

COMMERCIAL REVALUATION

Appraisal Documentation & Statistics

CITY OF
BURLINGTON, VT
2021



CONTENTS

Introduction.....	1
USPAP & Mass Appraisal.....	5
Property Identification.....	8
Neighborhood Delineation.....	9
Highest and Best Use.....	15
Sale Data.....	17
Preliminary Testing Results.....	20
Approaches to Value.....	24
Reconciliation & Review.....	31
Final Testing Results.....	33
Conclusion.....	35
Certification.....	36
Appendix.....	37

INTRODUCTION

Date of Report

March 9, 2022

Client and Intended Users

This report is prepared for John Vickery, Burlington City Assessor. Other intended users include any other as designated by Mr. Vickery. This is a public document. This report is intended to complement, but not replace, the supporting materials that have been provided to the assessor in the form of interim reports, quality audit reports and appendices, and procedural and training manuals throughout the project.

Intended Use

Use of this appraisal and its conclusions is limited to the administration of property taxes according to the governing laws of this jurisdiction.

Effective Date of the Appraisal

Pivotal to all appraisals is the determination of the “*date of value*”. The date of value is that point in time to which all valuation is focused. All valuation data before this date is collected, analyzed, and put into various formulae, tables, and models. For Burlington’s reassessment project, the effective date of value is April 1, 2021. Changes in economic trends after the date of value have no bearing on the value estimate. Although data was collected and analyzed prior to April 1, 2021, all final value were finalized after this date. As is the nature of most ad valorem mass appraisals, Burlington’s effective date of appraisal is, therefore, retrospective.

Scope of Work

Vermont statute V.S.A § 4041a requires a municipality to reappraise its Grand List properties if the Director of the Division of Property Valuation and Review determines that the municipality’s education grand list is at a common level of appraisal (CLA) below 85% or above 115% or has a coefficient of dispersion (COD) greater than 20%. The CLA and COD compare local appraised values to recent market sales. On July 9, 2018, the Vermont Tax Department provided notice to the City of Burlington of an order to reappraise all properties in Burlington as values were no longer meeting equitable

valuation standards set by the Vermont department of Tax and the International Association of Assessing Officers (IAAO). Burlington's previous revaluation was completed in 2005.

A revaluation is a complete and systematic valuation of all real property within a jurisdiction that is performed in order to ensure fair and equitable taxation. For this project, Safeground Organic Analytics' scope of work was to estimate the market value of all commercial, industrial, apartment, and exempt properties as of the date of value and conduct an informal hearing process. All the items were to be included in a final appraisal document as part of the revaluation process. It should be noted that Tyler Technologies was responsible for on-site data collection of physical property characteristics as part of this revaluation.

The cost, income, and sales comparison approaches to value were all considered in arriving at value conclusions for commercial, industrial, apartment, and exempt properties. In most cases, the income approach was the primary source of value, supported by the cost and sales comparison approaches.

The following steps were used to conduct the reassessment:

1. Before and after IAAO performance-based testing
2. Market conditions/time adjustment study
3. Land use code sales study by units of comparison to include SP/SF, SP/UNIT
4. Analyze the national commercial market including rents, vacancies and cap rates using industry resources such as Integra, HVS, CBRE, CoStar, Marcus Millichap, NAR, Colliers Commercial, Statista, LW Hospitality Advisors, Real Capital Analytics, Cushman and Wakefield, Lodging Analytics, The Boulder Group, and PWC
5. Analyze the regional commercial market including rents, vacancies and cap rates using the December 2019 & 2020 Allen, Brooks, & Minor Reports
6. Analyze the local commercial market including rents, vacancies, and cap rates using actual income and expense data supplied by property owners in 2018 and 2019
7. Land use code income and expense analysis to include GPI/SF, GPI/UNIT, vacancy rates, expense rates. NOI/SF, NOI/unit
8. Selection of land use code stratification models
9. Commercial income and cost model development
10. Progress meetings with the assessor and staff
11. Review of final values with assessor
12. Training for assessor and staff when needed
13. Conduct informal hearings with property owners
14. Perform reconciliation of hearing parcels based on information provided by

- property owners and representatives
15. Perform statistical testing based on State of Vermont and IAAO performance standards
 16. Documentation writing and editing

The City Assessor reviewed and provided input for market analysis, model construction, and final value conclusions.

Type and Definition of Value

Vermont law requires assessors appraise property according to its “fair market value” (32 V.S.A. § 4041). The estimated fair market value of a property is the price that the property will bring in the market when offered for sale and purchased by another, taking into consideration all the elements of the availability of the property, its use both potential and prospective, any functional deficiencies, and all other elements such as age and condition that combine to give property a market value. Those elements shall include the effect of any state or local law or regulation affecting the use of land, including 10 V.S.A. chapter 151 or any land capability plan established in furtherance or implementation thereof, rules adopted by the State Board of Health, and any local or regional zoning ordinances or development plans. In determining estimated fair market value, the sale price of the property in question is one element to consider but is not solely determinative.

The purpose of this reassessment project was to appraise the *fee simple market value* of all pertinent properties.

Fee simple is defined as:

“Absolute ownership unencumbered by any other interest or estate, subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power and escheat.”

Dictionary of Real Estate Appraisal 6th edition, The Appraisal Institute, 2015

Market value is defined as:

“The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently, knowledgeably, and for self-interest, and assuming neither is under undue duress.”

Dictionary of Real Estate Appraisal 6th edition, The Appraisal Institute, 2015

For purposes of this report and this reappraisal project, the terms market value and fair market value are considered to be synonymous. These definitions provide guidelines and boundaries to help appraisers ascertain whether data and resulting valuations meet acceptable standards.

Property Rights Appraised

As discussed above, the intent of the Burlington project was to value all the property rights in realty to produce what is commonly known as a fee simple appraisal. However, there are occasions where the fee simple rights have been divided. One such example in Burlington is an apartment building for which the land is leased to the building owner. In most cases when both rights in realty fully reflect market rates, the summation of each of the rights equals fee simple value.

Other examples of split property rights are leased fee interests in many office spaces in the CBD. These lease fee interests exist when the tenant has a below or above market rent. Appraisal of any property subject to a lease condition produces a leased fee appraisal. When a lease rent is equal to market rent, then leased fee interest equals fee simple interest. Great care was taken to identify whether a property had below or above market leases causing a leased fee value. All properties were appraised with market rent and expenses thus producing a fee simple rather than a leased fee appraisal or partial interest appraisal.

USPAP & MASS APPRAISAL

Real Property Assessment and reassessment is governed by Standard 5 [Development] and 6 [Reporting] of the Uniform Standards of Professional Practice (USPAP 2020-2021). This document provides the framework which governs the appraisal methodology, assumptions, and limiting conditions of the City of Burlington reassessment.

Standard 5 governs the development of a mass appraisal. To fulfill the standard “an appraiser must be aware of, understand, and correctly employ these recognized methods and techniques necessary to produce and communicate credible mass appraisals.”

Pivotal to Standard 5 is Rule 5-5 and Rule 5-6 which require that appraisers:

- have data of a sufficient quantity and quality to produce credible values
- collect, verify, and analyze data necessary to arrive at market value
- weigh and consider historical information and market trends
- consider the use of the Cost, Income, and Sales Comparison approaches
- employ recognized assessment techniques for model tables and calibration

Standard 6 governs the reporting of a mass appraisal. To fulfill the standard “an appraiser must communicate each analysis, opinion, and conclusion in a manner that is not misleading.”

The standards of USPAP were adhered to in the valuation of all commercial properties during the City of Burlington’s reassessment project.

Assumptions, Limiting Conditions, & Jurisdictional Exceptions

The following assumptions and limiting conditions apply to the 2021 Burlington, VT Revaluation:

- This report is intended to complement, but not replace, the supporting materials that have been provided to the Assessor in the form of interim reports, quality audit reports and appendices, and procedural and training manuals throughout the project.
- The properties were assumed to be free of any and all liens and encumbrances. Each property has also been appraised as though under responsible ownership and competent management.

- Surveys of the assessed properties have not been provided. We have relied upon tax maps and other materials while estimating physical dimensions and the acreage associated with assessed properties.
- We assume the utilization of the land and any improvements is located within the boundaries of the property described. It is assumed that there are no adverse easements or encroachments for any parcel that have not already been addressed in the mass appraisal.
- All data entry, including, but not limited to, property transfers, table maintenance, and property characteristics information entered by the City of Burlington is assumed to be accurate and complete.
- Property data collected by Tyler Technologies and maintained by the City of Burlington is assumed to be current, accurate, and complete.
- We assume that there are no hidden or unapparent conditions associated with the properties, subsoil, or structures which would render the properties (land and/or improvements) more or less valuable.
- It is assumed that the properties and/or the landowners are in full compliance with all applicable federal, state, and local environmental regulations and laws.
- It is assumed that properties are in compliance with all applicable zoning and use regulations.
- It is assumed that all required licenses, certificates of occupancy, consents, or other instruments of legislative or administrative authority from any private, local, state, or national government entity have been obtained for any use on which the value opinions contained within this report are based.
- We have not been provided a hazardous conditions report, nor are we qualified to detect hazardous materials. Therefore, evidence of hazardous materials which may or may not be present on a property, was not observed. As a result, the final opinion of value is predicated upon the assumption that there is no such material on any of the properties that might result in a loss or change in value.
- Information, estimates, and opinions furnished to the appraisers and incorporated into the analysis and final report were obtained from sources assumed to be reliable, and a reasonable effort has been made to verify such information. However, no warranty is given for the reliability of this information.

- The Americans with Disabilities Act (ADA) became effective January 26, 1992. We have not made compliance surveys nor conducted a specific analysis of any property to determine if it conforms to the various detailed requirements identified in the ADA. It is possible that such a survey might identify nonconformity with one or more ADA requirements, which could lead to a negative impact on the value of the property(s). Because such a survey has not been requested and is beyond the scope of this appraisal assignment, we did not take into consideration adherence or non-adherence to ADA in the valuation of the properties addressed in this report.
- Possession of this report does not carry with it the right of reproduction, and disclosure of this report is governed by the rules and regulations of the City of Burlington, Vermont and is subject to jurisdictional exception and the laws of the State of Vermont.
- That all the terms and conditions of the contract between Safeground, Inc. and the City of Burlington were fulfilled.

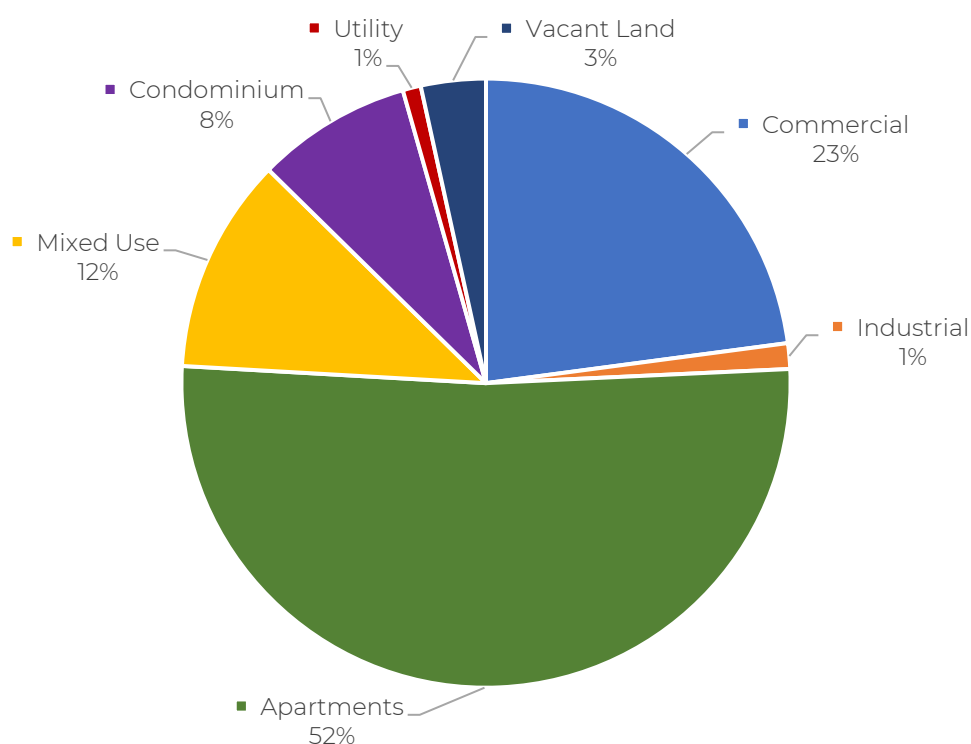
Extraordinary Assumptions and/or Hypothetical Conditions

There were no extraordinary assumptions and/or hypothetical conditions used in the execution of this project.

PROPERTY IDENTIFICATION

There are 1,249 taxable commercial, industrial, and apartment (CIA) properties in Burlington. Apartments dominate the makeup of CIA properties, followed by commercial, mixed-use, condominiums, vacant land, industrial, and utility. The table and chart below show the parcel distribution among all CIA property types.

PROPERTY TYPE	PARCEL COUNT
Commercial	286
Industrial	17
Apartments	645
Mixed Use	143
Condominium	103
Utility	12
Vacant Land	43
TOTAL	1,249



NEIGHBORHOOD DELINEATION

A neighborhood, from an appraisal perspective, is the identification of a location or area which influences property value due to economic, legal, and/or physical boundaries. From a more detailed perspective, a neighborhood can be further defined as a geographic area exhibiting a high degree of homogeneity in economic amenities, land use, economic trends, and property characteristics such as quality, age, and condition. Neighborhoods are not characterized as good, average, poor, etc. They stand on their own merits based on uniform composition. Simply put, the neighborhood can be defined as the area where similar properties compete economically.

Commercial neighborhoods are identified by a location or area which influences property value due to economic, legal, and physical boundaries. In most circumstances, properties will compete with each other within the same immediate neighborhood. Since rental rates are directly affected by location and apartment prices are driven by rental rate, apartments typically compete in the immediate neighborhood. Other properties, however, such as second floor office space, may cross neighborhood lines and compete throughout sections of Burlington. Other properties, like a 100,000 square foot Industrial property, will not only cross immediate neighborhood lines, but they will most likely compete throughout the county. Therefore, the neighborhood for 100,000 square foot industrial properties in Burlington can be considered to encompass all of Vermont. As property types and characteristics expand, so do neighborhood lines. The appraisal of Burlington's commercial properties considered the effect and/or the need of widening the understanding of what is a subject's neighborhood. Therefore, rental rate data and sale data were taken by crossing Burlington's neighborhood lines and, where necessary, city lines.

Delineation of valuation neighborhoods for commercial properties is a key driver in the valuation of land, the application of the income approach, and the application of the market approach.

Significant characteristics in defining neighborhoods include such items as:

- Physical boundaries
 - Natural – as rivers, streams, woods, etc.
- Distance from amenities such as the highway
- Building characteristics: type, quality, age, and condition
- Occupancy Type (i.e. industrial, apartment, retail, and office)
- Current zoning: Preexisting nonconformity and development rights
- Typical land size and land valuation
- Sale prices

In Burlington, neighborhood delineation involved the following procedures:

1. John Valente of Safeground Organic Analytics conducted a physical tour of the city.
2. A physical inspection was conducted to categorize the condition, desirability, and utility of all properties.
3. Based on physical observation, neighborhood boundaries were created or adjusted. The specific boundaries were determined by significant physical and/or economic differences from adjacent areas.
4. After review, boundaries and neighborhood numbers were revised in consultation with the assessor's office.
5. The boundaries were then refined down to the parcel level utilizing individual field tax maps.

After defining neighborhoods, the appraiser can then analyze the comparative differences between neighborhoods for such variables as age of dwelling, quality of construction, lot size, traffic, sale price, etc.

Burlington's twelve primary valuation neighborhoods are described in detail below, while a more comprehensive presentation of neighborhood data is available in the appendix of this document.

NEIGHBORHOOD 500 – Church Street Market

Located in the Center of Burlington, neighborhood 500 is comprised of only those properties on Church Street. It functions as the heart of the CBD in Burlington. It is bordered to the north by Pearl Street, to the south by Main Street, to the east by Church Street's eastern rear lot lines, and to the west by Church Street's western rear lot lines.

Neighborhood 500 is a valuable and desirable neighborhood in Burlington. The street is filled with restored late 19th or earlier 20th century elegant buildings. Only pedestrians are allowed on the brick street. The neighborhood consists of 48 improved Commercial parcels. The predominate use is retail space. Most of the retail space has second and third floor office and/or apartment space. The neighborhood is well trafficked throughout the year by University Students and tourists. The values range from \$382,200 to a high of \$14,651,400, with a median value of \$1,208,900. All properties in this neighborhood are in the D-Downtown zone.

NEIGHBORHOOD 510 – CBD Central Business District

Neighborhood 510 surrounds neighborhood 500 as an expanding circle stretching from the north by Pearl Street's northern rear lot lines, to the south by Main Street's rear lot lines, to the west by Battery Street's rear lot lines and to the east by South Street's western rear lot lines.

Neighborhood 510 is also a valuable and desirable neighborhood in Burlington. It functions as a ring around Church Street and makes up the balance of the Central Business District (CBD). The streets have a series of mixed-use buildings, office towers, parking garages, and banking facilities. The neighborhood consists of 173 improved Commercial parcels. The uses are evenly split between high-rise office condominium, office space over retail, and low-rise general office space. The values range from \$89,600 to a high of \$20,971,300, with a median value of \$905,500. 65% of the properties are in the D zone, 21% in the DT (Downtown Transition) zone and 9% in the RH (Residential-High Density) zone, with the balance in various other zones.

NEIGHBORHOOD 520 – North Street

Neighborhood 520 splits neighborhood 510 in half. It covers all the commercial properties on North Street with some minor frontages on spur streets.

North Street is a heavily traveled road, which has a mixture of multifamily units over small single user retail space; multifamily buildings sprinkled with smaller (<2,000 square foot) offices, and retail space. The neighborhood consists of 24 improved commercial parcels. Multifamily leases are typically for one year and are written on a gross-plus-utilities basis. Unlike the multifamily space, retail and office space are frequently month-to-month on a gross-plus-utilities basis. The values range from \$183,300 to a high of \$1,467,100 with a median value of \$560,750. 96% of the properties are in the NMU (Neighborhood Mixed Use) zone, with the remaining 4% in the RM (Residential-Medium Density) zone.

NEIGHBORHOOD 530 - Old North End

Neighborhood 530 covers the area north of neighborhood 510 and south of Interval. The neighborhood is bifurcated by North Street in neighborhood 520. It is bounded to the east by the rear lot lines of North Willard Street, to the west by North Ave and Depot Street, to the north by the New England Central Rail Line, and to the south by the rear lot lines of Pearl Street.

Neighborhood 530 is primarily comprised of older, early 20th century multifamily and apartment buildings situated on small parcels with limited parking. The neighborhood consists of 234 improved commercial parcels. Most leases are for a term of one year and are written on a gross-plus-utilities basis. The values range from \$48,800 to a high of \$9,497,700. 55% of the properties are in the RM zone, 24% in the NMU zone, and 14% in the RH (Residential-High Density) zone with the balance in various mixed zones.

NEIGHBORHOOD 540 - Riverside Ave

Neighborhood 540 covers all the properties on Riverside Avenue. Riverside Ave connects to Colchester Ave on the east side and North Prospect, Hyde, North Winooski on the west.

90% of the properties on the north side of Riverside Ave front the Winooski River. The downward slope to the river is extreme and reduces the useable acreage of the properties. Neighborhood 540 does not have a consistent prevalent use. The neighborhood consists of 25 improved commercial parcels. Most leases are for a term of one year and are written on a gross-plus-utilities basis. Values range from \$258,600 to a high of \$30,953,400, with a median value of \$763,000. 56% of the properties are in the NACR (Neighborhood Activity Center-Riverside) zone, 24% in the ELM (Enterprise-Light Manufacturing) zone, 12% in the NMU zone, and 8% in the RL zone.

NEIGHBORHOOD 550 – University Hill

Neighborhood 550 covers most of the east center of the city. It is bounded to the east by South Burlington, to the north by neighborhood 540 (Riverside Ave), to the west by the rear lot lines of South Union Street, to the south by South Burlington, and to the north by Riverside Ave.

The University of Vermont occupies almost 75% of this neighborhood and is the dominant economic force of this neighborhood. The remaining 25% provides housing and commercial space to service the university. Although the school has dormitories, many students opt to live off campus. The student demand has created apartment rents that exceed the city standard apartment rents by approximately 25%. Neighborhood 550 is primarily comprised of older, early 20th-century multifamily and apartment buildings on small lots that having limited parking. The neighborhood consists of 20 improved commercial parcels. Most leases are for a term of one year and are written on a gross-plus-utilities basis. Values range from \$360,700 to a high of \$11,836,600, with a median value of \$664,500. 45% of the properties are in the RH zone, 25% in the I (Institutional) zone, with the balance in various mixed zones.

NEIGHBORHOOD 560 – Shelburne Street

Neighborhood 560 is Shelburne Street with some parcels having frontage on Shelburne and adjoining frontage spur streets. It is bounded to the east by rear lot lines of neighborhood 570 and South Burlington, to the north by Locust Street and Ledge Road, to the west by the rear lot lines of neighborhood 590, and to the south by South Burlington.

Shelburne Ave has a variety of commercial uses from industrial properties, gas stations, car dealership, shopping centers, etc. The neighborhood consists of only 29 improved commercial properties. There are no dominant commercial uses on Shelburne Ave. The

road is heavily traveled because of a direct access ramp to I-89 via I-189. Many people use the exit to Shelburne Ave as a convenient access to downtown Burlington. Most leases are for a term of one year and are written on a full net or NNN basis. Values range from \$39,900 to a high of \$24,992,900, with a median value of \$695,700. 69% of the properties are in the NAC (Neighborhood Activity Center) zone, 24% in the RL zone, and 7% in the RM zone.

NEIGHBORHOOD 570 - South Hill Section

Neighborhood 570 is located in the southeast side of the city. It is bounded to the west by neighborhood 560 and the rear lot lines of South Union, to the north by the rear lot lines of Main Street, to the east by the South Prospect Street, and to the south by South Burlington.

There are 18 improved properties in this neighborhood. 59% of the neighborhood is comprised of either multifamily or apartment properties. Most leases are for a term of one year and are written on a gross-plus-utilities basis. Values range from \$32,000 to a high of \$3,251,500, with a median value of \$288,400. 89% of the properties are in the RL zone, 6% in the RM zone, and 6% in the RH zone.

NEIGHBORHOOD 580 – Industrial Park

Neighborhood 580 is located in the far southwest tip of the city. Primarily, it is bounded to the west by Lake Champlain, to the north by the rear lot lines of Harrison Ave, to the east by the Vermont Railway line and to the south by Red Rocks Park in South Burlington. In addition, the Blodgett site on the northern side of Lakeside Ave is also part of this neighborhood.

Neighborhood 580 is the predominant industrial area of Burlington. The neighborhood is comprised of these three dominant uses: Warehouse, Light Manufacturing, and office. The roads within this neighborhood are not heavily traveled. Most leases are for a term of one year and are written on a full net or NNN basis. Values range from \$417,300 to a high of \$22,167,300, with a median value of \$5,287,050. There are 20 improved commercial properties in this neighborhood. 90% of the properties are in the ELM zone, with the balance in various mixed zones.

NEIGHBORHOOD 590 - Pine Street

Neighborhood 590 is located in the south and south-central section of the city. It is bounded to the west by Lake Champlain and neighborhood 580, to the north by the rear lot lines of Main Street, to the east by the rear lot lines of Shelburne Street and South Union Street, and to the south by Queen City Parks Road.

Like neighborhood 570, neighborhood 590 is primarily a multifamily area. 48% of the neighborhood is comprised of either multifamily or apartment properties. Most leases

are for a term of one year and are written on a gross-plus-utilities basis. Values range from \$45,600 to a high of \$36,733,700, with a median value of \$836,450. These numbers are affected by fourteen large properties with values in excess \$5,000,000. There are 136 improved commercial properties in this neighborhood. 29% of the properties are in the ELM zone, 24% of the properties in the RL zone, 20% in the RM zone, and 11% in the RH zone, with the balance in various mixed zones.

NEIGHBORHOOD 600 – Waterfront

Neighborhood 600 is located on the eastern shore of Lake Champlain. It is bounded to the north by North Beach Park and neighborhood 610, to the east by Battery Street and North Street, and to the west by Lake Champlain.

Like neighborhood 500, neighborhood 600 attracts many tourists and college students. There are a variety of uses including restaurants, shops, museums, the ferry wharf, marinas, parks and reserves, and offices. Most leases are for a term of two to five years and are written on a full net NNN basis. Values range from \$46,800 to a high of \$9,439,700, with a median value of \$1,581,350. There are 20 improved commercial properties in this neighborhood. 45% of the properties are in the BST (Battery Street Transition) zone, 30% of the properties in the DW (Downtown Waterfront) zone, and 25% in the DWPT (Downtown Waterfront-Public Trust) zone.

NEIGHBORHOOD 610 – New North End

Neighborhood 610 is the largest neighborhood in area and comprises the entire north section of the city. It is bounded to the west by Lake Champlain, to the north and east by the Winooski River and Colchester, and to the south by the New England Central Railroad.

Neighborhood 610 has a wide variety of uses from gas stations, shopping centers, small retail shops, and service garages. The only concentration of use is multi-families and apartments at 52%. Most commercial leases are written on a two to five-year term on a NNN basis. Most apartment leases are for a term of one year and are written on a gross-plus-utilities basis. Values range from \$173,090 to a high of \$27,508,500, with a median value of \$1,053,300. These numbers are skewed by fifteen large properties with values in excess \$5,000,000. There are 75 improved commercial properties in this neighborhood. 49% of the properties are in the RL zone, 28% of the properties in the NAC zone, and the balance are in various mixed zones.

HIGHEST & BEST USE

The concept of highest and best use is pivotal to the accurate appraisal of all real property. In Burlington, commercial valuation was not completed until the appropriate highest and best use was chosen.

Highest and best use is defined as that reasonable and probable use that supports the highest present value, as defined, as of the effective date of valuation. Alternatively, it would be that use, from among reasonably probable and legal alternative uses, found to be physically possible, appropriately supported, financially feasible, and which results in highest land value (*Institute of Real Estate Appraisers – Real Estate Appraisal 15th edition*).

This definition applies specifically to the highest and best use of land. It is to be recognized that in cases where a site has existing improvements on it, the highest and best use may very well be determined to be different from the existing use. The existing use will continue, however, unless and until land value in its highest and best use exceeds the total value of the property in its existing use.

For commercial, industrial, and apartment (CIA) property types, market data suggests that recent market changes vary by property type. Despite moderate rent increases, multifamily (apartment) properties have experienced the most significant appreciation in value in recent years, buoyed by low vacancy, reduced mortgage rates, and diminished expectations for equity dividend rates. Retail and office properties have experienced flat or negative growth over the same period, a trend precipitated, or at least accelerated, by pandemic-related decreases in demand.

Despite these market changes, the present use of most properties remains its highest and best use. There is some speculative development in the conversion of office space into apartment use. There is little if any speculative development in industrial, warehouse, office, or retail use.

Impact of Covid-19 on Commercial Values

During the entire revaluation process, the appraisers closely observed the fluctuating economic conditions resulting from the COVID-19 pandemic. For many commercial properties, the appraisers had access to income and expense information for calendar years 2018 and 2019. The appraisers also continued to monitor market conditions through the appraisal date and considered 2020 and 2021 income and expense data when provided during the informal hearing process. Economic conditions during the COVID-19 pandemic were concluded to have both short-term and potentially long-

term impacts on the Burlington real estate market, including construction costs, market rents, expense rates and vacancy rates. It should be noted that not all these impacts were negative, with some market segments experiencing appreciating values throughout this period of time. The significance and duration of these impacts was observed to vary depending on specific property types, with some market segments trending back toward pre-pandemic levels as of the valuation date. The appraisers worked closely with the Burlington City Assessor throughout the process to determine the most appropriate methods of reflecting these fluctuating economic conditions in the estimates of market value.

In general, it was observed that as office and retail rents declined, vacancy, expenses and capitalization rates increased. At the same time apartment rents increased while vacancy and capitalization rates decreased. Rent concessions, rent deferrals, lease terminations were common for office and retail space. As vacancy increased expenses soared. Church Street office and retail space had varied degrees of vacancy, with some being significantly higher than others. This was echoed by some large national chains, such as Macy's, leaving Church Street. Although demand for apartment space persisted, some landlords were plagued with delayed payments and lost payments due to tenant unemployment. Hotel occupancy in Burlington was particularly hard-hit and dropped from 70% occupancy to a low of 30%.

SALE DATA

Accurate and complete sale data is vital to the revaluation process. The appraisers study and analyze market activity to help build and calibrate valuation models. Additionally, the appraisers analyze the relationship between appraised values and sale prices, or Appraisal-to-Sale Ratios (ASR's), to test for compliance with local and international assessment standards.

The date range for the sales sample used in this project was January 2018 through February 2021. A search of real estate transactions within this date range revealed 78 valid sales of commercial, industrial, and apartment properties in the City of Burlington. These sales represented arms-length transactions that adhered to the definition of market value cited above, including reasonable market exposure and a buyer and seller that each act prudently, knowledgeably, and for self-interest, where neither buyer nor seller is under undue duress.

Time Adjustments

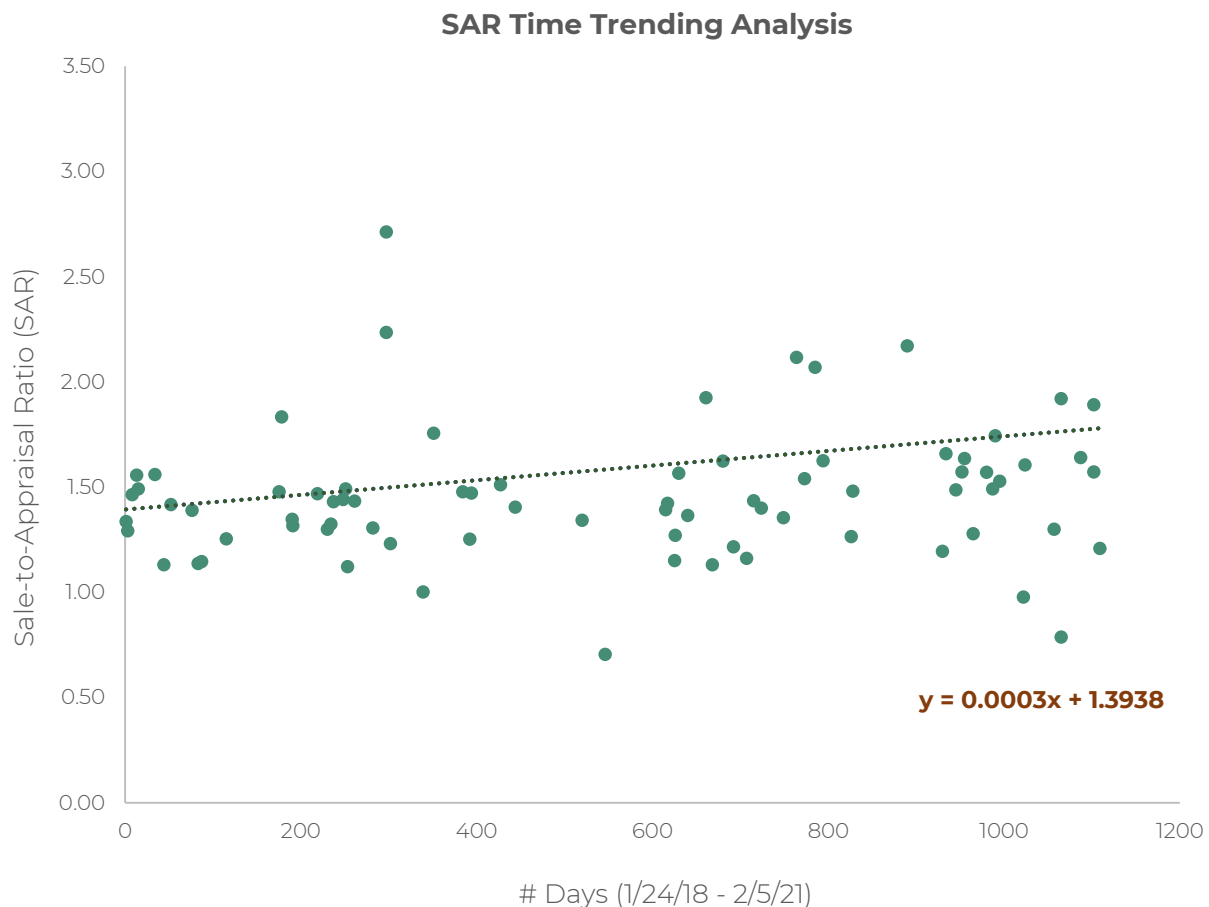
The appraisers consider time adjustments to sale prices where there is evidence of market appreciation or depreciation. The appraisers analyze trends in sale prices in order to identify and quantify market appreciation or depreciation from the date of sale to the date of value. As the goal of the revaluation is to estimate market value as of the appraisal date, the purpose of time adjustments is to make the sale prices within the sample more representative of market value as of the appraisal date.

One method of quantifying market changes is to analyze the resale of properties within the date range of the sales sample. For example, if Property A sells for \$100,000 on January 1, 2018 and then sells again on January 1, 2019 for \$112,000, the indicated market appreciation between the first and second sale is \$12,000, assuming there are no substantive physical changes to the property during that time. The appreciation in this example can be further calculated as 12% or 1% per month. There were not sufficient resales to rely solely upon this method of time adjustment for the City of Burlington revaluation.

A second method of quantifying market appreciation or depreciation is to analyze the ratios of sale prices within the sales sample to independent variables such as building area, apartment units, or even prior assessed values. This analysis can reveal trends that allow the appraisers to measure market changes over time.

For this project, the appraisers performed this second method of measuring market changes over time. The appraisers applied trend lines to scatter diagrams in Microsoft

Excel and extracted equations from those trend lines. These equations then allowed the appraisers to predict the ratios of sale prices to independent variables based upon the number of days that the sale occurred before the appraisal date. For this analysis, the appraisers invert the typical appraisal ratio statistic to reflect a positive trend in appreciation. Therefore, instead of appraisal-to-sale ratio (ASR), the analysis uses sale-to-appraisal ratio (SAR). Below is an example of this analysis:



This analysis suggests market appreciation of approximately 7.84% per year during the sampled date range.

SAR Trend: $y = 0.0003x + 1.3938$

y = expected sale-to-appraisal ratio

X = day in sale range (day 1 = January 24, 2018, day 1,164 = April 1, 2021)

Result for assessment date (April 1, 2021, day 1,164):

$y = 0.0003(1,164) + 1.3938$

$y = 1.743$

Result for day 1 of sale date range (January 24, 2018, day 1):

$$y = 0.0003 (1) + 1.3938$$

$$y = 1.3941$$

Change from beginning of sale date range to assessment date:

$$\% \text{ change} = (\text{day 1,164 result} / \text{day 1 result}) - 1$$

$$\% \text{ change} = (1.743 / 1.3941) - 1$$

$$\% \text{ change} = 25.0\% \text{ or } 0.0215\% \text{ per day or } 7.84\% \text{ per year}$$

Additional mitigating factors, such as the recent changes in economic conditions brought on by the COVID-19 pandemic and speculative sales discovered by the appraisers, led the appraisers to apply a more conservative time adjustment of 4.0% per year or 0.33% per month. This appreciation was applied to all sale prices within the sales sample to derive time adjusted sale prices. For example, if Property B sold for \$500,000 on October 1, 2020 (six months before the appraisal date), then the sale price was adjusted by 2% (0.33% x 6 months), or \$10,000. The time adjusted sale price for Property B is \$510,000.

The time adjusted sale prices are then used to calculate appraisal-to-sale ratios in all future analysis. A table of all valid sales used for analysis in this revaluation is included in the appendix of this document.

PRELIMINARY TESTING RESULTS

Valuation models must be accurate, reliable, and valid:

- Accuracy in valuation modeling refers to the accurate prediction of value on known and unknown data. The model should accurately appraise properties whether or not income, cost, or sale data is available.
- Reliability in valuation modeling refers to the ability of the model to replicate work in predicting accurate values, even when physical data changes. If a new apartment unit is added to a building even though the building has not increased in size, the model should increase the value.
- Validity in valuation modeling refers to the model's ability to value property features the way the appraiser intended. In Burlington, the value of a retail store on Main Street should not change if a 200 square foot shed is added to the rear of the building for storage. The shed does not increase income and therefore should not increase value.

Aside from meeting the criteria of USPAP, the best test of a model is its ability to meet IAAO Performance Standards. These standards are summarized in the table below:

TYPE	MEDIAN ASR	COD	PRD	PRB
Larger, urban jurisdictions	0.90–1.10	15.0 or less	0.98–1.03	-0.05 to 0.05
Smaller, rural jurisdictions	0.90–1.10	20.0 or less	0.98–1.03	-0.05 to 0.05
Vacant land	0.90–1.10	20.0 or less	0.98–1.03	-0.05 to 0.05

Burlington is considered a larger urban jurisdiction and would be held to the standards outlined above. All these standards refer to the appraisal-to-sale ratio (ASR).

Prior to the reassessment, the appraisers conducted a sales ratio study on Burlington's valid commercial sales from January 24, 2018 through February 5, 2021, consisting of 78 sales in total. The purpose of this testing was to measure the accuracy, uniformity, and equity of existing appraised values and, therefore, discern the extent to which the existing valuation models reflected market conditions and selling prices as of the date of valuation. Some of the most important statistical measures studied during this testing are described below:

- **Appraisal-to-Sale Ratio (ASR)**— The ASR measures the relationship between the appraised value and selling price of individual properties. It is calculated by dividing the appraised value by the time adjusted sale price. An ASR lower than 1.00 indicates that the assessment value is lower than the current market value suggested by the sale price and vice-versa. The calculated appraisal-to-sale ratios for each property in the sales sample are the basis for all other statistics described below.
- **Median**— The median is a statistical measure of central tendency. Measures of central tendency also include the mean and the mode. The median is defined as the middle value of an array, and its use in mass appraisal is typically preferred to other measures such as the mean, or average, as it is less influenced by statistical outliers. The median ASR is the primary measure of appraisal level, or appraisal accuracy, in mass appraisal.
- **Coefficient of Dispersion (COD)**— The COD is the primary measure of assessment uniformity, or assessment consistency, in mass appraisal. It is defined as the average absolute deviation from the median ASR expressed as a percentage of that median. Lower coefficients of dispersion indicate more consistent assessed values and, therefore, more reliable appraisal models.
- **Price-Related Differential (PRD)**— The PRD is a measure of vertical equity in mass appraisal. It is defined as the quotient of the mean ASR and the weighted mean ASR. Price-related differentials above 1.03 tend to indicate that higher-priced properties are being undervalued compared to lower-priced properties (regressivity), and price-related differentials below 0.98 tend to indicate that lower-priced properties are undervalued compared to more expensive properties in relation to market value (progressivity).
- **Price-Related Bias (PRB)**— The PRB is another measure of vertical equity in mass appraisal. It measures the percentage by which assessment ratios change when values are doubled or halved. For example, a PRB of -.06 would mean that assessment levels fall by 6% when values are doubled. Ratios that exceed the range of -.05 to +.05 indicate problems in the reliability of models or schedules. The PRB measurement is required by IAAO and not by the State of Vermont.

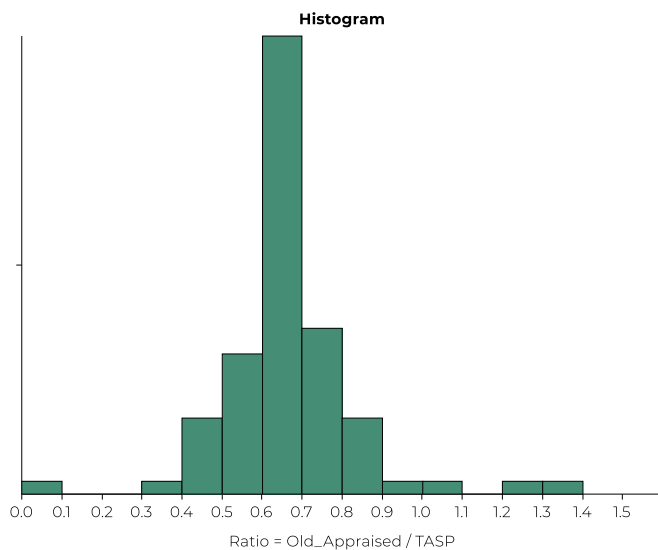
Preliminary testing results are shown below compared with IAAO standards. As described in the section above, this ratio study was conducted on a sales sample consisting of 78 valid and qualified sales occurring from January 24, 2018 through February 5, 2021. The entire sale sample is included in the appendix of this document. All statistical testing was conducted using NCSS Statistical Software Version 11.

	MEDIAN ASR	COD	PRD	PRB
Four-Family	0.63	6.72%	1.01	-0.02
Apartments	0.68	8.93%	1.03	-0.05
Commercial	0.77	28.01%	1.22	-0.14
Mixed-Use	0.60	28.90%	1.09	-0.15
Condominium	0.65	14.80%	0.93	0.01
Overall	0.65	16.15%	1.14	-0.06
IAAO Standards	0.90 - 1.10	15.00% or less	0.98-1.03	-.05 to .05
Results	FAILS	FAILS	FAILS	FAILS

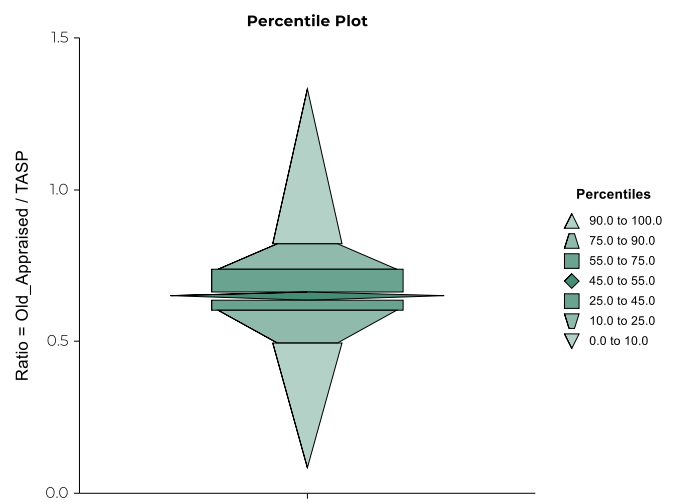
These results indicate that the existing appraisals are out of compliance with IAAO standards for appraisal level (Median ASR), appraisal uniformity (COD) and vertical equity (PRD & PRB).

The ASR performance test indicates that commercial properties are under-assessed by 30% to 67%. Failure on the COD test indicates the lack uniformity in correlation of selling prices to the existing appraised values. Despite the overall COD of 16.15% falling just outside of the acceptable range, stratification by property type indicates significant uniformity problems within the commercial, mixed-use, and condominium uses. In addition, both the PRD of 1.14 and the PRB of -0.06 indicate vertical equity issues, specifically that higher-priced properties are under-valued in comparison with relatively lower-priced properties. These vertical equity issues are particularly acute within the commercial and mixed-use property types.

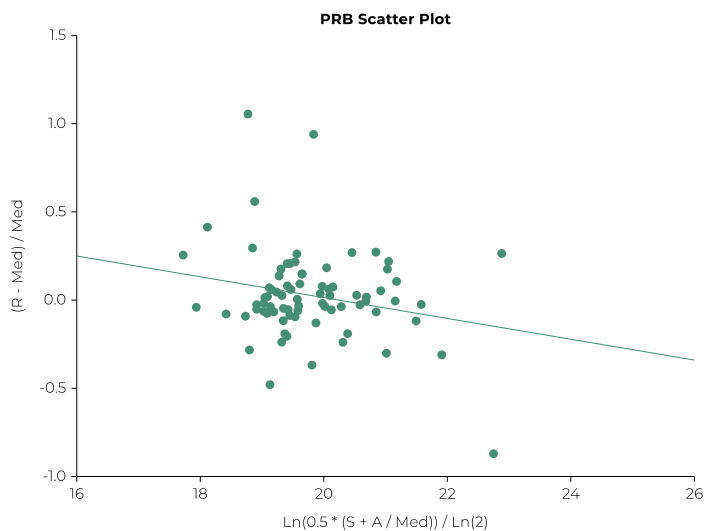
The diagrams and scatter plots below visualize the overall results of the preliminary testing:



The histogram above shows that there is a statistically normal distribution of ASRs around the median of 0.65. This indicates that properties are currently under-valued.



The percentile plot above is presented as a way to illustrate the concentration of ASRs by percentile and recognize the presence of outliers.



The downward-sloping trendline on the above PRB scatter diagram indicates that, in the current valuation models, assessment levels fall as values increase.



The trendline on the above scatter diagram shows a negative correlation between the variables ASR and Time-Adjusted Sale Price. This is another indication that appraisal levels are not consistent at different price ranges.

APPROACHES TO VALUE

The three approaches to value in real estate appraisal are the cost approach, sales comparison approach, and income approach. All three approaches to value were considered in arriving at value conclusions for commercial, industrial, apartment, and exempt properties for the City of Burlington revaluation project.

The Cost & Sales Comparison Approaches

The cost approach to value is based on the theory that the market value of an improved parcel can be estimated as the sum of the land value and the estimated depreciated value of the improvements. The underlying valuation principle of substitution affirms that a prudent buyer will pay no more for a property than the cost to acquire a similar site and construct improvements of equivalent desirability.

The improvement costs developed in this reassessment are *replacement costs*, the current cost of producing an improvement with equivalent desirability or utility. Replacement cost, as opposed to *reproduction cost*, is developed in order to reflect the way in which older improvements are treated by real estate investors. Replacement cost includes the costs of all improvements on the parcel, including primary structures, attached features (i.e. balconies, canopies, etc.), outbuildings, and other site improvements.

$$\text{Market Value} = \text{Land Value} + (\text{Replacement Cost New} - \text{Depreciation})$$

The sales comparison approach to value is a method of estimating market value by comparing similar properties that have sold or are for sale and adjusting prices based on marketplace conditions and property characteristics relevant to the value. Most mass appraisal projects do not utilize a direct sales comparison approach as this method is impractical for valuing an entire universe of properties. Rather, mass appraisal projects use sale data to inform other approaches to value and test valuation models for accuracy and reliability.

The cost approach was developed for commercial, industrial, and apartment (CIA) properties for this project, however, this approach was typically used in support of the income approach and not as a final indicator of value. Due to economic conditions and the inherent difficulty of extracting accurate depreciation estimates from the market, the income approach to value was deemed a more reliable method of deriving accurate market value, particularly when there existed sufficient market data on rents, vacancy, and expenses.

Land Valuation

Using the methods of neighborhood delineation described above, the appraisers were able to identify thirteen primary neighborhoods within the City of Burlington. Each of these neighborhoods was then assigned a neighborhood, or locational, adjustment factor. These factors are used to alter the previously existing land valuation models within the CAMA system, which establish base land values for each neighborhood using base lot sizes, base square footage rates, and adjustments for lots larger or smaller than the base lot size.

The appraisers determined these factors by considering the physical and economic characteristics of each neighborhood, including lot sizes, building types and ages, rents, traffic patterns, and highway access. Additionally, the appraisers performed two different types of sales analyses as part of the land valuation process.

In jurisdictions or neighborhoods where there are a sufficient number of vacant land sales, those sales are typically analyzed to support land models for each neighborhood. That was not the case in Burlington as there are few lots available or desired for development.

Because of a lack of recent vacant land sales in Burlington, the appraisers had to rely more heavily upon the industry-recognized land residual technique. In this technique, the appraiser removes the contributory building value from sold properties to arrive at a residual land value. The analysis is an iterative process of model testing against sales.

The land residual technique takes the value of a sold property on the date of the appraisal and subtracts the depreciated value of the improvements. What remains is the land residual amount for that sale. The appraisers have utilized this technique using sales in multiple neighborhoods with various building types.

Building Valuation

Building valuation is developed by estimating the replacement cost new of all primary structures, attached features, and outbuildings. The replacement cost new is derived from cost tables installed in the AP5 CAMA system. All commercial improvement cost tables used during the Burlington revaluation were based on the Marshall Swift Commercial Cost Service. This highly respected cost service provides generic cost replacement rates for buildings, extra features, and outbuildings. These cost tables were then locally adjusted to accommodate different building use types in Burlington. Since various construction types are necessary for different uses, several costs were developed for basic structures such as high-rise office buildings and service stations.

Interior finish, heating, plumbing, air conditioning, and lighting requirements varied for different uses, requiring cost ranges.

Building costs are also adjusted using adjustment factors for quality of construction (Grade. Quality of construction is one of the most significant adjustments to be made in the cost approach, as buildings of similar size and use can vary markedly in cost due to the quality of materials and workmanship. It is important to note, however, that construction costs do not vary by neighborhood. Construction costs are uniform throughout Burlington.

After estimating the replacement cost new for the subject property improvements, depreciation is then subtracted from these costs, dependent upon the effective age of the improvement. This depreciation is derived from the analysis of market data and accounts for the physical deterioration, functional obsolescence, and economic obsolescence of the subject improvements.

The Income Approach

The income approach is a method of valuing the present worth of anticipated monetary benefits for an income-producing property. When an investor buys a commercial property based on income, they use the following criteria to decide their acceptable purchase price:

- What will be my rate of return for the investment of my equity? This is also known as equity dividend rate or “cash on cash rate”
- How much will the property appreciate over time?
- What is the available financing and how will its terms affect the value?
- What is the anticipated Net Operating Income (NOI)?

Typically, investors will only buy properties when the equity dividend rate is equal to or better than substitute investments. If an investor can only receive a 4% return on their down payment, but they can receive a 16% return on a REIT, they may opt to go with the REIT investment.

In a reassessment project, Net Operating Income is the Gross Potential Income less all valid expenses, including vacancy but excluding taxes, amortization, or depreciation. Investors, as with appreciation, predict how rents will rise to offset increased expenses or increase profit beyond expenses.

In the appraisal of Burlington commercial, industrial and apartment properties, the Income approach was used as the primary determinant of value. The income approach best reflects the actions and motivations of investors who buy commercial properties in Burlington. The cost and market approaches were, on the other hand, relegated to a supportive role for valuing the properties. In the CAMA system, the income and cost approaches were fully developed and detailed. Unlike residential properties, the appraisal of commercial properties requires utilizing multiple units of comparison to arrive at an accurate value estimate. Units of comparison are those variables or characteristics that investors use in making decisions in purchasing commercial properties.

Units of comparison enable appraisers to distill value to a specific rate such as rent/square foot so that comparison may be made with properties that are somewhat dissimilar.

Burlington commercial properties can be analyzed with the following units of comparison:

- Income or Sale Price/square foot
- Income or Sale Price/gallons of gas pumped
- Income or Sale Price/apartment unit
- Income or Sale Price/restaurant seats
- Income or Sale Price/restaurant gross receipts
- Income or Sale Price/parking space
- Income or Sale Price/retail gross receipts per square foot
- Sale Price/income square foot
- Cost/square foot
- Sale Price per approved unit
- Income or Sale Price /nursing bed

Using the incorrect unit of comparison can lead to spurious results. The correct unit of comparison is that unit/variable which the commercial investor uses to make purchase decisions. These units of comparison can vary by city, neighborhood, or even within property types.

For instance, most of the stand-alone fast-food facilities should be valued based upon gross receipts because that is how investors would decide to purchase these properties. This decision is further evidenced by the fact that the current leases are based upon a base rent plus a percentage of gross receipts. However, it would be invalid to appraise a smaller independent restaurant on a gross-receipts basis. This

small, low volume, limited seating facility would be appraised on a lease/square foot as restaurant space, because that is how an investor would consider its value.

Using different units of comparison is not intended to produce higher values, just more valid and reliable values. Furthermore, using the sales of gasoline or the sales of food to determine value is not, if correctly employed, a valuation of business value. Care was taken in Burlington to speak to owners and investors of various property types to discern what they mean when discussing “gross receipts”, “base lease”, “net lease”, “gross lease”, etc.

In general rental rate/square foot was the most common unit of comparison in Burlington. In the case of atypical properties such as gas stations or restaurants, notes were left in the private comments section of the CAMA system to show which unit of comparison and methodology was used to arrive at value.

Gathering Income & Expense Data

Prior to the commencement of this revaluation project, the City of Burlington mailed income and expense questionnaires to the owners of all commercial, industrial, and apartment properties. These mailings requested that property owners report to the assessor’s office the income and expenses associated with ownership of the property for the years 2018 and 2019.

Overall, income and expense data was submitted for approximately 300 properties out of 1,249 commercial, industrial, and apartment properties. This represented a response rate of approximately 24%. Though individual responses are not public record, the reported income and expense data from 2018 and 2019 were analyzed and used as a foundation for the appraisers to build and calibrate the income models used in the income approach to value.

Capitalization Rate Development

In the direct capitalization of income, the net operating income is divided by a capitalization rate to arrive at the estimate of market value. In this project, the appraisers developed capitalization rates based on a study of overall rates in Burlington and developed a band of investment technique that considered both the return of investment and return on investment. Part of this process was to conduct a survey of mortgage rates for local and regional banks to establish rates leading up to the date of value. The appraisers then compared these to capitalization rates from investor surveys conducted by industry sources and standards.

Below are examples of band of investment capitalization development for three common property types in Burlington:

Band of Investment- **Apartments**

MORTGAGE TERMS				
AMOUNT	YEARS	INTEREST	IMPUTED ITAO/MONTHLY	IMPUTED ITAO/ANNUM
\$1	20	3.50%	0.0057996	0.069595166

HYPOTHETICAL PURCHASE	\$1,000,000
-----------------------	-------------

POSITION	LOAN TO VALUE	INVESTED	INSTALLMENT TO AMORTIZE ONE	RETURN ON INVESTMENT
Bank	80%	\$800,000	6.96%	5.57%

POSITION	EQUITY	INVESTED	EQUITY DIVIDEND RATE	RETURN ON INVESTMENT
Investor	20%	\$200,000	4.78%	0.96%

CAPITALIZATION RATE EXCLUDING TAXES	6.52%
EFFECTIVE TAX RATE	2.23%
CAPITALIZATION RATE INCLUDING TAXES	8.75%

Band of Investment- **Industrial**

MORTGAGE TERMS				
AMOUNT	YEARS	INTEREST	IMPUTED ITAO/MONTHLY	IMPUTED ITAO/ANNUM
\$1	20	3.75%	0.0059289	0.071146598

HYPOTHETICAL PURCHASE	\$1,000,000
-----------------------	-------------

POSITION	LOAN TO VALUE	INVESTED	INSTALLMENT TO AMORTIZE ONE	RETURN ON INVESTMENT
Bank	75%	\$750,000	7.11%	5.34%

POSITION	EQUITY	INVESTED	EQUITY DIVIDEND RATE	RETURN ON INVESTMENT
Investor	25%	\$250,000	9.23%	2.31%

CAPITALIZATION RATE EXCLUDING TAXES	7.64%
EFFECTIVE TAX RATE	2.36%
CAPITALIZATION RATE INCLUDING TAXES	10.00%

Band of Investment- **Retail**

MORTGAGE TERMS				
AMOUNT	YEARS	INTEREST	IMPUTED ITAO/MONTHLY	IMPUTED ITAO/ANNUUM
\$1	20	3.75%	0.0059289	0.071146598

HYPOTHETICAL PURCHASE	\$1,000,000
-----------------------	-------------

POSITION	LOAN TO VALUE	INVESTED	INSTALLMENT TO AMORTIZE ONE	RETURN ON INVESTMENT
Bank	75%	\$750,000	7.11%	5.34%

POSITION	EQUITY	INVESTED	EQUITY DIVIDEND RATE	RETURN ON INVESTMENT
Investor	25%	\$250,000	13.23%	3.31%

CAPITALIZATION RATE EXCLUDING TAXES	8.64%
EFFECTIVE TAX RATE	2.36%
CAPITALIZATION RATE INCLUDING TAXES	11.00%
COVID ADJUSTMENT	1.00%
TOTAL CAPITALIZATION RATE	12.00%

The third capitalization rate showed here for retail properties includes a 1% “COVID Adjustment.” This adjustment was made to capitalization rates for some property types most acutely affected by adverse economic conditions resulting from the COVID-19 pandemic. These conditions are described in more detail on pages 15 and 16 of this document. The 1% adjustment applied to the retail capitalization rate corresponds with an 8.3% reduction in appraised values for this property type:

Value for theoretical retail property with NOI of \$100,000 using 11.00% cap rate:

$$\$100,000 / 11.00\% = \$909,091$$

Value for theoretical retail property with NOI of \$100,000 using 12.00% cap rate:

$$\$100,000 / 12.00\% = \$833,333$$

Adjustment effect on appraised value:

$$(\$833,333 / \$909,091) - 1 = -8.3\%$$

RECONCILIATION & REVIEW

Subsequent to the production of values for individual properties, appraisers began the final step in the mass appraisal process prior to notifying property owner of their new proposed assessed values. During the review phase, appraisers review the value estimates, verify observable data, adjust the value estimates for any changes, choose the final valuation methodology, and ensure that like properties are appraised equitably. For this project, the review process was conducted by John Valente, ASA, with regular input provided by the city assessor. The review was conducted remotely using a variety of reports and tools including AssessPro 5.0, online GIS mapping, Microsoft Excel, income and expense reports, and sales data.

After the review process, data was modified or corrected in the CAMA system to reflect the judgment of the reviewer. Once entered, all value conclusions were tested for reliability and validity based on:

- Comparison with valid sales
- Comparison with income and expense data from similar properties
- Comparison with, if applicable, known cost data

As discussed earlier, the income approach was deemed a reliable indicator of value. For that reason, most commercial property in Burlington was valued using that approach. The cost approach was used to a limited degree to value atypical properties and smaller single-user properties. It was also used to support the income approach. Because of the modicum of sales data, the sales approach provided support to the primary approach and assisted in testing the accuracy of the models.

Informal Hearings

In April of 2021, after the appraisers established preliminary assessments, property owners in the city were mailed a reassessment notice. This notice informed property owners of the new preliminary assessment on their property and offered them an opportunity to participate in a process of informal valuation hearings. This process allowed property owners to make an appointment with one of the project's commercial appraisers to discuss their new assessed value.

Commercial appraiser John Valente conducted hearings for a total of 477 commercial, industrial, and apartment properties beginning on April 19th. During these hearings, property owners were able to ask questions about the valuation process, communicate their concerns with the preliminary assessment, and provide the appraisers additional

information on the property's physical characteristics, condition, and income. Owners were able to submit documentation to the appraisers via email, including property photos, income and expense statements, and recent appraisals. The appraisers then reviewed these property assessments and recommended actions based on the information and documents provided by property owners. These actions included data corrections and value reductions for some properties where warranted. The Burlington City Assessor had final approval for these changes.

Below are statistics related to the informal hearings:

Informal Hearings Conducted (# of properties)	477
Informal Hearings Conducted (% of C/I/A properties)	38%
Total Preliminary Value (hearing parcels)	\$898,057,444
Value Changes (# of properties)	401
Value Changes (% of hearing properties)	84%
Total Value Change (\$)	(\$190,295,873)
Average Value Change (total value change / # of hearings)	(\$398,943)
Average Value Change (total value change / total prelim value)	21%

FINAL TESTING RESULTS

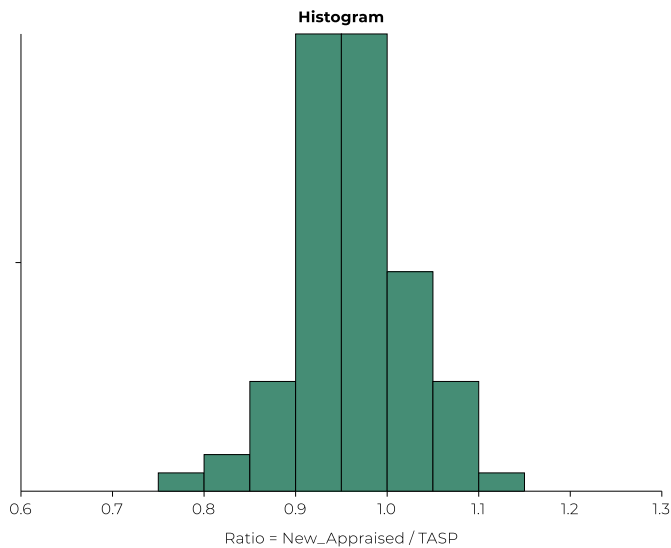
After the reassessment, a sales study of commercial, industrial, and apartment properties was conducted on the new valuation models with respect to value accuracy and validity. This study measured the extent to which the new valuation models reflected market conditions and selling prices on the date of value.

Cited below are the City of Burlington appraisal-to-sale ratio (ASR) tests compared to International Association of Assessing Officers (IAAO) Standards using NCSS Statistical Software on the City of Burlington's valid sales file.

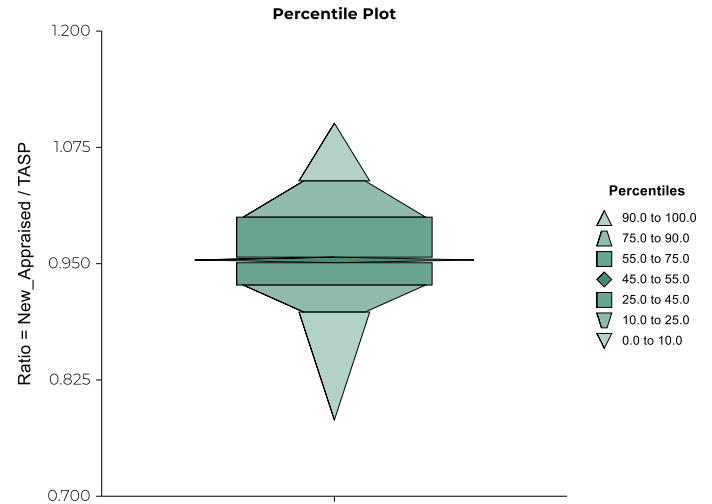
	MEDIAN ASR	COD	PRD	PRB
Four-Family	0.95	4.27%	1.00	-0.02
Apartments	0.97	4.98%	1.01	-0.04
Commercial	0.95	2.01%	1.00	0.00
Mixed-Use	0.95	2.64%	1.01	-0.02
Condominium	0.93	5.58%	0.99	0.01
Overall	0.95	4.30	1.01	0.00
IAAO Standards	0.90 - 1.10	15.00% or less	0.98-1.03	-.05 to .05
Results	PASSES	PASSES	PASSES	PASSES

The passing results in final valuation testing indicate that the City of Burlington revaluation project was successful in creating and employing valuation models that provide accurate, uniform, and equitable appraisals among all property types.

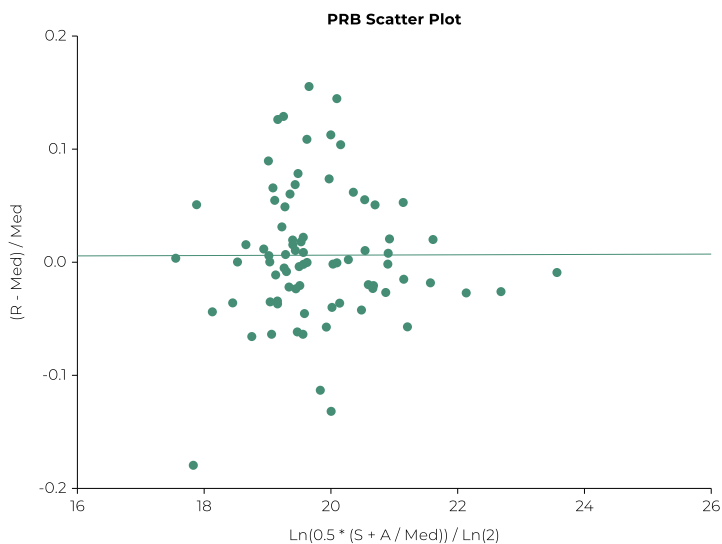
The diagrams and scatter plots below visualize the overall results of the final performance testing:



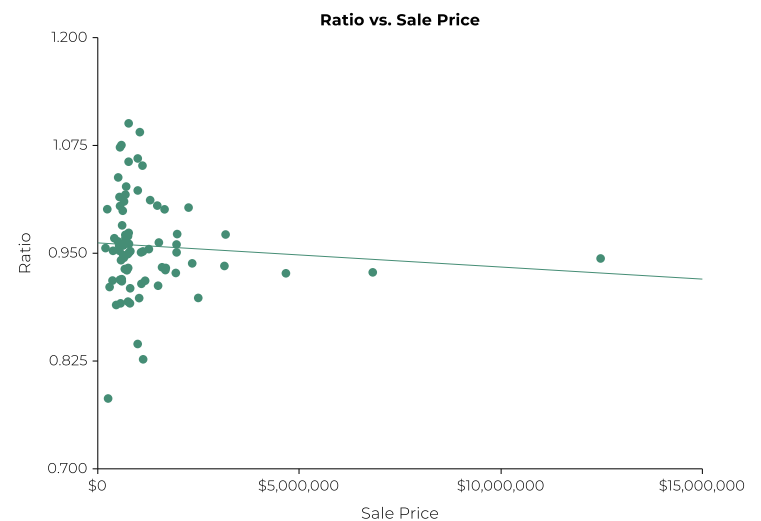
The histogram above shows that there is a statistically normal distribution of ASRs around the median of 0.95. This indicates an appraisal level well within Vermont & IAAO standards.



The percentile plot above is presented as a way to illustrate the concentration of ASRs by percentile and recognize the presence of outliers



The horizontal trendline on the above PRB scatter diagram indicates that, after revaluation, appraisal levels are consistent at different price ranges.



The trendline on the above scatter diagram shows a neutral correlation between the variables ASR and Sale Price. This is another indicator of the vertical equity achieved through this revaluation process.

CONCLUSION

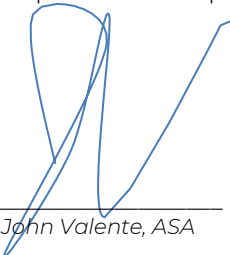
The revaluation of commercial, industrial, and apartment properties for the City of Burlington accomplished the following:

- Established fair market values as of the April 1, 2021 valuation date
- Met and exceeded IAAO and State of Connecticut standards
- Met USPAP Standards 5 and 6
- Produced accurate, reliable, and valid commercial valuation models
- Gathered extensive national, regional, and local income and expense data that helped to substantiate commercial values
- Gathered extensive national, regional, and local sales and cost data that helped to substantiate commercial values

CERTIFICATION

I certify that, to the best of my knowledge and belief:

- The statements of fact contained in this report are true and correct.
- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- I have no present or prospective interest in the property that is the subject of this report, and I have no personal interest with respect to the property.
- Any services regarding the subject performed by the appraiser within the three-year period immediately preceding acceptance of the assignment, as an appraiser or in any other capacity is identified in the body of the report.
- I have no bias with respect to any property that is the subject of this report or to the parties involved with this assignment.
- My engagement in this assignment was not contingent upon developing or reporting predetermined results.
- My compensation for completing this assignment is not contingent upon the reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- My analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice. (USPAP 2020-2021)
- I have not made a personal inspection of the properties that are the subject of this report. I did complete an exterior viewing of each property from a public way or with digital ortho, oblique and street level imagery captured in the last (3) years.
- My opinion of the total market value for the properties identified in this report and in the AssessPro CAMA system, as of the April 1, 2021 effective valuation date, is subject to the final adjustments made by the City as a result of the appeal process with property owners

Signature:  Date: 3/9/22
John Valente, ASA

Appendix

Burlington, VT Valid CIA Sales for 4/1/21 Revaluation

PARCEL ID	ADDRESS	SALE DATE	SALE PRICE	TIME ADJUSTED SALE PRICE
5536	57-59 BUELL ST	1/24/2018	\$985,000	\$1,108,519
4224	454 COLCHESTER AVE	1/26/2018	\$625,625	\$704,078
5116	213 NORTH WINOOSKI AVE	1/31/2018	\$490,000	\$551,446
4149	358-360 NORTH WINOOSKI AVE	2/5/2018	\$630,000	\$706,923
7122	117 BANK ST	2/7/2018	\$325,000	\$364,683
5199	76 NORTH UNION ST	2/26/2018	\$2,800,000	\$3,141,880
11158	44 MAPLE ST	3/8/2018	\$1,747,611	\$1,955,227
6101	64-66 HUNGERFORD TER	3/16/2018	\$1,425,000	\$1,594,290
5573	37 HYDE ST	4/9/2018	\$2,100,000	\$2,342,550
7093	76 MAIN ST	4/16/2018	\$615,000	\$686,033
7769	301 COLLEGE ST	4/20/2018	\$565,000	\$630,258
7655	242 SOUTH WINOOSKI AVE	5/18/2018	\$2,025,000	\$2,252,205
4185	500 RIVERSIDE AVE	7/17/2018	\$1,062,500	\$1,174,700
7177	332 PINE ST	7/20/2018	\$1,335,000	\$1,475,976
7111	65 MAIN ST	8/1/2018	\$895,000	\$989,512
4494	86-88 PITKIN ST	8/2/2018	\$973,688	\$1,073,296
8940	137-139 SHELBURNE ST	8/30/2018	\$620,000	\$683,426
11284	337-343 NORTH WINOOSKI AVE	9/10/2018	\$610,000	\$670,390
5404	200 PEARL ST	9/14/2018	\$515,000	\$565,985
5278	137 NORTH WINOOSKI AVE	9/17/2018	\$490,000	\$538,510
9687	203 SHELBURNE ST	9/28/2018	\$455,000	\$500,045
4199	81-89 CHASE ST	10/1/2018	\$735,000	\$807,765
4702	115 NORTH ST	10/3/2018	\$175,000	\$191,748
4836	46-50 PERU ST	10/11/2018	\$952,000	\$1,043,106
5418	16-18 LAFAYETTE PL	11/1/2018	\$905,000	\$991,609
7108	67-71 MAIN ST	11/16/2018	\$1,030,000	\$1,125,172
7107	73-75 MAIN ST	11/16/2018	\$690,000	\$753,756
5450	48-50 CLARKE ST	11/21/2018	\$700,000	\$764,680
8811	444 SOUTH UNION ST	12/28/2018	\$216,100	\$235,355
7895	337 COLLEGE ST	1/9/2019	\$690,000	\$749,202
7248	80 ST PAUL ST	2/11/2019	\$1,000,000	\$1,082,500
5818	129 LOOMIS ST	2/19/2019	\$549,000	\$594,293
11236	75 BRIGGS ST	2/21/2019	\$742,000	\$803,215
7305	206 MAPLE ST	3/26/2019	\$670,000	\$723,064
4117	603 RIVERSIDE AVE	4/12/2019	\$513,060	\$552,001
5501	58-60 NORTH UNION ST	6/27/2019	\$1,047,000	\$1,119,557
4147	368-378 NORTH WINOOSKI AVE	7/23/2019	\$275,000	\$293,150
4988	19-21 MONROE ST	9/30/2019	\$570,000	\$603,858

PARCEL ID	ADDRESS	SALE DATE	SALE PRICE	TIME ADJUSTED SALE PRICE
5408	21 LAFAYETTE PL	10/2/2019	\$613,000	\$647,389
8884	502-510 SOUTH WILLARD ST	10/10/2019	\$1,200,000	\$1,267,320
9549	967-977 PINE ST	10/11/2019	\$725,000	\$765,673
11154	180-192 MAIN ST	10/15/2019	\$1,850,000	\$1,953,785
8386	140 HOWARD ST	10/25/2019	\$520,000	\$549,172
7098	118 PINE ST	11/15/2019	\$705,000	\$742,224
5150	156-160 NORTH WINOOSKI AVE	11/22/2019	\$390,000	\$410,592
5431	43 NORTH UNION ST	12/4/2019	\$760,000	\$797,620
6876	32 GROVE ST	12/16/2019	\$620,000	\$650,690
11293	77 PINE ST	12/31/2019	\$6,499,999	\$6,821,749
6090	44357 GREENE ST	1/8/2020	\$1,430,000	\$1,496,066
6402	42-46 NORTH PROSPECT ST	1/17/2020	\$1,850,000	\$1,935,470
3869	237 ELMWOOD AVE	2/11/2020	\$735,000	\$766,532
7564	279-281 ST PAUL ST	2/26/2020	\$2,390,000	\$2,492,531
4037	680-698 RIVERSIDE AVE	3/6/2020	\$1,250,000	\$1,299,500
4791	72-74 NORTH CHAMPLAIN ST	3/18/2020	\$510,000	\$530,196
8333	125 LAKESIDE AVE	3/25/2020	\$12,000,000	\$12,475,200
7110	65 MAIN ST	3/27/2020	\$721,000	\$749,552
5475	41 CLARKE ST	4/28/2020	\$575,000	\$595,873
5344	135-137 PEARL ST	4/30/2020	\$750,000	\$777,225
9707	716 PINE ST	7/1/2020	\$4,533,000	\$4,667,630
5187	97 NORTH UNION ST	8/10/2020	\$670,000	\$685,477
5235	273 NORTH ST	8/14/2020	\$446,000	\$456,303
4085	233-235 NORTH WILLARD ST	8/25/2020	\$525,000	\$537,128
7329	131 MAIN ST	9/1/2020	\$250,000	\$255,775
5002	161-165 ELMWOOD AVE	9/4/2020	\$565,000	\$576,187
5246	94 NORTH WINOOSKI AVE	9/14/2020	\$972,000	\$991,246
6924	157-159 PINE ST	9/29/2020	\$575,000	\$586,385
7840	55-63 HARRINGTON TER	10/6/2020	\$1,650,000	\$1,677,225
5809	173-175 LOOMIS ST	10/9/2020	\$1,010,000	\$1,026,665
7752	250 SOUTH UNION ST	10/14/2020	\$1,660,000	\$1,687,390
6846	152 RIVERSIDE AVE	11/10/2020	\$372,500	\$377,417
4350	26-28 DREW ST	11/12/2020	\$500,000	\$506,600
7454	127 SOUTH WINOOSKI AVE	12/15/2020	\$1,950,000	\$1,969,305
7171	224-226 PINE ST	12/23/2020	\$765,000	\$772,574
7078	27 MAIN ST	12/23/2020	\$630,000	\$636,237
3759	88 LAFOUNTAIN ST	1/14/2021	\$615,000	\$619,059
7515	207 SOUTH UNION ST	1/29/2021	\$3,150,000	\$3,170,790
5402	180-184 PEARL ST	1/29/2021	\$1,505,000	\$1,514,933
7733	311-317 SOUTH UNION ST	2/5/2021	\$1,651,250	\$1,656,699

Neighborhood Breakdown by Land Use

NEIGHBORHOOD	LAND USE	PARCEL COUNT	MEDIAN LOT SIZE (AC)	MEDIAN YEAR BUILT	MEDIAN BLDG SIZE (SF)	MEDIAN VALUE
090-AREA ZONED REC CONS OPEN ALONG WINOOSKI	Commercial	1	8.90	0	0	\$161,500
	Utility Electric	2	22.78	1989	103,974	\$37,316,400
240-EAST AVENUE						
	Apartments	1	0.16	1910	2,206	\$483,100
270-DOWNTOWN						
	Commercial	1	0.03	1899	1,266	\$244,000
	Commercial and Residential	1	0.04	1899	1,376	\$334,900
	Commercial Land	2	0.03	0	0	\$32,950
	Utility Electric	1	0.00	0	0	\$0
	Utility Other	1	0.00	0	0	\$0
350-UVM CAMPUS						
	Apartments	1	0.00	2011	167,016	\$42,475,900
	RESIDENTAL APT CONDO	1	0.00	1999	12,381	\$1,191,200
500-CHURCH STREET MARKETPLACE						
	4 Family	1	0.03	1878	5,713	\$1,372,600
	Apartments	2	0.08	1914	10,280	\$1,542,300
	Commercial	31	0.11	1899	7,262	\$1,212,500
	Commercial and Residential	13	0.05	1899	6,505	\$1,111,800
	Commercial Condo	1	0.00	1900	13,615	\$2,989,300
510-CENTRAL BUSINESS DISTRICT						
	Apartments	3	0.33	1899	40,797	\$5,680,400
	Commercial	85	0.20	1920	7,757	\$1,210,500
	Commercial and Residential	26	0.09	1899	4,838	\$911,400
	Commercial Condo	56	0.00	1918	4,370	\$733,250
	Commercial Land	15	0.20	0	0	\$598,400
	RESIDENTAL APT CONDO	2	0.12	1954	18,537	\$2,073,850
	Utility Electric	1	0.00	0	0	\$0
515-DOWNTOWN AREA APTS RA AND R4						
	4 Family	28	0.12	1899	2,905	\$647,400
	Apartments	46	0.20	1900	5,121	\$1,197,950
	Commercial and Residential	6	0.09	1899	2,837	\$621,850
520-NORTH STREET						
	Commercial	7	0.11	1956	3,184	\$396,400
	Commercial and Residential	14	0.09	1899	4,192	\$682,400
	Commercial Condo	2	0.05	1952	1,686	\$311,800
	RESIDENTAL APT CONDO	1	0.00	2004	8,298	\$770,300

NEIGHBORHOOD	LAND USE	PARCEL COUNT	MEDIAN LOT SIZE (AC)	MEDIAN YEAR BUILT	MEDIAN BLDG SIZE (SF)	MEDIAN VALUE
530-OLD NORTH END	4 Family	88	0.13	1899	2,873	\$610,400
	Apartments	97	0.17	1899	4,431	\$920,200
	Commercial	23	0.14	1940	3,240	\$414,900
	Commercial and Residential	24	0.15	1899	3,929	\$562,850
	Commercial Land	2	1.34	0	0	\$232,000
	Commercial/Residential Condo	1	0.25	1899	5,975	\$618,600
	Utility Other	1	0.05	0	0	\$9,200
540-RIVERSIDE AVENUE	Apartments	1	20.87	2016	256,428	\$30,953,400
	Commercial	13	1.50	1960	3,740	\$690,100
	Commercial and Residential	6	0.65	1958	6,657	\$801,100
	Commercial Condo	1	0.00	1900	11,589	\$624,600
	Commercial Land	6	0.37	0	0	\$181,650
	Industrial	4	1.66	1968	18,050	\$1,298,600
550-COM.UNIVERSITY HILL	Commercial	9	0.25	1935	3,520	\$664,500
	Commercial and Residential	5	0.15	1910	4,093	\$723,500
	Commercial Condo	4	0.00	1949	3,371	\$426,600
	Utility Electric	1	0.84	1980	1,350	\$714,200
	Utility Other	1	1.01	1950	72,209	\$9,014,300
555-HILL SECTION NBHD APTS R4 AND RA	4 Family	86	0.14	1900	3,126	\$695,500
	Apartments	179	0.23	1899	5,062	\$1,178,500
	Commercial	1	0.59	1932	34,639	\$3,453,600
	Commercial and Residential	15	0.28	1930	4,161	\$662,800
	Commercial Land	1	3.30	0	0	\$3,187,400
560-SHELBURNE ST	Apartments	1	0.49	1967	5,696	\$1,251,300
	Commercial	13	0.41	1965	2,270	\$883,100
	Commercial and Residential	1	0.17	1930	2,240	\$695,700
	Commercial Condo	14	0.00	1971	1,768	\$354,650
	Commercial Land	1	0.34	0	0	\$78,300
570-SOUTH HILL SECTION	Commercial	2	0.72	1899	5,166	\$914,300
	Commercial and Residential	5	0.21	1899	5,940	\$888,500
	Commercial Condo	11	0.00	1899	1,010	\$119,800
580-INDUSTRIAL PARKWAY	Commercial	6	1.30	1964	16,689	\$1,279,300

NEIGHBORHOOD	LAND USE	PARCEL COUNT	MEDIAN LOT SIZE (AC)	MEDIAN YEAR BUILT	MEDIAN BLDG SIZE (SF)	MEDIAN VALUE
590-APTS SOUTH OF DOWNTOWN	Commercial Condo	2	0.00	1962	68,444	\$8,115,500
	Commercial Land	1	0.68	0	0	\$177,600
	Industrial	12	7.45	1962	39,089	\$5,875,450
	Industrial Land	3	3.00	0	0	\$450,000
	4 Family	28	0.17	1920	2,871	\$648,250
	Apartments	37	0.27	1900	6,402	\$1,301,700
	Commercial	51	0.69	1953	9,320	\$977,500
	Commercial and Residential	15	0.13	1899	3,884	\$626,700
	Commercial Condo	1	0.00	2005	630	\$45,600
	Commercial Land	7	0.32	0	0	\$403,200
	Industrial	1	1.68	1955	4,000	\$730,400
	Utility Electric	1	0.00	0	0	\$225,600
	Utility Other	2	0.14	979	5,257	\$608,300
600-WATERFRONT						
	Apartments	2	0.76	991	281	\$239,000
	Commercial	15	0.56	1900	13,936	\$2,604,300
	Commercial and Residential	3	0.16	1899	4,733	\$856,800
610-NEW NORTH END						
	4 Family	9	0.45	1942	3,548	\$655,700
	Apartments	30	0.76	1975	15,151	\$2,572,800
	Commercial	25	0.32	1965	2,574	\$825,000
	Commercial and Residential	8	0.29	1945	3,098	\$607,100
	Commercial Condo	1	0.00	1940	10,819	\$850,844
	Commercial Land	4	5.68	0	0	\$1,667,250
	RESIDENTAL APT CONDO	2	0.00	947	24,725	\$6,372,750
DWT-SC-DWT SMALL COMPLEX						
	Apartments	1	0.44	1890	6,439	\$1,368,700
	Commercial Condo	2	0.00	1900	1,865	\$402,350
	RESIDENTAL APT CONDO	2	0.00	2000	33,766	\$2,622,800
NNE-3-NEW NORTH END 3						
	Commercial	1	140.15	1926	26,612	\$4,119,300
	Commercial Land	1	1.16	0	0	\$26,100
	Utility Electric	1	0.00	0	0	\$3,268,700
SE-5-south of DT Typical						
	Apartments	1	0.19	1899	2,762	\$631,900
SHS-8-SOUTH HILL SECTION 8	Commercial	2	0.10	1933	1,816	\$329,100
	Apartments	1	0.24	1985	6,866	\$1,277,000

NEIGHBORHOOD	LAND USE	PARCEL COUNT	MEDIAN LOT SIZE (AC)	MEDIAN YEAR BUILT	MEDIAN BLDG SIZE (SF)	MEDIAN VALUE
UVM-6-UVM HILL AREA 6	Commercial and Residential	1	0.22	1881	3,364	\$916,300
	Apartments	1	0.85	1899	8,694	\$2,086,500
	Grand Total	1249	0.18	1900	4,058	\$847,500

Standard on Mass Appraisal of Real Property

Approved July 2017

International Association of Assessing Officers

This standard replaces the January 2012 *Standard on Mass Appraisal of Real Property* and is a complete revision. The 2012 *Standard on Mass Appraisal of Real Property* was a partial revision that replaced the 2002 standard. The 2002 standard combined and replaced the 1983 *Standard on the Application of the Three Approaches to Value in Mass Appraisal*, the 1984 *Standard on Mass Appraisal*, and the 1988 *Standard on Urban Land Valuation*. IAAO assessment standards represent a consensus in the assessing profession and have been adopted by the Executive Board of IAAO. The objective of IAAO standards is to provide a systematic means by which concerned assessing officers can improve and standardize the operation of their offices. IAAO standards are advisory in nature and the use of, or compliance with, such standards is purely voluntary. If any portion of these standards is found to be in conflict with the *Uniform Standards of Professional Appraisal Practice (USPAP)* or state laws, *USPAP* and state laws shall govern.

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Standard on Mass Appraisal of Real Property

1. Scope

This standard defines requirements for the mass appraisal of real property. The primary focus is on mass appraisal for ad valorem tax purposes. However, the principles defined here should also be relevant to CAMAs (CAMAs) (or automated valuation models) used for other purposes, such as mortgage portfolio management. The standard primarily addresses the needs of the assessor, assessment oversight agencies, and taxpayers.

This standard addresses mass appraisal procedures by which the fee simple interest in property can be appraised at market value, including mass appraisal application of the three traditional approaches to value (cost, sales comparison, and income). Single-property appraisals, partial interest appraisals, and appraisals made on an other-than-market-value basis are outside the scope of this standard. Nor does this standard provide guidance on determining assessed values that differ from market value because of statutory constraints such as use value, classification, or assessment increase limitations.

Mass appraisal requires complete and accurate data, effective valuation models, and proper management of resources. Section 2 introduces mass appraisal. Section 3 focuses on the collection and maintenance of property data. Section 4 summarizes the primary considerations in valuation methods, including the role of the three approaches to value in the mass appraisal of various types of property. Section 5 addresses model testing and quality assurance. Section 6 discusses certain managerial considerations: staff levels, data processing support, contracting for reappraisals, benefit-cost issues, and space requirements. Section 7 discusses reference materials.

2. Introduction

Market value for assessment purposes is generally determined through the application of mass appraisal techniques. Mass appraisal is the process of valuing a group of properties as of a given date and using common data, standardized methods, and statistical testing. To determine a parcel's value, assessing officers must rely upon valuation equations, tables, and schedules developed through mathematical analysis of market data. Values for individual parcels should not be based solely on the sale price of a property; rather, valuation schedules and models should be consistently applied to property data that are correct, complete, and up-to-date.

Properly administered, the development, construction, and use of a CAMA system results in a valuation system characterized by accuracy, uniformity, equity, reliability, and low per-parcel costs. Except for unique properties, individual analyses and appraisals of properties are not practical for ad valorem tax purposes.

3. Collecting and Maintaining Property Data

The accuracy of values depends first and foremost on the completeness and accuracy of property characteristics and market data. Assessors will want to ensure that their CAMA systems provide for the collection and maintenance of relevant land, improvement, and location features. These data must also be accurately and consistently collected. The CAMA system must also provide for the storage and processing of relevant sales, cost, and income and expense data.

3.1 Overview

Uniform and accurate valuation of property requires correct, complete, and up-to-date property data. Assessing offices must establish effective procedures for collecting and maintaining property data (i.e., property ownership, location, size, use, physical characteristics, sales price, rents, costs, and operating expenses). Such data are also used for performance audits, defense of appeals, public relations, and management information. The following sections recommend procedures for collecting these data.

3.2 Geographic Data

Assessors should maintain accurate, up-to-date cadastral maps (also known as assessment maps, tax maps, parcel boundary maps, and property ownership maps) covering the entire jurisdiction with a unique identification number for each parcel. Such cadastral maps allow assessing officers to identify and locate all parcels, both in the field and in the office. Maps become especially valuable in the mass appraisal process when a geographic information system (GIS) is used. A GIS permits graphic displays of sale prices, assessed values, inspection dates, work assignments, land uses, and much more. In addition, a GIS permits high-level analysis of nearby sales, neighborhoods, and market trends; when linked to a CAMA system, the results can be very useful. For additional information on cadastral maps, parcel identification systems, and GIS, see the *Standard on Manual Cadastral Maps and Parcel Identifiers* (IAAO 2016b), *Standard on Digital Cadastral Maps and Parcel Identifiers* (IAAO 2015), *Procedures and Standards for a Multipurpose Cadastre* (National Research Council 1983), and *GIS Guidelines for Assessors* (URISA and IAAO 1999).

3.3 Property Characteristics Data

The assessor should collect and maintain property characteristics data sufficient for classification, valuation, and other purposes. Accurate valuation of real property by any method requires descriptions of land and building characteristics.

3.3.1 Selection of Property Characteristics Data

Property characteristics to be collected and maintained should be based on the following:

- Factors that influence the market in the locale in question
- Requirements of the valuation methods that will be employed
- Requirements of classification and property tax policy
- Requirements of other governmental and private users
- Marginal benefits and costs of collecting and maintaining each property characteristic

Determining what data on property characteristics to collect and maintain for a CAMA system is a crucial decision with long-term consequences. A pilot program is one means of evaluating the benefits and costs of collecting and maintaining a particular set of property characteristics (see Gloudehans and Almy 2011, 46–49). In addition, much can be learned from studying the data used in successful CAMAs in other jurisdictions. Data collection and maintenance are usually the costliest aspects of a CAMA. Collecting data that are of little

STANDARD ON MASS APPRAISAL OF REAL PROPERTY—2017

importance in the assessment process should be avoided unless another governmental or private need is clearly demonstrated.

The quantity and quality of existing data should be reviewed. If the data are sparse and unreliable, a major canvass will be necessary. Data that have been confirmed to be reliable should be used whenever possible. New valuation programs or enhancements requiring major canvass activity or conversions to new coding formats should be viewed with suspicion when the existing database already contains most major property characteristics and is of generally good quality.

The following property characteristics are usually important in predicting residential property values:

Improvement Data

- Living area
- Construction quality or key components thereof (foundation, exterior wall type, and the like)
- Effective age or condition
- Building design or style
- Secondary areas including basements, garages, covered porches, and balconies
- Building features such as bathrooms and central air-conditioning
- Significant detached structures including guest houses, boat houses, and barns

Land Data

- Lot size
- Available utilities (sewer, water, electricity)

Location Data

- Market area
- Submarket area or neighborhood
- Site amenities, especially view and golf course or water frontage
- External nuisances, (e.g., heavy traffic, airport noise, or proximity to commercial uses).

For a discussion of property characteristics important for various commercial property types, see *Fundamentals of Mass Appraisal* (Gloudeamans and Almy 2011, chapter 9).

3.3.2 Data Collection

Collecting property characteristics data is a critical and expensive phase of reappraisal. A successful data collection program requires clear and standard coding and careful monitoring through a quality control program. The development and use of a data collection manual is essential to achieving accurate and consistent data collection. The data collection program should result in complete and accurate data.

3.3.2.1 Initial Data Collection

A physical inspection is necessary to obtain initial property characteristics data. This inspection can be performed either by appraisers or by specially trained data collectors. In a joint approach, experienced appraisers make key subjective decisions, such as the assignment of construction quality class or grade, and data collectors gather all other details. Depending on the data required, an interior inspection might be necessary. At a minimum, a comprehensive exterior inspection should be conducted. Measurement is an important part of data collection.

3.3.2.2 Data Collection Format

Data should be collected in a prescribed format designed to facilitate both the collecting of data in the field and the entry of the data into the computer system.

A logical arrangement of the collection format makes data collection easier. For example, all items requiring an interior inspection should be grouped together. The coding of data should be as objective as possible, with measurements, counts, and check-off items used in preference to items requiring subjective evaluations (such as "number of plumbing fixtures" versus "adequacy of plumbing: poor, average, good"). With respect to check-off items, the available codes should be exhaustive and mutually exclusive, so that exactly one code logically pertains to each observable variation of a building feature (such as structure or roof type). The data collection format should promote consistency among data collectors, be clear and easy to use, and be adaptable to virtually all types of construction. Specialized data collection formats may be necessary to collect information on agricultural property, timberland, commercial and industrial parcels, and other property types.

3.3.2.3 Data Collection Manuals

A clear, thorough, and precise data collection manual is essential and should be developed, updated, and maintained. The written manual should explain how to collect and record each data item. Pictures, examples, and illustrations are particularly helpful. The manual should be simple yet complete. Data collection staff should be trained in the use of the manual and related updates to maintain consistency. The manual should include guidelines for personal conduct during field inspections, and if interior data are required, the manual should outline procedures to be followed when the property owner has denied access or when entry might be risky.

3.3.2.4 Data Accuracy Standards

The following standards of accuracy for data collection are recommended.

- Continuous or area measurement data, such as living area and exterior wall height, should be accurate within 1 foot (rounded to the nearest foot) of the true dimensions or within 5 percent of the area. (One foot equates to approximately 30 centimeters in the metric system.) If areas, dimensions, or volumes must be estimated, the property record should note the instances in which quantities are estimated.
- For each objective, categorical, or binary data field to be collected or verified, at least 95 percent of the coded entries should be accurate. Objective, categorical, or binary data characteristics include such attributes as exterior wall material, number of full bathrooms, and waterfront view. As an example, if a data collector captures 10 objective, categorical, or binary data items for 100 properties, at least 950 of the 1,000 total entries should be correct.
- For each subjective categorical data field collected or verified, data should be coded correctly at least 90 percent of the time. Subjective categorical data characteristics include data items such as quality grade, physical condition, and architectural style.
- Regardless of specific accuracy requirements, consistent measurement is important. Standards including national, local and regional practices exist to support consistent measurement. The standard of measurement should be documented as part of the process. (American Institute of Architects 1995; Marshall & Swift Valuation Service 2017; International Property Measurement Standards Coalition n.d.; Building Owners and Managers Association International 2017)

3.3.2.5 Data Collection Quality Control

A quality control program is necessary to ensure that data accuracy standards are achieved and maintained. Independent quality control inspections should occur immediately after the data collection phase begins and may be performed by jurisdiction staff, project consultants,

STANDARD ON MASS APPRAISAL OF REAL PROPERTY—2017

auditing firms, or oversight agencies. The inspections should review random samples of finished work for completeness and accuracy and keep tabulations of items coded correctly or incorrectly, so that statistical tests can be used to determine whether accuracy standards have been achieved. Stratification by geographic area, property type, or individual data collector can help detect patterns of data error. Data that fail to meet quality control standards should be recollected.

The accuracy of subjective data should be judged primarily by conformity with written specifications and examples in the data collection manual. The data reviewer should substantiate subjective data corrections with pictures or field notes.

3.3.3 Data Entry

To avoid duplication of effort, the data collection form should be able to serve as the data entry form. Data entry should be routinely audited to ensure accuracy.

Data entry accuracy should be as close to 100 percent as possible and should be supported by a full set of range and consistency edits. These are error or warning messages generated in response to invalid or unusual data items. Examples of data errors include missing data codes and invalid characters. Warning messages should also be generated when data values exceed normal ranges (e.g., more than eight rooms in a 1,200-square-foot residence). The warnings should appear as the data are entered. When feasible, action on the warnings should take place during data entry. Field data entry devices provide the ability to edit data as it is entered and also eliminate data transcription errors.

3.3.4 Maintaining Property Characteristics Data

Property characteristics data should be continually updated in response to changes brought about by new construction, new parcels, remodeling, demolition, and destruction. There are several ways of updating data. The most efficient method involves building permits. Ideally, strictly enforced local ordinances require building permits for all significant construction activity, and the assessor's office receives copies of the permits. This method allows the assessor to identify properties whose characteristics are likely to change, to inspect such parcels on a timely basis (preferably as close to the assessment date as possible), and to update the files accordingly.

Another method is aerial photography, which also can be helpful in identifying new or previously unrecorded construction and land use.

Some jurisdictions use self-reporting, in which property owners review the assessor's records and submit additions or corrections. Information derived from multiple listing sources and other third-party vendors can also be used to validate property records.

Periodic field inspections can help ensure that property characteristics data are complete and accurate. Assuming that most new construction activity is identified through building permits or other ongoing procedures, a physical review including an on-site verification of property characteristics should be conducted at least every 4 to 6 years. Reinspections should include partial remeasurement of the two most complex sides of improvements and a walk around the improvement to identify additions and deletions. Photographs taken at previous physical inspections can help identify changes.

3.3.5 Alternative to Periodic On-site Inspections

Provided that initial physical inspections are timely completed and that an effective system of building permits or other methods of routinely identifying physical changes is in place, jurisdictions may employ a set of digital imaging technology tools to supplement field reinspections

with a computer-assisted office review. These imaging tools should include the following:

- Current high-resolution street-view images (at a sub-inch pixel resolution that enables quality grade and physical condition to be verified)
- Orthophoto images (minimum 6-inch pixel resolution in urban/suburban and 12-inch resolution in rural areas, updated every 2 years in rapid-growth areas or 6–10 years in slow-growth areas)
- Low-level oblique images capable of being used for measurement verification (four cardinal directions, minimum 6-inch pixel resolution in urban/suburban and 12-inch pixel resolution in rural areas, updated every 2 years in rapid-growth areas or 6–10 years in slow-growth areas).

These tool sets may incorporate change detection techniques that compare building dimension data (footprints) in the CAMA system to georeferenced imagery or remote sensing data from sources (such as LiDAR [light detection and ranging]) and identify potential CAMA sketch discrepancies for further investigation.

Assessment jurisdictions and oversight agencies must ensure that images meet expected quality standards. Standards required for vendor-supplied images should be spelled out in the Request for Proposal (RFP) and contract for services, and images should be checked for compliance with specified requirements. For general guidance on preparing RFPs and contracting for vendor-supplied services, see the *Standard on Contracting for Assessment Services* [IAAO 2008].

In addition, appraisers should visit assigned areas on an annual basis to observe changes in neighborhood condition, trends, and property characteristics. An on-site physical review is recommended when significant construction changes are detected, a property is sold, or an area is affected by catastrophic damage. Building permits should be regularly monitored and properties that have significant change should be inspected when work is complete.

3.4 Sale Data

States and provinces should seek mandatory disclosure laws to ensure comprehensiveness of sale data files. Regardless of the availability of such statutes, a file of sale data must be maintained, and sales must be properly reviewed and validated. Sale data are required in all applications of the sales comparison approach, in the development of land values and market-based depreciation schedules in the cost approach, and in the derivation of capitalization rates or discount rates in the income approach. Refer to *Mass Appraisal of Real Property* (Gloude-mans 1999, chapter 2) or *Fundamentals of Mass Appraisal* (Gloude-mans and Almy 2011 chapter 2) for guidelines on the acquisition and processing of sale data.

3.5 Income and Expense Data

Income and expense data must be collected for income-producing property and reviewed by qualified appraisers to ensure their accuracy and usability for valuation analysis (see Section 4.4.). Refer to *Mass Appraisal of Real Property* (Gloude-mans 1999, chapter 2) or *Fundamentals of Mass Appraisal* (Gloude-mans and Almy 2011, chapter 2) for guidelines addressing the collection and processing of income and expense data.

3.6 Cost and Depreciation Data

Current cost and depreciation data adjusted to the local market are required for the cost approach (see Section 4.2). Cost and depreciation manuals and schedules can be purchased from commercial services or created in-house. See *Mass Appraisal of Real Property* (Gloude-mans 1999, chapter 4) or *Fundamentals of Mass Appraisal* (Gloude-mans and Almy 2011, 180–193) for guidelines on creating manuals and schedules.

4. Valuation

Mass appraisal analysis begins with assigning properties to use classes or strata based on highest and best use, which normally equates to current use. Some statutes require that property be valued for ad valorem tax purposes at current use regardless of highest and best use. Zoning and other land use controls normally dictate highest and best use of vacant land. In the absence of such restrictions, the assessor must determine the highest and best use of the land by analyzing the four components—legally permissible, physically possible, appropriately supported, and financially feasible—thereby resulting in the highest value. Special attention may be required for properties in transition, interim or nonconforming uses, multiple uses, and excess land.

4.1 Valuation Models

Any appraisal, whether single-property appraisal or mass appraisal, uses a model, that is, a representation in words or an equation of the relationship between value and variables representing factors of supply and demand. Mass appraisal models attempt to represent the market for a specific type of property in a specified area. Mass appraisers must first specify the model, that is, identify the supply and demand factors and property features that influence value, for example, square feet of living area. Then they must calibrate the model, that is, determine the adjustments or coefficients that best represent the value contribution of the variables chosen, for example, the dollar amount the market places on each square foot of living area. Careful and extensive market analysis is required for both specification and calibration of a model that estimates values accurately. Mass appraisal models apply to all three approaches to value: the cost approach, the sales comparison approach, and the income approach.

Valuation models are developed for defined property groups. For residential properties, geographic stratification is appropriate when the value of property attributes varies significantly among areas and each area is large enough to provide adequate sales. It is particularly effective when housing types and styles are relatively uniform within areas. Separate models are developed for each market area (also known as economic or model areas). Subareas or neighborhoods can serve as variables in the models and can also be used in land value tables and selection of comparable sales. (See *Mass Appraisal of Real Property* [Gloude-mans 1999, 118–120] or *Fundamentals of Mass Appraisal* [Gloude-mans and Almy 2011, 139–143] for guidelines on stratification.) Smaller jurisdictions may find it sufficient to develop a single residential model.

Commercial and income-producing properties should be stratified by property type. In general, separate models should be developed for apartment, warehouse/industrial, office, and retail properties. Large jurisdictions may be able to stratify apartment properties further by type or area or to develop multiple models for other income properties with adequate data.

4.2 The Cost Approach

The cost approach is applicable to virtually all improved parcels and, if used properly, can produce accurate valuations. The cost approach is more reliable for newer structures of standard materials, design, and workmanship. It produces an estimate of the value of the fee simple interest in a property.

Reliable cost data are imperative in any successful application of the cost approach. The data must be complete, typical, and current. Current construction costs should be based on the cost of replacing a structure with one of equal utility, using current materials, design, and building standards. In addition to specific property types, cost models should

include the cost of individual construction components and building items in order to adjust for features that differ from base specifications. These costs should be incorporated into a construction cost manual and related computer software. The software can perform the valuation function, and the manual, in addition to providing documentation, can be used when nonautomated calculations are required.

Construction cost schedules can be developed in-house, based on a systematic study of local construction costs, obtained from firms specializing in such information, or custom-generated by a contractor. Cost schedules should be verified for accuracy by applying them to recently constructed improvements of known cost. Construction costs also should be updated before each assessment cycle.

The most difficult aspects of the cost approach are estimates of land value and accrued depreciation. These estimates must be based on non-cost data (primarily sales) and can involve considerable subjectivity. Land values used in the cost approach must be current and consistent. Often, they must be extracted from sales of improved property because sales of vacant land are scarce. Section 4.5 provides standards for land valuation in mass appraisal.

Depreciation schedules can be extracted from sales data in several ways. See *Mass Appraisal of Real Property* (Gloude-mans 1999, chapter 4) or *Fundamentals of Mass Appraisal* (Gloude-mans and Almy 2011, 189–192).

4.3 The Sales Comparison Approach

The sales comparison approach estimates the value of a subject property by statistically analyzing the sale prices of similar properties. This approach is usually the preferred approach for estimating values for residential and other property types with adequate sales.

Applications of the sales comparison approach include direct market models and comparable sales algorithms (see *Mass Appraisal of Real Property* [Gloude-mans 1999, chapters 3 and 4], *Fundamentals of Mass Appraisal* [Gloude-mans and Almy 2011, chapters 4 and 6], and the *Standard on Automated Valuation Models (AVMs)* [IAAO 2003]). Comparable sales algorithms are most akin to single-property appraisal applications of the sales comparison approach. They have the advantages of being familiar and easily explained and can compensate for less well-specified or calibrated models, because the models are used only to make adjustments to the selected comparables. They can be problematic if the selected comparables are not well validated or representative of market value. Because they predict market value directly, direct market models depend more heavily on careful model specification and calibration. Their advantages include efficiency and consistency, because the same model is directly applied against all properties in the model area.

Users of comparable sales algorithms should be aware that sales ratio statistics will be biased if sales used in the ratio study are used as comparables for themselves in model development. This problem can be avoided by (1) not using sales as comparables for themselves in modeling or (2) using holdout or later sales in ratio studies.

4.4 The Income Approach

In general, for income-producing properties, the income approach is the preferred valuation approach when reliable income and expense data are available, along with well-supported income multipliers, overall rates, and required rates of return on investment. Successful application of the income approach requires the collection, maintenance, and careful analysis of income and expense data.

Mass appraisal applications of the income approach begin with collecting and processing income and expense data. (These data should be expressed on an appropriate per-unit basis, such as per square foot or per apartment unit.) Appraisers should then compute normal or typical gross incomes, vacancy rates, net incomes, and expense ratios for various homogeneous strata of properties. These figures can be used to judge the reasonableness of reported data for individual parcels and to estimate income and expense figures for parcels with unreported data. Actual or

STANDARD ON MASS APPRAISAL OF REAL PROPERTY—2017

reported figures can be used as long as they reflect typical figures (or typical figures can be used for all properties).

Alternatively, models for estimating gross or net income and expense ratios can be developed by using actual income and expense data from a sample of properties and calibrated by using multiple regression analysis. For an introduction to income modeling, see *Mass Appraisal of Real Property* (Gloudeans 1999, chapter 3) or *Fundamentals of Mass Appraisal* (Gloudeans and Almy 2011, chapter 9). The developed income figures can be capitalized into estimates of value in a number of ways. The most direct method involves the application of gross income multipliers, which express the ratio of market value to gross income. At a more refined level, net income multipliers or their reciprocals, overall capitalization rates, can be developed and applied. Provided there are adequate sales, these multipliers and rates should be extracted from a comparison of actual or estimated incomes with sale prices (older income and sales data should be adjusted to the valuation date as appropriate). Income multipliers and overall rates developed in this manner tend to provide reliable, consistent, and readily supported valuations when good sales and income data are available. When adequate sales are not available, relevant publications and local market participants can be consulted.

4.5 Land Valuation

State or local laws may require the value of an improved parcel to be separated into land and improvement components. When the sales comparison or income approach is used, an independent estimate of land value can be made and subtracted from the total property value to obtain a residual improvement value. Some computerized valuation techniques provide a separation of total value into land and building components.

Land values should be reviewed annually. At least once every 4 to 6 years the properties should be physically inspected and revalued. The sales comparison approach is the primary approach to land valuation and is always preferred when sufficient sales are available. In the absence of adequate sales, other techniques that can be used in land appraisal include allocation, abstraction, anticipated use, capitalization of ground rents, and land residual capitalization. (See *Mass Appraisal of Real Property* [Gloudeans 1999, chapter 3] or *Fundamentals of Mass Appraisal* [Gloudeans and Almy 2011, 178–180].)

4.6 Considerations by Property Type

The appropriateness of each valuation approach varies with the type of property under consideration. Table 1 ranks the relative usefulness of the three approaches in the mass appraisal of major types of properties. The table assumes that there are no major statutory barriers to using all three approaches or to obtaining cost, sales, and income data. Although relying only on the single best approach for a given type of property can have advantages in terms of efficiency and consistency, the use of two or more approaches provides helpful cross-checks and flexibility and can thus produce greater accuracy, particularly for less typical properties.

Table 1. Rank of typical usefulness of the three approaches to value in the mass appraisal of major types of property

Type of Property	Cost Approach	Sales Comparison Approach	Income Approach
Single-family residential	2	1	3
Multifamily residential	3	1, 2	1, 2
Commercial	3	2	1
Industrial	1, 2	3	1, 2
Nonagricultural land	—	1	2
Agricultural ^a	—	2	1
Special purpose ^b	1	2, 3	2, 3

^a Includes farm, ranch, and forest properties.

^b Includes institutional, governmental, and recreation properties.

4.6.1 Single-Family Residential Property

The sales comparison approach is the best approach for single-family residential property, including condominiums. Automated versions of this approach are highly efficient and generally accurate for the majority of these properties. The cost approach is a good supplemental approach and should serve as the primary approach when the sales data available are inadequate. The income approach is usually inappropriate for mass appraisal of single-family residential properties, because most of these properties are not rented.

4.6.2 Manufactured Housing

Manufactured or mobile homes can be valued in a number of ways depending on the local market and ownership status. Often mobile homes are purchased separately and situated on a rented space in a mobile home park. In this case the best strategy is to model the mobile homes separately from the land. At other times mobile homes are situated on individual lots and bought and sold similar to stick-built homes. Particularly in rural areas they may be intermixed with stick-built homes. In these cases, they can be modeled in a manner similar to that for other residential properties and included in the same models, as long as the model includes variables to distinguish them and recognize any relevant differences from other homes (e.g., mobile homes may appreciate at a rate different from that for stick-built homes).

4.6.3 Multifamily Residential Property

The sales comparison and income approaches are preferred in valuing multifamily residential property when sufficient sales and income data are available. Multiple regression analysis (MRA) and related techniques have been successfully used in valuing this property type. Where adequate sales are available, direct sales models can be used. MRA also can be used to calibrate different portions of the income approach, including the estimation of market rents and development of income multipliers or capitalization rates. As with other residential property, the cost approach is useful in providing supplemental valuations and can serve as the primary approach when good sales and income data are not available.

4.6.4 Commercial and Industrial Property

The income approach is the most appropriate method in valuing commercial and industrial property if sufficient income data are available. Direct sales comparison models can be equally effective in large jurisdictions with sufficient sales. When a sufficient supply of sales data and income data is not available, the cost approach should be

STANDARD ON MASS APPRAISAL OF REAL PROPERTY—2017

applied. However, values generated should be checked against available sales data. Cost factors, land values, and depreciation schedules must be kept current through periodic review.

4.6.5 Nonagricultural Land

The sales comparison approach is preferred for valuing nonagricultural land. Application of the sales comparison approach to vacant land involves the collection of sales data, the posting of sales data on maps, the calculation of standard unit values (such as value per square foot, per front foot, or per parcel) by area and type of land use, and the development of land valuation maps or computer-generated tables in which the pattern of values is displayed. When vacant land sales are not available or are few, additional benchmarks can be obtained by subtracting the replacement cost new less depreciation of improvements from the sale prices of improved parcels. The success of this technique requires reliable cost data and tends to work best for relatively new improvements, for which depreciation is minimal.

Another approach is a *hybrid* model decomposable into land and building values. Although these models can be calibrated from improved sales alone, separation of value between land and buildings is more reliable when both vacant and improved sales are available.

4.6.6 Agricultural Property

If adequate sales data are available and agricultural property is to be appraised at market value, the sales comparison approach is preferred. However, most states and provinces provide for the valuation of agricultural land at use value, making the sales comparison approach inappropriate for land for which market value exceeds use value. Thus, it is often imperative to obtain good income data and to use the income approach for agricultural land. Land rents are often available, sometimes permitting the development and application of overall capitalization rates. Many states and provinces have soil maps that assign land to different productivity classes for which typical rents can be developed. Cost tables can be used to value agricultural buildings.

4.6.7 Special-Purpose Property

The cost approach tends to be most appropriate in the appraisal of special-purpose properties, because of the distinctive nature of such properties and the general absence of adequate sales or income data.

4.7 Value Reconciliation

When more than one approach or model is used for a given property group, the appraiser must determine which to use or emphasize. Often this can be done by comparing ratio study statistics. Although there are advantages to being consistent, sometimes an alternative approach or method is more reliable for special situations and atypical properties. CAMA systems should allow users to document the approach or method being used for each property.

4.8 Frequency of Reappraisals

Section 4.2.2 of the *Standard on Property Tax Policy* (IAAO 2010) states that current market value implies annual assessment of all property. Annual assessment does not necessarily mean, however, that each property must be re-examined each year. Instead, models can be recalibrated, or market adjustment factors derived from ratio studies or other market analyses applied based on criteria such as property type, location, size, and age.

Analysis of ratio study data can suggest groups or strata of properties in greatest need of physical review. In general, market adjustments can be highly effective in maintaining equity when appraisals are uniform within strata and recalibration can provide even greater accuracy. However, only physical reviews can correct data errors and, as stated in

Sections 3.3.4 and 3.3.5, property characteristics data should be reviewed and updated at least every 4 to 6 years. This can be accomplished in at least three ways:

- Reinspecting all property at periodic intervals (i.e., every 4 to 6 years)
- Reinspecting properties on a cyclical basis (e.g., one-fourth or one-sixth each year)
- Reinspecting properties on a priority basis as indicated by ratio studies or other considerations while still ensuring that all properties are examined at least every sixth year

5. Model Testing, Quality Assurance, and Value Defense

Mass appraisal allows for model testing and quality assurance measures that provide feedback on the reliability of valuation models and the overall accuracy of estimated values. Modelers and assessors must be familiar with these diagnostics so they can evaluate valuation performance properly and make improvements where needed.

5.1 Model Diagnostics

Modeling software contains various statistical measures that provide feedback on model performance and accuracy. MRA software contains multiple sets of diagnostic tools, some of which relate to the overall predictive accuracy of the model and some of which relate to the relative importance and statistical reliability of individual variables in the model. Modelers must understand these measures and ensure that final models not only make appraisal sense but also are statistically sound.

5.2 Sales Ratio Analyses

Regardless of how values were generated, sales ratio studies provide objective, bottom-line indicators of assessment performance. The IAAO literature contains extensive discussions of this important topic, and the *Standard on Ratio Studies* (2013) provides guidance for conducting a proper study. It also presents standards for key ratio statistics relating to the two primary aspects of assessment performance: level and uniformity. The following discussion summarizes these standards and describes how the assessor can use sales ratio metrics to help ensure accurate, uniform values.

5.2.1 Assessment Level

Assessment level relates to the overall or general level of assessment of a jurisdiction and various property classes, strata, and groups within the jurisdiction. Each group must be assessed at market value as required by professional standards and applicable statutes, rules, and related requirements. The three common measures of central tendency in ratio studies are the median, mean, and weighted mean. The *Standard on Ratio Studies* (2013) stipulates that the median ratio should be between 0.90 and 1.10 and provides criteria for determining whether it can be concluded that the standard has not been achieved for a property group. Current, up-to-date valuation models, schedules, and tables help ensure that assessment levels meet required standards, and values can be statistically adjusted between full reappraisals or model recalibrations to ensure compliance.

5.2.2 Assessment Uniformity

Assessment uniformity relates to the consistency and equity of values. Uniformity has several aspects, the first of which relates to consistency in assessment levels between property groups. It is important to ensure, for example, that residential and commercial properties are appraised at similar percentages of market value (regardless of the legal assessment ratios that may then be applied) and that residential assessment levels are consistent among neighborhoods, construction classes, age groups, and size groups. Consistency among property groups can be evaluated by comparing measures of central tendency calculated for each group.

STANDARD ON MASS APPRAISAL OF REAL PROPERTY—2017

Various graphs can also be used for this purpose. The *Standard on Ratio Studies* (IAAO 2013) stipulates that the level of appraisal for each major group of properties should be within 5 percent of the overall level for the jurisdiction and provides criteria for determining whether it can be concluded from ratio data that the standard has not been met.

Another aspect of uniformity relates to the consistency of assessment levels within property groups. There are several such measures, the preeminent of which is the coefficient of dispersion (COD), which represents the average percentage deviation from the median ratio. The lower the COD, the more uniform the ratios within the property group. In addition, uniformity can be viewed spatially by plotting sales ratios on thematic maps.

The *Standard on Ratio Studies* (IAAO 2013) provides the following standards for the COD:

- Single-family homes and condominiums: CODs of 5 to 10 for newer or fairly similar residences and 5 to 15 for older or more heterogeneous areas
- Income-producing properties: CODs of 5 to 15 in larger, urban areas and 5 to 20 in other areas
- Vacant land: CODs of 5 to 20 in urban areas and 5 to 25 in rural or seasonal recreation areas
- Rural residential, seasonal, and manufactured homes: CODs of 5 to 20.

The entire appraisal staff must be aware of and monitor compliance with these standards and take corrective action where necessary. Poor uniformity within a property group is usually indicative of data problems or deficient valuation procedures or tables and cannot be corrected by application of market adjustment factors.

A final aspect of assessment uniformity relates to equity between low- and high-value properties. Although there are statistical subtleties that can bias evaluation of price-related uniformity, the IAAO literature (see particularly *Fundamentals of Mass Appraisal* [Gloudemans and Almy 2011, 385–392 and Appendix B] and the *Standard on Ratio Studies* [IAAO 2013]) provides guidance and relevant measures, namely, the price-related differential (PRD) and coefficient of price-related bias (PRB).

The PRD provides a simple gauge of price-related bias. The *Standard on Ratio Studies* (IAAO 2013) calls for PRDs of 0.98 to 1.03. PRDs below 0.98 tend to indicate assessment progressivity, the condition in which assessment ratios increase with price. PRDs above 1.03 tend to indicate assessment regressivity, in which assessment ratios decline with price.

The PRB indicates the percentage by which assessment ratios change whenever values double or are halved. For example, a PRB of -0.03 would mean that assessment levels fall by 3 percent when value doubles. The *Standard on Ratio Studies* calls for PRBs of -0.05 to $+0.05$ and regards PRBs outside the range of -0.10 to $+0.10$ as unacceptable.

Because price is observable only for sale properties, there is no easy correction for the PRB, which is usually due to problems in valuation models and schedules. Sometimes other ratio study diagnostics will provide clues. For example, high ratios for lower construction classes may indicate that base rates should be reduced for those classes, which should in turn improve assessment ratios for low-value properties.

5.3 Holdout Samples

Holdout samples are validated sales that are not used in valuation but instead are used to test valuation performance. Holdout samples should be randomly selected with a view to obtaining an adequate sample while ensuring that the number of sales available for valuation will provide

reliable results for the range of properties that must be valued (holdout samples of 10 to 20 percent are typical). If too few sales are available, later sales can be validated and used for the same purpose. (For a method of using sales both to develop and test valuation models, see "The Use of Cross-validation in CAMA Modeling to Get the Most Out of Sales" [Jensen 2011].)

Since they were not used in valuation, holdout samples can provide more objective measures of valuation performance. This can be particularly important when values are not based on a common algorithm as cost and MRA models are. Manually assigning land values, for example, might produce sales ratio statistics that appear excellent but are not representative of broader performance for both sold and unsold properties. Comparable sales models that value a sold property using the sale of a property as a comparable for itself can produce quite different results when tested on a holdout group.

When a new valuation approach or technique is used for the first time, holdout sales can be helpful in validating use of the new method. In general, however, holdout samples are unnecessary as long as valuation models are based on common algorithms and schedules and the value assigned to a sale property is not a function of its price. Properly validated later sales can provide follow-up performance indicators without compromising the number of sales available for valuation.

5.4 Documentation

Valuation procedures and models should be documented. Appraisal staff should have at least a general understanding of how the models work and the various rates and adjustments made by the models. Cost manuals should be current and contain the rates and adjustments used to value improvements by the cost approach. Similarly, land values should be supported by tables of rates and adjustments for features such as water frontage, traffic, and other relevant influences. MRA models and other sales comparison algorithms should document final equations and should be reproducible, so that rerunning the model produces the same value. Schedules of rental rates, vacancy rates, expense ratios, income multipliers, and capitalization rates should document how values based on the income approach were derived.

It can be particularly helpful to prepare a manual, booklet, or report for each major property type that provides a narrative summary of the valuation approach and methodology and contains at least the more common rates and adjustments. Examples of how values were computed for sample properties can be particularly helpful. The manuals serve as a resource for current staff and can be helpful in training new staff or explaining the valuation process to other interested parties. Once prepared, the documents should be updated when valuation schedules change or methods and calculation procedures are revised.

5.5 Value Defense

The assessment office staff must have confidence in the appraisals and be able to explain and defend them. This confidence begins with application of reliable appraisal techniques, generation of appropriate valuation reports, and review of preliminary values. It may be helpful to have reports that list each parcel, its characteristics, and its calculated value. Parcels with unusual characteristics, extreme values, or extreme changes in values should be identified for subsequent individual review. Equally important, summary reports should show average values, value changes, and ratio study statistics for various strata of properties. These should be reviewed to ensure the overall consistency of values for various types of property and various locations. (See the *Uniform Standards of Professional Appraisal Practice*, Standards Rule 6-7, for reporting requirements for mass appraisals [The Appraisal Foundation 2012–2013].)

The staff should also be prepared to support individual valuations as required, preferably through comparable sales. At a minimum, staff should be able to produce a property record and explain the basic

STANDARD ON MASS APPRAISAL OF REAL PROPERTY—2017

approach (cost, sales comparison, or income) used to estimate the value of the property. A property owner should never be told simply that “the computer” or “the system” produced the appraisal. In general, the staff should tailor the explanation to the taxpayer’s knowledge and expertise. Equations converted to tabular form can be used to explain the basis for valuation. In all cases, the assessment office staff should be able to produce sales or appraisals of similar properties in order to support (or at least explain) the valuation of the property in question. Comparable sales can be obtained from reports that list sales by such features as type of property, area, size, and age. Alternatively, interactive programs can be obtained or developed that identify and display the most comparable properties.

Assessors should notify property owners of their valuations in sufficient time for property owners to discuss their appraisals with the assessor and appeal the value if they choose to do so (see the *Standard on Public Relations* [IAAO 2011]). Statutes should provide for a formal appeals process beyond the assessor’s level (see the *Standard on Assessment Appeal* [IAAO 2016a]).

6. Managerial and Space Considerations

6.1 Overview

Mass appraisal requires staff, technical, and other resources. This section discusses certain key managerial and facilities considerations.

6.2 Staffing and Space

A successful in-house appraisal program requires trained staff and adequate facilities in which to work and meet with the public.

6.2.1 Staffing

Staff should comprise persons skilled in general administration, supervision, appraisal, mapping, data processing, and secretarial and clerical functions. Typical staffing sizes and patterns for jurisdictions of various sizes are illustrated in *Fundamentals of Mass Appraisal* (Gloudemans and Almy 2011, 22–25). Staffing needs can vary significantly based on factors such as frequency of reassessments.

6.2.2 Space Considerations

The following minimum space standards are suggested for managerial, supervisory, and support staff:

- *Chief assessing officer (e.g., Assessor, director)*—a private office, enclosed by walls or windows extending to the ceiling, of 200 square feet (18 to 19 square meters)
- *Management position (e.g., chief deputy assessor, head of a division in a large jurisdiction, and so on)*—a private office, enclosed by walls or windows extending to the ceiling, of 170 square feet (15 to 16 square meters)
- *Supervisory position (head of a section, unit, or team of appraisers, mappers, analysts, technicians, or clerks)*—a private office or partitioned space of 150 square feet (14 square meters)
- *Appraisers and technical staff*—private offices or at least partitioned, quiet work areas of 50 to 100 square feet (5 to 10 square meters), not including aisle and file space, with a desk and chair
- *Support staff*—adequate workspace, open or partitioned, to promote intended work functions and access.

In addition, there should be adequate space for

- File storage and access
- Training and meetings

- Mapping and drafting
- Public service areas
- Printing and photocopy equipment
- Library facilities.

6.3 Data Processing Support

CAMAs require considerable data processing support.

6.3.1 Hardware

The hardware should be powerful enough to support applications of the cost, sales comparison, and income approaches, as well as data maintenance and other routine operations. Data downloading, mass calculations, GIS applications, and Web support tend to be the most computer-intensive operations. Processing speed and efficiency requirements should be established before hardware acquisition. Computer equipment can be purchased, leased, rented, or shared with other jurisdictions. If the purchase option is chosen, the equipment should be easy to upgrade to take advantage of technological developments without purchasing an entirely new system.

6.3.2 Software

CAMA software can be developed internally, adapted from software developed by other public agencies, or purchased (in whole or in part) from private vendors. (Inevitably there will be some tailoring needed to adapt externally developed software to the requirements of the user’s environment.) Each alternative has advantages and disadvantages. The software should be designed so that it can be easily modified; it should also be well documented, at both the appraiser/user and programmer levels.

CAMA software works in conjunction with various general-purpose software, typically including word processing, spreadsheet, statistical, and GIS programs. These programs and applications must be able to share data and work together cohesively.

Security measures should exist to prevent unauthorized use and to provide backup in the event of accidental loss or destruction of data.

6.3.2.1 Custom Software

Custom software is designed to perform specific tasks, identified by the jurisdiction, and can be specifically tailored to the user’s requirements. The data screens and processing logic can often be customized to reflect actual or desired practices, and the prompts and help information can be tailored to reflect local terminology and convention.

After completing the purchase or license requirements, the jurisdiction should retain access to the program source code, so other programmers are able to modify the program to reflect changing requirements.

The major disadvantages of custom software are the time and expense of writing, testing, and updating. Particular attention must be paid to ensuring that user requirements are clearly conveyed to programmers and reflected in the end product, which should not be accepted until proper testing has been completed. Future modifications to programs, even those of a minor nature, can involve system administrator approval and can be a time-consuming, costly, and rigorous job. (See *Standard on Contracting for Assessment Services* [IAAO 2008].)

6.3.2.2 Generic Software

An alternative to custom software is generic software, of which there are two major types: vertical software, which is written for a specific industry, and horizontal software, which is written for particular applications regardless of industry. Examples of the latter include database, spreadsheet, word processing, and statistical software. Although the actual instruction code within these programs cannot be modified, they typically permit the user to create a variety of customized

STANDARD ON MASS APPRAISAL OF REAL PROPERTY—2017

templates, files, and documents that can be processed. These are often referred to as commercial off-the-shelf software (COTS) packages.

Generic vertical software usually requires modification to fit a jurisdiction's specific needs. In considering generic software, the assessor should determine

- System requirements
- The extent to which the software meets the agency's needs
- A timetable for implementation
- How modifications will be accomplished
- The level of vendor support
- Whether the source code can be obtained.

(See Standard on Contracting for Assessment Services [IAAO 2008].)

Horizontal generic software is more flexible, permitting the user to define file structures, relational table layout, input and output procedures, including form or format, and reports. Assessment offices with expertise in such software (which does not imply a knowledge of programming) can adapt it for

- Property (data) file maintenance
- Market research and analysis
- Valuation modeling and processing
- Many other aspects of assessment operations.

Horizontal generic software is inexpensive and flexible. However, it requires considerable customization to adapt it to local requirements. Provisions should be made for a sustainable process that is not overly dependent on a single person or resource.

6.4 Contracting for Appraisal Services

Reappraisal contracts can include mapping, data collection, data processing, and other services, as well as valuation. They offer the potential of acquiring professional skills and resources quickly. These skills and resources often are not available internally. Contracting for these services not only can allow the jurisdiction to maintain a modest staff and to budget for reappraisal on a periodic basis, but also makes the assessor less likely to develop in-house expertise. (See the *Standard on Contracting for Assessment Services* [IAAO 2008].)

6.5 Benefit-Cost Considerations

6.5.1 Overview

The object of mass appraisal is to produce equitable valuations at low costs. Improvements in equity often require increased expenditures.

Benefit-cost analysis in mass appraisal involves two major issues: policy and administration.

6.5.2 Policy Issues

An assessment jurisdiction requires a certain expenditure level simply to inventory, list, and value properties. Beyond that point, additional expenditures make possible rapid improvements in equity initially, but marginal improvements in equity diminish as expenditures increase. At a minimum, jurisdictions should budget to meet statutory requirements and the performance standards contained in the *Standard on Ratio Studies* (IAAO 2013) and summarized in Section 5.2.

6.5.3 Administrative Issues

Maximizing equity per dollar of expenditure is the primary responsibility of assessment administration. To maximize productivity, the assessor and managerial staff must effectively plan, budget, organize, and control operations and provide leadership. This must be accomplished within the

office's legal, fiscal, economic, and social environment and constraints (Eckert, Gloudemans, and Kenyon 1990, chapter 16).

7. Reference Materials

Reference materials are needed in an assessment office to promote compliance with laws and regulations, uniformity in operations and procedures, and adherence to generally accepted assessment principles and practices.

7.1 Standards of Practice

The standards of practice may incorporate or be contained in laws, regulations, policy memoranda, procedural manuals, appraisal manuals and schedules, standard treatises on property appraisal and taxation (see section 6.2). Written standards of practice should address areas such as personal conduct, collection of property data, coding of information for data processing. The amount of detail will vary with the nature of the operation and the size of the office.

7.2 Professional Library

Every assessment office should have access to a comprehensive professional library that contains the information staff needs. A resource library may be digital or physical and should include the following:

- Property tax laws and regulations
- IAAO standards
- Historical resources
- Current periodicals
- Manuals and schedules
- Equipment manuals and software documentation.

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STANDARD 5: MASS APPRAISAL, DEVELOPMENT

FAQ See also
FAQ 127-
264

In developing a mass appraisal, an appraiser must identify the problem to be solved, determine the scope of work necessary to solve the problem, and correctly complete research and analyses necessary to produce a credible mass appraisal.

Comment: STANDARD 5 applies to all mass appraisals of real or personal property regardless of the purpose or use of such appraisals.⁵⁶ The reporting and jurisdictional exceptions applicable to public mass appraisals prepared for ad valorem taxation do not apply to mass appraisals prepared for other purposes.

A mass appraisal includes:

- 1) identifying properties to be appraised;
- 2) defining market area of consistent behavior that applies to properties;
- 3) identifying characteristics (supply and demand) that affect the creation of value in that market area;
- 4) developing a model structure that reflects the relationship among the characteristics affecting value in the market area;
- 5) calibrating the model structure to determine the contribution of the individual characteristics affecting value;
- 6) applying the conclusions reflected in the model to the characteristics of the property(ies) being appraised; and
- 7) reviewing the mass appraisal results.

The JURISDICTIONAL EXCEPTION RULE may apply to several sections of STANDARD 5 because ad valorem tax administration is subject to various state, county, and municipal laws.

STANDARDS RULE 5-1, GENERAL DEVELOPMENT REQUIREMENTS

In developing a mass appraisal, an appraiser must:

- (a) be aware of, understand, and correctly employ those recognized methods and techniques necessary to produce a credible mass appraisal;**

Comment: Mass appraisal provides for a systematic approach and uniform application of appraisal methods and techniques to obtain estimates of value that allow for statistical review and analysis of results.

This requirement recognizes that the principle of change continues to affect the manner in which appraisers perform mass appraisals. Changes and developments in the real property and personal property fields have a substantial impact on the appraisal profession.

To keep abreast of these changes and developments, the appraisal profession is constantly reviewing and revising appraisal methods and techniques and devising new methods and techniques to meet new circumstances. For this reason it is not sufficient for appraisers to simply maintain the skills and the knowledge they possess when they become appraisers. Each appraiser must continuously improve his or her skills to remain proficient in mass appraisal.

- (b) not commit a substantial error of omission or commission that significantly affects a mass appraisal; and**

Comment: An appraiser must use sufficient care to avoid errors that would significantly affect his or her opinions and conclusions. Diligence is required to identify and analyze the factors, conditions, data, and other information that would have a significant effect on the credibility of the assignment results.

- (c) not render a mass appraisal in a careless or negligent manner.**

⁵⁶ See Advisory Opinion 32, *Ad Valorem Property Tax Appraisal and Mass Appraisal Assignments*.

STANDARDS RULE 5-2, PROBLEM IDENTIFICATION**In developing a mass appraisal, an appraiser must:****(a) identify the client and other intended users;⁵⁷**

Comment: In ad valorem mass appraisal, the assessor, or party responsible for certification of the assessment or tax roll is required to apply the relevant law or statute and identify the clients and other intended users (if any).

(b) identify the intended use of the appraisal;

Comment: An appraiser must not allow the intended use of an assignment or a client's objectives to cause the assignment results to be biased.

(c) identify the type and definition of value, and ascertain whether the value is to be the most probable price:**(i) in terms of cash; or****(ii) in terms of financial arrangements equivalent to cash; or****(iii) in such other terms as may be precisely defined; and****(iv) if the opinion of value is to be based on non-market financing or financing with unusual conditions or incentives, identify the terms of such financing and any influences on value;****(d) identify the effective date of the appraisal;⁵⁸****(e) identify, from sources the appraiser reasonably believes to be reliable, the characteristics of the properties that are relevant to the type and definition of value and intended use,⁵⁹ including:****(i) the group with which a property is identified according to similar market influence;****(ii) the appropriate market area and time frame relative to the property being valued; and****(iii) their location and physical, legal, and economic characteristics;**

Comment: The properties must be identified in general terms, and each individual property in the universe must be identified, with the information on its identity stored or referenced in its property record.

When appraising proposed improvements, an appraiser must examine and have available for future examination, plans, specifications, or other documentation sufficient to identify the extent and character of the proposed improvements.⁶⁰

Ordinarily, proposed improvements are not appraised for ad valorem tax purposes. Appraisers, however, are sometimes asked to provide opinions of value of proposed improvements so that developers can estimate future property tax burdens. Sometimes units in condominiums and planned unit developments are sold with an interest in un-built community property, the pro rata value of which, if any, must be considered in the analysis of sales data.

(f) identify the characteristics of the market that are relevant to the purpose and intended use of the mass appraisal including:**(i) location of the market area;****(ii) physical, legal, and economic characteristics;****(iii) time frame of market activity; and****(iv) property interests reflected in the market;**

⁵⁷ See Advisory Opinion 36, *Identification and Disclosure of Client, Intended Use, and Intended Users*. Also applicable to Standards Rule 5-2(b).

⁵⁸ See Advisory Opinion 34, *Retrospective and Prospective Value Opinions*.

⁵⁹ See Advisory Opinion 23, *Identifying the Relevant Characteristics of the Subject Property of a Real Property Appraisal Assignment*, if applicable.

⁶⁰ See Advisory Opinion 17, *Appraisals of Real Property with Proposed Improvements*, if applicable.

(g) in appraising real property or personal property:

- (i) identify the appropriate market area and time frame relative to the property being valued;
- (ii) when the subject is real property, identify and consider any personal property, trade fixtures, or intangible assets that are not real property but are included in the appraisal;
- (iii) when the subject is personal property, identify and consider any real property or intangible assets that are not personal property but are included in the appraisal;
- (iv) identify known easements, restrictions, encumbrances, leases, reservations, covenants, contracts, declarations, special assessments, ordinances, or other items of similar nature; and
- (v) identify and analyze whether an appraised fractional interest, physical segment or partial holding contributes pro rata to the value of the whole;

Comment: The above requirements do not obligate the appraiser to value the whole when the subject of the appraisal is a fractional interest, physical segment, or a partial holding. However, if the value of the whole is not identified, the appraisal must clearly reflect that the value of the property being appraised cannot be used to develop the value opinion of the whole by mathematical extension.

(h) analyze the relevant economic conditions at the time of the valuation, including market acceptability of the property and supply, demand, scarcity, or rarity;**(i) identify any extraordinary assumptions necessary in the assignment. An extraordinary assumption may be used in an assignment only if:**

- (i) the extraordinary assumption is required to properly develop credible opinions and conclusions;
- (ii) the appraiser has a reasonable basis for the extraordinary assumption; and
- (iii) use of the extraordinary assumption results in a credible analysis;

(j) identify any hypothetical conditions necessary in the assignment. A hypothetical condition may be used in an assignment only if:

- (i) use of the hypothetical condition is clearly required for legal purposes, for purposes of reasonable analysis, or for purposes of comparison; and
- (ii) use of the hypothetical condition results in a credible analysis; and

(k) determine the scope of work necessary to produce credible assignment results in accordance with the SCOPE OF WORK RULE.⁶¹**STANDARDS RULE 5-3. PROPERTY'S USE AND APPROPRIATE MARKET**

When necessary for credible assignment results, an appraiser must:

(a) in appraising real property, identify and analyze the effect on use and value of the following factors:

- (i) existing land use regulations;
- (ii) reasonably probable modifications of such regulations;
- (iii) economic supply and demand;
- (iv) the physical adaptability of the real estate;
- (v) neighborhood trends; and
- (vi) highest and best use of the real estate; and

⁶¹ See Advisory Opinion 28, *Scope of Work Decision, Performance, and Disclosure*, and Advisory Opinion 29, *An Acceptable Scope of Work*.

Comment: This requirement sets forth a list of factors that affect use and value. In considering neighborhood trends, an appraiser must avoid stereotyped or biased assumptions relating to race, age, color, gender, or national origin or an assumption that race, ethnic, or religious homogeneity is necessary to maximize value in a neighborhood. Further, an appraiser must avoid making an unsupported assumption or premise about neighborhood decline, effective age, and remaining life. In considering highest and best use, an appraiser must develop the concept to the extent required for a proper solution to the appraisal problem.

- (b) in appraising personal property, identify and analyze the effects on use and value of industry trends, value-in-use, and trade level of personal property. Where applicable, analyze the current use and alternative uses to encompass what is profitable, legal, and physically possible, as relevant to the type and definition of value and intended use of the appraisal. Personal property has several measurable marketplaces; therefore, the appraiser must define and analyze the appropriate market consistent with the type and definition of value.

STANDARDS RULE 5-4, APPRAISAL METHODS

In developing a mass appraisal, an appraiser must:

- (a) identify the appropriate procedures and market information required to perform the appraisal, including all physical, functional, and external market factors as they may affect the appraisal;

Comment: Such efforts customarily include the development of standardized data collection forms, procedures, and training materials that are used uniformly on the universe of properties under consideration.

- (b) employ recognized techniques for specifying property valuation models; and

Comment: The formal development of a model in a statement or equation is called model specification. Mass appraisers must develop mathematical models that, with reasonable accuracy, represent the relationship between property value and supply and demand factors, as represented by quantitative and qualitative property characteristics. The models may be specified using the cost, sales comparison, or income approaches to value. The specification format may be tabular, mathematical, linear, nonlinear, or any other structure suitable for representing the observable property characteristics. Appropriate approaches must be used in appraising a class of properties. The concept of recognized techniques applies to both real and personal property valuation models.

- (c) employ recognized techniques for calibrating mass appraisal models.

Comment: Calibration refers to the process of analyzing sets of property and market data to determine the specific parameters of a model. The table entries in a cost manual are examples of calibrated parameters, as well as the coefficients in a linear or nonlinear model. Models must be calibrated using recognized techniques, including, but not limited to, multiple linear regression, nonlinear regression, and adaptive estimation.

STANDARDS RULE 5-5, APPROACHES TO VALUE

In developing a mass appraisal, when necessary for credible assignment results, an appraiser must:

- (a) collect, verify, and analyze such data as are necessary and appropriate to develop:
- (i) the cost new of the improvements;
 - (ii) depreciation;
 - (iii) value of the land by sales of comparable properties;
 - (iv) value of the property by sales of comparable properties;
 - (v) value by capitalization of income or potential earnings (i.e., rentals, expenses, interest rates, capitalization rates, and vacancy data);

Comment: This Standards Rule requires appraisers engaged in mass appraisal to take reasonable steps to ensure that the quantity and quality of the factual data that are collected are sufficient to produce credible mass appraisals.

- (b) base estimates of capitalization rates and projections of future rental rates and/or potential earnings capacity, expenses, interest rates, and vacancy rates on reasonable and appropriate evidence;⁶²**

Comment: This requirement calls for an appraiser, in developing income and expense statements and cash flow projections, to weigh historical information and trends, current market factors affecting such trends, and reasonably anticipated events, such as competition from developments either planned or under construction.

- (c) identify and, as applicable, analyze terms and conditions of any available leases; and**

- (d) identify the need for and extent of any physical inspection.⁶³**

STANDARDS RULE 5-6, CALIBRATED MASS APPRAISAL MODEL APPLICATION

When necessary for credible assignment results in applying a calibrated mass appraisal model an appraiser must:

- (a) value improved parcels by recognized methods or techniques based on the cost approach, the sales comparison approach, and income approach;**

- (b) value sites by recognized methods or techniques; such techniques include but are not limited to the sales comparison approach, allocation method, abstraction method, capitalization of ground rent, and land residual technique;**

- (c) when developing the value of a leased fee estate or a leasehold estate, analyze the effect on value, if any, of the terms and conditions of the lease;**

Comment: In ad valorem taxation the appraiser may be required by rules or law to appraise the property as if in fee simple, as though unencumbered by existing leases. In such cases, market rent would be used in the appraisal, ignoring the effect of the individual, actual contract rents.

- (d) analyze the effect on value, if any, of the assemblage of the various parcels, divided interests, or component parts of a property; the value of the whole must not be developed by adding together the individual values of the various parcels, divided interests, or component parts; and**

Comment: Although the value of the whole may be equal to the sum of the separate estates or parts, it also may be greater than or less than the sum of such estates or parts.

- (e) when analyzing anticipated public or private improvements, located on or off the site, analyze the effect on value, if any, of such anticipated improvements to the extent they are reflected in market actions.**

STANDARDS RULE 5-7, RECONCILIATION

In developing a mass appraisal an appraiser must:

- (a) reconcile the quality and quantity of data available and analyzed within the approaches used and the applicability and relevance of the approaches, methods and techniques used; and**

- (b) employ recognized mass appraisal testing procedures and techniques to ensure that standards of accuracy are maintained.**

⁶² See Advisory Opinion 33, *Discounted Cash Flow Analysis*.

⁶³ See Advisory Opinion 2, *Inspection of Subject Property*.

Comment: It is implicit in mass appraisal that, even when properly specified and calibrated mass appraisal models are used, some individual value conclusions will not meet standards of reasonableness, consistency, and accuracy. However, appraisers engaged in mass appraisal have a professional responsibility to ensure that, on an overall basis, models produce value conclusions that meet attainable standards of accuracy. This responsibility requires appraisers to evaluate the performance of models, using techniques that may include but are not limited to, goodness-of-fit statistics, and model performance statistics such as appraisal-to-sale ratio studies, evaluation of hold-out samples, or analysis of residuals.

STANDARD 6: MASS APPRAISAL, REPORTING

FAQ See also
FAQ 265-
334

1179 **In reporting the results of a mass appraisal, an appraiser must communicate each analysis, opinion,**
1180 **and conclusion in a manner that is not misleading.**

1181 Comment: STANDARD 6 addresses the content and level of information required in a report that
1182 communicates the results of a mass appraisal.

1183 STANDARD 6 does not dictate the form, format, or style of mass appraisal reports. The substantive content of
1184 a report determines its compliance.

1185 **STANDARDS RULE 6-1, GENERAL REPORTING REQUIREMENTS**

1186 **Each written report of a mass appraisal must:**

1187 **(a) clearly and accurately set forth the appraisal in a manner that will not be misleading;**

1188 **(b) contain sufficient information to enable the intended user(s) of the appraisal to understand the report**
1189 **properly; and**

1190 Comment: Documentation for a mass appraisal for ad valorem taxation may be in the form of (1) property
1191 records, (2) sales ratios and other statistical studies, (3) appraisal manuals and documentation, (4) market
1192 studies, (5) model building documentation, (6) regulations, (7) statutes, and (8) other acceptable forms.

1193 **(c) clearly and accurately disclose all assumptions, extraordinary assumptions, hypothetical conditions, and**
1194 **limiting conditions used in the assignment.**

1195 **STANDARDS RULE 6-2, CONTENT OF A MASS APPRAISAL REPORT**

1196 **The content of a mass appraisal report must be appropriate for the intended use of the appraisal and, at a**
1197 **minimum:**

1198 **(a) state the identity of the client, or if the client has requested anonymity, state that the identity is withheld**
1199 **at the client's request but is retained in the appraiser's workfile; state the identity of any intended user(s)**
1200 **by name or type;⁶⁴**

1201 Comment: Because the client is an intended user, they must be identified in the report as such. However, if the
1202 client has requested anonymity the appraiser must use care when identifying the client to avoid violations of the
1203 Confidentiality section of the ETHICS RULE.

1204 **(b) state the intended use of the appraisal;**

1205 **(c) disclose any assumptions or limiting conditions that result in deviation from recognized methods and**
1206 **techniques or that affect analyses, opinions, and conclusions;**

1207 **(d) state the effective date of the appraisal and the date of the report;**

1208 Comment: In ad valorem taxation the effective date of the appraisal may be prescribed by law. If no
1209 effective date is prescribed by law, the effective date of the appraisal, if not stated, is presumed to be
1210 contemporaneous with the data and appraisal conclusions.⁶⁵

1211 **(e) state the type and definition of value and cite the source of the definition;**

1212 Comment: Stating the type and definition of value also requires any comments needed to clearly indicate to
1213 intended users how the definition is being applied.

64 See Advisory Opinion 36, *Identification and Disclosure of Client, Intended Use, and Intended Users*. Also applicable to Standards Rules 6-2(b).

65 See Advisory Opinion 34, *Retrospective and Prospective Value Opinions*.

When reporting an opinion of value, state whether the opinion is:	1214
• In terms of cash or of financing terms equivalent to cash; or	1215
• Based on non-market financing with unusual conditions or incentives.	1216
When an opinion of value is based on non-market financing terms or financing with unusual conditions or incentives, summarize the terms of such financing and any influences on value.	1217
	1218
(f) state the properties appraised including the property rights; and, when the property rights to be appraised are specified in a statute or court ruling, reference the law;	1219
	1220
<u>Comment:</u> The report documents the sources for location, describing and listing the property. When applicable, include references to legal descriptions, addresses, parcel identifiers, photos, and building sketches. In mass appraisal this information is often included in property records.	1221
	1222
	1223
(g) summarize the scope of work used to develop the appraisal,⁶⁶ and explain the exclusion of the sales comparison approach, cost approach, or income approach;	1224
	1225
<u>Comment:</u> Summarizing the scope of work includes disclosure of research and analyses performed and might also include disclosure of research and analyses not performed.	1226
	1227
(h) when any portion of the work involves significant mass appraisal assistance, summarize the extent of that assistance;⁶⁷	1228
	1229
(i) summarize and support the model specification(s) considered, data requirements, and the model(s) chosen; provide sufficient information to enable the client and intended users to have confidence that the process and procedures used conform to accepted methods and result in credible value conclusions; and include a summary of the rationale for each model, the calibration techniques to be used, and the performance measures to be used;	1230
	1231
	1232
	1233
	1234
<u>Comment:</u> In the case of mass appraisal for ad valorem taxation, stability and accuracy are important to the credibility of value opinions.	1235
	1236
(j) summarize the procedure for collecting, validating, and reporting data; and summarize the sources of data and the data collection and validation processes;	1237
	1238
<u>Comment:</u> Reference to detailed data collection manuals or electronic records must be made, as appropriate, including where they may be found for inspection.	1239
	1240
(k) summarize calibration methods considered and chosen, including the mathematical form of the final model(s); summarize how value conclusions were reviewed; and, if necessary, state the availability and location of individual value conclusions;	1241
	1242
	1243
(l) when an opinion of highest and best use, or the appropriate market or market level was developed, summarize how that opinion was determined, and reference case law, statute, or public policy that describes highest and best use requirements;	1244
	1245
	1246
<u>Comment:</u> When actual use is the requirement, the report must summarize how use-value opinions were developed. The appraiser's reasoning in support of the highest and best use opinion must be provided in the depth and detail required by its significance to the appraisal.	1247
	1248
	1249
(m) identify the appraisal performance tests used and the performance measures attained;	1250
(n) summarize the reconciliation performed, in accordance with Standards Rule 5-7; and	1251
(o) include a signed certification in accordance with Standards Rule 6-3.	1252

⁶⁶ See Advisory Opinion 28, *Scope of Work Decision, Performance, and Disclosure* and Advisory Opinion 29, *An Acceptable Scope of Work*.

⁶⁷ See Advisory Opinion 31, *Assignments Involving More than One Appraiser*.

STANDARDS RULE 6-3, CERTIFICATION

A signed certification is an integral part of the appraisal report.

- (a) The wording of a certification does not have to match the following verbatim, but each of the elements must be addressed:**

I certify that, to the best of my knowledge and belief:

- the statements of fact contained in this report are true and correct.
- the reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- I have no (or the specified) present or prospective interest in the property that is the subject of this report, and no (or the specified) personal interest with respect to the parties involved.
- I have performed no (or the specified) services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding the agreement to perform this assignment.
- I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- my engagement in this assignment was not contingent upon developing or reporting predetermined results.
- my compensation for completing this assignment is not contingent upon the reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- my analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the *Uniform Standards of Professional Appraisal Practice*.
- I have (or have not) made a personal inspection of the properties that are the subject of this report. (If more than one person signs this certification, the certification must clearly specify which individuals did and which individuals did not make a personal inspection of the appraised property.)⁶⁸
- no one provided significant mass appraisal assistance to the person signing this certification. (If there are exceptions, the name of each individual providing significant mass appraisal assistance must be stated.)⁶⁹

Comment: The above certification is not intended to disturb an elected or appointed assessor's work plans or oaths of office.

- (b) An appraiser who signs any part of the appraisal report, including a letter of transmittal, must also sign a certification.**

Comment: In an assignment that includes only assignment results developed by the real property appraiser, any appraiser who signs a certification accepts full responsibility for all elements of the certification, for the assignment results, and for the contents of the appraisal report. In an assignment that includes personal property assignment results not developed by the real property appraiser(s), any real property appraiser who signs a certification accepts full responsibility for the real property elements of the certification, for the real property assignment results, and for the real property contents of the appraisal report.

⁶⁸ See Advisory Opinion 2, *Inspection of Subject Property*.

⁶⁹ See Advisory Opinion 31, *Assignments Involving More than One Appraiser*.

In an assignment that includes only assignment results developed by the personal property appraiser(s),	1293
any appraiser who signs a certification accepts full responsibility for all elements of the certification, for the	1294
assignment results, and for the contents of the appraisal report. In an assignment that includes real property	1295
assignment results not developed by the personal property appraiser(s), any personal property appraiser	1296
who signs a certification accepts full responsibility for the personal property elements of the certification, for	1297
the personal property assignment results, and for the personal property contents of the appraisal report.	1298
(c) When a signing appraiser has relied on work done by appraisers and others who do not sign the	1299
certification, the signing appraiser is responsible for the decision to rely on their work.	1300
(i) The signing appraiser is required to have a reasonable basis for believing that those individuals	1301
performing the work are competent; and	1302
(ii) The signing appraiser must have no reason to doubt that the work of those individuals is credible.	1303
<u>Comment:</u> Although a certification must contain the names of individuals providing significant mass appraisal	1304
assistance, it is not required that a summary of the extent of their assistance be located in a certification. This	1305
disclosure may be in any part(s) of the report.	1306