

- **None** - Properties with no discrepancies found between the existing data and the data obtained upon reinspection.
- **Drive-by inspection** - Properties for which a field review would have identified the discrepancies found, *i.e.*, discrepancies are for features such as building style, quality of construction, condition and/or story height.
- **Exterior measurement** - Properties for which an exterior measurement would have been required to identify the discrepancies found.
- **Interior inspection** - Properties for which an interior inspection would have been required to identify the discrepancies found, *i.e.*, discrepancies are for features such as an extra bathroom or fireplace or a finished living area in a basement or attic that was believed to be unfinished.

4.6.4 **Statistical Analysis**

A statistical analysis must be completed to evaluate the results of the data quality study.

Step 1 Compute Dollar and Percentage Impact of Discrepancies

- For each property, calculate the dollar difference between the existing assessed value and the value the property would have had if the data had been accurate.
- For each property, determine the percentage difference by dividing the dollar difference by the existing value.

<u>Example</u>	
Assessed valuation	\$100,000
Valuation with accurate data	\$115,000
Dollar difference	\$15,000
Percentage difference	15%
	(15,000 ÷ 100,000)
<u>Step 2 Calculate Mean Dollar and Percentage Difference</u>	
	<ul style="list-style-type: none"> • For the entire sample, and for each of the discrepancy categories identified in Section 4.6.3 above, calculate the mean dollar and mean percentage difference. • The mean for each is the average difference and is calculated by adding the difference for each property and dividing that total by the number of properties.
<u>Step 3 Calculate Median Dollar and Percentage Difference</u>	
	<ul style="list-style-type: none"> • For the entire sample, and for each of the discrepancy categories identified in Section 4.6.3 above, calculate the median dollar and median percentage difference. • The median for each is found by arraying the differences from high to low (or low to high) and locating the midpoint, with an equal number located above and below.

4.6.5 Corrective Action

The results must be evaluated to determine whether corrective actions are needed.

- **Median over 10%** - Assessors should conduct a full data collection program if the median in any category, class or type of property is greater than 10 percent.
- **Median between 5% and 10%** - Assessors should begin a three or six year, cyclical inspection program.
- **Median below 5%** - Assessors should continue ongoing maintenance and carry out a six or nine year, cyclical inspection program.

5.0 MARKET ANALYSIS

5.1 Analysis Period

Once arms-length sales have been identified and verified, assessors must conduct a sales analysis to determine assessment level and uniformity. An analysis is conducted before beginning a mass appraisal program to compare the level and uniformity of existing assessments with the current market and identify the valuation adjustments that need to be made. Once the program is complete, another analysis is conducted to ensure that the resulting values comply with DOR certification standards of fair cash value.

Taxes for a fiscal year are assessed as of the January 1st preceding the fiscal year. January 1 is the effective date of the analysis since assessors are to determine the value of properties as of that date. The sales analysis should be based on sales that occurred during the preceding calendar year.

Example

January 1, 2016 is the assessment date for fiscal year 2017, which begins on July 1, 2016. Calendar year 2015 sales are analyzed for fiscal year 2017.

5.2 Sample Size

Assessors must include all valid arms-length sales that occurred in the analysis period. In the example above, all valid sales that took place in calendar year 2014 would be used.

5.2.1 Minimum Sample

The sample should be at least two percent of the number of parcels in the class, or 10 sales in the class, whichever is greater. For residential properties, a separate analysis should be conducted for each of the following:

- Single-family homes.
- Condominiums.
- Two-family homes.
- Three-family homes.
- Apartment buildings (4 units and above).
- Residential vacant land.

5.2.2 Insufficient Sample

If the sample is less than two percent, or 10 sales, the assessors should include an additional 12 months of sales in the analysis in order to obtain an adequate sample. The additional months can be from either the year before the base year, or the six months before and the six months after the base year. The time period used must be the same for all classes analyzed that require an additional year.

Example

Calendar year 2015 sales of apartment buildings are insufficient. The assessors use the last 6 months of 2014 and the first 6 months of 2016 to obtain an adequate sample.

The sales study for any other class requiring sales in a second year such as single-family homes, condominiums, two-family homes, three-family homes or residential vacant land, must also include sales from those months.

5.3 Time Adjustments

Assessors may need to adjust the sales prices forward or backward to the assessment date before conducting the analysis if the real estate market is changing at a dramatic pace. This is only one method of determining the time adjustment. Other methods may be obtained from IAAO's publication, *Property Appraisal & Assessment Administration*.

5.3.1 Inflation/Deflation Rate

To determine a proper adjustment, assessors should first compute the sales/assessment ratio for earlier months of sales.

S/A Ratio Example

An analysis of s/a ratios for 2015 sales shows that:

- **January sales were, on average 100% of the current assessments.**
- **July sales were on average, 95% of the current assessments.**
- **December sales were, on average 90% of the current assessments.**

Deflation occurred at a 10% rate over the year.

$$\frac{90\% - 100\%}{100\%} = -10\% \text{ (decrease)}$$

5.3.2 Monthly Trend Factor

Adjustments in the sales price are made by computing a monthly adjustment factor. The factor is calculated by dividing the annual inflation rate by 12 months.

Example

Deflation occurred at a 10% rate over the year. The monthly adjustment factor is .83% ($10 \div 12$). For example:

- **October sales occurred 3 months before the assessment date and are adjusted by -2.5% ($-.83 \times 3$).**

- **May sales occurred 8 months before the assessment date and are adjusted by – 6.67% (-.83 x 8).**

5.4 Ratio Studies

Ratio studies can be used to analyze existing assessments by (1) assessment level and (2) assessment uniformity. Assessment level measures the degree to which the assessments approximate current market value. Assessment uniformity measures the degree to which properties in the same class or subclass are assessed at the same percentage of current market value.

5.4.1 Assessment Level

5.4.1.1 Assessment/Sales Ratio

Assessment level is determined by calculating the median assessment/sales ratio (ASR) for the class or subclass being analyzed. The first step is to calculate the ASR for each property in the sample. The ASR is calculated by dividing the current assessed valuation of the property by the sales price.

An ASR of 1.00 represents market value. An ASR below 1.00 indicates the property is assessed for less than its market value. An ASR above 1.00 indicates the property is assessed for more than its market value.

Example

A property assessed at \$100,000 sold for \$135,000. The ASR is .74 (100,000 ÷ 135,000). This property’s assessment is below market value, i.e., is 74% of its market value.

5.4.1.2 Median Assessment/Sales Ratio

The median ASR is then calculated for the municipality, class or subclass being analyzed. The median is generally a better measurement of assessment level than the mean (average) because it is not swayed by outlying sales.

<u>Step 1</u>	<p><u>Calculate ASRs</u></p> <ul style="list-style-type: none"> • Compute the ASR for each sale in sample.
<u>Step 2</u>	<p><u>Calculate Median ASR</u></p> <ul style="list-style-type: none"> • Array the ASRs from high to low (or low to high). • The median is the midpoint, with an equal number of ASRs located above and below.

5.4.2 Assessment Uniformity

Assessment uniformity is determined by calculating the coefficient of dispersion (COD) for the class or subclass being analyzed. The COD measures how sales prices for properties within the sample vary from the median ASR.

<u>Step 1</u>	<p><u>Calculate Absolute Deviation from Median</u></p> <ul style="list-style-type: none"> • Compute the amount by which the ASR for each sale in the sample deviates from the median ASR, <i>e.g.</i>, if the median ASR is .97 (97%), the deviations for sales with ASRs of .95 and .99 would both be .02. • The deviation for the sale or sales that established the median should be calculated and included. <ul style="list-style-type: none"> • If 1 sale determined the median, the deviation for that sale would be 0. • If 2 sales determined the median, one at .96 and the other at .98, resulting in a median of .97, the deviations for both sales would be .01.
<u>Step 2</u>	<p><u>Calculate Average Absolute Deviation from Median</u></p> <ul style="list-style-type: none"> • Add the absolute deviations of each sale in the sample. • Divide the total by the number of sales. <p style="text-align: center;"><u>Example</u></p> <p>The total of absolute deviations for a sample of 25 sales is 2.56 (256%). The average absolute deviation is $(2.56 \div 25)$ which equals .102 or 10.2%</p>
<u>Step 3</u>	<p><u>Calculate the Coefficient of Dispersion</u></p> <ul style="list-style-type: none"> • Divide the average absolute deviation by the median ASR. • Multiply that quotient by 100. <p style="text-align: center;"><u>Example</u></p> <p>The average absolute deviation is 10.2%. The median ASR is 97%. The COD is $(.102 \div .97 \times 100)$ which equals 10.5</p>

5.5 Certification Statistical Standards

5.5.1 ASR and COD Standards

For certification, the sales analysis must indicate the following mass appraisal standards of assessment level and uniformity for each type of property for which there is a sufficient sales sample:

<u>Type</u>	<u>Use Classes</u>	<u>Median ASR (Range)</u>	<u>COD (Maximum)</u>
Single-family	101	90-110%	10%
Condominiums	102	90-110%	10%
Two-family	104	90-110%	12%
Three-family	105	90-110%	12%
Apartments	111-112	90-110%	15%
Vacant Land	130-132	90-110%	20%
Commercial	300s	90-110%	20%
Industrial	400s	90-110%	20%
Mixed Use	013-031	90-110%	20%

5.5.2 ASR Differential

Certification standards also require that the difference in the median ASR of the residential subclass with the largest number of parcels and the median ASR of any other subclass of residential property should be five percent or less. The difference in the median ASR of the residential class use code w/the largest number of parcels and the median ASR of any other class should be 5% or less, but the median may not go below 90% or above 110%.

Example

The largest or predominate residential class is single-family homes and has a median ASR of 97%. All other residential classes would be required to have a median ASR of 92% to 102% to meet certification standards.

5.6 Sales Stratification

Assessors can and should stratify sales in a residential class into subgroups in order to more precisely identify the factors influencing market value. Subgroups can be based on such factors as:

- Neighborhood.
- Building style.
- Building grade.
- Building age.
- Selling price.
- Sale date.

The median ASR and COD should be calculated for each subgroup. The median for each subgroup should fall within five percent of the median of the corresponding residential use class. The COD for each subgroup should be within the range allowed for the class.

6.0 VALUATION METHODOLOGIES

6.1 Valuation Systems

Most communities already have a valuation system in place, commonly referred to as a Computer Assisted Mass Appraisal (CAMA) System. These systems have the ability to apply market changes to all comparable properties within the municipality.

6.1.1 Adjustment of Existing Valuation System

Sales analyses and other market data are used to identify what adjustments need to be made to the existing valuation system for improvements and land. This typically involves updating the CAMA system valuation models, such as land, cost and depreciation tables. Adjusting these tables maintains the integrity of the existing system because the values of all comparable properties would change at the same rate.

Examples

The existing land valuation schedule would be adjusted if the source of dispersion appears to be neighborhood differences.

The existing building valuation models, base cost tables or depreciation schedules would be adjusted if the source of dispersion appears to be a specific style or age of property.

6.1.2 Trending or Factoring Existing Valuations

In some cases, sales analyses may be used to adjust the assessments of a group of properties by a uniform percentage, rather than adjusting the CAMA system valuation models. This approach is effective when the underlying data is current and accurate and when separate trending factors are developed for comparable properties (such as by location, age, style, etc.) that appreciated or depreciated in value at the same rate. It may be an inappropriate appraisal technique where values have been previously factored and applying another factor would magnify underlying inequities.

Example

Sales of homes in a particular neighborhood indicate an ASR of 90%. The current valuations of all homes in a particular neighborhood are increased by 10%.

6.2 Residential Property

Residential properties are usually valued using the cost approach. This method calculates the current cost to replace the building using a recognized cost manual, local building costs and/or a cost trending multiplier (from an applicable national cost service). This cost estimate is then adjusted downward for depreciation due

to age or condition. Land is valued separately and added to the depreciated cost. The commonly used term for the building component is RCNLD for Replacement Cost New Less Depreciation.

Example

Subject property is a 20-year-old, 2,000 square feet (SF) single family home.
Updated construction costs are \$75/SF. The RCN = \$150,000 (2,000SF x 75/SF).
Updated depreciation tables indicate a 20-year-old home has lost 10% of its value.
RCNLD = \$135,000 [150,000 – 15,000 (10% of 150,000)].
Residential house lot value is \$45,000.
Final value is \$180,000 (135,000 + 45,000).

6.3 Vacant and Improved Land

The approach to valuing vacant and improved land depends on the sales database. The most reliable method is to analyze sales of vacant, raw land. Additionally, a land residual analysis should be conducted. This method subtracts the value of all improvements on a parcel from its sales price leaving an indicated land value. The results of both approaches should support the adjustments the assessors make to existing land valuation schedules for all classes to ensure that their application reflects current market value.

Example

A single-family home sells for \$300,000.
The RCNLD = \$200,000.
The residual or indicated land value is \$100,000.

6.4 Commercial and Industrial Property

Commercial and industrial properties are bought and sold on investor expectations. In valuing these properties, adjustments should consider the approaches to value that were used to determine their original base values. Certification guidelines require that assessors use at least two valuation methods to estimate the values of all investment properties.

The three methods used to value commercial and industrial properties are:

6.4.1 Cost Approach

This method calculates the current cost to replace the building, adjusts for depreciation due to age or condition and adds a separately determined land value.

Example

Subject property is a 10-year-old, 20,000 SF office building.
Updated construction costs for this type of structure are \$50/SF.
The RCN = \$1,000,000 (20,000SF x 50/SF).
Updated depreciation tables indicate a 10-year-old office building has lost 10% of its value.
RCNLD = \$900,000 [1,000,000 – 100,000 (10% of 1,000,000)].
Commercial land value is \$200,000.
Final value is \$1,100,000 (900,000 + 200,000).

6.4.2 Income Approach

This method requires the assessor to estimate the rental income from a property and capitalize that income into an estimate of current value. The approach recognizes that potential buyers demand property because they anticipate a future income stream. Assessors should collect current information on a community and regional level about rents, income, expenses, financing rates and terms and other data needed to develop capitalization rates. The necessary information can be obtained from a questionnaire, interviews with taxpayers, or from third party sources.

The formula that relates income to value under this approach is:

$$\text{Value (V)} = \text{Income (I)} \div \text{Capitalization Rate (R)}.$$

Example

Subject property is expected to provide a perpetual net income of \$50,000 a year.
The rate of return on investments of similar safety is 10%.
Final value is \$500,000 (50,000 ÷ .10).

6.4.3 Market Approach

This method analyzes recent commercial and industrial sales to develop units of value. These unit values may then be applied to comparable non-sold properties. Sales from surrounding communities with comparable property bases and market influences may also be used for analytical purposes.

Example

A 40,000 SF office building sells for \$3,000,000.
The dollar per square foot unit of value is \$75/SF (3,000,000 ÷ 40,000SF).

7.0 REASSESSMENT PROGRAMS AND WORKPLANS

7.1 Interim Years

Assessors must value all property at fair cash value as of January 1 each year. In the years between triennial certification, this means they must adjust valuations to reflect changes in the tax base due to new construction, alterations, demolitions or other physical changes. They must also monitor the market and if there has been a change in market conditions, adjust their valuations as needed so that all property valuations reflect current fair cash value.

7.1.1 Valuation Adjustment Plan

Assessors may undertake or complete a valuation adjustment program in years between triennial certification without the prior review or approval of the Bureau of Local Assessment (BLA). Appropriate analytical and appraisal methods must be used to develop any valuation adjustments. Once the program is completed, the new valuations must be equitable and consistent within and between all property classes, *i.e.*, they must meet the same mass appraisal measures of assessment level and uniformity as required for triennial certification. See Section 5.5 above.

Example

Initial analysis indicates the following ASRs for subclasses of residential properties:

- **75% Single family.**
- **70% Condominiums.**
- **95% Vacant land.**
- **96% Two-family.**

Assessors must adjust single family and condominium valuations. After adjustments are made, all residential subclasses must have ASRs between 90-110% and the ASRs must be within 5% of each other.

Assessors must prepare and retain documentation supporting the new valuations. This documentation might include, for example, income, expense and capitalization rate analyses, sales ratio studies or any other data that support the type and extent of the valuation changes made by the assessors.

7.1.2 Valuation Adjustment Report

Assessors must report the results of their analyses to BLA whether or not any valuation adjustments are made. The report is made on the form LA-15 "Interim Year Adjustment Report" (see page 2-22). It should be submitted as early as possible during the tax rate process, but must be received by the time the Form LA-4 "Assessment/Classification Report" is submitted.

7.2 Certification Year

Assessors must develop a reassessment program for meeting triennial certification requirements and submit a workplan to accomplish it to BLA.

7.2.1 Evaluate Current Capability

Assessors must thoroughly evaluate the resources available to them to complete a reassessment program, including the following:

7.2.1.1 CAMA System

The current CAMA system must be evaluated to determine if it has the capability to maintain the database, update the current valuation tables and produce required certification documentation.

7.2.1.2 Personnel

A reassessment program requires a substantial amount of time and labor. Assessors must determine if they have sufficient, qualified personnel to complete the program in-house in a timely manner. In-house personnel must have the appraisal knowledge, training and experience, and working knowledge of the CAMA system, required to complete assigned tasks.

7.2.1.3 Professional Assistance

Assessors may contract for professional assistance if they determine that in-house resources are not sufficient to complete all or portions of the program. Assessors may select from a wide range of data processing, appraisal, consulting or other professional services to revalue property, update an existing valuation system or otherwise assist them. Assessors are legally responsible for ensuring that valuations meet legal standards even if professional assistance is used.

If the plan includes any professional assistance, assessors should review procurement procedures and standards with their procurement officer and municipal counsel. The Uniform Procurement Act⁴ covers procurement of professional services generally, but the specific bidding procedures that apply depend on the type and value of the contract. Additional information is available from the Office of the Inspector General at www.mass.gov/ig. There may also be local bidding provisions that apply.

Assessors should consider a number of factors in addition to cost when choosing a contractor, including the contractor's:

- Familiarity with the municipality and area.
- Familiarity with the CAMA system used.

- Experience working with municipalities of similar size and complexity.
- Performance record.

7.2.1.4 Budget

Assessors must review the financial resources needed to implement and complete the program, prepare a program budget and request any additional funds needed. Funds should be appropriated two years in advance of the year certification is scheduled.

7.2.2 Prepare Workplan

Assessors must determine the program components needed to meet certification standards based on their analysis of market trends, data quality, CAMA system capability and BLA certification recommendations.

They must then prepare a workplan (see page 2-23) to document program components, personnel and timetable. The workplan is a valuable tool that allows assessors to:

- Define specific project tasks.
- Manage their limited human and financial resources.
- Monitor the progress of the program.

The workplan submitted to BLA includes following:

- Data maintenance and valuation system information.
- Program data collection, valuation and field review components for all property classes and who is responsible for completing them, in-house personnel or a contractor.
- Public disclosure activities (Individual impact notices required for certification only for full revaluation programs, *i.e.*, new data collection and valuation system).
- Appropriation status.
- Schedule for completing major steps in certification process. BLA will not accept a workplan unless a work schedule with projected completion dates is submitted.

For their own monitoring purposes, assessors should prepare a more detailed project workplan based on realistic estimates of the necessary work and time needed to complete it.

¹ G.L. c. 59, § 38.

² *Boston Gas Company v. Assessors of Boston*, 334 Mass. 549 (1956) defines fair cash value as “fair market value, which is the price an owner willing but not under compulsion to sell ought to receive from one willing but not under compulsion to buy.”

³ G.L. c. 59, § 2A(a), as added by St. 1989, c. 653, § 40.

⁴ G.L. c. 30B.

**Interim Year Adjustment Report
Bureau of Local Assessment - Department of Revenue
FY 20XX**

CITY/TOWN/DISTRICT _____
Municipality

Sales Ratio Study for the Period _____ *through* _____

Property Class	101	102	Misc 103, 109	104	105	111-112	130-132	300's	400's
Current Year # of Parcels									
Sales Divided by Prior FY Assessed Values									
Total # Sales > \$1000									
# Arms-Length Sales									
Prior Median ASR									
C O D									
Sales Divided by Current FY Assessed Values									
Total # Sales > \$1000									
# Arms-Length Sales									
% AL Sales/ Parcels									
Current Median ASR *									
C O D *									
% Change of Median ASR's									

* Statistical study results must conform to requirements as outlined in the "Guidelines to a Minimum Reassessment Program", section III B.

Commercial & Industrial

Have properties been adjusted ? Yes No

If adjusted, did you change: Capitalization rates Rent schedules Vacancy rates Land values
 Building costs recalibrated Depreciation tables Other adjustments (explain):

We, the undersigned, agree that in our judgment the valuation adjustments result in fair and equitable assessments both within and between all classes of property. Sufficient documentation has been developed to support all valuation adjustments and will be retained for 5 years.

Submitted by Board of Assessors: _____

 Date: _____

**Massachusetts Department of Revenue
Division of Local Services
Bureau of Local Assessment**

Revaluation Workplan

Community	Billing	Submitted by:	Position	Date

Since last certification:	Residential	Mixed use/C&I	Personal Property
Current CAMA System			
New valuation system	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
New Installation Completed	FY _____	FY _____	FY _____
If yes, was full field review done?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Data Collection Cycle	Number of years _____ Ending FY _____ % inspections completed to date _____	Number of years _____ Ending FY _____ % inspections completed to date _____	Number of years _____ Ending FY _____ % properties completed
504/local utilities: net book	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, appraiser/contractor*	
Electric generation plant:	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, agreement or appraiser/contractor*	

Program Components

	Residential		Mixed use/C&I		Personal Property	
	Inhse	Contractor Name*	Inhse	Contractor Name*	Inhse	Contractor Name*
Partial field review						
Full Field Review						
Data Collection						
Formal Data Quality Study						
Valuation						
Val. Field Review						

New mapping program? Yes No GIS: Yes No Integrated with CAMA? Yes No Last updated: _____

Impact Notices Yes No Classes: _____ Notification to 2nd home Owners Required. Not Applicable

Adequate Funds for Revaluation: Appropriation - Approved: _____ Pending: _____ Denied _____

Work Schedule Dates**

	start date	end date
Sales analysis		
Value generation		
Value review		
DOR review		
Public disclosure		
Tax rate set		

Additional Information:

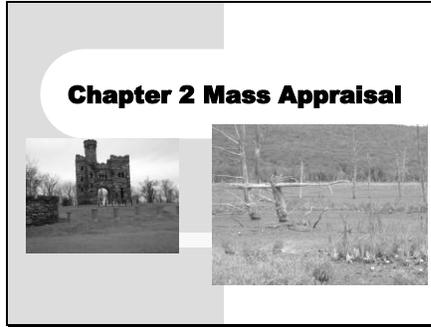
* Please list contractor(s) if known
** Indicate a complete proposed work schedule. Major changes will require a revised work schedule
REVISED 2008

MASS APPRAISAL ADDITIONAL RESOURCES

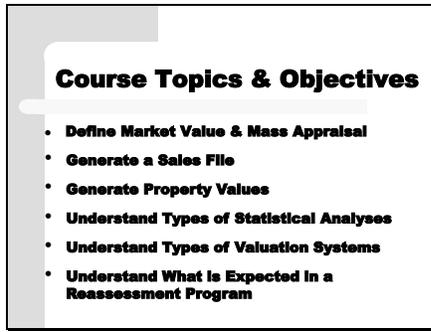
The following are additional resources on Mass Appraisal produced by DLS that are available on our website: www.mass.gov/dls.

- [*Certification Standards \(Guidelines for Development of a Minimum Reassessment Program \(Revised March 2015\)\)*](#) – Explains requirements for developing reassessment programs that will result in fair cash values meeting triennial certification requirements. Addresses sales analyses, property inspections, valuation methodologies and public disclosure programs. **Supplements the course handbook.**
- [*In-house Revaluation Cost-Benefit Analysis \(March 2003\)*](#) – Provides framework for local assessors to evaluate the activities required to complete an in-house revaluation program and determine the associated costs.
- [*Assessment Certification Manual and Spreadsheets \(Revised February 2009\)*](#) – Explains requirements for documenting sales analysis and valuation methodology during triennial certification review.
- [*Property Type Classification Codes \(Revised March 2015\)*](#) – Guidelines that establish coding system assessors must use in designating usage classification of property. **Supplements the course handbook.**
- [*Guidelines for Annual Assessment and Allocation of Tax Levy*](#) – Annual Informational Guideline Release (IGR) that details standards and procedures for annually determining property tax assessments, including triennial certification, classifying property according to use and allocating the tax levy among the property classes.

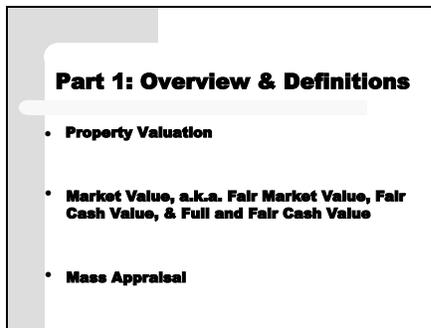
Slide 1



Slide 2



Slide 3



Slide 4

Property Valuation

Assessors Primary Responsibility:

Identify & Value All Real & Personal Property Every Year for Tax Purposes.

Every 3rd Year is a Certification Year. Other Years are Interim Years.

Slide 5

Market Value 

MA law requires assessment of all real & personal property at fair cash value as of January 1 every year.

One Definition: The price, as of a specific date, in cash or its equivalent, that a buyer and seller acting prudently and knowledgeably and under no duress, would settle upon after the property's reasonable exposure in a competitive market under all conditions requisite to a fair sale.

Slide 6

Mass Appraisal

The use of standardized procedures to ensure that all properties are valued uniformly and equitably as of a given date, using common data, standardized methods, and statistical testing.

Slide 7

Part 2: Sales Data 

Sales are the primary indicators of residential values in a community.

“Everything flows from the LA3.”

Slide 8

Sales Information & Identification

Registry of Deeds
MLS
Real Estate Brokers
Online Services
Real Estate Publications
Interview Buyers or Sellers

Slide 9

Sales Selection 

- **Arm's-Length Sales:**
 - willing seller & buyer not under compulsion;
 - knowledgeable, unrelated parties;
 - property on the market for a reasonable period of time.

Slide 10

Non-Arm's-Length Sales

- Sales within a family 
- Foreclosure
- Paper Transaction (convenience)
- Charitable Organization 
- Court Order 
- Abutter
- Affordable Housing

Slide 11

Sales Verification

- Send questionnaires 
- Inspect your sales!! 
- MLS info on the listing sheet
- Phone interviews 



Slide 12

Sales Database & Maps

After verifying arm's-length sales, create a sales database:

- Location
- Sale Price
- Sale Date
- Type of Property
- Photo(s)
- Put Data on Property Maps

Slide 13

Summary

- Property Valuation
- Market Value
- Mass Appraisal

Slide 14

Summary

- Sources of Sales Information
- Arm's Length & Non-Arm's-Length Sales
- Sales Verification
- Sales Database & Maps

Slide 15

Part 3: Tax Maps

- Land Valuation Tool
 - Locate and provide land info about every real property in the community.
 - Must be updated annually to reflect changes.

Slide 16

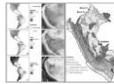
Tax Maps



- **Parcel ID System**
 - Provide a unique number for each parcel.
 - Use Map-Lot or Map-Block-Lot system.
- **Parcel Information**
 - Delineate every parcel.
 - Display land area.

Slide 17

Ideal Tax Maps



- Street names
- Road frontage
- Other dimensions
- Zoning boundaries
- Building footprints
- Easements & ROWs
- Land features – topo, wetlands, etc.

Slide 18

MASS GIS: OLIVER



Slide 19

Part 4: Property Inventory Data

- Property Record Card
- Real Property Descriptive Data
- Property Inspections
- New Construction Data
- Property Data Conversions
- Data Quality Analysis



Slide 20

Property Record Card or PRC

A PRC for every parcel.

- Major components:
 - Prior & current assessed values
 - Parcel ID
 - Ownership – current and historical
 - Land info
 - Building info
 - Inspection history
 - Building permits

Slide 21

Land Info

- **Acreage**
- **Segmentation**
- **Neighborhood**
- **Influences/factors – waterfront, views, topo, wetlands, traffic, etc.**

Slide 22

Building Info

Sketch or info from plans
Style
Story height
Year built
Grade
Condition
Features, e.g., # of rooms, bedrooms,
baths, fireplaces, finished basement,
outbuildings



Slide 23

Property Inspections

State certification requires that
all properties be inspected
at least once
every **9** years.

Slide 24

Full Measure and List

- During One Calendar Year
- Very Time Consuming
- May have to Hire Extra Staff
- May have to Hire a Contractor
- May be Very Expensive

*** The last 3 points are almost
guaranteed!!!

Slide 25

Cyclical Data Collection

- Most cost effective
- Cycles can run 3, 6 or 9 years
- Cost spread over longer period of time
- Minimizes need for additional staff



Slide 26

New Construction Data

Includes new buildings, remodels, demolitions

- Must collect (inspect) annually
- Status as of January 1 or June 30 (Ch. 653)
- % complete as of status date
- Coordinate info with Building Department

THIS IS NEW GROWTH!!



Slide 27

Percent Complete

Under Renovation

- Use national cost service or other recognized source to determine % complete
- Enter data as if complete, then assign depreciation percentage

EDM310 is
27%
COMPLETE



Slide 28

Example: First Fiscal Year	
Finished Bldg. Value	\$200,000
* % complete amount	* 60%
Partial Assessment	120,000
+ Land Value	+ 100,000
Total Assessment	\$ 220,000

Slide 29

Property Data Conversion

When a community changes valuation systems, DOR requires a *full field review of each property*.

* (Policy under review for FY2017)

Step 1: Drive-by to review style, grade, condition, sketch, photo, & other visible features.

Step 2: Physical inspection if numerous discrepancies are noted during the drive-by.

Slide 30

Data Quality Analysis (DQ)

Determines the quality of existing data and assesses the scope of data collection required as part of a mass appraisal program.

Slide 31

DQ Sample



- 2 to 5% of all properties
- Randomly selected
- Represent all attributes within the community, e.g., all styles, grades, ages, neighborhoods
- All property types:
 - Residential (including all subclasses)
 - Commercial
 - Industrial

Slide 32

DQ Sample Classification

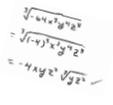
4 Categories of reviewed properties:

- ❖ **None:** no discrepancies
- ❖ **Drive-bys:** properties for which a field review would have identified the discrepancies found.
- ❖ **Exteriors:** properties for which an exterior inspection would have identified the discrepancies.
- ❖ **Interiors:** discrepancies for features such as bathroom count, finished basement, etc.

Slide 33

DQ Statistical Analysis

1. Calculate the \$ difference b/w existing and new values.
2. Determine the % difference by dividing the \$ difference by the existing value.



Slide 34

Example

Existing assessment	\$325,000
New Value	\$350,000
Value Difference	\$25,000

Value Difference/Original Assessments = % Change

Value Difference \$25,000
Original Value \$325,000 = 7.7% difference

Slide 35

Corrective Action

>10% If the value impact has a median greater than 10%, the community should conduct a full data collection program.	5-10% Begin a 3-to-6-year cyclical inspection program.	<5% Continue ongoing maintenance & a 6-to-9-year program.
---	--	--

Slide 36

Summary: Property Inventory Data

- Property Record Card
- Real Property Descriptive Data
- Property Inspections
- New Construction Data
- Property Data Conversions
- Data Quality Analysis

Slide 37

Part 5: Market Analysis

- Analysis Period
- Sample Size
- Time Adjustments
- Ratio Studies
- Certification Statistical Standards
- Sales Stratification

Slide 38

Analysis Period



For FY 2017:

- the assessment date is January 1, 2016.
- all valid sales in 2015 are used *IF* there are enough sales in the property class or sub-class.
- otherwise, 2 years of sales are used—2014 and 2015, *OR*, the last 6 months of 2014, all of 2015, and the 1st 6 months of 2016. If a second year is used, it must be the same timeframe for all classes or sub-classes. No 3rd year!

Slide 39

Sample Size

both
neither nor
either or
none no any

Within each class or sub-class, the total number of valid sales needed is 2% of the total parcels, or, 10 sales in the class or sub-class, whichever is greater.

NOTE: Simple math for smaller groups:
If 500 or less parcels, 10 sales needed.

Slide 40

Without 2%

Panels in class or subclass	100	200	300	400	500	600	700	800	900	1000	2000	5000	100000
% of Sales Needed	10%	5%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Number of Sales	10	10	10	10	10	12	14	16	18	20	40	100	2000

Slide 41

- Classes and Sub-classes include:**
- ✓ Single family (101)
 - ✓ Residential condos (102)
 - ✓ Two-family (104)
 - ✓ Three-family (105)
 - ✓ Apartments (111-112)
 - ✓ Residential land (130-132)
 - ✓ Commercial (300s)
 - ✓ Industrial (400s)
 - ✓ Mixed-use (013-031)

Slide 42

Time Adjustments 

May be needed if the real estate market is changing at a dramatic pace.

Determined by:
Inflation/Deflation Rate
 or by
Monthly Trend Factor

Slide 43

Inflation/Deflation Rate

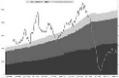
Example:

January sales ratio = 90%

July sales ratio = 85%

December sales ratio = 80%

Indication: a 10% rate of inflation.



Slide 44

Monthly Trend Factor

Formula: -10% in 12 months = -.83%/month:

October 2015 – (3 months before 1/1/16)

3 x .83% = -2.5% adjustment

May 2015 - (8 months before 1/1/16)

8 x .83% = -6.7 % adjustment



Slide 45

Ratio Studies

Ratio studies are done at the beginning of the process to find out where assessments fall within the market and to identify areas that may need adjustments.

Ratio studies are also done at the end of the process to ensure certification guidelines have been met.

Slide 46

Ratio Studies

Check the assessment level for each class or sub-class by finding:

the Median Assessment to Sales Ratio (ASR).

ASR = Assessed Value divided by Sale Price.

Slide 47

Calculating the Sales Ratio

Current assessed value	\$ 375,000	
		= 93.8%
Selling Price or adjusted selling price	\$ 400,000	

Slide 48

Assessment Level

Ratios less than 100% are **below market** value.

Ratios more than 100% are **above market** value.

The allowed range of *sale ratio medians* is 90-110%.

Slide 49

Median Assessment/Sales Ratio

List ratios of valid sales from either low to high or high to low.

If a sub-class had 25 sales – the median would be the 13th sale (12 higher and 12 lower).

If a sub-class had 26 sales – the median would be the average of the 13th and 14th sales.

If that ASR is 97%, for example, that is the median for the group.

Slide 50

Assessment Uniformity or COD

Determines if the assessments are consistent and uniform in the class or sub-class

State Certification Guidelines specify the acceptable Coefficient of Dispersion (COD) for each class.

The range of acceptable CODs is 10-20.

If the COD is higher – the assessments are out of range!

Slide 51

(+)

COD Calculation

- Determine the amount that all sales ratios vary from the median. This gives the deviation.
NOTE: It is always measured as a positive number.
- Calculate the average of the deviations.
- Calculate the Average Absolute Deviation / Median.
- Multiply by 100.

BE POSITIVE

BE POSITIVE

+

Slide 52

Example

COD Calculation (cont'd.)

1. The total absolute deviations for a sample of 25 sales is 2.56.
2. The average deviation is therefore $2.56/25 = 0.102$.
3. Assume the median ASR is 97% or 0.97.
4. Average deviation of $0.102/ASR$ of $0.97 = 0.105$.
5. $0.105 \times 100 =$ a COD of 10.5.

Slide 53

Certification Statistical Standards

ASRs for all classes and sub-classes must be within 5% of the predominant class (class with the most parcels), which is almost always single families.

Note: Classes need to be b/w 90 and 110%, while sub-classes can go below 90% .

If the median is 97%
 then all other classes and sub-classes need to be in the range of:
92% to 102%

Slide 54

Certification ASR Standards

For Example

With a single-family median of 97%
 If the median in the sub-class of condominiums is 90%, this would fall 7% below the single-family median.



More work would need to be done to raise the median at least 2%.

Slide 55

Sales Stratified into Subgroups

For residential properties only, and usually for just 101s and 102s

Neighborhood	NOTE: In the
Building Style	condo class –
Building Grade	by complex,
Building Age	sale price, and
Sale Price & Date	sale date.

Sub-group medians should be within 5% of the overall median.

Slide 56

Stratified into Subgroups

The median for condos is 94%.
 - Each complex needs to be between 90% and 99%. If the median is 92%, complexes need to be between 87% and 97%.

Subgroups *can* fall outside of the 90% to 110% guideline BUT they must meet the 5% rule.

Slide 57

Summary

Date of Assessment is the preceding January 1 of the FY.

For FY 2017 – Date of Assessment is January 1, 2016.

Values are based on sales in 2015 unless 2 years are needed for certain groups.

Slide 58

Summary

- In classes with 500 or more total parcels, 2% valid sales are required.
- In classes with less than 500 total parcels, 10 valid sales are required.
- A 3rd year is not used no matter how few sales.

Slide 59

Summary

- Sometimes you may need to adjust sales for appreciation or depreciation.
- To measure fairness, perform ratio studies.
- Statistics need to meet State Certification Guidelines.

Slide 60

Part 6: Valuation Methodologies

Introduce

- ✓ Valuation Systems
- ✓ Residential Property
- ✓ Vacant & Improved Land
- ✓ Commercial & Industrial Property

Slide 61

Valuation Systems

All communities have a valuation system in place called Computer Assisted Mass Appraisal system, or CAMA.



Slide 62

With any information system...

G.I.G.O. the more accurate the data, the more accurate the final value estimate.



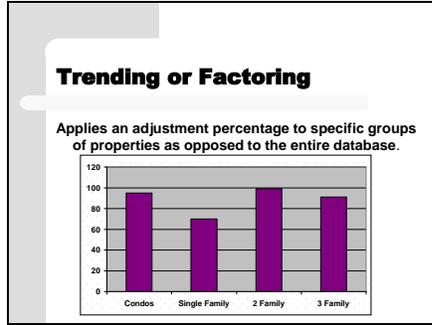
Slide 63

Adjustment of CAMA

Updating

- > Land Tables
- > Cost Tables
- > Depreciation Tables

Slide 64



Slide 65

Trending or Factoring

Within the single family sub-class, adjust by:

- ❖ Age
- ❖ Style
- ❖ Neighborhood



Ex: Within a particular neighborhood, the ASR is 80%; therefore, adjust upward.

Slide 66

Residential Properties

In Mass Appraisal, residential properties are usually valued by the Cost Approach: Building + Land Value.

The building component can be summarized as: RCNLD, or, Replacement Cost New Less Depreciation.

Slide 67

Example:

- 20 year old, 2,000SF Single Family House.
Updated construction cost is \$150,000 (RCN).
- Depreciation is \$15,000 (D).

RCNLD = \$135,000

ADD LAND VALUE FOR THE TOTAL PROPERTY VALUE

Slide 68

Vacant & Improved Land

- Analyze available vacant raw land sales.
- Land Residual Analysis:

Residential Sale Price
— Value of All Improvements

Indicated Land Value

Slide 69

Land Residual Analysis

- Sale Price \$300,000
- RCNLD \$200,000
- Indicated Land value = \$100,000

Slide 70

Commercial & Industrial Property

Generally bought and sold on investors' expectations.

Three acceptable methods for valuation:
 Cost, Sales, & Income (*must use 2 methods*).



Slide 71

Income Approach



- Assessors estimate the rental income from a property and capitalize that income into an estimate of current value.

Slide 72

Income Approach Steps

- Determine Potential Gross Income (PGI)
- Subtract Vacancy and Collection Loss
- Subtract Allowable Expenses (repairs, taxes, maintenance, etc.)
- Result = Net Operating Income (NOI)
- NOI / Capitalization Rate = Value

Slide 73

**Income Approach Formula
"IRV"**

V = I/R R = I/V I = VR

V = Value
I = Income
R = Capitalization rate

Slide 74

Income Approach Example

- A property is expected to provide Net Income of \$50,000 for the year.
- The rate of return on investments of similar safety is 10% (the Cap Rate).

\$50,000 / 0.10 = \$500,000 value

Slide 75

Income & Expense Info

- Requested from C&I property owners every January by assessors
- Regional publications and online sources
- Cap Rate info from:
 - market extraction (use IRV)
 - regional publications (Loopnet, CoStar)

Slide 76

Summary

- ❑ CAMA system
- ❑ Trending or factoring
- ❑ RCNLD
- ❑ Land valuation
- ❑ C&I properties (2 approaches to value)

Slide 77

Part 7: Reassessment Programs and Workplans

All communities are on a 3-year cycle:

- 2 Interim Years – values are adjusted to reflect changes in construction and market activities. DOR does a limited review but does not certify values.
- Certification Year – every 3rd year. AKA triennial certification, recertification, reval. DOR does a comprehensive review and certifies values.

Slide 78

Interim Year Example

Initial analysis indicates an overall ASR of:

- ✓ single family class at 75%
- ✓ condominium class at 70%
- ✓ vacant land class at 95%
- ✓ multi family class at 96%.

*Adjust single family & condo values.
All classes b/w 90-110% & within 5% of each other.*

Slide 82

Resources cont.

Regardless of the assistance...
 the local Board of Assessors is still responsible that all values are at full and fair cash value.



Slide 83

Resources cont.

The Bureau of Local Assessment recommends that funds necessary to complete the certification are in place 2 years before certification year to allow for timely completion.



Slide 84

Uniform Procurement Act

MGL Chapter 30B. The Inspector General's office provides guidance regarding procurement issues (617-727-9140).



Slide 85

Choosing a Vendor

- Review their familiarity with:
 - the area.
 - your computer system.
 - communities the same size and complexity as yours.

And, contact previous customers for references.



Slide 86

Workplan

A workplan is a tool assessors can use to:

- Define specific tasks.
- Manage their limited human and financial resources.
- Monitor the progress of the program.

Slide 87

**Workplan Form
1st Section**

Background	Residential	Mixed use/C/A	Personal Property
Since the last certification:			
New valuation system If yes, name of new system	Yes No	Yes No	Yes No
Installation completed	FY _____	FY _____	FY _____
Has your department done a formal data quality study?	Yes No date _____	Yes No date _____	
Is there a cyclical reinspection program in place?	Yes No	Yes No	
If yes,	number of years ending FY _____ % properties completed to date _____	number of years ending FY _____ % properties completed to date _____	
System on which your personal property accounts are listed and valued			
Sold local citizens: net book Yes <input type="checkbox"/> No <input type="checkbox"/> If no, appraiser/contractor			
Electric generation plant: Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, agreement or appraiser/contractor			

QUIZ

MASS APPRAISAL – SALES AND DATA

Answer the following questions.

1. You have just received two deeds and you need to determine the arms-length sale. Which sale below appears to be arms-length (a “good” sale)?
 - a. The deed lists John Smith to Mary Smith. Your assessed value is \$500,000. The sales price was \$100,000.
 - b. The deed lists Jane Doe to Roger White. Your assessed value is \$400,000. The sales price was \$425,000.

2. You drive by the property of the valid sale identified in Question 1 and notice an enclosed front porch worth \$5,000 is not listed on the property record card. Find the percentage of error by taking the amount of the error and dividing it by the assessed value.

3. You have done a data quality study to verify the accuracy of your data. Below is the percentage of errors resulting from your study. Determine the median (the midpoint).
 - 1%
 - 9%
 - 12%
 - 13%
 - 25%

4. The median means that half your data has percentage errors in value equal or greater to the median. Based on the median determined in Question 3, what does your community need to do for data quality?

5. Correct the assessed value by adding in the amount of the missing porch to the original assessed value. Find the assessment/sales ratio of the sale by taking the corrected assessment and dividing it by the sale price. The closer to 100% the better! How did the assessor do on this property?

APPLICATION EXERCISE 1 MASS APPRAISAL – STATISTICAL ANALYSIS

No. 1 - Answer the following questions.

1. Community A has 2,500 single-family homes. How many valid sales of single-family homes should occur to meet certification guidelines for this class?

2. Community B has 650 condos. It has 18 condo sales in the base year. Is that a sufficient sample?

3. Community C has 375 single-family homes. Over a two-year period, 8 valid sales of single-family homes occur. Does the community have to use a third year of sales?

4. Community D is using two years of sales for condos. The period covers 7/1/2014 to 6/30/2016. The community is also using two years of sales for two and three family homes covering the period 1/1/2014 to 12/31/2015. Is this acceptable?

5. Community E has 450 single-family homes. In 2015, it has 8 valid sales. It has 1 valid sale in December 2014, 2 valid sales in November 2014, and 3 valid sales in October 2014. How many months of 2014 sales does the community have to use to have an adequate sample?

No. 2 - Calculate the median ASR and COD for the following sales.

<u>Sales</u> <u>Date</u>	<u>Map</u>	<u>Lot</u>	<u>Class</u>	<u>Sales</u> <u>Price</u>	<u>Current</u> <u>Assessment</u>	<u>ASR</u> <u>Ratio</u>	<u>Low/High</u> <u>Array</u>	<u>Absolute</u> <u>Deviation</u>
010815	8	30B	101	391700	332700	_____	_____	_____
050115	11	129	101	185900	110000	_____	_____	_____
061515	14	13C	101	270500	194200	_____	_____	_____
080215	5A	32	101	140000	111000	_____	_____	_____
080215	5	31	101	185000	129200	_____	_____	_____
082715	23	8	101	300000	202900	_____	_____	_____
083115	13	49B	101	168000	120300	_____	_____	_____
083115	14	52	101	430000	230100	_____	_____	_____
100115	15	4G	101	210000	129900	_____	_____	_____
111615	7B	21	101	310000	266700	_____	_____	_____
121115	5	28B	101	265000	197000	_____	_____	_____

Exercise Steps.

1. Calculate the Assessment Sales Ratio for each sale.
2. Array each sale by ASR from Low to High.
3. Determine the median.
4. Calculate the Absolute Deviation for each sale.
5. Calculate the Average Absolute Deviation.
6. Calculate the Coefficient of Dispersion.

No. 3 - Calculate the median ASR and COD for the following sales.

<u>Sales</u> <u>Date</u>	<u>Map</u>	<u>Lot</u>	<u>Class</u>	<u>Sales</u> <u>Price</u>	<u>Proposed</u> <u>Assessment</u>	<u>ASR</u> <u>Ratio</u>	<u>Low/High</u> <u>Array</u>	<u>Absolute</u> <u>Deviation</u>
010815	8	30B	101	391700	385100	_____	_____	_____
050115	11	129	101	185900	175300	_____	_____	_____
061515	14	13C	101	270500	271100	_____	_____	_____
080215	5A	32	101	140000	136600	_____	_____	_____
080215	5	31	101	185000	204900	_____	_____	_____
082715	23	8	101	300000	287700	_____	_____	_____
083115	13	49B	101	168000	152000	_____	_____	_____
083115	14	52	101	430000	425700	_____	_____	_____
100115	15	4G	101	210000	176200	_____	_____	_____
111615	7B	21	101	310000	317000	_____	_____	_____
121115	5	28B	101	265000	274300	_____	_____	_____

Exercise Steps.

1. Calculate the Assessment Sales Ratio for each sale.
2. Array each sale by ASR from Low to High.
3. Determine the median.
4. Calculate the Absolute Deviation for each sale.
5. Calculate the Average Absolute Deviation.
6. Calculate the Coefficient of Dispersion.

APPLICATION EXERCISE 2

MASS APPRAISAL – VALUATION ADJUSTMENTS

For each of the following two sets of sales, determine if a pattern of inequity exists by calculating the ASR for each sale. If a pattern exists, identify what factor assessors must adjust to remedy it.

Sales Set 1

Sale 1

Single Family
Assessed for \$300,000
Sold 5/20/15-\$350,000
Neighborhood 4
Cape Style
Built 1960
ASR

Sale 2

Single Family
Assessed for \$380,000
Sold 5/1/15-\$400,000
Neighborhood 6
Colonial Style
Built 2000
ASR

Sale 3

Single Family
Assessed for \$312,000
Sold 5/15/15-\$375,000
Neighborhood 6
Cape Style
Built 1986
ASR

Sale 4

Single Family
Assessed for \$270,000
Sold 4/29/15-\$340,000
Neighborhood 5
Cape Style
Built 1971
ASR

Sale 5

Single Family
Assessed for \$300,000
Sold 5/3/15-\$295,000
Neighborhood 4
Ranch Style
Built 1965
ASR

Sale 6

Single Family
Assessed for \$315,000
Sold 5/25/15-\$370,000
Neighborhood 3
Cape Style
Built 1955
ASR

Sales Set 2

Sale 1

Single Family
Assessed for \$390,000
Sold 5/20/15-\$400,000
Neighborhood 5
Cape Style
Built 1985
ASR

Sale 2

Single Family
Assessed for \$500,000
Sold 5/3/15-\$450,000
Neighborhood 6
Colonial Style
Built 2000
ASR

Sale 3

Single Family
Assessed for \$475,000
Sold 5/15/15-\$425,000
Neighborhood 6
Split Level Style
Built 1975
ASR

Sale 4

Single Family
Assessed for \$545,000
Sold 4/29/15-\$485,000
Neighborhood 6
Contemporary Style
Built 1990
ASR

Sale 5

Single Family
Assessed for \$490,000
Sold 5/1/15-\$440,000
Neighborhood 6
Ranch Style
Built 1970
ASR

Sale 6

Single Family
Assessed for \$435,000
Sold 5/25/15-\$445,000
Neighborhood 5
Bungalow Style
Built 1930
ASR

QUIZ ANSWERS MASS APPRAISAL – SALES AND DATA

1. You have just received two deeds and you need to determine the arms-length sale. Which sale below appears to be arms-length (a “good” sale)?
 - a. The deed lists John Smith to Mary Smith. Your assessed value is \$500,000. The sales price was \$100,000. **NON-ARMS-LENGTH.**
 - b. The deed lists Jane Doe to Roger White. Your assessed value is \$400,000. The sales price was \$425,000. **ARMS-LENGTH.**

2. You drive by the property of the valid sale identified in Question 1 and notice an enclosed front porch worth \$5,000 is not listed on the property record card. Find the percentage of error by taking the amount of the error and dividing it by the assessed value.

.0125 or 1.25%

3. You have done a data quality study to verify the accuracy of your data. Below is the percentage of errors resulting from your study. Determine the median (the midpoint).

1%
 9%
12% - median
 13%
 25%

4. The median means that half your data has percentage errors in value equal or greater to the median. Based on the median determined in Question 3, what does your community need to do for data quality?

A median of over 10% indicates the need for a full data collection program.

5. Correct the assessed value by adding in the amount of the missing porch to the original assessed value. Find the assessment/sales ratio of the sale by taking the corrected assessment and dividing it by the sale price. The closer to 100% the better! How did the assessor do on this property?

A/S ratio is .953 or 95.3% (405,000/425,000). Excellent!

APPLICATION EXERCISE 1 ANSWERS MASS APPRAISAL – STATISTICAL ANALYSIS

No. 1.

1. Community A has 2,500 single-family homes. How many valid sales of single-family homes should occur to meet certification guidelines for this class? **50. ($0.02 \times 2,500$)**

2. Community B has 650 condos. It has 18 condo sales in the base year. Is that a sufficient sample? **YES. ($18/650 = 2.8\%$)**

3. Community C has 375 single-family homes. Over a two-year period, 8 valid sales of single-family homes occur. Does the community have to use a third year of sales? **NO.**

4. Community D is using two years of sales for condos. The period covers 7/1/2014 to 6/30/2016. The community is also using two years of sales for two and three family homes covering the period 1/1/2014 to 12/31/2015. Is this acceptable? **NO.**

5. Community E has 450 single-family homes. In 2015, it has 8 valid sales. It has 1 valid sale in December 2014, 2 valid sales in November 2014, and 3 valid sales in October 2014. How many months of 2014 sales does the community have to use to have an adequate sample? **12 months. A full second year is required regardless of meeting the 2% OR 10 sales rule.**

No. 2.

<u>Sales Date</u>	<u>Map</u>	<u>Lot</u>	<u>Class</u>	<u>Sales Price</u>	<u>Current Assessment</u>	(1) <u>ASR Ratio</u>	(2) <u>Low/High Array</u>	(4) <u>Absolute Deviation</u>
083115	14	52	101	430000	230100	<u>.54</u>	<u>1</u>	<u>.18</u>
050115	11	129	101	185900	110000	<u>.59</u>	<u>2</u>	<u>.12</u>
100115	15	4G	101	210000	129900	<u>.62</u>	<u>3</u>	<u>.10</u>
082715	23	8	101	300000	202900	<u>.68</u>	<u>4</u>	<u>.04</u>
080215	5	31	101	185000	129200	<u>.70</u>	<u>5</u>	<u>.02</u>
061515	14	13C	101	270500	194200	<u>.72</u>	<u>6</u>	<u>0</u>
083115	13	49B	101	168000	120300	<u>.72</u>	<u>7</u>	<u>0</u>
121115	5	28B	101	265000	197000	<u>.74</u>	<u>8</u>	<u>.03</u>
080215	5A	32	101	140000	111000	<u>.79</u>	<u>9</u>	<u>.08</u>
010815	8	30B	101	391700	332700	<u>.85</u>	<u>10</u>	<u>.13</u>
111615	7B	21	101	310000	266700	<u>.86</u>	<u>11</u>	<u>.14</u>
							Total	.84
							Average	.84/11= .08

- 3) Median equals .72
 5) Average of Absolute Deviations are .08

- 6) COD is 10.7%
 $.08 / .72 = .107$
 $.107 \times 100 = 10.7\%$

No. 3.

<u>Sales Date</u>	<u>Map</u>	<u>Lot</u>	<u>Class</u>	<u>Sales Price</u>	<u>Proposed Assessment</u>	(1) <u>ASR Ratio</u>	(2) <u>Low/High Array</u>	(4) <u>Absolute Deviation</u>
010815	8	30B	101	391700	385100	<u>.98</u>	<u>5</u>	<u>.00</u>
050115	11	129	101	185900	175300	<u>.94</u>	<u>3</u>	<u>.04</u>
061515	14	13C	101	270500	271100	<u>1.00</u>	<u>8</u>	<u>.02</u>
080215	5A	32	101	140000	136600	<u>.98</u>	<u>6</u>	<u>.00</u>
080215	5	31	101	185000	204900	<u>1.11</u>	<u>11</u>	<u>.13</u>
082715	23	8	101	300000	287700	<u>.96</u>	<u>4</u>	<u>.02</u>
083115	13	49B	101	168000	152000	<u>.90</u>	<u>2</u>	<u>.08</u>
083115	14	52	101	430000	425700	<u>.99</u>	<u>7</u>	<u>.01</u>
100115	15	4G	101	210000	176200	<u>.84</u>	<u>1</u>	<u>.14</u>
111615	7B	21	101	310000	317000	<u>1.02</u>	<u>9</u>	<u>.04</u>
121115	5	28B	101	265000	274300	<u>1.04</u>	<u>10</u>	<u>.06</u>
							Total	.54
							Average	.54/11=.05

- 3) Median equals .98
 5) Average of Absolute Deviations are .049

- 6) COD is 5.0%
 $.05 / .98 = .05$
 $.05 \times 100 = 5\%$

APPLICATION EXERCISE 2 ANSWERS MASS APPRAISAL – VALUATION ADJUSTMENTS

Sales Set 1

Cape Cod style homes are underassessed and must be adjusted

Sale 1

Single Family
Assessed for \$300,000
Sold 5/20/15-\$350,000
Neighborhood 4
Cape Style
Built 1960
ASR .86

Sale 2

Single Family
Assessed for \$380,000
Sold 5/1/15-\$400,000
Neighborhood 6
Colonial Style
Built 2000
ASR .95

Sale 3

Single Family
Assessed for \$312,000
Sold 5/15/15-\$375,000
Neighborhood 6
Cape Style
Built 1986
ASR .83

Sale 4

Single Family
Assessed for \$270,000
Sold 4/29/15-\$340,000
Neighborhood 5
Cape Style
Built 1971
ASR .79

Sale 5

Single Family
Assessed for \$300,000
Sold 5/3/15-\$295,000
Neighborhood 4
Ranch Style
Built 1965
ASR 1.02

Sale 6

Single Family
Assessed for \$315,000
Sold 5/25/15-\$370,000
Neighborhood 3
Cape Style
Built 1955
ASR .85

Sales Set 2**Neighborhood 6 is being overassessed and must be adjusted****Sale 1**

Single Family
 Assessed for \$390,000
 Sold 5/20/15-\$400,000
 Neighborhood 5
 Cape Style
 Built 1985
ASR .98

Sale 2

Single Family
 Assessed for \$500,000
 Sold 5/3/15-\$450,000
 Neighborhood 6
 Colonial Style
 Built 2000
ASR 1.11

Sale 3

Single Family
 Assessed for \$475,000
 Sold 5/15/15-\$425,000
 Neighborhood 6
 Split Level Style
 Built 1975
ASR 1.12

Sale 4

Single Family
 Assessed for \$545,000
 Sold 4/29/15-\$485,000
 Neighborhood 6
 Contemporary Style
 Built 1990
ASR 1.12

Sale 5

Single Family
 Assessed for \$490,000
 Sold 5/1/15-\$440,000
 Neighborhood 6
 Ranch Style
 Built 1970
ASR 1.11

Sale 6

Single Family
 Assessed for \$435,000
 Sold 5/25/15-\$445,000
 Neighborhood 5
 Bungalow Style
 Built 1930
ASR .98