Iredell County – 2023 Reappraisal
Uniform Schedule of Values, Standards, and Rules
Market Value Schedule

This document has been prepared in accordance with

Article 19, Section 105-317, Paragraph (b), of the

General Statutes of North Carolina which reads:

"In preparation for each revaluation of real property required by General Statutes 105-286, it shall be the duty of the assessor to see that: (1) Uniform schedules of value, standards and rules to be used in appraising real property at its true value and its present-use value are prepared and are sufficiently detailed to enable those making appraisals to adhere to them in appraising real property."

Conflicts of Law

If any portion of this Schedule of Values, Standards and Rules or the enforcement thereof is found to be unlawful or unconstitutional that portion shall not operate to invalidate the rest of these schedules, standards and rules. Any subsequent law changes shall be followed in accordance with and applied to schedules, standards and rules.

Jurisdictional Exception Rule

If any part of USPAP (Uniform Standards of Professional Appraisal Practice 2022-2023 Edition) is contrary to the law or public policy of any jurisdiction, only that part shall be void and of no force or effect in that jurisdiction.

Article 13.
Standards for Appraisal and Assessment.

§ 105-283. Uniform appraisal standards.

All property, real and personal, shall as far as practicable be appraised or valued at its true value in money. When used in this Subchapter, the words "true value" shall be interpreted as meaning market value, that is, the price estimated in terms of money at which the property would change hands between a willing and financially able buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of all the uses to which the property is adapted and for which it is capable of being used. For the purposes of this section, the acquisition of an interest in land by an entity having the power of eminent domain with respect to the interest acquired shall not be considered competent evidence of the true value in money of comparable land. (1939, c. 310, s. 500; 1953, c. 970, s. 5; 1955, c. 1100, s. 2; 1959, c. 682; 1967, c. 892, s. 7; 1969, c. 945, s. 1; 1971, c. 806, s. 1; 1973, c. 695, s. 11; 1977, 2nd Sess., c. 1297.)

§ 105-284. Uniform assessment standard.

(a) Except as otherwise provided in this section, all property, real and personal, shall be assessed for taxation at its true value or use value as determined under G.S. 105-283 or G.S. 105-277.6, and taxes levied by all counties and municipalities shall be levied uniformly on assessments determined in accordance with this section.

(b) The assessed value of public service company system property subject to appraisal by the Department of Revenue under G.S. 105-335(b)(1) shall be determined by applying to the allocation of such value to each county a percentage to be established by the Department of Revenue. The percentage to be applied shall be either:

(1) The median ratio established in sales assessment ratio studies of real property conducted by the Department of Revenue in the county in the year the county conducts a reappraisal of real property and in the fourth and seventh years thereafter; or

(2) A weighted average percentage based on the median ratio for real property established by the Department of Revenue as provided in subdivision (1) and a one hundred percent (100%) ratio for personal property. No percentage shall be applied in a year in which the median ratio for real property is ninety percent (90%) or greater.

If the median ratio for real property in any county is below ninety percent (90%) and if the county assessor has provided information satisfactory to the Department of Revenue that the county follows accepted guidelines and practices in the assessment of business personal property, the weighted average percentage shall be applied to public service company property. In calculating the weighted average percentage, the Department shall use the assessed value figures for real and personal property reported by the county to the Local Government Commission for the preceding year. In any county which fails to demonstrate that it follows accepted guidelines and practices, the percentage to be applied shall be the median ratio for real property. The percentage established in a year in which a sales assessment ratio study is conducted shall continue to be applied until another study is conducted by the Department of Revenue.

(c) Notice of the median ratio and the percentage to be applied for each county shall be given by the Department of Revenue to the chairman of the board of commissioners not later than April 15 of the year for which it is to be effective. Notice shall also be given at the same time to the public service companies whose property values are subject to adjustment under this section. Either the county or an affected public service company may challenge the real property ratio or the percentage established by the Department of Revenue by giving notice of exception within 30 days after the mailing of the Department's notice. Upon receipt of such notice of exception, the Department shall

arrange a conference with the challenging party or parties to review the matter. Following the conference, the Department shall notify the challenging party or parties of its final determination in the matter. Either party may appeal the Department's determination to the Property Tax Commission by giving notice of appeal within 30 days after the mailing of the Department's decision.

(d) Property that is in a development financing district and that is subject to an agreement entered into pursuant to G.S. 159-108 shall be assessed at its true value or at the minimum value set out in the agreement, whichever is greater.(1939, c. 310, s. 500; 1953, c. 970, s. 5; 1955, c. 1100, s. 2; 1959, c. 682; 1967, c. 892, s. 7; 1969, c. 945, s. 1; 1971, c. 806, s. 1; 1973, c. 695, s. 12; 1985, c. 601, s. 1; 1987 (Reg. Sess., 1988), c. 1052, s. 1; 2003-403, s. 20.)

Article 14.
Time for Listing and Appraising Property for Taxation.

§ 105-286. Time for general reappraisal of real property.

(a) Octennial Cycle. – Each county must reappraise all real property in accordance with the provisions of G.S. 105-283 and G.S. 105-317 as of January 1 of the year set out in the following schedule and every eighth year thereafter, unless the county is required to advance the date under subdivision (2) of this section or chooses to advance the date under subdivision (3) of this section.

(1) Schedule of Initial Reappraisals.

Division One – 1972: Avery, Camden, Cherokee, Cleveland, Cumberland, Guilford, Harnett, Haywood, Lee, Montgomery, Northampton, and Robeson.

Division Two – 1973: Caldwell, Carteret, Columbus, Currituck, Davidson, Gaston, Greene, Hyde, Lenoir, Madison, Orange, Pamlico, Pitt, Richmond, Swain, Transylvania, and Washington.

Division Three – 1974: Ashe, Buncombe, Chowan, Franklin, Henderson, Hoke, Jones, Pasquotank, Rowan, and Stokes.

Division Four – 1975: Alleghany, Bladen, Brunswick, Cabarrus, Catawba, Dare, Halifax, Macon, New Hanover, Surry, Tyrrell, and Yadkin.

Division Five – 1976: Bertie, Caswell, Forsyth, Iredell, Jackson, Lincoln, Onslow, Person, Perquimans, Rutherford, Union, Vance, Wake, Wilson, and Yancey.

Division Six – 1977: Alamance, Durham, Edgecombe, Gates, Martin, Mitchell, Nash, Polk, Randolph, Stanly, Warren, and Wilkes.

Division Seven – 1978: Alexander, Anson, Beaufort, Clay, Craven, Davie, Duplin, and Granville.

Division Eight – 1979: Burke, Chatham, Graham, Hertford, Johnston, McDowell, Mecklenburg, Moore, Pender, Rockingham, Sampson, Scotland, Watauga, and Wayne.

(2) Mandatory Advancement. – A county whose population is 75,000 or greater according to the most recent annual population estimates certified to the Secretary by the State Budget Officer must conduct a reappraisal of real property when the county's sales assessment ratio determined under G.S. 105-289(h) is less than .85 or greater than 1.15, as indicated on the notice the county receives under G.S. 105-284. A reappraisal required under this subdivision must become effective no later than January 1 of the earlier of the following years:

a. The third year following the year the county received the notice.

b. The eighth year following the year of the county's last reappraisal.

(3) Optional Advancement. – A county may conduct a reappraisal of real property earlier than required by subdivision (1) or (2) of this subsection if the board of county commissioners adopts a resolution providing for advancement of the reappraisal. The resolution must designate the effective date of the advanced reappraisal and may designate a new reappraisal cycle that is more frequent than the octennial cycle set in subdivision (1) of this subsection. The board of county commissioners must promptly forward a copy of the resolution adopted under this subdivision to the Department of Revenue. A more frequent reappraisal cycle designated in a resolution adopted under this subdivision continues in effect after a mandatory reappraisal required under subdivision (2) of this subsection unless the board of county commissioners adopts another resolution that designates a different date for the county's next reappraisal.

(b) (c) Repealed by Session Laws 2008 146, s. 1.1, effective July 1, 2009. (1939, c. 310, s. 300; 1941, c. 282, ss. 1, 11/2; 1943, c. 634, s. 1; 1945, c. 5; 1947, c. 50; 1949, c. 109; 1951, c. 847; 1953, c. 395; 1955, c. 1273; 1957, c. 1453, s. 1; 1959, c. 704, s. 1; 1971, c. 806, s. 1; 1973, c. 476, s. 193; 1987, c. 45, s. 1; 2008 146, s. 1.1.)

Article 19.
Administration of Real and Personal Property Appraisal.

§ 105-317. Appraisal of real property; adoption of schedules, standards, and rules.

(a) Whenever any real property is appraised it shall be the duty of the persons making appraisals:

(1) In determining the true value of land, to consider as to each tract, parcel, or lot separately listed at least its advantages and disadvantages as to location; zoning; quality of soil; waterpower; water privileges; dedication as a nature preserve; conservation or preservation agreements; mineral, quarry, or other valuable deposits; fertility; adaptability for agricultural, timber producing, commercial, industrial, or other uses; past income; probable future income; and any other factors that may affect its value except growing crops of a seasonal or annual nature.

(2) In determining the true value of a building or other improvement, to consider at least its location; type of construction; age; replacement cost; cost; adaptability for residence, commercial, industrial, or other uses; past income; probable future income; and any other factors that may affect its value.

(3) To appraise partially completed buildings in accordance with the degree of completion on January 1.

(b) In preparation for each revaluation of real property required by G.S. 105-286, it shall be the duty of the assessor to see that:

(1) Uniform schedules of values, standards, and rules to be used in appraising real property at its true value and at its present use value are prepared and are sufficiently detailed to enable those making appraisals to adhere to them in appraising real property.

(2) Repealed by Session Laws 1981, c. 678, s. 1.

(3) A separate property record be prepared for each tract, parcel, lot, or group of contiguous lots, which record shall show the information required for compliance with the provisions of G.S. 105-309 insofar as they deal with real property, as well as that required by this section. (The purpose of this subdivision is to require that individual property records be maintained in sufficient detail to enable property owners to ascertain the method, rules, and standards of value by which property is appraised.)

(4) The property characteristics considered in appraising each lot, parcel, tract, building, structure and improvement, in accordance with the schedules of values, standards, and rules, be accurately recorded on the appropriate property record.

(5) Upon the request of the owner, the board of equalization and review, or the board of county commissioners, any particular lot, parcel, tract, building, structure or improvement be actually visited and observed to verify the accuracy of property characteristics on record for that property.

(6) Each lot, parcel, tract, building, structure and improvement be separately appraised by a competent appraiser, either one appointed under the provisions of G.S. 105-296 or one employed under the provisions of G.S. 105-299.

(7) Notice is given in writing to the owner that he is entitled to have an actual visitation and observation of his property to verify the accuracy of property characteristics on record for that property.

(c) The values, standards, and rules required by subdivision (b) (1) shall be reviewed and approved by the board of county commissioners before January 1 of the year they are applied. The board of county commissioners may approve the schedules of values, standards, and rules to be used in appraising real property at its true value and at its present use value either separately or simultaneously. Notice of the receipt and adoption by the board of county commissioners of either or both the true value and present use value schedules, standards, and rules, and notice of a property owner's right to comment on and contest the schedules, standards, and rules shall be given as follows:

(1) The assessor shall submit the proposed schedules, standards, and rules to the board of county commissioners not less than 21 days before the meeting at which they will be considered by the board. On the same day that they are submitted to the board for its consideration, the assessor shall file a copy of the proposed schedules, standards, and rules in his office where they shall remain available for public inspection.

(2) Upon receipt of the proposed schedules, standards, and rules, the board of commissioners shall publish a statement in a newspaper having general circulation in the county stating:

a. That the proposed schedules, standards, and rules to be used in appraising real property in the county have been submitted to the board of county commissioners and are available for public inspection in the assessor's office; and

b. The time and place of a public hearing on the proposed schedules, standards, and rules that shall be held by the board of county commissioners at least seven days before adopting the final schedules, standards, and rules.

(3) When the board of county commissioners approves the final schedules, standards, and rules, it shall issue an order adopting them. Notice of this order shall be published once a week for four successive weeks in a newspaper having general circulation in the county, with the last publication being not less than seven days before the last day for challenging the validity of the schedules, standards, and rules by appeal to the Property Tax Commission. The notice shall state:

a. That the schedules, standards, and rules to be used in the next scheduled reappraisal of real property in the county have been adopted and are open to examination in the office of the assessor; and

b. That a property owner who asserts that the schedules, standards, and rules are invalid may except to the order and appeal therefrom to the Property Tax Commission within 30 days of the date when the notice of the order adopting the schedules, standards, and rules was first published.

(d) Before the board of county commissioners adopts the schedules of values, standards, and rules, the assessor may collect data needed to apply the schedules, standards, and rules to each parcel in the county. (1939, c. 310, s. 501; 1959, c. 704, s. 4; 1967, c. 944; 1971, c. 806, s. 1; 1973, c. 476, s. 193; c. 695, s. 5; 1981, c. 224; c. 678, s. 1; 1985, c. 216, s. 2; c. 628, s. 4; 1987, c. 45, s. 1; c. 295, s. 1; 1997 226, s. 5.)

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THE APPEAL PROCESS

The 2023 assessed value indicates fair market value as of the effective date of the most recent countywide reappraisal which is January 1, 2023. Taxpayers who believe this value does not reflect the fair market value of the property may appeal by following the appeal process indicated below:

Iredell County Appeal Review

The first step of the appeal process is to complete an Appeal Form in its entirety and return it with documentation to the County Assessor's Office P.O. Box 1027, Statesville NC 28687, within 30 days of the Date of Notice. You may also complete and submit a request online at https://www.bttaxpayerportal.com/ TaxpayerPortalIR/Appeal. An appraiser will review the information provided and respond with a new Notice of Real Estate Assessed Value. The objective of this review will be to assure property is appraised at 100% of its true (market) value as of January 1, 2023; therefore, value could decrease, increase or stay the same. Taxpayers who wish to further appeal the assessed value may file an appeal with the Iredell County Board of Equalization and Review.

Iredell County Board of Equalization and Review (Ref: NCGS 105-322)

An appeal to the Iredell County Board of Equalization and Review (Board) may be requested any time prior to the adjournment of the Board or within 30 days of the last Notice of Real Estate Assessed Value. The first meeting of the Board must be held no earlier than the first Monday in April and no later than the first Monday in May. **Actual times and dates will be advertised in local newspapers.** Appeals must be postmarked by the United States Postal Service within the allocated time periods. If a postmark cannot be read or is not present the form will be considered received on the date it arrives in the Assessor's Office. All requests for a hearing should be made in writing to the Iredell County Board of Equalization and Review – PO Box 1027 – Statesville, NC 28687. Appeals may also be made online at https://www.bttaxpayerportal.com/TaxpayerPortalIR/Appeal. Online appeals must be submitted prior to the adjournment of the Board or within 30 days of the last Notice of Real Estate Assessed Value. Prior to the Board hearing an appraiser will visit the property to ensure the accuracy of the Assessor's data. If the appraiser and the taxpayer reach an agreement, an Assessment Agreement may be signed and presented to the Board for final approval. If an agreement is not reached the taxpayer will be notified of the date and time of the Board hearing. At the hearing the taxpayer will have the opportunity to present their evidence and testimony to the Board. A County appraiser will present the County's evidence and make a recommendation of value to the Board. Within 30 days after the Board hearing the taxpayer will receive a Notice of Decision indicating the Board's determination of value. Taxpayers unsatisfied with the value indicated in the Board Notice of Decision may appeal to the NC Property Tax Commission within 30 days of the date of the Notice.

North Carolina Property Tax Commission

Appeals to the NC Property Tax Commission (PTC) must be filed within 30 days of the date of the Notice of Decision from the Iredell County Board of Equalization and Review. These appeals are typically heard in Raleigh. The PTC is made up of 5 members, appointed by the Governor and the Legislature. Information for the NC Property Tax Commission may be reviewed at **https://www.ncdor.gov/taxes/north-carolinas-property-tax-system/property-tax-commission** Prior to the hearing, representatives of the Department of Revenue will meet with the County and the taxpayer to review the merits of the case and resolve them when possible. The taxpayer or the County may appeal the decision of the PTC to the Court of Appeals.

North Carolina Court of Appeals

The NC Court of Appeals may hear appeals from the Property Tax Commission. The taxpayer or the County may appeal the decision of the Court of Appeals to the NC Supreme Court.

North Carolina Supreme Court

The NC Supreme Court may hear appeals from the Court of Appeals. There are no appeals of the decision of the Supreme Court.

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INTRODUCTION

The purpose of the 2023 Reappraisal is to equalize the tax burden among property owners and among all classes of property. The periodic reappraisal of real property equalizes the tax burden by ensuring all real property is assessed at the current fair market value.

Market value as defined by the Machinery Act of North Carolina under G.S. 105-283 Uniform Appraisal Standards is "the price estimated in terms of money at which the property would change hands between a willing and financially able buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of all the uses to which the property is adapted and for which it is capable of being used."

To accomplish the County's goal of determining just and equitable values the County Assessor must turn to mass appraisal methods and techniques based on solid appraisal principles. In mass appraising, as in any kind of appraising, the realities of the local market along with state and local laws must be considered. Also, fundamental to any mass appraisal system are knowledge, judgment and the ability to adapt a standardized system to the local market. A standardized system and method of handling both data and the application of the three basic approaches to value is necessary to achieve equalization and uniformity in the valuation process.

The three basic approaches which may be used to arrive at a fair market value are summarized as follows:

COST APPROACH	This approach consists of estimating the land value and the depreciated cost of the improvements to arrive at a value. Theoretically, the substitution principle is the basis for determining the maximum value of the property by this approach. The substitution principle assumes the value is equal to the cost of acquiring a substitution of equal utility assuming no cost delay is encountered.
SALES COMPARISON APPROACH	This approach utilizes the application of prior recent sales data from the market. Use of this approach requires that the sales used should be analyzed to determine that the conditions of fair market value have been satisfied.
INCOME APPROACH	The two most common applications of this approach in mass appraising are the capitalized net income and the gross rent multiplier.

The use of any of the three approaches requires careful consideration to be given to:

1. The relevancy of the approach applied to the property under consideration.
2. The inherent strengths and weaknesses of the approach used.
3. The amount and reliability of the data collected.
4. The effect of the local market on the data collected.

This standardized system or Schedule of Values is designed and adopted to be used to establish Fair Market Value as of January 1 of the Reappraisal year. Reappraisal projects are mandated by State law to be performed every eight years unless the Board of County Commissioners desires to perform the projects more frequently. In the interest of maintaining fair and equitable values for the taxpayers, the Iredell County the Board of County Commissioners passed a resolution establishing a four year reappraisal cycle for Iredell County as required by G. S. 105-286(a) (3).

Finally, it must be remembered, the true test of a mass appraisal system rests upon its acceptance by the County Assessor, taxpayers, administrative review bodies such as the Board of County Commissioners, Board of Equalization and Review, the NC Department of Revenue and the courts.

The material contained in this manual is provided to enable the user to apply standard procedures to the mass appraisal of property. In certain cases, the procedures are manually implemented and controlled; in others, the highly sophisticated data processing and appraisal systems are available to assure standard methods are employed. The principle to be recognized is that of standardization of data and operations as a vehicle to achieving the goals of the appraisal system.

ANALYSIS OF FORECLOSURE ACTIVITY

Neighborhoods in Iredell County are analyzed to determine if there are excessive foreclosures. If, based on appraiser judgment, it is determined foreclosures are having a negative impact on sales prices in the neighborhood, a market adjustment may be made to reflect this negative impact.

STANDARD ON MASS APPRAISAL OF REAL PROPERTY

Iredell County follows the standards and requirements as set by the International Association of Assessing Officers publication on the Standard on Mass Appraisal of Real Property, Approved July 2017.

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—2017

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.

3.4 Overview

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3.6 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.

3.6.1 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 Gloudemans 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 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 recanvass will be necessary.

Data that have been confirmed to be reliable should be used whenever possible. New valuation programs or enhancements requiring major recanvass 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* (Gloudemans and Almy 2011, chapter 9).

3.6.2 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, 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* (Gloudemans 1999, chapter 2) or *Fundamentals of Mass Appraisal (*Gloudemans 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* (Gloudemans 1999, chapter 2) or *Fundamentals of Mass Appraisal* (Gloudemans 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* (Gloudemans 1999, chapter 4) or *Fundamentals of Mass Appraisal (*Gloudemans 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* [Gloudemans 1999, 118–120] or *Fundamentals of Mass Appraisal* [Gloudemans 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* (Gloudemans 1999, chapter 4) or *Fundamentals of Mass Appraisal* (Gloudemans 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* [Gloudemans 1999, chapters 3 and 4], *Fundamentals of Mass Appraisal* [Gloudemans 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 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* (Gloudemans 1999, chapter 3) or *Fundamentals of Mass Appraisal* (Gloudemans 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* [Gloudemans 1999, chapter 3] or *Fundamentals of Mass Appraisal* [Gloudemans 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 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.

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 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 meetingsMapping 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 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 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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Glossary

Abstraction Method - Method of land valuation in the absence of vacant land sales, whereby improvement values obtained from the cost model are subtracted from sale prices of improved parcels to yield residual land value estimates. Also called land residual technique.

Accrued Depreciation - (1) The amount of depreciation, from any and all sources, that affects the value of the property in question on the effective date of the appraisal.

(2) In accounting, the amount reserved each year or accumulated to date in the accounting system for replacement of a building or other asset. When depreciation is recorded as a dollar amount, it may be deductible from total plant value or investment to arrive at the rate base for public utilities. See also Depreciation.

Acquisition Value - An assessed value based on the cost of acquiring the property; increases in this value are usually limited until the next qualifying sale.

Adaptive Estimation Procedure (AEP) - A computerized, iterative, self-referential procedure using properties for which sales prices are known to produce a model that can be used to value properties for which sales prices are not known. Also called Feedback.

Adjusted Sale Price - The sale price that results from adjustments made to the stated sale price to account for the effects of time, personal property, financing, or the like.

Adjustments - Modifications in the reported value of a variable, such as sale price or gross income. For example, adjustments can be used to estimate market value in the sales comparison approach by adjusting the sale price of the comparable for differences between comparable and subject properties.

Ad Valorem Tax - A tax levied in proportion to the value of the thing(s) being taxed.

Aerial Photograph - A photograph of a part of the earth's surface taken by an aircraft-supported camera.

Agricultural Property - Improved or unimproved land devoted to or available for the production of crops or other agricultural products, livestock and agricultural support buildings.

Allocation Method - A method used to value land, in the absence of vacant land sales, by using a typical ratio of land to improvement value. Also called land ratio method.

Appraisal Foundation, The - The organization authorized by the United States Congress as the source of appraisal standards and appraiser qualifications.

Appraisal Ratio - (1) The ratio of the appraised value to an indicator of market value. (2) By extension, an estimated fractional relationship between the appraisals and market values of a group of properties. See also Level of Appraisal.

Appraisal Ratio Study - A ratio study using independent expert appraisals as indicators of market value.

Arm's-Length Sale - A sale between two unrelated parties, both seeking to maximize their positions from the transaction.

Assessment Cycle - A legally sanctioned reappraisal period generally ranging from 1 to 10 years.

Assessment Date - The status date for tax purposes. Appraised values reflect the status of the property and any partially completed construction as of this date.

Assessment Equity - The degree to which assessments bear a consistent relationship to market value.

Assessment Level - The common or overall ratio of assessed values to market values.

Assessment Maps - See Cadastral Map.

Assessment Ratio - (1) The fractional relationship an assessed value bears to the market value of the property in question. (2) By extension, the fractional relation- ship the total of the assessment roll bears to the total market value of all taxable property in a jurisdiction. See Level of Assessment.

Assessment Ratio Study - An investigation intended to determine the assessment ratio and assessment equity.

Audit - A systematic investigation or appraisal of procedures or operations for the purpose of determining conformity with specific prescribed criteria.

Audit, Performance - An analysis of an organization to determine whether or not the quantity and quality of work performed meets standards. Ratio studies are an important part of performance audits of an assessing organization.

Audit, Procedural - An examination of an organization to determine whether established or recommended procedures are being followed.

Audit Program - The procedures undertaken or particular work done by an accountant in conducting an examination.

Audit Trail - A set of records of the changes made to another set of records.

Automated Valuation Model - A computer program for property valuation that analyzes data using an automated process. See also Computer-Assisted Mass Appraisal.

Base Year Value - In a nonmarket-value assessment system, the assessed value established as of a specific year.

Benchmark - (1) A term used in land surveying to mean a known point of reference. (2) In property appraisal, a property of known value and of known effective age and replacement cost. (3) By extension, a model property to be used in determining by comparison the grade or quality class of other properties.

Cadastral Map - A scale map displaying property ownership boundaries and showing the dimensions of each parcel with related information such as parcel identifier, survey lines, and easements.

Calibration - The process of estimating the coefficients in a mass appraisal model.

CAMA - *See Computer-assisted Mass Appraisal.*

Capitalization Rate - Any rate used to convert an estimate of future income to an estimate of market value; the ratio of net operating income to market value.

Capitalization of Ground Rents - A method of estimating land value in the absence of comparable sales; applicable where there is an income stream, for example, to farmland and commercial land leased on a net basis.

Class - A set of items defined by common characteristics. (1) In property taxation, property classes such as residential, agricultural, and industrial may be defined. (2) In assessment, building classification systems based on type of building design, quality of construction, or structural type are common. (3) In statistics, a predefined category into which data may be put for further analysis. For example, ratios may be grouped into the following classes: less than 0.500, 0.500 to 0.599, 0.600 to 0.699, and so forth.

Coding - (1) The act of reducing a description of a unique object, such as a parcel of real estate, to a set of one or more measures or counts of certain of its characteristics, such as square footage, number of bathrooms, and the like. (2) Encoding, a related term, is usually used to refer to the act of translating coded descriptions useful to human beings into a form that can be processed by computers. (3) Coding is sometimes also used to refer to the writing of instructions that direct the processing done by computers.

Coefficient - (1) In a mathematical expression, a number or letter preceding and multiplying another quantity. For example, in the expression, 5X, 5 is the coefficient of X, and in the expression a Y, a is the coefficient of Y. (2) A dimensionless statistic, useful as a measure of change or relationship, for example, correlation coefficient.

Coefficient of Price-Related Bias (PRB) - A measure of vertical equity between lower and higher value properties. The PRB indicates the percentage by which assessment ratios change whenever values double or are halved, for example, a PRB of −0.035 means that ratios fall by 3.5 percent when values double and increase by 3.5 percent when values are halved.

Commercial Property - In general, any nonindustrial, nonresidential realty of a commercial enterprise. Includes realty used as a retail or wholesale establishment, hotel or motel, service station, commercial garage, warehouse, theater, bank, nursing home, and the like.

Comparable Sales; Comparables - (1) Recently sold properties that are similar in important respects to a property being appraised. The sale price and the physical, functional, and locational characteristics of each of the properties are compared to

those of the property being appraised in order to arrive at an estimate of value. (2) By extension, the term comparables is sometimes used to refer to properties with rent or income patterns comparable to those of a property being appraised.

Comparative Unit Method - (1) A method of appraising land parcels in which an average or typical value is estimated for each stratum of land. (2) A method of estimating replacement cost in which all the direct and indirect costs of a structure (except perhaps architect's fees) are aggregated and specified with reference to a unit of comparison, such as square feet of ground area or floor area or cubic content. Separate factors are commonly specified for different intervals of the unit of comparison and for different story heights, and separate schedules are commonly used for different building types and quality classes.

Computer-Assisted Assessment System - A system for assessing real and personal property with the assistance of a computer. A computer may be used, for example, in the appraisal process, in keeping track of ownership and exemption status, in printing the assessment roll, in coordinating the workload of real property appraisers and personal property appraisers with respect to the assessment of commercial and industrial properties, and in a number of other areas.

Computer-Assisted Mass Appraisal (CAMA) –

A system of appraising property, usually only certain types of real property that incorporates computer-supported statistical analyses such as multiple regression analysis and adaptive estimation procedure to assist the appraiser in estimating value.

Cost - The money expended in obtaining an object or attaining an objective; generally used in appraisal to mean the expense, direct and indirect, of constructing an improvement.

Cost Approach - (1) One of the three approaches to value, the cost approach is based on the principle of substitution—that a rational, informed purchaser would pay no more for a property than the cost of building an acceptable substitute with like utility. The cost approach seeks to determine the replacement cost new of an improvement less depreciation plus land value. (2) The method of estimating the value of property by (a) estimating the cost of construction based on replacement or reproduction cost new or trended historic cost (often adjusted by a local multiplier), (b) subtracting depreciation, and (c) adding the estimated land value. The land value is most frequently determined by the sales comparison approach.

Cost Schedules - Charts, tables, factors, curves, equations, and the like intended to help estimate the cost of replacing a structure from knowledge of some other factors, such as its quality class and number of square feet.

Data - The general term for masses of numbers, codes, and symbols. Data is the plural of datum, one element of data.

Data Edit - The process of examining recorded data to ensure that each element of data is reasonable and is consistent with others recorded for the same object, such as a parcel of real estate. Data editing, which may be done by persons or by computer, is essentially a mechanical process, distinct from verifying the correctness of the recorded information by calling or writing property owners.

Data Management - The human (and sometimes computer) procedures employed to ensure that no information is lost through negligent handling of records from a file that all information is properly supplemented and up-to-date, and that all information is easily accessible.

Depreciation - Loss in value of an object, relative to its replacement cost new, reproduction cost new, or original cost, regardless of the cause of the loss in value. Depreciation is sometimes subdivided into three types: physical deterioration (wear and tear), functional obsolescence (suboptimal design in light of current technologies or tastes), and economic obsolescence (poor location or radically diminished demand for the product). See also Accrued Depreciation.

Depreciation Schedules - Tables used in mass appraisal that show the typical loss in value at various ages or effective ages for different types of properties.

Discount Rate - The rate of return on investment; the rate an investor requires to discount future income to its present worth.

Economic Area - See Market Area.

Equity - (1) In assessment, the degree to which assessments bear a consistent relationship to market value. Measures include the coefficient of dispersion, coefficient of variation, and price-related differential. (2) In popular usage, a synonym for tax fairness. (3) In ownership, the net value of property after liens and other charges have been subtracted.

Expense Ratios - The ratio of expenses to gross income.

Factor - (1) An underlying characteristic of something (such as a house) that may contribute to the value of a variable (such as its sale price) but is observable only indirectly. For example, construction quality is a factor definition by workmanship, spacing of joists, and materials used. Factor definition and measurement may be done subjectively or by a computer-assisted statistical algorithm known as factor analysis. (2) Loosely, any characteristic used in adjusting the sale prices of comparables. (3) The reciprocal of a rate. Assessments may be equalized by multiplying them by a factor equal to the reciprocal of the assessment ratio, and value can be estimated using the income approach by multiplying income by a factor equal to the reciprocal of the discount rate.

Feedback - See Adaptive Estimation Procedure.

Front Foot - The unit or standard of linear measure used in measuring frontage.

Geographic Information System (GIS) - (1) A database management system used to store, retrieve, manipulate, analyze, and display spatial information. (2) One type of computerized mapping system capable of integrating spatial data (land information) and attribute data among different layers on a base map.

Gross Income - The payments to an owner that a property can generate before expenses are deducted.

Gross Income Multiplier - A capitalization technique that uses the ratio between the sale price of a property and its potential gross income or its effective gross income.

Holdout Sample - A sample not used in model development but rather to test the model. The sample is usually drawn randomly and provides an objective test of the model when applied to properties not used to develop the model.

Improvements - Buildings, other structures, and attachments or annexations to land that are intended to remain so attached or annexed, such as sidewalks or sewers.

Income Approach - One of the three approaches to value, based on the concept that current value is the present worth of future benefit to be derived through income production by an asset over the remainder of its economic life. The income approach uses capitalization to convert the anticipated benefit of the ownership of property into an estimate of present value.

Industrial Property - In general, any property used in a manufacturing activity, such as a factory, wholesale bakery, food processing plant, mill, mine, or quarry.

Integrity - The quality of a data element or program being what it says it is; usually distinguished from validity, the quality of its being what it should be in terms of some ultimate purpose. After data are edited and encoded and programs are prepared, their integrity is ensured by safeguards that prevent accidental or unauthorized tampering with them.

Land - (1) In economics, the surface of the earth and all the natural resources and natural productive powers over which possession of the earth's surface gives man control. (2) In law, a portion of the earth's surface, together with the earth below it, the space above it, and all things annexed thereto by nature or by man. See also Improvements.

Land Residual Technique - See Abstraction Method.

Legal Description - A delineation of dimensions, boundaries, and relevant attributes of a real property parcel that serve to identify the parcel for all purposes of law. The description may be in words or codes, such as metes and bounds or coordinates. For a subdivided lot, the legal description would probably include lot and block numbers and subdivision name.

Level of Appraisal - The common, or overall, ratio of appraised values to market values. Three concepts are usually of interest: the level required by law, the true or actual level, and the computed level, based on a ratio study.

Level of Assessment; **Assessment Ratio -** The common or overall ratio of assessed values to market values. Compare Level of Appraisal. Note: The two terms are sometimes distinguished, but there is no convention determining their meanings when they are. Three concepts are commonly of interest: what the assessment ratio is legally required to be, what the assessment ratio actually is, and what the assessment ratio seems to be, on the basis of a sample and the application of inferential statistics. When level of assessment is distinguished from assessment ratio, level of assessment usually means either the legal requirement or the true ratio, and assessment ratio usually means the true ratio or the sample statistic.

Linear Regression - A kind of statistical analysis used to investigate whether a dependent variable and a set of one or more

independent variables share a linear correlation and, if they do, to predict the value of the dependent variable on the basis of the values of the other variables. Regression analysis of one dependent variable and only one independent variable is called simple linear regression, but it is the word simple (not linear) that distinguishes it from multiple regression analysis with its multiple independent variables.

Location - The numerical or other identification of a point (or object) sufficiently precise so the point can be situated. For example, the location of a point on a plane can be specified by a pair of numbers (plane co-ordinates) and the location of a point in space can be specified by a set of three numbers (space coordinates). However, location may also be specific in terms other than coordinates. A location may be specified as being at the intersection of two specified lines by identifying it with some prominent and known feature (e.g., "on top of Pikes Peak" or "at the junction of the Potomac and Anacostia Rivers").

Map - A conventional representation, usually on a plane surface and at an established scale, of the physical features (natural, artificial or both) of a part or the whole of the earth's surface. Features are identified by means of signs and symbols, and geographical orientation is indicated.

Map, Tax - A map drawn to scale and delineated for lot lines or property lines or both, with dimensions or areas and identifying numbers, letters, or names for all delineated lots or parcels.

Market - (1) The topical area of common interest in which buyers and sellers interact. (2) The collective body of buyers and sellers for a particular product.

Market Adjustment Factors - Market adjustment

factors, reflecting supply and demand preferences, are often required to adjust values obtained from the cost approach to the market. These adjustments should be applied by type of property and area and are based on sales ratio studies or other market analyses. Accurate cost schedules, condition ratings, and depreciation schedules will minimize the need for market adjustment factors.

Market Analysis - A study of real estate market conditions for a specific type of property.

Market Area - A geographic area, typically encompassing a group of neighborhoods, defined on the basis that the properties within its boundaries are subject to similar economic forces and supply and demand factors. A separate valuation model is often developed for each market area. Smaller or mid-sized jurisdictions may constitute a single market area.

Market Value - Market value is the major focus of most real property appraisal assignments. Both economic and legal definition of market value have been developed and refined. A current economic definition agreed upon by agencies that regulate federal financial institutions in the United States is: The most probable price (in terms of money) which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale

as of a specific date and the passing of title from seller to buyer under conditions whereby:

- The buyer and seller are typically motivated;
- Both parties are well informed or well advised, and acting in what they consider their best interests;
- A reasonable time is allowed for exposure in the open market;
- Payment is made in terms of cash in United States dollars or in terms of financial arrangements comparable thereto;
- The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

Market-Value Standard - A requirement of law or practice that the assessment ratio of all properties be equal to one. Two issues are implicit here: that fractional assessment levels be avoided and that all property be assessed on the basis of its market value and not on the basis of its value in some particular use—for example,

agriculture—unless that use is the only use to which the property can legally be put (in which case its use value would be equal to its market value).

Mass Appraisal - The process of valuing a group of properties as of a given date, using standard methods, employing common data, and allowing for statistical testing.

Mass Appraisal Model - A mathematical expression of how supply and demand factors interact in a market.

Model - (1) A representation of how something works. (2) For purposes of appraisal, a representation (in words or an equation) that explains the relationship between value or estimated sale price and variables representing factors of supply and demand.

Model Area - See Market Area.

Model Calibration - The development of adjustments, or coefficient based on market analysis, that identifies specific factors with an actual effect on market value.

Model Specification - The formal development of a model in a statement or equation, based on data analysis and appraisal theory.

Multiple Regression, Multiple Regression Analysis (MRA) - A particular statistical technique, similar to correlation, used to analyze data in order to predict the value of one variable (the dependent variable), such as market value, from the known values of other variables (called independent variables), such as lot size, number of rooms, and so on. If only one independent variable is used, the procedure is called simple regression analysis and differs from correlation analysis only in that correlation measures the strength of relationship, whereas regression predicts the value of one variable from the value of the other. When two or more variables are used, the procedure is called multiple regression analysis. See Linear Regression.

Neighborhood - (1) The environment of a subject property that has a direct and immediate effect on value. (2) A geographic area (in which there are typically fewer than several thousand properties) defined for some useful purpose, such as to ensure for later multiple regressions modeling that the properties are relatively homogeneous and share important locational characteristics.

Net Income - The income expected from a property after deduction of allowable expenses.

Net Income Multiplier - A factor expressing the relationship between value and net operating income; the reciprocal of the overall rate.

Objective - The quality of being defined by specific criteria without the need for judgment.

Open Market - A freely competitive market in which any buyer or seller

may trade and in which prices are determined by competition.

Overall Rate (OAR) - A capitalization rate that blends all requirements of discount, recapture, and effective tax rates for both land and improvements; used to convert annual net operating income into an indicated overall property value.

Parcel - A contiguous area of land described in a single legal description or as one of a number of lots on a plat; separately owned, either publicly or privately; and capable of being separately conveyed.

Parcel Identifier - A code, usually numerical, represents a specific land parcel's legal description. The purpose of parcel identification is to permit reference to legal descriptions by using a code of uniform and manageable size, thereby facilitating record keeping and handling. Also called parcel identification number.

Personal Property - Consists of every type of property that is not real property. Personal property is movable without damage to itself or the real estate and is subdivided into tangible and intangible.

Price, Adjusted Sale - The sale price that results from adjustments made to the stated sale price to account for the effects of time, personal property, atypical financing, and the like.

Price, Market - The value of a unit of goods or service, expressed in terms of money, as established in a free and open market. Note: This term is sometimes distinguished from market value on the ground that the latter term assumes that buyers and sellers are informed, but this assumption is also implied by the phrase free and open market. Compare Price, Sale.

Price, Sale - (1) The actual amount of money exchanged for a unit of goods or services, whether or not established in a free and open market. An indicator of market value. (2) Loosely used synonymously with offering or asked price. Note: The sale price is the selling price to the vendor and the cost price to the vendee.

Property - (1) An aggregate of things or rights to things. These rights are protected by law. There are two basic types of property: real and personal. (2) The legal interest

of an owner in a parcel or thing.

Property Record Card (Form) - An assessment document with blanks for the insertion of data for property identification and description, for value estimation, and for property owner satisfaction. The basic objectives of property record forms are (1) to serve as a repository of most of the information deemed necessary for identifying and describing a property, valuing a property, and assuring property owners that the assessor is conversant with their properties, and (2) to document property appraisals. Use of properly designed property record forms permits an organized and uniform approach to amassing a property inventory.

Ratio, Assessment - *See Assessment Ratio.*

Ratio Study - A study of the relationship between appraised or assessed values and market values. Indicators of market values may be either sales (sales ratio study) or independent expert appraisals (appraisal ratio study). Of common interest in ratio studies are the level and uniformity of the appraisals or assessments. *See also Level of Appraisal and Level of Assessment.*

RCN - Replacement cost new or reproduction cost new.

RCNLD - Replacement cost new less depreciation or reproduction cost new less depreciation.

Real Estate - The physical parcel of land and all improvements permanently attached. Compare Real Property.

Real Property - Consists of the interests, benefits and rights inherent in the ownership of land plus anything permanently attached to the land or legally defined as immovable; the bundle of rights with which ownership of real estate is endowed. To the extent that real estate commonly includes land and any permanent improvements, the two terms can be understood to have the same meaning. Also called realty.

Reappraisal - The mass appraisal of all property within an assessment jurisdiction accomplished within or at the beginning of a reappraisal cycle (see below, sense 2). Also called revaluation or reassessment.

Reappraisal Cycle - (1) The period of time necessary for a jurisdiction to have a complete reappraisal. For example, a cycle of 5 years occurs when one-fifth of a jurisdiction is reappraised each year and also when a jurisdiction is reappraised all at once every 5 years. (2) The maximum interval between reappraisals as stated in laws.

Reassessment - (1) The relisting and revaluation of all property, or all property of a given class, within an assessment district by order of an authorized officers or body after a finding by such an officer or body that the original assessment is too faulty for correction through the usual procedures of review and equalization. (2) The revaluation of all real property by the regularly constituted assessing authorities, as distinguished from assessment on the basis of valuations most or all of which were established in some prior year. See also Revaluation.

Reciprocal - The result obtained when one is divided by a given number.

Reconciliation - The final step in the valuation process wherein consideration is given to the relative strengths and weaknesses of the three approaches to value, the nature of the property appraised, and the quantity and quality of available data in formation of an overall opinion of value (either a single point estimate or a range

of value). Also termed correlation in some texts.

Regression Analysis - See Multiple Regression Analysis.

ReliabilityThe degree to which measures are free from random error and therefore yield consistent results; the extent to which a procedure yields consistent results on repeated trials.

Replacement Cost; Replacement Cost New (RCN) - The cost, including material, labor, and overhead, that would be incurred in constructing an improvement having the same utility to its owner as a subject improvement, without necessarily reproducing exactly any particular characteristics of the subject. The replacement cost concept implicitly eliminates all functional obsolescence from the value given; thus, only physical depreciation and economic obsolescence need to be subtracted to obtain replacement cost new less depreciation (RCNLD).

Replacement Cost New Less Depreciation (RCLD) - In the cost approach, replacement cost new less physical incurable depreciation.

Reproduction Cost; Reproduct*ion* Cost New - The cost of constructing a new property, reasonably identical (having the same characteristics) with the given property except for the absence of physical depreciation, using the same materials, construction standards, design, and quality of

workmanship, computed on the basis of prevailing prices and on the assumption of normal competency and normal conditions.

Residual Property - Property used for housing such as single-family residences, duplexes, or apartment buildings.

Residual - The difference between an observed value and a predicted value for a dependent variable.

Residual Technique - A method of arriving at the unknown value of a property component by subtracting the known values of other components from a known overall value.

Revaluation - A reappraisal of property, especially a complete reappraisal of real property after assessment for 1 or more years on valuations most (or all) of which were established in some prior year.

Compare Reassessment and Reappraisal.

Review -(1) Consideration by a board of appeals, a board of equalization, a board of review, or a court of individual, property class, or district assessments, whether for the purpose of adding omitted taxable property, removing exempt property, or equalizing the valuations placed on listed property. (2) The act or process of critically studying a report, such as an appraisal, prepared by another.

Sale, Arm's-Length - A sale in the open market between two unrelated parties, each of whom is reasonably knowledgeable of market conditions and under no undue pressure to buy or sell.

Sale Price - *See Price, Sale; Price, Adjusted Sale.*

Sales Comparison Approach • One of three approaches to value, the sales comparison approach estimates a property's value (or some other characteristic, such as its depreciation) by reference to comparable sales.

Sales Data - (1) Information about the nature of the transaction, the sale price, and the characteristics of a property as of the date of sale. (2) The elements of information needed from each property for some purpose, such as appraising properties by the direct sales comparison approach.

Sales File - A file of sales data.

Sales Ratio Study - A ratio study that uses sale prices as proxies for market values.

Schedules - Tables, equations, or some other means of presenting the relationship between the values of two or more variables that are functionally related. For example, cost schedules present the relationship between cost per square foot and living area for a number of quality classes, building heights, and other characteristics.

Single-Property Appraisal - Systematic appraisal of properties one at a time.

Site - The location of a person, thing, or event.

Site Characteristics - (1) Characteristics of (and data that describe) a particular property, especially land size, shape, topography, drainage, and so on, rather than location and external economic forces.

Software - (1) Computer programs. (2) Those parts of a computer system that are not machinery or circuits; procedures and possibly documentation are included along with programs.

Special-Purpose Property - A property adapted for a single use.

Standard 6 - See Uniform Standards of Professional Appraisal Practice.

Stratify - To divide, for purposes of analysis, a sample of observations into two or more subsets according to some criterion or set of criteria.

Stratum, Strata (pl.) - A class or subset that results from stratification.

Subarea - *See Neighborhood*.

Subclass - A group of properties within a class, smaller than the class, usually (although not necessarily) defined by stratification rather than by sampling.

Subject Property - The property being appraised.

Subjective - Having the quality of requiring judgment in arriving at an appropriate answer of value of a variable (such as the quality class of a structure).

Three Approaches to Value - A convenient way to group the various methods of appraising a property. The cost approach encompasses several methods for estimating replacement cost new of an improvement less depreciation plus land value. The sales comparison approach estimates values by comparison with similar properties for which sales prices are known. The methods included in the income approach are based on the assumption that value equals the present worth of the rights to future income.

Time-Adjusted Sale Price - The price at which a property sold, adjusted for the effects of price changes reflect in the market between the date of sale and the date of analysis.

Trending - Adjusting the values of a variable for the effects of time. Usually used to refer to adjustments of assessments intended to reflect the effects of inflation and deflation and sometimes also, but not necessarily, the effects of changes in the demand for micro-locational goods and services.

Trending Factor - A figure representing the increase in cost or sale price over a period of time. Trending accounts for the relative difference in the value of a dollar between two periods.

Uniformity - The equality of the burden of taxation in the method of assessment.

Uniform Standards of Professional Appraisal Practice (USPAP) - Annual publication of the Appraisal Standards Board of The Appraisal Foundation: "These Standards deal with the procedures to be followed in performing an appraisal, appraisal review, or appraisal consulting service and the manner in which an appraisal, appraisal review, or appraisal consulting service is communicated. … Standard 6 establishes requirements for the development and reporting of mass appraisals of a universe of properties for ad valorem tax purposes or any other intended use" (The Appraisal Foundation, Appraisal Standards Board 2002, Preamble, p. 6).

Unit of Comparison - A property as a whole or some smaller measure of the size of the property used in the sales comparison approach to estimate a price per unit.

Use Class - (1) A grouping of properties based on their use rather than, for example, their acreage or construction. (2) One of the following classes of property: single-family residential, multi-family residential, agricultural, commercial, industrial, vacant land, and institutional / exempt. (3) Any subclass refinement of the above—for example, townhouse, detached single-family, condominium, house on farm, and so on.

Use Value - (1) The value of property in a specific use. (2) Property entirely used for a specific purpose or use that may entitle the property to be assessed at a different level than others in the jurisdiction. Examples of properties that may be assessed at use value under the statutes include agricultural land, timberland, and historical sites.

USPAP - *See Uniform Standards of Professional Appraisal Practice.*

Valuation - (1) The process of estimating the value— market, investment, insured, or other properly defined value—of a specific parcel or parcels of real estate or of an item or items of personal property as of a given date. (2) The process or business of appraising, of making estimates of the value of something. The value usually required to be estimated is market value.

Valuation Date - The specific date as of which assessed values are set for purposes of property taxation. This date may also be known as the date of finality. *See also Assessment Date.*

Valuation Model - A representation in words or in an equation that explains the relationship between value or estimated sale price and variables representing factors of supply and demand.

Value - (1) The relationship between an object desired and a potential owner; the characteristics of scarcity, utility, desirability, and transferability must be present for value to exist. (2) Value may also be described as the present worth of future benefit arising from the ownership of real or personal property. (3) The estimate sought in a valuation. (4) Any number between positive infinity and negative infinity. *See also Market Value.*

Variable - An item of observation that can assume various values, for example, square feet, sale prices, or sales ratios. Variables are commonly described using measures of central tendency and dispersion.

Verify - To check the accuracy of something. For example, sales data may be verified by interviewing the purchaser of the property, and data entries may be verified by check digits.

Assessment Standards of the International Association of Assessing Officers

Guide to Assessment Standards
Standard on Assessment Appeal
Standard on Automated Valuation Models
Standard on Contracting for Assessment Services
Standard on Digital Cadastral Maps and Parcel Identifiers
Standard on Manual Cadastral Maps and Parcel Identifiers
Standard on Mass Appraisal of Real Property
Standard on Oversight Agency Responsibilities
Standard on Professional Development
Standard on Property Tax Policy
Standard on Public Relations
Standard on Ratio Studies
Standard on Valuation of Personal Property
Standard on Valuation of Property Affected by Environmental Contamination
Standard on Verification and Adjustment of Sales

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