

UTAH STATE TAX COMMISSION

Property Tax Division



ASSESSMENT/SALES RATIO STUDY REFERENCE GUIDE

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PREFACE

Utah law requires all real property to be assessed at market value.¹ Assessing property consistently at market value creates equity by ensuring that the property tax burden is distributed uniformly among taxpayers throughout the state.

Counties are responsible for assessment of property on a local basis. The Utah Code requires assessors to complete detailed property reviews on a five-year cycle and to update values annually using current market data.² The State Tax Commission utilizes the Assessment/Sales Ratio Study to monitor and equalize local assessments of real property statewide. It conducts the study annually as prescribed by statute.³

The study serves as both a monitoring device for the State Tax Commission as well as a tool for counties in achieving quality assessments. State and county officials work jointly in the actual gathering, cleaning and analysis of the data. Administrative Rule R884-24P-27 requires that a preliminary study be completed by April 30th each year. The counties can then apply adjustments to their valuations prior to closing their tax rolls on May 22nd.

If the county's own adjustments are insufficient for the county to achieve legal standards, then corrective action is ordered by the Tax Commission. Depending on the particular assessment standards that are not achieved, the commission may order the county to apply factors to its values, or it may order the county to complete a detailed review of certain properties. All factor orders are required to be implemented prior to tax notices being mailed to the taxpayers on July 22nd. The deadline for compliance with other orders may be extended to the following assessment year if conditions necessitate it.

County assessors and their staff contribute many hours and resources each year to aid in the completion of this study. Their cooperation and commitment have resulted in significant improvements to the quality of the study over the years and to the quality of assessment uniformity overall.

1 Utah Code, §59-2-103

2 Utah Code, §59-2-303.1

3 Utah Code, §§59-2-704 & 704.5

INTRODUCTION

This Assessment/Sales Ratio Study is conducted in accordance with the relevant state statutes,⁴ administrative rules,⁵ and using the applicable guidelines recommended for such studies by the International Association of Assessing Officers (IAAO).⁶

The purpose of this study is to measure the overall assessment performance and effectiveness of the local assessment jurisdiction. Two general tests are employed:

First, the “level of assessment” test evaluates the tendency of assessments to be at, above, or below market value. It is especially useful in determining the proportional equity of the tax revenue contributions of counties to the Uniform School Fund. The mean and the median are used to estimate the countywide level of assessment for each of three classes of property: residential, commercial, and vacant land properties.

Note: A fourth class of property could be created by splitting residential into primary and secondary, with respect to their residential exemption status, but current market trends do not justify that distinction for purposes of this study.

Second, the “uniformity” test addresses the degree of variability of assessments, whether tightly grouped near the average level of assessment or widely dispersed above and below. Uniformity is measured statistically using the coefficient of dispersion (COD) and the coefficient of variation (COV). These measures are important in evaluating assessment performance because they indicate how consistently property is being assessed within a specific county. A high degree of dispersion among ratios indicates a lack of equity in assessments.

The mean and the median are not only used to measure the level of assessment countywide, but also to measure uniformity or equity *within* each county. This is accomplished through the process of “stratification,” where the three classes of property listed above are stratified into smaller samples to identify specific valuation characteristics.

The level of assessment and the uniformity within each county must comply with the standards set forth in Administrative Rule R884-24P-27. In the case of non-compliance,

4 Utah Code, §§59-2-704 & 704.5

5 Utah Administrative Code, R884-24P-27 & R861-1A-11

6 International Association of Assessing Officers, Standard on Ratio Studies (Kansas City: The International Association of Assessing Officers, 2013)

the State Tax Commission may order a county to take corrective action.⁷ Corrective action orders are designed to address specific valuation problems, while minimizing any adverse impact the action may have on assessments that meet standard.

The current Assessment/Sales Ratio Study is based on arms-length sales occurring from the prior year January 1, through December 31. Sales are selected primarily from qualified warranty deeds, supported by data received in response to questionnaires completed by the buyer of the property. In areas where a multiple listing service is available, sales reported by the local service may be used when appropriate to supplement the returned questionnaires. Where samples are small for a given class of property, the study period may be extended. In extreme cases other analysis may be used to determine compliance. This would be accomplished through the evaluation of the county's assessment procedures and practices including local valuation guidelines, market data collection, or elements of training, resources, and funding.

Appraisals may be performed to supplement the sales data where sample size is small.⁸

METHODOLOGY

Overview

The sample for the study consists of properties that have recently sold. Two values are necessary to construct an assessment/sale ratio for a specific property. The first is the county's appraised market value, which is obtained from the county assessor's records. The second is the sale price of the property, which is obtained from buyers' responses to questionnaires or from other market sources. For purposes of this study, the terms "appraised market value" and "assessed value" are synonymous, meaning the assessor's fair market valuation before any exemptions or statutory reductions.

The assessed value is divided by the sale price to obtain each property's assessment/sale ratio. The entire sample of ratios is then analyzed statistically to evaluate a county's assessment performance.

Sale Data Collection

The study begins with the identification of properties that have sold. Recorded deeds are the basis for identifying potential sales to be included in the study. Questionnaires are mailed to the grantees listed on deeds to request information about the recorded transaction. In addition, sale data may be gathered from local multiple listing services where available and appropriate. Each sale transaction is screened and verified before it is considered to be an arms-length representation of the market. The following criteria are used to qualify recorded deeds for the study:

⁷ Utah Code, §59-2-704(2) .

⁸ Utah Code, §59-2-704(3) .

1. Deeds must be instruments of conveyance of real property.
2. In most cases they must be warranty deeds or special warranty deeds. In some cases quit claim deeds may be used if they represent a substantial portion of the market.
3. The instrument recordation date is between January 1, and December 31 of the prior year.

Up to two questionnaires are mailed to the person or persons listed as grantee for each deed in order to obtain a response.

Sale Data Cleaning

Returned questionnaires are screened and only arms-length market transactions qualify for inclusion in the study. Sold properties are classified into three general use types: residential, commercial, and vacant land. The following are reasons to exclude a sale from the study:

1. The sale occurred outside the current study period of January 1 to December 31 of the prior year. Where sales activity is limited, sales from prior periods may be used.
2. The sale was compulsory because of foreclosure, divorce, condemnation, etc. In some cases, as in severe downturns in the real estate market, foreclosures may become a dominant component of the market. In those cases foreclosures may be carefully screened and included in the study.
3. The sale was between relatives, affiliated companies, or their officers.
4. The property was sold to or purchased from any church, fraternal, educational, or governmental organization.
5. Real estate in more than one county was involved.
6. A partial interest only was purchased or sold.
7. Possession by the buyer was delayed for more than one year.
8. The sale was strictly a transfer of convenience; i.e., the creation of a family trust or the correction of a title.
9. The sale involved an unknowledgeable buyer or seller.
10. The sale involved a trade for which a value cannot be verified.

11. The sale included a significant amount of personal property for which a value cannot be verified.
12. The property involved mixed-use from among the three classifications.
13. The property was assessed under the Farmland Assessment Act during the study period.
14. The property was split or joined during the prior year and lacked a serial number or assessment as of January 1 of the prior year.

Matching Sale to Assessment

Care must be taken to achieve an accurate match between the sold property and the property as appraised by the county assessor to insure that an appropriate comparison can be made between the two. For example, after a home sells, the new owner may change the property by building additional living area. In that case the home, in its new form, no longer represents the property as it was on the date of sale. If the assessment occurs following the change, the sale and the assessment do not match and must be excluded from the study. On the other hand, if the assessment occurs prior to the change, then the ratio may be included in the study.

Another instance where care must be used to match the sale and assessment is when a major change in property use occurs after the date of sale. If the assessor could not have readily anticipated the change in use through highest and best use analysis, then the property that was assessed may not match the property that sold and may need to be excluded.

Adjustments to the Sale Price

Sale prices may require adjustment to ensure they represent only the value of the real estate under current market conditions. The following are conditions under which sale prices require adjustment:

1. The sale included a significant amount of personal property for which a value is known.
2. The market conditions on the date of sale were different than they were on January 1 of the prior year and evidence supports a “time-adjustment.”

Assessment Data Collection

Assessed values are collected from the assessor’s records along with the location and selected physical characteristics of each sold property. Location is identified first according to broad regions, then by smaller areas called districts, and finally by specific market areas called neighborhoods. Size of sold parcels is identified by number of acres.

Improvement age, effective age and floor area is gathered. Since sales often involve multiple parcels in a transaction, care is taken to ensure that data for all parcels involved in the sale are identified and included.

Statistical Analysis

An assessment/sale ratio for each sold property in the sample is calculated by dividing the assessed value by the sale price. The ratios are then stratified into the three general classes for analysis. Each class is further stratified into sub-classes based on location, age or effective age, and size. Statistics for sub-class stratifications form a basis for issuing corrective action orders, but are not reported here.

Sample size plays a critical role in the analysis. The larger the sample size, the more reliable the statistics will be. On the other hand, finer sub-class stratifications often produce a more accurate identification of areas needing adjustment. The Tax Commission usually will only order action on sample sizes of 10 or more ratios. Nevertheless, samples of less than 10 ratios may still be useful to assessors in equalizing values.

Three averages or measures of central tendency are analyzed: the median, the mean and the dollar-weighted mean (DWM). In addition, a 95% confidence interval is calculated around the median and the mean. Two measures of dispersion are analyzed as a test for uniformity: the coefficient of dispersion (COD) and the coefficient of variation (COV). Vertical equity is analyzed using the price-related differential (PRD). Although the DWM and the PRD provide helpful insight into the sample tendencies, they are not used to determine compliance with legal standards.

The example in FIGURE 1 presents five individual assessment/sale ratios. Included are the parcel number, the assessed or appraised market value, and the sale price for each parcel. The individual ratios are computed by dividing each assessed value by its related sale price.

FIGURE 1

<u>PARCEL</u>	<u>ASSESSED VALUE</u>	<u>SALE PRICE</u>	<u>RATIO %</u>
1	\$88,000	\$101,000	87
2	67,000	63,000	106
3	59,000	58,000	102
4	72,000	72,500	99
5	52,000	54,000	96

The mean is the arithmetic average of the ratios and is calculated by summing the ratios and dividing by the number of ratios in that sample. The mean ratio in FIGURE 1 is calculated as follows: $87\% + 106\% + 102\% + 99\% + 96\% = 490\%$; then, $490\% \div 5 = 98\%$.

The median is simply the middle ratio of the sorted or arrayed assessment/sale ratios. If there is an even number of ratios, the median is the average of the middle two ratios. The median divides the data into two equal parts and is less affected by the extreme ratios on either side of the distribution than other measures of central tendency.

To find the median, the individual ratios in FIGURE 1 are arranged in order of magnitude from lowest to highest. The middle ratio in the series is then selected. This array is presented in FIGURE 2. The number of sales in this sample is odd; therefore the ratio of 99 is identified as the median or middle ratio.

FIGURE 2

<u>PARCEL</u>	<u>ASSESSED VALUE</u>	<u>SALE PRICE</u>	<u>RATIO%</u>
1	\$88,000	\$101,000	87
5	52,000	54,000	96
4	72,000	72,500	99 *
3	59,000	58,000	102
2	<u>67,000</u>	<u>63,000</u>	106
Totals:	\$338,000	\$348,500	

* The Median is the middle number in the array.

The DWM is calculated by dividing the sum of the county's appraised market values for the sold properties in the sample by the sum of the sale prices for those properties. The DWM doesn't give equal weight to each ratio; rather, it gives weight to each sale dollar and thus is more affected by ratios with high sales prices.

The dollar-weighted mean is calculated for FIGURE 2 by dividing the total of the county appraised values of \$338,000 by the total of the sale prices of \$348,500 = 97%.

Since a measure of central tendency simply calculates the average for one single instance, it is conceivable that each new sample, theoretically speaking, could produce a different measure of central tendency within a given range. In fact, the central tendency of the entire population that the samples represent can only be assumed to fall within a certain range. The wider we expand the range, the more confident we become that the “true” measure of central tendency lies within it. This range is the confidence interval. For this study the 95% confidence interval is used, meaning we are 95% confident that the “true” measure of central tendency lies within it. A detailed presentation of the calculation of the 95% confidence intervals is presented in IAAO’s *Property Appraisal and Assessment Administration*.⁹

The COD is the average absolute deviation from the central tendency divided by the measure of central tendency. In this study the COD is calculated about the median. The average absolute deviation is defined as the sum of the absolute differences between the individual observations and the measure of central tendency, divided by the number of observations.

Calculation of the COD for the ratios in FIGURE 2 is illustrated in FIGURE 3 below.

⁹ International Association of Assessing Officers, *Property Appraisal and Assessment Administration* (Chicago: The International Association of Assessing Officers, 1999) pp. 608-609

FIGURE 3

<u>RATIO %</u>		<u>MEDIAN %</u>		<u>ABS. Deviation From MEDIAN</u>
87	-	99	=	12
96	-	99	=	3
99	-	99	=	0
102	-	99	=	3
106	-	99	=	<u>7</u>
				25
Total Deviation ÷ Number of Ratios = Average Deviation				
$25 \div 5 = 5.0$				
Average Deviation ÷ Median x 100 = COD				
$(5.0 \div 99) \times 100 = 5.05$				

The COV is the standard deviation expressed as a percentage of the mean. The standard deviation is the square root of the variance. The variance is the summation of the squared deviations from the mean divided by the degrees of freedom (the number in the sample minus one).

Using the same ratios as above, the COV is calculated in FIGURE 4 below:

FIGURE 4

<u>RATIO %</u>		<u>MEAN %</u>	<u>(ABS. Deviation)² From MEAN</u>
87	-	98	121
96	-	98	4
99	-	98	1
102	-	98	16
106	-	98	<u>64</u>
			206
Sum of Squared Deviations ÷ (Number of Ratios – 1) = Variance			
$206 \div 4 = 51.5$			
$\sqrt{\text{Variance}} = \text{Standard Deviation}$			
$\sqrt{51.5} = 7.18$			
Standard Deviation ÷ Mean x 100 = COV			
$7.18 \div 98 \times 100 = 7.33$			

The PRD describes to what degree assessments are regressive or progressive. It is calculated by dividing the mean ratio by the dollar-weighted mean ratio. An assessment is said to be regressive if higher priced properties are under-assessed relative to lower priced properties. Conversely, a progressive assessment is when higher priced properties are over-assessed relative to lower priced properties. The PRD is typically expressed in decimal form. If the PRD is greater than 1, the assessment is regressive; if less than 1, it is progressive.

In the preceding examples, the mean ratio is 98% and the dollar-weighted mean ratio is 97%; therefore, the PRD is $0.98 \div 0.97 = 1.01$. This is very slightly regressive.

PERFORMANCE STANDARDS

The Tax Commission has adopted standards of performance developed primarily from those recommended by the IAAO.¹⁰ They are written in Administrative Rule R884-24P-27. The standards are summarized in FIGURE 5:

FIGURE 5

County Size	Property Class	Minimum Sample Size	Mean or Median	COD	COV
Urban	Primary Residential	10	95 – 105%	15	19
	Commercial	10	90 – 110%	20	25
	Vacant Land	10	90 – 110%	20	25
	Secondary Residential	10	95 – 105%	20	25
Rural	Primary Residential	10	90 – 110%	20	25
	Commercial	10	90 – 110%	25	31
	Vacant Land	10	90 – 110%	25	31
	Secondary Residential	10	90 – 110%	25	31

The statistical measure used in the analysis depends on whether or not the sample ratios are normally distributed around the mean; in other words, whether or not the sample is parametric. If the sample is parametric, the mean and the COV are analyzed. If not, the median and COD are analyzed.

The first test for level of assessment compliance is whether the measure of central tendency is between 90% and 110% of market value (95%-105% for urban residential). If the sample measure of central tendency falls within the 90% to 110% range, the sample passes and analysis ends. If the sample measure of central tendency falls outside of that range, a second test is applied.

The second test analyzes the confidence interval. If the confidence interval contains the legal level of assessment of 100 percent, the sample passes and analysis ends. If the legal level of assessment of 100 percent lies outside the confidence interval, a county may be ordered to factor the properties lying in the affected strata.

To determine what factor should be applied in areas that fail to pass the first two tests, the COV or COD are reviewed to determine the reliability of the sample. If the COV or COD passes standard, the county may be ordered to factor its corresponding assessments from the measure of central tendency to the legal level of assessment of 100 percent. If the COV or COD fails standard, the sample's measure of central tendency may not reflect the population's true measure of central tendency. Therefore, a county may be ordered to factor its corresponding assessments from the end of the confidence interval that is

¹⁰ International Association of Assessing Officers, Standard on Ratio Studies (Kansas City: The International Association of Assessing Officers, 2013)

closest to the legal level of assessment of 100 percent. For example, suppose a rural residential sample has a distribution that is parametric, a mean of 80%, and a confidence interval ranging from 70% to 90%. If the COV were 24 (meets standard), our factor would need to increase assessments from the mean of 80% to the legal level of 100 percent. In other words 100% divided by 80% equals a factor of 1.25. On the other hand, if the COV were 27 (does not meet standard), then our factor would need to increase assessments from the upper limit of the confidence interval of 90% to the legal level of 100%. In other words 100% divided by 90% equals a factor of 1.11.

A test for uniformity of assessments is conducted only on properties for which a detailed review of individual property characteristics was performed during the current assessment cycle. This test analyzes the COD or COV. If the sample's measure of dispersion is equal to or less than the standards shown in Figure 5, the sample passes and analysis ends. If the measure of dispersion is higher than the standard limit, the sample fails and a county may be ordered to perform the detailed review on the properties again.

SELECTIVE APPRAISAL AUDITS

County assessments are audited to determine if the sold properties in the study have been assessed in the same manner as properties that have not sold. A sample from each group is analyzed by dividing the current year's assessments by the prior year's assessments. The ratio indicates the percent change in value for that group. If the percent change is similar for each group, treatment of both groups is assumed to be uniform. If the change in assessments for the two groups varies significantly, sold properties are assumed to have been "selectively" appraised, and corrective action may be ordered.

APPEAL OF CORRECTIVE ACTION ORDERS

Counties receiving orders to correct their assessments may appeal those orders pursuant to Administrative Rule R861-1A-11. The rule also allows the Property Tax Division to adjust orders prior to a county's official appeal or to enter into stipulations with counties subsequent to an appeal.

- I. First Solicitation Letter
- II. Second Solicitation Letter
- III. Real Property Transfer Survey

I. FIRST SOLICITATION LETTER

September 20, 2002

Dear Property Owner:

The laws of the State of Utah require this office to conduct a study each year to determine the relationship between assessed value and the current market value of all classes of real estate. Section 59-1-210(14) of the Utah Code empowers the Tax Commission to request information needed to ensure fair property taxation.

Public records indicate that you **bought (or sold)** real property during our study period. Please answer questions one (1) through eleven (11) concerning the transfer of the described property and return the 'Real Property Transfer Survey' form by **(October 5, 2002)**. **A prompt response will insure that you do not receive a second mailing of the questionnaire.**

If you have not been involved in a transaction which included exchange of monies, but **recently refinanced, corrected a defective title, created a family trust or added/deleted names on a deed**, it will only be necessary to complete question #7 of the survey. This question pertains to the reasons for the sale. Item **(G) Transfer of Convenience**, would be the applicable response for these types of transfers.

Postage paid, business reply envelope is enclosed for your convenience. Please include the reference number from the questionnaire on any correspondence. The information you supply will help ensure that property taxes are fair and equitable; and that each property pays its fair share of the cost of local government. If you need assistance, please call 297-3647 during normal business hours. If you are calling from outside of the Salt Lake area, you may call 1-800-662-4335, enter 1, 73647 (ext).

Sincerely,

Valuation Appraiser
Sales Ratio Studies
Property Tax Division

II. SECOND SOLICITATION LETTER

September 20, 2002

SECOND REQUEST

Dear Property Owner:

This office recently sent you a Real Property Transfer Survey regarding a real estate transaction to which you were a party. Our records indicate that **we have not yet received the completed survey.**

Utah law requires this office to conduct the study annually to determine the relationship between taxable value and the current market value of all classes of real estate. Utah Code Ann. Section 59-1-210(14) (Supp. 1987) empowers the Tax Commission to request information needed to ensure fair property taxation. The information you supply will help ensure that property taxes are fair and equitable.

Enclosed is a copy of the survey form recently sent to you. If you have not been involved in a transaction which included exchange of monies, **but recently refinanced, corrected a defective title, created a family trust or added/deleted names on a deed,** it will only be necessary to complete question #7 of the survey. This question pertains to the reasons for the sale. Item ***(G) Transfer of Convenience***, would be the applicable response for these types of transfers.

Please complete and return it by **(October 5, 2002)**, in the postage paid business reply envelope provided. If you have already returned the first survey, **please accept our thanks for your cooperation and discard this second request.** If you need assistance, please call 297-3647 during normal business hours. If you are calling from outside of the Salt Lake area, you may call 1-800-662-4335, enter 1, 73647 (ext).

Sincerely,

Valuation Appraiser
Sales Ratio Studies
Property Tax Division

III. REAL PROPERTY TRANSFER SURVEY



RETURN USTC, PROPERTY TAX DIVISION
TO 210 NORTH 1950 WEST
 SALT LAKE CITY, UT. 84134

-PT-- GRANTEE: AA 12345679 -----

0-

REAL PROPERTY TRANSFER SURVEY

Utah State Tax Commission TC-221

----- Please return by: -----

>>>> June 25, 1995

REFERENCE NUMBER: AA 1234 5679

SERIAL NUMBER:

SERIES: 1 COUNTY:

ACCOUNT: 0

SEQ.: 0

----- GRANTOR: (Seller) -----

----- LEGAL: (May Not All Print) --

1. Address/location of property (approximate if necessary)

(street) (city or area) (county)

2. In this sale, what was the:

A. Date of sale

SALE PRICE OF: (month/year)

B. Land/buildings \$

C. Personal Property (if any) \$

(i.e. machinery, inventory, water rights, etc.)

Specify Any Personal Property: \$

D. Total Sale Price (B + C) \$

DOWN PAYMENT: \$

E. Down Payment Cash \$

F. Down Payment Other (if any) \$

(i.e. jewelry, coins, sweat equity, etc.)

Specify Any Down Payment Other: \$

3. Specify any trade of real estate in this transaction.

A. Type of property

B. Agreed upon value (if any) \$

4. Circle the letter of the category below that best describes property included in the sale price.

A. Vacant land, residential lot, or recreational lot

B. Vacant commercial land

C. Residence

D. Mobile home and lot

E. Apartment building

F. Commercial land and building(s)

G. Agricultural land only

H. Agricultural land and building(s)

I. Cabin or summer home (seasonal use only)

J. Other: \$

5. If use of the property has changed since time of sale, enter new use (use letter from list in #4).

6. Explain any reason this sale may not have been a "fair market value" transaction.

7. Circle the letter(s) of the following that apply to this sale.

A. This was a forced transaction because of foreclosure, divorce, court order, condemnation, probate, etc.

B. Sale was between relatives, affiliated companies or officers.

C. Property was sold to or purchased from any church, fraternal, educational, or governmental organization.

D. Real estate in more than one county was involved in this sale.

E. Partial interest only was purchased or sold.

F. Possession by buyer was delayed for more than one year from date of deed.

G. A transfer of convenience (i.e. refinance, correct defective title, create family trust, add/delete names on deed, etc.)

H. None of the above.

8. Circle the letter(s) indicating the types of financing used in this sale (circle all that apply).

A. Conventional

F. Farmer's Home Loan

B. Graduated payment

G. Utah Housing Authority

C. Adjustable rate mortgage

H. Assumption of mortgage

D. FHA

I. Seller financing

E. VA

J. Cash

9. Please give financing details if known.

Amount Financed \$ Interest Rate %

Length of Loan (yrs.) Explain if Necessary

10. Was sale handled through a real estate agent or broker? If yes, name of agent or broker

11. In the event we need to contact you about this survey, please list your name, phone number, and best time to be reached.

print name phone best time

Thank you for taking a moment to answer these questions. Your help in obtaining thorough & accurate sales information is appreciated.

These answers are, to the best of my knowledge, true and correct.

Signature

Date

GLOSSARY

Of particular importance in any sales ratio study is a clear understanding of the definitions used in the analysis. This is especially true for Utah because of the unique nature of some of its property tax laws.

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.

Appraisal: An opinion by a qualified appraiser of the estimated value of real property. Elements of the analysis include: preliminary survey and planning; collection of data; application of cost, comparative sales, or income approaches; correlation and reconciliation of indicated values; and the final value estimate.

Arms-length Transaction: A real estate sale between two unrelated, knowledgeable parties, neither of whom is under abnormal pressure from the other and each is attempting to maximize his gains.

Assessment Level: The level of assessment after application of any fractional assessment ratio, partial exemption, or other adjustment.

Assessment Uniformity: The degree to which properties within a specific class or county are assessed at equal percentages of market value. Common measures of uniformity are the coefficient of dispersion and the coefficient of variation.

Coefficient of Dispersion (COD): The average absolute deviation of all assessment/sales ratios from the chosen measure of central tendency expressed as a percentage of the measure of central tendency. The lower the coefficient of dispersion, the more uniform are the assessments.

Coefficient of Variation (COV): The standard deviation expressed as a percentage of the mean.

Confidence Interval: An estimated range of values, which is expected to include the true population parameter (mean, median) at a specified confidence level. It can be thought of as a measure of precision for the sample statistic or point estimate.

Confidence Level: The required degree of confidence in a statistical test or confidence interval, commonly 90, 95, or 99 percent. A 95 percent confidence interval would mean, for example, that one can be 95 percent confident that the population parameter (mean or median ratio) falls in the indicated range.

Date of Sale: The date on which the real property sale was agreed to. The data of recording may be used as a proxy for the date of sale. (See Transaction Date)

Deed Recordation: The process of registering a real property sale with the county recorder's office.

Detailed Review: A detailed review of property characteristics for each property performed by the assessor at least once every five years.

Dispersion: The degree to which data are distributed around a measure of central tendency. Measures of dispersion include the range, average deviation, standard deviation, coefficient of dispersion, and coefficient of variation.

Dollar-Weighted Mean (DWM): The measure of central tendency weighted by the dollar value of each entry. It is calculated by dividing the sum of all the adjusted assessments by the sum of all the adjusted sales prices.

Factoring: The process by which all assessments or a group of assessments are adjusted to meet the legal level of assessment. Factoring is considered appropriate when coefficients of dispersion are relatively low. The correct factor is calculated by dividing the target level of assessment by the current level of assessment.

Intangible Property: The non-physical evidence of ownership and of property rights such as patent rights, copyrights, notes, mortgages, deeds of trust, and stock certificates.

Market Value: The most probable sale price of a property in terms of money in a competitive and open market, assuming that the buyer and seller are acting prudently and knowledgeably, allowing sufficient time for the sale, and assuming that the transaction is not affected by undue pressures.

Mean: A measure of central tendency. The result of adding all the values of a variable and dividing by the number of values.

Measures of Central Tendency: Those statistics that measure the tendency of ratio data to center about a typical or central value. Measures of central tendency include the median, the mean, the mode, and the dollar-weighted mean.

Measures of Variability: Those statistics that measure the amount of dispersion, variability, or dissimilarities of ratio data. Some measure absolute differences, while others measure relative variability. Included as measures of variability are the range, average absolute deviation, and the standard deviation. Measures of relative variability include the coefficient of dispersion and the coefficient of variation.

Median: A measure of central tendency. The value of the middle item in an uneven number of items arranged or arrayed according to size; the arithmetic average of the two central items in an even number of items similarly arranged.

Mode: The value in a set of numbers that occurs most often.

Nonparametric Statistic: A statistic whose interpretation of reliability does not depend on the distribution of the underlying data.

Normal Distribution: A theoretical distribution often approximated in real world situations. It is symmetrical and bell-shaped; 68 percent of the observations occur within one standard deviation of the mean and 95 percent within two standard deviations of the mean.

Observation: One recording or occurrence of the value of a variable, for example, one sale ratio among a sample of sales ratios.

Parameter: Numerical descriptive measure of the population, for example, the arithmetic mean or standard deviation. Parameters are generally unknown and estimated from statistics calculated from a sample of the population.

Parametric Statistic: A statistic whose interpretation depends on the distribution of the data. Parametric statistics are most reliable when the data sample is normally distributed.

Population: The total number of properties in an assessment jurisdiction of a property class of interest.

Price-Related Differential: The mean divided by the weighted mean. The statistic has a slight bias upward. Price-related differentials above 1.03 tend to indicate assessment regressivity; price-related differentials below 0.98 tend to indicate assessment progressivity.

Progressivity: The assessment of higher-priced properties at a higher percentage of market value than lower-priced properties.

Property Class: An assigned category of property used in the analysis of sales in the assessment/sales ratio study. Utah uses four principal categories: 1) primary residential, 2) commercial, 3) vacant land, and 4) secondary residential.

Quit Claim Deed: This document transfers to the buyer any interest the seller may have, without warranty to clear title.

Random Sample: A sample chosen such that each unit in the population has an equal chance of being selected.

Range: (1) The maximum value of a sample minus the minimum value. (2) The difference between the maximum and minimum values that a variable may assume.

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.

Real Estate: The physical parcel of land and improvements to the land.

Real Property: The sum of tangible and intangible property rights in land and improvements; the rights, interests, and benefits connected with real estate.

Regressivity: The assessment of lower-priced properties at a higher percentage of market value than higher-priced properties.

Sale Price: The price for which a property was sold.

Sale Ratio: The ratio of an appraised (or assessed) value to the sale price or adjusted sale price of a property.

Sales chasing: Sales chasing is the practice of using the sale of a property to trigger a selective appraisal of that property at or near the selling price. Sales chasing causes invalid uniformity results in a sales ratio study and invalid appraisal level results because similar unsold parcels are not appraised at a similar time and in similar manner to the sold property.

Sample: A set of observations selected from a population. If the sample was randomly selected, basic concepts of probability may be applied.

Standard Deviation: The statistic calculated from a set of numbers by subtracting the mean from each value and squaring the remainders, adding together these squares, dividing by the size of the sample less one, and taking the square root of the result. When the data are normally distributed, one can calculate the percentage of observations within any number of standard deviations of the mean from normal probability tables. When the data are not normally distributed, the standard deviation is less meaningful and should be used with caution.

Statistical Estimator: This estimates some characteristic of the sample drawn from the population for study. Parameters are used to estimate some characteristic about the population in general.

Statistics: Numerical descriptions calculated from a sample to estimate measures (parameters) for the population. Statistics include the mean, median, and the coefficient of dispersion.

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

Subset: A group of properties within a sample, smaller than the sample, usually although not necessarily defined by stratification rather than by sampling.

Transaction Date: The date the transaction occurred.

Trending: Adjusting the values of a variable for the effects of time. Usually used to refer to adjustments of assessments or sales prices intended to reflect the effects of inflation and deflation.

Variance: A measure of dispersion equal to the Standard Deviation squared. It is calculated by summing the squared deviations about the mean and dividing that sum by the number of ratios in the sample less one.

Warranty Deed: A document from seller to buyer transferring title free and clear of all encumbrances except those specifically spelled out or of public record.

Weighted mean ratio: Sum of the appraised values divided by the sum of the sales prices, which weights each ratio in proportion to the sale price.