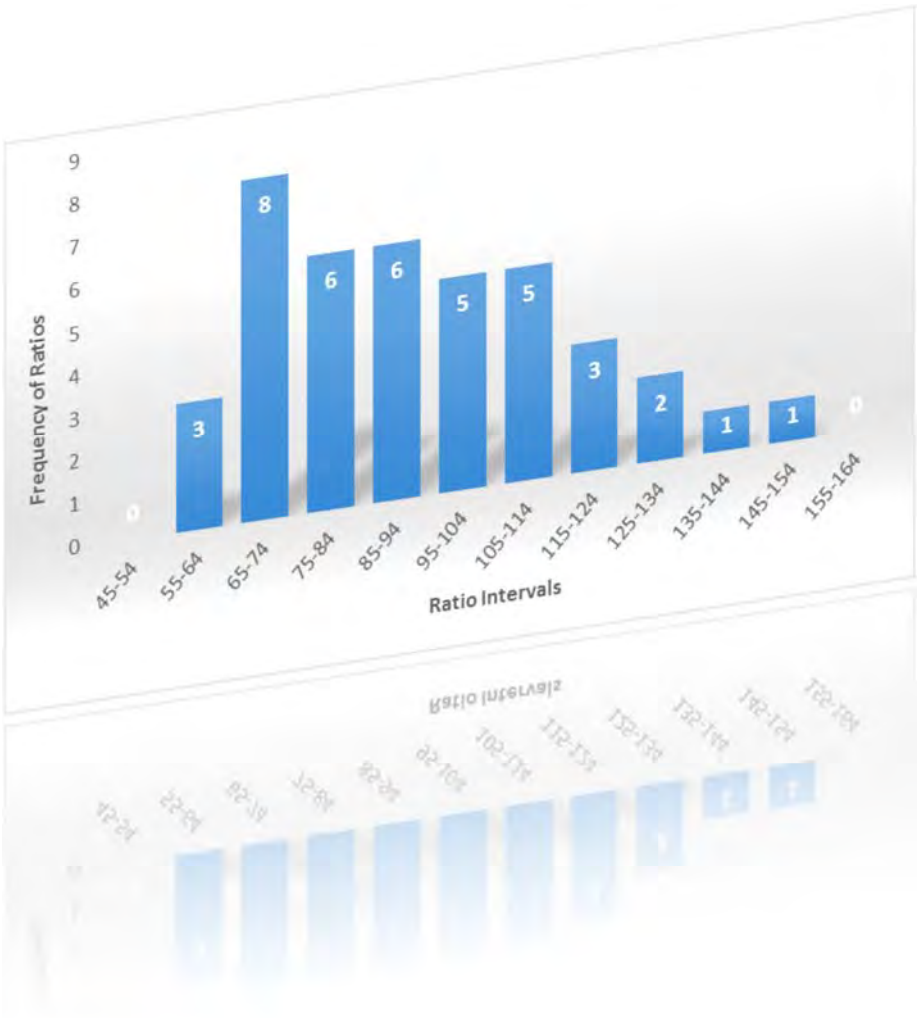
Assessor's Ratio Procedures Manual



OREGON DEPARTMENT OF REVENUE

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Preface

Purpose of the Ratio Manual

The purpose of the Oregon Department of Revenue *Assessor's Certified Ratio Study Procedures Manual* is to provide guidance and instruction to county assessors and analysts to complete ratio studies that result in an Assessor's Certified Ratio Study report complying with Oregon Revised Statutes (ORS) 309.200 and Oregon Administrative Rule (OAR) 150-309-0230, 150-309-0240, 150-309-0240.

Scope and Limitation of the Ratio Manual

This technical manual outlines processes and procedures for achieving consistent and verifiable ratio studies. Additionally, the manual provides a standardized structure to be utilized when reporting ratio study findings. Authority and limitations for development of the manual is provided by Oregon statutes and rules. The *International Association of Assessing Officers (IAAO) Standard on Ratio Studies (2013)* was consulted as a guiding reference.

The manual is a result of collaborative efforts between the Department of Revenue and county assessors, managers, and analysts, and is intended to be modified and updated on an ongoing basis.

Ratio Procedures Manual

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SECTION 1

INTRODUCTION, BASIC STEPS, AND TIMELINE

County assessors are responsible for managing estimates of property values and annually developing new assessment and tax rolls. Assessment roll value changes are a direct result of research conducted by the assessor's office employing mass appraisal techniques to maintain uniformity and equity.

Real estate prices continually fluctuate throughout the year. Oregon Revised Statutes (ORS) mandate assessors track and measure the real estate market in order to maintain 100 percent of **real market value** (RMV) as of the January 1 assessment date. To demonstrate compliance has been achieved, assessors are required by ORS 309.200 to annually complete ratio studies and publish the Assessor's Certified Ratio Study report. With the knowledge attained while completing the ratio study, the assessor can identify appraisal priorities.

The report assists the Department of Revenue (DOR) in fulfilling the role of general supervision and control over the statewide system of property taxation provided in ORS 306.115(1). The department reviews the counties' valuation programs to verify standards are met and to measure the health of the statewide valuation system.

Definitions

Assessment Date:

Oregon Revised Statute (ORS) 308.210 Assessing property; record as assessment roll; changes in ownership or description of real property and manufactured structures assessed as personal property.

> (1) The assessor shall proceed each year to assess the value of all taxable property within the county, except property that by law is to be otherwise assessed. The assessor shall maintain a full and complete record of the assessment of the taxable property for each year as of January 1, at 1:00 a.m. of the assessment year, in the manner set forth in ORS 308.215. Such record shall constitute the assessment roll of the county for the year.

Ratio Study:

Oregon Administrative Rule (OAR) 150-309-0230

(4) Appraisal ratio study is a statistical compilation of appraisal ratios for a representative group of properties in the county randomly selected on a property class basis to produce an indication of the ratio of the prior year's real market value to the current year's real market value for all taxable properties in a particular class of property within the county, in a particular class of property within an appraisal area, or in a particular class of property within a market area.

(12) Ratio study is a study which estimates:

(a) The percentage relationship between the total prior year's real market value of each class of taxable property on the prior assessment roll and the total current real market value of the same properties in each class on the current assessment roll; and

(b) The percentage relationship between the total prior year's real market value of each class of taxable property on the prior assessment roll and the total current real market value of the same properties in each class on the current assessment roll within each appraisal area, or market area.

(13) Sales ratio is the percentage relationship between the real market value for the prior assessment year and the selling price for a particular property.

Specifically, RMV divided by the sale price results in a sales ratio.

(RMV / Sale Price = Sales Ratio)

Purpose of the Assessor's Certified Ratio Study Report

The annual studies and ratio report:

- Provides supportable conclusions for adjusting roll values to arrive at 100 percent of RMV in compliance with ORS 308.232
- Fulfills the assessor's requirement set forth in ORS 309.200(1)(2)(3) to supply a report providing conclusions relating to market value to the clerk of the Board of Property Tax Appeals (BoPTA)
- Establishes a basis for testing county valuation programs. It creates a source of data that allows the county assessor and the Department of Revenue to measure results of the assessment programs

The study is a primary management tool as stated by the International Association of Assessing Officers (IAAO):

> Local jurisdictions should use ratio studies as a primary mass appraisal testing procedure and their most important performance analysis tool. Ratio studies provide a means for testing and evaluating mass appraisal valuation models to ensure the value estimates meet attainable standards of accuracy. (*IAAO Standard on Ratio Studies, 2013, pg 8*)

The Ratio Study Manual

The DOR *Assessor's Certified Ratio Study Procedures Manual* outlines a systematic approach to preparing and reporting ratio studies. The purpose of the ratio manual is to provide county assessors and analysts with procedures for developing ratio studies as required by ORS 309.200. The department must approve any deviation from the procedures set out in this manual OAR 150-309-0250(2). The manual covers these topics:

- Collecting sales data
- Classifying and sorting sales according to property class/use
- Confirming and verifying market transactions; investigating outliers, researching anomalies
- Calculating change in market conditions over time
- Identifying patterns in market areas
- Calculating ratios indicating a measurable difference between RMV and market sales
- Applying statistical methods of measurement
- Assembling required elements of an Assessor's Certified Ratio Study report

The ratio manual provides guidance to assessors and analysts in fulfilling the following responsibilities:

- Researching and verifying market transactions
- Preparing and adjusting sales to use in the ratio study
- Sorting sales according to property class
- Calculating ratios
- Analyzing sales to identify patterns and anomalies
- Applying statistical methods to develop market related conclusions

- Creating an official document demonstrating report conclusions for a specified date
- Communicating this information to assessors, appraisers, taxpayers, and public officials

Certification of the Assessor's Certified Ratio Study confirms the report meets statutory requirements. When the ratio study report is completed, it is submitted to the Oregon Department of Revenue and is available for public review.

The Assessor's Certified Ratio Study reports are used by:

Assessors demonstrate compliance with statute by developing a supportable annual ratio study which can then be used to develop the required valuation plan. As a management tool, the assessor can ensure adequate staff and resources are available to meet assessment obligations.

The **assessor's staff** may present information from the Assessor's Certified Ratio Study report as a resource and reference document to the county BoPTA members in support of roll real market values.

The **Board of Property Tax Appeals** utilizes the ratio study in their decision making process regarding appeals brought before the Board. ORS 309.200(1)(2)(3) states this study shall be filed with the Clerk of the Board no later than October 15 of each year; this allows board members the opportunity to review the study's conclusions before convening in February when appeal reviews begin.

A copy of the report is required to be filed with the **Department of Revenue** who examines the assessor's ratio programs and ratio reports to: measure compliance with statutes, ensure equitable assessment levels, and monitor county valuation programs for determination of appropriate valuation results.

Appraisers use sales files and ratio studies together as key elements in the management of valuation areas. For each area, pertinent data can be extracted from the sales file and analyzed. Appraisers determine current real market value levels by property class, review extreme ratios

for possible errors in appraisals, and identify the need for further stratification of the sales data to determine whether there are separate market influences within the market area being measured. During setup, the Assessor's Certified Ratio Study report can supply a time trend adjustment and provide support to the analysis. Corroborating outcomes increase the reliability of appraisal conclusions of real market value.

The **Department of Justice** and **Tax Courts** may consult county ratio studies as established reference documentation in support of local and statewide valuation appeals.

County governing bodies refer to the Assessor's Certified Ratio Study report when establishing potential funding levels and allowances for community services dependent upon local funding (i.e., police, fire, improvement districts, etc.). By statute, the department's annual ratio review findings and recommendation letters sent to each assessor are forwarded to the county governing body.

The state **Legislature** uses county ratio studies to evaluate statewide performance of assessment programs.

Taxpayers can reference this resource document regarding residential, commercial, and industrial valuation. The report supplies information regarding applied trends, market activity, and sales data.

Basic Steps to Complete a Ratio Study

1. Collect sales for the time period January 1 through December 31.
2. Confirm and verify sales for analysis.
3. Provide the sales database, including all rejected sales, to the Department of Revenue, when requested, under its supervisory responsibility and authority per ORS 306.115.
4. Check outlier ratios for needed additional analysis before inclusion in the array.
5. Create a sales file containing only qualified, usable sales.
6. Conduct a sales time trend analysis to determine if adjustments for changes in market conditions over time are appropriate.
7. Apply indicated time trends to adjust sales or ratios to the assessment date. Calculate measures of central tendency and select the most representative one before adjusting prior year's roll values.
8. Analyze each sales array; address arrays that may need supplemental studies (e.g., multi–years, similar class combined, etc.). Calculate central tendencies and select the most representative one; compute an adjustment factor. Test results.
9. Prepare and assemble the ratio study report.
10. Submit a copy of the Assessor's Certified Ratio Study report with the DOR no later than July 1 per OAR 150-309-0250.
    a. The DOR will examine each study and submit written recommendations or orders prior to September 1 to each assessor and county governing body per ORS 309.203.
    b. The assessor applies the adjustment factors to the real market values on the roll as recommended by DOR.
11. A certified copy of the Assessor's Certified Ratio Study report must be filed with the Clerk of the Board of Property Tax Appeals per ORS 309.200(3) no later than October 15.

Timeline

January 1:	The sales collection year begins January 1 and ends December 31. Sales information is collected, confirmed, sorted, and determined to be usable or unusable, and condition is coded and entered into the sales file. Periodically, the volume of sales data is checked and a plan is developed for additional studies, if necessary. The ratio study year begins immediately following the sales collection year (for example: the sales collection year of January 1, 2014 through December 31, 2014 is for the January 1, 2015 ratio study year), and continues until the Assessor's Certified Ratio Study report is complete. Sales analysis may be started earlier than the January 1 assessment date. Some important dates to consider are as follows:
February 15:	All sales should be entered into the database.
On or before July 1:	Deadline to file a certified copy of the ratio study with the Department of Revenue, Property Tax Division, or request an extension in writing.
August 1:	Last date to submit a report if an extension has been granted.
On or before September 1:	The department provides written findings and recommendations to the assessor. A copy is sent to the county governing body. The department notifies assessors if assessment levels are in jeopardy, per ORS 309.200(2)(a) and 309.200(2)(b). The law states "The department shall issue a written order to the Assessor if deemed necessary."
September 25:	Assessment rolls are finalized.
October 15:	The assessor files a certified copy of the ratio study with the Clerk of the Board of Property Tax Appeals.
November 1:	Deadline for submitting Valuation Plans not submitted with the ratio study report.

SECTION 2

PROPERTY CLASSIFICATION AS IT APPLIES TO COUNTY RATIO STUDIES

By virtue of its name, mass appraisal implies valuation of a large number of properties. County assessors are tasked with managing property values to maintain uniformity and equity of real market values (RMV) in the property tax system. Data analysis conducted during the annual ratio study is the primary method for managing property valuation. In order to organize the data for analysis, a system has been structured in statute and administrative rule [ORS 308.215 and OAR 150-308-0310] to meet the needs of the counties and provide consistency statewide.

To be meaningful, a system of identification is required that allows data sets to be sorted. **Property classification** is the most basic process of identifying properties in a consistent manner. Statute specifies a uniform structure for counties to follow, and consistency among counties is imperative for analysis of statewide legislative actions.

Each parcel of property within the state is classified in accordance with ORS 308.215. Consistent classification ensures that property receives the correct annual adjustment for valuation. With the exception of specially assessed properties, the classification must be based upon *highest and best use* of the property and must be maintained on a continuing basis by the assessor. A county is required to separately identify and adjust land and improvement values for each property class for each market area to bring real property to RMV.

> ***Highest and Best Use (HBU)*** *A property's highest and best use is the use found to be physically possible, legally permitted, and economically feasible, and that returns the highest value to that property. If the property is improved, the land as if vacant and available to be improved to its highest and best use is first considered, and then the property as improved is evaluated. The higher value of the two is the* ***highest and best use of the property.***

The basic property class codes and definitions established by OAR 150-308-0310 provide a consistent method of grouping similar property types and must be used to organize sales data. For ratio studies, property class is the starting point for arraying sales data for analysis. This sales

array also facilitates determining adjustments and computing the weights of value components by property class and market area countywide. The basic classes are also used to summarize the results of county ratio studies. The standard grouping allows for comparison between counties and for statewide analyses.

Basic Property Classes

The following table and information is an explanation of how the administrative rule governing property classification is used for ratio study purposes. The complete rule [OAR 150-308-0310] is in the Statutes and Rules section of this manual.

Basic Property Classes

	*Use Second & Third Digits only for **First Digits** 1 - 8*	
First Digit	**Second Digit**	**Third Digit**
0-Miscellaneous	0-No Significance (HBU & zoning are same)	0-Vacant
1-Residential	1-Residential zone	1-Improved
2-Commercial	2-Commercial zone	2-Condominium
3-Industrial	3-Industrial zone	3-State responsibility
4-Tract	4-Unzoned farmland (Non-EFU)	4-Partially exempt
5-Farm	5-Exclusive Farm Use (EFU)	5-Taxable leased
6-Forest	6-Small Tract Forestland (STF)	6-Waterfront
7-Multi-family	7-Permanent Farm-Use (Disqualified due to ORS 215.236)	7-Mobile home parks
8-Recreation	8-Multiple special	8-(Left blank)
9- (See **Exempt** list)	9-Potential development	9-Manufactured Structure

1-0-0 Residential land only is an unimproved property that has residential use as its highest and best use (HBU), and the primary zoning is residential.

1-0-1 Residential property is an improved property that has residential use as its HBU. (The 0 indicates the HBU conforms to zoning.)

2-0-0 Commercial land only is an unimproved property that has commercial use as its HBU, and the primary zoning is commercial.

2-0-1 Commercial property is an improved property that has commercial use as its HBU. This HBU is as income-producing property. Examples of commercial property include, but are not limited to: retail stores, supermarkets, discount stores, department stores, convenience marts, financial institutions, office buildings, small retail laundries, dry cleaners, medical and dental office buildings, recreational vehicle parks, restaurants, theaters, automobile service stations and truck stops, automotive service centers, parking garages, car dealerships, hotels, and motels.

3-0-0 Industrial land only is an unimproved property that has industrial use as its HBU, and the primary zoning is industrial.

3-0-1 Industrial property is an improved property that has industrial use as its HBU. Industrial property includes, but is not limited to, those properties described by ORS 306.126, OAR 150-306-0090(1), and ORS 308.408. Industrial property is typically located in an industrial zone, but may be located in areas with other types of zoning, for example, if it is a pre-existing or conditional use. Property-use characteristics typically include assembly, processing or manufacturing products from raw materials or fabricated parts and include factories that render service, for example, large non-retail laundries, and dry cleaners. Examples of industrial property include, but are not limited to, steel plants, foundries, chemical plants, and assembly plants; saw mills, plywood plants, and wood pulp or paper mills; high technology facilities, research and development facilities, science parks, and light and heavy manufacturing facilities; storage and distribution warehouses (including mini-storage); natural resource processing and refining facilities such as natural gas wells and rock quarries. Classification of property as industrial is a separate determination from appraisal responsibility. Department or county responsibility for appraising industrial property is described in OAR 150-306-0090(1).

4-0-0 Tract land only is parcels of varying sizes of unimproved acreage where the HBU is for development to a suburban or rural homesite, but the land is not divided into urban-type lots.

4-0-1 Tract property is parcels of varying sizes of improved acreage where the HBU is for use as a suburban or rural homesite, but the land is not divided into urban-type lots.

5-0-0 Farm and range land is vacant land where the HBU is for the production of agricultural crops, feeding or management of livestock, or any other agricultural use. And, the land is not specially assessed for farm use.

5-0-1 Farm and range property is land improved with buildings where the HBU is for the production of agricultural crops, feeding or management of livestock, or any other agricultural use. And, the land is not specially assessed for farm use.

5-4-0 Non-EFU zone farm and range land is vacant land that is under special farm use assessment by application.

5-4-1 Non-EFU zone farm and range property is land improved with buildings that is under special farm use assessment by application.

5-5-0 EFU zoned farm and range land is vacant land which is under special farm use assessment by zoning.

5-5-1 EFU zoned farm and range property is land improved with buildings which is under special farm use assessment by zoning.

6-0-0 Forest land is vacant land which has a HBU use for growing and harvesting trees of a marketable species.

6-0-1 Forest property is land improved with buildings which has a HBU for growing and harvesting trees of a marketable species.

6-4-0 Forest land is vacant land for which the HBU is other than growing and harvesting of trees of a marketable species and which has been designated as forest land by application.

6-4-1 Forest property is improved with buildings for which the HBU is other than growing and harvesting of trees of a marketable species and which has been designated as forest land by application.

6-6-0 Small Tract Forestland property is vacant land that is under special forestland assessment as Small Tract Forestland (STF) by application.

6-6-1 Small Tract Forestland property is land improved with buildings that is under special forestland assessment as STF by application.

7-0-0 Multi-family land is unimproved land that has multiple housing (five or more living units) as the HBU, and the primary zoning is multi-family.

7-0-1 Multi-family property is an improved property that has multiple housing (five or more living units) as its HBU, Multi-family property includes property developed as a manufacture housing park.

8-0-0 Recreation land is unimproved land that has recreational use as its HBU.

8-0-1 Recreation property is an improved property that provides recreational opportunity as its highest and best use.

The property classification associated with the property may or may not be the current use per OAR 150-308-0310(7)(a).

Mixed-use or **transitional properties** typically cannot be defined with the basic property classifications listed above, but may be coded utilizing the **Basic Property Classes** table. Per OAR 150-308-0310, the property class for mixed-use or transitional properties will be assigned based upon the use that contributes the most to the real market value as of the current assessment date. The property classification system must not be used to categorize market data that is more accurately described by other characteristics, such as the quality class of the improvements, market areas, or neighborhoods. Each digit of the code defines property as described in the following explanations.

First Digit

The first digit of the property class code (as shown in column one of the **Basic Property Classes** table) indicates the **highest and best use (HBU)** of property, except for specially assessed property. It usually is the present use and typically reflects the current zoning. However, the first digit code for non-conforming, mixed-use, or transitional property may be inconsistent with zoning or the current use.

1 Residential: described as one to four family units
2 Commercial: uses include retail, office, financial institutions, offices etc.
3 Industrial: uses include assembly, manufacturing, or processing
4 Tract small: acreage parcels of at least one acre being used as suburban or rural homesites
5 Farm: uses include rangeland or agricultural
6 Forest: activity includes growing and harvesting marketable timber
7 Multi-family: described as residential use of five or more living units
8 Recreation: used for recreational purposes

Second Digit

The second digit further categorizes the property. This number reflects the zoning or designates the land as specially assessed. A zero indicates the HBU conforms to zoning. A second digit of 1, 2, or 3 indicates the designated zoning when the zoning is not the same as HBU of the property.

Use the following guide:

0	No Significance: Indicates HBU of the property and zoning are the same.
1, 2, 3	Indicates HBU and zoning are not the same. *Example:* For a property located in a commercial zone with a residential improvement and a residential HBU, the property class would be 1-2-1. If the HBU is commercial, the property class would be 201 regardless of the actual use.
4, 5	Indicates special assessment for farm-use and forest-use lands.
6	Indicates special assessment for Small Tract Forestland (STF).
7	Indicates property permanently disqualified from farm or forest land use due to ORS 215.236 (nonfarm dwelling in exclusive farm use zone).
8	Indicates property carries more than one special assessment; i.e., combination of farm use and designated forest land or other combination of special assessments. Also used for specially assessed, government-restricted multi-unit rental housing that is specially assessed under ORS 308.701 – ORS 308.724.
9	Indicates property has potential for further development, e.g., it has been subdivided or is sub-dividable.

Third Digit

The third digit is unique to the class and acts as an additional identifier.

0	Vacant: may have some onsite development (OSD)
1	Improved (typical of class)
2	Condominium
3	State responsibility: property appraised by the DOR
4	Partially exempt
5	Taxable leased: otherwise exempt property rented by a taxable owner
6	Waterfront
7	Mobile home park
8	(Left blank)
9	Manufactured structure

Miscellaneous Property: Class 0-x-x

Per OAR 150-308-0310(7)(b), unique properties can be classified under the miscellaneous category. The miscellaneous category can also be used for property requiring a separate trend. Properties classified as miscellaneous are assigned a number beginning with zero as described in the **Basic Property Classes** table. When determining property class codes for miscellaneous categories, apply the following coding system:

The first digit is always zero (0) and denotes the major class: Miscellaneous Property.

The second digit indicates the basic class to which the property relates:

0-0-x Miscellaneous Property
0-1-x Miscellaneous Residential
0-2-x Miscellaneous Commercial
0-3-x Miscellaneous Industrial
0-4-x Miscellaneous Tract
0-5-x Miscellaneous Farm
0-6-x Miscellaneous Forest
0-7-x Miscellaneous Multi-family
0-8-x Miscellaneous Recreational
0-9-x Miscellaneous Exempt

The third digit is unique to the class, further defining property characteristics:

0-x-0 Unbuildable size, Department of Environmental Quality, easement, right-of-way, etc.
0-x-1 Improvement only
0-x-2 Mineral interest
0-x-3 Centrally assessed (DOR responsibility: utilities, railroads, airlines)
0-x-4 Historic
0-x-5 Open space
0-x-6 (Left blank)
0-x-7 Timeshare property
0-x-8 Enterprise zone
0-x-9 Manufactured structure

Examples:

0-0-9 Real property manufactured structure
0-1-9 Personal property manufactured structure

Exempt Property: Class 9-x-x

Properties classified as exempt are assigned a property class number beginning with the digit nine. When determining property class codes for exempt categories, apply the following coding system:

The first digit is always nine (9) and defines the property as exempt.

The second digit identifies the type of property or ownership:

9-0-x Student housing

9-1-x Church
9-2-x School
9-3-x Cemetery
9-4-x City
9-5-x County
9-6-x State owned
9-7-x Federally owned
9-8-x Benevolent, fraternal ownership
9-9-x Port properties or other municipal properties

The third digit is unique to this class and acts as an additional identifier:

9-x-0 Vacant
9-x-1 Improved
9-x-2 Partially exempt
9-x-3 Taxable leased property
9-x-4 In lieu of value (tax)
9-x-5 Temporarily exempt
9-x-6 Native American holdings
9-x-7 (Left blank)
9-x-8 Mineral interest
9-x-9 Manufactured structure

Examples:

9-0-1 OSU student housing
9-1-2 Church property with for-profit bookstore

Multi-Account Sales

Only one property classification should be included in the sales record. If a sale includes more than one parcel and they are different property classifications, the predominant classification should be used.

Machinery and Equipment

ORS 308.215(2) (Statute amended in 2012)

(2)For purposes of the classification of real property required under subsection (1)(a)(C) of this section, property listed in paragraph (a), (b) or (c) of this subsection must be classified, together with any other property listed in the respective paragraph, separately from all other property:

(a) Machinery and equipment.

(b) Property appraised under ORS 306.126, other than machinery and equipment.

(c) Industrial property, other than property appraised under ORS 306.126, and commercial property.

As of the date of this publication, the Department of Revenue has not addressed the property classification of real property machinery and equipment (M&E) in an administrative rule. However, DOR surveyed the counties and found the most common property classifications used to identify real property M&E are 0-3-3, 0-3-6, 0-3-8, and 3-0-8.

SECTION 3

SALES DATA COLLECTION AND STANDARD DATA FORMAT

The annual ratio study begins with the collection of information on property sales throughout the county. All available sales should be used for each property class. This will avoid distortion of the results and provide an accurate reflection of the assessment program.

Sales Data Year

- The sales collection year is from January 1 through December 31. Collection of sales data must be organized, timely, and continuous. It is advisable to have each month's sales completed by the last working day of the following month. The sales analysis process can be started prior to the first of the year. The collection and processing of sales through December should be completed and compiled by February 15.

- After the sales data have been gathered and arrayed, analysis and computation begin. Analysis for the current year and sales collection for the coming year overlap. As statistical analysis begins for the current year, sales collection for the coming year is taking place.

- The certified ratio study is to be finalized and delivered to the DOR by July 1. The department will consider an extension for cause, to last no later than August 1, if a request is filed in writing with the department prior to July 1.

Market Data Sources

Sales information is taken from recorded instruments such as deeds, mortgages, and contracts. Other information from unrecorded sources, such as comments from realtors or appraisers, can be used only when thorough verification has been conducted.

Written procedures should be developed that outline the timely movement of the sales information from the clerk's office through the assessor's office and then to the data analyst. This process is known as sales take-off. The data analyst needs to ensure that the sales collection,

confirmation, and qualification process is current.

Data Sources:

- Primary sources for real property transactions include recorded and unrecorded property transfers such as deeds, contracts, and mortgages.
- Oregon Building Codes Division (BCD) is responsible for maintaining ownership and siting information for manufactured structures. Most transactions take place through the BCD *LOIS System* at the county assessor's office or mobile home dealerships, which will be acting on behalf of the division.
- Secondary sources include individual buyers and sellers, and the records of real estate offices; multiple-listings services; title companies; government and private sector fee appraisers; building contractors; financial institutions; and developers.

Secondary sources are very important when data is limited. They can provide information regarding market activity. A banker may explain a policy regarding sales after foreclosure, i.e., whether a sale price is at market value or at liquidation value. Real estate brokers can verify whether a listing is above or below what the market reflects. Listing prices can be utilized in the ratio study for supporting data only when they are adjusted for the typical differences between the asking prices and final sale consideration. The adjustments must be developed in a special study.

Sales Database

Pertinent information is maintained in a sales database. This is an organized filing system with related market information, such as prices and trends from actual sales, real estate publications, and regional economic and employment information. This information is used by the data analyst to understand market activity and can be used to develop supplemental studies related to the ratio and adjustment program.

Property Sale Identification

It is important to identify each transaction in the computer generated sales database system with the appropriate Map and Tax Lot numbers. Other identification numbers that can be used, not to replace Map and Tax Lot numbers are:

- Account number
- Reference number
- Key number
- Serial number

Multi-Account Sales

When more than one account is included in a sale, all accounts need to be identified within the database, and the total RMV of the land and improvements from the current certified roll of all accounts involved must be used. These types of sales should be handled with caution because they are more complex than the typical transaction of properties within the sales array.

Standard Data Format ORS 306.125(1)

Submit assessment and taxation information in standard data exchange formats as required by ORS 308.215, 308.217, 308.219, 309.310, and 311.105.

The sales record or sales database should contain all pertinent information regarding transactions. The sales listings and related statistical data will be developed from this information. Not all information maintained in the sales record is used to create the sales listings. The program should have the flexibility to sort on any of the data fields.

Provide the sales database, including all rejected sales, to the Department of Revenue, when requested, under its supervisory responsibility and authority per ORS 306.115.

Database Fields

The following data fields should be included in any sales database. This database need not be entirely separate from the assessment roll or other databases maintained by the county, provided the analyst is able to store, view, and retrieve the necessary information.

1. **Grantor's name** — seller
2. **Grantor's address** (optional)
3. **Grantee's name** — buyer
4. **Grantee's address**
5. **Account number** — consists of township, range, section, and tax lot numbers
6. **Code area number** — taxing district code
7. **Instrument number** — deed, volume and page numbers, instrument number, or other identifying numbers to locate the recordation of the deed or contract
8. **City** — city code numbers (if used)
9. **Building class** — the principal building class as shown on the appraisal inventory record, computer printout, or envelope. Other buildings shall be coded by type, enabling separate adjustments, if necessary.
10. **Year built** — the year the principal building was constructed
11. **Percent good** — a measure of depreciation (physical, functional, and economic) determined for the principal building.
12. **Year appraised** — the assessment year for which the field appraisal of the property was made. ORS 308.234.
    - This information allows separate studies of current RMV levels based on appraisals prepared in different years.
    - If the land and improvements were valued separately for different assessment years, the earliest date will be considered the year appraised.
    - For counties that recalculate, a revaluation is conducted on an annual basis. Care should be taken to maintain the actual year of last physical inspection of the property upon which the basic characteristics (square foot area, quality class, condition, other improvements, etc.) were determined as the year appraised.
13. **Appraisal area** — appraisal area within the county.
    - Counties are no longer required to maintain six appraisal maintenance areas.
    - Counties may continue to maintain six appraisal maintenance areas or identify new appraisal areas based on their needs analysis and available resources.
14. **Market area** — a group of properties that generally share important characteristics that influence value. See OAR 150-309-0230 and 150-308-0380.

15. **Acres** (size) — total acres or square footage included in the transaction (if available).

16. **Ratio** — a percentage obtained by dividing the RMV from the current certified roll by the sale price (SP) (Roll RMV ÷ SP = Sales Ratio).

17. **Condition (reject) code** — a code showing the status of a sale that has either been disqualified or accepted for ratio study purposes. See Section 5 of this manual.

18. **Condition code explanation** — specific explanation as to why the condition code was selected.

19. **Roll year** — current assessment roll is the roll being prepared for the tax year beginning July 1 of the current calendar year, per OAR 150-309-0230(7).

    Note: Prior year sales will have a different roll year than current year sales. These sales must be analyzed to determine if a trend exists and properly adjusted to the current assessment date.

20. **Real market value** — the RMV of land and improvements including manufactured structures taken from the current certified roll. RMV must reflect the condition of the property at the time of sale and not be influenced by consolidations, segregations, demolished, repairs, remodeling, or additions that were not included in the sale.

21. **Sale price** — the sale price or amount of consideration shown on the deed or contract.

22. **Sale price data** — (gathered from confirmation).

    - Terms: type of financing, down payment, interest rate, and duration of the mortgage
    - Conditions surrounding the sale (foreclosure, distress, open market, illness, length of time on market, etc.)
    - Encumbrances or liens assumed by the purchaser
    - Adjustments to the sale price: may include, but are not limited to, personal property, points paid by the grantor, repair allowances, any portions not assessed for property tax purposes included in the selling price (timber, crops, orchards)

23. **Date of sale** — the date the sale instrument was signed or the sale price was agreed upon between seller and buyer. The recordation date indicates the date the transaction became public record.

24. **Property class** — outlined in Section 3 or as specified in OAR 150-308-0310.

25. **County number** (1 - 36) — usable for multi-county ratio study report (see Addenda).

26. **Instrument type** — warranty deed, trust deed, contract, etc.

27. **Zoning** — residential, commercial, industrial, EFU, etc.
28. **Multiple-account indicator** — more than one parcel (account) in transaction.
29. **Comments**.
30. **Staff**, including the data analyst, confirming sales.
31. **Optional information** — additional information may be captured, if determined appropriate. This may include items such as:
    - Storing an adjustment to a recorded price (for personal property)
    - Noting sales questionnaires have been sent or received
    - Storing the adjusted sale price and date
    - Identifying unusual properties (waterfront, etc.)

At this point, all sales have been organized but not analyzed.

SECTION 4

INVESTIGATING SALE TRANSACTIONS

Sales Confirmation and Verification

Real estate sales provide the basis for valuing real property. Sales are also used to measure equality and uniformity of assessment. The use of sales for these purposes has been tested in the courts.

As data is collected, deeds and contracts should be carefully examined to identify characteristics of individual sales. There may be sufficient information on the recorded instrument to support rejecting the sale for use in the current ratio study. If not immediately rejected, an attempt should be made to confirm the sale by mail or personal contact. Both confirmed and unconfirmed sales are analyzed to create a listing of sales used to complete ratio studies.

The data analyst, registered appraisers, or other trained non-appraisal staff may complete confirmation duties. The person confirming the sale should be identified in the sales file as well as notation of the method used. Support staff may complete certain portions of the confirmation process such as mailing sales questionnaires, recording responses, and data entry. It is important to document when questionnaires were mailed or other forms of contact were attempted.

The assessor is responsible for developing written sales confirmation and verification procedures to ensure consistency and uniformity in collection and screening of sales data. The terms confirmation and verification are different in their definition:

- C**onfirm** is to cause someone to believe something more strongly.

  Example: While obtaining information by telephone about a property sale, the buyer states the information about the sale and inventory in the record is correct. This sale has been **confirmed**.

- V**erify** is to prove, show, or find out that something is true or correct; having first-hand knowledge. It is a higher level of validation.

  Example: Upon a field inspection, the appraiser interviewed the buyer and observed first-

hand the information in the inventory record was correct. This sale has been **verified**.

Methods of Confirmation and Verification

All methods should follow a standardized format to maintain consistency of data collection. The following is a list of commonly used methods and their level of affirmation. Each method is described in more detail below.

Typical methods are:

- Questionnaire letter - confirmation
- Telephone - confirmation
- Email or Internet digital form - confirmation
- Field inspection and interview (Level 1, 2, or 3 inspection) - verification

Questionnaire Letter

The questionnaire letter is the most widely used method of sale confirmation and should be customized for different property types. Letters should be on county letterhead and include the purpose of the questionnaire along with county contact information. Some counties include a postage-paid return envelope. See questionnaire examples at the end of this section.

Here are some considerations when evaluating responses:

- Interest transferred (fee simple, partial, etc.)
- Was this an arm's length transaction?
    - Was there a relationship between the buyer and seller?
    - When was the price negotiated?
    - How long was the property exposed to the market?
    - Was either party under duress?
- The stated reason for purchase.
- When personal property is listed in the sale, determine how it affects the sale price.

- Did the sale price include unpaid taxes or assessments?
- Were the closing costs/points paid by the seller?
- Has the property changed since the sale price was negotiated?

If responses from both the buyer and seller are received, they should be carefully compared.

- Did the buyer and seller provide the same sale date?
- Did the buyer and the seller confirm the sale price and related terms?

Telephone Contact

Telephone confirmation is an effective method of confirming sales with the grantor, grantee, or an agent directly involved in the transaction.

The caller should organize the interview prior to the call to make certain all necessary questions are answered in one contact. Use the questionnaire as a guide to ensure the information gathered is consistent.

Email or Internet Digital Form

Some counties have electronic questionnaires available on their website where interested parties can provide sale confirmation.

Field Inspection

Field inspection and in-person interview provide the most confident level of affirmation of the property characteristics and condition of sale for all properties (residential including manufactured structures, farm, commercial, industrial, etc.). Complex property transactions such as commercial, industrial, and farm properties, typically require an on-site field inspection. Such sales usually involve both real and personal property.

The letter questionnaire can provide guidance to ensure that the information gathered is consistent. Additional questions should be added that are specific to the type of property.

Levels 1, 2, and 3 are acceptable levels of inspection for field verification of sales (*Appraisal Methods Manual*):

- Level 1. A full inspection, exterior and interior.
- Level 2. An exterior inspection is made. No attempt at an interior inspection is made unless a major change to the property is detected.
- Level 3. A street inspection is conducted. (Drive-by inspection only, unless a major change to the property is detected.)
- Level 4. No on-site inspection is made. This level is intended for recalculation purposes only and is not valid for appraisal because property characteristics are not verified. Oblique aerial photography is in this category.

An Exception to Typical Confirmation Practices

Under certain circumstances, a choice not to confirm sales may be acceptable. This exception to typical confirmation practices is to use only the consideration (sale price) directly from the recording instrument. This exception should **only** be used for residential properties when:

- There is a large quantity of sales
- Sales can be documented as representative of properties in a study area
- Confidence intervals are sufficiently narrow (+/- 5%)

Sample size can minimize the effect of extreme ratios on central tendencies. When using this exception, **all relevant sales** in that market area **must remain in the study** (that are not found to be unusable for ratio study purposes as in DOR Condition Codes 1-23). Do not eliminate sales without sufficient and compelling information.

SALE ADJUSTMENTS AND QUALIFICATION

Adjustments to Identify and Consider

Property sales often include more than land and buildings and may contain certain obligations of the buyer or seller. When sale prices include furniture, machinery, livestock, timber, orchard trees, or farm crops, identify the item and the value allocated to each adjustment. Non-taxable elements such as farm machinery and intangible business value should be subtracted from the sale price. If a buyer assumes sewer or street assessments, delinquent property taxes, or other title clearing ownership expenses, the sale price may need to be adjusted.

When evaluating these adjustments, consider the following:

- Does the amount adjusted appear reasonable?
- What was the source of the value estimate?
- What is the source of any revised value?

Multi-Account Sales

If a sale includes more than one parcel or account, care should be exercised that all accounts have been included.

General Acceptance of Sales

In evaluating each sale, it is critical to determine whether the sale meets the standards for inclusion in the ratio study. If a sale cannot be confirmed and there is no apparent reason to reject it, the sale **must be included** in the ratio study. Attempts to confirm these sales should be documented in the sale listing.

> The sales reviewer should take the position that all sales are candidates as valid sales for the ratio study unless sufficient and compelling information can be documented to show otherwise. If sales are excluded without substantiation, the study may appear to be subjective. Reason codes can be established for invalid sales. (*IAAO Standard on Ratio Studies*, 2013, page 48)

Identifying Unusable Sales

The following types of sales are generally found to be **unusable** for ratio study purposes.

Conditions that **may** invalidate a sale include but are not limited to:

1. **Sales involving government agencies, public utilities, and educational institutions**. Such sales can involve an element of compulsion (eminent domain) and often occur at prices higher than would otherwise be expected in the market. Liquidation sales may reflect a lower than typical market price.

2. **Sales involving charitable or religious organizations.** A sale involving these organizations can include an element of philanthropy and may contain an atypical consideration or restrictive covenant.

3. **Sales involving financial institutions.** A sale in which the lienholder is the buyer may be in lieu of a foreclosure or a judgment and the sale price can equal the loan balance only.

4. **Sales between relatives or corporate affiliates**. These sales are usually not open market, arm's length transactions.

5. **Sales settling an estate**. A conveyance by an executor or trustee under powers granted in a will may not represent fair market value. Verify if the sale took place soon after the will was filed and admitted to probate in order to satisfy debts or the wishes of an heir.

6. **Forced sales.** Such sales include those resulting from a judicial order. The seller in such cases is usually a sheriff, receiver, or other court officer.
7. **Sales of doubtful title.** When a sale is made on other than a warranty deed, there is a question of whether the title is merchantable. Quit claim deeds and trustees' deeds are examples.

8. **Property description:** Incorrect legal description. Deed may describe a parcel with ownership other than grantor or legal description may not be complete.

9. **Partial interest and segregation:** Partial interest sales and segregations may not represent true real market value of the entire property on the roll.

10. **Acquisitions or Divestments by Real Estate Investors:** Purchases or sales by large corporations, pension funds, or real estate investment trusts (REITs) that involve multiple parcels.

Sales with Special Conditions

Sales with special conditions may be open-market transactions, and with thorough and complete verification, may qualify for use in ratio studies.

1. **Land contracts:** Current contract sales exposed to the market in the normal manner and having terms similar to typical open-market transactions (down payment, interest rates, and duration of loan) may qualify for use in the ratio study. Deeds in fulfillment of a land contract often reflect market conditions several years in the past, and such dated information should not be included in the ratio analysis.

2. **Auctions:** Auction sales of real property tend to be at the lower end of the price range. When verification reveals properties have been well-advertised and the auction well-attended, the sales may be valid for consideration in ratio studies.

3. **IRS Revenue Code 1031 Exchanges:** These are in almost all cases valid transactions between knowledgeable parties who researched the available market and conducted this exchange to defer a capital gains tax event. One of the main criteria in this kind of exchange requires the party selling an investment property to reinvest in like kind of property for equal or greater value than the relinquished property. Acceptable exchanges under IRC 1031 include real property with real property, personal property with personal property, aircraft with aircraft, etc., of equal or greater value. This type of transaction is subject to a time-period limitation.

4. **Property Sold Not Same as Appraised:** If property sells in a condition that is different from the way it had been valued, under certain circumstances it can be revalued and used in a ratio

study. However, this is generally not the case. The caution in this instance is that property characteristics of the sold property are known while the current characteristics of the unsold properties in that study area remain unknown.

Prior to inclusion of the revalued sale in the ratio study, the following conditions must be met:

- There are no significant changes in the property rights transferred or in the permitted use, and the parcel was not divided since the last appraisal date
- The sale is representative of the study area (see IAAO Section 4.5 on "Sample Representativeness" below)
- The properties in the study area were appraised within the most recent five years using the same date of value and appraisal procedure (see IAAO Section 4.8 on "Frequency of Reappraisals" below)
- The sold property is revalued to reflect current characteristics of the sold property utilizing the same setup studies as the unsold properties in that study area

Excerpt from *IAAO Standard on Ratio Studies*, 2013:

Section 4.5, "Sample Representativeness:"

In general, a ratio study is valid to the extent that the sample is sufficiently representative of the population.

The distribution of ratios in the population cannot be ascertained directly and appraisal accuracy can vary from property to property. By definition, a ratio study sample would be representative when the distribution of ratios of properties in the sample reflects the distribution of ratios of properties in the population. Representativeness is improved when the sample proportionately reflects major property characteristics present in the population of sold and unsold properties. As long as sold and unsold parcels are appraised in the same manner and the sample is otherwise representative, statistics calculated in a sales ratio study can be used to infer appraisal performance for unsold parcels.

However, if parcels that sell are selectively reappraised based on their sale prices and if such parcels are in the ratio study, uniformity inferences will not be accurate (appraisals appear more uniform than they are). In this situation, measures of appraisal level also will not be supportable unless similar unsold parcels are appraised by a model that produces the same overall percentage of market value (appraisal level) as on the parcels that sold (see Appendix E, "Sales Chasing Detection Techniques"). Assessing officials must incorporate a quality control program; including checks and audits of the data, to ensure that sold and unsold parcels are appraised at the same level.

Excerpt from *IAAO Standard on Mass Appraisal of Real Property*, 2013:

Section 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:
• Re-inspecting all property at periodic intervals (i.e., every 4 to 6 years)
• Re-inspecting properties on a cyclical basis (e.g., one-fourth or one-sixth each year)
• Re-inspecting 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

Sales or transaction instruments deemed **unusable** for the ratio study purposes may have valid uses in other studies, such as appraisal setup, etc. When used in other studies, make proper adjustments for date of sale and any subsequent changes to the property since the last appraisal or valuation.

Condition Codes (IAAO Reason Code)

Once confirmation and verification is complete, a final condition code is applied. Condition codes were developed to provide a numeric means of categorizing property sales by the circumstances surrounding the transaction. The code represents the most compelling sale condition description, which ties to its usability in the ratio study. This list can be expanded to fit the individual needs of a county. The county's complete condition code list must be included in the ratio study report.

It is critical to select and assign the most appropriate condition code and then record it in the sale condition data field. Sales can be sorted by the condition code for use in the ratio study.

Sales Data Condition (Reject or Reason) Codes

Code No.	Description
1.	Change of use.
2.	Deed does not show warranty of title.
3.	Grantee/grantor is a political subdivision (government agency).
4.	Grantee is a bank or other financial institution, or lender foreclosure.
5.	Grantee is charitable, religious, or other institution.
6.	Grantee and Grantor are related or business associates.
7.	Conveyance of partial or divided interest.
8.	Grantee and grantor are the same, transfer of convenience.
9.	Trade…(exchange of properties).
10.	Conveyance of property to avoid lien/foreclosure.
11.	Grantor is sheriff or other court office (administrator), receiver, guardian, trustee.
12.	Contract payoff.
13.	Critical field on deed/document left blank.
14.	Prior year's real market value or sale price missing.
15.	Date of sale missing.
16.	Sale includes personal property, which cannot be accurately extracted.
17.	Sale includes orchards, crops, or other exempt properties.
18.	Mortgage balance is not noted.
19.	Error in classification (unless corrected by reclassification).
20.	Other errors or omissions (miscellaneous)—*MUST* explain under "Reasons for Rejection."
21.	Property sold is not the same as valued for the current certified roll. This does not include general ongoing maintenance and repair (GOMAR) unless there is an "exception value" included.
22.	Sale includes designated forestland and/or timber.
23.	Sales of properties that have had the real market value adjudicated by the BOPTA,

DOR, or Tax Court (in the past five years).

30. Usable, but *unconfirmed,* within current sales year.

31. Unconfirmed *prior* year's sale adjusted for time and used in current year's ratio study.

32. Confirmed prior year's sale adjusted for time and used in current year's ratio study.

33. Confirmed sale.

The following sale conditions are unusable and only require a condition code for the sale listing.

The grantor is a sheriff, receiver, or other court officer disposing of property under a judicial order or administrative proceeding

The grantor and grantee are the same, and the deed merely changes the nature of the interest in the property

The transaction conveys an undivided interest with no value

A tenancy in common is created

A tenancy by the entirety is created

Grantor and grantee are related, and *no value is conveyed*

The sale is a dedication to the public

The instrument is a security conveyance for financing purposes, i.e., Trust Deed

Adjacent owners are exchanging property, and no value is conveyed, i.e., lot-line adjustment

The "sale"/instrument is a partial release of a mortgage

The transfer is in lieu of foreclosure

The transfer involves a death certificate

The instrument is a re–recording or Correction Deed

The transaction is a conveyance of seller's contract balance; no real property is involved, i.e., memorandum of contract

Sample sales cover letter and questionnaires follow

Counties typically have cover letters and sale questionnaires pre-filled with some transaction information. The following examples contain suggested questions and sample text for different types of properties that a county may want to include when confirming sales. A higher rate of return on completed questionnaires may be achieved by including stamped and self-addressed return envelopes.

Some counties now collect sales confirmation information by using fillable forms on their websites, saving time and costs.

County Letterhead Here

Sample Cover Letter

Dear Property Owner:

Each year, we are required by law (ORS 309.200) to conduct sales studies using information acquired from recorded documents (deeds, contracts, etc.). Please take a few moments to complete the questionnaire.

Why is the sales information needed?

It is important for the assessor's office to confirm the details of this property sale in order to maintain uniform and equitable assessment. Sales of real estate are used as the main basis in establishing the market value of land, buildings, and other improvements.

How will the information be used?

Appraisers will consider the selling price and other details from the questionnaire, along with the selling prices of similar properties, to determine the market value for many properties. Information about current building construction costs, income and expenses (for income producing properties), condition of the buildings, etc., will be used in various valuation studies.

Why are so many questions asked about my property?

The deed provides the recorded sale price of the property, but does not include all necessary information to complete a proper evaluation of the sale. Sales prices may include special conditions, furniture, machinery, timber, livestock, and farm crops. The value of these items is considered separately from the total selling price when the sales are analyzed.

What other details should be noted?

Crops, timber, plants, and orchard trees are not taxable. If the purchase price included any of these items, please show the number of acres and type of item. Some property included in the sale may not be assessable for property tax purposes. Amounts paid to the seller for sewer or street assessments, property taxes, or other expenses should be listed. Since this information is typically not provided on the deed, it is essential to notify the assessor about these special

conditions of the sale.

County Letterhead Here

Residential Sales Questionnaire

Regarding the recent transaction involving property located at: *situs street address* _____

situs city state zip _____
(pre-filled by County)

(Name) County is required by law to value all property at real market value (ORS 308.232), defined as what it would sell for in cash terms paid by an informed buyer to an informed seller, each acting without compulsion in an arm's length transaction (ORS 308.205). Answers to the following questions assist us to evaluate this transaction in terms of our statutory obligations.

The information is important and will be used to develop and refine models for estimating market value.

If you have questions, please contact the (Name) County Assessor's Office, at (phone number or email address). Thank you for your assistance.

Sale Price: $ _____ Sale Date: _____ (pre-filled by County)

1. Is the sale price and date listed above accurate? If not, please correct. Y / N

2. Property type: ___ House ___Multi-family (# of units) ___ Recreational ___ Manufactured Home
   Other _____

3. Was the property listed on the open market at the time of sale? If yes, for how long? _____ Y / N

4. Was a realtor involved? (Listing office: _____) Y / N

   If not, how did you discover the property? _____

   How was the price determined? _____

5. Original asking price (if known) $_____

6. Financing:
   ___ Financial Institution Down payment $ _____
   ___ Cash sale
   ___ Traded for: _____ Value:_____
   ___ Land sale contract/Owner carried/Assumption _____
   ___ Other _____

7. Was personal property (appliances, furniture, farm machinery, etc.) included in the sale? Y / N

   Describe: _____ Estimated/agreed upon value $ _____

8. Was timber or crop value included in the purchase? Value $_____ Y / N

9. Were there unpaid delinquent taxes, liens, or assessments assumed by the purchaser? Y / N

   If so, how much? $_____

10. Were there unusual restrictions attached to the property (contaminated property, slide zone, wetlands)? Y / N

    Describe: _____

11. Nature of sale: ___ Typical market sale ___ Property sold at auction? ___ Satisfaction of contract?
___ Sale between relatives, friends, business associates?
___ Property traded/exchanged? Value $_____
___ Other _____

12. Forced sale? ___ Death in the family/Estate sale ___ Court order
___ In lieu of foreclosure/repossession ___ Delinquent taxes
___ Other _____

13. Is this a **bare land** purchase? (Please indicate any improvements included in the purchase.)

___ Excavation	(cost $_____)	___ Road	(cost $_____)
___ Well/municipal water	(cost $_____)	___ Septic approval	(cost $_____)
___ Septic/sewer installed	(cost $_____)	___ Construction loan	(cost $_____)
___ Landscaping	(cost $_____)		

14. Was property remodeled/changed ___ **prior** or ___ **after** sale? Y / N

___ Remodel ___ Room addition ___ Add building ___Remove building

Describe: _____

15. Did purchase include the construction of a new house? Y / N

Date complete: _____ Cost: $_____

16. Condition of the house, multi-family unit, or manufactured home at the time of the sale?
___ Fair ___ Average ___ Good ___ New Comments: _____

17. Was a manufactured home included in the sale? Y / N

Year	_____	Manufacturer	_____	Model	_____
Width	_____	Length	_____	Total Sq. Ft.	_____
X-number	_____	(or) Title exempt	_____		

18. If a duplex, triplex, or fourplex, how many units? 1 2 3 4 None

Monthly rent per unit? $_____

Rent includes: ___water ___ sewer ___ garbage ___ parking ___ other _____

19. Reason for purchase or sale? _____

20. Do you feel the price you paid was a fair market value? _____

21. Additional comments: _____
_____
_____

Printed name: _____ Daytime phone: _____

Signature: _____ Date signed: _____

It may be necessary for an appraiser to call for additional details or clarification. Thank you!

County Letterhead Here
(For a commercial property transaction)

Regarding the recent transaction involving property located at:
situs street address _____

situs city state zip _____
(pre-filled by County)

Dear Buyer:

(Name) County is required by law to value all property at real market value (ORS 308.232), defined as what it would sell for in cash terms paid by an informed buyer to an informed seller, each acting without compulsion in an arm's length transaction (ORS 308.205). Answers to the following questions assist us to evaluate this transaction in terms of our statutory obligations.

The information is important and will be used to develop and refine models for estimating market value of all properties of the same type (i.e., warehouses, apartments, stores).

If you have questions, please contact the (Name) County Assessor's Office, at (phone number or email address). Thank you for your assistance.

1. Total sales price.....$_____

2. Date sales price was agreed upon: .....____/____/____

3. Was an appraisal completed? [ ] no [ ] yes, appraised value: $_____

4. Did this transaction involve any of the following? Please check all that apply.

   [ ] buyer/seller related personally/professionally [ ] partial interest conveyed [ ] charitable organization
   [ ] buyer owns adjoining property [ ] auction or distress sale [ ] tenant purchase

5. Did the sale price include any of the following? If yes, please show estimated value or indicate if unknown.

   significant repairs or other changes to the property paid by seller or out of escrow?.....$_____or [ ] unknown

   exchange of non-cash property (e.g. 1031 exchange)? .....$_____or [ ] unknown

   an existing business?.....$_____or [ ] unknown

   personal property: furniture, equipment, machinery, etc.?.....$_____or [ ] unknown

6. Were any unpaid taxes, special assessments, mortgages, commissions, tenant improvements, or other obligations assumed by you as the purchaser and included in the sale price listed above?

   [ ] no [ ] yes; please state nature and amount:_____

7. Did the seller provide any financing in conjunction with this transaction?

   [ ] no [ ] yes; please describe: _____% down payment _____% interest _____term in months [ ] balloon payment

8. Other than listed above, did any characteristic of this transaction represent atypical or non-market terms? Please describe.

   _____

9. Was the property listed or advertised on the open market?

   [ ] yes, listed with broker; broker name: _____
   [ ] yes, but not listed with broker as far as you know [ ] no, not on open market [ ] do not know

10. Have any major changes been made to the property since the sale date?

    [ ] no [ ] yes: $_____ value, description: _____

11. Do you feel the price you paid was fair market value and why? _____

    _____

12. Which of the following best represents the anticipated use for the property? Please check all that apply.

    [ ] occupancy by your business [ ] lease to tenants (current or new) [ ] redevelopment, change of use [ ] quick resale

    Other _____

13. How did you determine what you were willing to pay for this property? Please check all that apply.

    [ ] primarily land value
    [ ] price per square foot of improvements: $_____
    [ ] mortgage payments and/or expenses
    [ ] advice of others: broker, appraiser, business associates, family, etc.
    [ ] historical income & expenses
    [ ] estimated future income & expenses

14. If you based your decision on [ ] historical, [ ] current, or [ ] future income and expenses, what did you use?

    Gross Rent Multiplier (sales price÷ rental income): ..... _____ [ ] monthly income or [ ] annual

    Gross Income Multiplier (sales price÷ rental income & other income): ..... _____ [ ] monthly income or [ ] annual

    Direct Capitalization:

    Annual Potential Gross Income (income before vacancy, rent loss, or expenses): ... $_____

    Anticipated Vacancy & Rent Loss: ..... _____%

    Annual Expenses (please do not include property taxes): ..... $_____

    Anticipated Net Operating Income (NOI): ..... $_____

    Direct Cap Rate (annual NOI ÷ Sale Price): ..... _____%

    [ ] Used yield capitalization or discounted cash flow (DCF) to determine value.

    Other method to determine value, please describe:_____

Print Name: _____ Daytime Phone: _____

Signature: _____

It may be necessary for an appraiser to call for additional details or clarification. Thank you!

County Letterhead Here
(For a commercial property transaction)

Regarding the recent transaction involving property located at:
situs street address _____
situs city state zip _____
(pre-filled by County)

Dear Seller:

(Name) County is required by law to value all property at real market value (ORS 308.232), defined as what it would sell for in cash terms paid by an informed buyer to an informed seller, each acting without compulsion in an arm's length transaction (ORS 308.205). Answers to the following questions assist us to evaluate this transaction in terms of our statutory obligations.

The information is important and will be used to develop and refine models for estimating market value of all properties of the same type (i.e., warehouses, apartments, stores).

If you have questions, please contact the (Name) County Assessor's Office, at (phone number or email address). Thank you for your assistance.

1. Total sales price $_____ Date sales price was agreed upon: _____/_____/____
2. What was the reason for selling the property? _____
3. Was an appraisal completed? [ ] no [ ] yes, appraised value: $_____
4. Did this transaction involve any of the following? Please check all that apply.

   [ ] buyer/seller related personally/professionally [ ] partial interest conveyed [ ] charitable organization
   [ ] buyer owns adjoining property [ ] auction or distress sale [ ] tenant purchase

5. Did the sale price include any of the following? If yes, please show estimated value or indicate if value is unknown.

   significant repairs or changes to the property paid by you as seller or out of escrow?.....$_____or [ ] unknown

   exchange of non-cash property (e.g. 1031 exchange)? .....$_____or [ ] unknown

   an existing business?.....$_____or [ ] unknown

   personal property: furniture, equipment, machinery, etc.?.....$_____or [ ] unknown

6. Were any unpaid taxes, special assessments, mortgages, commissions, tenant improvements, or other obligations assumed by the purchaser and included in the sale price listed above?

   [ ] no [ ] yes; please state nature and amount:_____

7. Did you, as the seller, provide any financing in conjunction with this transaction?

   [ ] no [ ] yes; please describe: _____% down payment _____% interest _____term in months [ ] balloon payment

8. Other than listed above, did any characteristic of this transaction represent atypical or non-market terms? Please describe.

   _____

9. How long was the property on the market? _____ months [ ] never on the market
10. Was the property listed with a real estate broker? [ ] no [ ] yes; number of months: _____

    Broker name: _____

11. Were any major changes made to the property prior to closing as a condition of sale (e.g. new roof, HVAC replaced)?

    [ ] no [ ] yes: $_____ value, description: _____

Print Name: _____ Daytime Phone: _____

Signature: _____

It may be necessary for an appraiser to call for additional details or clarification. Thank you!

SECTION 5

DATA ORGANIZATION: RATIO CALCULATION, OUTLIERS, & TRIMMING

Ratio Calculation

The analyst accesses the sales listing database and selects all usable sales in a **specific property class** or market **area** and arrays (an ordered list) them in a sales list including **but not limited to** the following: condition code, property class, account number, land value, land size, improvement value, total real market value, sale price, sale date, the sale ratio and other data pertinent to the analysis.

Comparing the real market value (RMV) on the roll as of January 1 to the sale price (SP) results in a relative relationship called a **sales ratio** (Ratio). The objective of the ratio is to measure the validity of the roll values, meaning how the roll values compare to the sale prices.

RMV/SP = RATIO

Example: RMV on the roll is $99,830. Sale price is $125,000.

$99,830/$125,000 = 0.79864 rounded to 0.80 or 80% or 80

A sales ratio can be expressed as a percent or decimal. The common practice is to express the ratio as a whole number.

The following, Exhibit SL-1, is an example of sales arrayed by ratios in ascending order.

Exhibit SL-1

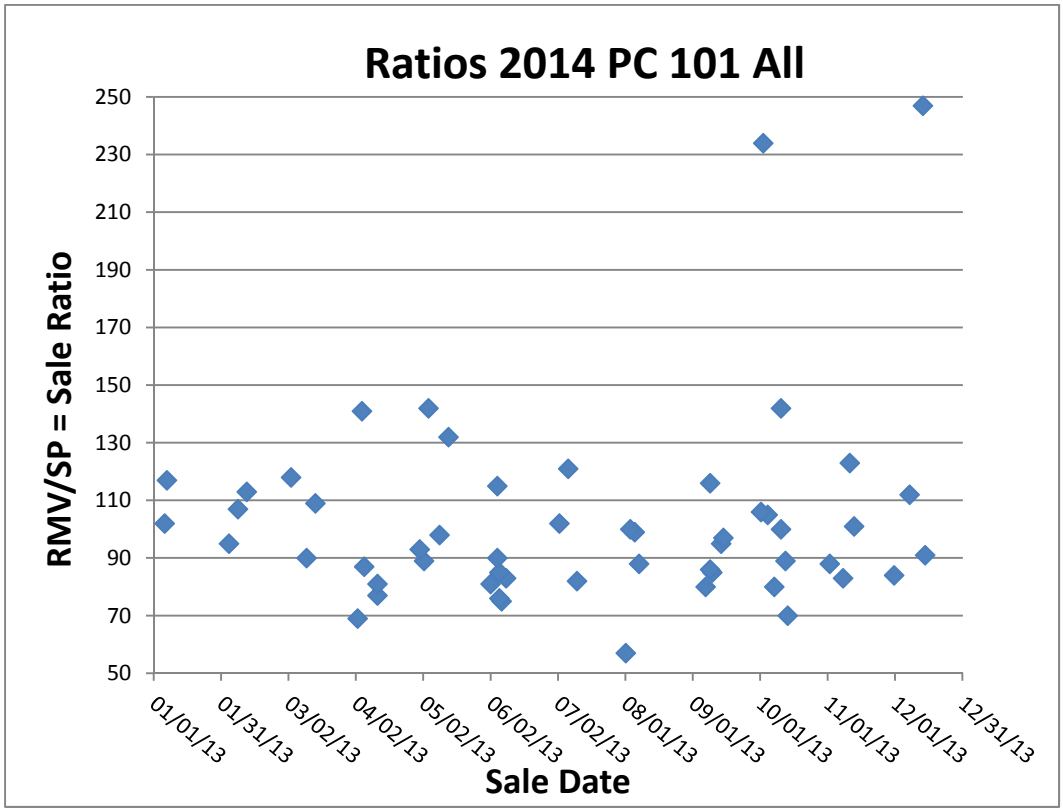
Sale #	MA	Property Class	Condition Code	Acct #	Map & Taxlot	Instrument Number	Acres	Land RMV	Imp RMV	Total RMV	Sale Price	Sale Date	Sale Ratio
29	1	101	34	20115	18S4709 4110	3615	0.18	29,790	66,530	96,320	169,400	08/02/13	57
9	1	101	34	1216	18S4704DA 2900	4263	0.15	24,070	29,450	53,520	78,000	04/03/13	69
46	1	101	33	1427	18S4704DA 9200	2730	0.13	19,880	34,340	54,220	78,000	10/14/13	70
24	1	101	33	2161	18S4709AA 8500	2819	0.15	25,440	82,760	108,200	145,000	06/07/13	75
22	1	101	33	1443	18S4704DC 1400	2809	0.21	30,550	67,720	98,270	129,999	06/06/13	76
12	1	101	33	2815	18S4709CD 1800	4289	0.24	34,470	88,470	122,940	160,000	04/12/13	77
33	1	101	33	20240	18S4705AD 109	3485	0.29	43,770	96,030	139,800	175,000	09/07/13	80
42	1	101	33	1000	18S4704CC 3100	2839	0.22	31,460	68,370	99,830	125,000	10/08/13	80
13	1	101	33	1401	18S4704DB 6500	4795	0.26	38,480	59,240	97,720	120,000	04/12/13	81
19	1	101	34	980	18S4704CC 1900	2799	0.26	38,480	49,390	87,870	108,600	06/02/13	81
28	1	101	33	950	18S4704CC 100	1482	0.22	31,460	65,450	96,910	117,500	07/11/13	82
25	1	101	34	1446	18S4704DC 1700	4257	0.17	28,730	37,700	66,430	80,000	06/09/13	83
48	1	101	34	1601	18S4705AC 7500	4065	0.24	34,470	90,150	124,620	150,500	11/08/13	83
51	1	101	33	19844	18S4705AD 237	4196	0.24	34,470	115,220	149,690	179,000	12/01/13	84
23	1	101	33	1774	18S4705DA 4001	4866	0.24	34,470	58,910	93,380	109,900	06/06/13	85
36	1	101	33	15298	18S4705DD 4200	4551	0.16	27,360	72,440	99,800	117,500	09/10/13	85
34	1	101	33	1814	18S4705DA 8100	2579	0.25	37,110	71,400	108,510	126,000	09/09/13	86
11	1	101	33	1143	18S4704CD 7000	2963	0.22	31,460	112,020	143,480	165,000	04/06/13	87
32	1	101	34	918	18S4704CB 1106	3190	0.24	34,470	82,180	116,650	133,000	08/08/13	88
47	1	101	34	20235	18S4705AD 104	2555	0.24	34,470	117,920	152,390	174,000	11/02/13	88
15	1	101	34	20265	18S4705DA 602	4117	0.23	33,100	98,560	131,660	147,193	05/03/13	89
45	1	101	33	1710	18S4705C 7900	2670	0.22	31,460	93,410	124,870	139,900	10/13/13	89
7	1	101	34	18843	18S4704BC 3500	3818	0.23	33,100	55,980	89,080	99,500	03/11/13	90
20	1	101	33	19083	18S4705C 9200	4320	0.32	54,030	174,820	228,850	254,000	06/05/13	90
54	1	101	34	19110	18S4705C 11900	4059	0.32	54,030	200,990	255,020	280,000	12/15/13	91
14	1	101	34	19837	18S4705AD 230	1031	0.29	43,770	200,380	244,150	263,000	05/01/13	93
3	1	101	34	20196	18S4705DA 701	4556	0.26	38,480	103,740	142,220	149,963	02/04/13	95
37	1	101	34	1087	18S4704CD 1500	3547	0.17	28,730	54,590	83,320	88,000	09/14/13	95
38	1	101	34	19691	18S4705BD 1400	4633	0.29	43,770	146,850	190,620	197,000	09/15/13	97
17	1	101	34	15619	18S4705DB 9600	1478	0.31	51,530	158,610	210,140	214,000	05/10/13	98
31	1	101	33	8094	18S4705DB 1700	5027	0.30	50,620	67,600	118,220	120,000	08/06/13	99
30	1	101	33	2124	18S4709AA 5001	4017	0.13	19,880	17,690	37,570	37,500	08/04/13	100
43	1	101	33	19307	18S4704BC 7400	4513	0.23	33,100	78,860	111,960	112,000	10/11/13	100
50	1	101	34	786	18S4704BD 3900	1328	0.21	30,090	85,590	115,680	115,000	11/13/13	101
1	1	101	33	967	18S4704CC 909	3651	0.26	38,480	81,580	120,060	117,500	01/06/13	102
26	1	101	34	18670	18S4705DC 2000	4950	0.14	21,250	76,300	97,550	96,000	07/03/13	102
41	1	101	34	8313	18S4709CC 4100	2461	0.25	37,110	67,620	104,730	99,500	10/05/13	105
39	1	101	34	979	18S4704CC 1800	3097	0.26	38,480	71,190	109,670	103,000	10/02/13	106
4	1	101	33	1836	18S4705DB 3000	2536	0.26	38,480	133,210	171,690	161,000	02/08/13	107
8	1	101	33	154	18S4703BC 6200	4398	0.15	24,070	17,960	42,030	38,500	03/15/13	109
52	1	101	34	2471	18S4709BA 11100	4096	0.29	43,770	101,280	145,050	130,000	12/08/13	112
5	1	101	34	19087	18S4705C 9600	3788	0.32	54,030	262,060	316,090	279,000	02/12/13	113
21	1	101	34	2531	18S4709BC 1000	1034	0.31	51,980	319,480	371,460	323,348	06/05/13	115
35	1	101	34	1717	18S4705C 8600	4559	0.24	34,470	128,450	162,920	140,000	09/09/13	116
2	1	101	33	2813	18S4709CD 1600	2367	0.24	34,470	61,840	96,310	82,000	01/07/13	117
6	1	101	33	19795	18S4709BC 1503	2388	0.26	38,480	108,820	147,300	124,900	03/04/13	118
27	1	101	33	1329	18S4704DB 601	1481	0.15	24,070	12,160	36,230	30,000	07/07/13	121
49	1	101	34	3222	18S4710BD 4400	5030	0.15	24,070	43,480	67,550	55,000	11/11/13	123
18	1	101	34	1227	18S4704DA 3900	4020	0.13	19,880	11,050	30,930	23,500	05/14/13	132
10	1	101	33	1052	18S4704CC 6800	4211	0.21	30,090	40,190	70,280	50,000	04/05/13	141
16	1	101	33	1954	18S4705DD 2800	2556	0.31	51,530	55,080	106,610	75,000	05/05/13	142
44	1	101	34	1038	18S4704CC 6000	3654	0.23	33,100	108,700	141,800	99,789	10/11/13	142
40	1	101	33	3269	18S4710BD0 8600	4953	0.15	24,070	8,730	32,800	14,000	10/03/13	234
53	1	101	34	2340	18S4709AD 12600	2464	0.21	30,090	74,910	105,000	42,500	12/14/13	247

Total Sales = 54

Scatter Diagram

Sales ratio results may be diagramed to provide a visual representation. These diagrams are also referred to as chart, graph, or plot and the terms are interchangeable. A scatter diagram is a useful tool to visualize data points for analysis. Exhibit SD-1 is a scatter diagram that employs the data from Exhibit SL-1 and illustrates the relationship between date of sale and the associated sale ratio. The **individual sale ratios** in the array are plotted with the sale dates on the x-axis and their respective ratios on the y-axis.

Exhibit SD-1



Development of graphs should be consistent and fields should be clearly labeled so users can readily interpret the data.

- Title with applicable year (example: Ratios 2014 PC 101)
- Format and label x-axis as Sale Date range
- Format and label y-axis as ratio formula (RMV/SP = Sale Ratio) "Dividing the appraised value by the sale price forms the ratios" (*IAAO Standards on Ratio Studies-2013,* 2.1 The Concepts of Market Value and Appraisal Accuracy, page 7)

Outliers

Ratios in Exhibit SL-1 are sorted in ascending order. This grouping allows the analyst to readily identify extreme ratios at either end of the array as compared with other ratios in the sales list. These very low or very high ratios are often called **outliers**. Some outliers occur naturally; others may be due to data entry error. In Exhibit SD-1, the two data points significantly separated from the cluster of data are likely outliers.

Outliers require additional scrutiny to identify whether the sale is a non-market transaction and may need to be trimmed or is an arm's-length transaction and should remain in the study. According to the IAAO, outlier ratios can result from any of the following:

1. An erroneous sale price
2. A non-market sale
3. Unusual market variability
4. A mismatch between the property sold and the property appraised
5. An error in the appraisal of an individual parcel
6. An error in the appraisal of a subgroup of parcels
7. Any of a variety of transcription or data handling errors

If an error can be corrected (for example, office input error), the sale could be left in the sales list. However, leaving outlier sales in the data analysis can have a controlling influence over statistical measures (e.g., mean, standard deviation, coefficient of variation, confidence interval).

When outliers are not representative of the general market, they should be trimmed from the sales list using approved methods. If a trimming method is used to reject outlier ratios from the sales list, include the method and reasoning in the ratio study report.

Arbitrarily trimming outliers based solely on their positioning in the ratio array is not an acceptable procedure and is not supported by the Department of Revenue or the IAAO.

> However, trimming of outliers using arbitrary limits, for example, eliminating all ratios less than 50 percent or greater than 150 percent, tends to distort results and should not be employed. *(IAAO Standard on Ratio Studies-2013*, Appendix B, B.3 Outlier Trimming, page 53)

Method: A Trimmed Mean

The **mean** is the **average** of all ratios. Extreme ratios at either end of the array may distort the mean. In Exhibit SD-1, these two outlier sales may be trimmed to remove their influence on the mean. Removing a number of sales from the high end of the array and an **equal** number from the low end of the array is an acceptable trimming technique. A new average, the **trimmed mean**, is calculated using the remaining ratios.

The trimmed mean is a more reliable indicator of central tendency than the untrimmed mean because the influence of extreme ratios is diminished. When properly applied, no degree of trimming using this technique has any effect on the median (middle of the array) because an equal number of the lowest and highest ratios are excluded. Other measures of central tendency will be only slightly affected.

Trimming Limits

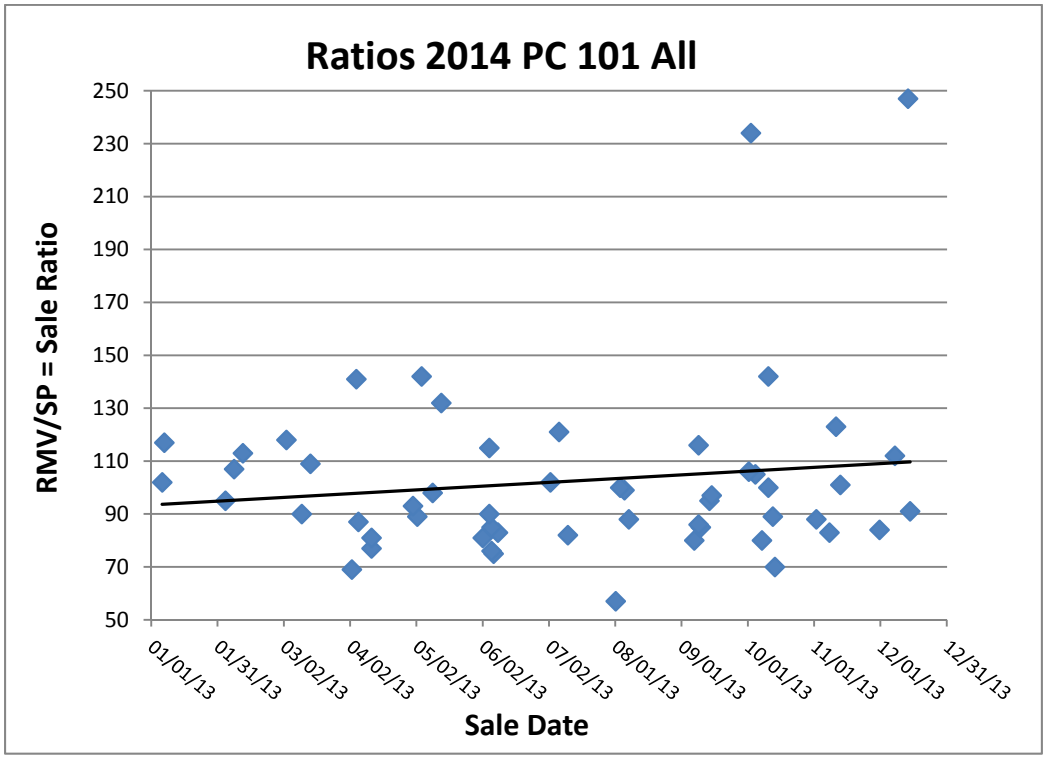
Trimming is not mandatory. When trimming is warranted, it is applied after the initial calculation of ratios (as in SL-1 above) and before all other studies.

> Outlier identification and trimming should follow the sales validation process and precede the calculation of ratio statistics and related tests or analyses. (*IAAO Standard on Ratio Studies-2013*, Appendix B, B.1 Identification of Ratio Outliers, page 53)

Limits are set for trimming outliers. For small samples, trim no more than 10 percent. Equally trimming the upper and lower five percent of the data creates a 10 percent trimmed mean. An exception to the 10 percent rule is a sample that has fewer than 20 sales and includes an extreme outlier. Since trimming the extreme outlier **must be** paired with a sale at the opposite end of the array, the percentage of trim will exceed 10 percent and should be well documented in the study report. Larger samples should not be trimmed greater than 10 percent.

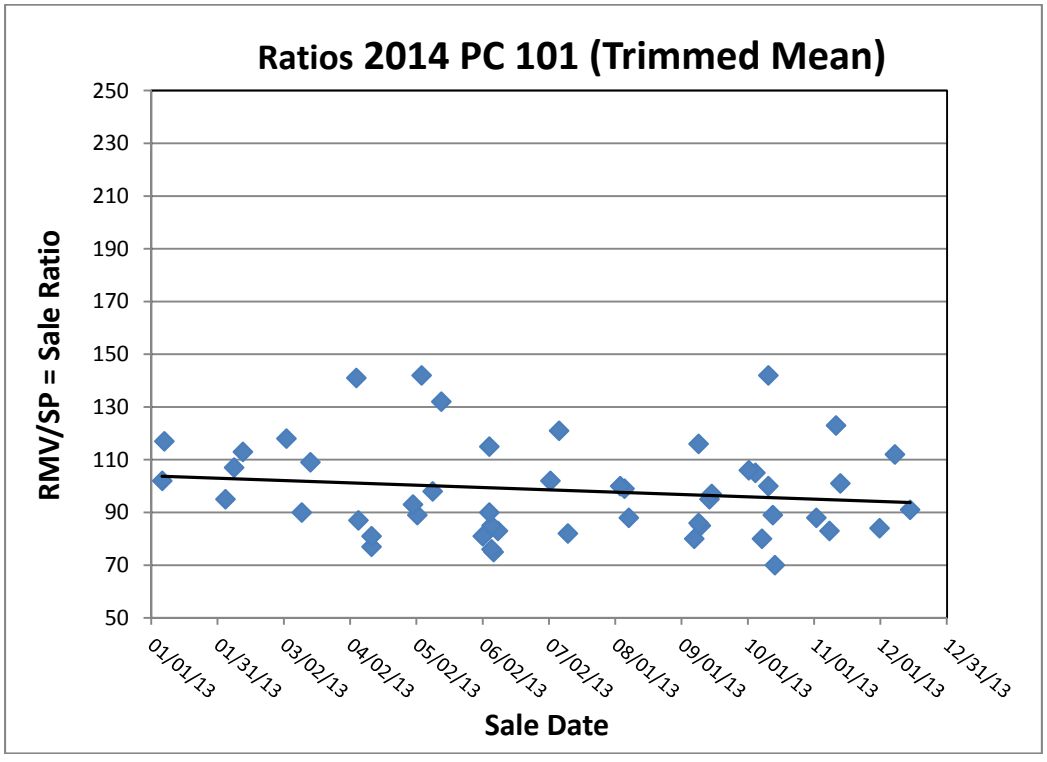
Exhibit SD-1 is shown below with a trend line added. Exhibit SD-2 illustrates a scatter diagram after properly removing the two high ratio outliers and the two lowest ratio sales from Exhibit SL-1 while remaining within the trimming limits. The change in the slope of the trend line demonstrates the influence of these outliers.

Exhibit SD-1 with Trend Line Added



95	Mediar
102	Mean
21	COD

Exhibit SD-2 Trimmed Mean Method with 7% Trim



95	Mediar
98	Mean
15	COD

Method: Interquartile Range Trimming

The other approved method for identifying extreme outliers is called **Interquartile Range** (IQR). This trimming method is based on sound statistical theory and practice and is supported by the Department of Revenue and the IAAO. Unlike the Trimmed Mean method, this analysis does not depend on equal trimming from both ends of the array. This application is particularly effective when data is skewed to one side. It adjusts the skewed data to reflect a more normal distribution by computing trim boundaries which identify the outlier ratios. Dividing a list of sales into quarters and statistically computing the trim boundaries requires several steps and is best applied using a spreadsheet program. The steps are as follows:

1. Array ratios in ascending order. (In Exhibit SL-1 the ratios range from 57 to 247)
2. Identify the number of sales. (In Exhibit SL-1 there are **54 sales**)
3. Identify the first trim boundary (quartile point) located between the first and second quarter.

   Formula to locate the boundary between the first and second quartile:

   a. (0.25 x number of ratios) + 0.25
   b. Example using Exhibit SL-1: (0.25 x 54 ratios) + 0.25 = 13.75

      13.75 is three-quarters between the 13th and 14th ratio in the array of 54 sales

      Ratio 13 = 83.00 and Ratio 14 = 84.00

      Three-quarters between = (84.00 – 83.00) x 0.75 = 0.75

      The first quartile point = 83.00 + 0.75 = 83.75
4. Identify the third trim boundary (quartile point) located between the third and fourth quarter.

   a. 0.75 x number of ratios) + 0.75
   b. Example using Exhibit SL-1: (0.75 x 54 ratios) + 0.75 = 41.25

      41.25 is one-quarter between the 41st and 42nd ratio in the array of 54 sales

      Ratio 41 = 112.00 and Ratio 42 = 113.00

      One-quarter between = (113.00 – 112.00) x 0.25 = 0.25

      The third quartile point = 112.00 + 0.25 = 112.25
5. Compute the interquartile range

   a. The distance between the third and first quartile = interquartile range
   b. 112.25 – 83.75 = 28.5

6. Establish the lower boundary
    a. Lower trim point = first quartile − (interquartile range x 1.5)
    b. 83.75 − (28.5 x 1.5) = 41.00
7. Establish the upper boundary
    a. Upper trim point = third quartile + (interquartile range x 1.5)
    b. 112.25 + (28.5 x 1.5) = 155.00
8. Outliers identified:
    a. Any ratios that are less than 41.00

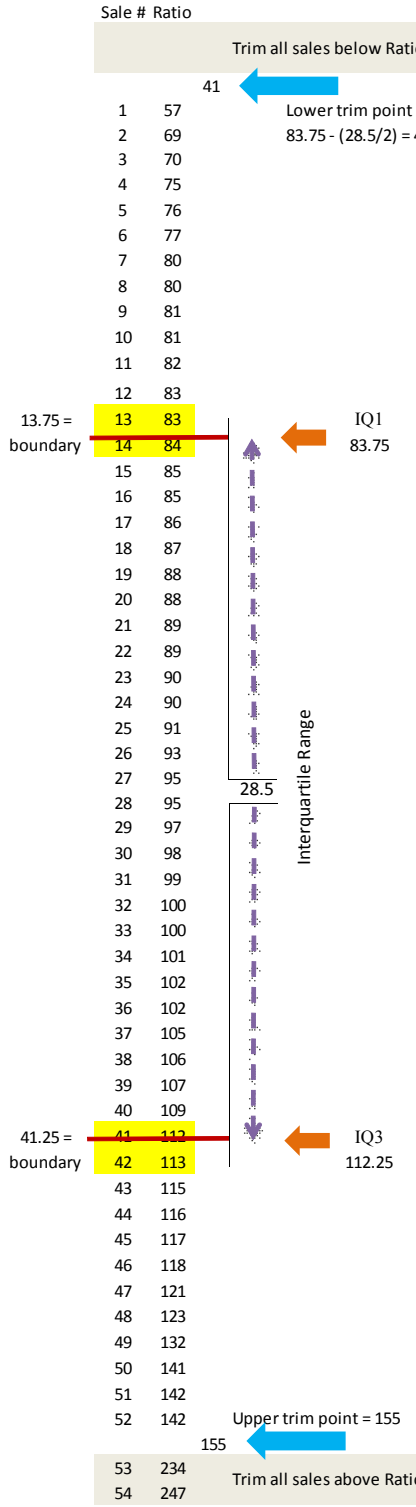
       In Exhibit SL-1, there are no ratios that are less than 41.00
    b. Any ratios that are greater than 155.00

       In Exhibit SL-1, there are two ratios greater than 155.00 (234 and 247)
9. Remove identified outliers from the ratio array and calculate the central tendencies.

The exhibits below illustrate the trend line slope before and after the IQR trimming method is applied.

Method: Interquartile Range Trimming

Data from Exhibit SL-1



Sale #	Ratio
1	57
2	69
3	70
4	75
5	76
6	77
7	80
8	80
9	81
10	81
11	82
12	83
13	83
14	84
15	85
16	85
17	86
18	87
19	88
20	88
21	89
22	89
23	90
24	90
25	91
26	93
27	95
28	95
29	97
30	98
31	99
32	100
33	100
34	101
35	102
36	102
37	105
38	106
39	107
40	109
41	112
42	113
43	115
44	116
45	117
46	118
47	121
48	123
49	132
50	141
51	142
52	142
53	234
54	247

Step #1

Array ratios in ascending order. (In Exhibit SL-1 the ratios range from 57 to 247)

Step #2

Identify the number of sales. (In Exhibit SL-1 there are 54 sales)

Step #3

Identify the first trim boundary (quartile point) located between the first and second quarter.

Formula to locate the boundary between the first and second quartile:

a. (0.25 x number of ratios) + 0.25

b. Example using Exhibit SL-1: (0.25 x 54 ratios) + 0.25 = 13.75
13.75 is three-quarters between the 13th and 14th ratio in the array of 54 sales
Ratio 13 = 83.00 and Ratio 14 = 84.00
Three-quarters between = (84.00 – 83.00) x 0.75 = 0.75
The first quartile point = 83.00 + 0.75 = 83.75

Step #4

Identify the third trim boundary (quartile point) located between the third and fourth quarter.

a. 0.75 x number of ratios) + 0.75

b. Example using Exhibit SL-1: (0.75 x 54 ratios) + 0.75 = 41.25
41.25 is one-quarter between the 41st and 42nd ratio in the array of 54 sales
Ratio 41 = 112.00 and Ratio 42 = 113.00
One-quarter between = (113.00 – 112.00) x 0.25 = 0.25
The third quartile point = 112.00 + 0.25 = 112.25

Step #5

Compute the interquartile range

a. The distance between the third and first quartile = interquartile range

b. 112.25 – 83.75 = 28.5

Step #6

Establish the lower boundary

a. Lower trim point = first quartile − (interquartile range x 1.5)

b. 83.75 − (28.5 x 1.5) = 41.00

Step #7

Establish the upper boundary

a. Upper trim point = third quartile + (interquartile range x 1.5)

b. 112.25 + (28.5 x 1.5) = 155.00

Step #8

Outliers identified:

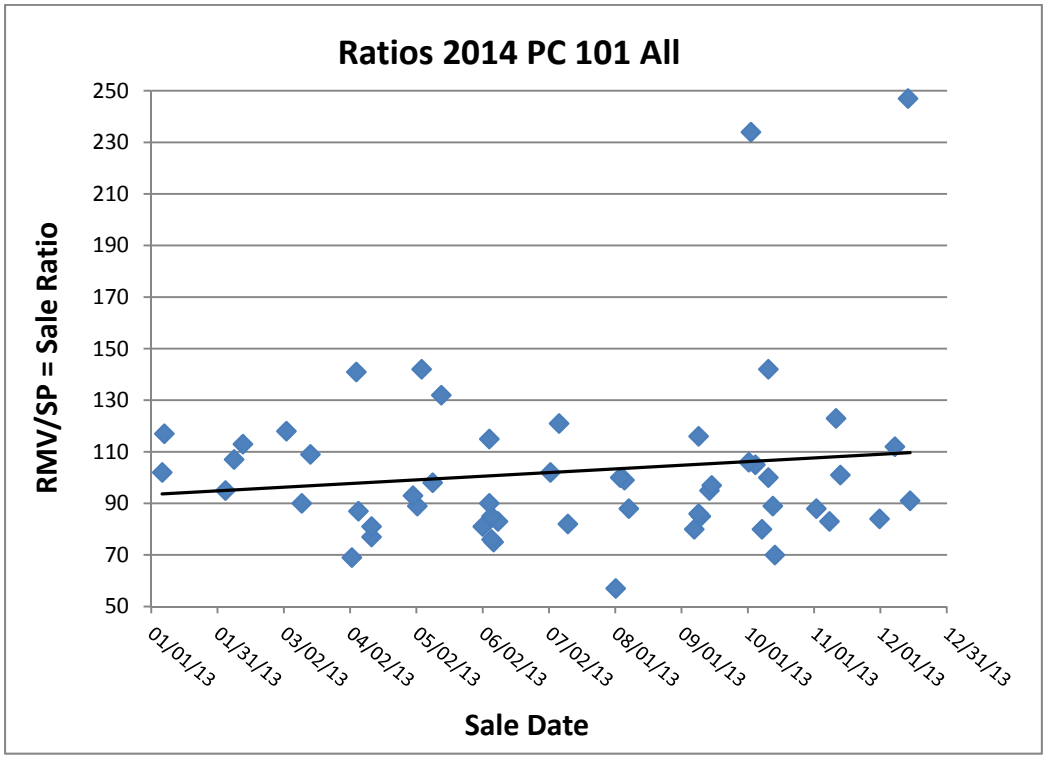
a. Any ratios that are less than 41.00
In Exhibit SL-1, there are no ratios that are less than 41.00

b. Any ratios that are greater than 155.00
In Exhibit SL-1, there are two ratios greater than 155.00 (234 and 247)

Step #9

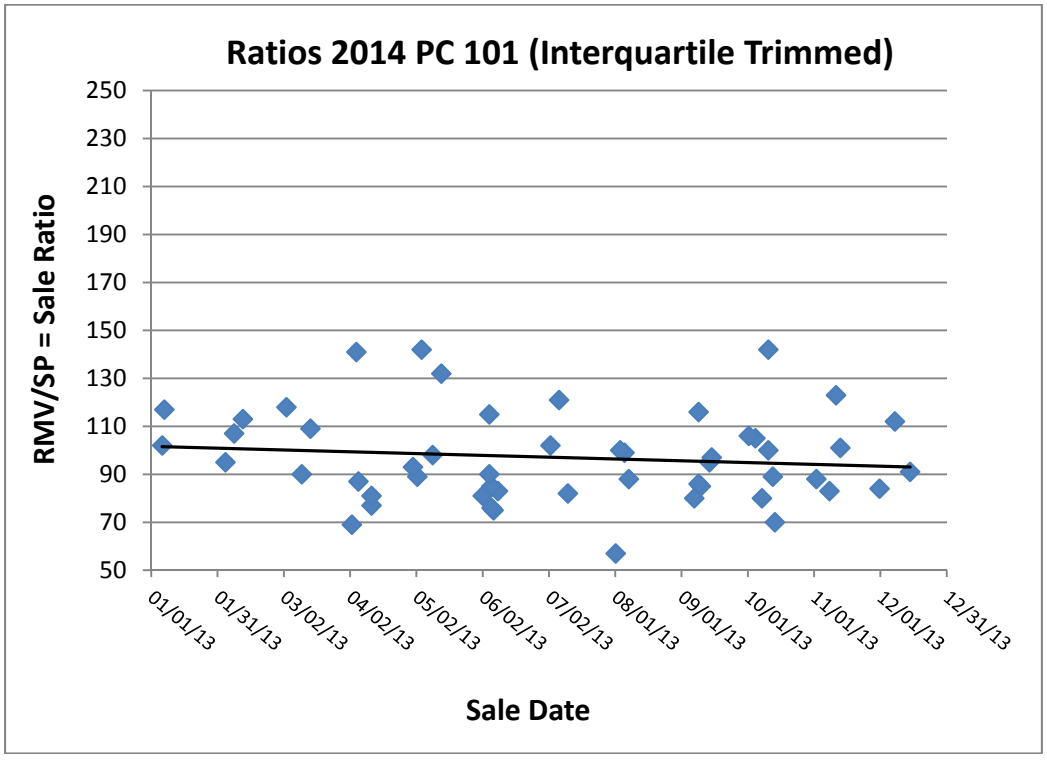
Remove identified outliers from the ratio array and calculate the central tendencies.

Exhibit SD-1 with Trend Line Added



95	Mediar
102	Mean
21	COD

Exhibit SD-3 Interquartile Method with 4% Trim



94	Mediar
97	Mean
16	COD

Trimming Limits Specific to IQR

For some distributions, such as when the sample exhibits a high clustering around a specific ratio, the IQR outlier identification method is not appropriate. In such cases the IQR could be quite narrow, leading to the calculation of lower and upper boundaries for outliers and extremes that are quite close to the middle of the data. In such cases, ratios beyond those boundaries should not be automatically excluded, but instead reasonable judgment should be applied to exclude only true outliers or extremes. As one safeguard, analysts can refrain from automatically deleting any "outliers" or "extremes" inside the boundaries where 95 percent (two standard deviations) of the observations would be expected to lie, assuming a normal distribution of data. (*IAAO Standard on Ratio Studies-2013,* Appendix B, B.4 Trimming Limitations, page 54)

Trimming Recap

- Trimming is not mandatory
- When trimming, follow recognized procedures and show documentation
- Trim before all other studies
- Do not exceed trim limits and show documentation
- Trimmed Mean Method: trim equal amounts from both ends of the ratio array
- IQR Method: statistically robust; allows trimming of ratios in unequal numbers from the extreme ends of an array, but certain conditions must be met

SECTION 6

BASIC RATIO STATISTICS

Introduction

Knowledge of basic statistics is necessary to assemble a credible ratio study report. Some statistical measures the analyst must be familiar with are median, mean, weighted mean, geometric mean, and mode. These statistical measures infer where most of the data seems to be concentrated in a dataset (sales list) and are referred to as **central tendencies**. These central tendencies are derived from the arrayed ratios in the sales listings (sample). Ratios can be expressed in decimal, percent, or whole number form.

There are several measures of central tendency that have proven to be reliable in ratio studies and each has relative advantages and disadvantages. The three most applicable to ratio studies, **median**, **mean**, and **weighted mean,** are required to complete the ratio study report. The goal is to select one central tendency that best measures the RMV level for the study period.

- **Median** is the middle of the array, influenced only by the position of the ratios in the array, not by their values. The median is required to calculate the coefficient of dispersion (COD - see Section 9).
- **Mean** (Arithmetic Mean) is the simple average of the individual ratios in the sales array. The mean is required to calculate the price related differential (PRD - see Section 9).
- **Weighted mean** is derived by dividing the total of the current certified roll RMVs or recalculated value of the sales by the total of the sale prices in the array and is required to calculate the PRD.

Two additional measures of central tendency that may be used are geometric mean and mode.

- **Geometric mean** is determined by multiplying all of the ratios in an array sequentially and then taking the "-nth" root of this product.
- **Mode** is the ratio that occurs in the ratio array most frequently.

The following chart summarizes the strengths and weaknesses of each central tendency as used in a ratio study.

Central Tendencies	Advantages	Disadvantages	Is Recommended When:
Median	Unbiased by extreme ratios. Totally positional. Eliminates distortion due to high and low ratios. Less affected by data errors. Basis for COD.	Ignores all ratios except for a few ratios around the median indicator.	The sample is skewed or distorted by extreme ratios at either end (not a normal distribution).
Mean	Uses all the data. Basis for standard deviation, COV, and PRD.	Affected by extreme ratios at either end of the array.	The ratios vary with normal distribution and there are no extreme ratios in the array.
Weighted Mean	Reduces distortion due to high or low ratios. Measures value level on a dollar-by-dollar basis and is a required component for PRD.	Price related weighting distorts toward ratios on higher priced properties. It is susceptible to sampling error.	There are few, if any, high-end RMVs and selling prices in the array vary from the typical market values and sale prices in the sample.
Geometric Mean	It is unbiased and eliminates distortion due to high ratios. It normalizes the range being averaged and tends to offset the mean's upward bias.	Not useful as basis for uniformity and reliability statistics.	The sample has a skewed distribution, this central tendency is less influenced by extreme high ratios than the mean.
Mode	Unbiased (totally positional).	Often not available	Primarily used for support of other central tendencies.

Median (Central Tendency)

The **median**, or middle ratio of an array, is influenced only by the position of the ratios in the array, not by their values. Extreme ratios do not affect the median.

The mathematical formula for locating the position of the **median** in the array:

$$n + 1 \div 2 = \text{the position of the median where (n) equals the number of sales}$$

To compute the median central tendency, add one (1) to the total number of sales in the array whether there is an **odd or even number** of sales.

Median – Odd number of sales (use Exhibit Table 1)

1. Sort sales list by ratio in ascending order
2. Add one (1) to the total number of sales and divide the sum by 2
3. Locate the ratio associated with this sale number position

Utilizing Exhibit Table 1, the median is calculated as: $(1 + 9) \div 2 = 5$
The ratio associated with sale number 5 is the median **93**

Exhibit Table 1

Appraisal Area	Property Class	Certified Roll Real Market Value	Sale Price	Sale Number	Ratio
3	100	$ 1,830	$ 3,000	1	61
3	100	8,000	9,800	2	82
3	100	7,500	8,500	3	88
3	100	7,000	7,500	4	93
3	100	7,000	7,500	5	93
3	100	11,000	11,830	6	93
3	100	10,000	10,000	7	100
3	100	8,000	7,000	8	114
3	100	10,150	6,150	9	165
TOTALS		**70,480**	**$71,280**		
				Median	**93**

Median – Even number of sales (use Exhibit Table 2)

1. Sort sales list by ratio in ascending order
2. Add one (1) to the total number of sales and divide the sum by 2
   This result will fall *between* two sale numbers
3. Identify the two ratios above and below the result of step 2
4. Add the two ratios together and divide by 2

Utilizing Exhibit Table 2, the median is calculated as: (10 + 1) ÷ 2 = 5.5
The result of 5.5 falls *between* the sale numbers 5 and 6 (associated ratios 96 and 98)
The median is the average of sale numbers 5 and 6 (96 + 98) ÷ 2 = **97**

Exhibit Table 2

Appraisal Area	Property Class	Land Value	Imp. Value	Total RMV	Sale Price	Sale No.	Ratio
1	101	$24,000	$101,500	$125,500	$278,900	1	45
1	101	12,000	168,000	180,000	200,000	2	90
1	101	9,000	51,000	60,000	62,500	3	96
1	101	9,000	51,500	60,500	63,000	4	96
1	101	9,000	52,000	61,000	63,500	5	96
1	101	9,000	59,800	68,800	70,000	6	98
1	101	9,000	60,600	69,600	70,000	7	99
1	101	12,000	49,500	61,500	60,000	8	102
1	101	7,500	34,450	41,950	35,000	9	119
1	101	7,500	31,750	39,250	22,000	10	178
TOTALS:				**$768,100**	**$924,900**		
						Median	**97**

Discussion of Exhibit Tables 1 and 2:

- The median is the most reliable central tendency because it is not affected by the extreme ratios in the arrays
- The median would **not** be representative of central tendency if the exhibits:
  - Contained few ratios with a wide range, or
  - Many ratios congregated at both the upper and lower ends of the array, leaving few ratios in the center of the array

Mean (Central Tendency)

Often referred to as the arithmetic mean, the **mean** is the simple average of the individual ratios in the sales array.

The mathematical formula for locating the **mean** in the array:

$$\overline{X} = \text{Sum of Ratios} \div \text{Number of Sales in the Array}$$

To compute the mean using Exhibit Table 3:

1. Total (sum) of the ratios = 784
2. Total number of sales = 8
3. Divide the total ratios by the total number of sales: 784 ÷ 8 = 98

Exhibit Table 3

Appraisal Area	Class	Land Value	Imp. Value	Total RMV	Total Price	Sale No.	Ratio
3	401	$82,640	$78,010	$160,650	$200,000	1	80
3	401	17,450	5,490	22,940	26,000	2	88
3	401	64,370	28,940	93,310	105,000	3	89
3	401	15,310	25,200	40,510	45,000	4	90
3	401	28,580	1,470	30,050	30,000	5	100
3	401	13,320	14,580	27,900	28,000	6	100
3	401	22,360	22,790	45,150	40,000	7	113
3	401	22,670	40,180	62,850	50,500	8	124
TOTAL				**$483,360**	**$524,500**	**8**	**784**
						Mean	**98**

Discussion of Exhibit Table 3

- The mean is a reliable indicator of central tendency in this exhibit because the array does not have extreme ratios
- The mean would **not** be representative of central tendency for this array if there were extreme ratios

Weighted Mean (Central Tendency)

The **weighted mean** ratio is derived by dividing the total of the current certified roll RMVs of the sales by the total of the sale prices in the array then multiply by 100 to convert from a decimal to a whole number.

Mathematically, the formula for the weighted mean is:

$$X_{\text{Wt. Mean}} = (\text{Total RMVs} \div \text{Total Sale Prices}) \times 100$$

To compute the weighted mean from Exhibit Table 4:

1. Total (sum) the RMVs in the sales array: $2,786,390.
2. Total (sum) the sale prices of the sales in the array: $2,809,610.
3. Divide the total RMV by the total sale prices.

Weighted Mean from Exhibit Table 4 = ($2,786,390 ÷ $2,809,610) x 100 = 99

Exhibit Table 4

Appraisal Area	Property Class	Land Value	Imp. Value	Total RMV	Sale Price	Sale No.	Ratio
5	101	$120,850	$2,540	$123,390	$210,000	1	59
2	101	52,030	53,550	105,580	135,000	2	78
5	101	15,500	38,840	54,340	68,200	3	80
2	101	60,120	161,220	221,340	275,000	4	80
2	101	20,620	89,460	110,080	129,000	5	85
2	101	20,760	96,340	117,100	130,060	6	90
2	101	20,760	96,430	117,190	130,000	7	90
2	101	19,470	97,630	117,100	129,000	8	91
5	101	41,690	155,150	196,840	200,850	9	98
5	101	74,030	83,530	157,560	159,000	10	99
4	101	35,280	177,910	213,190	200,000	11	107
5	101	14,500	12,850	27,350	25,000	12	109
3	101	35,100	396,860	431,960	382,000	13	113
3	101	17,660	78,860	96,520	83,000	14	116
5	101	12,500	22,690	35,190	30,000	15	117
3	101	18,730	137,500	156,230	130,000	16	120
3	101	38,460	160,390	198,850	164,000	17	121
3	101	23,860	129,150	153,010	120,000	18	128
5	101	31,250	25,110	56,360	40,500	19	139
2	101	36,350	60,860	97,210	69,000	20	141
TOTALS:				**$2,786,390**	**$2,809,610**		
						Weighted Mean	**99**

Discussion of Exhibit Table 4:

- The weighted mean is the best selected central tendency because it takes into consideration the ratios of the sales with large dollar values that are evenly distributed throughout the sample
- The weighted mean weighs each ratio in proportion to its sale price, whereas the mean and median give *equal* weight to each sale price
- The weighted mean would **not** be representative of central tendency if the exhibit:
    - Contained several high-value properties with relatively low or high ratios which could indicate a sampling error
    - Had higher value properties concentrated at either end of the array

The three primary measures of central tendency are illustrated in Exhibit Table 5 and is followed by a discussion of the best indicator selection.

Exhibit Table 5

Property Class 101 in MA 1

Appraisal Area	Property Class	Land Value	Imp. Value	Total RMV	Sale Price	Sale No.	Ratio
1	101	$24,000	$101,500	$125,500	$150,000	1	84
1	101	12,000	168,000	180,000	200,000	2	90
1	101	9,000	51,000	60,000	62,500	3	96
1	101	9,000	51,500	60,500	63,000	4	96
1	101	9,000	52,000	61,000	63,500	5	96
1	101	9,000	59,800	68,800	70,000	6	98
1	101	9,000	60,600	69,600	70,000	7	99
1	101	12,000	49,500	61,500	60,000	8	102
1	101	7,500	34,450	41,950	35,000	9	119
1	101	7,500	31,750	39,250	30,000	10	130
TOTALS:				$768,100	$804,000		1,010
					MEAN		**101**
					WEIGHTED MEAN		**96**
					MEDIAN		**97**

Discussion of Exhibit Table 5:

1. The mean is distorted upward by the high ratio at the end of the sample (sale number 10)
2. The weighted mean is distorted by the comparatively two large value sales in the sample at the low end (sales number 1 and 2)
3. The median is the best indicator because it is not affected by either the high ratio or large value sales

Other Measures of Central Tendency to Consider

Geometric Mean (Central Tendency)

The geometric mean, or GeoMean, is a measure determined by multiplying all of the ratios in an array sequentially and then taking the n^{th} root of this product.

In Exhibit Table 3, the number of sales is **8** and the n^{th} root is $^{1/}$**8.**

In Exhibit Table 4, there are **20** sales. The n^{th} root is $^{1/n}$ or $^{1/}$**20.**

The formula for the geometric mean in Exhibit Table 4 is:

$(59*78*80*80*85*90*90*91*98*99*107*109*113*116*117*120*121*128*139*141)^{1/20} = 100.773$ or 101

Note: Asterisk indicates that each ratio number is multiplied by the next sequential number.

The mathematical formula for the geometric mean is expressed:

$$\text{Geometric mean} = X_{GeoMean} = \sqrt[n]{X_1 \times X_2 \times \ldots X_n}$$

Where: $X_1 \times X_2$ represent each ratio in the sample

n = the number of ratios in the sample

$\sqrt[n]{X} = X^{1/n}$

Use the following steps to compute the geometric mean:

1. Compute the ratio for each sale in the array
2. Multiply each ratio by the next ratio in the array (this will be a very large number)
3. Take the n^{th} root of the ultimate product (in Exhibit Table 4 since there are 20 ratios, n = 20 and the $n^{th} = ^{1/20}$), rounded to a whole number

Discussion of geometric mean

- The geometric mean may be applicable when the sample is skewed with high ratios
- The geometric mean, like the median, is not as susceptible to distortion by extreme high ratios as the mean or the weighted mean
- Unless every ratio in the sample is identical, the geometric mean will be less than the mean
- If the ratios vary widely, the geometric mean may lie considerably below the other measures of central tendency
- The geometric mean is not useful as a basis for calculating reliability statistics

Mode (Central Tendency)

The mode is the ratio that occurs most frequently in the ratio array. There is no formula for this calculation. The mode, like the median, is a positional measure.

The steps are:

1. Sort the ratios in ascending order
2. Count how many of each ratio
3. The ratio that appears most often is the mode
4. Having two modes is bimodal. More than two modes are multimodal

In Exhibit Table 5, the ratio of 96 appears most often and is the mode.

In Exhibit Table 4, the ratios of 80 and 90 appear the most frequently and both occur an equal number of times. This indicates that the array in Exhibit Table 4 is bimodal.

SECTION 7

ANALYSIS: CHANGE IN MARKET CONDITIONS OVER TIME

Introduction

Market conditions change over time. Statute establishes an assessment date of January 1, at 1:00 a.m., and requires assessors to value property as of that date [ORS 308.210(1)]. Property sales occur throughout the entire year and prices must be adjusted to reflect the real market value of the property as if the sale occurred on the assessment date.

Assessors are also required by statute to annually collect sales for the assessment year from January 1 to December 31. Collected sales are placed in a database for confirmation and coding of sales. This database need not be entirely separate from the assessment roll or other databases maintained by the county provided the analyst is able to store, view, and retrieve the necessary information. The sales from this file can be used to investigate, measure, and adjust sale prices for change in market conditions.

Fluctuating market conditions may create the need to apply an adjustment to sales prices that occurred during the sales year. Although the adjustment is often called a **time adjustment**, time itself is not the reason for the adjustment; *it is the movement of value over time.* The adjustment is expressed as a percentage of increase or decrease to sales prices to reflect what the property would have sold for as of the assessment date.

A January through December ratio study, as required by statute (ORS 309.200), without a time adjustment, reflects the market at a mid-point of the sales year, usually July. When a time study reveals a change in market conditions is warranted, **but is not applied**, the values are **not** adjusted to the January 1 assessment date.

Any adjustment for change in market conditions over time should be based on well supported analysis of the data. If the investigation and analysis indicate market conditions have not changed over time, an adjustment to sale prices for change over time is not required. Regardless

of the adjustment conclusion, the supporting study and objective rationale is required in the ratio study report.

Time adjustments are applied in the beginning stages of the study(s) and affect all further analysis and conclusions.

Trends

Assessors are required to investigate annual trends in real estate market values for ratio purposes (ORS 309.200). Within the annual trends there may be seasonal trends and sometimes short-term trends that suggest variable rates of change occurring throughout the year. The analyst must recognize the types of trends affecting the current market in order to research and properly adjust sale prices to the assessment date.

Types of Trends

A trend is the general movement over time of a statistically measureable change. Sale prices reflect preferences in the market and may be influenced by local, regional, national, or world-wide trends. Some familiar trends include:

Annual Trend

This is the rate of change from one year to the next or any 12-month period.

Cost Trend

The rate of change in construction costs.

Economic Trend

A general trend logically based on economic factors.

Long-Term Trend

The rate of change over a number of years is the Long-Term Trend. Some industries such as housing or wood products experience dynamics that may or may not change rapidly and are cyclical in nature. These industry-wide changes may reflect changes in supply (resource shortage) and demand (demographic change).

Market Trend

This is the rate of change of market prices for specific classes of properties, such as multi-family

residential, commercial, etc. Market trends are often set by or follow local, statewide, or regional economics.

Seasonal Trend

Seasonal trend is a rate of change over a few specific months. This would also include winter use areas, summer use areas; financial reporting quarterly periods, etc.

Seasonal Variation

The seasonal variation is a consistent relationship between an annual trend and a seasonal trend.

Short-Term Trend

Rate of change calculated over a few months or weeks. This may be used to determine the direction of the market at a point in time.

Examining Market Trends

After the sales list is trimmed, the next step is to determine if there is an identifiable trend in property sale prices over the assessment year or the range of the study period (monthly, quarterly, annually, or multi-year). The two main methods of examining the market are **Ratio Analysis** and **Direct Sales Analysis**. Ratio Analysis examines the relationship between the roll value and the sale price and utilizes the techniques of direct calculation and mid-point. Direct Sales Analysis studies compare the relationship of sales prices of the same (double) or highly similar (paired) properties over a period of time (annual, quarter, month).

I. Ratio Analysis
    a. Direct Calculation
    b. Mid-point

II. Direct Sales Analysis
    a. Double sales
    b. Paired sales

The following table, Exhibit SL-2, is the sales array from Section 5 (Ratio Calculation, Outliers, and Trimming), after applying the Trimmed Mean Method. The sales list is trimmed from 54 to 50 sales; two high ratio outliers were trimmed as well as two sales from the other end of the array according to the approved method. This table will be used to demonstrate techniques of Ratio Analysis.

Exhibit SL-2

Sale #	MA	Property Class	Condition Code	Acct #	Map & Taxlot	Instrument Number	Acres	Land RMV	Imp RMV	Total RMV	Sale Price	Sale Date	Sale Ratio
46	1	101	33	1427	18S4704DA 9200	2730	0.13	19,880	34,340	54,220	78,000	10/14/13	70
24	1	101	33	2161	18S4709AA 8500	2819	0.15	25,440	82,760	108,200	145,000	06/07/13	75
22	1	101	33	1443	18S4704DC 1400	2809	0.21	30,550	67,720	98,270	129,999	06/06/13	76
12	1	101	33	2815	18S4709CD 1800	4289	0.24	34,470	88,470	122,940	160,000	04/12/13	77
33	1	101	33	20240	18S4705AD 109	3485	0.29	43,770	96,030	139,800	175,000	09/07/13	80
42	1	101	33	1000	18S4704CC 3100	2839	0.22	31,460	68,370	99,830	125,000	10/08/13	80
13	1	101	33	1401	18S4704DB 6500	4795	0.26	38,480	59,240	97,720	120,000	04/12/13	81
19	1	101	34	980	18S4704CC 1900	2799	0.26	38,480	49,390	87,870	108,600	06/02/13	81
28	1	101	33	950	18S4704CC 100	1482	0.22	31,460	65,450	96,910	117,500	07/11/13	82
25	1	101	34	1446	18S4704DC 1700	4257	0.17	28,730	37,700	66,430	80,000	06/09/13	83
48	1	101	34	1601	18S4705AC 7500	4065	0.24	34,470	90,150	124,620	150,500	11/08/13	83
51	1	101	33	19844	18S4705AD 237	4196	0.24	34,470	115,220	149,690	179,000	12/01/13	84
23	1	101	33	1774	18S4705DA 4001	4866	0.24	34,470	58,910	93,380	109,900	06/06/13	85
36	1	101	33	15298	18S4705DD 4200	4551	0.16	27,360	72,440	99,800	117,500	09/10/13	85
34	1	101	33	1814	18S4705DA 8100	2579	0.25	37,110	71,400	108,510	126,000	09/09/13	86
11	1	101	33	1143	18S4704CD 7000	2963	0.22	31,460	112,020	143,480	165,000	04/06/13	87
32	1	101	34	918	18S4704CB 1106	3190	0.24	34,470	82,180	116,650	133,000	08/08/13	88
47	1	101	34	20235	18S4705AD 104	2555	0.24	34,470	117,920	152,390	174,000	11/02/13	88
15	1	101	34	20265	18S4705DA 602	4117	0.23	33,100	98,560	131,660	147,193	05/03/13	89
45	1	101	33	1710	18S4705C 7900	2670	0.22	31,460	93,410	124,870	139,900	10/13/13	89
7	1	101	34	18843	18S4704BC 3500	3818	0.23	33,100	55,980	89,080	99,500	03/11/13	90
20	1	101	33	19083	18S4705C 9200	4320	0.32	54,030	174,820	228,850	254,000	06/05/13	90
54	1	101	34	19110	18S4705C 11900	4059	0.32	54,030	200,990	255,020	280,000	12/15/13	91
14	1	101	34	19837	18S4705AD 230	1031	0.29	43,770	200,380	244,150	263,000	05/01/13	93
3	1	101	34	20196	18S4705DA 701	4556	0.26	38,480	103,740	142,220	149,963	02/04/13	95
37	1	101	34	1087	18S4704CD 1500	3547	0.17	28,730	54,590	83,320	88,000	09/14/13	95
38	1	101	34	19691	18S4705BD 1400	4633	0.29	43,770	146,850	190,620	197,000	09/15/13	97
17	1	101	34	15619	18S4705DB 9600	1478	0.31	51,530	158,610	210,140	214,000	05/10/13	98
31	1	101	33	8094	18S4705DB 1700	5027	0.30	50,620	67,600	118,220	120,000	08/06/13	99
30	1	101	33	2124	18S4709AA 5001	4017	0.13	19,880	17,690	37,570	37,500	08/04/13	100
43	1	101	33	19307	18S4704BC 7400	4513	0.23	33,100	78,860	111,960	112,000	10/11/13	100
50	1	101	34	786	18S4704BD 3900	1328	0.21	30,090	85,590	115,680	115,000	11/13/13	101
1	1	101	33	967	18S4704CC 909	3651	0.26	38,480	81,580	120,060	117,500	01/06/13	102
26	1	101	34	18670	18S4705DC 2000	4950	0.14	21,250	76,300	97,550	96,000	07/03/13	102
41	1	101	34	8313	18S4709CC 4100	2461	0.25	37,110	67,620	104,730	99,500	10/05/13	105
39	1	101	34	979	18S4704CC 1800	3097	0.26	38,480	71,190	109,670	103,000	10/02/13	106
4	1	101	33	1836	18S4705DB 3000	2536	0.26	38,480	133,210	171,690	161,000	02/08/13	107
8	1	101	33	154	18S4703BC 6200	4398	0.15	24,070	17,960	42,030	38,500	03/15/13	109
52	1	101	34	2471	18S4709BA 11100	4096	0.29	43,770	101,280	145,050	130,000	12/08/13	112
5	1	101	34	19087	18S4705C 9600	3788	0.32	54,030	262,060	316,090	279,000	02/12/13	113
21	1	101	34	2531	18S4709BC 1000	1034	0.31	51,980	319,480	371,460	323,348	06/05/13	115
35	1	101	34	1717	18S4705C 8600	4559	0.24	34,470	128,450	162,920	140,000	09/09/13	116
2	1	101	33	2813	18S4709CD 1600	2367	0.24	34,470	61,840	96,310	82,000	01/07/13	117
6	1	101	33	19795	18S4709BC 1503	2388	0.26	38,480	108,820	147,300	124,900	03/04/13	118
27	1	101	33	1329	18S4704DB 601	1481	0.15	24,070	12,160	36,230	30,000	07/07/13	121
49	1	101	34	3222	18S4710BD 4400	5030	0.15	24,070	43,480	67,550	55,000	11/11/13	123
18	1	101	34	1227	18S4704DA 3900	4020	0.13	19,880	11,050	30,930	23,500	05/14/13	132
10	1	101	33	1052	18S4704CC 6800	4211	0.21	30,090	40,190	70,280	50,000	04/05/13	141
16	1	101	33	1954	18S4705DD 2800	2556	0.31	51,530	55,080	106,610	75,000	05/05/13	142
44	1	101	34	1038	18S4704CC 6000	3654	0.23	33,100	108,700	141,800	99,789	10/11/13	142

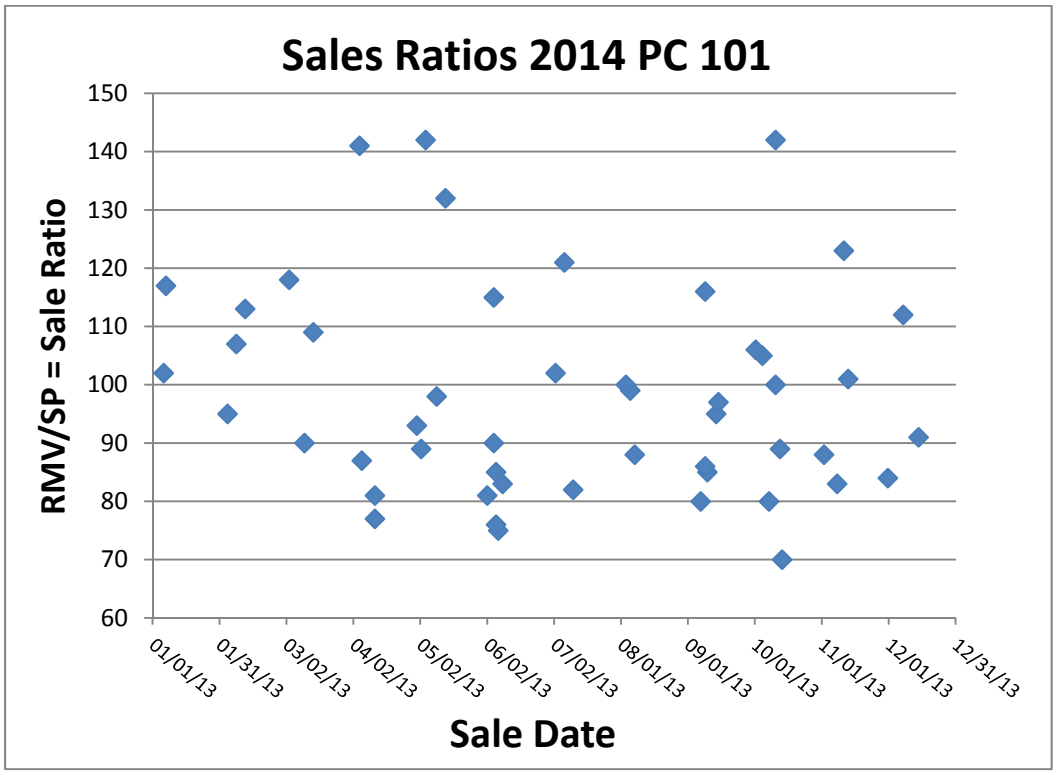
Total Sales= 50

Ratio Analysis

Diagramming Sales Ratios

Sales ratio results may be diagramed to provide a visual representation to illustrate any movement in value over time. Exhibit SD-4 is a plot of Exhibit SL-2 ratios.

Exhibit SD-4



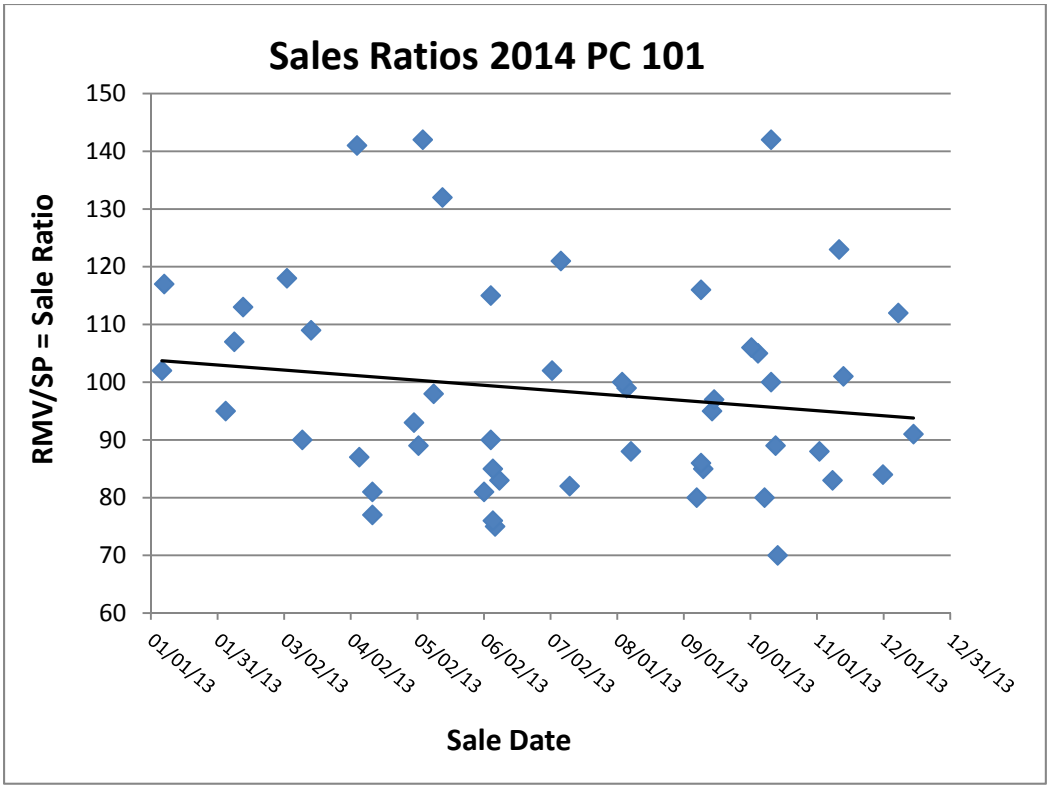
Adding a Trend Line

A trend line, or regression, is a line of best fit between data points on a graph. When added to a scatter diagram of sales ratios, the line indicates the general direction of the ratios over time. The direction of the trend line represents the opposite (inverse) of market movement:

- An upward slope (trend) in the ratio line indicates the sale prices are decreasing.
- A downward slope (trend) in the ratio line indicates the sales prices are increasing.
- A trend line that does not slope (level) indicates no significant change in market prices over time in relation to roll values; no adjustment for change over time is required.

A linear regression trend line is added to the dataset and illustrated below in Exhibit SD-5.

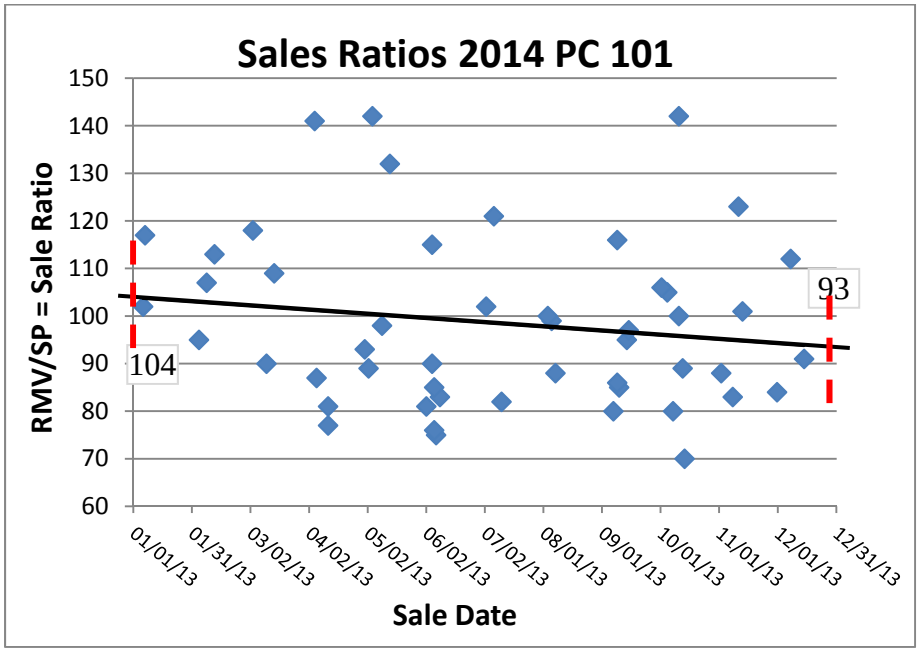
Exhibit SD-5



In Exhibit SD-5, the linear regression line slopes down from left to right, indicating the sales ratios are decreasing (market is increasing). This supports a conclusion that sale prices occurring throughout the year should be adjusted upward to reflect the property value as of the January 1 assessment date. The next step is to calculate a **rate of change**.

Determining the Rate of Change over Time

Exhibit SD-6



Ratio Analysis: Direct Calculation Applied on an Annual Basis

One example of determining the overall change in the market over time is to identify and compare the intersection of the regression line with the y-axis as of the beginning and ending of the study period using the inverse ratio technique.

In Exhibit SD-6, the trend line on the chart slopes downward indicating roll values at the end of the year represent a smaller portion of sale prices than they did at the beginning of the year (sale prices are increasing).

The extended regression line intersects the y-axis at the beginning of the period (January 1) at the ratio point of 104 and intersects the y-axis at the end of the period (December 31) at the ratio point 93. It is evident that a change in market conditions occurred over the year. In order to compute an adjustment factor, use the following steps:

Steps to calculate a factor to adjust sale prices to the assessment date (Exhibit SD-6 data):

1. Extend the ratio regression line and identify the y-axis intersection points as of the beginning (104%) and the ending (93%) of the ratio year.

2. Compute the **amount of change** from the ending point to the beginning point of the period (104% - 93% = 11%). This is not the adjustment factor.

3. Compute an annual **change factor**. The difference between the December 31 sale prices which represent 100% of market value for the assessment date and the change over the period (11%) is the amount of end of year price represented by a beginning of year sale (100% -11% = 89%)
   - When the market is increasing, subtract the amount of change from 100%
   - When the market is decreasing, add the amount of change to 100%

4. Calculate an **annual adjustment factor** by dividing the amount from step 3 into 100% (100% ÷ 89% = 112%)

5. Step 4 indicates the amount a beginning year sale must be adjusted to represent end of year prices. Subtract 100% from the amount in step 4 to arrive at the overall adjustment for the year
   (112% - 100% = 12%)

6. Determine an intermediate period adjustment factor. Divide the overall adjustment for the year by the number of periods (months, quarters). To arrive at the intermediate adjustment factor on a monthly basis, divide the overall adjustment factor for the year from step 5 by the number of months in a year
   (12% ÷ 12 = 1% per month)

The conclusion of the rate of change per month is used to adjust sale prices on a monthly basis from the date of sale to the target January 1 assessment date.

Example: A property sold for $200,000 in May

1. Determine the monthly adjustment factor (1.0% per month from above)

2. Determine the number of months between the sale date and the assessment date:
   There are 8 months between the sale date and the assessment date:
   May, June, July, August, September, October, November, December

3. Determine the total adjustment factor for this sale:
   The number of months multiplied by the monthly adjustment factor
   8 x 1.0 = 8.0%

4. Apply the total adjustment factor to the sale price to find the total adjustment:
   200,000 x 8% = 16,000

5. Add the total adjustment to the sale price to arrive at the adjusted sale price:
   200,000 + 16,000 = 216,000
   The adjusted sale price would be $216,000

   Steps 4 and 5 could be combined and expressed as: 200,000 x 108%.

It must be emphasized this technique of applying a linear regression analysis assumes property values change by a *constant percentage each month* throughout the year.

In Exhibit SL-3, the sale prices are adjusted by a monthly rate. Market area studies will use the resulting adjusted sale prices as the baseline for analysis.

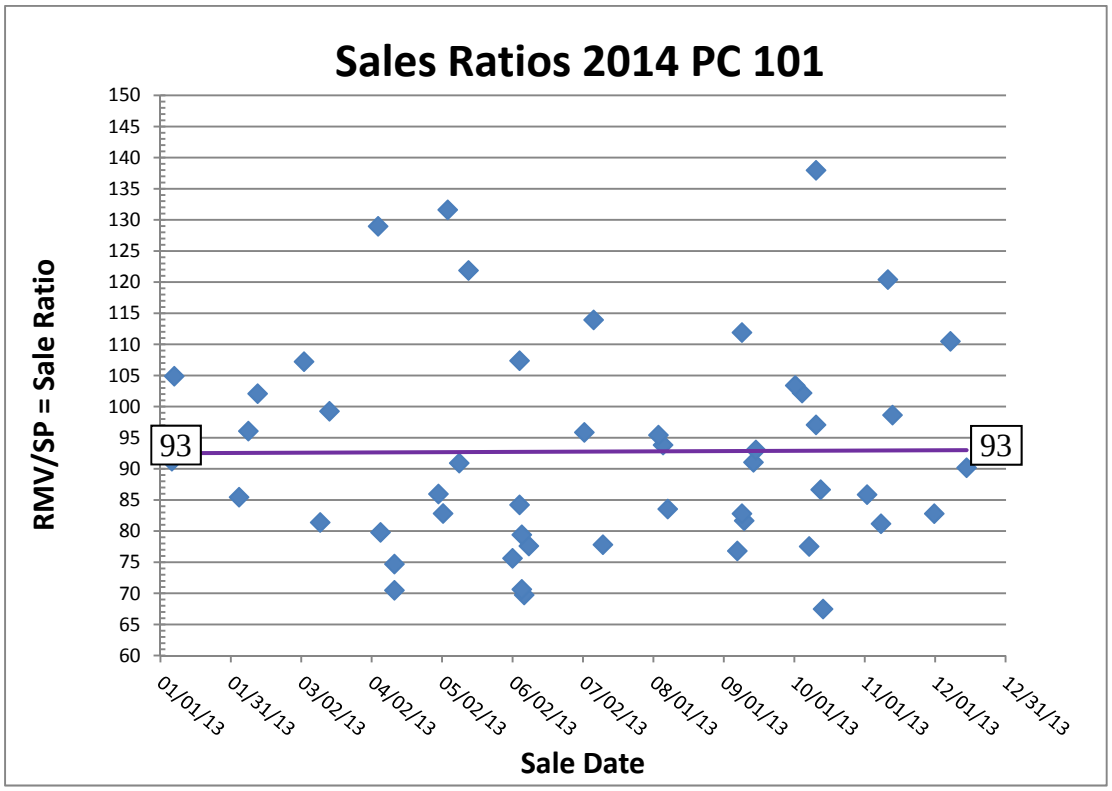
Exhibit SL-3 - Time Trend adjusted sale prices

Target Assessment Date: 1/1/2014

Sale #	MA	Property Class	Condition Code	Acct #	Map & Taxlot	Instrument Number	Acres	Land RMV	Imp RMV	Total RMV	Sale Price	Sale Date	Before Ratio	# Mos to Jan 2014	Adjusted SP	After Ratio
46	1	101	33	1427	18S4704DA 9200	2730	0.13	19,880	34,340	54,220	78,000	10/14/13	70	3	80,340	67
24	1	101	33	2161	18S4709AA 8500	2819	0.15	25,440	82,760	108,200	145,000	06/07/13	75	7	155,150	70
22	1	101	33	1443	18S4704DC 1400	2809	0.21	30,550	67,720	98,270	129,999	06/06/13	76	7	139,099	71
12	1	101	33	2815	18S4709CD 1800	4289	0.24	34,470	88,470	122,940	160,000	04/12/13	77	9	174,400	70
33	1	101	33	20240	18S4705AD 109	3485	0.29	43,770	96,030	139,800	175,000	09/07/13	80	4	182,000	77
42	1	101	33	1000	18S4704CC 3100	2839	0.22	31,460	68,370	99,830	125,000	10/08/13	80	3	128,750	78
13	1	101	33	1401	18S4704DB 6500	4795	0.26	38,480	59,240	97,720	120,000	04/12/13	81	9	130,800	75
19	1	101	34	980	18S4704CC 1900	2799	0.26	38,480	49,390	87,870	108,600	06/02/13	81	7	116,202	76
28	1	101	33	950	18S4704CC 100	1482	0.22	31,460	65,450	96,910	117,500	07/11/13	82	6	124,550	78
25	1	101	34	1446	18S4704DC 1700	4257	0.17	28,730	37,700	66,430	80,000	06/09/13	83	7	85,600	78
48	1	101	34	1601	18S4705AC 7500	4065	0.24	34,470	90,150	124,620	150,500	11/08/13	83	2	153,510	81
51	1	101	33	19844	18S4705AD 237	4196	0.24	34,470	115,220	149,690	179,000	12/01/13	84	1	180,790	83
23	1	101	33	1774	18S4705DA 4001	4866	0.24	34,470	58,910	93,380	109,900	06/06/13	85	7	117,593	79
36	1	101	33	15298	18S4705DD 4200	4551	0.16	27,360	72,440	99,800	117,500	09/10/13	85	4	122,200	82
34	1	101	33	1814	18S4705DA 8100	2579	0.25	37,110	71,400	108,510	126,000	09/09/13	86	4	131,040	83
11	1	101	33	1143	18S4704CD 7000	2963	0.22	31,460	112,020	143,480	165,000	04/06/13	87	9	179,850	80
32	1	101	34	918	18S4704CB 1106	3190	0.24	34,470	82,180	116,650	133,000	08/08/13	88	5	139,650	84
47	1	101	34	20235	18S4705AD 104	2555	0.24	34,470	117,920	152,390	174,000	11/02/13	88	2	177,480	86
15	1	101	34	20265	18S4705DA 602	4117	0.23	33,100	98,560	131,660	147,193	05/03/13	89	8	158,968	83
45	1	101	33	1710	18S4705C 7900	2670	0.22	31,460	93,410	124,870	139,900	10/13/13	89	3	144,097	87
7	1	101	34	18843	18S4704BC 3500	3818	0.23	33,100	55,980	89,080	99,500	03/11/13	90	10	109,450	81
20	1	101	33	19083	18S4705C 9200	4320	0.32	54,030	174,820	228,850	254,000	06/05/13	90	7	271,780	84
54	1	101	34	19110	18S4705C 11900	4059	0.32	54,030	200,990	255,020	280,000	12/15/13	91	1	282,800	90
14	1	101	34	19837	18S4705AD 230	1031	0.29	43,770	200,380	244,150	263,000	05/01/13	93	8	284,040	86
3	1	101	34	20196	18S4705DA 701	4556	0.26	38,480	103,740	142,220	149,963	02/04/13	95	11	166,459	85
37	1	101	34	1087	18S4704CD 1500	3547	0.17	28,730	54,590	83,320	88,000	09/14/13	95	4	91,520	91
38	1	101	34	19691	18S4705BD 1400	4633	0.29	43,770	146,850	190,620	197,000	09/15/13	97	4	204,880	93
17	1	101	34	15619	18S4705DB 9600	1478	0.31	51,530	158,610	210,140	214,000	05/10/13	98	8	231,120	91
31	1	101	33	8094	18S4705DB 1700	5027	0.30	50,620	67,600	118,220	120,000	08/06/13	99	5	126,000	94
30	1	101	33	2124	18S4709AA 5001	4017	0.13	19,880	17,690	37,570	37,500	08/04/13	100	5	39,375	95
43	1	101	33	19307	18S4704BC 7400	4513	0.23	33,100	78,860	111,960	112,000	10/11/13	100	3	115,360	97
50	1	101	34	786	18S4704BD 3900	1328	0.21	30,090	85,590	115,680	115,000	11/13/13	101	2	117,300	99
1	1	101	33	967	18S4704CC 909	3651	0.26	38,480	81,580	120,060	117,500	01/06/13	102	12	131,600	91
26	1	101	34	18670	18S4705DC 2000	4950	0.14	21,250	76,300	97,550	96,000	07/03/13	102	6	101,760	96
41	1	101	34	8313	18S4709CC 4100	2461	0.25	37,110	67,620	104,730	99,500	10/05/13	105	3	102,485	102
39	1	101	34	979	18S4704CC 1800	3097	0.26	38,480	71,190	109,670	103,000	10/02/13	106	3	106,090	103
4	1	101	33	1836	18S4705DB 3000	2536	0.26	38,480	133,210	171,690	161,000	02/08/13	107	11	178,710	96
8	1	101	33	154	18S4703BC 6200	4398	0.15	24,070	17,960	42,030	38,500	03/15/13	109	10	42,350	99
52	1	101	34	2471	18S4709BA 11100	4096	0.29	43,770	101,280	145,050	130,000	12/08/13	112	1	131,300	110
5	1	101	34	19087	18S4705C 9600	3788	0.32	54,030	262,060	316,090	279,000	02/12/13	113	11	309,690	102
21	1	101	34	2531	18S4709BC 1000	1034	0.31	51,980	319,480	371,460	323,348	06/05/13	115	7	345,982	107
35	1	101	34	1717	18S4705C 8600	4559	0.24	34,470	128,450	162,920	140,000	09/09/13	116	4	145,600	112
2	1	101	33	2813	18S4709CD 1600	2367	0.24	34,470	61,840	96,310	82,000	01/07/13	117	12	91,840	105
6	1	101	33	19795	18S4709BC 1503	2388	0.26	38,480	108,820	147,300	124,900	03/04/13	118	10	137,390	107
27	1	101	33	1329	18S4704DB 601	1481	0.15	24,070	12,160	36,230	30,000	07/07/13	121	6	31,800	114
49	1	101	34	3222	18S4710BD 4400	5030	0.15	24,070	43,480	67,550	55,000	11/11/13	123	2	56,100	120
18	1	101	34	1227	18S4704DA 3900	4020	0.13	19,880	11,050	30,930	23,500	05/14/13	132	8	25,380	122
10	1	101	33	1052	18S4704CC 6800	4211	0.21	30,090	40,190	70,280	50,000	04/05/13	141	9	54,500	129
16	1	101	33	1954	18S4705DD 2800	2556	0.31	51,530	55,080	106,610	75,000	05/05/13	142	8	81,000	132
44	1	101	34	1038	18S4704CC 6000	3654	0.23	33,100	108,700	141,800	99,789	10/11/13	142	3	102,783	138

Total Sales 50

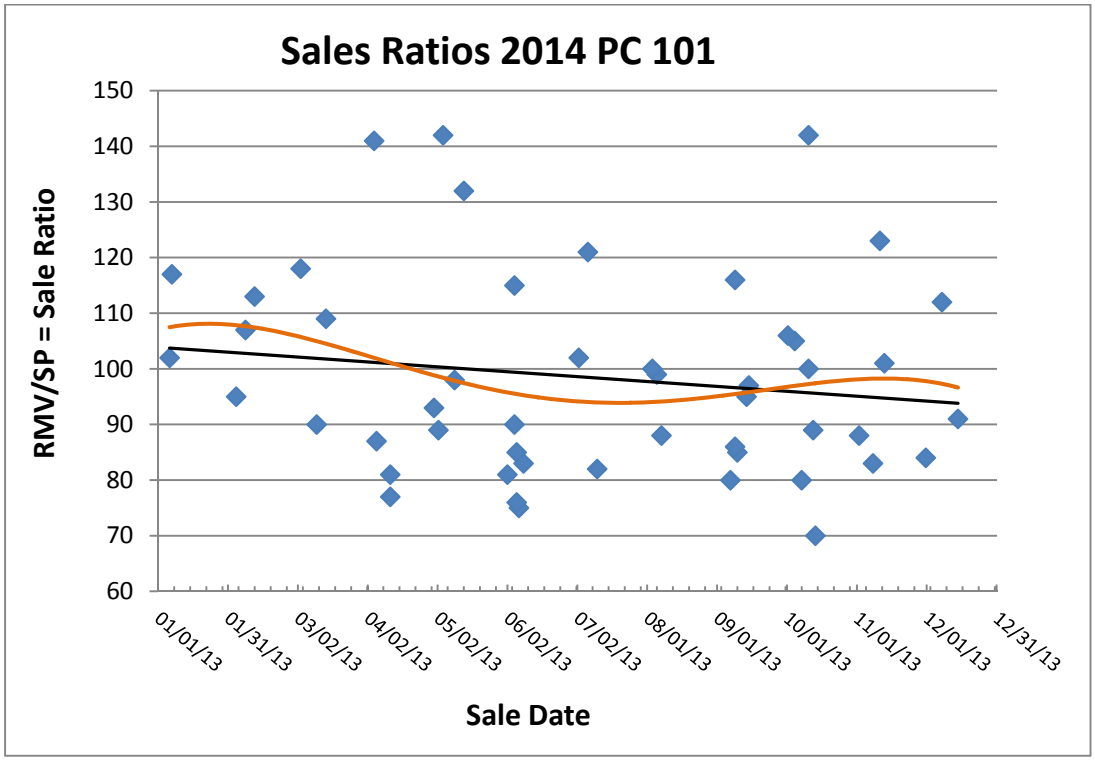
Exhibit SD-7



The sale prices have been adjusted, after ratios were computed, and the ratios plotted in Exhibit SD-7 chart. Compare Exhibit SD-7 to SD-6 and it becomes apparent that the trend line has leveled throughout the year, indicating the sales prices listed in Exhibit SL-3 are adjusted correctly to reflect their sale prices as of the assessment date. The sales list, Exhibit SL-3, now has three new columns; before ratio, adjusted sale price, and after ratio.

Ratio Analysis: Direct Calculation on Monthly or Quarterly Basis

Exhibit SD-8



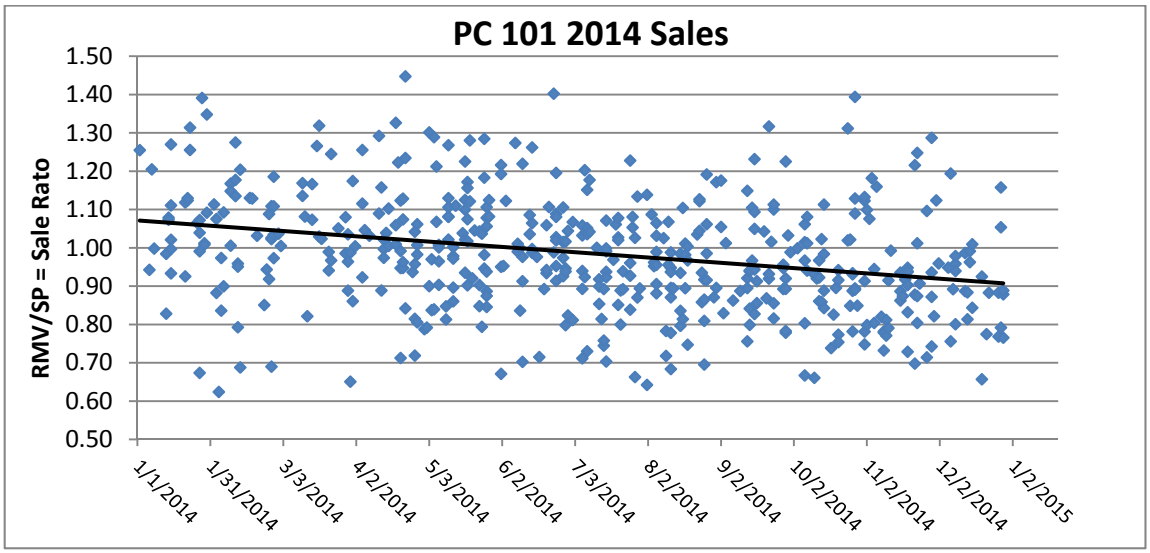
A curvilinear regression line is added to the data in Exhibit SD-7 and is shown in Exhibit SD-8. It provides a visual illustration of sale price fluctuations over the period and, in this example, it reinforces the **general direction** of the market as illustrated by the **linear** regression line and adds confidence to that conclusion. Further, it suggests the rate of change throughout the year is not constant. The rate of change during the spring and summer months appears to be different than in the fall and winter – the prices were higher in the spring and summer than they were in the fall and winter as compared to the roll values. This curve implies analysis of the data over shorter periods (month or quarter) should be considered.

Statistically, 20 sales per analytical period (month, quarter, or year) have been used as an acceptable guide. There are only 50 sales in the SL-2 dataset which provides insufficient sales to confidently proceed with further analysis over **shorter** periods. However, the analysis on an **annual basis** remains valid and can be applied.

Larger Datasets

A trimmed list of 505 sales (see Exhibit SL-4 at end of this section) contributes in excess of 20 sales per period providing a basis for sound statistical calculation of central tendencies for shorter periods; in this example: month. Exhibit SD-9 plots the ratios of these sales with a linear regression line applied that indicates the market increased over the year.

Exhibit SD-9



To analyze the sales over a shorter period (month and/or quarter):

1. Array the data in the sales list on a **monthly** and/or **quarterly** basis.

2. Confirm there are at least 20 sales per period.

3. Compute and table the central tendencies.

4. Select the **central tendency** that is most representative of the market for each period as illustrated in Exhibit T-6.

   The Selected Central Tendency is sometimes erroneously referred to as the Selected Ratio. A **ratio** is a comparison between two numbers. A **central tendency** is a statistical measure.

5. Include the table in the ratio study report.

Exhibit T-6

Improved County Wide 101 Time Trend Analysis PC-101
Ratio Table 2014 Sales

Month	Month	Count	Cumulative Count	Median	Mean	W. Mean	Selected
Jan	1	29	29	***1.07***	1.08	1.06	1.07
Feb	2	34	63	1.03	***1.01***	1.00	1.01
Mar	3	24	87	***1.03***	1.04	1.02	1.03
Apr	4	43	130	***1.01***	1.02	1.01	1.01
May	5	61	191	***1.02***	1.02	1.02	1.02
Jun	6	48	239	***1.00***	1.01	1.00	1.00
Jul	7	51	290	0.94	0.96	***0.95***	0.95
Aug	8	53	343	0.95	***0.94***	0.94	0.94
Sep	9	42	385	0.94	***0.96***	0.96	0.96
Oct	10	43	428	***0.93***	0.94	0.92	0.93
Nov	11	47	475	0.89	0.92	***0.92***	0.92
Dec	12	30	505	0.89	0.91	***0.90***	0.90
	Total Sales:	505					

Explanation of Central Tendency Selection

Month	Selected Central Tendency	Reason for Selection (data is not significantly skewed)
January	Median	Supported by the Mean and the Wtd. Mean
February	Mean	Bracketed by the Median and the Wtd. Mean
March	Median	Supported by the other central tendencies
April	Median	Supported by other central tendencies
May	Median	Same as the other central tendencies
June	Median	Supported by the Mean and the Wtd. Mean
July	Weighted Mean	Bracketed by the other central tendencies
August	Mean	Same as the Wtd. Mean; supported by the Median
September	Mean	Same as the Wtd. Mean; supported by the Median
October	Median	Bracketed by the Mean and the Wtd. Mean
November	Weighted Mean	Supported by the Mean
December	Wtd. Mean	Bracketed by the Mean and the Median

Exhibit T-7

Improved County Wide 101 Time Trend Analysis PC-101

Ratio Analysis								Sale Price Adjustment Calculation		
Month	Month	Count	Cumulative Count	Median	Mean	W. Mean	Selected	Change to End of Yr	Change Factor	Sale Price Adj Factor
Jan	1	29	29	***1.07***	1.08	1.06	1.07	0.17	0.83	1.20
Feb	2	34	63	1.03	***1.01***	1.00	1.01	0.11	0.89	1.12
Mar	3	24	87	***1.03***	1.04	1.02	1.03	0.13	0.87	1.15
Apr	4	43	130	***1.01***	1.02	1.01	1.01	0.11	0.89	1.12
May	5	61	191	***1.02***	1.02	1.02	1.02	0.12	0.88	1.14
Jun	6	48	239	***1.00***	1.01	1.00	1.00	0.10	0.90	1.11
Jul	7	51	290	0.94	0.96	***0.95***	0.95	0.05	0.95	1.05
Aug	8	53	343	0.95	***0.94***	0.94	0.94	0.04	0.96	1.04
Sep	9	42	385	0.94	***0.96***	0.96	0.96	0.06	0.94	1.06
Oct	10	43	428	***0.93***	0.94	0.92	0.93	0.03	0.97	1.03
Nov	11	47	475	0.89	0.92	***0.92***	0.92	0.02	0.98	1.02
Dec	12	30	505	0.89	0.91	***0.90***	0.90	0.00	1.00	1.00
	Total Sales:	505								

Ratio Analysis: Direct Calculation Applied on a Monthly Basis

The difference between the beginning point (month of sale) and the end point (December for a January 1 assessment date) is used to determine the adjustment necessary to modify a sale price occurring in any month to its projected sale price in December. For example, if a sale occurred in January:

1. The selected central tendency for January is 1.07; the selected central tendency for December is 0.90, and the difference is 0.17 (1.07 – 0.90 = 0.17). See *Change to End of Year* column in Exhibit T-7.

2. The **change factor** is calculated by subtracting the end of year difference from 1.00 (1.00 – 0.17 = 0.83). See *Change Factor* column in Exhibit T-7.

3. The *Sale Price Adjustment Factor* (to adjust January sale prices to end of year) is computed by dividing 1.00 by the change factor (1.00 / 0.83 = 1.20).

The procedure is repeated for each period (month).

Example: A property sold for $200,000 in May

1. Use the monthly sale price adjustment factor for May from the table (1.14 from Exhibit T-7)

2. Apply the May adjustment factor to the sale price to calculate the **adjusted** sale price:
   200,000 x 1.14 = 228,000
   The adjusted sale price would be $228,000.

Apply the appropriate monthly sale price adjustment factor to each sale to modify the sale prices to a projected sale date of December for the January 1 assessment date.

Market area studies will use the resulting adjusted sale prices as the baseline for analysis.

In conclusion: The analysis of market change over time in Exhibits SD-6, SD-7, and SD-8 is approached on an **annual** basis. When sufficient sales are available, time trends can be identified and measured by grouping sales ratios by month and/or quarter. Exhibits SD-9, T-6, and T-7 demonstrate analysis on a monthly basis.

A time adjustment developed using a ratio trend is usually accurate if there is an adequate number of sales per time period (month, quarter, or annual). Caution, judgment, and supplemental information need to be utilized when concluding time adjustments with limited sales data.

Ratio Analysis: Mid-point

This technique is **not** used to adjust sale prices. It modifies the selected central tendency so an adjustment factor can be calculated to adjust RMVs to the assessment date.

It locates the middle sale of a sales list which may or may not occur in the middle of the calendar year. Like a median, the mid-point is only positional: half of the sales occur before the mid-point and half occur after. There is no reliance or influence of ratios on the mid-point sale.

The amount of change in the market from the mid-point to the end of the period is calculated as the change in ratio over time and then **applied to selected central tendencies** (not to adjust sale prices) of market area studies. Sufficient sales in the mid-point month are needed for this technique to be useful.

Step by step instructions to create a mid-point ratio table.

In the following table, a full year of sales is analyzed on a monthly basis.

1. Sort the sales in ascending order by the sale date.
2. Count the number of sales in each month and list in a column in the table.
3. Next to the Month column from Step 2, calculate and enter the cumulative sales count.
4. Total the number of sales in the entire sorted array.

Month	Month	Count	Cumulative Count
Jan	1	18	18
Feb	2	16	34
Mar	3	11	45
Apr	4	29	74
May	5	30	104
Jun	6	38	142
Jul	7	43	185
Aug	8	32	217
Sep	9	41	258
Oct	10	39	297
Nov	11	32	329
Dec	12	23	352
	Total Sales:	352	

5. Divide the total number of sales by 2 to locate middle sale, regardless of the month in which it occurs.

(352 / 2 = 176)

6. Identify the month in the Cumulative Count column (created in Step 2) in which the middle sale occurs.
   (Sale number 176 falls in July so July is selected as the mid-point month.)

	Month	Month	Count	Cumulative Count
	Jan	1	18	18
	Feb	2	16	34
	Mar	3	11	45
	Apr	4	29	74
	May	5	30	104
	Jun	6	38	142
Mid-point	Jul	7	43	185
	Aug	8	32	217
	Sep	9	41	258
	Oct	10	39	297
	Nov	11	32	329
	Dec	12	23	352
		Total Sales:	352	

7. Compute the central tendencies for the mid-point month (July) and for December.
8. Select a central tendency that is the best fit for the mid-point month (July) and the end-

date month (December).

(July selected 0.92 and December selected 0.90.)

Improved Countywide Time Trend Analysis PC-101
Mid-point Ratio Table 2013 Sales

	Month	Month	Count	Cumulative Count	Median	Mean	W. Mean	Selected
	Jan	1	18	18				
	Feb	2	16	34				
	Mar	3	11	45				
	Apr	4	29	74				
	May	5	30	104				
	Jun	6	38	142				
Mid-point	Jul	7	43	185	0.91	***0.92***	0.93	0.92
	Aug	8	32	217				
	Sep	9	41	258				
	Oct	10	39	297				
	Nov	11	32	329				
	Dec	12	23	352	0.90	***0.90***	0.91	0.90
		Total Sales:	352					

9. Compute the percent change from the selected central tendency of the ratios for the mid-point and end-date months.

   The formula is: (end year selected central tendency – mid-point selected central tendency) divided by the mid-point selected central tendency = the **trend factor**

   (0.90 – 0.92) ÷ 0.92 = -0.02 trend factor

10. Calculate a Mid-point **Time Adjustment Factor**:
    a. If the trend factor is a **positive** adjustment (number) ADD to 1.00
    b. If the trend factor is a **negative** adjustment (number) SUBTRACT from 1.00

    1.00 - 0.02 = 0.98 or 98% = Time Adjustment Factor

11. Create a conclusion box and display it in the ratio study report time study section.

Conclusion: The mid-point of the sales is found to be July (7th month),
With a corresponding mid-point mean central tendency of 0.92
The end of the year central tendency is 0.90
(0.90-0.92)/0.92 = -0.02 or -2%
1.00 - 0.02 = 0.98, the Mid-point Time Adjustment Factor

12. The Mid-point Time Adjustment Factor will only be applied to the selected central tendency in individual market area studies. It adjusts the selected central tendency for change to the market conditions over time.

    For example, in Market Study Area XYZ, the before adjustment central tendencies are:

Mean	1.06
Median	**1.06**
Weighted Mean	1.07

Selected Central Tendency is the Median (1.06)

Time Adjustment Factor from the Mid-point study above is 0.98.

Multiply the selected central tendency from the market area study (1.06) by the time adjustment factor (0.98) equals the **adjusted central tendency** for the market area.

1.06 x 0.98 = 1.038 or 1.04 rounded

The **adjusted** central tendency for the market area is 1.04 (due to change in market conditions over time).

13. Calculate the overall adjustment for the study area: Divide 1.00 by the adjusted central tendency calculated in Step 12 (1.04).

    1.00 / 1.04 = 0.96 Overall Adjustment Factor

In conclusion: In contrast to other time adjustment methods, this technique does not calculate a factor to adjust sales. The factor is applied to the selected central tendency. A time adjustment developed using a mid-point adjustment factor is usually accurate if there is an adequate number of sales per month. Caution, judgment, and supplemental information need to be utilized when concluding time adjustments.

Direct Sales Analysis

Two direct sales techniques for determining a time adjustment:

- **Double Sales**: A property that sold twice during a relatively short period of time. Confirm and/or verify both sales. There should be no significant changes to the property between sales.
- **Paired Sales:** These properties are very similar in all property characteristics (class, age, condition, etc.) but are not the same property. Confirm and/or verify both sales.

Use a spreadsheet or database format to analyze sales data. The visual layout provides a consistent, organized process for all users of the ratio study report. The basic steps are as follows:

1. List the sales by account number or map and tax lot number.
2. List the first sale date and sale price.
3. List the second sale date and price.
4. Determine the gross change in dollars between sale prices (Subtract the oldest sale price from the newest sale price.)
5. Divide the gross change by the **oldest** sale price. The result indicates the gross change in value expressed as a decimal (factor).
6. Compute the number of months between sales.
7. Divide the gross change factor by the number of months.
8. Calculate the mean monthly change of all the double and/or paired sales.

Double Sales

The following example demonstrates using double sales to determine the monthly change in value. Assume the following:

1. The assessment date is January 1; the sales year is the prior January 1 through December 31.
2. For the current sales year, property class 1-0-1 only had three double sales countywide.

Double Sales

Map	Prop ID	Prop Cl	Ac	Yr Blt	Imp Size	Stat	Sale Price	Sale Date	Gross $ Change	Gross % Change	Number of Months	Change Factor	Monthly % Change
072W07DD00305	R328483	101	0.18	2003	1609	R41	$178,500	04-Sep-13					
072W07DD00305	R328483	101	0.18	2003	1609	R41	$199,900	15-Sep-14	$21,400	0.12	12	0.0100	1.00
051W06CC17700	R110519	101	0.11	1990	1616	R41	$193,500	01-Feb-14					
051W06CC17700	R110519	101	0.11	1990	1616	R41	$209,800	20-Dec-14	$16,300	0.08	10	0.0084	0.84
061W34DD04300	R17431	101	0.51	1952	1617	R41	$215,000	07-Jan-13					
061W34DD04300	R17431	101	0.51	1952	1617	R41	$243,200	05-Feb-14	$28,200	0.13	12	0.0109	1.09
											Mean	0.0098	0.98

This analysis indicates the prior year sales could be adjusted approximately one percent per month. Apply the appropriate monthly sale price adjustment factor to each sale to modify the sale prices to a projected assessment date of January 1.

Paired Sales

Paired sales analysis uses the same techniques as double sales but, instead of being the same property that resold, they are two highly similar properties that sold at different times during the study period. Minor differences in property characteristics may require an adjustment to achieve an optimal match.

For example, suppose two homes in a newer tract neighborhood sold within six months of each other. The first sale was for $212,000, and the second sale was for $220,000. The homes are very similar except that the second home has an extra garage space, the depreciated value of which is $2,800. Adding the $2,800 to the sales price of the first home yields an adjusted sales price of $214,800. These sales are now ready to be analyzed as described in the double sales technique above.

Matched/Paired Sales

Map	Prop ID	Prop Cl	Ac	Yr Blt	Imp Size	Stat	Sale Price	Sale Date	Gross $ Change	Gross % Change	Number of Months	Change Factor	Monthly % Change
051W07AB08100	R332245	101	0.12	2003	1633	R41	$210,000	27-Jul-13					
052W07BD02200	R342776	101	0.12	2014	1619	R41	$223,000	31-Mar-14	$13,000	0.06	8	0.0077	0.77
061W34BA03700	R324799	101	0.24	2001	1650	R41	$235,000	03-Feb-14					
061W34AB05501	R340113	101	0.17	2014	1654	R41	$262,500	13-Dec-14	$27,500	0.12	10	0.0117	1.17
052W13BA06900	R343351	101	0.21	2014	1752	R41	$252,400	13-Apr-13					
052W13BA05900	R343341	101	0.14	2014	1699	R41	$264,700	24-Aug-13	$12,300	0.05	4	0.0122	1.22
063W35AB09700	R64105	101	0.22	1961	1731	R41	$225,000	14-Jan-14					
063W26BB02200	R44653	101	0.31	1967	1770	R41	$239,000	25-Oct-14	$14,000	0.06	9	0.0069	0.69
072W06AD04400	R51288	101	0.44	1976	1759	R41	$279,000	24-Mar-14					
072W06AD07200	R33728	101	0.043	1979	1833	R41	$298,600	17-Dec-14	$19,600	0.07	8	0.0088	0.88
061W35BB13100	R102352	101	0.16	1996	1790	R41	$228,000	15-Jan-14					
061W10AD06000	R339644	101	0.21	2007	1802	R41	$246,300	27-Oct-14	$18,300	0.08	9	0.0089	0.89
											Mean	0.0094	0.94

In conclusion: A time adjustment developed using direct sale is usually accurate if there is an adequate number of sales per time period (month, quarter, or annual). Caution, judgment, and supplemental information need to be utilized when concluding time adjustments with limited sales data.

Exhibit SL-4

Acct #	Maint Area	Study Area	NH	Prop Cl	Cond Code	Deed Type	Yr Blt	% Good	Imp Sq Ft	Stat	Acres	Land Value	Imp Value	Total Prior Year Roll Value	Sale Date	Sale Price	Ratio
10000600	5	5	505	101	30A	WD	1989	92	1144	131	0.23	85,720	82,460	168,180	1/2/2014	134,000	1.26
10321500	6	2	602	101	30A	WD	1991	98	1070	131	0.34	46,240	102,240	148,480	1/6/2014	157,500	0.94
10367900	6	2	602	101	33	WD	1974	86	1910	143	0.20	54,740	195,280	250,020	1/7/2014	207,500	1.20
10535900	1	5	105	101	30B	WD	1966	82	1935	141	0.24	114,670	90,540	205,210	1/8/2014	205,500	1.00
10643500	6	92	692	101	30A	WD	1950	79	1606	134	0.19	60,900	79,090	139,990	1/13/2014	169,000	0.83
10808100	6	93	693	101	30A	WD	1955	72	1404	131	0.21	88,120	89,110	177,230	1/13/2014	180,000	0.98
10975400	1	6	106	101	30A	WD	1968	77	1300	131	0.15	85,110	73,580	158,690	1/14/2014	147,800	1.07
10937200	4	5	405	101	33	WD	1965	77	1566	131	0.16	129,140	156,760	285,900	1/14/2014	265,000	1.08
10007943	5	5	505	101	33	WD	1991	98	1095	131	0.17	86,270	71,520	157,790	1/15/2014	169,000	0.93
10001866	5	6	506	101	30A	WD	1991	98	1760	141	1.13	121,950	94,350	216,300	1/15/2014	216,900	1.00
10006540	5	5	505	101	30B	WD	1939	69	1004	131	0.21	69,460	42,910	112,370	1/15/2014	110,000	1.02
10004141	5	5	505	101	30A	WD	1965	82	1586	131	0.23	97,020	116,600	213,620	1/15/2014	192,215	1.11
10003711	5	5	505	101	30A	WD	1966	82	1687	131	0.57	102,520	125,980	228,500	1/15/2014	179,900	1.27
10009164	5	5	505	101	30A	WD	2001	100	2331	232	0.36	91,680	148,890	240,570	1/21/2014	259,900	0.93
10008727	5	6	506	101	30A	WD	1980	86	1676	132	0.29	84,710	109,940	194,650	1/21/2014	174,000	1.12
10011172	4	5	405	101	30A	WD	1968	81	1596	131	0.17	60,900	96,490	157,390	1/22/2014	140,000	1.12
10011847	4	5	405	101	30	WD	1977	81	1380	131	0.18	91,600	81,820	173,420	1/22/2014	153,500	1.13
10013408	4	5	405	101	30A	WD	1986	93	1415	141	0.14	119,190	125,640	244,830	1/23/2014	195,000	1.26
10012616	4	5	405	101	30A	WD	1988	95	1117	131	0.30	103,410	83,220	186,630	1/23/2014	142,000	1.31
10021176	4	10	410	101	33	WD	1999	100	2123	143	0.26	199,740	263,820	463,560	1/26/2014	435,000	1.07
10022853	4	8	408	101	30A	WD	1954	62	1703	131	0.22	100,980	91,070	192,050	1/27/2014	285,000	0.67
10022636	4	8	408	101	30A	WD	1979	82	1098	131	0.24	85,720	75,860	161,580	1/27/2014	163,000	0.99
10022115	4	9	409	101	33	WD	1965	80	1312	131	0.22	91,830	77,670	169,500	1/27/2014	163,000	1.04
10023088	4	8	408	101	33	WD	1985	92	1024	131	0.19	97,560	56,810	154,370	1/27/2014	143,900	1.07
10024108	4	9	409	101	30A	WD	1994	100	1417	141	0.22	98,520	150,500	249,020	1/28/2014	179,000	1.39
10028240	4	5	405	101	30A	WD	1958	76	2472	331	0.16	80,990	109,690	190,680	1/29/2014	189,000	1.01
10024602	4	13	413	101	30A	WD	1958	82	1877	131	0.31	117,330	102,310	219,640	1/29/2014	217,000	1.01
10047893	2	3	203	101	33	WD	1972	83	1056	131	0.19	105,200	47,360	152,560	1/30/2014	139,700	1.09
10047844	2	3	203	101	33	WD	1960	77	1373	131	0.14	86,770	81,800	168,570	1/30/2014	125,000	1.35
10048620	2	3	203	101	30B	WD	1930	65	2238	232	0.15	102,650	75,520	178,170	2/2/2014	160,000	1.11
10049202	2	4	204	101	30A	WD	1988	94	2031	141	0.24	118,410	155,290	273,700	2/3/2014	310,000	0.88
10049537	2	4	204	101	33	WD	1973	79	1521	131	0.12	109,640	98,500	208,140	2/3/2014	193,500	1.08
10052177	2	3	203	101	30A	WD	1952	69	752	121	0.22	50,820	55,310	106,130	2/4/2014	170,000	0.62
10052493	2	3	203	101	33	WD	1951	75	832	121	0.21	85,660	39,710	125,370	2/5/2014	149,900	0.84
10053058	2	3	203	101	33	WD	1978	84	1884	142	0.23	119,190	124,280	243,470	2/5/2014	250,000	0.97
10053901	2	3	203	101	33	WD	1960	82	1750	141	0.24	98,520	141,780	240,300	2/6/2014	267,000	0.90
10057002	2	3	203	101	33	WD	1979	89	1008	131	0.20	62,580	56,540	119,120	2/6/2014	109,000	1.09
10058869	2	4	204	101	33	WD	1996	100	1439	132	0.14	57,630	90,750	148,380	2/9/2014	147,500	1.01

Acct #	Maint Area	Study Area	NH	Prop Cl	Cond Code	Deed Type	Yr Blt	% Good	Imp Sq Ft	Stat	Acres	Land Value	Imp Value	Total Prior Year Roll Value	Sale Date	Sale Price	Ratio
10059313	2	4	204	101	33	WD	1989	96	1949	141	0.29	126,930	139,460	266,390	2/9/2014	232,000	1.15
10057467	2	2	202	101	33	WD	1950	56	1520	122	0.18	118,460	56,750	175,210	2/9/2014	150,000	1.17
10059808	2	9	209	101	33	WD	1930	58	540	122	0.10	47,810	37,330	85,140	2/11/2014	75,000	1.14
10066344	2	9	209	101	33	WD	1981	91	1996	142	0.24	108,740	162,140	270,880	2/11/2014	230,000	1.18
10060402	2	9	209	101	33	WD	1978	81	1108	131	0.22	100,580	68,370	168,950	2/11/2014	132,500	1.28
10070050	2	11	211	101	30A	WD	1975	63	1144	131	0.17	59,330	41,000	100,330	2/12/2014	126,500	0.79
10070986	2	11	211	101	33	WD	1950	75	1144	121	0.17	87,040	50,890	137,930	2/12/2014	145,000	0.95
10070505	2	8	208	101	30A	WD	1950	75	2880	432	0.23	80,990	149,210	230,200	2/12/2014	240,000	0.96
10071317	2	8	208	101	33	WD	1950	82	1976	131	0.31	135,730	136,110	271,840	2/13/2014	395,000	0.69
10071170	2	11	211	101	30A	WD	1970	82	1831	132	0.22	277,280	336,860	614,140	2/13/2014	510,000	1.20
10071617	2	11	211	101	33	WD	1980	86	1364	131	0.15	121,950	67,390	189,340	2/17/2014	167,500	1.13
10073991	2	11	211	101	33	WD	1943	71	864	131	0.16	92,550	48,480	141,030	2/18/2014	124,900	1.13
10075163	2	11	211	101	30A	WD	1965	82	1280	131	0.19	119,190	56,140	175,330	2/20/2014	169,900	1.03
10079361	2	3	203	101	33	WD	1973	62	1130	131	0.14	63,270	44,380	107,650	2/23/2014	126,500	0.85
10080971	2	2	202	101	33	WD	1970	83	1327	131	0.11	74,370	66,640	141,010	2/24/2014	149,400	0.94
10082317	2	1	201	101	33	WD	1991	98	1092	132	0.24	93,920	143,970	237,890	2/25/2014	259,000	0.92
10082040	2	1	201	101	30A	WD	1979	89	1096	131	0.16	49,930	83,840	133,770	2/25/2014	122,900	1.09
10086114	2	3	203	101	30A	WD	1966	80	1098	121	0.19	45,880	40,400	86,280	2/26/2014	125,000	0.69
10085256	2	3	203	101	33	BS	1960	77	1136	121	0.17	91,290	51,430	142,720	2/26/2014	139,500	1.02
10083441	2	12	212	101	30A	WD	1964	79	1118	131	0.21	87,230	77,320	164,550	2/26/2014	160,300	1.03
10086780	2	12	212	101	33	WD	1945	72	2818	232	0.27	85,610	102,900	188,510	2/26/2014	170,000	1.11
10091568	2	12	212	101	30A	WD	1990	98	1000	131	0.37	69,440	92,640	162,080	2/27/2014	166,500	0.97
10089487	2	6	206	101	30A	WD	1960	75	1891	151	0.17	115,270	176,530	291,800	2/27/2014	282,000	1.03
10090715	2	8	208	101	30A	WD	1979	89	1144	131	0.37	96,420	83,710	180,130	2/27/2014	162,500	1.11
10090156	2	8	208	101	30A	WD	1945	72	3073	232	0.23	85,610	139,700	225,310	2/27/2014	190,000	1.19
10091850	2	12	212	101	30A	WD	1977	84	1756	141	0.41	103,710	134,830	238,540	3/1/2014	230,000	1.04
10092223	2	12	212	101	30A	WD	1976	87	1672	141	0.22	174,120	197,330	371,450	3/2/2014	369,500	1.01
10092442	2	8	208	101	33	WD	2003	100	1862	141	0.22	86,980	168,600	255,580	3/11/2014	225,000	1.14
10093121	2	6	206	101	30A	WD	1930	65	966	121	0.27	69,460	33,440	102,900	3/11/2014	88,000	1.17
10093421	2	11	211	101	33	WD	1974	79	2044	143	0.20	176,130	170,130	346,260	3/12/2014	320,000	1.08
10094613	2	8	208	101	33	WD	1955	64	2198	131	0.22	185,750	133,970	319,720	3/13/2014	389,000	0.82
10117319	2	10	210	101	30A	WD	1979	85	1080	132	0.15	81,700	35,330	117,030	3/15/2014	109,000	1.07
10095318	2	9	209	101	30B	WD	1954	76	1502	131	0.42	117,340	69,350	186,690	3/15/2014	160,000	1.17
10117919	2	10	210	101	33	WD	1979	82	1247	131	0.18	85,720	78,890	164,610	3/17/2014	130,000	1.27
10128877	3	4	304	101	33	WD	1978	84	1841	141	0.17	119,190	137,690	256,880	3/18/2014	249,500	1.03
10128015	3	4	304	101	30A	WD	1960	76	1296	131	0.22	148,050	181,680	329,730	3/18/2014	250,000	1.32
10129621	3	4	304	101	30A	WD	1966	76	1784	131	0.12	90,020	94,190	184,210	3/19/2014	179,900	1.02
10130244	3	4	304	101	30A	WD	1964	79	1716	122	0.14	77,240	84,150	161,390	3/22/2014	171,500	0.94
10130810	3	4	304	101	30B	WD	1976	80	1372	131	0.17	94,390	86,820	181,210	3/22/2014	183,138	0.99

Acct #	Maint Area	Study Area	NH	Prop Cl	Cond Code	Deed Type	Yr Blt	% Good	Imp Sq Ft	Stat	Acres	Land Value	Imp Value	Total Prior Year Roll Value	Sale Date	Sale Price	Ratio
10131743	3	4	304	101	30A	WD	1978	84	1560	131	0.23	91,710	87,770	179,480	3/23/2014	185,500	0.97
10132812	3	1	301	101	30A	WD	1987	94	1507	141	0.18	119,190	111,170	230,360	3/23/2014	185,000	1.25
10134297	3	1	301	101	33	WD	1946	73	1134	121	0.09	105,070	48,370	153,440	3/26/2014	146,000	1.05
10135129	3	1	301	101	33	WD	1952	59	864	131	0.21	166,410	60,290	226,700	3/29/2014	229,900	0.99
10135402	3	23	323	101	30A	WD	1977	81	1301	131	0.18	79,850	86,490	166,340	3/29/2014	154,000	1.08
10135794	3	23	323	101	30A	WD	1978	84	2608	131	0.25	119,190	136,740	255,930	3/30/2014	288,000	0.89
10135729	3	23	323	101	30A	WD	1976	87	1929	131	0.25	174,120	186,050	360,170	3/30/2014	373,500	0.96
10136117	3	23	323	101	33	WD	1980	86	1368	131	0.24	119,190	86,800	205,990	3/30/2014	198,900	1.04
10136849	3	23	323	101	30A	WD	1950	70	1366	121	0.40	24,314	88,940	113,250	3/31/2014	174,000	0.65
10137251	3	23	323	101	30A	WD	1972	83	2900	152	0.20	96,390	273,970	370,360	3/31/2014	375,000	0.99
10137811	3	23	323	101	30A	WD	1954	76	1463	131	0.16	114,650	78,210	192,860	4/1/2014	224,000	0.86
10138231	3	23	323	101	30A	WD	1984	90	1764	141	0.19	109,590	183,460	293,050	4/1/2014	249,500	1.17
10138540	3	23	323	101	30A	WD	1994	100	1296	131	0.45	91,600	92,680	184,280	4/2/2014	183,500	1.00
10138831	3	23	323	101	30A	WD	1967	79	1672	133	0.17	194,490	137,900	332,390	4/5/2014	360,000	0.92
10139180	3	1	301	101	33	WD	1965	82	2042	141	0.18	111,210	188,970	300,180	4/5/2014	269,000	1.12
10139520	3	1	301	101	30A	WD	1992	99	1460	131	0.10	121,950	65,120	187,070	4/5/2014	149,000	1.26
10140386	3	1	301	101	33	WD	1965	76	962	131	0.18	90,910	57,710	148,620	4/6/2014	142,000	1.05
10142857	3	23	323	101	30A	WD	1965	80	1680	141	0.24	113,680	130,870	244,550	4/8/2014	237,000	1.03
10143683	3	23	323	101	30A	WD	1994	100	1970	141	0.25	101,030	215,000	316,030	4/12/2014	290,000	1.09
10143278	3	23	323	101	30A	WD	1950	75	926	131	0.18	92,550	49,620	142,170	4/12/2014	110,000	1.29
10144185	3	23	323	101	30A	WD	1993	99	1710	131	0.21	111,450	115,250	226,700	4/13/2014	255,000	0.89
10145171	3	1	301	101	30A	WD	1974	83	1545	141	0.17	119,190	114,740	233,930	4/13/2014	202,000	1.16
10167848	3	11	311	101	30B	WD	1987	95	1032	131	2.00	71,020	96,510	167,530	4/14/2014	172,000	0.97
10146834	3	1	301	101	30A	WD	1972	84	1104	131	0.15	73,460	71,110	144,570	4/14/2014	145,000	1.00
10158611	3	13	313	101	30A	WD	1981	91	1800	133	0.90	89,650	156,600	246,250	4/14/2014	241,000	1.02
10170315	3	11	311	101	33	WD	1965	77	1672	131	0.58	139,810	184,970	324,780	4/15/2014	312,500	1.04
10174838	3	16	316	101	30A	WD	1991	98	2074	142	0.57	123,670	228,910	352,580	4/16/2014	350,800	1.01
10175671	3	16	316	101	30B	WD	1988	95	1619	141	0.30	121,950	87,550	209,500	4/16/2014	190,000	1.10
10177746	3	11	311	101	30A	WD	1975	83	1448	131	0.80	102,660	73,900	176,560	4/19/2014	174,900	1.01
10179251	3	23	323	101	30A	WD	1989	97	1929	141	0.19	114,260	155,930	270,190	4/19/2014	255,000	1.06
10176344	3	23	323	101	30A	WD	1975	86	1695	141	0.34	101,100	120,750	221,850	4/19/2014	167,211	1.33
10179633	3	23	323	101	33	WD	1992	98	3981	152	0.20	242,920	673,270	916,190	4/20/2014	749,000	1.22
10183819	3	16	316	101	30B	WD	1948	74	768	111	0.66	124,900	29,080	153,980	4/21/2014	216,000	0.71
10187944	3	16	316	101	30A	WD	1987	88	1082	131	0.32	78,650	72,930	151,580	4/21/2014	160,000	0.95
10185691	3	16	316	101	30A	WD	1979	89	1332	131	1.03	73,840	114,630	188,470	4/21/2014	190,000	0.99
10184988	3	16	316	101	30A	WD	1950	75	1550	231	1.99	80,990	62,290	143,280	4/21/2014	127,500	1.12
10189076	3	16	316	101	30A	WD	1945	64	1440	122	0.50	62,310	60,600	122,910	4/22/2014	129,650	0.95
10195175	3	24	324	101	30A	WD	1974	83	1745	142	0.23	113,050	103,640	216,690	4/22/2014	225,000	0.96
10196511	3	11	311	101	30A	WD	1965	76	2782	132	0.73	85,610	116,710	202,320	4/22/2014	188,300	1.07

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10192031	3	23	323	101	33	WD	1953	82	1092	131	0.50	104,710	64,620	169,330	4/22/2014	150,000	1.13
10198596	3	11	311	101	30A	WD	1930	65	1315	122	1.27	85,660	48,980	134,640	4/23/2014	159,900	0.84
10196852	3	11	311	101	33	WD	1999	100	2357	132	0.43	104,120	141,600	245,720	4/23/2014	199,000	1.23
10201451	3	11	311	101	30A	WD	1935	68	744	131	1.10	69,460	39,110	108,570	4/23/2014	75,000	1.45
10202237	3	11	311	101	33	WD	1966	78	1512	141	0.69	172,530	143,260	315,790	4/26/2014	337,000	0.94
10202802	3	23	323	101	30B	WD	1950	56	492	121	0.41	138,320	30,690	169,010	4/27/2014	235,000	0.72
10205273	1	3	103	101	33	WD	1950	79	1082	131	0.34	55,460	66,800	122,260	4/27/2014	150,000	0.82
10205654	1	3	103	101	30A	WD	1940	82	939	121	0.23	111,720	37,730	149,450	4/27/2014	156,000	0.96
10207152	1	6	106	101	30A	WD	1973	79	1412	141	0.24	92,550	87,620	180,170	4/27/2014	172,900	1.04
10208386	1	3	103	101	33	WD	1960	71	440	123	0.19	167,850	78,310	246,160	4/28/2014	450,000	0.55
10209991	1	3	103	101	33	WD	1945	64	1137	121	0.19	73,840	42,210	116,050	4/28/2014	144,000	0.81
10209682	1	3	103	101	33	WD	1949	70	1023	121	0.23	62,340	59,550	121,890	4/28/2014	124,000	0.98
10210773	1	3	103	101	30A	WD	1958	82	1400	131	0.29	81,020	90,260	171,280	4/28/2014	170,000	1.01
10211770	1	3	103	101	30A	WD	1977	81	1191	131	0.16	86,690	77,900	164,590	4/28/2014	155,000	1.06
10257221	1	7	107	101	30A	WD	1953	82	1136	131	0.46	96,380	72,630	169,010	5/1/2014	214,500	0.79
10258882	1	7	107	101	30A	WD	1950	60	1008	131	0.26	62,290	39,820	102,110	5/2/2014	128,900	0.79
10259432	1	7	107	101	30B	WD	1977	81	1019	131	0.24	85,720	54,630	140,350	5/3/2014	155,900	0.90
10259050	1	7	107	101	30A	WD	1976	83	1550	132	0.18	96,270	157,530	253,800	5/3/2014	195,000	1.30
10259821	1	7	107	101	30A	WD	2003	100	2751	142	0.16	183,170	218,800	401,970	5/4/2014	480,000	0.84
10260223	1	7	107	101	30A	WD	1963	78	1259	131	0.18	87,230	73,890	161,120	5/4/2014	166,000	0.97
10260670	1	7	107	101	30A	WD	1972	81	1162	131	0.17	57,630	64,130	121,760	5/5/2014	145,000	0.84
10260970	1	7	107	101	33	WD	1989	96	2273	152	0.18	207,810	436,800	644,610	5/5/2014	500,000	1.29
10271371	1	4	104	101	30B	WD	1972	83	1584	132	0.25	94,740	81,490	176,230	5/6/2014	165,000	1.07
10271971	1	4	104	101	33	WD	1966	82	1150	131	0.17	96,380	73,380	169,760	5/6/2014	140,000	1.21
10272360	1	4	104	101	30A	WD	1960	82	2068	131	6.74	107,730	136,200	243,930	5/7/2014	270,000	0.90
10277803	4	2	402	101	33	WD	1963	76	1380	121	0.24	122,140	47,720	169,860	5/7/2014	176,000	0.97
10278389	4	2	402	101	33	WD	1991	95	1556	131	0.16	71,620	117,640	189,260	5/7/2014	189,000	1.00
10276556	4	1	401	101	30B	WD	1960	82	2402	134	0.27	90,100	131,650	221,750	5/7/2014	220,000	1.01
10280522	4	1	401	101	30A	WD	1946	68	1008	131	0.16	86,820	77,470	164,290	5/10/2014	202,000	0.81
10279651	4	1	401	101	33	WD	1961	77	1344	121	0.13	51,950	95,940	147,890	5/10/2014	174,500	0.85
10283180	7	1	701	101	33	WD	1950	82	1757	133	0.19	106,020	146,400	252,420	5/11/2014	247,000	1.02
10313264	6	3	603	101	30A	WD	1930	65	1855	111	0.22	59,410	53,550	112,960	5/11/2014	104,500	1.08
10313396	6	3	603	101	30B	WD	1977	87	1398	131	0.44	78,050	92,910	170,960	5/11/2014	158,000	1.08
10281454	7	1	701	101	30A	WD	1984	93	2083	153	0.26	213,890	323,570	537,460	5/11/2014	485,970	1.11
10296855	7	1	701	101	33	WD	1961	82	1519	141	0.83	103,050	100,910	203,960	5/11/2014	180,500	1.13
10313051	6	3	603	101	30A	WD	1977	81	1768	231	0.18	63,940	105,980	169,920	5/11/2014	134,000	1.27
10315435	6	92	692	101	30A	WD	1950	75	1016	131	0.21	84,180	47,030	131,210	5/13/2014	152,500	0.86
10313899	6	93	693	101	30A	WD	1980	90	1396	143	0.24	134,260	169,650	303,910	5/13/2014	339,000	0.90
10314287	6	93	693	101	33	WD	1966	80	1755	131	0.23	78,050	96,890	174,940	5/13/2014	180,000	0.97

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10313726	6	93	693	101	30A	WD	1963	78	1008	131	0.20	82,570	80,900	163,470	5/13/2014	167,000	0.98
10314879	6	92	692	101	33	WD	1970	83	960	131	0.18	80,540	59,780	140,320	5/13/2014	140,000	1.00
10315701	6	92	692	101	30A	WD	1977	88	1690	141	0.19	174,120	197,830	371,950	5/14/2014	335,000	1.11
10316181	6	92	692	101	33	WD	1970	77	880	131	0.13	112,130	47,820	159,950	5/17/2014	154,000	1.04
10318862	6	2	602	101	30A	WD	1951	75	1246	121	0.23	83,760	47,170	130,930	5/18/2014	140,000	0.94
10316440	6	92	692	101	30A	WD	1974	86	1452	131	0.22	85,660	108,360	194,020	5/18/2014	189,900	1.02
10319617	6	2	602	101	30A	WD	1988	95	1440	141	0.49	121,950	82,080	204,030	5/18/2014	185,500	1.10
10316685	6	92	692	101	30A	WD	1963	78	1367	131	0.25	108,240	96,610	204,850	5/18/2014	182,000	1.13
10317403	6	92	692	101	30A	WD	1937	69	818	121	0.18	69,460	31,460	100,920	5/18/2014	82,350	1.23
10322920	6	2	602	101	30A	WD	1988	96	1735	141	0.17	139,450	185,310	324,760	5/19/2014	359,900	0.90
10321478	6	2	602	101	33	WD	1966	78	1744	131	0.33	181,170	154,700	335,870	5/19/2014	330,000	1.02
10320033	6	92	692	101	30A	WD	1974	86	1550	231	0.15	162,730	173,210	335,940	5/19/2014	312,500	1.08
10322531	6	92	692	101	30A	WD	1979	89	1041	131	0.23	91,830	77,580	169,410	5/19/2014	146,480	1.16
10322051	6	92	692	101	30A	WD	1964	79	816	131	0.15	56,110	72,810	128,920	5/19/2014	110,000	1.17
10324370	6	92	692	101	30A	WD	1991	98	1514	131	0.22	112,380	97,910	210,290	5/20/2014	187,500	1.12
10324002	6	92	692	101	33	WD	1965	77	1884	131	0.34	129,140	180,150	309,290	5/20/2014	241,500	1.28
10324775	6	92	692	101	30A	WD	1956	76	1568	131	0.22	133,660	89,120	222,780	5/21/2014	242,000	0.92
10325625	6	2	602	101	30A	WD	1978	81	1302	131	0.20	156,450	96,570	253,020	5/22/2014	242,000	1.05
10327123	6	2	602	101	30A	WD	1963	82	1192	132	0.22	83,040	53,090	136,130	5/24/2014	160,500	0.85
10325974	6	2	602	101	33	WD	1964	78	1014	131	0.27	85,660	63,400	149,060	5/24/2014	165,000	0.90
10326605	6	2	602	101	33	WD	1975	86	1651	131	0.19	87,230	114,520	201,750	5/24/2014	193,400	1.04
10329724	6	2	602	101	33	WD	1970	83	1334	141	0.12	155,250	140,620	295,870	5/25/2014	372,500	0.79
10330355	6	10	610	101	30A	WD	1990	97	2544	142	0.12	170,810	408,990	579,800	5/25/2014	559,000	1.04
10331337	6	10	610	101	30A	WD	1973	83	1897	131	0.11	96,270	135,590	231,860	5/26/2014	245,000	0.95
10333028	6	2	602	101	33	WD	1974	79	1056	131	0.45	85,660	63,600	149,260	5/26/2014	152,000	0.98
10331911	6	2	602	101	30A	WD	1970	83	2356	151	0.11	94,770	242,500	337,270	5/26/2014	285,000	1.18
10333638	6	92	692	101	30A	WD	1990	97	1496	131	0.22	103,410	108,570	211,980	5/26/2014	165,000	1.28
10334294	6	93	693	101	33	WD	1961	72	1308	131	0.37	125,930	121,800	247,730	5/27/2014	292,900	0.85
10335434	6	3	603	101	33	WD	1959	76	1934	142	0.22	145,580	112,460	258,040	5/27/2014	295,000	0.87
10335159	6	3	603	101	30A	WD	1961	77	1164	131	0.24	68,870	70,360	139,230	5/27/2014	157,000	0.89
10335240	6	3	603	101	30A	WD	1950	75	1372	131	0.23	85,660	64,390	150,050	5/27/2014	159,900	0.94
10334691	6	93	693	101	30A	WD	1965	77	1590	143	0.19	173,170	207,180	380,350	5/27/2014	360,000	1.06
10335775	6	3	603	101	30A	WD	1959	76	1310	131	0.21	110,290	63,870	174,160	5/27/2014	161,500	1.08
10336180	6	3	603	101	33	WD	1977	84	1503	141	0.48	90,770	141,620	232,390	5/27/2014	210,000	1.11
10337526	6	2	602	101	30A	WD	1984	90	1468	141	0.16	119,190	116,660	235,850	5/28/2014	218,000	1.08
10336887	6	2	602	101	30A	WD	1973	83	2096	143	0.19	112,370	160,450	272,820	5/28/2014	242,500	1.13
10339006	6	2	602	101	30A	WD	1963	61	1684	131	0.35	62,290	51,750	114,040	6/2/2014	169,900	0.67
10338553	6	10	610	101	30A	WD	1973	85	1651	141	0.12	73,460	111,960	185,420	6/2/2014	195,000	0.95
10340421	6	2	602	101	33	WD	1981	86	1152	131	0.20	114,670	59,510	174,180	6/2/2014	146,000	1.19

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10339535	6	2	602	101	30B	WD	1966	82	1258	131	0.22	96,270	97,110	193,380	6/2/2014	159,000	1.22
10342465	6	3	603	101	30A	WD	1978	89	1584	141	0.28	194,600	205,550	400,150	6/3/2014	420,000	0.95
10342821	6	3	603	101	30A	WD	1980	86	1188	131	0.25	121,950	63,640	185,590	6/4/2014	165,300	1.12
10342986	6	3	603	101	30B	WD	1965	82	1682	151	0.23	101,770	216,730	318,500	6/8/2014	250,000	1.27
10343160	6	3	603	101	30A	WD	1988	96	2540	142	0.21	187,830	292,640	480,470	6/9/2014	485,000	0.99
10343981	6	4	604	101	33	WD	1960	82	1118	131	0.24	105,050	65,780	170,830	6/9/2014	169,000	1.01
10345365	6	4	604	101	30B	WD	1989	95	2258	151	0.12	48,760	289,940	338,700	6/10/2014	405,000	0.84
10344506	6	3	603	101	30A	WD	1990	97	1861	152	0.23	96,270	228,810	325,080	6/10/2014	325,000	1.00
10348216	6	93	693	101	30A	WD	1978	81	1751	141	0.21	80,810	108,270	189,080	6/11/2014	269,000	0.70
10347455	6	3	603	101	30A	WD	1959	76	1008	131	0.23	134,650	63,940	198,590	6/11/2014	217,500	0.91
10349539	6	3	603	101	33	WD	1978	88	1526	131	0.37	87,230	101,310	188,540	6/11/2014	193,000	0.98
10346953	6	93	693	101	30A	WD	1972	83	1917	151	0.22	106,470	241,170	347,640	6/11/2014	285,000	1.22
10350265	6	3	603	101	30A	WD	1960	71	2158	142	0.24	167,960	241,280	409,240	6/14/2014	395,000	1.04
10351042	6	5	605	101	30B	WD	1987	94	1285	141	0.58	119,190	101,750	220,940	6/14/2014	203,450	1.09
10351107	6	5	605	101	30A	WD	1987	94	1876	131	0.33	90,020	156,900	246,920	6/15/2014	250,000	0.99
10351440	6	4	604	101	30A	WD	1980	82	1006	131	0.21	85,660	56,930	142,590	6/15/2014	143,000	1.00
10351951	6	3	603	101	30B	WD	1997	100	2100	131	0.27	102,270	121,320	223,590	6/15/2014	210,000	1.06
10352138	6	3	603	101	33	WD	1990	98	1024	131	0.36	82,060	97,840	179,900	6/15/2014	142,500	1.26
10352381	6	3	603	101	30A	WD	1977	81	1734	131	0.30	85,720	86,170	171,890	6/17/2014	176,000	0.98
10352632	6	3	603	101	33	WD	1977	64	1508	131	0.43	62,290	42,860	105,150	6/18/2014	147,000	0.72
10353035	6	4	604	101	30A	WD	1960	82	1590	131	0.24	101,020	127,510	228,530	6/20/2014	256,000	0.89
10353165	6	3	603	101	33	WD	1991	98	1916	141	0.34	84,100	210,100	294,200	6/21/2014	315,000	0.93
10354056	6	3	603	101	30B	WD	1990	97	1131	141	0.19	72,810	70,920	143,730	6/21/2014	152,500	0.94
10353408	6	5	605	101	30A	WD	1975	86	2108	152	0.23	90,880	189,890	280,770	6/21/2014	265,000	1.06
10354251	6	2	602	101	30	WD	1977	84	1433	133	0.26	110,920	116,770	227,690	6/22/2014	205,650	1.11
10354788	6	2	602	101	30A	WD	1968	77	1064	131	0.17	91,600	63,480	155,080	6/24/2014	156,900	0.99
10354391	6	2	602	101	30A	WD	1950	82	1804	131	0.26	98,380	83,960	182,340	6/24/2014	130,000	1.40
10358455	6	3	603	101	30B	WD	1978	88	1114	131	0.27	78,050	81,900	159,950	6/25/2014	175,000	0.91
10358261	6	3	603	101	33	WD	1979	85	1617	131	0.20	119,190	101,140	220,330	6/25/2014	231,200	0.95
10357998	6	3	603	101	33	WD	1978	89	1789	131	0.30	59,650	142,080	201,730	6/25/2014	197,840	1.02
10356529	6	4	604	101	30B	WD	1965	79	1164	131	0.20	80,800	93,970	174,770	6/25/2014	170,000	1.03
10357349	6	2	602	101	33	WD	1948	74	652	121	0.20	83,760	32,240	116,000	6/25/2014	107,300	1.08
10355911	6	3	603	101	30A	WD	1957	75	1412	131	0.25	62,340	128,130	190,470	6/25/2014	174,900	1.09
10356829	6	3	603	101	30B	WD	1962	82	1420	131	0.26	122,040	81,250	203,290	6/25/2014	170,000	1.20
10359931	6	4	604	101	30A	WD	1985	94	1860	142	0.55	181,780	243,240	425,020	6/28/2014	459,000	0.93
10360309	6	2	602	101	33	WD	1959	82	1156	131	0.24	114,670	50,970	165,640	6/28/2014	170,000	0.97
10361371	6	2	602	101	30B	WD	1968	83	1831	131	0.11	158,280	156,570	314,850	6/28/2014	310,000	1.02
10361743	6	2	602	101	33	WD	1988	95	1996	151	0.16	114,610	222,650	337,260	6/28/2014	305,000	1.11
10366661	6	3	603	101	33	WD	1930	65	924	131	0.08	70,560	37,130	107,690	6/29/2014	134,900	0.80

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10365818	6	3	603	101	33	WD	1930	65	936	121	0.21	83,760	40,160	123,920	6/29/2014	132,000	0.94
10364271	6	2	602	101	30A	BS	1973	83	1987	141	0.16	96,270	157,460	253,730	6/29/2014	268,000	0.95
10367090	6	2	602	101	30A	WD	1978	84	1984	141	0.16	119,190	129,970	249,160	6/29/2014	245,000	1.02
10362781	6	2	602	101	30A	WD	2014	100	1704	131	0.16	59,080	119,350	178,430	6/29/2014	158,900	1.12
10367286	6	2	602	101	30A	WD	1975	80	1360	121	0.17	78,670	65,660	144,330	6/30/2014	175,200	0.82
10367634	6	2	602	101	30A	WD	1987	94	1780	131	0.16	96,270	143,940	240,210	6/30/2014	230,000	1.04
10367983	6	2	602	101	33	WD	1954	76	1954	141	0.16	138,740	111,680	250,420	7/2/2014	308,500	0.81
10373423	5	12	512	101	30A	WD	1977	88	1868	131	0.11	66,130	147,410	213,540	7/2/2014	200,000	1.07
10375741	6	2	602	101	31	WD	1961	82	3242	143	0.14	175,220	258,380	433,600	7/6/2014	609,000	0.71
10374111	5	2	502	101	30A	WD	1972	84	2260	131	0.11	85,570	142,180	227,750	7/6/2014	255,000	0.89
10374916	5	2	502	101	30A	BS	1967	82	1631	131	0.14	102,520	113,600	216,120	7/6/2014	229,900	0.94
10374576	5	2	502	101	30A	WD	1974	83	1152	131	0.11	114,670	50,570	165,240	7/6/2014	160,000	1.03
10376585	6	2	602	101	33	WD	1978	88	1602	131	0.15	87,230	109,100	196,330	7/6/2014	185,500	1.06
10376869	6	2	602	101	30A	WD	1980	82	1404	131	0.15	110,050	69,180	179,230	7/7/2014	194,000	0.92
10377087	6	2	602	101	30A	WD	1997	100	1180	141	0.19	107,190	143,010	250,200	7/7/2014	208,000	1.20
10379591	5	2	502	101	33	WD	1979	83	1248	131	0.14	60,900	66,820	127,720	7/8/2014	174,900	0.73
10381396	5	1	501	101	30A	WD	1989	97	2107	142	0.23	98,480	139,760	238,240	7/8/2014	230,000	1.04
10380195	5	2	502	101	33	WD	1976	83	1644	131	0.11	102,520	153,010	255,530	7/8/2014	242,900	1.05
10380411	5	2	502	101	33	WD	1979	85	3396	142	0.12	134,730	199,270	334,000	7/8/2014	290,000	1.15
10383176	5	1	501	101	33	WD	1965	80	1640	141	0.21	122,150	132,200	254,350	7/9/2014	244,000	1.04
10382950	5	1	501	101	33	WD	1966	78	1529	234	0.19	291,450	392,720	684,170	7/9/2014	581,000	1.18
10383508	5	1	501	101	33	WD	1955	76	1622	132	0.28	85,660	81,940	167,600	7/12/2014	167,500	1.00
10383630	5	1	501	101	30A	WD	1966	78	2846	143	0.18	148,030	327,980	476,010	7/13/2014	557,500	0.85
10386781	5	12	512	101	30A	WD	2001	100	1680	132	0.18	65,000	108,110	173,110	7/13/2014	192,500	0.90
10384140	5	1	501	101	30A	WD	1968	77	1212	131	0.15	90,020	64,140	154,160	7/13/2014	167,900	0.92
10387641	5	2	502	101	30A	WD	1968	77	2432	232	0.07	94,940	92,430	187,370	7/14/2014	230,000	0.81
10389318	5	12	512	101	30A	WD	1960	61	1467	131	0.27	67,210	49,160	116,370	7/15/2014	156,200	0.75
10391959	5	2	502	101	33	WD	1978	64	1056	131	0.11	59,330	44,560	103,890	7/15/2014	137,000	0.76
10390085	5	2	502	101	30A	WD	1940	70	800	131	0.12	65,710	42,290	108,000	7/15/2014	121,000	0.89
10393552	5	2	502	101	30A	WD	1972	62	1152	131	0.11	62,290	43,190	105,480	7/16/2014	149,950	0.70
10394242	5	2	502	101	30A	WD	1961	76	1566	131	0.15	110,630	69,450	180,080	7/16/2014	195,000	0.92
10393422	5	2	502	101	30A	BS	1963	78	1414	131	0.05	126,150	117,670	243,820	7/16/2014	260,000	0.94
10393976	5	2	502	101	30A	WD	1974	83	1715	131	0.15	119,190	116,780	235,970	7/16/2014	238,000	0.99
10394137	5	2	502	101	30A	WD	1961	82	1317	141	0.16	96,680	95,090	191,770	7/16/2014	192,000	1.00
10394607	5	2	502	101	30B	WD	1986	95	1820	141	0.13	108,740	164,530	273,270	7/16/2014	255,000	1.07
10394891	5	2	502	101	33	WD	1940	82	2053	231	0.20	111,720	104,440	216,160	7/19/2014	223,000	0.97
10395140	5	2	502	101	30A	WD	1976	87	1276	131	0.14	58,520	102,730	161,250	7/20/2014	151,900	1.06
10396403	5	2	502	101	30A	WD	1950	75	1075	131	0.11	84,180	64,850	149,030	7/21/2014	175,000	0.85
10396690	5	1	501	101	30A	WD	1980	86	1272	141	0.15	119,190	100,260	219,450	7/21/2014	215,000	1.02

Acct #	Maint Area	Study Area	NH	Prop Cl	Cond Code	Deed Type	Yr Blt	% Good	Imp Sq Ft	Stat	Acres	Land Value	Imp Value	Total Prior Year Roll Value	Sale Date	Sale Price	Ratio
10395944	5	2	502	101	30A	WD	1957	82	1856	141	0.12	118,050	115,700	233,750	7/21/2014	227,500	1.03
10397953	5	2	502	101	30A	WD	1984	93	1387	141	0.17	51,250	148,230	199,480	7/21/2014	185,000	1.08
10398309	5	2	502	101	30A	WD	1965	80	1975	131	0.15	73,460	122,560	196,020	7/22/2014	245,000	0.80
10398196	5	2	502	101	30B	WD	2003	100	2090	142	0.23	117,620	246,900	364,520	7/22/2014	410,000	0.89
10398925	5	2	502	101	33	WD	1964	79	1435	141	0.15	86,770	89,920	176,690	7/23/2014	198,000	0.89
10399020	5	2	502	101	30A	WD	1978	84	1984	142	0.23	125,060	161,420	286,480	7/23/2014	305,000	0.94
10399313	5	2	502	101	30A	WD	1946	68	676	121	0.14	51,950	38,640	90,590	7/26/2014	108,000	0.84
10399689	5	2	502	101	30A	WD	1930	65	1288	131	0.17	91,570	60,040	151,610	7/26/2014	163,500	0.93
10399913	5	2	502	101	33	WD	1989	96	1952	141	0.12	119,190	145,040	264,230	7/26/2014	275,000	0.96
10399816	5	2	502	101	30B	WD	1980	90	1148	131	0.13	51,250	126,850	178,100	7/26/2014	145,000	1.23
10400183	5	2	502	101	30A	WD	1976	87	2444	143	0.18	167,010	388,680	555,690	7/27/2014	527,500	1.05
10400339	5	2	502	101	30A	WD	1989	97	1678	141	0.16	129,450	151,600	281,050	7/27/2014	260,000	1.08
10400639	5	2	502	101	30A	WD	1985	94	1831	142	0.15	160,670	308,030	468,700	7/28/2014	707,000	0.66
10401392	5	2	502	101	30A	WD	1962	76	950	131	0.13	82,630	53,760	136,390	7/28/2014	132,900	1.03
10400881	5	2	502	101	30A	WD	2014	100	5357	154	0.16	112,370	204,130	316,500	7/28/2014	220,000	1.44
10402826	5	2	502	101	30A	BS	1960	82	1362	131	0.11	98,380	64,860	163,240	7/29/2014	187,500	0.87
10402283	5	2	502	101	30A	WD	1949	82	1152	121	0.15	83,040	41,720	124,760	7/29/2014	110,000	1.13
10403723	5	2	502	101	30A	WD	1930	65	864	121	0.11	92,550	37,170	129,720	7/30/2014	145,000	0.89
10404795	5	2	502	101	33	WD	1972	78	1632	141	0.18	90,543	150,440	240,980	8/2/2014	375,000	0.64
10405416	5	2	502	101	30A	BS	1971	81	2072	131	0.15	261,350	108,700	370,050	8/2/2014	325,000	1.14
10405629	5	2	502	101	33	WD	1976	83	1400	131	0.15	119,190	99,400	218,590	8/4/2014	201,000	1.09
10406153	5	2	502	101	30A	WD	1979	85	1712	141	0.14	122,320	142,440	264,760	8/5/2014	278,000	0.95
10406877	5	2	502	101	33	WD	1987	94	1310	131	0.14	121,950	68,130	190,080	8/5/2014	197,500	0.96
10410286	5	2	502	101	30A	WD	1969	77	1196	131	0.12	85,720	61,470	147,190	8/6/2014	167,000	0.88
10412821	5	2	502	101	30A	WD	1984	90	1790	131	0.13	96,710	109,320	206,030	8/6/2014	227,500	0.91
10412205	5	2	502	101	30A	WD	1968	77	1568	231	0.15	69,420	81,600	151,020	8/6/2014	158,000	0.96
10413054	5	2	502	101	33	WD	1988	96	1890	141	0.11	211,170	205,520	416,690	8/6/2014	421,000	0.99
10411649	5	2	502	101	30A	WD	1940	70	2006	121	0.16	80,990	78,840	159,830	8/6/2014	154,900	1.03
10408367	5	2	502	101	30A	WD	1962	82	1792	141	0.17	97,270	136,960	234,230	8/6/2014	220,000	1.06
10413999	5	2	502	101	30A	WD	1986	87	1939	131	0.24	100,190	135,710	235,900	8/9/2014	230,000	1.03
10414814	5	2	502	101	30A	WD	1970	83	1470	121	0.07	81,140	94,810	175,950	8/10/2014	245,000	0.72
10415957	5	2	502	101	30A	WD	1948	82	1295	122	0.15	79,270	56,750	136,020	8/10/2014	173,630	0.78
10416604	5	2	502	101	30A	WD	1977	88	1144	131	0.19	68,600	98,700	167,300	8/11/2014	175,000	0.96
10416961	5	2	502	101	33	WD	1983	88	1606	131	0.15	96,270	136,070	232,340	8/11/2014	217,500	1.07
10420093	5	1	501	101	30A	WD	1982	69	1040	131	0.16	62,290	44,310	106,600	8/12/2014	155,900	0.68
10419212	5	1	501	101	33	WD	1955	82	2528	132	0.16	98,220	129,060	227,280	8/12/2014	292,000	0.78
10419115	5	1	501	101	30A	WD	1962	78	2706	141	0.15	104,910	137,650	242,560	8/12/2014	278,500	0.87
10417943	5	2	502	101	30A	WD	1960	61	1924	131	0.18	35,680	115,350	151,030	8/12/2014	168,600	0.90
10420580	5	1	501	101	33	WD	1981	86	1604	131	0.19	126,930	94,350	221,280	8/12/2014	236,000	0.94

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10418450	5	1	501	101	30A	WD	1999	100	2440	162	0.35	305,900	334,190	640,090	8/12/2014	675,000	0.95
10420871	5	2	502	101	33	WD	1990	98	1272	131	0.19	71,050	125,600	196,650	8/12/2014	199,000	0.99
10421721	5	2	502	101	33	WD	1963	78	2090	131	0.19	78,050	90,120	168,170	8/13/2014	188,000	0.89
10423149	6	2	602	101	30A	WD	1945	82	1382	121	0.26	98,380	36,280	134,660	8/16/2014	169,000	0.80
10421837	5	1	501	101	33	WD	1957	75	836	131	0.20	41,560	82,090	123,650	8/16/2014	147,900	0.84
10424111	6	3	603	101	30A	WD	1973	79	1365	131	1.20	91,600	80,450	172,050	8/16/2014	184,000	0.94
10426365	6	3	603	101	30A	WD	1990	95	1200	131	0.48	85,720	86,690	172,410	8/16/2014	175,000	0.99
10429750	5	7	507	101	33	WD	1955	82	2256	143	0.70	90,770	153,550	244,320	8/17/2014	300,000	0.81
10430104	5	7	507	101	30A	WD	1950	82	955	131	0.36	109,750	65,860	175,610	8/17/2014	159,000	1.10
10431768	5	7	507	101	30A	WD	1959	82	1404	131	0.29	96,380	82,030	178,410	8/18/2014	199,400	0.89
10431508	5	7	507	101	30A	WD	2001	100	1444	131	0.23	59,980	156,100	216,080	8/18/2014	220,000	0.98
10432247	5	7	507	101	30A	WD	1982	92	1311	131	0.34	90,250	103,960	194,210	8/18/2014	192,000	1.01
10433574	5	7	507	101	33	WD	2000	100	3825	142	0.40	152,950	249,860	402,810	8/19/2014	539,000	0.75
10434554	5	7	507	101	30A	WD	1966	80	2170	133	0.60	79,000	157,090	236,090	8/19/2014	244,000	0.97
10435486	5	7	507	101	30A	WD	1988	95	2438	152	1.02	96,270	325,260	421,530	8/19/2014	420,000	1.00
10436474	5	7	507	101	30A	WD	1980	86	1364	131	0.35	121,950	65,380	187,330	8/23/2014	181,000	1.03
10438661	5	7	507	101	33	WD	1957	82	1252	131	0.38	94,040	73,140	167,180	8/24/2014	160,000	1.04
10437032	5	7	507	101	30A	WD	1969	83	1004	131	0.29	121,950	46,360	168,310	8/24/2014	150,000	1.12
10439579	5	7	507	101	30A	WD	1977	84	1370	141	0.25	89,270	128,240	217,510	8/24/2014	193,000	1.13
10443983	5	1	501	101	33	WD	1953	76	948	131	0.28	76,400	56,660	133,060	8/25/2014	155,000	0.86
10443462	5	7	507	101	30A	WD	1960	71	1026	131	0.51	134,470	99,410	233,880	8/25/2014	250,000	0.94
10448868	5	7	507	101	33	WD	1978	64	1152	131	0.50	67,210	45,850	113,060	8/26/2014	162,500	0.70
10449159	5	7	507	101	30A	WD	1977	84	1413	131	0.29	112,850	61,170	174,020	8/26/2014	214,900	0.81
10449726	5	7	507	101	30A	WD	1962	76	1088	131	0.27	85,720	59,600	145,320	8/26/2014	168,000	0.87
10452601	5	1	501	101	30A	WD	1980	86	1188	131	0.14	121,950	55,540	177,490	8/26/2014	193,500	0.92
10455209	5	7	507	101	33	WD	1972	78	1920	231	0.37	85,610	79,270	164,880	8/27/2014	180,000	0.92
10486508	5	1	501	101	30A	WD	1989	96	1902	131	0.16	119,190	117,380	236,570	8/27/2014	240,000	0.99
10474480	5	4	504	101	30A	WD	1977	84	1843	131	1.00	96,270	161,750	258,020	8/27/2014	243,000	1.06
10454156	5	7	507	101	30A	WD	1999	100	2281	152	1.05	134,470	417,250	551,720	8/27/2014	462,998	1.19
10487853	5	1	501	101	30A	WD	1968	77	1222	131	0.16	84,180	69,540	153,720	8/30/2014	176,500	0.87
10488980	5	1	501	101	30A	WD	1972	81	1100	141	0.18	60,900	80,140	141,040	8/31/2014	157,500	0.90
10489481	5	1	501	101	30A	WD	1988	80	1548	131	0.50	41,880	158,290	200,170	8/31/2014	170,850	1.17
10490136	5	1	501	101	30A	WD	1990	97	2478	151	0.20	152,910	314,280	467,190	9/2/2014	443,000	1.05
10490004	5	1	501	101	33	WD	1979	82	1490	141	0.15	157,480	94,150	251,630	9/2/2014	214,000	1.18
10490451	5	1	501	101	30A	WD	1953	72	1676	121	0.11	111,300	89,510	200,810	9/3/2014	242,000	0.83
10490777	5	1	501	101	33	WD	1964	76	1260	131	0.39	159,370	92,800	252,170	9/4/2014	249,000	1.01
10492228	5	12	512	101	33	WD	2001	100	2141	141	0.13	122,040	158,820	280,860	9/7/2014	325,500	0.86
10493036	5	1	501	101	30A	WD	1995	100	1224	131	0.18	49,090	135,600	184,690	9/10/2014	208,000	0.89
10494245	5	1	501	101	33	WD	1958	82	1552	131	0.16	111,380	92,000	203,380	9/13/2014	269,000	0.76

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10501466	5	7	507	101	30B	WD	1957	76	1223	131	1.00	67,560	66,720	134,280	9/13/2014	150,000	0.90
10505208	6	6	606	101	30B	WD	1991	98	2090	142	0.81	70,970	196,140	267,110	9/13/2014	290,000	0.92
10493758	5	1	501	101	30A	WD	1975	87	1228	131	0.28	86,530	180,140	266,670	9/13/2014	232,050	1.15
10505701	6	3	603	101	30A	WD	1930	65	925	121	0.46	67,560	30,740	98,300	9/14/2014	123,000	0.80
10535730	1	5	105	101	30A	WD	1976	83	2408	142	0.34	90,770	166,020	256,790	9/14/2014	305,000	0.84
10505997	6	3	603	101	33	WD	1976	80	1420	131	0.36	90,700	71,730	162,430	9/14/2014	173,000	0.94
10506253	6	3	603	101	33	WD	1950	75	1472	132	0.75	92,550	76,790	169,340	9/14/2014	179,900	0.94
10549048	1	7	107	101	30A	WD	1945	72	1015	131	0.18	80,990	53,410	134,400	9/15/2014	139,000	0.97
10551875	7	1	701	101	33	WD	1977	84	1708	131	0.20	114,770	161,420	276,190	9/15/2014	250,000	1.10
10556143	6	3	603	101	33	WD	1940	70	1248	121	0.25	82,630	49,800	132,430	9/16/2014	160,000	0.83
10557026	6	3	603	101	33	WD	1985	92	2902	141	0.17	111,720	185,480	297,200	9/16/2014	315,000	0.94
10554621	3	23	323	101	33	WD	1975	83	1683	142	0.21	102,380	118,090	220,470	9/16/2014	210,000	1.05
10552458	7	1	701	101	30A	WD	1960	71	1928	143	0.16	195,040	188,950	383,990	9/16/2014	351,000	1.09
10555064	3	23	323	101	33	WD	2014	100	1308	131	0.21	94,870	76,210	171,080	9/16/2014	138,900	1.23
10557431	5	1	501	101	30A	WD	1972	83	2524	232	0.20	85,770	125,630	211,400	9/17/2014	247,000	0.86
10558949	2	7	207	101	33	WD	1955	82	1624	141	0.19	263,650	101,560	365,210	9/17/2014	400,000	0.91
10563369	5	1	501	101	33	WD	1950	82	1270	131	0.24	114,300	52,580	166,880	9/20/2014	160,000	1.04
10563669	6	2	602	101	33	WD	1940	70	1464	113	0.28	78,670	55,940	134,610	9/21/2014	155,000	0.87
10564973	2	7	207	101	30A	WD	1948	74	1032	132	0.20	90,700	47,220	137,920	9/22/2014	149,900	0.92
10566228	1	7	107	101	33	WD	1930	65	1296	131	0.16	85,660	53,140	138,800	9/22/2014	148,900	0.93
10568675	7	1	701	101	30A	WD	1989	96	1444	131	0.19	111,450	93,980	205,430	9/22/2014	156,000	1.32
10568886	7	1	701	101	30A	WD	1972	83	1200	131	0.20	121,950	55,840	177,790	9/23/2014	175,000	1.02
10570421	6	93	693	101	33	WD	2002	74	2997	141	0.18	148,030	329,180	477,210	9/24/2014	585,000	0.82
10570713	6	93	693	101	30A	WD	1992	97	1080	131	0.20	56,670	84,430	141,100	9/24/2014	164,950	0.86
10572602	1	3	103	101	30A	WD	1977	84	2507	151	0.44	89,270	277,730	367,000	9/24/2014	333,500	1.10
10572757	5	1	501	101	33	WD	1979	85	1554	141	0.11	119,190	109,030	228,220	9/24/2014	205,000	1.11
10573640	5	1	501	101	30A	WD	1948	82	840	121	0.33	91,540	37,470	129,010	9/28/2014	144,500	0.89
10577895	6	3	603	101	30A	WD	1950	75	1500	122	0.31	111,750	47,410	159,160	9/28/2014	168,000	0.95
10576418	6	3	603	101	30A	WD	1930	65	953	121	0.26	85,660	40,560	126,220	9/28/2014	132,000	0.96
10580206	6	3	603	101	30B	WD	1950	82	1476	132	0.23	101,380	66,040	167,420	9/29/2014	215,000	0.78
10581560	6	3	603	101	30A	WD	1986	76	1012	131	0.35	67,210	56,460	123,670	9/29/2014	157,900	0.78
10578832	2	7	207	101	30A	WD	1968	77	1936	133	0.20	121,190	227,120	348,310	9/29/2014	390,000	0.89
10579336	5	1	501	101	30A	WD	1965	82	2436	131	0.21	115,310	165,330	280,640	9/29/2014	305,000	0.92
10579115	5	1	501	101	30A	WD	1981	91	1184	131	0.15	172,990	138,890	311,880	9/29/2014	254,500	1.23
10583041	6	3	603	101	30A	WD	1998	100	1612	131	0.46	81,420	124,970	206,390	9/30/2014	199,900	1.03
10583643	5	1	501	101	33	WD	1959	82	1032	131	0.16	110,660	47,570	158,230	10/1/2014	160,000	0.99
10584062	6	2	602	101	30A	WD	1992	98	1852	142	0.14	148,280	301,330	449,610	10/4/2014	450,000	1.00
10591565	2	7	207	101	30A	WD	1935	68	884	111	0.19	17,700	29,000	46,700	10/7/2014	70,000	0.67
10589371	5	2	502	101	30A	WD	1927	75	1064	132	0.12	91,020	67,250	158,270	10/7/2014	197,000	0.80

Acct #	Maint Area	Study Area	NH	Prop Cl	Cond Code	Deed Type	Yr Blt	% Good	Imp Sq Ft	Stat	Acres	Land Value	Imp Value	Total Prior Year Roll Value	Sale Date	Sale Price	Ratio
10594408	7	2	702	101	30A	WD	1946	73	997	121	0.10	82,010	43,730	125,740	10/7/2014	130,000	0.97
10586235	5	1	501	101	30A	WD	1955	79	1711	132	0.35	93,670	70,770	164,440	10/7/2014	162,000	1.02
10594262	7	2	702	101	30A	WD	1989	96	1008	131	0.08	103,410	76,080	179,490	10/7/2014	169,000	1.06
10594871	5	1	501	101	30A	WD	1972	84	1380	133	0.17	176,200	134,230	310,430	10/8/2014	330,000	0.94
10595631	6	93	693	101	30A	WD	1986	95	2661	152	0.23	108,740	271,880	380,620	10/8/2014	376,000	1.01
10595399	6	93	693	101	33	WD	1946	73	1160	122	0.23	83,760	47,070	130,830	10/8/2014	121,000	1.08
10595737	6	93	693	101	30A	WD	1985	94	1129	122	0.24	115,260	86,300	201,560	10/11/2014	305,000	0.66
10595981	6	93	693	101	33	WD	1980	90	1008	131	0.23	64,940	61,690	126,630	10/11/2014	136,000	0.93
10596222	6	93	693	101	30A	WD	1964	78	2046	131	0.23	47,110	132,350	179,460	10/12/2014	195,000	0.92
10596466	6	93	693	101	30A	WD	1963	82	1240	131	0.23	114,670	53,210	167,880	10/13/2014	195,000	0.86
10597318	6	93	693	101	30A	WD	1940	70	832	121	0.25	87,930	33,890	121,820	10/13/2014	132,000	0.92
10600181	5	1	501	101	33	WD	1977	84	1208	131	0.42	101,380	79,540	180,920	10/13/2014	187,000	0.97
10601703	2	3	203	101	33	WD	1945	82	1062	131	0.18	104,380	71,270	175,650	10/14/2014	204,500	0.86
10601957	3	23	323	101	30A	WD	1988	95	1440	131	0.17	96,040	93,250	189,290	10/14/2014	185,000	1.02
10608567	4	5	405	101	30A	WD	1969	81	3900	144	0.17	177,390	792,330	969,720	10/15/2014	1,150,000	0.84
10610656	5	2	502	101	30A	WD	1952	82	1298	121	0.16	88,040	64,800	152,840	10/15/2014	172,000	0.89
10613939	3	23	323	101	30A	WD	1948	74	1045	121	0.23	111,450	46,030	157,480	10/15/2014	160,000	0.98
10614343	3	23	323	101	30A	WD	2003	100	3558	131	0.20	98,960	218,360	317,320	10/15/2014	285,000	1.11
10615654	3	23	323	101	30A	WD	1990	97	3736	143	0.20	299,230	402,550	701,780	10/18/2014	950,000	0.74
10615816	3	23	323	101	30A	WD	1945	72	1180	132	0.16	69,460	54,400	123,860	10/19/2014	150,000	0.83
10616481	5	1	501	101	30A	WD	1966	80	1144	131	0.18	87,230	73,090	160,320	10/20/2014	179,000	0.90
10621891	4	2	402	101	33	WD	1965	76	1411	131	0.14	135,470	83,200	218,670	10/21/2014	289,900	0.75
10617365	6	93	693	101	33	WD	1950	82	840	121	0.23	98,380	38,960	137,340	10/21/2014	177,500	0.77
10616799	5	1	501	101	33	WD	1988	94	1092	131	0.19	42,740	92,750	135,490	10/21/2014	147,900	0.92
10617868	6	93	693	101	33	WD	1971	78	1920	231	0.20	85,610	77,300	162,910	10/21/2014	172,950	0.94
10626508	6	4	604	101	33	WD	1930	65	816	131	0.12	74,510	41,230	115,740	10/25/2014	113,500	1.02
10624831	6	2	602	101	30A	WD	1985	94	3586	143	0.19	171,880	438,170	610,050	10/25/2014	465,000	1.31
10628398	1	7	107	101	30A	WD	1940	70	792	121	0.15	85,660	36,590	122,250	10/26/2014	144,000	0.85
10627628	4	6	406	101	30A	WD	1967	79	1205	131	0.12	178,500	138,280	316,780	10/26/2014	310,000	1.02
10630922	4	11	411	101	33	WD	1960	76	1124	121	0.31	69,420	55,730	125,150	10/27/2014	160,000	0.78
10633409	7	1	701	101	33	WD	1987	95	1104	131	0.19	51,250	105,070	156,320	10/27/2014	176,000	0.89
10632112	1	9	109	101	30A	WD	1965	76	1149	131	0.19	92,550	62,960	155,510	10/27/2014	167,000	0.93
10630012	4	11	411	101	30A	WD	1949	82	1548	131	0.32	96,710	90,130	186,840	10/27/2014	200,000	0.93
10643178	6	92	692	101	30A	WD	1989	96	1520	131	0.21	121,950	73,230	195,180	10/28/2014	219,000	0.89
10634529	6	2	602	101	30A	WD	1975	86	2112	133	0.38	47,210	127,120	174,330	10/28/2014	194,900	0.89
10642571	4	2	402	101	33	WD	1965	76	1452	131	0.20	114,070	82,070	196,140	10/28/2014	180,000	1.09
10637494	6	3	603	101	30A	WD	1946	68	1012	121	0.35	107,530	40,410	147,940	10/28/2014	131,000	1.13
10638677	4	8	408	101	30A	WD	1946	68	1032	121	0.16	105,060	61,580	166,640	10/28/2014	119,500	1.39
10645080	2	3	203	101	30A	WD	1989	96	1759	131	0.11	119,190	111,000	230,190	10/29/2014	271,000	0.85

Acct #	Maint Area	Study Area	NH	Prop Cl	Cond Code	Deed Type	Yr Blt	% Good	Imp Sq Ft	Stat	Acres	Land Value	Imp Value	Total Prior Year Roll Value	Sale Date	Sale Price	Ratio
10649636	6	92	692	101	30A	WD	1976	80	2216	231	0.23	80,990	92,160	173,150	11/1/2014	231,350	0.75
10647852	1	7	107	101	30A	WD	1960	75	1830	122	0.18	72,910	103,000	175,910	11/1/2014	225,000	0.78
10650224	6	92	692	101	30A	WD	1995	100	1731	131	0.23	98,380	111,780	210,160	11/1/2014	230,000	0.91
10645543	6	2	602	101	30A	WD	1990	97	2504	142	0.02	139,810	365,750	505,560	11/1/2014	450,000	1.12
10648824	1	7	107	101	30A	WD	1952	82	1150	131	0.22	113,160	66,990	180,150	11/1/2014	159,000	1.13
10653205	6	93	693	101	33	WD	1962	74	2224	122	0.20	200,880	146,540	347,420	11/2/2014	435,000	0.80
10657047	4	7	407	101	33	WD	1988	96	2320	153	0.14	227,760	410,020	637,780	11/2/2014	580,000	1.10
10657241	4	7	407	101	33	WD	1990	97	1597	141	0.15	111,720	119,550	231,270	11/3/2014	214,900	1.08
10658163	4	5	405	101	30A	WD	1941	71	896	131	0.22	64,790	41,590	106,380	11/4/2014	90,000	1.18
10658520	4	5	405	101	33	WD	1974	81	1144	131	0.19	57,630	62,210	119,840	11/5/2014	149,000	0.80
10658950	4	5	405	101	33	WD	1968	81	2400	133	0.16	69,050	136,010	205,060	11/5/2014	217,000	0.94
10665111	6	93	693	101	30A	WD	1970	83	1689	132	0.24	47,330	130,180	177,510	11/6/2014	153,000	1.16
10671976	6	92	692	101	30A	WD	1949	82	882	231	0.15	85,770	45,520	131,290	11/8/2014	160,000	0.82
10672656	6	93	693	101	33	WD	1958	75	1248	121	0.20	127,350	88,720	216,070	11/9/2014	295,000	0.73
10675602	1	3	103	101	33	WD	1969	83	2242	144	0.09	140,380	166,560	306,940	11/9/2014	393,900	0.78
10675457	1	3	103	101	30A	WD	1960	80	896	121	0.11	59,380	40,720	100,100	11/9/2014	128,000	0.78
10676704	6	2	602	101	30A	WD	1950	70	690	121	0.29	49,320	42,440	91,760	11/10/2014	119,000	0.77
10676958	6	92	692	101	33	WD	1960	82	1604	121	0.19	71,510	70,620	142,130	11/10/2014	175,000	0.81
10686311	6	92	692	101	30A	WD	1956	65	1234	131	0.21	134,470	98,790	233,260	11/11/2014	295,000	0.79
10684042	1	4	104	101	30A	WD	1980	82	1876	141	0.23	164,630	171,740	336,370	11/11/2014	367,500	0.92
10686741	6	92	692	101	30A	WD	1973	85	1592	131	0.21	49,320	122,870	172,190	11/12/2014	173,400	0.99
10691342	3	23	323	101	30A	WD	1950	75	1745	122	0.19	93,500	59,940	153,440	11/16/2014	177,855	0.86
10690758	6	3	603	101	30A	WD	1969	83	1631	131	0.23	114,670	67,130	181,800	11/16/2014	205,000	0.89
10692039	6	93	693	101	33	WD	1999	100	2456	142	0.18	114,770	240,700	355,470	11/16/2014	379,900	0.94
10692949	1	4	104	101	30A	WD	1975	83	1752	141	0.39	119,190	119,460	238,650	11/17/2014	273,000	0.87
10698958	2	2	202	101	30B	WD	1940	70	888	121	0.15	64,790	40,710	105,500	11/18/2014	115,000	0.92
10701033	6	3	603	101	30A	WD	1940	70	1280	132	0.19	69,460	54,440	123,900	11/19/2014	169,900	0.73
10703288	4	11	411	101	30A	WD	1978	81	1728	232	0.24	57,980	110,130	168,110	11/19/2014	202,000	0.83
10704411	5	6	506	101	33	WD	1978	84	1920	132	1.10	96,420	119,400	215,820	11/19/2014	239,000	0.90
10710202	6	93	693	101	33	WD	1985	92	1688	141	0.18	119,190	129,910	249,100	11/19/2014	265,500	0.94
10709314	6	2	602	101	30A	WD	1980	90	1658	141	0.19	49,090	168,810	217,900	11/19/2014	232,200	0.94
10702859	4	11	411	101	30A	WD	1971	83	2732	141	0.23	111,220	235,500	346,720	11/19/2014	365,655	0.95
10711225	5	1	501	101	30A	WD	1979	65	850	131	0.20	59,330	34,480	93,810	11/22/2014	134,400	0.70
10710860	5	1	501	101	30A	WD	1973	85	2032	131	0.20	73,460	115,240	188,700	11/22/2014	214,900	0.88
10711012	5	1	501	101	30A	WD	1982	92	1048	131	0.14	84,440	104,040	188,480	11/22/2014	155,000	1.22
10718768	1	4	104	101	30A	WD	1972	78	1226	141	0.25	94,390	76,900	171,290	11/23/2014	213,000	0.80
10720133	4	15	415	101	33	WD	1930	65	1021	121	0.11	67,560	37,360	104,920	11/23/2014	120,000	0.87
10713160	2	10	210	101	33	WD	1965	80	1242	131	0.19	51,950	115,070	167,020	11/23/2014	165,000	1.01
10719901	4	15	415	101	33	WD	1968	77	768	121	0.14	84,180	40,650	124,830	11/23/2014	100,000	1.25

Acct #	Maint Area	Study Area	NH	Prop Cl	Cond Code	Deed Type	Yr Blt	% Good	Imp Sq Ft	Stat	Acres	Land Value	Imp Value	Total Prior Year Roll Value	Sale Date	Sale Price	Ratio
10720952	2	5	205	101	30A	WD	1973	85	1629	131	0.16	91,830	105,850	197,680	11/24/2014	218,000	0.91
10721683	6	3	603	101	30A	BS	1950	70	1025	131	0.24	92,740	69,440	162,180	11/27/2014	227,000	0.71
10722882	4	1	401	101	33	WD	1979	89	2224	232	0.15	58,950	182,320	241,270	11/27/2014	220,000	1.10
10723343	6	93	693	101	30A	WD	1930	58	536	121	0.18	42,740	31,560	74,300	11/29/2014	100,000	0.74
10725423	2	13	213	101	33	WD	1957	76	1132	131	0.40	84,180	64,030	148,210	11/29/2014	169,950	0.87
10726495	6	92	692	101	30A	WD	1978	84	1296	131	0.17	119,190	75,340	194,530	11/29/2014	207,800	0.94
10729776	6	3	603	101	30A	WD	1988	95	1733	141	0.24	110,200	159,110	269,310	11/29/2014	209,176	1.29
10731516	2	13	213	101	30A	WD	1968	83	1536	131	0.22	114,670	64,440	179,110	11/30/2014	218,000	0.82
10735186	2	8	208	101	33	WD	1978	89	1333	131	0.20	129,140	174,350	303,490	12/1/2014	270,000	1.12
10735331	6	92	692	101	33	WD	1958	82	1490	131	0.25	97,270	106,200	203,470	12/2/2014	212,000	0.96
10737430	6	93	693	101	33	WD	1955	82	1716	141	0.19	95,920	133,670	229,590	12/6/2014	242,000	0.95
10746178	6	92	692	101	30A	WD	1973	85	1274	131	0.05	64,280	78,660	142,940	12/7/2014	189,000	0.76
10746583	6	93	693	101	33	WD	1986	90	1230	132	0.19	55,460	79,510	134,970	12/7/2014	113,000	1.19
10746794	6	93	693	101	30A	WD	1978	88	1596	131	0.21	78,050	122,750	200,800	12/8/2014	225,000	0.89
10753095	6	5	605	101	30A	WD	1976	83	3063	144	0.18	93,970	266,340	360,310	12/9/2014	449,900	0.80
10754685	6	3	603	101	30A	WD	1945	72	1231	131	0.17	85,660	60,850	146,510	12/9/2014	155,900	0.94
10746956	6	93	693	101	30A	WD	1986	93	1526	141	0.26	103,410	121,880	225,290	12/9/2014	235,000	0.96
10754247	6	3	603	101	30A	WD	1970	83	4222	152	0.41	152,280	410,500	562,780	12/9/2014	575,000	0.98
10760351	6	5	605	101	33	WD	1979	82	2792	331	0.18	59,410	153,500	212,910	12/13/2014	240,000	0.89
10759041	6	2	602	101	33	WD	1974	86	1184	131	0.15	129,140	146,150	275,290	12/13/2014	279,000	0.99
10761324	6	92	692	101	30A	WD	1957	82	2347	141	0.24	101,020	199,650	300,670	12/14/2014	369,500	0.81
10763488	2	10	210	101	30A	WD	1962	82	1209	131	0.22	96,380	81,710	178,090	12/14/2014	201,500	0.88
10766533	6	93	693	101	30A	WD	1987	94	2660	152	0.20	113,170	305,560	418,730	12/15/2014	434,900	0.96
10765383	6	92	692	101	33	WD	1978	84	1480	131	0.18	102,780	90,570	193,350	12/15/2014	195,000	0.99
10767213	6	93	693	101	33	WD	1988	95	2471	152	0.18	96,270	269,550	365,820	12/16/2014	433,500	0.84
10766841	6	93	693	101	33	WD	1937	69	1716	132	0.18	154,000	81,270	235,270	12/16/2014	233,000	1.01
10768842	6	6	606	101	30A	WD	1972	62	1404	131	0.44	62,290	50,090	112,380	12/20/2014	171,000	0.66
10769598	2	11	211	101	30A	WD	1979	85	1296	131	0.21	119,190	82,530	201,720	12/20/2014	218,000	0.93
10771249	7	1	701	101	30A	WD	1955	82	2416	133	0.53	94,770	133,810	228,580	12/22/2014	295,000	0.77
10772462	6	2	602	101	30A	WD	1965	77	928	131	0.16	105,300	88,970	194,270	12/23/2014	220,000	0.88
10773775	4	1	401	101	33	WD	1948	74	834	121	0.14	83,760	41,920	125,680	12/27/2014	163,500	0.77
10773604	4	1	401	101	30A	WD	1963	75	1040	131	0.14	166,010	76,860	242,870	12/27/2014	275,000	0.88
10774171	3	24	324	101	30A	WD	1980	90	2628	144	0.67	177,450	337,340	514,790	12/28/2014	650,000	0.79
10775865	6	2	602	101	33	WD	1982	90	864	131	0.27	91,830	72,570	164,400	12/28/2014	156,000	1.05
10774780	5	1	501	101	30	WD	1950	82	2246	132	0.23	99,380	97,480	196,860	12/28/2014	170,000	1.16
10779333	2	3	203	101	33	WD	2014	100	1978	231	0.09	99,030	112,970	212,000	12/29/2014	276,800	0.77
10777673	6	2	602	101	30A	WD	1959	76	1248	131	0.26	85,720	63,620	149,340	12/29/2014	169,900	0.88
10779909	4	1	401	101	30A	WD	1977	81	1307	131	0.16	91,600	77,340	168,940	12/29/2014	190,000	0.89

SECTION 8

ANALYSIS: MARKET AREA STRATIFICATION

History of Stratification in Oregon Property Mass Appraisal Valuation

From 1955 to 1996, the assessor was required by law to physically reappraise all properties in the county every six years. This was often referred to as the six year cycle. Stratification was used to divide counties into six appraisal areas (maintenance areas). These appraisal areas were created on the basis of the number of properties that could be appraised in a year. Appraisal areas were usually associated with a city or other landmark or characteristic.

Although the six year cycle is no longer required by statute (after Measure 50 went into effect in 1997), some counties continue to maintain appraisal on a cycle basis. Many counties manage property valuation through other methods: reappraisal of problem areas, market area recalculation, and adjustments based on ratio analysis and traditional trending.

Each of these methods require stratification of properties into market areas based on commonalities such as use (commercial, residential, multi-family) or other identifiable criteria.

Stratification

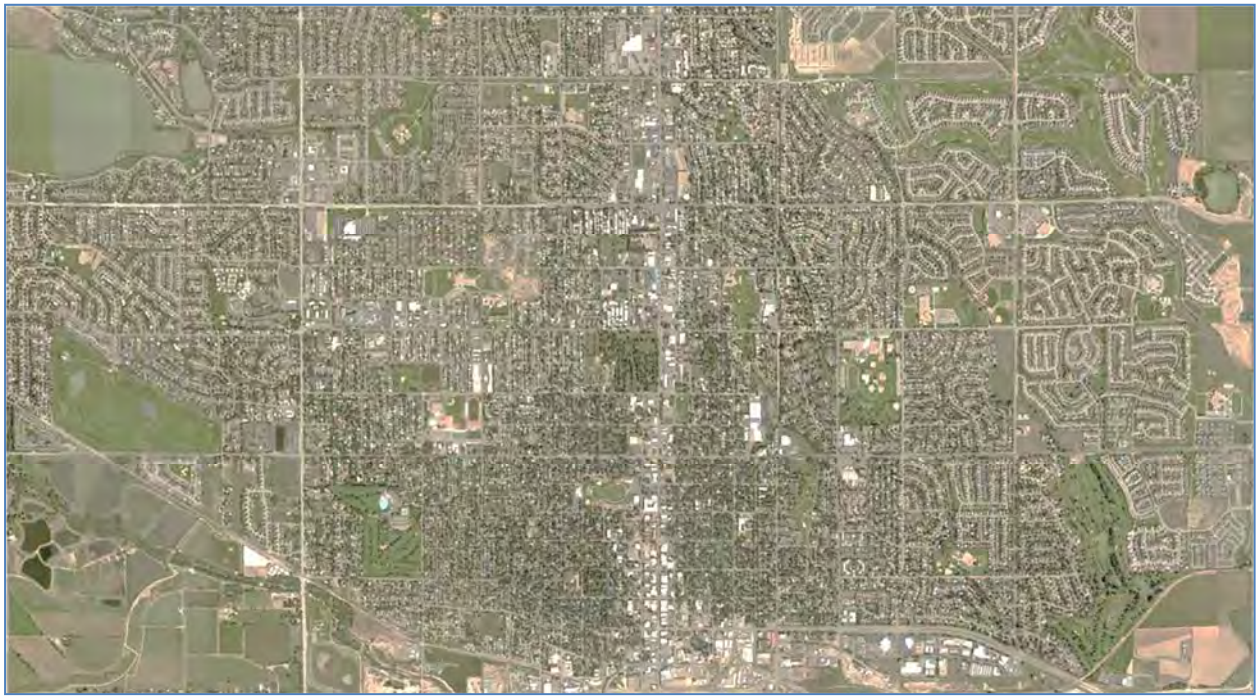
Stratification means arranging something into categories. For ratio analysis, stratification is the arrangement of property characteristic data into categories on the basis of one or more selected measures that are significant to buyers. Commercial properties are usually stratified by use-type (retail, convenience store, gas stations). Residential properties are typically grouped for analysis into neighborhoods, then combined into market study areas. Examples of common characteristics used for stratification of residential properties are: highest and best use, age, size, construction quality, land-to-building ratio, and price range.

One of the primary uses of market area stratification is the Assessor's Certified Ratio Study report. Grouping commercial properties by use-type and competing residential neighborhoods into market study areas assists the data analyst in interpreting market activity.

The following is an example in the process of stratification.

First an area of properties is selected for analysis. (In this example, **residential** properties are the focus of the study.)

Selected Area



Properties sharing common characteristics in the selected area are stratified into neighborhoods.

Neighborhood

Typically, a neighborhood is identified within physical, geographical, and/or political boundaries and consists of a group of properties with complementary uses, sharing similar market appeal and important location characteristics to include:

- Access
- Amenities
- Schools
- Public utilities
- Age, quality, or type of structure
- Price range

There is no single neighborhood that completely fulfills all of the needs and desires of all of the people. Neighborhoods are a compromise of the most preferred characteristics.

Keep in mind the four factors of value when identifying neighborhoods: utility, scarcity, desire, and effective purchasing power. Utility and scarcity by themselves do not make value. A potential buyer must also have a desire and the financial means to complete the purchase.

- Utility is the ability of a property to satisfy a human want or need.
- Scarcity is created through the forces of supply and demand. As demand increases or supply decreases, the value of a property will likely change.
- Desire is the potential purchaser's wish to obtain an item.
- Effective purchasing power means the ability to participate in the market with cash or its equivalency.

Some neighborhood components to consider are:

- Amenities (quality of schools, parks, open spaces, recreational opportunities, proximity to public transportation)
- Access (street patterns, road surface)
- Public utilities (water, sewer/septic, internet, electric)
- Land (size, shape, topography, view)
- Structure (age, quality of construction, size)
- Price range

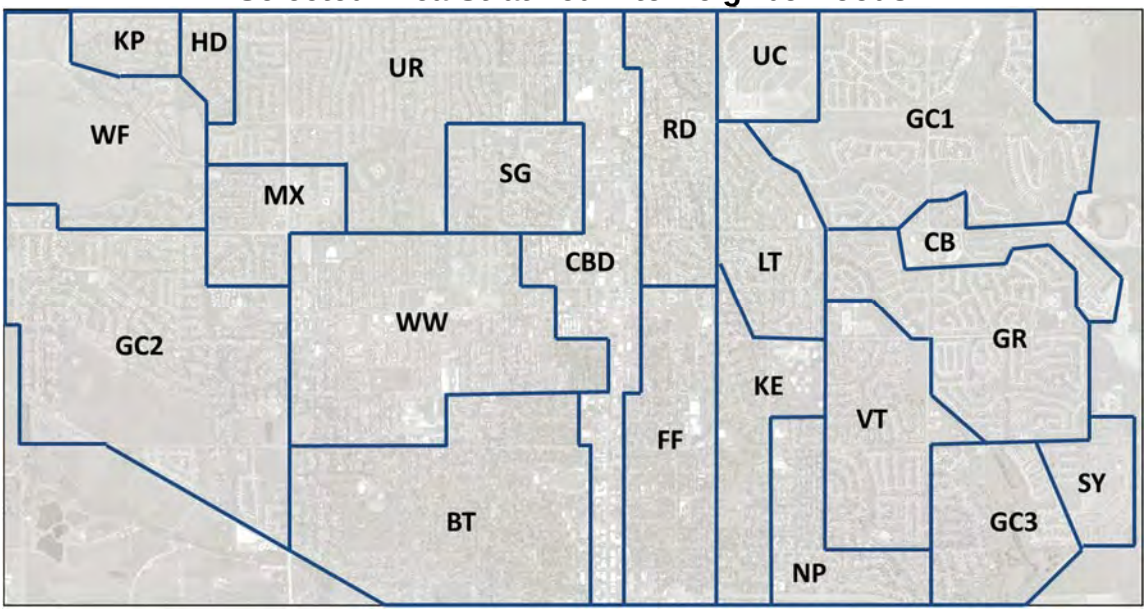
Amenities, access, and public utilities are factors that generally contribute to desirability of location and need to be documented. The other neighborhood components of land size, structural characteristics, and price range are factors that can be numerically quantified and should be utilized to further identify a contiguous group of compatible properties within a location.

Once the boundary of compatible properties is identified, a neighborhood can be created.

Neighborhood Codes

Each neighborhood is assigned an individual code for identification. Assigning these codes to individual accounts within a neighborhood provides a resource to readily calculate the number of accounts within each neighborhood and to group them for analysis. The use of this coding system is integral to the Assessor's Certified Ratio Study.

Selected Area Stratified into Neighborhoods



CBD: Central Business District

Market Study Area

Multiple contiguous or noncontiguous residential neighborhoods that experience similar market forces may be grouped together to form a **market study area**. In the case of commercial or industrial properties, it may be appropriate to group properties by use rather than geographic location and to consider local, regional, national, or international markets in the analysis.

Market area is defined by Oregon Administrative Rules (OAR):

> **OAR 150-308-0380** (2)(a)(C) "Market area" is defined as a group of properties that share important characteristics affecting their value. It may be defined along physical/geographical or abstract boundaries or, as in the case of commercial property, according to use. Properties included in a market area do not have to be contiguous.
>
> **OAR 150-309-0230** (2) A market area is a group of properties that generally shares important characteristics that influence value. Each market area should contain a sufficient number of accounts to ensure an adequate sale sample for analysis.

In some instances, a specific market area could encompass an entire county or region. For example, manufactured structure parks, golf courses, motels, gas stations, or fast-food restaurants can be viewed as countywide market areas for analysis and adjustment purposes.

Combining Neighborhoods into Market Study Areas

When exploring the potential combination of a group of neighborhoods into a market study area, test the **degree of similarity** between the neighborhoods. One method to test the degree of similarity is the following:

1. Calculate averages of selected property characteristics within a neighborhood (NH 1). Some characteristics that may be considered include:
    a. Land size
    b. Improvement quality classification
    c. Improvement size
    d. Age of improvements
    e. Real market value
2. Select another neighborhood (NH 2) that may be compatible with the first neighborhood and calculate the average for the same characteristics as in Step 1.
3. Calculate a factor to compare the average of each neighborhood characteristic to potentially establish a degree of similarity: divide the small number by the large number. In the example below for the land size characteristic, divide 12,000 by 15,000 to arrive at a factor.
4. Continue this process for each of the other selected property characteristics.
5. Calculate the average of all factors. If the average of all factors is equal to or greater than (≥) 0.80, the neighborhoods may be suitable for combining into a market study area. In the example displayed, the average of all factors is 0.82 and indicates NH 1 and NH 2 can be combined into a market study area.

	Average					
Area	**Land Size**	**Imp Quality Class**	**Imp Size**	**Imp Age**	**RMV**	**Average of all Factors**
NH 1	12,000	4.5	2,000	20	$200,000	
NH 2	15,000	4.5	1,800	30	$150,000	
Factor	0.80	1.00	0.90	0.67	0.75	**0.82**

6. Combine the two neighborhoods (NH 1 and NH 2) and recalculate the average for each characteristic of the entire population (all the properties in neighborhoods). For example, if NH 1 has a population of 110 properties and NH 2 has a population of 220 properties, the combined population is 330 and the characteristics of NH 2 would have more influence on the average of both areas due to its greater number of accounts.

	Average					
Area	**Land Size**	**Imp Quality Class**	**Imp Size**	**Imp Age**	**RMV**	**Average of all Factors**
NH 1&2	14,000	4.5	1,867	27	$166,700	
Factor						

7. Continue to develop a market study area by adding other potentially compatible neighborhoods one at a time, comparing on an individual basis to determine if they are suitable for combining.

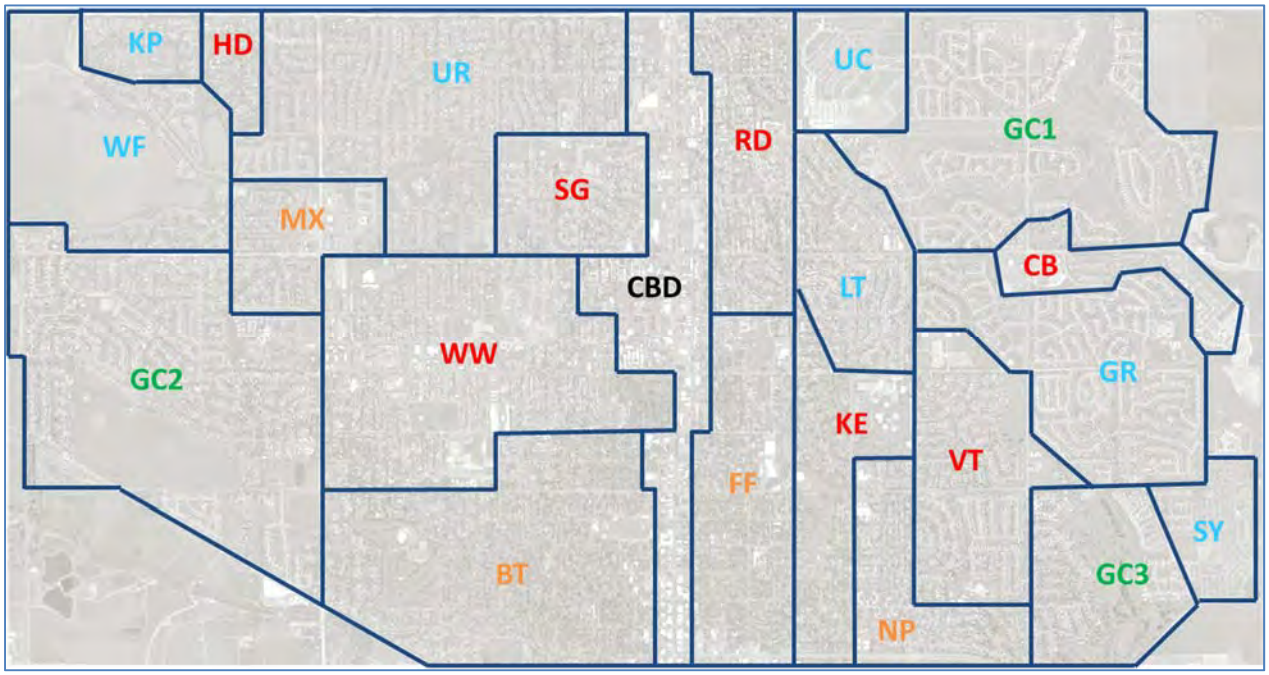
For example:

	Average					
Area	**Land Size**	**Imp Quality Class**	**Imp Size**	**Imp Age**	**RMV**	**Average of all Factors**
NH 1	12,000	4.5	2,000	20	$200,000	
NH 2	15,000	4.5	1,800	30	$150,000	
NH 3	12,000	4.0	1,750	35	$130,000	
Factor 1&3	1.00	0.89	0.88	0.57	0.65	**0.798**
Factor 2&3	0.80	0.89	0.97	0.86	0.87	**0.878**

The average of all factors for the combined NH 1 and NH 3 (0.798) indicates it is borderline for combining into a market study area. The average of all factors for the combined NH 2 and NH 3 (0.878) shows they are clearly suitable for combining since the factor is at least 0.80.

Neighborhoods having similar characteristics compete in the marketplace for the same potential buyers and are grouped to form market study areas. Studies to analyze their degree of similarity are completed to document their compatibility. The grouped neighborhoods may or may not be contiguous.

Selected Area with Neighborhood Codes and Market Area Groupings
Property Classes 100, 101, 109



Market Area Description	Combined Neighborhoods
Golf course influence	GC1, GC2, GC3
High density older construction, mixed, some MFS	BT, FF, MX, NP
High density newer construction	WW, RD, SG, HD, VT, CB, KE
Medium density residential	GR, UR, UC, KP, WF, LT, SY

Redefining Market Areas

At times the desirability of the characteristics in a neighborhood within a market area change and necessitate a realignment of the neighborhood from one market area to another more compatible market area.

For example, a group of small towns countywide with similar characteristics are combined into a single market study area. One town changed due to the development of a nearby resort and is experiencing rapid growth. Analysis suggests it is no longer compatible with the other small towns in the market study area. This town should be removed from the current market study area and either studied as a separate market or combined with other compatible resort towns experiencing similar economic conditions. This realignment benefits both market study areas. It allows a focused analysis of the affected small town and avoids skewing the other small town property RMVs not experiencing the new resort influence.

Reorganizing neighborhoods into different study areas should **only** be done when analysis indicates a change is warranted. Calculation of the degree of similarity between a neighborhood and the remainder of the market area can be used to document the need for modification. Changes to market area composition must be documented in the ratio study report and the appropriate analysis attached for review.

Conclusion

Stratification of properties into neighborhoods and then grouping neighborhoods into market study areas is important for credible statistical analysis of market trends and the confident development and application of annual value adjustments. Unsupported reorganization of neighborhoods between market areas tends to undermine the integrity of the adjustment program.

SECTION 9

ANALYZING DATA FOR SAMPLE BIAS, MEASURES OF UNIFORMITY & RELIABILITY

Sample

Statistical techniques require samples (a set of observations selected from a population) to be selected in a random manner. Random means that each member of a population has the same chance of being selected as any other member.

Utilizing only sold properties may not represent a random sample because property owners are not randomly chosen to sell their properties. Recognize that ratio studies may display bias because the sample represents only sold properties.

Sample Bias

Bias is a systematic error that can prejudice findings in some way. It may be due to some flaw in measurement or method. Bias due to method of sampling may arise when certain characteristics are given a greater or lesser representation in the sample than in the population.

A ratio study by its nature may result in a biased sample simply because it is comprised of only properties that recently sold and may not be representative of all properties in the market study area. Ratio studies rely on a self-selection process that separates sold properties from those that are unsold.

Example: A study area is in a town that consists of newer homes on in-fill lots mixed with older homes of varying quality. Most of the sales are newer, average quality houses. The sales of only newer houses biased this sample as they are not representative of the older houses in the study area. Additional analysis may be necessary to determine if the newer and older homes should be in separate study areas.

Likewise, results will be biased if usable sales are excluded from a sample due to arbitrary trimming.

Bias is seldom desirable, but the important thing is to recognize possible sources of bias and to weigh the effect. A test for bias should be conducted to determine if the sample is representative of the population.

Testing for Bias

Investigate bias using the degree of similarity test (from the previous section) to calculate a factor that measures the similarity between the market study area and the sample.

1. Select the property characteristics to be used to compare the market study area with the sample. Some characteristics that may be considered include:
    a. Land size
    b. Improvement quality classification
    c. Improvement size
    d. Age of improvements
    e. Real market value
2. Calculate the average numeric value of each property characteristic selected in step 1 for the market study area.
3. Calculate the average numeric value of each property characteristic selected in step 1 for the sample.
4. Calculate a factor to compare the average numeric values of the market area characteristics to the average numeric values of the sample characteristics to establish a degree of similarity: divide the small number by the large number.
5. Calculate the average of all factors. When the factor is equal to or greater than (≥) 0.80, the sample may be representative of the market study area.

	Average					
	Land Size	**Imp Quality Class**	**Imp Size**	**Imp Age**	**RMV**	**Average of all Factors**
Market Area	12,000	4.5	2,000	20	$200,000	
Sample	15,000	4.5	1,800	30	$150,000	
Factor	0.80	1.00	0.90	0.67	0.75	**0.82**

In another example, if the average RMV of the population is $207,900, is the following sample biased?

MA	NH	Prop Class	Map	Acct	Land RMV	Imp RMV	Total RMV	Sale Price
4	1	401	110515A	00801	$70,300	$152,320	$222,620	$257,000
1	1	401	110306B	00100	$26,530	$ 96,710	$123,240	$137,500
2	1	401	120511A	00500	$36,150	$ 39,310	$ 75,460	$ 74,990
4	1	401	110515B	90010	$63,070	$124,670	$187,740	$182,500
1	1	401	100436D	02800	$22,450	$131,650	$154,100	$144,900
1	1	401	100436D	00501	$17,500	$149,800	$167,300	$145,000
6	1	401	140530O	00900	$44,210	$ 44,110	$ 88,320	$ 68,000
						Average:	$145,540	

Answer: The average total RMV from the sample is $145,540 and the average RMV of the population is $207,900. Test the bias by dividing the smaller number by the larger number. The result is a degree of similarity factor of **0.70**.

The sample based only on the RMV appears biased and may not be as representative of the market area as desired. Continue to test other property characteristics to arrive at an overall degree of similarity factor.

When the test indicates the sample is not representative of the market study area, the sample is not reliable to use for adjustment of RMVs for that area. It may be necessary to expand the market study area or an indication the area requires recalculation or reappraisal.

Sales from a non-random sampling may be a source of bias but are used in ratio studies because the sample is the best available information and steps are taken to minimize bias and its effects.

Bias is one test of a sample reliability, but there are other considerations. Uniformity of the ratio distribution within the sample should be examined.

Ratio Distribution

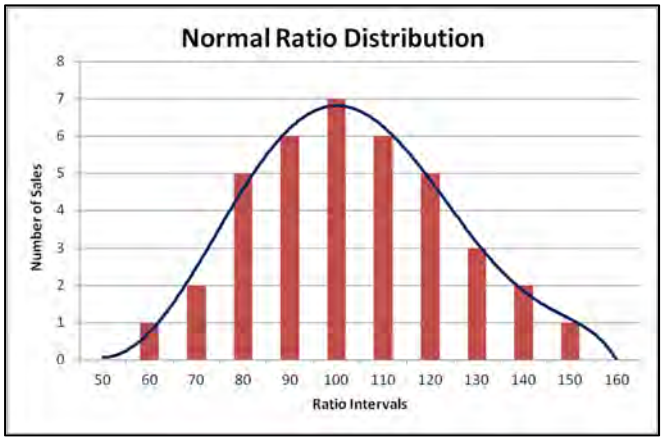
Calculated sales ratios tend to be scattered across a range. An examination of the uniformity of the ratio distribution can provide important information about what central tendencies may be most reliable.

The distribution of the ratios can be graphed as a **histogram** providing a visual representation of the sales ratio array. A histogram is a bar chart, or graph, of a frequency distribution of ratios in the sample. The highest bar represents the most frequent ratio within the interval. Common ratio distributions are illustrated below.

Common Ratio Distributions

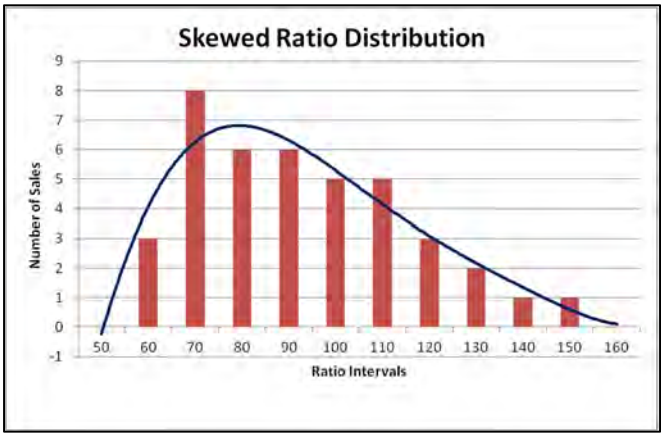
Normal Distribution

Many statistical measures rely on normal distributions, illustrated by a bell–shaped curve, to indicate uniformity. Both the mean and median central tendencies are reliable measures when the array contains a normal distribution of ratios near the center of the range.



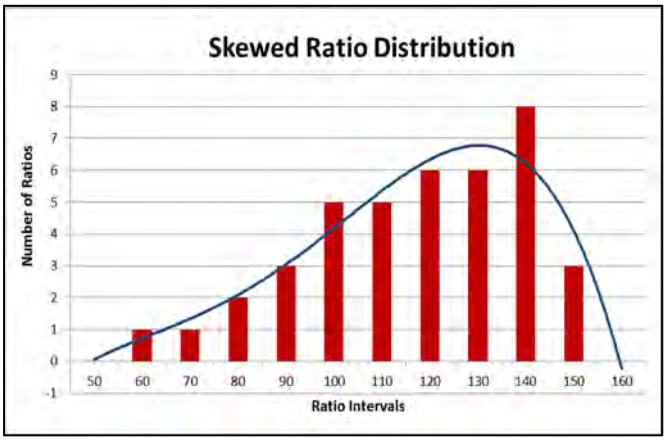
Skewed Distribution (Right Skew)

When data is skewed to the right, use of a median or geometric mean may be appropriate because they are less influenced by extreme high ratios than the mean central tendency. The central tendency provided by a geometric mean will move toward the data cluster more than the mean.



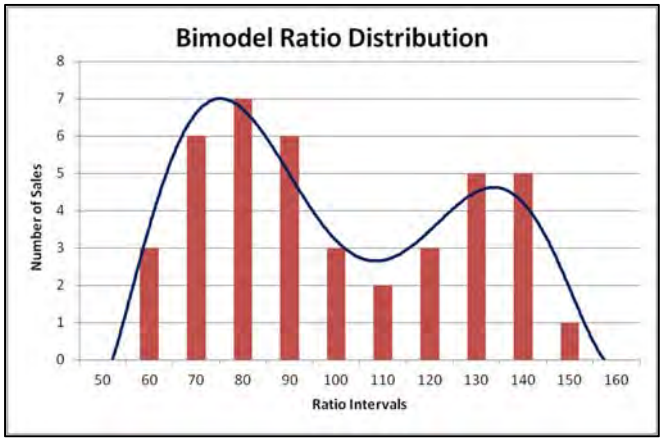
Skewed Distribution (Left Skew)

When data is skewed to the left, the median is the most appropriate measure. The central tendency provided by a geometric mean will move away from the data cluster more than the mean or median and is a less reliable measure.



Bimodal Distribution

When there is more than one curve, the sales array may indicate there is a need to further stratify the sales data into two or more groups, i.e., different ages or classes of houses, lot sizes, amenities as view/non-view, etc. for additional analyses.



Since the sales array is a representation of the total population or market area, multiple market influences can be occurring at the same time. By stratifying the original sales array further, a more accurate picture is derived and adjustments can be applied more accurately to those properties being affected provided there are sufficient sales.

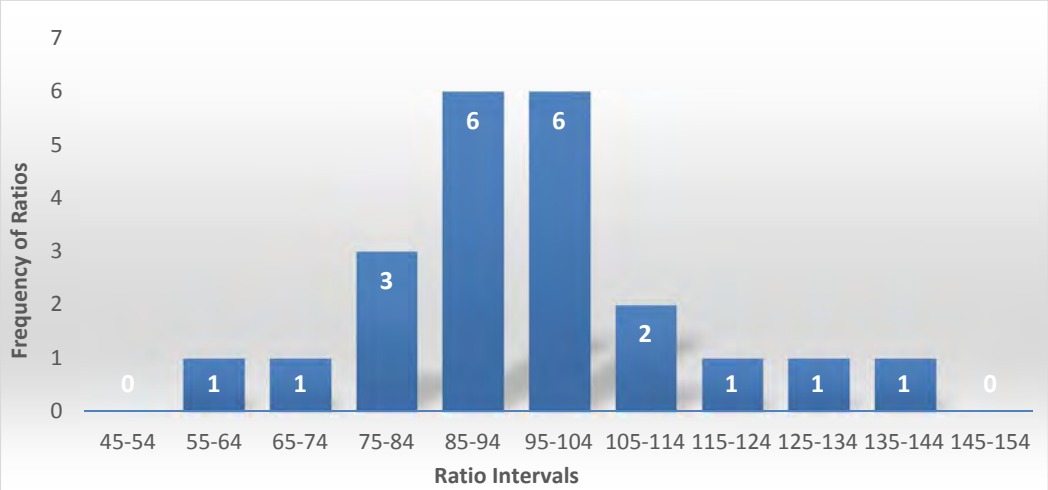
Construct a Histogram

Ratio distribution depicted in a histogram can provide important information about what central tendencies may be most reliable. To construct a histogram that displays ratio frequency distribution, array all the ratios from the market study area, select intervals in which to group the ratios, and then count the number of ratios in each interval.

Example 1

Sale	Ratio
1	59
2	70
3	76
4	81
5	82
6	86
7	87
8	88
9	88
10	91
11	93
12	95
13	97
14	99
15	101
16	102
17	103
18	107
19	111
20	118
21	133
22	140

Normal Distribution - Bell Curve



Range:	(45-54)	(55-64)	(65-74)	(75-84)	(85-94)	(95-104)	(105-114)	(115-124)	(125-134)	(135-144)	(145-154)
Interval:	50	60	70	80	90	100	110	120	130	140	150
# Ratios:	0	1	1	3	6	6	2	1	1	1	0

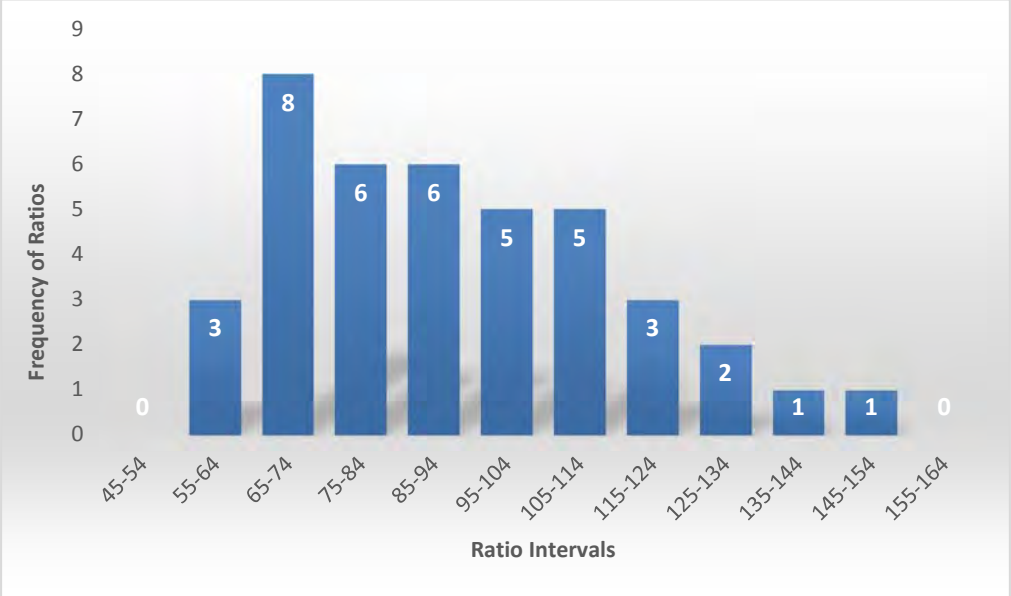
96	Mean	14	AAD
94	Median	15	COD
94	Geometric Mean	19	STD Dev
		20	COV

This histogram displays the number of times each ratio appears in the range of 59 to 140 showing a normal distribution in a bell curve. The mean or median central tendencies would likely best represent the market conditions in this study area.

Example 2

Sale	Ratio
1	59
2	60
3	64
4	65
5	66
6	66
7	67
8	67
9	68
10	69
11	73
12	75
13	76
14	77
15	79
16	79
17	83
18	85
19	87
20	88
21	89
22	89
23	91
24	95
25	96
26	96
27	99
28	103
29	105
30	105
31	109
32	111
33	114
34	116
35	119
36	123
37	128
38	131
39	141
40	149

Skewed Distribution - No Bell Curve



Range:	(45-54)	(55-64)	(65-74)	(75-84)	(85-94)	(95-104)	(105-114)	(115-124)	(125-134)	(135-144)	(145-154)	(155-164)
Interval:	50	60	70	80	90	100	110	120	130	140	150	160
# Ratios:	0	3	8	6	6	5	5	3	2	1	1	0

92	Mean	19	AAD
89	Median	21	COD
89	Geometric Mean	23	STD Dev
		26	COV

This histogram displays the number of times each ratio appears revealing a skewed distribution in the range of 59 to 149. The median or the geometric mean central tendencies would likely best represent the market conditions in this study area. The mean is influenced by the higher ratios in this array.

Measures of Appraisal Uniformity

Statutes require both equality and uniformity of real market value estimates (ORS 308.232 and 308.233). Roll values at 100% of real market value (RMV) is the measure of **equality (**equity) and coefficient of dispersion (COD) is the measure of **uniformity**.

To arrive at a COD, the **average absolute deviation** (AAD) and the **median** of all sales ratios in the array must be calculated.

Average Absolute Deviation (AAD)

The AAD measures the average spread, or number of point differences between each ratio and the median ratio. The **absolute value** of a number may be thought of as its distance from zero. In mathematics, the absolute value of a number is the non-negative value without regard to sign. The positive or negative value measurement is unimportant; the magnitude of the differences is the significant aspect.

Mathematically, the AAD can be written as follows:

$$\text{AAD} = \frac{\sum \left| X_i - \tilde{X}_{median} \right|}{n}$$

Where *AAD* is the Average Absolute Deviation
$\sum$ represents sum of
X_i represents each ratio
$\tilde{X}$ is the median central tendency
n is the number of ratios

The average absolute deviation is computed as follows:

1. Calculate the median central tendency.
2. Subtract the median central tendency from each sale ratio in the array. The difference should be shown as a positive number. Only the amount of deviation is important, not the plus or minus sign.
3. Sum the absolute values of the computed deviations from step 2.
4. Divide the sum by the total number of ratios.

Example 3

Sale No.	Land RMV	Imp. RMV	Total RMV	Total Price	Sale Ratio	Median	AD
1	82,640	78,010	160,650	200,000	80	95	15
2	17,450	5,490	22,940	26,000	88	95	7
3	64,370	28,940	93,310	105,000	89	95	6
4	15,310	25,200	40,510	45,000	90	95	5
5	28,580	1,470	30,050	30,000	100	95	5
6	13,320	14,580	27,900	28,000	100	95	5
7	22,360	22,790	45,150	40,000	113	95	18
8	22,670	40,180	62,850	50,500	124	95	29
			483,360	524,500	784		90

Median = 95
AAD = 90 ÷ 8 = 11.25

When the AAD is expressed as a percentage of the **median**, it is called the **coefficient of dispersion** (COD).

Coefficient of Dispersion (COD)

The COD is the average absolute deviation converted to a percentage of the median. This conversion is necessary to establish a relationship between the average absolute deviation and the **median** central tendency. Using the AAD, the COD is calculated mathematically as follows:

$$\text{COD} = \frac{\text{AAD}}{\tilde{X}\ Median} \text{ x } 100$$

1. Divide the AAD of the array by the median.
2. Multiply this result by 100 to convert it to a percentage.

Using the example above:

$$\text{COD} = (\text{AAD} \div \tilde{X}_{Median}) \text{ x } 100$$
$$11.25 \div 95 = 0.1184 \text{ or } 0.12 \times 100 = \textbf{12 COD}$$

This computation is important in measuring uniformity of RMV. The COD indicates how widely the values in an array vary from the central tendency (the median). The lower the percentage of deviation, the greater the uniformity within the property class or sample.

Allowable coefficients of dispersion vary by property class. In general, depending on property types, CODs ranging from 10 to 20 indicate acceptable assessment levels. Care should be taken to ensure that low coefficients are the result of good appraisal valuation practices and not sale chasing or inappropriate trim methods.

- Single family residences in generally non-homogeneous areas should have coefficients of 15 or less. In newer and fairly homogeneous areas, 10 or less
- Commercial properties in rural areas should have coefficients of 20 or less, and in larger urban jurisdictions, 15 or less
- Vacant land and improved rural properties should have coefficients of 20 or less
- Manufactured structures should have coefficients of 25 or less
- Multi-family properties should have coefficients of 12 or less

COD Standards

The following table is from the Oregon Administrative Rule (OAR 150-308-0380). It outlines the maximum COD standards, by property class, established by assessors and the DOR to measure the results of the counties' valuation programs in Oregon:

Type of property (Property Class)	**Maximum COD**
Vacant Land (100, 400)	20
Real & Personal Manufactured Structures/Mobile Homes	25
Urban Residential (101)	
Homogeneous	10
Nonhomogeneous	15
Rural Improved (101, 401)	20
Apartments (701)	12
Other Income (201)	
Large Urban	15
Smaller Rural	20

When a market area does not meet the standard in the first year, the area is considered to be ***out of standard*** and appropriate corrective action should be addressed in the Valuation Plan. If the market study area remains out of standard for two or more consecutive years, the area is ***out of compliance.*** When an area in the county is out of compliance, the county is subject to the provisions of ORS 308.062.

Standard Deviation

The **standard deviation** is another measure of uniformity and is based on the average spread between each ratio and the **mean** central tendency.

Mathematically, the standard deviation can be written as follows:

$$s = \sqrt{\frac{\sum(X_i - \bar{X}_{mean})^2}{n-1}}$$

Where s is the standard deviation
$\sum$ represents *sum of*
X_i represents each ratio
$\bar{X}_{mean}$ is the mean central tendency
n is the number of ratios

To compute the standard deviation:

1. Calculate the mean central tendency.
2. Subtract the mean central tendency from each sale ratio in the array.
3. Square the resulting differences (squared numbers have a positive sign).
4. Sum the squared differences.
5. Divide the sum of the squared differences by the **number of ratios less 1.0** to obtain the sample variance of the ratios.
6. Compute the square root of the sample variance of the ratios. The result is the standard deviation.

Using the formula above, the standard deviation is computed as follows:

Example 4

Sale No.	Land RMV	Imp. RMV	Total RMV	Total Price	Sale Ratio	Mean	Difference	Squared Difference
1	82,640	78,010	160,650	200,000	80	98	-18	324
2	17,450	5,490	22,940	26,000	88	98	-10	100
3	64,370	28,940	93,310	105,000	89	98	-9	81
4	15,310	25,200	40,510	45,000	90	98	-8	64
5	28,580	1,470	30,050	30,000	100	98	2	4
6	13,320	14,580	27,900	28,000	100	98	2	4
7	22,360	22,790	45,150	40,000	113	98	15	225
8	22,670	40,180	62,850	50,500	124	98	26	676
			483,360	524,500	784			1,478

Mean = 98
1,478 ÷ (8-1) = 211 variance of ratios
Sq Root of 211 = 14.5 Standard Deviation = 14.5

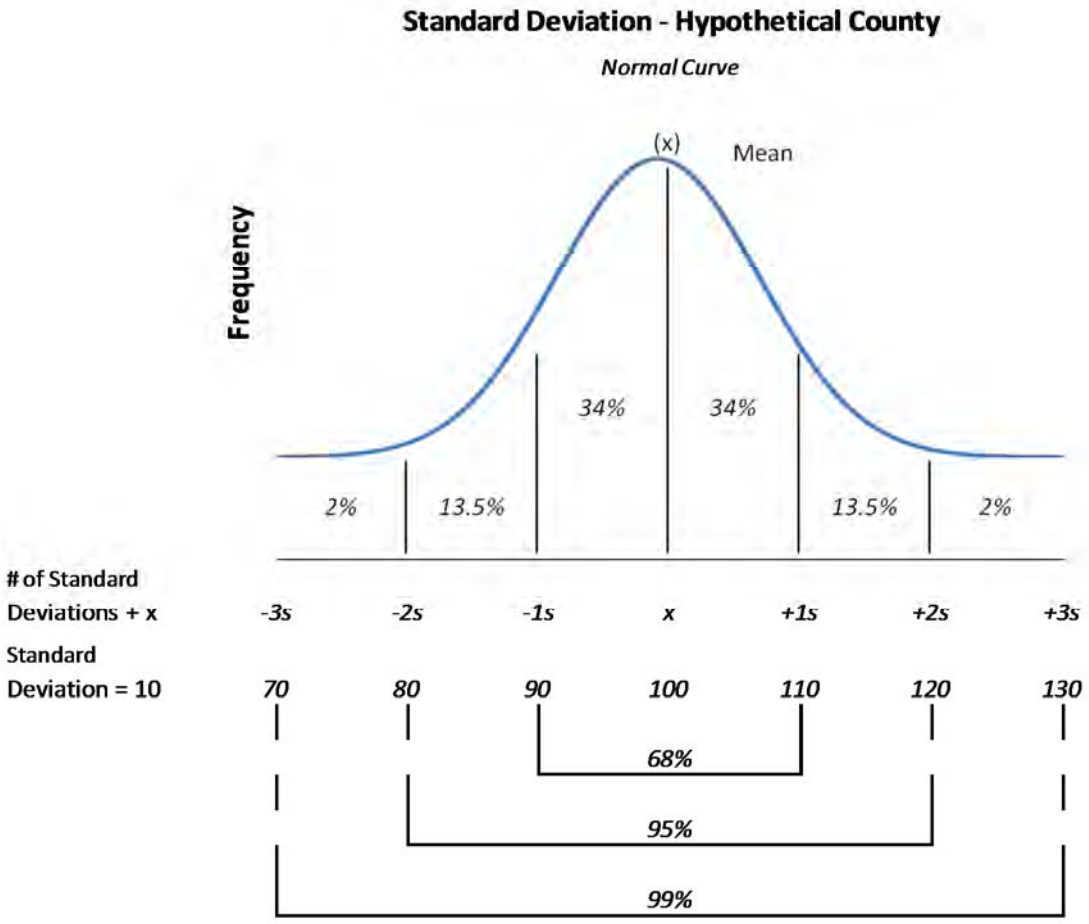
Distribution of the Sample

The interpretation of the standard deviation needs to take into account whether the data can be regarded as normally distributed. **Normal distributions** are seen as a symmetrical bell curve when graphically represented. The definition of normal distribution implies the following:

1. 68 percent +/– of all sales fall within **one standard deviation** of the mean.
2. 95 percent +/– of all sales fall within **two standard deviations** of the mean.
3. 99 percent +/– of all sales fall within **three standard deviations** of the mean.

The following is a graphic illustration of the percentage of data that can be expected to occur within each of three standard deviations from the mean in a normal distribution.

Example 5



If the sales array in Example 4 is normally distributed the results would be:

- One standard deviation (14.5) on each side of the mean (98) will include approximately 68 percent of sales and the ratios between 83.5 and 112.5.
- Two standard deviations (29) on each side of the mean (98) will include approximately 95 percent of sales and the ratios between 69 and 127.
- Three standard deviations (43.5) on each side of the mean (98) will include approximately 99 percent of sales and the ratios between 54.5 and 141.5.

Coefficient of Variation (COV)

The Coefficient of Variation is a measurement of the differences between the standard deviation of the sample and the **mean** central tendency expressed as a percentage.

Mathematically the formula for determining the coefficient of variation is:

$$COV = \frac{s}{\bar{X}_{Mean}} \times 100$$

Where s is the standard deviation
$\bar{X}_{mean}$ is the mean central tendency

The COV is computed as follows:

1. Compute the standard deviation of the array.
2. Divide the standard deviation by the mean.
3. Multiply the result by 100 in order to convert the factor to a percentage.

Using the standard deviation arrived at from Example 4, the COV would be:

$$14.5 \div 98 = 0.1480 \text{ or } 0.15 \times 100 = \mathbf{15\% \ COV}$$

The COV is a recognized measure of uniformity for normal distributions. However, sales data samples for ratio studies rarely represent normal distributions, so no COV standards have been established.

Price-Related Differential (PRD)

The PRD is used to evaluate whether RMVs are reasonably uniform between high and low valued properties, often referred to as **vertical uniformity**. An absence of vertical uniformity is termed assessment regressivity or progressivity.

Regressivity: high-value properties are under-valued relative to low-value properties

Progressivity: high-value properties are over-valued relative to low-value properties

For example, in a market area where property values range from $100,000 to $250,000, the following sales occurred:

Sale	RMV	Sale Price	Ratio
A	$150,000	$110,000	1.36
B	$145,000	$110,000	1.32
C	$225,000	$220,000	1.02
D	$240,000	$250,000	0.96

Sales A and B are at the lower end of the price range and are selling for a lesser portion of the RMV resulting in high ratios. Sales C and D are near the upper end of the price range and are selling for a greater portion of the RMV resulting in lower ratios. The higher priced properties appear to be under appraised as compared to the lower priced properties.

This market area is *regressive* since low-value properties are valued at greater percentages of market value than high-value properties. Regressivity may occur in residential markets as a result of failure to apply appropriate improvement quality classification on more expensive properties or to fully recognize differences in site values. Regressivity has the potential to put a proportionately higher tax burden on new lower value properties than new higher value properties.

Valuations for assessment purposes should be neither progressive nor regressive.

Measuring Regressivity and Progressivity

The PRD is a statistical way to measure valuation regressivity or progressivity. It is calculated by dividing the **arithmetic mean** by the **weighted mean**. The mathematical formula is:

$$\text{PRD} = \bar{X}_{Mean} \div \text{X}_{Wtd.\,Mean}$$

When the PRD is within a range of 0.98 to 1.03, the degree of vertical valuation uniformity is considered acceptable.

Lower PRDs (less than 0.98) suggest the appraisal level is progressive meaning higher value properties are being valued nearer to their actual sale prices than lower value properties.

Higher PRDs (greater than 1.03) suggest the appraisal level is regressive meaning lower value properties are being valued nearer to their actual sale prices than higher value properties.

Regressive PRD Example

(The weighted mean is less than the arithmetic mean)

RMV	Sale Price	Ratio	Comment
$100,000	$ 75,000	133	High RMV—Low Sale Price
$100,000	$ 75,000	133	High RMV—Low Sale Price
$200,000	$200,000	100	
$200,000	$200,000	100	
$300,000	$325,000	92	Low RMV—High Sale Price
$300,000	$325,000	92	Low RMV—High Sale Price
		108	= Arithmetic Mean
$1,200,000	$1,200,000	100	= Weighted Mean

Regressive PRD = 1.08 (Arithmetic Mean ÷ Weighted Mean)

Progressive PRD Example

(The weighted mean is greater than the arithmetic mean)

RMV	Sale Price	Ratio	Comment
$ 100,000	$ 125,000	80	Low RMV—High Sale Price
$ 100,000	$ 125,000	80	Low RMV—High Sale Price
$ 200,000	$ 200,000	100	
$ 200,000	$ 200,000	100	
$ 300,000	$ 275,000	109	High RMV—Low Sale Price
$ 300,000	$ 275,000	109	High RMV—Low Sale Price
		96	= Arithmetic Mean
$1,200,000	$1,200,000	100	= Weighted Mean

Progressive PRD = 0.96 (Arithmetic Mean ÷ Weighted Mean)

The PRD provides only an indication, not proof, of valuation bias. When sample sizes are small, price-related differentials outside the acceptable range may occur simply because of random sampling error. Further, price-related differentials have a natural upward bias (regressivity) because of changes in market conditions over time.

The PRD is a useful tool in the management of appraisal programs and can be used to direct appraisal staff to areas of concern in specific locations.

Weighting

Weighting is a process that maintains land value uniformity between vacant land accounts and the land component of improved accounts. The ultimate goal in the weighting process is to distribute the overall adjustment in proper proportions among the components of value (land, onsite development, primary improvements, and farm buildings) in a market area.

A land adjustment factor is calculated through a study of vacant land sales. An overall market area adjustment is calculated for improved properties. The land adjustment factor is applied to the land component of improved properties. The weighting process provides a basis for calculation of the adjustment factor to be applied to the improvement component to achieve the overall adjustment.

Elements needed to compute an *unknown* adjustment factor for a study area:

- RMV of the components (land, OSD, improvements, farm buildings);
- The overall adjustment factor computed from the selected central tendency;
- Known adjustment factors for all components from other studies (except for the one unknown factor).

Steps and Examples of Improvement Adjustment Factor Calculation

Example #1 (A simplified weighting process using two components.)

Known: An adjustment factor for land is **0.90** (determined from vacant land sales).

An overall adjustment factor of **0.95** (determined from the improved accounts).

RMV of All Improved Accounts	
Current RMV Land	$33,077,860
Current RMV Improvements	174,785,320
Current Total RMV	$207,863,180

Steps:

1. Calculate the adjusted RMV for the land portion of the improved accounts.
   Multiply the current year total land RMV by the adjustment factor of 0.90 from vacant land sales.

   $33,077,860 * 0.90 = **$29,770,074** adjusted RMV of land

2. Calculate the adjusted RMV total for the improved accounts.
   Multiply the current year total RMV by the overall adjustment factor of 0.95 from the improved sales.

   $207,863,180 * 0.95 = **$197,470,021** total adjusted RMV

3. Calculate the adjusted RMV for improvements.
   Subtract the calculated adjusted RMV of the land from the total adjusted RMV.

   197,470,021 – $29,770,074 = **$167,699,947** adjusted RMV of improvements

4. Calculate the improvement adjustment factor.

Divide the total adjusted RMV of improvements by the total unadjusted RMV for improvements.

$167,699,947 / $174,785,320 = **0.959462** (rounded to **0.96**) improvements adjustment factor

Current and Adjusted RMVs

Component	Current RMV	Adjustment Factor	Adjusted RMV
Land	$33,077,860	0.90	$29,770,074
Improvements	$174,785,320	**0.96**	$167,793,907
Total	$207,863,180	0.95	$197,563,981

Rounding differences may slightly distort calculation results.

Example #2 (Another weighting process using two components.)

Known: An adjustment factor for land is **0.90** (determined from vacant land sales).

An overall adjustment factor rounded to **1.05** (determined from the improved accounts).

RMV of All Improved Accounts:

Current RMV Land	$33,077,860
Current RMV Improvements	174,785,320
Current Total RMV	$207,863,180

Steps:

1. Calculate the percentage of the total RMV that is attributable to the land and then to the improvements.

   Land: Divide the current land RMV by current total RMV.

   $33,077,860 / $207,863,180 = 0.1591 factor = 15.91% land (weight)

   Improvements: Divide the current total improvement RMV by current total RMV.

   $174,785,320 / $207,863,180 = 0.8409 factor = 84.09% improvement (weight)

2. Calculate the improvement adjustment factor.

   The land weight factor divided by the vacant land adjustment factor plus the improvement weight factor divided by *X* (unknown improvement adjustment factor) is equal to the total weight (1.0) divided by the overall adjustment factor.

$$\frac{\text{Land weight}}{\text{Land adjustment factor}} + \frac{\text{Improvement weight}}{\text{Improvement adjustment factor}} = \frac{1.00}{\text{Overall adjustment factor}}$$

a. $$\frac{0.1591}{0.90} + \frac{0.8409}{X} = \frac{1.00}{1.05}$$

b. Convert fractions to decimal equivalents (0.1591 / 0.90 = 0.1768 etc.).

$$0.1768 + \frac{0.8409}{X} = 0.9524$$

c. Solve for X: Subtract 0.1768 from both sides of the equation.

$$\frac{0.8409}{X} = 0.9524 - 0.1768$$

$$\frac{0.8409}{X} = 0.7756$$

d. Multiply both sides of the equation by X.

$$0.8409 = 0.7756X$$

e. Divide both sides of the equation by 0.7756

$$\frac{0.8409}{0.7756} = X$$

$$1.0842 = X \quad \text{Rounded to } 1.08$$

Component	Current RMV	Adjustment	Adjusted RMV
Land	$33,077,860	0.90	$29,770,074
Improvements	$174,785,320	1.08	$188,768,146
Total	$207,863,180	1.05	$218,538,220

Rounding differences may slightly distort calculation results.

Example #3 (A weighting process using four components.)

Known: Overall adjustment factor is **0.95** (determined from the improved accounts).

Components	Real Market Value	Adjustment Factor
Current Land	$40,000,000	0.90
Current OSD	$5,000,000	1.00
Current Improvement	$145,000,000	*X*
Farm Building (FB)	$10,000,000	0.98
Total	$200,000,000	0.95

Steps:

1. Compute the percent weight for each component value.

Components	Real Market Value	Weight Percentage
Land	$40,000,000	20.0%
OSD	$5,000,000	2.5%
Improvement	$145,000,000	72.5%
FB	$10,000,000	5.0%
Total	$200,000,000	100.0%

2. Compute improvement adjustment factor:

$$\frac{\text{Land weight}}{\text{Land adjustment factor}} + \frac{\text{OSD weight}}{\text{OSD adjustment factor}} + \frac{\text{Improvement weight}}{\text{Improvement adjustment factor}} + \frac{\text{FB weight}}{\text{FB adjustment factor}} = \frac{1.00}{\text{Overall adjustment factor}}$$

a. $$\frac{0.20}{0.90} + \frac{0.025}{1.00} + \frac{0.725}{X} + \frac{0.05}{0.98} = \frac{1.00}{0.95}$$

b. $$0.2222 + 0.0250 + \frac{0.7250}{X} + 0.0510 = 1.0526$$

c. $$\frac{0.7250}{X} = 1.0526 - 0.2222 - 0.0250 - 0.0510$$

d. $$\frac{0.7250}{X} = 0.7544$$

e. Multiply both sides of the equation by X.

$$0.7250 = 0.7544X$$

f. Divide both sides of the equation by 0.7544.

$$0.96 = X$$

Components	Current RMV	Adjustment	Adjusted RMV
Land	$40,000,000	0.90	$36,000,000
OSD	$5,000,000	1.00	$5,000,000
Improvement	$145,000,000	**0.96**	$139,200,000
FB	$10,000,000	0.98	$9,800,000
Total	$200,000,000	0.95	$190,000,000

Measures of Reliability

Decisions made using ratio studies have the potential of affecting hundreds of thousands of ***real market values*** *across the state.* Measures of reliability shape the **confidence** that can be placed in the conclusions drawn in ratio studies. A 95% confidence level is accepted as a standard for ratio study analysis.

> **Confidence Level**: a measure of the reliability of a result. A confidence level of 95 percent or 0.95 means that if the same population is sampled on numerous occasions and interval estimates are made on each occasion, the resulting intervals would bracket the true population parameter in approximately 95% of the cases.
>
> **Confidence Interval:** expresses the degree of uncertainty associated with a sample statistic. Confidence intervals indicate (a) the precision of the estimate and (b) the uncertainty of the estimate. Example, when the central tendency of the ratios equals 100% and the confidence interval is ±7.2%, the ratios can be expected to fall within a range from 92.8% to 107.2%.

$$\text{Confidence Interval for a 95\% Confidence Level} = \text{Mean} \quad +/- \quad \frac{1.96 \times \text{Standard Deviation}}{\text{Square Root of (Sample Size)}}$$

The calculations of central tendency and confidence interval assume that sales are representative of the population of the study area. Sales concentrated in areas where valuations are either progressive or regressive will result in skewed reliability measures. In study areas where sold properties are reappraised and unsold properties are not, measures of central tendency and confidence intervals will not represent the true status of the assessment program.

When measures of reliability are wide due to small arrays, poor uniformity, or both, additional data is required for proper analysis. If poor uniformity is the cause, a reappraisal is required.

Given a representative sales sample, reliability depends on two factors.

1. Size of the sample.
2. Uniformity within the sample as it relates to the overall population in the study area.

Based on a confidence level (90%, 95%, or 99%), a confidence interval for the mean, median, or weighted mean can be calculated. For ratio study purposes, a 95% confidence level is used.

The following table can be used to determine whether a sample size is adequate based on a **95% confidence level.**

Factors for Calculation of Confidence Interval

Sample size of at least	COV = 10	COV = 20	COV = 30
5	±12.4%	±24.8%	±37.2%
10	±7.2%	±14.3%	±21.5%
50	±2.8%	±5.5%	±8.3%
100	±2.0%	±3.9%	±5.9%
300	±1.1%	±2.3%	±3.4%

Example:

Selected central tendency = 90
COV = 20
Sample size = 50

Using the Calculation of Confidence Interval table above, the probability is 95% of the ratios in the study area can be expected to fall within a range from 85.05 to 94.95.

1. Calculate the confidence interval: 5.5% × 90 = 4.95
2. Apply the confidence interval to the central tendency to establish a range in which the ratios are expected to fall.
   Lower limit: 90 – 4.95 = **85.05**
   Upper limit: 90 + 4.95 = **94.95** Range: 9.90

If the sample size is increased to 300, the probability is 95% of the ratios in the study area can be expected to fall within a range from 87.93 to 92.07 computed as follows:

1. Calculate the confidence interval: 2.3% × 90 = 2.07
2. Apply the confidence interval to the central tendency to establish a range in which the ratios are expected to fall.

Lower limit: 90 – 2.07 = **87.93**

Upper limit: 90 + 2.07 = **92.07** Range: 4.14

In the second example, by adjusting only the sample size, there is a greater confidence in the interval results reflecting increased reliability of the sample. This is demonstrated by the reduced range between the ratios in the second example, 4.14 compared to the first example 9.90.

This next example demonstrates the selected central tendency of 93 is not a supportable market indication because of the 46.12 confidence interval range.

Example:

Selected central tendency = 93
COV = 24
Sample size = 6

Using the Calculation of Confidence Interval table above, the probability is 95% of the ratios in the study area can be expected to fall within a range from 69.94 to 116.06.

1. Calculate the confidence interval: 24.8% × 93 = 23.06
2. Apply the confidence interval to the central tendency to establish a range in which the ratios are expected to fall.

   Lower limit: 93 – 23.06 = **69.94**

   Upper limit: 93 + 23.06 = **116.06** Range: 46.12

IAAO Standard on Ratio Studies 2013, page 34

11.1.2 Recommended Appraisal Level Standards for Direct and Indirect Equalization

The performance standard adopted by an oversight agency should be a range around the legally required level of appraisal in a property class or an overall jurisdiction. This range should be 90 to 110 percent of the legally required level of appraisal for direct equalization or reappraisal, or 95 to 105 percent for indirect equalization. A smaller maximum range for indirect equalization is justified because taxpayers are not as comprehensively affected. Oversight agencies should adopt performance standards that are as close to the legally required level as can be justified given the local situation and taking into account the factors discussed herein.

In addition to the above appraisal level standards, each class of property for which appraisal level standards have been defined must be within 5 percent of the overall level of appraisal of the jurisdiction (see section 11.2.3, "Uniformity among Strata," in this part). Both criteria must be met.

SECTION 10

RECALCULATION TRENDING AND ADDITIONAL STUDIES

Recalculation

Traditional trending in Oregon began in the 1970s as a method of testing and adjusting true cash values of properties in the time period between six-year appraisal cycles. The trends were based on sales studies of market movement over time in each cycle maintenance area and applied annually. As time passed, the studies became more detailed where land and improvements were studied and trended separately within each maintenance area. Eventually, traditional trending was refined to separate the value contributions of land, on site development (OSD), major improvements, and farm buildings within market study areas.

Recalculation further refines the process and is essentially **a more comprehensive form of trending.** An existing valuation model is adjusted or a new one created based on current market analysis of property characteristics. Application of the modified model calculates a new estimate of real market value for each property.

It is important to compare the traditional trending, the recalculation process, and appraisal:

- Traditional trending, recalculation, and appraisal all calculate new market values estimates
- Both recalculation and appraisal rely on constructing valuation models based on current market analysis
- Recalculation relies on the inventory characteristics as they appear on the assessment record without field verification of the characteristics of the unsold properties in the market study area
- Appraisal requires field verification and updating of property characteristics through physical inspections of all properties being revalued to assure equal and equitable treatment of both sold and unsold properties

Values developed through recalculation are treated differently than those developed through reappraisal when applied to adjudicated RMVs. By statute, when an area is trended, adjudicated values can be adjusted to proportionately reflect the percentage change in value due to the adjudication. However, when a property is reappraised, the adjudicated values may not be changed.

Oregon Revised Statute 309.115 and the associated OAR 150-309-0210(3) provide direction and clarification for adjustment of adjudicated values.

> **ORS 309.115 Effect of property value correction upon appeal; exceptions.** (1) If the Department of Revenue, the board of property tax appeals or the tax court or other court enters an order correcting the real market value of a separate assessment of property and there is no further appeal from that order, except as provided under subsection (2) or (3) of this section, the value so entered shall be the real market value entered on the assessment and tax rolls for the five assessment years next following the year for which the order is entered.
> (2) Notwithstanding subsection (1) of this section, the following adjustments may be made to the real market value during the period described in subsection (1) of this section:
> (a) Annual trending or indexing applied to all properties of the same property class in the county, or within clearly defined areas of the county under this chapter.
> (b) Annual trending or depreciation factors applied to similar property.
>
> **OAR 150-309-0210**
> (3) Assessors may develop valuation models to determine the real market value of property in the same property class and in the same defined market area that rely on applying trending, indexing, and depreciation factors to multiple, identifiable property characteristics on file.

Ratio Study Reporting for Recalculated Market Areas

Provide these three primary components in ratio study reports when recalculation models are employed in the revaluation of properties in market study areas:

- Before ratio analysis
- Recalculated RMVs with a description of the recalculation process used
- After ratio analysis

Ratio Study Analysis Before Adjustment of Roll Values (Before Ratio)

A **before ratio analysis** is a resource used to test RMV equality and uniformity and can provide important information as to the overall status of the assessment and taxation program. The before ratio compares the previous year's certified roll RMV to the sale prices of properties that sold during the sales year.

The study utilizes arm's length transactions that have not been adjusted for observed differences in property characteristics that may have been discovered during the sales confirmation and/or verification process. The before ratio results in a raw un-skewed profile of the program.

In addition to RMV level, a before ratio provides an evaluation of the equality and uniformity of assessment between sold and unsold property valuations. The accuracy of the inventory record can be evaluated through an analysis of the sales data, especially not same as appraised (NSA) and/or outlier sales. These considerations are especially important when a decision to traditionally trend, recalculate, or appraise is required.

Recalculation Process

The recalculation process can consider all of the numerous individual characteristics in the valuation model. It is distinguished from appraisal by its lack of a property inspection. Market studies (LCM, depreciation, etc.) should be similar or the same as those used in an appraisal setup. Both recalculation and traditional trending accomplish the task of adjusting the assessment roll to a statistical 100% of RMV each year without a physical in-field verification of property characteristics.

The county must be able to explain the recalculation process to the taxpayer and is required to include an explanation of the methods in the ratio study report.

> **ORS 306.255 Information for taxpayers concerning property taxes, appraisals and appeals.** (1) The county assessor shall provide and make available to taxpayers, upon request, the following information:
>
> (b) An explanation of the methods of appraisal generally and, if of interest to the taxpayer, the method or methods of valuation of the type of property with which the taxpayer is concerned.

Ratio Study Analysis After Adjustment of Roll Values (After Ratio)

The **after ratio analysis** is a comparison of the newly modified RMVs achieved through recalculation or reappraisal divided by the appropriately adjusted sale prices. A successful assessment program will attain a statistical 100% of RMV, validated by central tendencies, and maintain acceptable uniformity as measured by the COD.

When central tendencies vary significantly from 100%, the appraisal model may require adjustment or an overall trend may need to be applied to the property RMVs.

For example, an after ratio of 107% indicates the new recalculated or reappraised RMVs are not at market. The valuation model should be rechecked for data entry or formula errors. If no explanation is found, each component of the model should be reconsidered. If no satisfactory explanation for the 107% ratio is discovered, the overall adjustment factor (100 ÷107 = 0.93 or 93%) is necessary to achieve the 100% RMV and should be applied and described in the ratio study report.

Supplemental Studies

When the initial data from sales arrays is analyzed and found to be inadequate, additional studies would be necessary to develop the most appropriate ratio conclusions. Supplemental studies are prepared and analyzed in the same consistent manner as other studies.

The following supplemental studies are recognized and approved by the Department of Revenue:

A. Combined Property Class Studies

B. Straddle Study (explanation follows)

C. Appraisal Ratio Studies (explanation follows)

D. Rent Studies

E. Farm Buildings Studies

F. Accessory Structures Studies

G. Real Estate Listings

H. Building Class Study

I. Multi-year Studies

Straddle Study

Any study, sensitive to change from a specific point in time, where the sample is developed from sales spanning equal distance from each side of the point (assessment date) is a straddle study.

Example

January 1 is the assessment date. A six-month study of sales should include October, November, December (from the sales collection year) and January, February, March (after the January assessment date).

2015 Oct	2015 Nov	2015 Dec	January 1 Assessment Date	2016 Jan	2016 Feb	2016 Mar

This study can be used as an after ratio study to ascertain that corrective trends applied did, in fact, bring roll values to 100% of RMV.

These studies are also used when properties are recalculated annually to test the validity of the new values for 100% RMV as of the setup date.

Appraisal Ratio Studies

Appraisal ratio studies include a physical appraisal of a sample of properties typical of a defined market area. This type of study is necessary when sales data is inadequate to derive valid ratio conclusions. Current certified roll values are divided by the newly appraised values to arrive at valid ratio conclusions for the remaining properties in the area.

A qualified appraiser other than the one who appraised the property originally for assessment purposes should make the appraisals. A random selection of properties that is of sufficient size to be representative of the property class and the market study area should be appraised.

An appraisal ratio study is compiled and computed in the same manner as a sales ratio study. Data that can be used in an appraisal ratio study are: gross rent multipliers, construction cost indices, prior years' sales, real estate trends, and sales data from other counties.

An appraisal ratio study includes the following steps:

1. Select a sufficient random sample of properties to be appraised
2. Assign qualified appraiser(s) to appraise the properties
3. Perform a field inspection of the selected properties
4. Correlate data (sales, gross rent multipliers, cost indices, etc.)
5. Calculate value estimates for the sample properties
6. Compute appraisal ratios by dividing the last certified RMV by the newly appraised RMV of the sample properties
7. Array ratios for analysis, then check for anomalies within the sample compared to the market study area and property class
8. Determine market study area adjustment conclusions

Recap

Recalculation, reappraisal, and traditional trending are methods of updating RMVs to achieve 100% of real market value as of the assessment date. The use of supplemental studies is a strategy that may provide additional support for valuation and ratio conclusions. All supplemental studies utilized in analysis conclusions must be described and documented as part of the ratio study report.

SECTION 11

PREPARING AND ASSEMBLING THE RATIO STUDY REPORT

Contents of the Assessor's Certified Ratio Study Report

Basic contents of the Assessor's Certified Ratio Study Report is governed by Oregon Administrative Rule (OAR) 150-309-0240. The rule requires inclusion of a number of exhibits and states the study report will be prepared in accordance with OAR 150-309-0250.

OAR 150-309-0250 addresses the processes and procedures used in the study report, the responsibility for the report, and the source reference for reporting. It states the study report must be completed under the supervision of the county assessor in conformance with the current *Assessor's Ratio Procedures Manual* and the *Data Exchange Manual* published by the Department of Revenue.

The Ratio Study Report Must Include:

Cover Page

- County name
- Name of Report (*Assessor's Certified Ratio Study*)
- Assessment year affected
- Other optional information per county's discretion

Assessor's Certification Page

- Statement signifying the ratio study has been prepared according to ORS 309.200
- Certification that identified adjustments will achieve 100% of Real Market Value per ORS 308.323
- Assessor's signature and date of signing
- Designated county report contact and designee's contact information

Table of Contents

- Titles of major topics in the report
- Other topics as deemed appropriate by the county
- A page numbering system

Introduction and Analysis of Valuation Methods and Procedures

- Purpose of the report
- Format of the report
- Scope of the report
- Status of the assessor's RMV adjustment program
  - Description of the recalculation process (if utilized)
  - Identification of the current assessment computer system(s)
  - Actions of the assessor after ratio study report
- Number of sales during study year (January 1 through December 31)
  - Total number of sales (considered arm's-length transactions)
  - Number of sales used in the studies
  - Number of sales confirmed and/or verified
- Property classification codes as used in the county
- List of sale condition codes with definitions as used in the county
- Sales listing format
- Description of report sections
  - Summary of Adjustments and After Ratio
  - Sales trimming method
  - Change in Market Conditions Over Time (Time Study)
  - Market area studies, conclusions, and adjustment pages

County Map

Summary of Adjustments and After Ratios

List all property classes and market areas within each class, even when no adjustment is planned.

- Residential
- Tract

- Multi-family
- Market farm and forest
- Commercial
- Industrial
- Manufactured structures
- Recreation
- Other (waterfront, etc.)

Sales Trimmed

- Method used for trimming sales
- Sales list of all arm's-length transactions trimmed

Change in Market Conditions Over Time (Time Study)

- Calculate and display central tendencies (mean, median, weighted mean, etc.)
- Conclusion of change over time analysis
- Chart or appropriate graph of the sales ratios plotted against dates of sales

  Note: *Counties with large data sets need to select an appropriate chart or graph to portray their data. When charting or graphing sales, be sure to label the axis points: x axis=dates of sales, y axis=ratios*
- List of all sales used in the time study

Market Area Studies (Analysis Pages)

- Before adjustment market area ratio study (before trending, updating property characteristics, and/or recalculation of RMVs)
  - Map of area(s) included in the study
  - Number of accounts in the study area
  - Number of sales used in the study
  - Central tendencies (mean, median, weighted mean, etc.)
  - Weighting (for market areas with improved property types)
  - A histogram showing frequency of sales ratios before adjustments
  - List of all sales used in the market area study

- After adjustment, market area ratio study (after trending, recalculation of RMVs, or other adjustment) Note: The after ratio study may be combined with the before ratio analysis in non-recalculation areas where characteristics of sale properties are not updated and RMVs are not adjusted by means other than traditional trending.
    - Central tendencies (mean, median, weighted mean, etc.)
    - Narrative description for selection of the measure of central tendency considered most representative of the market in the study area
    - Weighting (for market areas with improved property types)
    - A histogram showing frequency of sales ratios after adjustments
    - Current COD and PRD with a 3 to 5 year COD history

Supplemental Studies (i.e. Straddle Study, Appraisal Ratio Study)

- Explanation of the study
- Conclusion of the study
- The market areas where the supplemental study is applied

Valuation Plan for the Ratio Year

- Submit with ratio study report, or
- May be submitted separately but must be received by November 1
- Include the following information in the plan:
    - Report progress in areas where CODs were out of standard in the previous year
    - Update progress on prior year's Valuation Plan to reflect what was accomplished and what remains to be completed
    - Actions planned to repair values in areas with out-of-standard CODs

Example Report Format

County Name

Assessor's Certified Ratio Study

Assessment Year

CERTIFICATION

20__ Ratio Study, _____ County

Certification and Analysis of Valuation Methods and Procedures

State of Oregon

County of _____

I, _____, Assessor of _____ County, State of Oregon, do hereby certify that I have prepared a ratio study for the current tax year, according to ORS 309.200 and guidelines developed by the Department of Revenue. The attached is a complete and accurate copy of the original now on file in my office.

I further certify the ratios and adjustments identified in this study will achieve 100 percent of real market value for real property and manufactured structures for the current year according to ORS 308.232.

This report is delivered to the Department of Revenue and will be provided to the Clerk of the Board of Property Tax Appeals to provide current knowledge of the adjustment program used by my office.

Assessor's Signature	Date
Designated Ratio Study Contact	Date
Contact's email address	Contact's Phone

TABLE OF CONTENTS

20__ RATIO STUDY, _____ County

Change in Market Conditions Over Time (Time Study) ____

Market Area Studies (Analysis Pages)

- Residential ____
- Tract ____
- Multi-family ____
- Market farm and forest ____
- Commercial ____
- Industrial ____
- Manufactured structures ____
- Recreation ____
- Others as necessary ____

Supplemental Studies ____

Valuation Plan for the Ratio Year ____

20 _ _ ASSESSOR'S CERTIFIED RATIO STUDY

_____COUNTY

Introduction and Analysis of Valuation Methods and Procedures

Purpose of the Ratio Study Report

The purpose of this ratio study is to assist the assessor in maintaining equality of assessment through valuation of property at 100 percent of real market value (RMV) and uniformity as measured through coefficients of dispersion.

The purpose is accomplished through the study of the relationship between prior year or recalculated real market values and the sale prices of properties. The study:

- Is useful in managing the county appraisal and adjustment programs
- Measures the real market value level from year to year
- Identifies adjustment factors necessary to achieve the required RMVs for the current roll
- Documents the analysis and decision-making process

Format of the Report

The format is intended to be flexible and document the adjustment program. The report is structured to provide introductory information, a Summary of Adjustments with After Ratios and CODs, Time Trend Analysis with analysis and supporting sales data, Market Area Studies and Conclusions with analysis and supporting sales data.

Scope of the Report

This ratio study investigates the valuation levels for the majority of real property and provides indicated adjustments necessary to achieve 100% of real market value. The ratio study does not report on the valuation of personal property, specially assessed property, and some industrial properties that are annually recalculated.

Status of the Assessor's RMV Adjustment Program

The report describes the county's recalculation process (if utilized).

The county's current assessment computer system is _____. (If in conversion, identify new system, explain status of transition, and projected completion date.)

The assessor's office will continue to review market information. It is possible that additional data or further analysis will lead to different conclusions than contained in this report. Changes to this study will be reported to the department and to the Board of Property Tax Appeals.

Number of Sales during Study Year

Total number of arm's-length transactions during study year _____

Number of sales used in the studies _____

Number of sales confirmed and/or verified _____

Recalculation Process

The recalculation process can consider all of the numerous individual characteristics in the valuation model. It is distinguished from appraisal by its lack of a property inspection. Market studies (LCM, depreciation, etc.) should be similar or the same as those used in an appraisal setup. Both recalculation and traditional trending accomplish the task of adjusting the assessment roll to a statistical 100% of RMV each year without a physical in-field verification of property characteristics.

The county must be able to explain the recalculation process to the taxpayer and is required to include an explanation of the methods in the ratio study report.

> **ORS 306.255 Information for taxpayers concerning property taxes, appraisals and appeals.** (1) The county assessor shall provide and make available to taxpayers, upon request, the following information:
>
> (b) An explanation of the methods of appraisal generally and, if of interest to the taxpayer, the method or methods of valuation of the type of property with which the taxpayer is concerned.

Property Classification Codes

Consistent classification ensures that each property receives the correct analysis for valuation. A system has been structured in statute and administrative rule [ORS 308.215 and OAR 150-308-0310] to meet this need and provide consistency statewide. Property classification, with the exception of specially assessed properties, is based on *highest and best use* of the property and must be maintained on a continuing basis by the assessor.

Basic Property Classification Codes

100	Residential land only	101	Residential property
200	Commercial land only	201	Commercial property
300	Industrial land only	301 303	Industrial property County Industrial property DOR
400	Tract land only	401	Tract property
500	Farm & range land only, not specially assessed	501	Farm & range property not specially assessed
540	Non-EFU zone land, which is under special assessment by application	541	Non-EFU zone farm and range property under special assessment farm use assessment by application
550	EFU zoned farm & range land only, specially assessed	551	EFU zoned farm & range property, specially assessed and market
600	Forestland only, classified and specially assessed	601	Forest property specially assessed and market
640	Forestland only designated by application	641	Forest property designated by application, specially assessed and market
700	Multi-family land only	701	Multi-family property
800	Recreation land only	801	Recreation property
000	Miscellaneous land only	009	Real property Manufactured structures
		019	Personal property Manufactured structures

Property class codes: for a complete listing and description see ORS 308.215 and OAR

The report includes adjustments to real market value estimates of farm and forest deferred properties.

Condition Code

Condition codes were developed to provide a numeric means of categorizing property sales by the circumstances surrounding the transaction. The code represents the most compelling sale condition description, which ties to its usability in the ratio study.

Basic Sales Data Condition (or Reason) Codes

Code	Description
1	Change of use
2	Deed does not show warranty of title
3	Grantee/grantor is a political subdivision (government agency)
4	Grantee is a bank or other financial institution, or lender foreclosure
5	Grantee is charitable, religious, or other institution
6	Grantee and Grantor are related or business associates
7	Conveyance of partial or divided interest
8	Grantee and grantor are the same, transfer of convenience
9	Trade (exchange of properties)
10	Conveyance of property to avoid lien/foreclosure
11	Grantor is sheriff or other court office (administrator), receiver, guardian, trustee
12	Contract payoff
13	Critical field on deed/document left blank
14	Prior year's real market value or sale price missing
15	Date of sale missing
16	Sale includes personal property, which cannot be accurately extracted
17	Sale includes orchards, crops, or other exempt properties
18	Mortgage balance is not noted
19	Error in classification (unless corrected by reclassification)
20	Other errors or omissions (miscellaneous)—*MUST* explain under Reasons for Rejection
21	Property sold is not the same as assessed for the current certified roll
22	Sale includes designated forestland and/or timber
23	Sales of properties that have had the real market value adjudicated by the BOPTA, DOR, or Tax Court (in the past five years)
30	Usable, but *unconfirmed*, within current sales year
31	Unconfirmed *prior* year's sale adjusted for time and used in current year's ratio study
32	Confirmed prior year's sale adjusted for time and used in current year's ratio study
33	Confirmed sale

Sales Listings

A collection of sales or market data that have been analyzed and determined to be adequate for use in the ratio study. The collection of sales is usually organized in a standard format (see below). Each study has a sales listing. For each sale in the listing, the property is identified, classified and a ratio calculated.

A description of major headings in the **standard format** of sales listings:

- **Market Area**: specific group of properties selected for study, i.e. residential neighborhoods, convenience stores, retail shops
- **Account Number:** numeric or alphanumeric property identifier
- **Property Class (PC)**: A three digit number designating type of property
  Example: 1-0-0 Residential Vacant or 1-0-1 Residential Improved
- **Condition Code:** a numeric means of categorizing property sales by the circumstances surrounding the transaction
- **Map and Tax Lot:** Locates the property in the county. Sales that include more than one account display an asterisk (*) after the tax lot number.
- **Instrument Number:** The recording number that identifies the sale document
- **Total RMV:** This is usually the RMV from the current certified assessment roll. In some cases it is the value that would have been on the roll although the property has changed. Examples of such changes include construction of buildings and consolidation with other tax lots.
- **Sale Price:** Normally the consideration on the document transferring ownership.
- **Adjusted Sale Price** (when applicable)**:** The estimated sale price for the property if it were to sell January 1, assessment date for the current study; or, if the sale price is adjusted to remove personal property value, for example.
- **Sale Number:** sales are ordered and each is identified with a number
- **Ratio:** A comparison where the RMV on the certified roll for a Before Ratio (and the recalculated RMV for an After Ratio) is divided by the Sale Price or Adjusted Sale Price and the result is expressed as a percentage. This expresses the RMV level as of the date of sale or as of January 1 assessment date. Example: Current RMV on the

certified roll: $95,000. Property sold in May for $100,000. The ratio is computed as $95,000 ÷ $100,000 = 0.95 or a ratio of 95 percent (represents the level of valuation as of May).

Note**:** The sale was not adjusted to January 1 of the current year.

Description of Report Sections

Summary of Adjustments

Summary pages list market area studies for each property classification. The summary should specify the area(s) and the number of accounts affected by the study; report page number; adjustment factors for land, improvements, and overall; after ratio; PRD; COD standard for the area and the COD for the reporting year.

Market areas are listed

- **Residential**: residential land, single family dwellings, condominiums, duplexes, tri-plexes, four-plexes and manufactured structures
- **Rural**: tract property, market residential improvements, farm, and forest buildings
- **Income**: land and improvements for commercial, industrial, and multi-family properties
- **Other**: land and improvements that do not fit into any of the other categories: recreational properties and mineral rights [if it is actively being mined as of the assessment date ORS. 308.115 (2)] including site improvements

Sales Trimming

Very low or very high ratios are often called outliers. Outliers require additional scrutiny to identify whether the sale is a non-market transaction or an extreme event that may tend to skew the results of the study.

Standard statistical trimming methods (Trimmed Mean and Interquartile Range) are recognized as a means to identify and remove certain outliers from sales listings used in

market analysis. Trimming is not mandatory but when appropriate, it is performed before all other studies.

Change in Market Conditions Over Time (Time Study)

Fluctuating market conditions may create the need to apply an adjustment to sales prices that occurred during the sales year. Although the adjustment is often called a time adjustment, time itself is not the reason for the adjustment; it is the movement of value over time. The adjustment is expressed as a percentage of increase or decrease to sales prices to reflect what the property would have sold for as of the assessment date.

This section includes trend analysis and documented support for the conclusions. The data is usually presented in graphic form by month and/or quarter followed by a narrative conclusion. Time trends may be developed for various property classes but usually apply to residential properties.

Market Area Studies (Analysis Pages)

Each study should include a map of the study area, market area identifier (name, code number, etc.), description of the physical location, and the property classification(s) studied. Describe land characteristics, dominate age, type of improvements, and the last year physically appraised.

The analysis pages include:

- Number of accounts in the study area
- Number of sales used for the study
- Measures of central tendency calculated for the sales
    - **Median**: the middle of the array, influenced only by the position of the ratios in the array, not by their values
    - **Mean** (Arithmetic Mean): the simple average of the individual ratios in the sales array
    - **Weighted Mean**: derived by dividing the total of the current certified roll RMVs or recalculated value of the sales by the total of the sale prices in the array
- Narrative description for the selection of the measure of central tendency considered

most representative of the market study area. *Note*: No single sale should have a large influence on the selected central tendency.

  - Avoid a MEAN distorted by extreme ratios
  - Avoid a WEIGHTED MEAN influenced by high valued properties at either end of the array
  - Avoid a MEDIAN when gaps exist in the middle of the frequency distribution

- Calculated overall adjustment factor. (When a time adjustment is applied to the selected central tendency, the adjustment information will be included on the analysis page.)
- For improved properties, the overall adjustment factor may be weighted and applied to the individual RMV components (land, OSD, farm buildings, major improvements)
  - A correct overall adjustment factor will result in half the properties being over market and half being under market but does not test uniformity in valuation (which is measured by CODs)
  - A single adjustment factor applied to all components cannot reduce the distribution of ratios within a property class or improve the COD
  - Weighting by percentage of the individual RMV components may be applied when sufficient data is available and may improve COD
- Histogram showing frequency of sales ratios before and after adjustments: a visual aid used to display distribution of ratios and gives an indication of the degree of uniformity
- Coefficient of Dispersion (COD): average deviation from the median converted to a percentage. It measures uniformity of real market value levels.
- Price Related Differential (PRD): used to evaluate whether RMVs are reasonably uniform between high and low valued properties
- Current and 3-5 year performance history for COD and PRD

COUNTY MAP

and

MAPS OF MARKET AREAS AS APPROPRIATE

Summary of Adjustments

				Adjustments								
Property Class	**Maint Area**	**NH**	**# of Accts**	**Land**	**OSD**	**Major Imps**	**Farm Buildings**	**Overall**	**After Ratio**	**COD Standard**	**COD 2016**	**Page #**

Sales Trimming Method and List of Sales Trimmed

Method used for trimming sales:

List of arm's-length transactions trimmed:

Time Trend Analysis
for the January 1, 20_ _ Assessment Date

Trend Studies Method(s):

List the method(s) used in the time trend study:

I. Ratio Analysis
   a. Direct Calculation
   b. Mid-point (annual)

II. Direct Sales Analysis
   a. Double Sales
   b. Paired Sales

Charts:

Market Activity (monthly, quarterly, etc.)

Sales History

Trend Conclusions:

Residential, Commercial, Other

Market Area Studies
(Analysis Pages)

For each market study area include the following:

- Map of market study area
- Description of the market study area

Property Class/Type: Market Area name/number/code or unit type: _____

Number of Accounts in the Study: _____ Number of Sales: _____

ADJUSTMENT CALCULATION SUMMARY:

Weighting Calculations (For Improved Property Types only) Year Last Appraised _____

Values	Before Adjustment	Before Adjustment	After Adjustment	After Adjustment
Land	$ _____	_____ %	$ _____	_____ %
OSD	$ _____	_____ %	$ _____	_____ %
Improvements	$ _____	_____ %	$ _____	_____ %
Other (Outbuildings)	$ _____	_____ %	$ _____	_____ %
Total	$ _____	_____ %	$ _____	_____ %

Selected Central Tendency & Adjustment Factors

	Central Tendency	Adjustment Factor	
Selected Central Tendency:	_____		
Mid-Point Adjustment Factor:		_____	
Modified Selected Central Tendency:	_____		
Overall Adjustment Factor*:*		_____	
Land Adjustment Factor*:*		_____	
OSD Adjustment Factor*:*		_____	
Improvement Adjustment Factor*:*		_____	
Other Adjustment Factor*:*		_____	
After Ratio:			_____ %

Explanation for Selection of Central Tendency: _____

_____

_____

Valuation History

History	2016	2015	2014	2013	2012
Coefficient of Dispersion (COD)					
Price Related Differential (PRD)					

Sales Listings and Statistics

Frequency Distribution Histogram

Central Tendencies and Related Statistics

Median

Average Deviation

Coefficient of Dispersion

Mean

Standard Deviation

Coefficient of Variation

Weighted Mean

Price Related Differential

Additional Measures of Central Tendency

Geometric Mean

Mode

Sales Ratio Arrays (in ascending order)

VALUATION PLAN

Explanation of planned valuation activities for the next ratio year. Other formats containing this information may be submitted. Provide the plan with the ratio study report or submit separately not later than November 1.

Valuation activities from the prior plan that were completed.

Valuation activities from the prior plan that were not completed and obstacles encountered preventing achievement.

Valuation activities planned for the next ratio year.

Discuss study areas of concern: out of standard CODs, aged inventory records, recent natural disasters, etc.

As part of the Ratio Report and the Valuation Plan, complete the form below for market areas where Coefficients of Dispersion (COD) are **currently out of standard**.

Areas where Coefficients of Dispersion Are Out of Standard (Two years in a row is Out of Compliance)							
Market Area	***Property Class/Type***	***# of Accounts Affected***	***Current Year COD***	***Prior CODs***			
				1 Year	***2 Years***	***3 Years***	***4 Years***

SECTION 12

STATUTES AND RULES
RELATING TO COUNTY RATIO STUDIES

ORS 192.430 Functions of custodian of public records; rules. (1) The custodian of any public records, including public records maintained in machine readable or electronic form, unless otherwise expressly provided by statute, shall furnish proper and reasonable opportunities for inspection and examination of the records in the office of the custodian and reasonable facilities for making memoranda or abstracts therefrom, during the usual business hours, to all persons having occasion to make examination of them. If the public record is maintained in machine readable or electronic form, the custodian shall furnish proper and reasonable opportunity to assure access.
(2) The custodian of the records may adopt reasonable rules necessary for the protection of the records and to prevent interference with the regular discharge of duties of the custodian. [1973 c.794 §4; 1989 c.546 §1]

ORS 306.115 General supervision over property tax system; correction of assessment rolls.
(1) The Department of Revenue shall exercise general supervision and control over the system of property taxation throughout the state. The department may do any act or give any order to any public officer or employee that the department deems necessary in the administration of the property tax laws so that all properties are taxed or are exempted from taxation according to the statutes and Constitutions of the State of Oregon and of the United States. Among other acts or orders deemed necessary by the department in exercising its supervisory powers, the department may order the correction of clerical errors, errors in valuation or the correction of any other kind of error or omission in an assessment or tax roll as provided under subsections (2) to (4) of this section.
(2) The department may order a change or correction to the assessment or tax roll for the current tax year applicable to all real or personal property of the same class or in the same area if the order of the department is mailed not later than October 15 of the current tax year.
(3) The department may order a change or correction applicable to a separate assessment of property to the assessment or tax roll for the current tax year and for either of the two tax years immediately preceding the current tax year if for the year to which the change or correction is applicable the department discovers reason to correct the roll which, in its discretion, it deems necessary to conform the roll to applicable law without regard to any failure to exercise a right of appeal.
(4) Before ordering a change or correction to the assessment or tax roll under subsection (3) of this section, the department may determine whether any of the conditions specified in subsection (3) of this section exist in a particular case. If the department determines that one of the conditions specified does exist, the department shall hold a conference to determine whether to order a change or correction in the roll.
(5) For purposes of this section, “current tax year” means the tax year in which the need for the change or correction is brought to the attention of the department.
(6) The remedies provided under this section are in addition to all other remedies provided by law. [1983 c.605 §1; 1985 c.613 §18; 1987 c.656 §1; 1989 c.171 §42; 1991 c.5 §20; 1991 c.459 §32; 1995 c.650 §66; 1997 c.541 §89]

ORS 306.120 Uniform methods of assessment; continuing study of equalization. The Department of Revenue shall:
(1) Issue regulations, bulletins, manuals, instructions and directions to county assessors, county boards of property tax appeals and tax collectors as to the methods best calculated to secure uniformity according to law, in the system of assessment and collection of taxes.
(2) Carry on a continuing study with the object of equalizing for the purposes of assessment and taxation property values within the counties and between the counties. [Amended by 1997 c.541 §94]

ORS 306.125 Property tax appraisal program; maps, plats, standardized record systems for assessors and tax collectors.

(1) The Department of Revenue is authorized to institute programs for the appraisal of property in counties of the state and to make appraisals for the use of county assessors and boards of property tax appeals in assessing property and reviewing assessment rolls, and may install, and assist in the preparation and maintenance of, maps, plats or standardized record systems, as prescribed by the department, in the offices of assessors and tax collectors.

(2) The department and county courts are authorized to enter into agreements for the sharing of the expenses of such appraisals and installations including salaries and expenses of department employees engaged therein.

(3) Counties entering into agreements pursuant to this section may pay to the Department of Revenue from time to time:

(a) Moneys to be disbursed by the department as part of the county's share in the expenses authorized under this section and agreed to under such agreements; and

(b) Moneys to reimburse the department where department disbursements under such agreements, whether from the department's appropriations from the State General Fund or from moneys credited to the Assessment and Taxation County Account, have exceeded its proportionate share of expenses and a rebalancing of expense-sharing accounts is deemed desirable or necessary.

(4)(a) All moneys received by the Department of Revenue under subsection (3) of this section shall be immediately turned over to the State Treasurer, who shall deposit the moneys in the General Fund to the credit of an account to be known as the Assessment and Taxation County Account, and such account hereby is continuously appropriated to the Department of Revenue for the purposes of this section and ORS 306.117.

(b) The Department of Revenue may use the moneys to the credit of the Assessment and Taxation County Account, or any part thereof, for expenditures in connection with appraisals and installations contracted for, including cash advances for travel and living expenses of employees, and including payments to any county made to rebalance expense-sharing accounts, from time to time, where a county's disbursements under agreements entered into pursuant to this section have exceeded its proportionate share of expenses under such agreement. Any moneys received in reimbursement of these cash advances shall be deposited in the Assessment and Taxation County Account. Refunds of unexpended receipts may be made to the counties. [1953 c.232 §1; 1959 c.115 §1; 1963 c.84 §1; 1985 c.604 §6; 1997 c.541 §95; 2005 c.94 §29; 2013 c.730 §5]

ORS 306.255 Information for taxpayers concerning property taxes, appraisals and appeals.
(1) The county assessor shall provide and make available to taxpayers, upon request, the following information:
(a) An explanation of the ad valorem property tax system, including but not limited to the manner in which the amount of ad valorem property tax is determined, the manner in which the taxpayer's share of that tax is determined and the manner in which the limitations on the amount of that tax is determined.
(b) An explanation of the methods of appraisal generally and, if of interest to the taxpayer, the method or methods of valuation of the type of property with which the taxpayer is concerned.
(c) A general explanation of the manner in which to appeal the value of property and a description of the kind of information that may be needed to present an appeal.
(2) The Department of Revenue shall prepare written materials concerning each of the subjects identified in subsection (1) of this section and make those materials available to the county assessors and to individual taxpayers upon request. [1991 c.903 §6]

308.062 Action by department when appraisals not being conducted as provided by law; reimbursement of department costs.

(1) If the Department of Revenue determines that appraisals in any county are not being made as provided by law, to meet the requirements of real market value and under a program that ensures compliance with ORS 308.234, or if the department determines that the county is not in compliance with a conference agreement or a plan developed at a conference as provided under ORS 294.181, it shall make a written report to the county court or board of county commissioners of the county, describing the provisions of law which are not being followed and recommending specific measures to be taken by the county court or board and the assessor to cure the deficiencies noted.

(2) If the department thereafter discovers that any measure or measures are not being taken as recommended under subsection (1) of this section, and that as a result, in the department's opinion, appraisals in the county are not being made as provided by law, including meeting the requirements of ORS 308.232 or 308.234, the department shall give 30 days' written notice to the assessor and to the county court or board of county commissioners of its intention to use the most practicable means to cure the deficiencies, including but not limited to the use of its own employees and equipment or the use of fee appraisers. If within the 30-day period the assessor and the county court or board of county commissioners fail to take action to correct the deficiencies through the providing of funds and personnel, or by the submission of a plan acceptable to the department, the department shall proceed to cure the deficiencies. The county court or board of county commissioners shall bear the full expense of the necessary actions taken by the Department of Revenue for the benefit of the county, aided by the provisions of subsection (3) of this section.

(3) In the event that the department must perform services within or for a county pursuant to subsection (2) of this section, the costs shall be advanced from its Assessment and Taxation County Account, described in ORS 306.125, and, except as otherwise provided by law, that account shall be reimbursed for the sum of such costs from the county's share of the state shared funds, unless other provision is made by action of the county court or board. Reimbursement of the Assessment and Taxation County Account shall be made from time to time upon the order of the Secretary of State to the State Treasurer, based upon the Department of Revenue's certified, itemized statement of such costs to the Secretary of State. Reimbursement shall be from an equal proportion of all state share funds required or permitted to be distributed to the county that are not otherwise dedicated as provided by law. If the county is a county for which expenditures for assessment and taxation have been certified under ORS 294.175, the total reimbursement to the department shall not exceed the amount of the expenditures so certified. If the county is a county for which expenditures for assessment and taxation have not been certified under ORS 294.175, the total reimbursement to the department shall not exceed the total amount of expenditures as determined for purposes of issuing the notice required under ORS 294.175 (4). Copies of the department's certified itemized statement of costs shall be sent to the county court or board and to the county assessor. [1989 c.796 §18; 1991 c.459 §175; 1997 c.782 §8; 2003 c.169 §10]

ORS 308.205 Real market value defined; rules. (1) Real market value of all property, real and personal, means the amount in cash that could reasonably be expected to be paid by an informed buyer to an informed seller, each acting without compulsion in an arm's-length transaction occurring as of the assessment date for the tax year.
(2) Real market value in all cases shall be determined by methods and procedures in accordance with rules adopted by the Department of Revenue and in accordance with the following:
(a) The amount a typical seller would accept or the amount a typical buyer would offer that could reasonably be expected by a seller of property.
(b) An amount in cash shall be considered the equivalent of a financing method that is typical for a property.
(c) If the property has no immediate market value, its real market value is the amount of money that would justly compensate the owner for loss of the property.
(d) If the property is subject to governmental restriction as to use on the assessment date under applicable law or regulation, real market value shall not be based upon sales that reflect for the property a value that the property would have if the use of the property were not subject to the restriction unless adjustments in value are made reflecting the effect of the restrictions.
[Amended by 1953 c.701 §2; 1955 c.691 §§1, 2; 1977 c.423 §2; 1981 c.804 §34; 1989 c.796 §30; 1991 c.459 §88; 1993 c.19 §6; 1997 c.541 §152]

OAR 150-308-0240
Real Property Valuation for Tax Purposes
(1) For the purposes of this rule, the following words and phrases have the following meaning:
(e) "Highest and best use" means the reasonably probable and legal use of vacant land or an improved property that is physically possible, appropriately supported, and financially feasible, and that results in the highest value. See The Appraisal of Real Estate, 12th edition (2001).
(e) "Highest and best use" means the reasonably probable use of vacant land or an improved property that is legally permissible, physically possible, financially feasible, and maximally productive, which results in the highest real market value.

ORS 308.215 Contents of assessment roll; rules. (1) The assessor shall prepare the assessment roll in the following form:
(a) Real property shall be listed in sequence by account number or by code area and account numbers. For each parcel of real property, the assessor shall set down in the assessment roll according to the best information the assessor can obtain:
(A) The name of the owner or owners and, if the assessor or tax collector is instructed in writing by the owner or owners to send statements and notices relating to taxation to an agent or representative, the name of such agent or representative.
(B) A description as required by ORS 308.240 with its code area and account numbers.
(C) The property class, in accordance with the classes established by rule by the Department of Revenue.
(D) The number of acres and parts of an acre, as nearly as can be ascertained, unless it is divided into blocks and lots.
(E) The real market value of the land, excluding all buildings, structures, improvements and timber thereon.
(F) The real market value of all buildings, structures and improvements thereon.
(G) The real market value of each unit together with its percentage of undivided interest in the common elements of property subject to ORS 100.005 to 100.910 stating separately the real market value of the land, buildings, structures and improvements of each unit.
(H) For each parcel of real property granted an exemption under ORS 307.250 to 307.283, the real market value so exempt.
(I) The total assessed value, maximum assessed value and real market value of each parcel of real property assessed.
(b) For personal property, the assessor shall set down separately in the assessment roll, according to the best information the assessor can obtain:
(A) The names, including assumed business names, if any, of all persons, whether individuals, partnerships or corporations, or other owner, owning or having possession or control of taxable personal property on January 1, at 1:00 a.m. of the assessment year. If it is a partnership, the names of two general partners and the total number thereof.
(B) The real market value of the personal property assessed, with a separate value for each category of personal property, if any. The Department of Revenue, by rule, may establish such categories as appear useful or necessary for good tax administration.
(C) The number of the code area assigned by the assessor covering the situs of the property on January 1.
(D) The total assessed, maximum assessed and real market value for the property.
(c) Real property and machinery and equipment listed on the assessment roll shall each bear a distinctive designation so that machinery and equipment can be identified with the real property upon which the machinery and equipment is located.
(d)(A) The listing of manufactured structures on the assessment roll, whether as real or personal property, shall be done in a distinctive manner so that manufactured structures may be readily distinguished from other property.
(B) In lieu of listing manufactured structures on the assessment roll as real or personal property, the assessor may list manufactured structures in a separate section of the assessment roll. In any county where such separate listing of manufactured structures is made the manufactured structures assessed as real property under ORS 308.875 shall bear a distinctive designation so that it can be identified with the real property upon which it is located. In like manner the real

property upon which the manufactured structure is situated shall bear a distinctive designation so that it can be identified with the manufactured structure. Where a homestead exemption is granted to a manufactured structure assessed as real property under ORS 308.875, which manufactured structure is listed on a portion of the assessment roll separate from the real property, the exempt amount shall apply first to the value of the manufactured structure, and any remainder shall apply to the parcel of land upon which it is situated.
(2) For purposes of the classification of real property required under subsection (1)(a)(C) of this section, property listed in paragraph (a), (b) or (c) of this subsection must be classified, together with any other property listed in the respective paragraph, separately from all other property:
(a) Machinery and equipment.
(b) Property appraised under ORS 306.126, other than machinery and equipment.
(c) Industrial property, other than property appraised under ORS 306.126, and commercial property.
(3) The Department of Revenue may by rule require that the assessment roll include information in addition to that required by subsection (1) of this section. [Amended by 1957 c.324 §2; 1963 c.270 §1; 1963 c.541 §43; 1965 c.344 §1; 1967 c.568 §1; 1971 c.529 §13; 1971 c.568 §1; 1971 c.747 §16; 1977 c.718 §6; 1979 c.692 §3; 1981 c.804 §36; 1983 s.s. c.5 §3; 1985 c.350 §1; 1985 c.613 §7; 1991 c.459 §91; 1997 c.541 §155; 1999 c.579 §4; 2012 c.30 §1]

150-308-0310
Real Market Value and Property Classification as Part of Assessment Roll
(1) In addition to the assessed value of property, the assessment roll must show:
(a) The real market value (RMV) of the land, excluding all buildings, structures, and improvements thereon;
(b) The RMV of all buildings, structures, and improvements; and
(c) The total RMV for each parcel of real property not required to be assessed as a unit.
(d) For properties subject to ORS Chapter 100, for example, condominiums and time shares that are required to be assessed as a unit, the assessment roll must show the RMV as well as the assessed value of each unit.
(2) The assessment roll must include the property classification code number for each parcel of real property in the county, except for those properties assessed by the department under ORS 308.505 to 308.665. The assessor must classify and assign a property classification code number to each parcel as provided in section (8) of this rule.
(3) The assessor must maintain the proper classification on each parcel of property.
(4) A county must separately identify and adjust land and improvement values for each property class for each market area to bring real property to RMV. These adjustments to value must be developed from market studies or by any other method approved by the department as provided under ORS 309.200.
(5) The class code numbers that this rule establishes must be used for computing the real property class ratios required by ORS 309.200.
(6) An assessor must obtain written approval from the Department of Revenue before deviating from the basic property classes defined in section (8) of this rule.
(7)(a) All classification must be based upon highest and best use of the property. The term "highest and best use" is defined in OARs 150-308-0240 and 150-308-0260. The class associated with the property may or may not be its current use.

(b) Unique properties can be classified under the “miscellaneous” category in section (8). The “miscellaneous” category can also be used for property requiring a separate trend.
(c) The property classification system must not be used to categorize market data that is more accurately described by other characteristics, such as the quality class of the improvements, market areas, or neighborhoods.
(d) The property class for mixed-use or transitional properties will be assigned based upon the use that contributes the most to the real market value on the current assessment date.
(A) A mixed-use property is one in which different parts of the property are used differently, such as a commercial use on one part, and a residential use on another part.
(B) A transitional use property is one in which the real market value on the current assessment date, at its current highest and best use, is being influenced in the market by an anticipated change in future use, such as residential property that is likely to sell for a commercial use in the future, but is not in commercial use on the assessment date.
(8) DEFINITIONS FOR PROPERTY CLASSIFICATION SYSTEM. [Classification not included. See ED. NOTE.]
(9) Starting with the 2006–07 tax year, each assessor must prepare an annual plan that outlines how the county will comply with the provisions of this rule no later than the January 1, 2009 assessment date. The plan must be submitted as part of the sales ratio study and accompanying appraisal plan submitted under ORS 309.200 and 309.203. The plan must address how the county complies with, or intends to comply with the provisions of this rule for the initial tax year and all subsequent tax years up to the 2009–2010 tax year.
[ED. NOTE: Classification referenced is available from the agency.]
Stat. Auth.: ORS 305.100, 308.215
Stats. Implemented: ORS 308.215
Hist.: 3-70; 9-71; 11-73; 1-1-77; TC 10-1978, f. 12-5-78, cert. ef. 12-31-78; TC 17-1979, f. 12-20-79, cert. ef. 12-31-79; RD 9-1984, f. 12-5-84, cert. ef. 12-31-84; RD 16-1987, f. 12-10-87, cert. ef. 12-31-87; RD 9-1989, f. 12-18-89, cert. ef. 12-31-89; RD 8-1991, f. 12-30-91, cert. ef. 12-31-91; RD 6-1993, f. 12-30-93, cert. ef. 12-31-93, Renumbered from 150-308.215(1); RD 6-1994, f. 12-15-94, cert. ef. 12-30-94; RD 1-1995, f. 12-29-95, cert. ef. 12-31-95; RD 9-1997, f. & cert. ef. 12-31-97; REV 11-2000, f. 12-29-00, cert. ef. 12-31-00; REV 2-2002, f. 6-26-02, cert. ef. 6-30-02; REV 2-2005, f. 6-27-05, cert. ef 6-30-05; REV 4-2006, f. & cert .ef. 7-31-06; Renumbered from 150-308.215(1)-(A), REV 57-2016, f. 8-13-16, cert. ef. 9-1-16

ORS 308.232 Property to be valued at 100 percent real market value and assessed at assessed value. All real or personal property within each county not exempt from ad valorem property taxation or subject to special assessment shall be valued at 100 percent of its real market value. Unless the property is subject to maximum assessed value adjustment under ORS 308.149 to 308.166, the property shall be assessed at the property's assessed value determined under ORS 308.146. [1953 c.701 §2; 1959 c.519 §1; 1961 c.243 §1; 1967 c.293 §6; 1979 c.241 §33; 1981 c.804 §39; 1985 c.613 §8; 1991 c.459 §97; 1997 c.541 §159]

ORS 308.234 Record of last appraisal; Department of Revenue to approve methods of appraisal.
The county assessors shall preserve in their respective offices records to show when each parcel of real property was last appraised. Each parcel of real property shall be appraised using a method of appraisal approved by the Department of Revenue by rule. [1955 c.575 §1; 1967 c.105 §1; 1967 c.293 §8; 1997 c.541 §161]

150-308-0380
Appraisal of Real Property
The following constitutes standards for the valuation of real property except for property assessed under ORS 308.505 to 308.665 and ORS 308.805 to 308.820.
(1) Industrial property. In the case of industrial properties, appraisals must conform with the following conditions:
(a) Basic data and supplemental data for an appraisal must be the same as required in ORS 308.290 and 308.411. Valid data in any previous appraisal such as property descriptions, inventory listing, maps, etc., may be used in the appraisal.
(b) An appraisal as provided by the industrial property return process is not an appraisal contemplated under ORS 308.234.
(c) A valuation review as provided in OAR 150-308-0300 is an appraisal as contemplated under ORS 308.234, if the valuation review meets the requirements of 308.411.
(d) Nothing in this rule is intended to invalidate any assessment that appears on the assessment roll.
(2) All other real property. Real property must be valued at its real market value (RMV) using methods approved by the department and the results must meet the performance standards required by this rule.
(a) The following definitions apply for the purposes of this rule:
(A) "Coefficient of dispersion" (COD) is the average absolute deviation of a group of numbers from the median expressed as a percentage of the median. In ratio studies, it refers to the average absolute deviation from the median ratio, expressed as a percent of the median ratio.
(B) "Homogeneous" describes a market area where the properties have a high degree of similarity in one or more of the following: type, use, quality, or condition.
(C) "Market area" is defined as a group of properties that share important characteristics affecting their value. It may be defined along physical/geographical or abstract boundaries or, as in the case of commercial property, according to use. Properties included in a market area do not have to be contiguous.
(D) "Nonhomogeneous" means market areas that do not meet the definition of "homogeneous."

(b) ORS 308.232 requires that all real property be valued at 100 percent of its RMV. Achieving and maintaining RMV is measured by the ratio study. Ratios must be computed for each market area, where possible. In market areas where the amount of sales data is insufficient for statistical analysis, one or more of the following actions should be taken to provide adequate data:
(A) A two-year sales sample may be used;
(B) Comparable market areas may be combined; or
(C) Appraisal ratio data may be included.
(c) Criteria for results-based valuation standards:
(A) RMV at 100 percent.
(B) COD standards for measuring equity of RMV: [Formula not included. See ED. NOTE.]
(C) Exceptions to COD standards. When a market area does not meet the standards because of a market anomaly, the correction may be delayed until the following year, waived, or have alternate standards applied, as approved by the Department of Revenue.
(d) The department will determine compliance with standards of this rule by annual reviews of the results determined by the county.
(A) If compliance deficiencies are found, the department must make written notification to the assessor of the deficiencies and identify appropriate corrective action. Within 30 days of notification of the deficiencies, the assessor must respond in writing to the department as to the action to be taken to correct the identified deficiencies.
(B) In the event an assessor's program has been found to be deficient and the assessor does not take action to correct the deficiencies as outlined in the department's written notification, the department will take action as required by ORS 308.062.
[ED. NOTE: Formulas referenced are not included in rule text. Click here for PDF copy of formula(s).]
Stat. Auth.: ORS 305.100
Stats. Implemented: ORS 308.234
Hist.: 8-65; 1-66; 3-70; 9-70; 9-71; 8-72; TC 10-1978, f. 12-5-78, cert. ef. 12-31-78; REV 4-1998, f. & cert. ef. 6-30-98; REV 9-1998, f. 12-11-98, cert. ef. 12-31-98; REV 12-1998, f. 12-29-98, cert. ef. 12-31-98; REV 6-2001, f. & cert. ef. 12-31-01; REV 11-2010, f. 7-23-10, cert. ef. 7-31-10; Renumbered from 150-308.234, REV 57-2016, f. 8-13-16, cert. ef. 9-1-16

ORS 309.200 Assessor to collect sales data and prepare ratio study; filing study with board and department.

(1) Between January 1 and December 31 of each year the county assessor shall collect sales data for a ratio study.

(2) The assessor shall prepare and complete a certified ratio study in the time and manner provided by the rules adopted by the Department of Revenue. A copy of the sales data collected and used as the basis for conclusions relating to real market value shall be included with the ratio study. The assessor shall file a certified copy of the sales data and ratio study with the department, as prescribed by department rule.

(3) Not later than October 15 of each year the assessor shall file with the clerk of the board of property tax appeals a copy of the ratio study. [1975 c.753 §2; 1981 c.804 §23; 1985 c.613 §24; 1989 c.330 §18; 1991 c.459 §202; 1993 c.270 §43; 1997 c.541 §239; 1999 c.655 §7]

150-309-0230

Assessor's Ratio Study for Tax Purposes: Definitions

(1) Appraisal area is an area in a county generally composed of one or more school districts, a city or other political subdivision, or any other logical division established by the county assessor for conducting an orderly reappraisal of taxable property as required by ORS 308.234.

(2) A market area is a group of properties that generally shares important characteristics that influence value. Each market area should contain a sufficient number of accounts to ensure an adequate sale sample for analysis.

(3) Appraisal ratio is the percentage relationship between the real market value for the prior year and an estimate of the current year's real market value made by a qualified appraiser for a particular property.

(4) Appraisal ratio study is a statistical compilation of appraisal ratios for a representative group of properties in the county randomly selected on a property class basis to produce an indication of the ratio of the prior year's real market value to the current year's real market value for all taxable properties in a particular class of property within the county, in a particular class of property within an appraisal area, or in a particular class of property within a market area.

(5) Assessor's ratio study is required to be filed with the clerk of the board of property tax appeals.

(6) Class is a classification of property described in OAR 150-308-0310.

(7) Current assessment roll is the roll being prepared for the tax year beginning July 1, of the current calendar year.

(8) Current real market value is the property's real market value, or for specially assessed properties the statutory value, as of the January 1, assessment date for which the roll is being prepared.

(9) New construction is a new structure or structures added to the current assessment roll or value added by completion of construction, remodeling, renovation or other physical improvement of existing property.

(10) Properties added to the roll are any properties on the current assessment roll which were not assessed on the prior year's roll. They include value added by changed status of specially assessed properties and value added through partitioning or subdividing properties.

(11) Qualified appraiser is an appraiser registered pursuant to ORS 308.010 or who is licensed or certified under 674.310.

(12) Ratio study is a study which estimates:
(a) The percentage relationship between the total prior year's real market value of each class of taxable property on the prior assessment roll and the total current real market value of the same properties in each class on the current assessment roll; and
(b) The percentage relationship between the total prior year's real market value of each class of taxable property on the prior assessment roll and the total current real market value of the same properties in each class on the current assessment roll within each appraisal area, or market area.
(13) Sales ratio is the percentage relationship between the real market value for the prior assessment year and the selling price for a particular property.
(14) Sales ratio study is a statistical compilation of sales ratios designed to produce an indication of the real market value ratio of each property class, and the real market value ratio of each property class within each appraisal area, or market area.
(15) Taxable property includes all locally assessed property, real and personal, not exempt from taxation (whether appraised by the assessor or the Department of Revenue). It does not include properties assessed by the Department of Revenue pursuant to ORS 308.505 to 308.660.
(16) Real market value ratio is the percentage relationship between the prior year's real market value of a class of taxable property on the prior assessment roll and the current real market value of the same property on the current assessment roll.
Stat. Auth.: ORS 305.100
Stats. Implemented: ORS 309.200
Hist.: 12-19-75; TC 17-1979, f. 12-20-79, cert. ef. 12-31-79; RD 9-1984, f. 12-5-84, cert. ef. 12-31-84; RD 9-1989, f. 12-18-89, cert. ef. 12-31-89; RD 2-1996, f. 12-23-96, cert. ef. 12-31-96; RD 9-1997, f. & cert. ef. 12-31-97; Renumbered from 150-309.200-(A), REV 26-2016, f. 8-12-16, cert. ef. 9-1-16

150-309-0240
Contents of the Assessor's Certified Ratio Study
The Assessor's Certified Ratio Study shall be prepared in accordance with OAR 150-309-0250, completed according to instructions provided by the Department of Revenue, and consist of the following items:
(1) Table of Contents.
(2) Certification of assessor's ratio study and adjustment program.
(3) Analysis of valuation methods and procedures.
(4) Introduction (purpose of report, format of the report, etc.).
(5) Reconciliation of real market value forecast analysis.
(6) Time trend analysis.
(7) County map showing appraisal areas.
(8) Listing of property class codes and descriptions. If the county has not yet converted to basic property class codes, as required by OAR 150-308-0310, provide a cross reference listing.
(9) Ratio computations, conclusions and identification of each study area whether an adjustment will be made or not, with supporting data in conformance with the current edition of the Assessor's Ratio Procedures Manual:
(a) Pertinent sales listings and supplemental studies.
(b) Computations of statistical data and conclusion explanations.

(10) Summary of the valuation plan indicating those areas to be revalued, reappraised, or recalculated.
(11) Summary of adjustments pages for all planned adjustments to bring all properties to 100% real market value (including all areas with no planned adjustments).
(12) An after ratio study for areas revalued, reappraised or recalculated. The after ratio study is a sales to real market value ratio study that is designed to test whether or not a county's annual valuation program has produced real market values that meet the statutory requirement to bring all properties to 100% of real market value.
Stat. Auth.: ORS 305.100
Stats. Implemented: ORS 309.200
Hist.: 12-19-75; TC 17-1979, f. 12-20-79, cert. ef. 12-31-79; RD 9-1984, f. 12-5-84, cert. ef. 12-31-84; RD 16-1987, f. 12-10-87, cert. ef. 12-31-87; RD 9-1989, f. 12-18-89, cert. ef. 12-31-89; RD 2-1996, f. 12-23-96, cert. ef. 12-31-96; REV 13-1999, f. 12-30-99, cert. ef. 12-31-99; Renumbered from 150-309.200-(B), REV 26-2016, f. 8-12-16, cert. ef. 9-1-16

150-309-0250
Preparation of the Sales Ratio Study
(1) The collecting, recording, confirming, analyzing, and formatting of the sales data used in the sales ratio study and any other data to be used in preparing the certified ratio study must be done under the supervision of the county assessor in conformance with the current *Assessor's Ratio Procedure Manual and Data Exchange Manual* published by the department.
(2) Deviations from the procedures contained in the manual must be approved by the department.
(3) The sales data file, if electronically maintained, must have the format required by OAR 150-306-0080.
(4) Counties must prepare and complete a Certified Ratio Study for all property classes each year on or before July 1. The assessor must file a copy of the study with the department no later than July 1 of each year. The department will consider an extension for cause, to last no later than August 1, if a request is filed in writing with the department prior to July 1.
[Publications: Publications referenced are available from the agency.]
Stat. Auth.: ORS 305.100
Stats. Implemented: ORS 309.200
Hist.: 12-19-75; TC 17-1979, f. 12-20-79, cert. ef. 12-31-79; RD 9-1989, f. 12-18-89, cert. ef. 12-31-89; REV 11-2000, f. 12-29-00, cert. ef. 12-31-00; REV 6-2001, f. & cert. ef. 12-31-01; Renumbered from 150-309.200-(C), REV 26-2016, f. 8-12-16, cert. ef. 9-1-16

ORS 309.203 Real market value standard; compliance; recommendations or orders by department; examination of ratio study; action if assessed value deviates from real market value.

(1) On or before June 15 of each year, the Department of Revenue shall give specific written recommendations or orders to the county assessor as to the actions which, in the department's judgment, should be taken by the assessor in order to achieve compliance with the real market value standard required under ORS 308.232 in the forthcoming assessment roll. Copies shall be sent to the county governing body for their information. On or before July 15 following, the county assessor shall act upon the recommendations or orders of the department, or notify the department in writing, of any objections to the department's recommendations or orders.

(2) After May 1, but prior to September 1, the department shall examine the certified ratio study prepared by each county assessor under ORS 309.200 and studies prepared by the department, to determine if the value of all locally assessed taxable properties complies with the real market value requirements of ORS 308.232. The assessor and the department shall cooperate with each other to keep the department informed as to the assessor's needs and as to the status of the current assessment work. If, in the judgment of the department, the attainment of the real market value standard required under ORS 308.232 is in jeopardy, the department shall notify the assessor in writing of the determination and the factors giving rise to it, with the statement that if unfulfilled statutory duties specified by the department are not met, the department shall take action pursuant to this section. A copy of such notice shall be sent to the county governing body, for its information. On or before September 1, the department shall issue a written order to the assessor to adjust the classes of property on the assessment roll:

(a) If the department finds that the ratio of all taxable properties deviates more than five percent from the real market value level required by ORS 308.232, the department shall order an adjustment to the real market values that will result in compliance with ORS 308.232. The assessor shall apply the adjustment to real market values on the assessment roll and compute corrected assessed values if necessary. A tolerance of five percent from 100 percent may be presumed by the department to meet the requirements of ORS 308.232. Notwithstanding satisfactory compliance with the provisions of paragraph (b) of this subsection, the department shall take any action necessary to achieve the real market value level required by ORS 308.232.

(b) If the department finds that the real market value for any class of property provided for under ORS 308.215 deviates more than 10 percent from 100 percent of real market value for the class, the department shall order a change of values to bring the class to 100 percent of real market value. The order may be made applicable to the class throughout the county or to the class in specific areas of the county and may take into account variations caused by appraisals being made in different years.

(c) If the department's order results in a valuation increase, the increase may be appealed in the manner provided by ORS 309.100.

(3) If the department orders an adjustment to the real market values of property under subsection (2) of this section, the department shall immediately give notice to the assessor, showing why the adjustment is ordered. [Formerly 309.035; 2001 c.509 §1]

ABBREVIATIONS and GLOSSARY

Abbreviations:

AAD: Average Absolute Deviation

AD: Absolute Deviation

AV: Assessed Value

BOPTA: Board of Property Tax Appeals

COD: Coefficient of Dispersion

COV: Coefficient of Variation

DOR: Department of Revenue

IAAO: International Association of Assessing Officers

MAV: Maximum Assessed Value

MLS: Multiple Listing Service

PRD: Price Related Differential

RMV: Real Market Value

Glossary:

Absolute Deviation: In an array, the absolute value of the difference between a sample point and the median. For assessment purposes, the median ratio is the central tendency used to calculate the Coefficient of Dispersion. Its formula is expressed as:

$$AD = | X_i - \widetilde{X}_{median} |$$

Absolute Value or Number: The value of a number regardless of its sign. For example: 3 and – 3 both have an absolute value of 3. An absolute number is expressed between two vertical lines:

$$| 5 - 15 | = | -10 | = 10$$

Abstract of Title: A summary of all conveyances, such as deeds or wills, and legal proceedings, giving the name of the parties, the description of the land, and the agreements, arranged to show the continuity of ownership for a specific piece of property. See also *Title*.

Account Number: A number assigned to each property by which it is listed and identified on the assessment roll and tax roll. **ORS 308.215** requires that property be listed in sequence by account number. Any number that is permanently assigned to a property can serve this purpose. Other points of reference used are Key Numbers, Reference Numbers, etc. (Ref. 1989 Oregon Cadastral Map System, Volume 1, Concepts and Standards Manual).

Adjustment Area: A group of properties to which a given percentage adjustment is applied to real market value as a result of a ratio study. This group of properties is usually synonymous with a market area, maintenance area, study area, etc.

Adjustment, Market Value: The percentage or dollar amounts applied to real market value as a result of ratio studies.

Adjustment Programs:

> **Blanket Adjustment Program:** Adjustments, dollar or percentages, applied to all property in an equal amount, ignoring property location and/or property class. For example, a 10 percent adjustment applied to the prior year's real market value of all classes of property in a valuation area, or areas, in the county is a blanket adjustment.
>
> **Selective Adjustment Program:** Adjustments applied to properties on a selective basis that considers trends and indexes as they relate to each property class, or properties within a property class. For example, varying percentage or dollar adjustments applied by class of property by appraisal area is a selective adjustment program. The percentage relationship between the prior year's real market value and an estimate of current real market value made by a qualified appraiser for a particular property.

Adjusted Sales Price: The sales price that results from adjustments made to the stated sales price to account for effect of time, personal property, financing, etc.

After Ratio Study: The After Ratio Study is a sales ratio study designed to test whether or not a county's annual valuation program is producing real market values that meet the requirements of bringing all properties to 100 percent of real market value. It is a process by which values are established annually by physical reappraisal, recalculation, or trending, producing current year RMVs and comparing them with current year sales. See **OAR 150-309-0240**.

Appraisal Date: For mass appraisal this is a predetermined point in time to which all appraisals are made. All sales used in the pre-appraisal setup are adjusted to this date to reflect either inflationary or deflationary trends in the market. This date usually differs from the assessment date or the inspection date.

Appraisal Ratio: The percentage relationship (ratio) between a property's current year roll real market value and its newly appraised real market value.

Appraisal Ratio Study: A statistical compilation of appraisal ratios for a representative group

of properties in the county. These properties are randomly selected on a property class basis to produce an indication of the ratio of the current year real market value for a taxable property in a particular class of property within an appraisal area or market area. Generally used in areas of limited or no sales data.

Arithmetic Mean: A measure of central tendency also called the *average.* The mean is the total of all the ratios in the array divided by the number of the ratios in the array. Repeat this procedure for each property class, by market area, which you have identified in your county.

$\overline{X}$ = Total Ratios ÷ number of sales in array

Arm's-Length Transaction: A transaction freely arrived at in an open market, unaffected by abnormal pressure or by the absence of normal competitive negotiations, as might be true in the case of a transaction between related parties.

Assessment Date: January 1 at 1:00 a.m. See **ORS 308.210.**

Assessment Program: The entire process used by the assessor to administer the property tax system.

Assessment Roll: A certified document prepared annually by the assessor with a comprehensive listing of all taxable property within the county. See **ORS 308.210** for contents of the Assessment Roll.

Assessment Year: January 1 through December 31.

Assessed Value (AV): The lower of the property's maximum assessed value (MAV) or real market value (RMV). For specially assessed property, the lesser of RMV or MAV for any market portion, plus the lesser of the specially assessed value (SAV) or maximum specially assessed value (MSAV) for each individual soil class, qualified home site, and on-site development.

Average Absolute Deviation: The average of the absolute deviation in the array.

$$AAD = \frac{\Sigma \mid X_i - \tilde{X}_{median} \mid}{n}$$

Average Deviation: A measure of dispersion computed by dividing the total of absolute deviations by the number of sales in the class.

Bias: See *Sample Bias.*

Board of Property Tax Appeals (BOPTA): Local appeal board that replaced the Board of Equalization and Board of Ratio Review. The board convenes the first Monday in February of each year.

Building Class: The quality classification (1-8) of the principal structure on the property

sometimes referred to as the Factor Book Class.

Centrally Assessed Property (ORS 308.515): Property assessed by the Department of Revenue. It includes property used by a company in performing any of the following businesses or services: rail transportation; private rail cars; air transportation; communications; electrical generation; transmission and distribution; natural gas distribution; gas and oil pipelines; and water transportation.

Central Tendency: The tendency of most kinds of data to cluster around some type or central value, such as a *median* or *mean.*

Certified Assessment Roll: The real market values for the year just prior to the current roll in preparation. See *Assessment Roll.*

Changed Property Ratio (CPR): Ratio determined by dividing the average maximum assessed value (AMAV) by the average real market value (ARMV) f*or the same area and property class of unchanged property,* countywide. The constitutional definition does not include the word "countywide" in the CPR definition. If you read the definition of "Area" in **ORS 308.149,** it states that Area means the county in which the property is located. Hence, the policy is to calculate the CPR countywide.

Coefficient of Determination (r^2): The proportion of the total variance in the dependent variable that is explained by the independent variables; the proportion of total variance explained by the regression.

Coefficient of Dispersion (COD): The COD facilitates comparison of the deviation or dispersion about different sized *medians.* It is the ratio of the average absolute deviation to the *median.* The average deviation is converted to a percentage. It is calculated with the following formula (since it is expressed as a percent, multiply by 100 as shown).

$$COD = \frac{AAD}{\tilde{X}_{Median}} \times 100$$

Coefficient of Variation (COV): A relative measure of dispersion. The ratio of the standard deviation to the *mean.* Since the standard deviation is expressed as a percent of the mean, the COV facilitates comparison of variability about different sized means. The standard deviation divided by the mean, times 100 (standard deviation is expressed as a percentage), is calculated with the following formula:

$$COV = \frac{s}{\bar{X}_{Mean}} \times 100$$

Computer Assisted Appraisal Program (CAAP): Means any use of a computer to calculate or develop real property values, or to store any property characteristics. The entire process used by the assessor to value property using computer-assisted valuations or computerized valuation methods.

Condition Code(s): A numeric code reflecting the circumstances of each sale transaction. It is the result of the sale confirmation process. After each sale is verified and coded as to its usability in the ratio analysis process, all sales can then be sorted by the condition code desired by the analyst. The list showing the options in a coded fashion (for concise identification) is in Chapter 5.

Confidence Interval: For a given confidence level, the range within which one can conclude that the population parameter (such as the median or mean appraisal ratio) lies. The reliability of the confidence interval depends on the extent to which any required statistical assumptions are met.

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

Consideration: The price or subject matter that induces a contract; may be in money, commodity exchange, or a transfer of personal effort. In appraisal, usually the actual price at which the property is transferred.

Contract: An agreement between competent legal parties to do some legal act or to refrain from doing some legal act in exchange for consideration. See *Land Contract.*

Conveyance: A written instrument that passes an interest in real property from one person to another; may be a deed, mortgage, or lease, but not a will.

County Assessment Function Funding Assistance Account (CAFFAA): A fund that is established by **ORS Chapter 294** to give quarterly grants to counties that provide resources to achieve compliance, if the counties planned estimate of expenditures for assessment and taxation so determined are adequate.

Current Assessment Roll: The roll in preparation for the tax year that lists the properties identified as of January 1.

Data: In appraisal, it is the information pertinent to a specific assignment. In statistics, it is information or fact, most generally in numerical form, that can be classified by qualitative characteristics (ratios), size, frequency distribution, or time (time series or regression analysis).

Date of Sale: Date conveyance instrument was signed and notarized, signifying the date that sale price or terms were agreed upon between the buyer and seller.

Deed: A legal instrument in writing that, when properly executed and delivered, conveys an estate or interest in real property. Examples, listed in their order of importance, are:

General Warranty Deed, a.k.a.: Warranty Deed, Statutory Warranty Deed: This

deed provides the greatest amount of protection of any other deed type to the grantee. Grantor warrants protection (covenants) against all valid claims to the property's title since private ownership and into perpetuity.

Special Warranty Deed: This deed conveys the title to the described property with limited protection for the grantee. The protection, referred to as warrants or covenants, is limited to the acts created or suffered by the grantor.

Bargain and Sale Deed: This deed conveys the entire estate as [legally] described, held by the grantor. There are no warranties or covenants concerning the quality of title being conveyed by the grantor.

Quitclaim Deed: This deed is used to convey title or relinquish the interest, if any, of the grantor. No quality of title is implied.

Trust Deed: A deed by which a trustor (borrower) conveys his title to a trustee for the benefit of a beneficiary (lender) as security for money borrowed against the property.

"Statutory—Deed": Refers to **ORS 93.580** et seq; cites in statute the implied covenants, minimal verbiage for certain deeds; cites the types of deeds with this reference; provided for by legislative action.

Deviation: The difference between the selected ratio (central tendency) and the individual ratios in an array. In this formula the median is used.

$D = Xi - \tilde{X}_{Median}$

Dispersion: In statistics, the degree of scatter of a set of terms or observations, usually measured from a central tendency such as the *mean* or *median.*

Equity: The degree to which assessment bears a consistent relationship to real market value. Equity of assessment means property groups are valued at the same level of assessment, for example 100 percent of RMV. Equity is closely related to uniformity. See also *Horizontal Inequity* and *Vertical Inequity.*

Frequency Distribution: A tabulation of individual ratios, usually expressed in a graph format, determined by counting the ratios falling within uniform ratio spreads, such as: 10, 20 or 30 percentage points.

Geometric Mean: A measure of central tendency that is not as susceptible to distortion as the mean and weighted mean. This measure of central tendency is computed by multiplying all the ratios together in the array and dividing by their *-nth* root, where *n* is the number of sales in the array.

Grantee (buyer): A legal party to which property is transferred by deed or other instruments.

Grantor (seller): A legal party who transfers property by deed or grants property rights through any other instrument (seller).

Heterogeneous: Mixed, varied, non-homogeneous.

Highest and Best Use: The highest value that a property is capable of attaining at the time of appraisal considering the legally permitted use, financial feasibility, the capability to produce the greatest net return to the land and/or buildings over a given period, and what is physically possible.

Histogram: A bar chart or graph of a frequency distribution in which the lengths of the horizontal or vertical bars are proportional to the number of the percentages of observations in each defined set(s) of boundaries.

Hold-Out-Sample: A sample of sales that have been collected after the sales ratio year, whereby the ratio level is determined from this sample and a comparison is made of the current ratio level to the projected ratio level.

Homogeneous: Describes a market area where the property types and uses are similar, and the inhabitants have compatible cultural, social and economic interests.

Horizontal Inequity: Differences based on criteria of improvement grades rather than value range in the levels of appraisal of groups of properties. For example, properties in one market area may have a higher appraisal level than similar properties in another market area. See *Vertical Inequity*.

Index: A number, usually expressed as a percentage, used to measure change such as a construction cost index. Indexes are developed to identify the amount of change to be made by applying adjustments. (See *Relative Index* for further explanation as to how it was used in previous ratio studies).

Instrument: In relation to real estate, the term refers to a formal legal document, such as deed, contract, mortgage, lien, lease, will, etc. For Assessor use, the instrument must have recordation number(s) from the County Clerk's office in which the property is located.

Instrument Number: Volume and Page, Micro fiche, or other traceable filing number to locate the date and time of instrument recordation, as with deeds, mortgages, contracts, liens, etc.

Land Contract: A real estate installment purchase agreement whereby the buyer may use, occupy, and enjoy land, but no deed is given by the seller (no title has been passed) until all or specified part of the sale price has been paid; subsequently evidenced by a valid recorded deed. (Also referred to as Land Sale Contract, Contract for Sale, Memorandum of Contract.)

Locally Appraised: Real and personal property appraised by county assessor's staff.

Manufactured Structure: A class of structures built off-site, designed to be moved "…on the public highways that have sleeping, cooking and plumbing facilities that are intended for human occupancy, and that are being used for residential purposes." This class of structure includes manufactured dwellings, mobile homes, manufactured homes, recreational vehicles, and recreational structures and are further identified by year of manufacture and limitations of use described in **ORS 446.003.**

Market Area: That geographic area or political jurisdiction within which alternative similar properties are effectively competitive with the subject property in the minds of probable potential purchasers. A group of properties that generally share important characteristics that influence value. Each market area should contain a sufficient number of accounts to ensure an adequate sales sample for analysis.

Market Price: The amount actually paid, or to be paid, for a property in a particular transaction. Differs from market value in that it is an accomplished or historic fact, whereas *market value* is and remains an estimate until proved. Market price involves no assumption of prudent conduct by the parties, or absence of undue stimulus, or of any other condition basic to the fair or open market value concept.

Mass Appraisal: A method of appraising a large number of properties at one time by adopting standard techniques, giving due consideration to the valuation process so that uniformity and equity of values can be achieved between all properties.

Maximum Assessed Value (MAV): A term defined by Measure 50, passed by Oregon voters in 1997. The maximum (limit) of a property's assessed value (AV). For the 1997–98 tax year, maximum assessed value (MAV) was the 1995–96 real market value (RMV) less 10 percent. For tax years after 1997–98, the MAV will be the greater of 103 percent of the property's assessed value from the prior year or 100 percent of the property's MAV from the prior year. MAV may be increased or recalculated under certain circumstances to reflect changes to the property (exceptions).

Mean: The result of adding all the values of a variable and dividing by the number of values. (See also, *arithmetic mean,* or *average.*)

Median: A measure of central tendency calculated by determining the exact middle ratio in an array. The value of the middle item where an odd number of items are arrayed according to size; or the arithmetic average of the two central items, if there is a even number of items. It is a positional average and is not affected by the size of extreme values. In an array, for an example, extreme ratios may skew the mean or the weighted mean. However, the median and the geometric mean will be less subject to the influence of the extreme ratios.

$$(n + 1) \div 2$$

n equals the number of sales in the array.

Midpoint (Selected Ratio): A ratio within the sales collection period that best represents the majority of sales activity (month or quarter). Not necessarily the middle of the sale year.

Mode: A ratio that occurs most frequently in a ratio array.

Modular Home/Structure: "Mobile modular unit" means a prefabricated structure that is more than eight and one half feet wide, is used for commercial or business purposes and is capable of being moved on the highway. Per **ORS 308.866.**

Multiple Listing Service (MLS): A commercial service that provides a system that pools the price listings of all member real estate companies, for a fee. It effectively expands the offerings a real estate agency may show to prospective buyers and extends the marketing of an agency's own listings.

Neighborhood: See *Market Area.*

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

Outlier: An observation that has an unusual value, that varies widely from a measure of central tendency. Some outliers occur naturally, others may be due to data error.

Parameter: Descriptive characteristics of a population as a whole. For instance, it could be the average square footage, or the average Real Market Value, or the average percent good in the market place.

Personal property: Any property that is not realty; all moveable items not permanently affixed to or part of real estate. Also known as *chattels.* Intangible personal property (i.e., mortgages, computer software, etc.) is not assessable in Oregon. Beginning in 1997-98, most personal property accounts less than $10,000 in value, but excluding manufactured structures, are not required to pay property tax.

Population: All the properties in an appraisal area, market area, or study area.

Price-related differential (PRD): The price-related differential is a measurement of assessment *regressivity* and *progressivity.* It is calculated by dividing the mean by the weighted mean. Price-related differentials greater than 1.00 suggest that the high-valued parcels in the array are under-appraised (regressive), thus pulling the weighted mean below the mean. If the price-related differential is less than 1.00, it suggests that the high-valued parcels are relatively over-appraised (progressive), pulling the weighted mean above the mean.

$$PRD = \frac{\bar{x}}{\bar{x}_w}$$

Progressivity: Appraisals are considered progressive where high-valued properties are over-appraised relative to low-valued properties.

Property Class: A three-digit code number, maintained on a continuing basis, for each individual parcel of locally assessed real property in a county. The classification assigned will be determined by the land's highest and best use except when specially assessed. **OAR 150-308-0310** lists the property class codes approved by the department.

Ratio: Relational value in number or degree between two similar things. The relative size of two quantities expressed as the quotient of one divided by the other. See Sales Ratio.

Ratio Study: The assessor's certified ratio study required by **ORS 309.200-(A)** and filed with the clerk of the Board of Property Tax Appeals (Oct 15). The contents must comply with **OAR 150-309-0240** and the current *Assessor's Ratio Study Procedures Manual.* This study estimates the percentage relationship between (1) the total prior year's real market value of taxable property on the prior assessment roll and (2) the total current real market value of the same properties in each property class countywide; in each appraisal area; within each appraisal area within each market area; and/or by month and quarter by sale date.

Real Market Value (RMV): The amount in cash that could reasonably be expected to be paid by an informed buyer to an informed seller, each acting without compulsion in an arm's-length transaction occurring as of the assessment date for the tax year. As established by statute **ORS 308.205**.

Real Market Value Ratio: The percentage relationship between the prior year's real market value of taxable property on the certified assessment roll and the same property on the current assessment roll.

Real Property (RP): An identified parcel or tract of land including any improvements. For purposes of the ratio study, all real property accounts in the county including those that the Department of Revenue is responsible for, i.e., utilities, unless otherwise indicated.

Recalculation: An automated valuation processing method where traditional mass-appraisal set-up techniques are utilized and applied. These techniques and market-based value components are implemented using tabled, computer-aided formats replicating real market value levels for applicable classes of real property.

Recordation Date: The calendar date and time of day that the written evidence of a completed transaction became of public record or notice in the county where the real property is located. This date and time are the critical elements which establish priority in the chain of title of a property.

Relative Index: An index that calculates the percentage a property class contributes to the countywide ratio.

Reliability: In a statistical sense, concerns the degree of confidence one can place in a calculated statistic for a sample. There are two related measures of reliability: confidence intervals and standard error.

Regressivity: Appraisals are considered regressive where high-valued properties are under-appraised relative to low-valued properties.

Rural: Pertaining to the area outside the relatively larger and moderate-sized cities and surrounding population concentrations. Rural properties are generally characterized by farms, ranches, small towns, and unpopulated regions. Check with the planning and zoning department in your county for specific applications, limitations, and requirements. Also, check with utility companies and lending institutions for further considerations.

"Rurban:" Areas on the fringe of urban development that are, or may be in the process of being developed for urban uses. See caveats for rural.

Sale: The act of selling; exchange of goods or services for an amount of money or its equivalent. (Webster's Dictionary) For ratio purposes, see also *Arm's-Length Transaction.*

Sales Analysis: Sales data used to analyze RMV levels by measuring changes in sales prices against prior year's RMVs.

Sales Array: A grouping of sales listed in ascending order according to the size of the ratio.

Sales List: A listing of all sales used in the ratio study prepared in accordance with **OAR 150-309-0250**.

Sale Price: The price at which the property actually sold. (See also *Market Price.*)

Sales Ratio: The percentage relationship between RMV from the certified assessment roll and the selling price for a particular property. This can be expressed as a percent or decimal. The common practice is to express the ratio as a whole number. Multiply the quotient by 100. This ratio is also an indication of RMV level.

$$\text{Sales ratio} = (\text{RMV} \div \text{Sales Price}) \times 100 = \text{Ratio}$$

Sales Ratio Study: A statistical compilation of sales ratios designed to produce an indication of the real market value ratio of each property class countywide and each property class within each appraisal area, property class within each market area, and property class within each study area.

Sales Take-off: The systematic process of taking pertinent information from recorded and unrecorded property transfers (deeds) on a month-by-month basis and organizing this information in a database or manual sales record file for future use.

Sample: A set of observations selected from a population. If the sample was randomly selected,

basic concepts of probability may be applied.

Sample Bias: Bias is a systematic distortion of the results from consistent error. It may be due to some flaw in measurement (poor statistical technique or application of condition codes), the method of selecting the sample (the consistencies and intentional distortion in the real estate marketplace), or the poor selection of market area parameters.

Scatter Diagram: A graphic means of depicting the relationship or correlation between two variables by plotting one variable on the horizontal axis and one variable on the vertical axis. Often in ratio studies, it is informative to determine how ratios are related to other variables. A variable of interest is plotted on the horizontal axis and the ratios on the vertical axis.

Similarity, Percent of (PS): A measurement of sample bias developed by the Oregon Department of Revenue. Percent of Similarity compares some known parameters of the population with its estimate from the sample. The measurement is simply the smaller (from the sample or population) number divided by the larger (from the sample or the population) number and expressed as a percent.

$$PS = \frac{small\ number}{large\ number} \times 100$$

Situs Address: The physical U.S. Mail address/location of the property (street address, rural route, etc.) although, typically assigned by the local planning division.

Standard Deviation: A measure used to check the variation of the sample from the mean. 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.

$$s = \sqrt{\frac{\Sigma\,(X_i - \overline{X}_{Mean})^2}{n - 1}}$$

State Responsibility Industrial Accounts (ORS 306.126, OAR 150-306-0090):
Principal Industrial Property: Any unit of industrial property having a RMV of the improvement on the assessment roll for the preceding year of over $5 million. Some examples: sawmills, food processing facilities, printing and publishing operations, etc.

Secondary Industrial Property: Any unit of industrial property having a RMV of the improvement on the assessment roll for the preceding year of more than $1 million but of $5 million or less. Some examples of state responsibility accounts: sawmills, plywood plants, paper mills, electronics, chemical manufacture, food processing, metals, etc.

Statistical Class (stat class): A three-digit classification code (not to be confused with

property classification) of structural improvements. This code identifies characteristics of that structure such as: type, stories, building class, etc.

Straddle Study: Any study sensitive to change from a specific point, where the sample is developed from sales spanning equal distance from each side of the specific point (assessment date).

Stratification: A process of dividing data into smaller components, such as: identifying individual components of sales data and separating them from a larger assortment of sales data for analysis purposes. Examples could include analyses by square foot, by age, or year built. Another example could be stratifying an array of ratios into ranges…0 to 25 percent, 25 to 50 percent, 50 to 75 percent, etc.

Study Area: Usually a smaller delineation than a market area. Typically, it is a group of properties identified during the sales ratio process when an analysis of the sales indicates a separate market is developing due to unique characteristics setting these properties apart from the rest of the area. A study area may develop into a market area or valuation area.

Suburb, Suburban: A town or unincorporated developed area in close proximity to a city. Suburbs, largely residential, are often dependent on the city for employment and support services; generally characterized by low-density development relative to the city.

Tax Year: The period for which the property is taxed (July 1–June 30).

Title: The union of all elements that constitute proof of ownership. It is the evidence that the owner is in legal possession of the property.

Trend: A series of related changes, such as real estate price trends, time trends, market trends, etc.

Usable Sale: A sale used in a ratio study that meets the criteria for an *arm's-length transaction.*

Urban Property: Real estate located in an urban area, generally characterized by relatively high-density development and extensive availability of city water and sewer service. See also rural, "rurban," and suburban.

Valuation: A universal term used to encompass all methods of valuing property, from the traditional physical reappraisal to alternative methods (i.e., recalculation, etc.).

Valuation Area: An area in a county generally composed of one or more school districts, a city or political subdivision, or any other logical division established by the county assessor for the purpose of conducting an orderly valuation of taxable properties as required by **ORS 308.234**. All real properties in such an area normally will be valued at the same time.

Valuation Date: The roll year for which the last valuation was made of the property.

Variable: Mathematically, in an equation, a component or value subject to change; statistically a phenomenon or characteristic associated with a population or sample.

Vendee: A buyer, typically associated with Contract of Sale.

Vendor: A seller, typically associated with Contract of Sale.

Vertical Inequity: Differences in the levels of appraisal of properties related to the value ranges of the properties. That is, properties of higher value levels have appraisal levels different from properties of lower value. See *Horizontal Inequity*. See IAAO texts. Often referred to when discussing *price-related differential* (PRD) with the PRD falling within the range of .98 and 1.03.

Weight: The percentage value that represents the relative importance of each element's contribution to the total.

Weighted Mean: A measure of central tendency determined by dividing the sum of the RMVs in an array by the sum of the sale prices (or other indications of market value) for each property class in each market area or countywide.

$X_{Wt.\ Mean}$ = (Total RMVs ÷ Total Sale Prices) × 100

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Credits

Department of Revenue:

Mass Appraisal Team

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