2016
GRAND COUNTY PROPERTY ASSESSMENT STUDY

WILDROSE
APPRAISAL, INCORPORATED
Audit Division
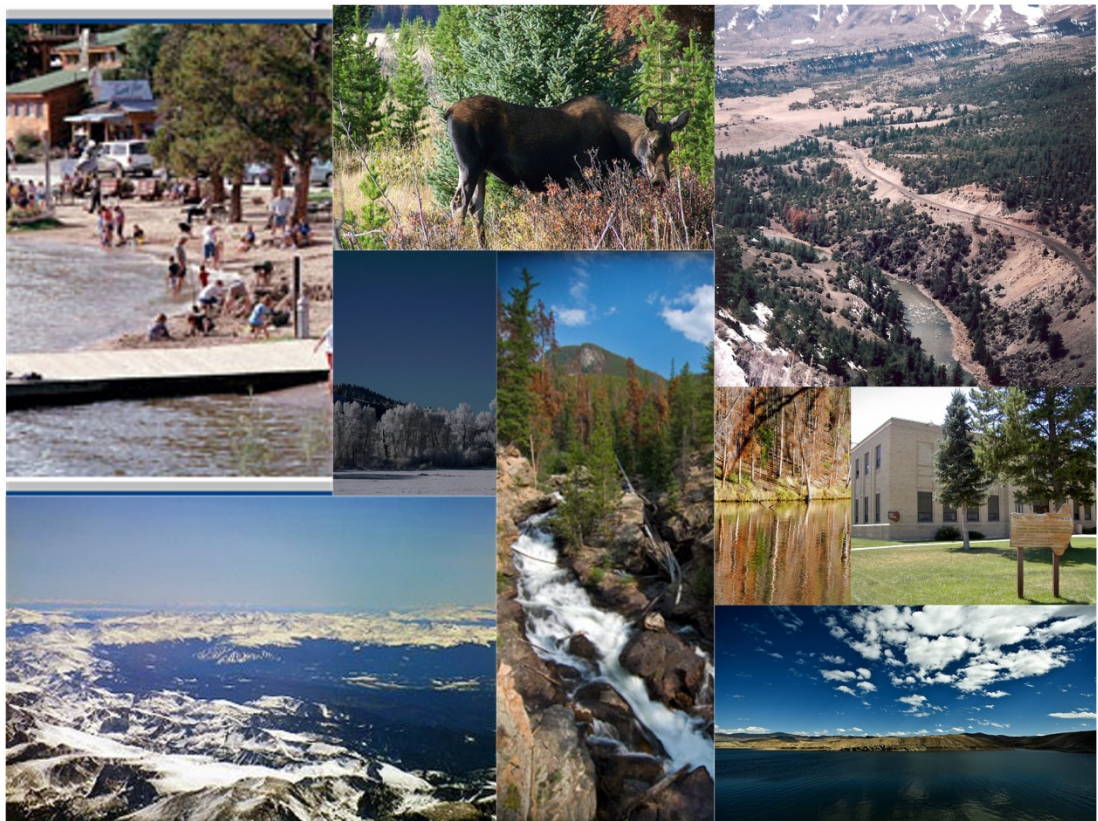
WILDROSE
APPRAISAL, INCORPORATED
Audit Division

September 15, 2016

Mr. Mike Mauer
Director of Research
Colorado Legislative Council
Room 029, State Capitol Building
Denver, Colorado 80203

> **RE:** **Final Report for the 2016 Colorado Property Assessment Study**

Dear Mr. Mauer:

Wildrose Appraisal Inc.-Audit Division is pleased to submit the Final Reports for the 2016 Colorado Property Assessment Study.

These reports are the result of two analyses: A procedural audit and a statistical audit.

The procedural audit examines all classes of property. It specifically looks at how the assessor develops economic areas, confirms and qualifies sales, develops time adjustments and performs periodic physical property inspections. The audit reviews the procedures for determining subdivision absorption and subdivision discounting. Valuation methodology is examined for residential properties and commercial properties. Procedures are reviewed for producing mines, oil and gas leaseholds and lands producing, producing coal mines, producing earth and stone products, severed mineral interests, and non-producing patented mining claims.

Statistical audits are performed on vacant land, residential properties, commercial/industrial properties and agricultural land. A statistical analysis is performed for personal property compliance on the eleven largest counties: Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Jefferson, Larimer, Mesa, Pueblo and Weld. The remaining counties receive a personal property procedural study.

Wildrose Appraisal Inc. – Audit Division appreciates the opportunity to be of service to the State of Colorado. Please contact us with any questions or concerns.

Harry J. Fuller

Harry J. Fuller
Project Manager
Wildrose Appraisal Inc. – Audit Division

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INTRODUCTION

The State Board of Equalization (SBOE) reviews assessments for conformance to the Constitution. The SBOE will order revaluations for counties whose valuations do not reflect the proper valuation period level of value.

The statutory basis for the audit is found in C.R.S. 39-1-104 (16)(a)(b) and (c).

The legislative council sets forth two criteria that are the focus of the audit group:

To determine whether each county assessor is applying correctly the constitutional and statutory provisions, compliance requirements of the State Board of Equalization, and the manuals published by the State Property Tax Administrator to arrive at the actual value of each class of property.

To determine if each assessor is applying correctly the provisions of law to the actual values when arriving at valuations for assessment of all locally valued properties subject to the property tax.

The property assessment audit conducts a two-part analysis: A procedural analysis and a statistical analysis.

The procedural analysis includes all classes of property and specifically looks at how the assessor develops economic areas, confirms and qualifies sales, and develops time adjustments. The audit also examines the procedures for adequately discovering, classifying and valuing agricultural outbuildings, discovering subdivision build-out and subdivision discounting procedures. Valuation methodology for vacant land, improved residential properties and commercial properties is examined. Procedures for producing mines, oil and gas leaseholds and lands producing, producing coal mines, producing earth and stone products, severed mineral interests and non-producing patented mining claims are also reviewed.

Statistical analysis is performed on vacant land, residential properties, commercial/industrial properties, agricultural land, and personal property. The statistical study results are compared with State Board of Equalization compliance requirements and the manuals published by the State Property Tax Administrator.

Wildrose Audit has completed the Property Assessment Study for 2016 and is pleased to report its findings for Grand County in the following report.

REGIONAL/HISTORICAL SKETCH OF GRAND COUNTY

Regional Information

Grand County is located in the Western Slope region of Colorado. The Western Slope of Colorado refers to the region west of the Rocky Mountains. It includes Archuleta, Delta, Dolores, Eagle, Garfield, Grand, Gunnison, Hinsdale, Jackson, La Plata, Mesa, Moffat, Montezuma, Montrose, Ouray, Pitkin, Rio Blanco, Routt, San Juan, San Miguel, and Summit counties.

Historical Information

Grand County had an estimated population of approximately 14,546 people with 8 people per square mile, according to the U.S. Census Bureau's 2014 estimated census data. This represents a -2 percent change from April 1, 2010 to July 1, 2014.

When Grand County was created on February 2, 1874 it was carved out of Summit County and contained land to the western and northern borders of the state, which is now in present day Moffat County and Routt County. It was named after Grand Lake and the Grand River, an old name for the Colorado River, which has its headwaters in the county. On January 29, 1877 Routt County was created and Grand County shrunk down to its current western boundary. When valuable minerals were found in North Park, Grand County claimed the area as part of its county, a claim Larimer County also held. It took a decision by the Colorado Supreme Court in 1886 to declare North Park part of Larimer County, setting Grand County's northern boundary.

Grand Lake is the deepest and largest natural lake in Colorado and the area attracts an impressive diversity of wildlife. Prehistoric peoples, and later Native American Ute, Arapaho and Cheyenne tribes made annual pilgrimages to the area each summer to fish, hunt and reap the bounty of nature's harvest. It wasn't long before trappers, traders and explorers followed.

In the mid-1800s, European hunting parties discovered Grand Lake. Some hunters constructed summer lodges and hired local mountain men as guides. The area was permanently settled in 1867. Grand Lake Village's first full-time, year-round residents were an intriguing mix of miners (who participated in a brief mining boom) and hunting guides. In the late 1870s, silver was discovered in the rivers and mountains near Grand Lake. Prospectors bought supplies in local stores and established small mountain mining communities. Almost overnight, the town of Grand Lake transformed into a bustling economy.

Winter Park Resort is Colorado's longest continually operated ski resort featuring over 3,000 acres of award-winning terrain including groomers, terrain parks, bumps, steeps, trees, and most definitely deeps. Winter Park Resort averages 329 inches of snow, much in part to its ideal location amidst the Rocky Mountains. Just 67 miles northwest of Denver, Winter Park Resort is the closest major destination resort to Denver International Airport.
(Wikipedia.org, www.grandlakechamber.com & http://www.winterparkresort.com/)

RATIO ANALYSIS

Methodology

All significant classes of properties were analyzed. Sales were collected for each property class over the appropriate sale period, which was typically defined as the 18-month period between January 2013 and June 2014. Counties with less than 30 sales typically extended the sale period back up to 5 years prior to June 30, 2014 in 6-month increments. If there were still fewer than 30 sales, supplemental appraisals were performed and treated as proxy sales. Residential sales for all counties using this method totaled at least 30 per county. For commercial sales, the total number analyzed was allowed, in some cases, to fall below 30. There were no sale quantity issues for counties requiring vacant land analysis or condominium analysis. Although it was required that we examine the median and coefficient of dispersion for all counties, we also calculated the weighted mean and price-related differential for each class of property. Counties were not passed or failed by these latter measures, but were counseled if there were anomalies noted during our analysis. Qualified sales were based on the qualification code used by each county, which were typically coded as either "Q" or "C." The ratio analysis included all sales. The data was trimmed for counties with obvious outliers using IAAO standards for data analysis. In every case, we examined the loss in data from trimming to ensure that only true outliers were excluded. Any county with a significant portion of sales excluded by this trimming method was examined further. No county was allowed to pass the audit if more than 5% of the sales were "lost" because of trimming. For the largest 11 counties, the residential ratio statistics were broken down by economic area as well.

Conclusions

For this final analysis report, the minimum acceptable statistical standards allowed by the State Board of Equalization are:

ALLOWABLE STANDARDS RATIO GRID		
Property Class	**Unweighted Median Ratio**	**Coefficient of Dispersion**
Commercial/Industrial	Between .95-1.05	Less than 20.99
Condominium	Between .95-1.05	Less than 15.99
Single Family	Between .95-1.05	Less than 15.99
Vacant Land	Between .95-1.05	Less than 20.99

The results for Grand County are:

Grand County Ratio Grid					
Property Class	Number of Qualified Sales	Unweighted Median Ratio	Price Related Differential	Coefficient of Dispersion	Time Trend Analysis
Commercial/Industrial	37	0.969	1.025	11.7	Compliant
Condominium	526	0.996	1.007	7	Compliant
Single Family	776	0.985	1.019	10	Compliant
Vacant Land	281	1.000	1.043	13.4	Compliant

After applying the above described methodologies, it is concluded from the sales ratios that Grand County is in compliance with SBOE, DPT, and Colorado State Statute valuation guidelines.

Recommendations

None

TIME TRENDING VERIFICATION

Methodology

While we recommend that counties use the inverted ratio regression analysis method to account for market (time) trending, some counties have used other IAAO-approved methods, such as the weighted monthly median approach. We are not auditing the methods used, but rather the results of the methods used. Given this range of methodologies used to account for market trending, we concluded that the best validation method was to examine the sale ratios for each class across the appropriate sale period. To be specific, if a county has considered and adjusted correctly for market trending, then the sale ratios should remain stable (i.e. flat) across the sale period. If a residual market trend is detected, then the county may or may not have addressed market trending adequately, and a further examination is warranted. This validation method also considers the number of sales and the length of the sale period. Counties with few sales across the sale period were carefully examined to determine if the statistical results were valid.

Conclusions

After verification and analysis, it has been determined that Grand County has complied with the statutory requirements to analyze the effects of time on value in their county. Grand County has also satisfactorily applied the results of their time trending analysis to arrive at the time adjusted sales price (TASP).

Recommendations

None

SOLD/UNSOLD ANALYSIS

Methodology

Grand County was tested for the equal treatment of sold and unsold properties to ensure that "sales chasing" has not occurred. The auditors employed a multi-step process to determine if sold and unsold properties were valued in a consistent manner.

We test the hypothesis that the assessor has valued unsold properties consistent with what is observed with the sold properties based on several units of comparison and tests. The units of comparison include the actual value per square foot and the change in value from the previous base year period to the current base year. The first test compares the actual value per square foot between sold and unsold properties by class. The median and mean value per square foot is compared and tested for any significant difference. This is tested using non-parametric methods, such as the Mann-Whitney test for differences in the distributions or medians between sold and unsold groups. It is also examined graphically and from an appraisal perspective. Data can be stratified based on location and subclass. The second test compares the difference in the median change in value from the previous base year to the current base year between sold and unsold properties by class. The same combination of non-parametric and appraisal testing is used as with the first test. A third test employing a valuation model testing a sold/unsold binary variable while controlling for property attributes such as location, size, age and other attributes. The model determines if the sold/unsold variable is statistically and empirically significant. If all three tests indicate a significant difference between sold and unsold properties for a given class, the Auditor may meet with the county to determine if sale chasing is actually occurring,

or if there are other explanations for the observed difference.

If the unsold properties have a higher median value per square foot than the sold properties, or if the median change in value is greater for the unsold properties than the sold properties, the analysis is stopped and the county is concluded to be in compliance with sold and unsold guidelines. All sold and unsold properties in a given class are first tested, although properties with extreme unit values or percent changes can be trimmed to stabilize the analysis. The median is the primary comparison metric, although the mean can also be used as a comparison metric if the distribution supports that type of measure of central tendency.

The first test (unit value method) is applied to both residential and commercial/industrial sold and unsold properties. The second test is applied to sold and unsold vacant land properties. The second test (change in value method) is also applied to residential or commercial sold and unsold properties if the first test results in a significant difference observed and/or tested between sold and unsold properties. The third test (valuation modeling) is used in instances where the results from the first two tests indicate a significant difference between sold and unsold properties. It can also be used when the number of sold and unsold properties is so large that the non-parametric testing is indicating a false rejection of the hypothesis that there is no difference between the sold and unsold property values.

These tests were supported by both tabular and graphics presentations, along with written documentation explaining the methodology used.

| Sold/Unsold Results	
Property Class	**Results**
Commercial/Industrial	Compliant
Condominium	Compliant
Single Family	Compliant
Vacant Land	Compliant

Conclusions

After applying the above described methodologies, it is concluded that Grand County is reasonably treating its sold and unsold properties in the same manner.

Recommendations

None

Acres By Subclass	Value By Subclass
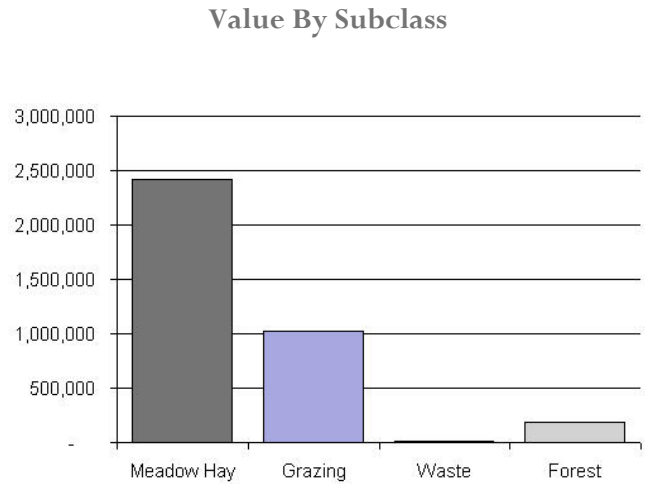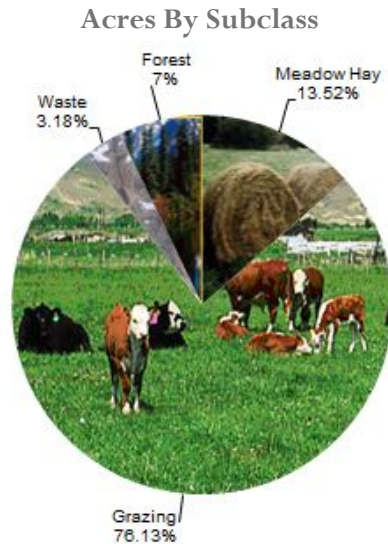
Agricultural Land

County records were reviewed to determine major land categories such as irrigated farm, dry farm, meadow hay, grazing and other lands. In addition, county records were reviewed in order to determine if: Aerial photographs are available and are being used; soil conservation guidelines have been used to classify lands based on productivity; crop rotations have been documented; typical commodities and yields have been determined; orchard lands have been properly classified and valued; expenses reflect a ten year average and are typical landlord expenses; grazing lands have been properly classified and valued; the number of acres in each class and subclass have been determined; the capitalization rate was properly applied. Also, documentation was required for the valuation methods used and any locally developed yields, carrying capacities, and expenses. Records were also checked to ensure that the commodity prices and expenses, furnished by the Property Tax

Administrator (PTA), were applied properly. (See Assessor Reference Library Volume 3 Chapter 5.)

Conclusions

An analysis of the agricultural land data indicates an acceptable appraisal of this property type. Directives, commodity prices and expenses provided by the PTA were properly applied. County yields compared favorably to those published by Colorado Agricultural Statistics. Expenses used by the county were allowable expenses and were in an acceptable range. Grazing lands carrying capacities were in an acceptable range. The data analyzed resulted in the following ratios:

Grand County Agricultural Land Ratio Grid						
Abstract Code	Land Class	Number Of Acres	County Value Per Acre	County Assessed Total Value	WRA Total Value	Ratio
4137	Meadow Hay	34,295	73.83	2,531,865	2,531,865	1.00
4147	Grazing	193,059	6.28	1,212,832	1,212,832	1.00
4177	Forest	18,167	7.49	135,999	135,999	1.00
4167	Waste	8,068	1.99	16,027	16,027	1.00
Total/Avg		253,589	15.37	3,896,722	3,896,722	1.00

Recommendations

None

Agricultural Outbuildings

Methodology

Data was collected and reviewed to determine if the guidelines found in the Assessor's Reference Library (ARL) Volume 3, pages 5.74 through 5.77 were being followed.

Conclusions

Grand County has substantially complied with the procedures provided by the Division of Property Taxation for the valuation of agricultural outbuildings.

Recommendations

None

Agricultural Land Under Improvements

Methodology

Data was collected and reviewed to determine if the guidelines found in the Assessor's Reference Library (ARL) Volume 3, pages 5.19 and 5.20 were being followed.

Conclusions

Grand County has used the following methods to discover land under a residential improvement on a farm or ranch that is determined to be not integral under 39-1-102, C.R.S.:

- Questionnaires
- Field Inspections
- Phone Interviews
- In-Person Interviews with Owners/Tenants
- Personal Knowledge of Occupants at Assessment Date
- Aerial Photography/Pictometry

Grand County has used the following methods to discover the land area under a residential improvement that is determined to be not integral under 39-1-102, C.R.S.:

- Property Record Card Analysis
- Field Inspections
- Phone Interviews
- In-Person Interviews with Owners/Tenants
- Personal Knowledge of Occupants at Assessment Date
- Aerial Photography/Pictometry

Grand County has substantially complied with the procedures provided by the Division of Property Taxation for the valuation of land under residential improvements that may or may not be integral to an agricultural operation.

Recommendations

None

SALES VERIFICATION

According to Colorado Revised Statutes:

A representative body of sales is required when considering the market approach to appraisal.

(8) In any case in which sales prices of comparable properties within any class or subclass are utilized when considering the market approach to appraisal in the determination of actual value of any taxable property, the following limitations and conditions shall apply:

(a)(I) Use of the market approach shall require a representative body of sales, including sales by a lender or government, sufficient to set a pattern, and appraisals shall reflect due consideration of the degree of comparability of sales, including the extent of similarities and dissimilarities among properties that are compared for assessment purposes. In order to obtain a reasonable sample and to reduce sudden price changes or fluctuations, all sales shall be included in the sample that reasonably reflect a true or typical sales price during the period specified in section 39-1-104 (10.2). Sales of personal property exempt pursuant to the provisions of sections 39-3-102, 39-3-103, and 39-3-119 to 39-3-122 shall not be included in any such sample.

(b) Each such sale included in the sample shall be coded to indicate a typical, negotiated sale, as screened and verified by the assessor. (39-1-103, C.R.S.)

The assessor is required to use sales of real property only in the valuation process.

(8)(f) Such true and typical sales shall include only those sales which have been determined on an individual basis to reflect the selling price of the real property only or which have been adjusted on an individual basis to reflect the selling price of the real property only. (39-1-103, C.R.S.)

Part of the Property Assessment Study is the sales verification analysis. WRA has used the above-cited statutes as a guide in our study of the county's procedures and practices for verifying sales.

WRA reviewed the sales verification procedures in 2016 for Grand County. This study was conducted by checking selected sales from the master sales list for the current valuation period. Specifically WRA selected 30 sales listed as unqualified.

All of the sales in the unqualified sales sample had reasons that were clear and supportable.

For residential, commercial, and vacant land sales with considerations over $500, the contractor has examined and reported the ratio of qualified sales to total sales by class and performed the following analyses of unqualified sales:

> The contractor has examined the manner in which sales have been classified as qualified or unqualified, including a listing of each step in the sales verification process, any adjustment procedures, and the county official responsible for making the final decision on qualification.

> The contractor has reviewed with the assessor any analysis indicating that sales data are inadequate, fail to reflect typical properties, or have been disqualified for insufficient cause. In addition, the contractor has reviewed the disqualified sales by assigned code. If there appears to be any inconsistency in the coding, the contractor has

conducted further analysis to determine if the sales included in that code have been assigned appropriately.

Conclusions

Grand County appears to be doing a good job of verifying their sales. WRA agreed with the county's reason for disqualifying each of the sales selected in the sample. There are no recommendations or suggestions.

Recommendations

None

ECONOMIC AREA REVIEW AND EVALUATION

Methodology

Grand County has submitted a written narrative describing the economic areas that make up the county's market areas. Grand County has also submitted a map illustrating these areas. Each of these narratives have been read and analyzed for logic and appraisal sensibility. The maps were also compared to the narrative for consistency between the written description and the map.

Conclusions

After review and analysis, it has been determined that Grand County has adequately identified homogeneous economic areas comprised of smaller neighborhoods. Each economic area defined is equally subject to a set of economic forces that impact the value of the properties within that geographic area and this has been adequately addressed. Each economic area defined adequately delineates an area that will give "similar values for similar properties in similar areas."

Recommendations

None

NATURAL RESOURCES

Earth and Stone Products

Methodology

Under the guidelines of the Assessor's Reference Library (ARL), Volume 3, Natural Resource Valuation Procedures, the income approach was applied to determine value for production of earth and stone products. The number of tons was multiplied by an economic royalty rate determined by the Division of Property Taxation to determine income. The income was multiplied by a recommended Hoskold factor to determine the actual value. The Hoskold factor is determined by the life of the reserves or the lease. Value is based on two variables: life and tonnage. The operator determines these since there is no other means to obtain production data through any state or private agency.

Conclusions

The County has applied the correct formulas and state guidelines to earth and stone production.

Recommendations

None

VACANT LAND

Subdivision Discounting

Subdivisions were reviewed in 2016 in Grand County. The review showed that subdivisions were discounted pursuant to the Colorado Revised Statutes in Article 39-1-103 (14) and by applying the recommended methodology in ARL Vol 3, Chap 4. Subdivision Discounting in the intervening year was accomplished by reducing the absorption period by one year. In instances where the number of sales within an approved plat was less than the absorption rate per year calculated for the plat, the absorption period was left unchanged.

Conclusions

Grand County has implemented proper procedures to adequately estimate absorption periods, discount rates, and lot values for qualifying subdivisions.

Recommendations

None

POSSESSORY INTEREST PROPERTIES

Possessory Interest

Possessory interest property discovery and valuation is described in the Assessor's Reference Library (ARL) Volume 3 section 7 in accordance with the requirements of Chapter 39-1-103 (17)(a) (II) C.R.S. Possessory Interest is defined by the Property Tax Administrator's Publication ARL Volume 3, Chapter 7: A private property interest in government-owned property or the right to the occupancy and use of any benefit in government-owned property that has been granted under lease, permit, license, concession, contract, or other agreement.

Grand County has been reviewed for their procedures and adherence to guidelines when assessing and valuing agricultural, commercial and ski area possessory interest properties. The county has also been queried as to their confidence that the possessory interest properties have been discovered and placed on the tax rolls.

Conclusions

Grand County has implemented a discovery process to place possessory interest properties on the roll. They have also correctly and consistently applied the correct procedures and valuation methods in the valuation of possessory interest properties.

Recommendations

None

PERSONAL PROPERTY AUDIT

Grand County was studied for its procedural compliance with the personal property assessment outlined in the Assessor's Reference Library (ARL) Volume 5, and in the State Board of Equalization (SBOE) requirements for the assessment of personal property. The SBOE requires that counties use ARL Volume 5, including current discovery, classification, documentation procedures, current economic lives table, cost factor tables, depreciation table, and level of value adjustment factor table.

The personal property audit standards narrative must be in place and current. A listing of businesses that have been audited by the assessor within the twelve-month period reflected in the plan is given to the auditor. The audited businesses must be in conformity with those described in the plan.

Aggregate ratio will be determined solely from the personal property accounts that have been physically inspected. The minimum assessment sample is one percent or ten schedules, whichever is greater, and the maximum assessment audit sample is 100 schedules.

For the counties having over 100,000 population, WRA selected a sample of all personal property schedules to determine whether the assessor is correctly applying the provisions of law and manuals of the Property Tax Administrator in arriving at the assessment levels of such property. This sample was selected from the personal property schedules audited by the assessor. In no event was the sample selected by the contractor less than 30 schedules. The counties to be included in this study are Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Jefferson, Larimer, Mesa, Pueblo, and Weld. All other counties received a procedural study.

Grand County is compliant with the guidelines set forth in ARL Volume 5 regarding discovery procedures, using the following methods to discover personal property accounts in the county:

- Public Record Documents
- MLS Listing and/or Sold Books
- Chamber of Commerce/Economic Development Contacts
- Local Telephone Directories, Newspapers or Other Local Publications
- Personal Observation, Physical Canvassing or Word of Mouth
- Questionnaires, Letters and/or Phone Calls to Buyer, Seller and/or Realtor

The county uses the Division of Property Taxation (DPT) recommended classification and documentation procedures. The DPT's recommended cost factor tables, depreciation tables and level of value adjustment factor tables are also used.

Grand County submitted their personal property written audit plan and was current for the 2016 valuation period. The number and listing of businesses audited was also submitted and was in conformance with the written audit plan. The following audit triggers were used by the county to select accounts to be audited:

- Businesses in a selected area
- Accounts with obvious discrepancies
- New businesses filing for the first time
- Accounts with greater than 10% change
- Incomplete or inconsistent declarations
- Accounts with omitted property
- Same business type or use

- Businesses with no deletions or additions for 2 or more years
- Non-filing Accounts - Best Information Available
- Accounts close to the $7,300 actual value exemption status
- Lowest or highest quartile of value per square foot
- Accounts protested with substantial disagreement

Conclusions

Grand County has employed adequate discovery, classification, documentation, valuation, and auditing procedures for their personal property assessment and is in statistical compliance with SBOE requirements.

Recommendations

None

WILDROSE AUDITOR STAFF

Harry J. Fuller, *Audit Project Manager*

Suzanne Howard, *Audit Administrative Manager*

Steve Kane, *Audit Statistician*

Carl W. Ross, *Agricultural / Natural Resource Analyst*

J. Andrew Rodriguez, *Field Analyst*

APPENDICES

STATISTICAL COMPLIANCE REPORT
FOR GRAND COUNTY
2016

I. OVERVIEW

Grand County is a mountain resort located in western Colorado. The county has a total of 25,790 real property parcels, according to data submitted by the county assessor's office in 2016. The following provides a breakdown of property classes for this county:
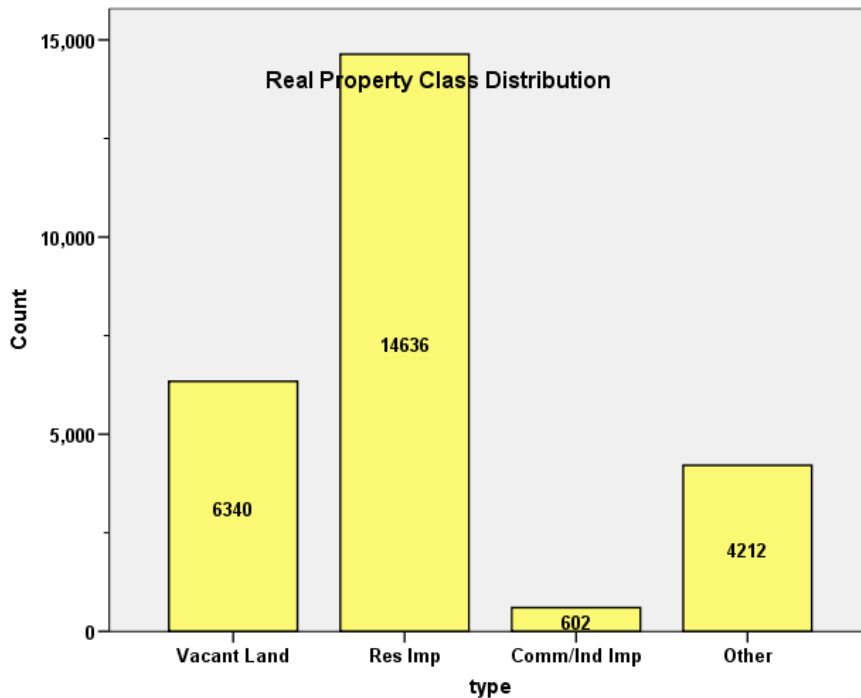
The vacant land class of properties was dominated by residential land. Residential lots (coded 100) accounted for 86.3% of all vacant land parcels.

For residential improved properties, single family properties accounted for 65.3% of all residential properties. Residential condominiums accounted for 32.7% of all residential improved properties. Based on the guidelines for the state audit statistical compliance analysis, we will analyze residential condominiums separately.

Commercial and industrial properties represented a much smaller proportion of property classes in comparison. Commercial/industrial sales accounted for 2.3% of all such properties in this county.

II. DATA FILES

The following sales analyses were based on the requirements of the 2016 Colorado Property Assessment Study. Information was provided by the Grand Assessor's Office in April 2016. The data included all 5 property record files as specified by the Auditor.

III. RESIDENTIAL SALES RESULTS

There were 1,131 qualified residential sales in the 24-month sale period prior to June 30, 2014. The following analysis separated residential condominiums from other residential property types:

Residential Non-Condominiums (776 Sales)

Median	0.985
Price Related Differential	1.019
Coefficient of Dispersion	10.0

Residential Condominiums (526 Sales)

Median	0.996
Price Related Differential	1.007
Coefficient of Dispersion	7.0

The above ratio statistics were in compliance with the standards set forth by the Colorado State Board of Equalization (SBOE) for the overall residential sales. The following graphs describe further the sales ratio distribution for these properties:

Residential Non-Condominiums

ResCondo: .00

Mean = .98
Std. Dev. = .145
N = 776
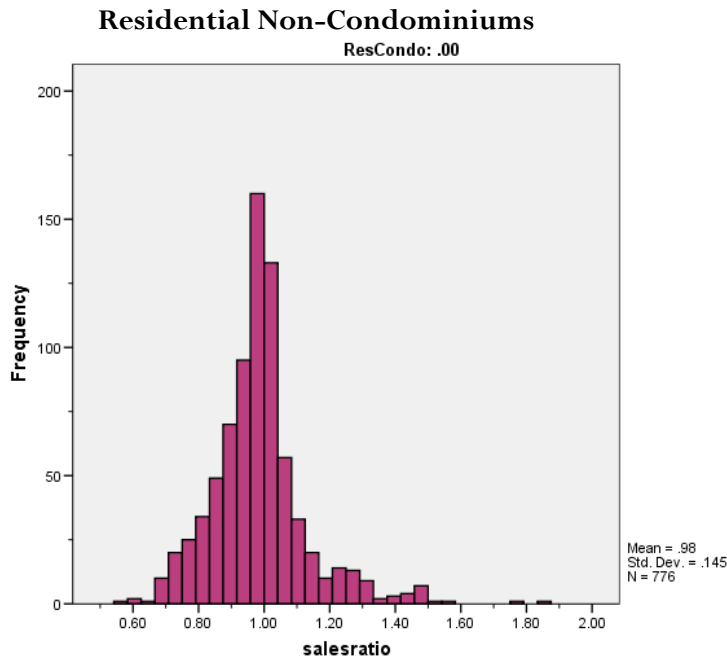
Residential Condominiums
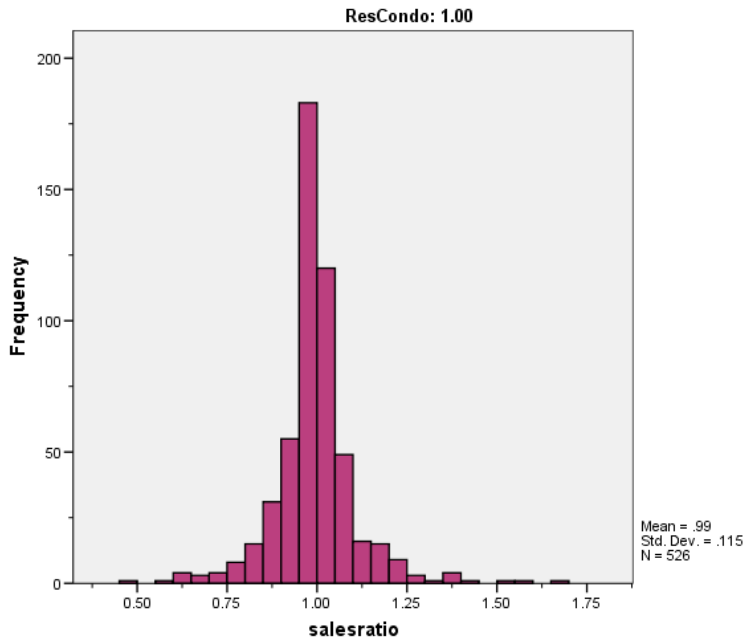
The above graphs indicate that the distribution of the sale ratios was within state mandated limits. No sales were trimmed.

Residential Market Trend Analysis

We next analyzed the residential dataset using the 24-month sale period for any residual market trending, as follows:

ResCondo	Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
.00	1	(Constant)	.979	.010		99.259	.000
		SalePeriod	.001	.001	.025	.709	.479
1.00	1	(Constant)	.979	.010		98.014	.000
		SalePeriod	.001	.001	.079	1.817	.070

a. Dependent Variable: salesratio

The above statistical results indicate that both groups of residential properties had no significant trend in their sales ratios. We therefore concluded that the assessor has adequately addressed market trending in the valuation of residential properties.

Sold/Unsold Analysis

In terms of the valuation consistency between sold and unsold residential properties, we compared the 2016 median actual value per square foot between each group, stratified by subdivision, as follows:

Report

ValSF

ResCondo	sold	N	Median	Mean
.00	UNSOLD	9,012	$182.35	$207.11
	SOLD	776	$205.42	$229.25
1.00	UNSOLD	4,071	$165.22	$178.09
	SOLD	526	$175.16	$181.65

ResCondo = .00

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of ValSF is the same across categories of sold.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

ResCondo = 1.00

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of ValSF is the same across categories of sold.	Independent-Samples Mann-Whitney U Test	.039	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

We next compared the same properties using the percent change in value between sold and unsold residential properties, grouped by condominiums and other residential properties:

Report

DIFF

ResCondo	sold	N	Median	Mean
.00	UNSOLD	8,803	1.069	1.083
	SOLD	774	1.102	1.110
1.00	UNSOLD	4,198	.943	.963
	SOLD	526	.968	.965

The above results indicate that sold and unsold residential properties were valued in a consistent manner.

IV. COMMERCIAL/INDUSTRIAL SALE RESULTS

There were 37 qualified commercial and industrial sales in the 24-month sale period prior to June 30, 2014.

Median	0.969
Price Related Differential	1.025
Coefficient of Dispersion	11.7

The above table indicates that the Grand County commercial/industrial sale ratios were in compliance with the SBOE standards. The following histogram and scatter plot describe the sales ratio distribution further:

Mean = .97
Std. Dev. = .154
N = 37

Commercial Sale Price by Sales Ratio
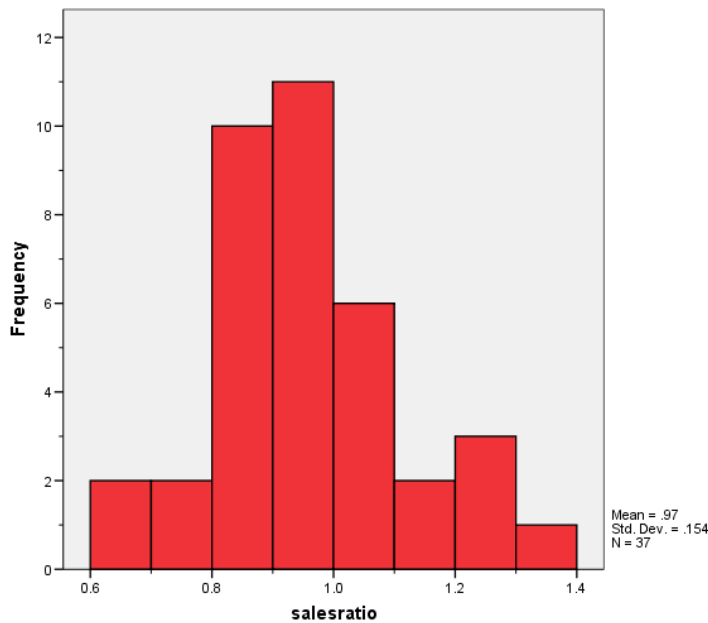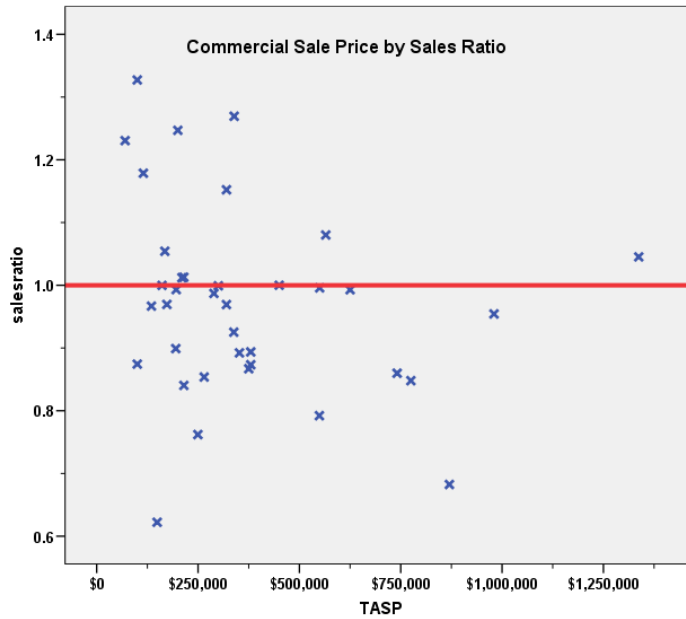
Commercial Market Trend Analysis

The assessor did not apply any market trend adjustment to the commercial dataset. The 37 commercial sales were analyzed, examining the sale ratios across the 24-month sale period with the following results:

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.974	.047		20.821	.000
	SalePeriod	.000	.004	-.012	-.070	.945

a. Dependent Variable: salesratio
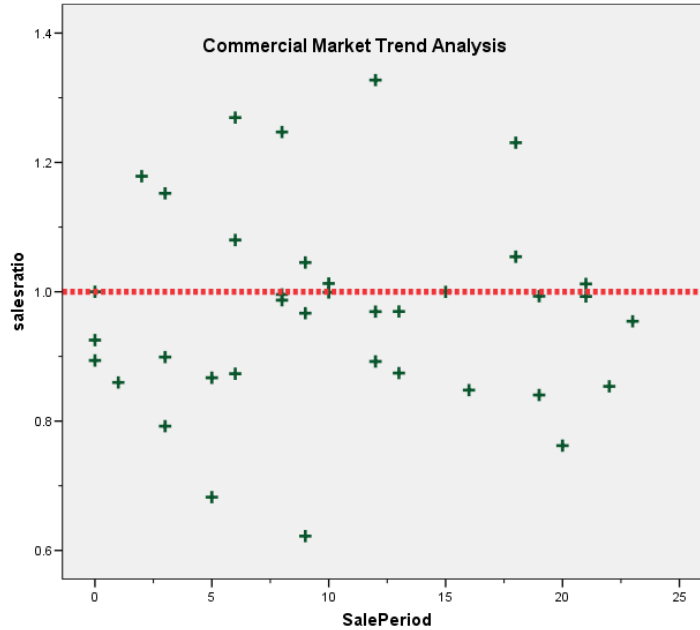
The market trend results indicated no statistically significant trend. We concur that no market trend adjustments were warranted for properties in this class for Grand County.

Sold/Unsold Analysis

We compared the median and median change in value from 2014 to 2016 between sold and unsold commercial properties to determine if the assessor was valuing each group consistently. While this is a challenge to prove in this county, given the small number of sales and the overall diversity of commercial/industrial properties across six economic areas, the following results indicate that based on the median and mean actual value, both groups were valued overall in a consistent manner:

Report

DIFF

sold	N	Median	Mean
UNSOLD	566	.992	1.243
SOLD	37	.986	1.066

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of DIFF is the same across categories of sold.	Independent-Samples Mann-Whitney U Test	.605	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

V. VACANT LAND SALE RESULTS

There were 281 qualified vacant land sales in the 24-month sale period prior to June 30, 2014.

Median	1.000
Price Related Differential	1.043
Coefficient of Dispersion	13.4

The above table indicates that the Grand County vacant land sale ratios were in compliance with the SBOE standards. The following histogram and scatter plot describe the sales ratio distribution further:
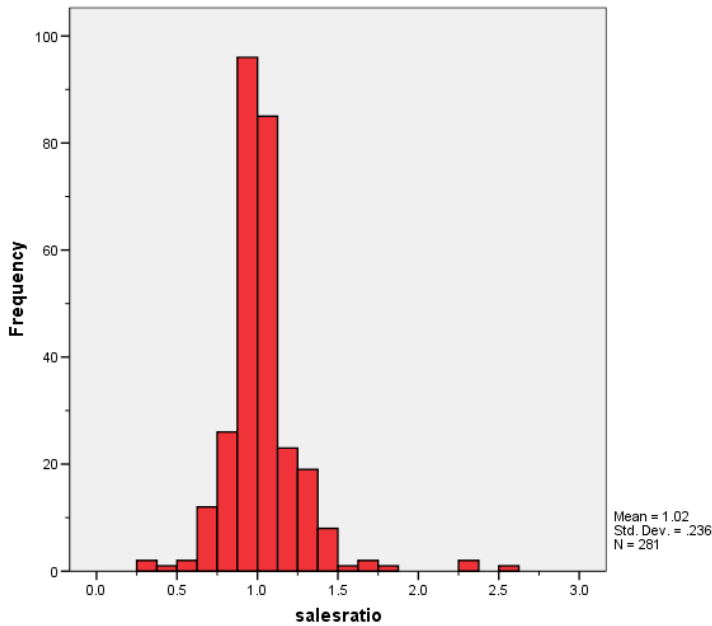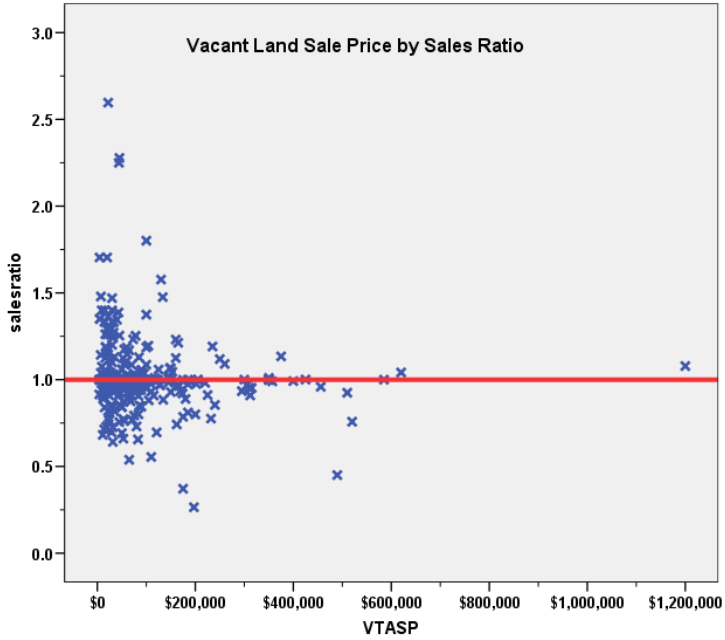
Vacant Land Market Trend Analysis

The 281 vacant land sales were analyzed, examining the sale ratios across the 24-month sale period with the following results:

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.001	.027		36.608	.000
	VSalePeriod	.002	.002	.057	.956	.340

a. Dependent Variable: salesratio
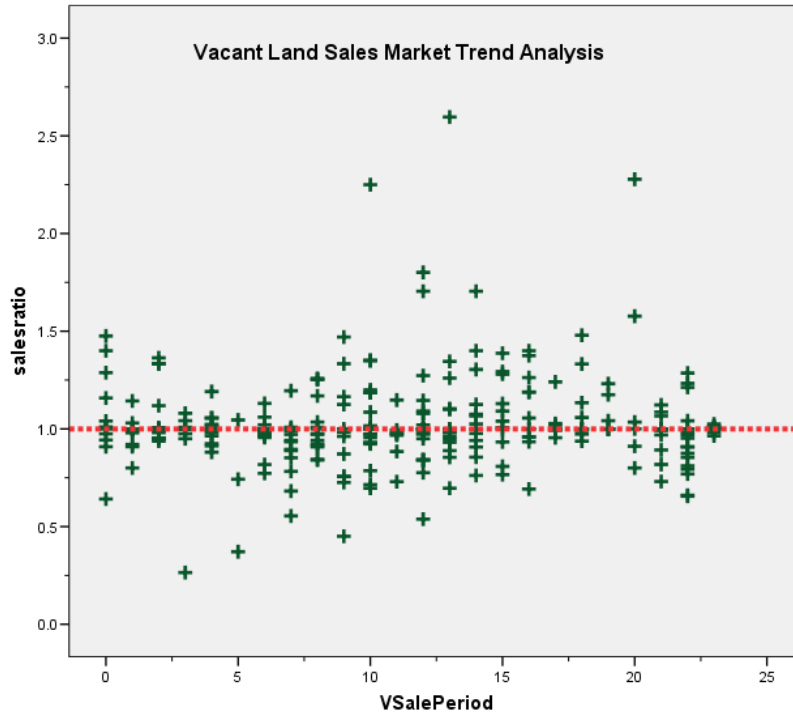
Vacant Land Sales Market Trend Analysis

The market trend results indicated no statistically significant trend. We concur that no market trend adjustments were warranted for properties in this class for Grand County.

Sold/Unsold Analysis

We compared the median and mean change in actual value between 2014 and 2016 for vacant land properties to determine if sold and unsold properties were valued consistently. The following analysis compared both groups for subdivisions with at least 3 sales:

Report
DIFF

SUBDIVNO	sold	N	Median	Mean
258		42	1.000	.989
		3	1.000	1.162
300		75	.981	.991
		3	1.000	1.321
1040		8	.806	.806
		3	.806	.836
1110		32	1.482	1.387
		5	1.140	1.049
1130		34	.577	.577
		6	.861	.779
1250		56	1.011	1.008
		11	1.011	1.084

1280	98	.749	.771
	4	.869	.888
1450	22	1.134	1.134
	4	1.134	1.134
1526	26	.945	.945
	3	.945	.945
1773	276	.979	.999
	14	.909	1.062
1853	38	1.015	1.026
	7	1.067	.955
2140	51	1.240	1.228
	4	1.240	1.162
2230	99	1.173	1.248
	9	1.173	1.224
2239	48	.670	.670
	3	.698	.689
2264	18	1.179	1.123
	3	1.400	1.319
2421	12	.801	.801
	3	.801	1.082
2507	28	1.000	.992
	4	.917	.957
2544	16	1.147	1.136
	3	1.147	1.338
2546	41	1.186	1.165
	6	1.264	1.340
2870	40	1.275	1.275
	3	1.402	1.402
2950	16	1.104	1.104
	3	1.104	1.104
9030	149	1.000	.991
	4	1.033	1.035

The above results show that sold and unsold vacant land properties were valued consistently.

V. AGRICULTURAL IMPROVEMENTS ANALYSIS

The final statistical verification concerned the assigned actual values for agricultural residential improvements. We compared the actual value per square foot rate for this group and compared it to rates assigned to residential single family improvements in Grand County.

The following indicates that agricultural residential improvements were valued in a manner similar to the single family residential improvements in this county:

Report

IMPVALSF

ABSTRIMP	N	Median	Mean
1212	5,339	$120.61	$135.37
4277	395	$117.49	$128.83

Hypothesis Test Summary

|	Null Hypothesis	Test	Sig.	Decision
1	The distribution of IMPVALSF is the same across categories of ABSTRIMP.	Independent-Samples Mann-Whitney U Test	.090	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

VI. CONCLUSIONS

Based on this statistical analysis, there were no significant compliance issues concluded for Grand County as of the date of this report.

STATISTICAL ABSTRACT
Residential

| ResCondo | Mean | 95% Confidence Interval for Mean | | Median | 95% Confidence Interval for Median | | | Weighted Mean | 95% Confidence Interval for Weighted Mean | | Price Related Differential | Coefficient of Dispersion | Coefficient of Variation |
		Lower Bound	Upper Bound		Lower Bound	Upper Bound	Actual Coverage		Lower Bound	Upper Bound			Mean Centered
.00	.985	.975	.995	.985	.976	.993	95.2%	.966	.953	.980	1.019	.100	14.7%
1.00	.995	.985	1.005	.996	.992	.998	95.0%	.988	.980	.996	1.007	.070	11.6%

The confidence interval for the median is constructed without any distribution assumptions. The actual coverage level may be greater than the specified level. Other confidence intervals are constructed by assuming a Normal distribution for the ratios.

Commercial/Industrial

| Mean | 95% Confidence Interval for Mean | | Median | 95% Confidence Interval for Median | | | Weighted Mean | 95% Confidence Interval for Weighted Mean | | Price Related Differential | Coefficient of Dispersion | Coefficient of Variation |
	Lower Bound	Upper Bound		Lower Bound	Upper Bound	Actual Coverage		Lower Bound	Upper Bound			Mean Centered
.971	.919	1.022	.969	.894	1.000	95.3%	.947	.893	1.000	1.025	.117	15.9%

The confidence interval for the median is constructed without any distribution assumptions. The actual coverage level may be greater than the specified level. Other confidence intervals are constructed by assuming a Normal distribution for the ratios.

Vacant Land

| Mean | 95% Confidence Interval for Mean | | Median | 95% Confidence Interval for Median | | | Weighted Mean | 95% Confidence Interval for Weighted Mean | | Price Related Differential | Coefficient of Dispersion | Coefficient of Variation |
	Lower Bound	Upper Bound		Lower Bound	Upper Bound	Actual Coverage		Lower Bound	Upper Bound			Mean Centered
1.023	.996	1.051	1.000	.991	1.000	95.8%	.981	.950	1.013	1.043	.134	23.1%

The confidence interval for the median is constructed without any distribution assumptions. The actual coverage level may be greater than the specified level. Other confidence intervals are constructed by assuming a Normal distribution for the ratios.

Residential Median Ratio Stratification

Sale Price

Case Processing Summary

		Count	Percent
SPRec	LT $25K	18	1.4%
	$25K to $50K	29	2.2%
	$50K to $100K	87	6.7%
	$100K to $150K	171	13.1%
	$150K to $200K	198	15.2%
	$200K to $300K	291	22.4%
	$300K to $500K	336	25.8%
	$500K to $750K	117	9.0%
	$750K to $1,000K	35	2.7%
	Over $1,000K	20	1.5%
Overall		1302	100.0%
Excluded		0	
Total		1302	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LT $25K	1.079	1.028	.155	19.5%
$25K to $50K	.996	1.011	.147	19.5%
$50K to $100K	1.016	.996	.127	18.2%
$100K to $150K	.998	.999	.086	15.0%
$150K to $200K	.996	1.002	.094	14.0%
$200K to $300K	.982	.999	.085	12.8%
$300K to $500K	.991	.999	.075	10.9%
$500K to $750K	.974	1.000	.057	7.7%
$750K to $1,000K	.999	.998	.074	11.5%
Over $1,000K	.922	1.037	.098	13.1%
Overall	.992	1.018	.088	13.5%

Subclass

Case Processing Summary

		Count	Percent
ABSTRIMP	1212	769	59.1%
	1214	1	0.1%
	1215	4	0.3%
	1225	2	0.2%
	1230	526	40.4%
Overall		1302	100.0%
Excluded		0	
Total		1302	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1212	.983	1.015	.100	14.6%
1214	1.463	1.000	.000	.
1215	1.020	1.061	.089	15.3%
1225	.809	1.196	.235	33.2%
1230	.996	1.007	.070	11.5%
Overall	.992	1.018	.088	13.5%

Improvement Age

Case Processing Summary

		Count	Percent
AgeRec	Over 100	4	0.3%
	75 to 100	16	1.2%
	50 to 75	38	2.9%
	25 to 50	493	37.9%
	5 to 25	700	53.8%
	5 or Newer	51	3.9%
Overall		1302	100.0%
Excluded		0	
Total		1302	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
Over 100	1.008	1.085	.143	22.6%
75 to 100	.927	1.063	.152	21.8%
50 to 75	.886	.991	.129	16.6%
25 to 50	.993	1.024	.101	15.3%
5 to 25	.995	1.020	.075	11.8%
5 or Newer	.976	1.005	.057	7.4%
Overall	.992	1.018	.088	13.5%

Improved Area

Case Processing Summary

		Count	Percent
ImpSFRec	LE 500 sf	69	5.3%
	500 to 1,000 sf	348	26.7%
	1,000 to 1,500 sf	450	34.6%
	1,500 to 2,000 sf	256	19.7%
	2,000 to 3,000 sf	135	10.4%
	3,000 sf or Higher	44	3.4%
Overall		1302	100.0%
Excluded		0	
Total		1302	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LE 500 sf	.994	1.027	.099	15.4%
500 to 1,000 sf	.990	1.013	.088	13.3%
1,000 to 1,500 sf	.993	1.014	.086	13.4%
1,500 to 2,000 sf	.990	1.021	.090	13.9%
2,000 to 3,000 sf	.993	1.026	.083	11.9%
3,000 sf or Higher	1.004	1.048	.077	15.0%
Overall	.992	1.018	.088	13.5%

Improvement Quality

Case Processing Summary

		Count	Percent
ImpSFRec	LE 500 sf	69	5.3%
	500 to 1,000 sf	348	26.7%
	1,000 to 1,500 sf	450	34.6%
	1,500 to 2,000 sf	256	19.7%
	2,000 to 3,000 sf	135	10.4%
	3,000 sf or Higher	44	3.4%
Overall		1302	100.0%
Excluded		0	
Total		1302	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LE 500 sf	.994	1.027	.099	15.4%
500 to 1,000 sf	.990	1.013	.088	13.3%
1,000 to 1,500 sf	.993	1.014	.086	13.4%
1,500 to 2,000 sf	.990	1.021	.090	13.9%
2,000 to 3,000 sf	.993	1.026	.083	11.9%
3,000 sf or Higher	1.004	1.048	.077	15.0%
Overall	.992	1.018	.088	13.5%

Improvement Condition

Case Processing Summary

		Count	Percent
ImpSFRec	LE 500 sf	69	5.3%
	500 to 1,000 sf	348	26.7%
	1,000 to 1,500 sf	450	34.6%
	1,500 to 2,000 sf	256	19.7%
	2,000 to 3,000 sf	135	10.4%
	3,000 sf or Higher	44	3.4%
Overall		1302	100.0%
Excluded		0	
Total		1302	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LE 500 sf	.994	1.027	.099	15.4%
500 to 1,000 sf	.990	1.013	.088	13.3%
1,000 to 1,500 sf	.993	1.014	.086	13.4%
1,500 to 2,000 sf	.990	1.021	.090	13.9%
2,000 to 3,000 sf	.993	1.026	.083	11.9%
3,000 sf or Higher	1.004	1.048	.077	15.0%
Overall	.992	1.018	.088	13.5%

Commercial Median Ratio Stratification

Sale Price

Case Processing Summary

		Count	Percent
SPRec	$50K to $100K	3	8.1%
	$100K to $150K	3	8.1%
	$150K to $200K	6	16.2%
	$200K to $300K	7	18.9%
	$300K to $500K	9	24.3%
	$500K to $750K	5	13.5%
	$750K to $1,000K	3	8.1%
	Over $1,000K	1	2.7%
Overall		37	100.0%
Excluded		0	
Total		37	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
$50K to $100K	1.231	1.008	.123	21.2%
$100K to $150K	.967	1.026	.192	29.6%
$150K to $200K	.996	.998	.073	12.4%
$200K to $300K	.987	.999	.082	12.5%
$300K to $500K	.925	1.005	.104	16.5%
$500K to $750K	.993	1.004	.085	12.9%
$750K to $1,000K	.848	.995	.107	16.4%
Over $1,000K	1.045	1.000	.000	.
Overall	.969	1.025	.117	15.9%

Subclass

Case Processing Summary

		Count	Percent
ABSTRIMP	1714	1	2.7%
	1721	3	8.1%
	1726	1	2.7%
	2212	10	27.0%
	2215	4	10.8%
	2225	2	5.4%
	2230	9	24.3%
	2233	1	2.7%
	2235	2	5.4%
	2240	3	8.1%
	2245	1	2.7%
Overall		37	100.0%
Excluded		0	
Total		37	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1714	.969	1.000	.000	.
1721	.999	1.029	.113	17.0%
1726	.987	1.000	.000	.
2212	.934	1.019	.085	10.0%
2215	1.023	1.103	.177	22.0%
2225	1.135	1.017	.119	16.8%
2230	.874	1.030	.145	20.8%
2233	1.231	1.000	.000	.
2235	.996	1.002	.004	0.5%
2240	1.045	.976	.060	10.6%
2245	.993	1.000	.000	.
Overall	.969	1.025	.117	15.9%

Improvement Age

Case Processing Summary

		Count	Percent
AgeRec	Over 100	1	2.7%
	75 to 100	9	24.3%
	50 to 75	6	16.2%
	25 to 50	12	32.4%
	5 to 25	9	24.3%
Overall		37	100.0%
Excluded		0	
Total		37	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
Over 100	1.054	1.000	.000	.
75 to 100	.899	.992	.078	11.0%
50 to 75	1.087	1.054	.163	19.1%
25 to 50	.968	1.011	.090	12.6%
5 to 25	.993	1.028	.123	19.3%
Overall	.969	1.025	.117	15.9%

Improved Area

Case Processing Summary

		Count	Percent
ImpSFRec	LE 500 sf	3	8.1%
	500 to 1,000 sf	2	5.4%
	1,000 to 1,500 sf	4	10.8%
	1,500 to 2,000 sf	2	5.4%
	2,000 to 3,000 sf	5	13.5%
	3,000 sf or Higher	21	56.8%
Overall		37	100.0%
Excluded		0	
Total		37	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LE 500 sf	.874	1.089	.232	35.3%
500 to 1,000 sf	1.003	1.000	.009	1.3%
1,000 to 1,500 sf	1.006	.998	.025	3.6%
1,500 to 2,000 sf	1.044	1.007	.195	27.5%
2,000 to 3,000 sf	.894	1.064	.070	12.9%
3,000 sf or Higher	.969	1.020	.115	15.5%
Overall	.969	1.025	.117	15.9%

Improvement Quality

Case Processing Summary

		Count	Percent
QUALITY	1	1	2.7%
	2	4	10.8%
	3	13	35.1%
	4	15	40.5%
	5	3	8.1%
	6	1	2.7%
Overall		37	100.0%
Excluded		0	
Total		37	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1	1.327	1.000	.000	.
2	.934	1.057	.144	21.4%
3	.987	.990	.090	12.5%
4	.954	1.022	.112	15.6%
5	.993	.984	.066	11.0%
6	.682	1.000	.000	.
Overall	.969	1.025	.117	15.9%

Improvement Condition

Case Processing Summary

		Count	Percent
CONDITION	0	1	2.7%
	1	4	10.8%
	2	27	73.0%
	3	5	13.5%
Overall		37	100.0%
Excluded		0	
Total		37	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
0	1.327	1.000	.000	.
1	1.103	1.002	.099	14.8%
2	.954	1.020	.103	14.4%
3	1.012	1.021	.094	15.2%
Overall	.969	1.025	.117	15.9%

Vacant Land Median Ratio Stratification

Sale Price

Case Processing Summary

		Count	Percent
SPRec	LT $25K	69	24.6%
	$25K to $50K	54	19.2%
	$50K to $100K	81	28.8%
	$100K to $150K	27	9.6%
	$150K to $200K	19	6.8%
	$200K to $300K	12	4.3%
	$300K to $500K	14	5.0%
	$500K to $750K	4	1.4%
	Over $1,000K	1	0.4%
Overall		281	100.0%
Excluded		0	
Total		281	

Ratio Statistics for CURRLND / VTASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LT $25K	1.000	1.001	.171	29.4%
$25K to $50K	1.000	1.000	.178	31.1%
$50K to $100K	.991	.993	.097	16.1%
$100K to $150K	.998	.995	.104	19.1%
$150K to $200K	.959	1.010	.166	26.2%
$200K to $300K	.991	.999	.081	11.4%
$300K to $500K	.991	1.012	.069	15.9%
$500K to $750K	.962	.993	.093	13.5%
Over $1,000K	1.079	1.000	.000	.
Overall	1.000	1.043	.134	23.8%

Subclass

Case Processing Summary

		Count	Percent
ABSTRLND	100	200	71.2%
	200	6	2.1%
	520	5	1.8%
	530	5	1.8%
	540	2	0.7%
	550	3	1.1%
	560	1	0.4%
	1112	57	20.3%
	1125	1	0.4%
	2140	1	0.4%
Overall		281	100.0%
Excluded		0	
Total		281	

Ratio Statistics for CURRLND / VTASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
100	1.000	1.050	.147	24.4%
200	.999	.958	.061	11.6%
520	.852	1.064	.084	12.1%
530	1.000	1.014	.030	6.6%
540	1.088	.969	.098	13.9%
550	1.000	1.004	.043	6.5%
560	.982	1.000	.000	.
1112	.990	1.026	.104	24.6%
1125	.450	1.000	.000	.
2140	1.079	1.000	.000	.
Overall	1.000	1.043	.134	23.8%