



Boulder County Colorado

2023

# BOULDER COUNTY PROPERTY ASSESSMENT STUDY

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September 15, 2023

Ms. Natalie Castle  
Director of Research  
Colorado Legislative Council  
Room 029, State Capitol Building  
Denver, Colorado 80203

**RE: Final Report for the 2023 Colorado Property Assessment Study**

Dear Ms. Castle:

East West Econometrics - Audit Division is pleased to submit the Final Reports for the 2023 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 locally assessed 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.

East West Econometrics – Audit Division appreciates the opportunity to be of service to the State of Colorado. Please contact us with any questions or concerns.

A handwritten signature in cursive script, reading "Harry J. Fuller".

Harry J. Fuller  
Project Manager  
East West Econometrics – Audit Division

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# INTRODUCTION

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## Colorado

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.

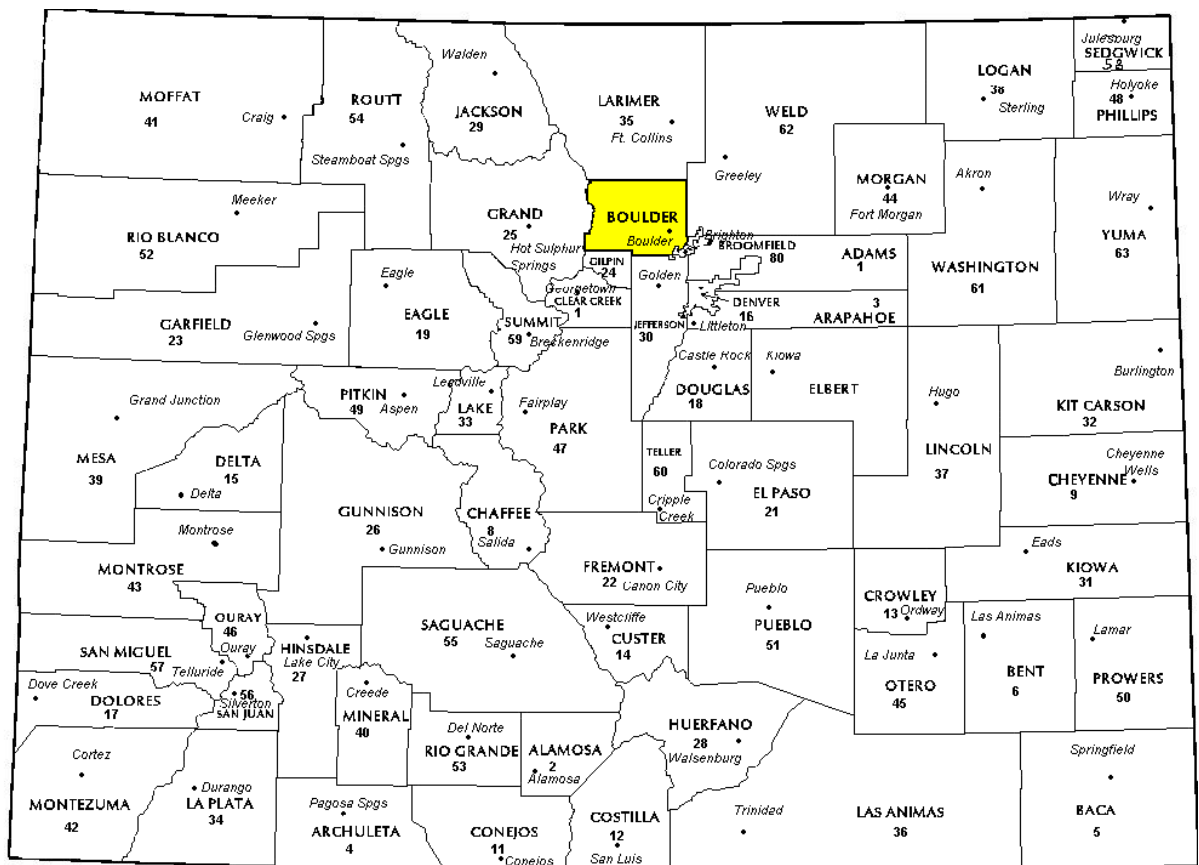
East West Econometrics Audit has completed the Property Assessment Study for 2023 and is pleased to report its findings for Boulder County in the following report.

# REGIONAL/HISTORICAL SKETCH OF BOULDER COUNTY

## Regional Information

Boulder County is located in the Front Range region of Colorado. The Colorado Front Range is a colloquial geographic term for the populated areas of the State that are just east of the foothills of the Front Range. It includes

Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, El Paso, Jefferson, Larimer, Pueblo, and Weld counties.



## Historical Information

Boulder County has approximately 726.3 square miles and an estimated population of approximately 326,196 people with 405.6 people per square mile, according to the U.S. Census Bureau's 2020 estimated census data. This represents a 10.7 percent change from April 1, 2010 to July 1, 2019.

Boulder County was one of the original 17 counties created by the Territory of Colorado on January 11, 1861. The county was named for Boulder City and Boulder Creek, so named because of the abundance of boulders in the area. Boulder County retains essentially the same borders as in 1861, although a small portion of its southeastern corner became part of the City and County of Broomfield in 2001.

In the early to mid 1800s, the nomadic Southern Arapaho Native American tribe frequently wintered at the base of the foothills in the Boulder area. Chief Niwot and his band called the site their home. Other nomadic tribes included the Utes, Cheyennes, Comanches, and Sioux.

The first recorded European settlers in the area were gold prospectors who arrived in 1858,

when Boulder was part of the Nebraska Territory (The former boundary between Nebraska and Kansas territories is the present Baseline Road in Boulder). The "Boulder City Town Company" was founded on February 10, 1859. Boulder's first school house was built in 1860, followed by the creation of the Colorado Territory in 1861. In 1871 'Boulder City' was incorporated. In 1873 the railroad was extended to Boulder and, in 1890, the Boulder Railroad Depot was constructed to serve as a station for the Union Pacific Railroad. In 1876 Colorado was granted statehood, and in that same year the University of Colorado at Boulder opened.

Mining gold, silver, and coal continued to be a prominent part of the local economy until the mid 1900s. A coal miners strike lasted from 1910 to 1915, causing a military presence in nearby Louisville. Mining's relevance in the local economy declined in the 1940s, when the city began actively recruiting clean industry, such as the National Bureau of Standards, which today is the National Institute of Standards and Technology, home of the atomic clock.

*(Wikipedia.org)*

# RATIO ANALYSIS

## Methodology

All significant classes of property were analyzed. Sales were collected for each property class over the eighteen month period from January 1, 2021 through June 30th, 2022. Property classes with less than thirty sales had the sales period extended in six month increments up to an additional forty-two months. If this extended sales period did not produce the minimum thirty qualified sales, the Audit performed supplemental appraisals to reach the minimum.

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.

All sixty-four counties were examined for compliance on the economic area level. Where there were sufficient sales data, the neighborhood and subdivision levels were tested for compliance. Although counties are determined to be in or out of compliance at the class level, non-compliant economic areas, neighborhoods and subdivisions (where applicable) were discussed with the Assessor.

**Data on the individual economic areas, neighborhoods and subdivisions are found in the STATISTICAL APPENDIX.**

## 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
Residential Condominium	Between .95-1.05	Less than 15.99
Residential	Between .95-1.05	Less than 15.99
Vacant Land	Between .95-1.05	Less than 20.99



The results for Boulder County are:

Boulder County Ratio Grid					
Property Class	Number of Qualified Sales	Unweighted Median Ratio	Price Related Differential	Coefficient of Dispersion	Time Trend Analysis
Commercial/Industrial	254	0.966	1.074	19.2	Compliant
Residential	11,700	0.974	1.043	9.2	Compliant
Vacant Land	166	0.967	1.033	20.6	Compliant

After applying the above described methodologies, it is concluded from the sales ratios that Boulder 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 Boulder County has complied with the statutory requirements to analyze the effects of time on value in their county. Boulder 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

Boulder 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
Residential	Compliant
Vacant Land	Compliant

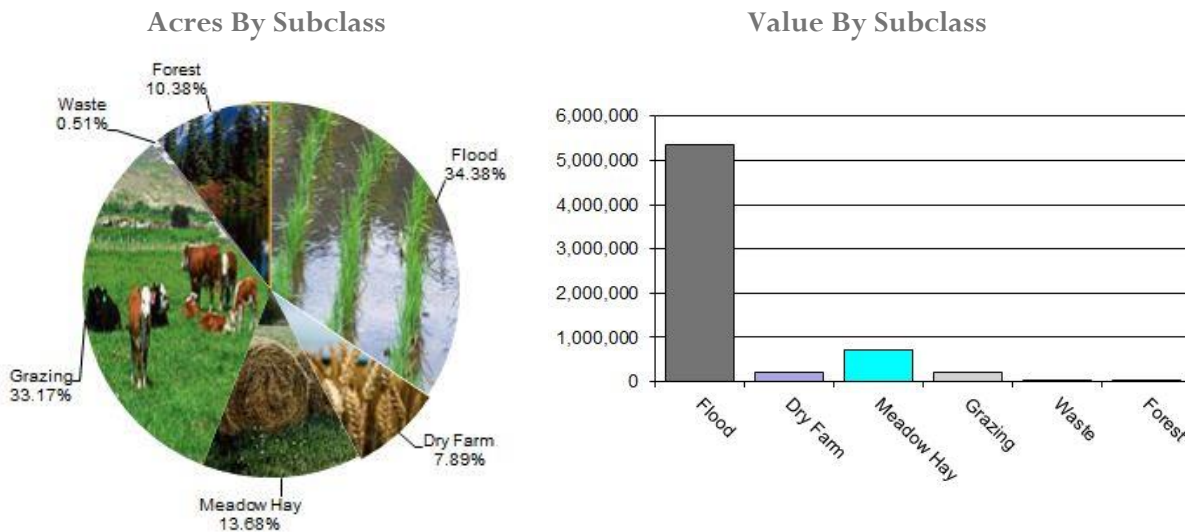
### Conclusions

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

### Recommendations

None

# AGRICULTURAL LAND STUDY



## 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:

Boulder County Agricultural Land Ratio Grid						
Abstract Code	Land Class	Number Of Acres	County Value Per Acre	County Assessed Total Value	WRA Total Value	Ratio
4117	Flood	19,802	269.83	5,343,272	5,427,081	0.98
4127	Dry Farm	4,542	48.74	221,393	219,987	1.01
4137	Meadow Hay	7,878	92.51	728,829	728,365	1.00
4147	Grazing	19,105	10.93	208,768	208,768	1.00
4177	Forest	5,979	4.43	26,513	26,409	1.00
4167	Waste	296	2.19	647	647	1.00
Total/ Avg		57,602	113.35	6,529,423	6,611,258	0.99

## Recommendations

None

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## Agricultural Outbuildings

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### 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.

Property Taxation for the valuation of agricultural outbuildings.

### Recommendations

None

### Conclusions

Boulder County has substantially complied with the procedures provided by the Division of

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## Agricultural Land Under Improvements

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### 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

Boulder 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
- Written Correspondence other than Questionnaire
- Aerial Photography/Pictometry

Boulder 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
- Questionnaires
- Field Inspections
- Phone Interviews
- In-Person Interviews with Owners/Tenants
- Written Correspondence other than Questionnaire
- Aerial Photography/Pictometry

Boulder 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.

EWE reviewed the sales verification procedures in 2023 for Boulder County. This study was conducted by checking selected sales from the master sales list for the current valuation period. Specifically EWE selected 67 sales listed as unqualified.

All but one of the sales selected in the sample gave reasons that were clear and supportable. One sale had insufficient reason for disqualification.

For residential, commercial, and vacant land sales with considerations over \$100,000, 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.

When less than 50 percent of sales are qualified in any of the three property classes (residential, commercial, and vacant land), the contractor analyzed the reasons for disqualifying sales in any subclass that constitutes at least 20 percent of the class, either by number of properties or by value, from the prior year. 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.

If 50 percent or more of the sales are qualified, the contractor has reviewed a

statistically significant sample of unqualified sales, excluding sales that were disqualified for obvious reasons.

Boulder County did not qualify for in-depth subclass analysis.

### **Conclusions**

Boulder County appears to be doing an adequate job of verifying their sales.

### **Recommendations**

None

# ECONOMIC AREA REVIEW AND EVALUATION

## **Methodology**

Boulder County has submitted a written narrative describing the economic areas that make up the county's market areas. Boulder 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 Boulder 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

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## Earth and Stone Products

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### 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

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## Producing Oil and Gas

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### Methodology

Assessors Reference Library (ARL) Volume 3, Chapter 6: Valuation of Natural Resources

### STATUTORY REFERENCES

Section § 39-1-103, C.R.S., specifies that producing oil or gas leaseholds and lands are valued according to article 7 of title 39, C.R.S. Actual value determined - when.

(2) The valuation for assessment of leaseholds and lands producing oil or gas shall be determined as provided in article 7 of this title. § 39-1-103, C.R.S.

Article 7 covers the listing, valuation, and assessment of producing oil and gas leaseholds and lands.

### Valuation:

#### Valuation for assessment.

(1) Except as provided in subsection (2) of this section, on the basis of the information contained in such statement, the assessor shall value such oil and gas leaseholds and lands for assessment, as real property, at an amount equal to eighty-seven and one-half percent of:

(a) The selling price of the oil or gas sold there from during the preceding calendar year, after excluding the selling price of all oil or gas delivered to the United States government or any agency thereof, the state of Colorado or any agency thereof, or any political subdivision of the state as royalty during the preceding calendar year;

(b) The selling price of oil or gas sold in the same field area for oil or gas transported from the premises which is not sold during the preceding calendar year, after excluding the selling price of all oil or gas delivered to the United States government or any agency thereof, the state of Colorado or any agency thereof, or any political subdivision of the state as royalty during the preceding calendar year. § 39-7-102, C.R.S.

### Conclusions

The county applied approved appraisal procedures in the valuation of oil and gas.

### Recommendations

None

# VACANT LAND

## **Subdivision Discounting**

Subdivisions were reviewed in 2023 in Boulder County. The review showed that subdivisions were discounted pursuant to 39-1-103 (14) C.R.S. Discounting procedures were applied to all subdivisions where less than 80 percent of vacant land parcels were sold. An absorption rate was estimated for each discounted subdivision. An appropriate discount rate was developed using the Summation Method,

following Division of Property Taxation guidelines.

## **Conclusions**

Boulder 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.

Boulder 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

Boulder 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

Boulder 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.

Boulder 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
- Secretary of State business search
- Leasing Company Information

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.

Boulder County submitted their personal property written audit plan and was current for the 2023 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:

- 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 \$52,000 actual value exemption status
- Accounts protested with substantial disagreement

Boulder County's median ratio is 1.00. This is in compliance with the State Board of Equalization (SBOE) compliance requirements

which range from .90 to 1.10 with no COD requirements.

### **Conclusions**

Boulder 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



# EAST WEST ECONOMETRICS AUDITOR STAFF

**Harry J. Fuller**, *Audit Project Manager*

**Suzanne Howard**, *Audit Administrative Manager*

**Steve Kane**, *Audit Statistician*

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

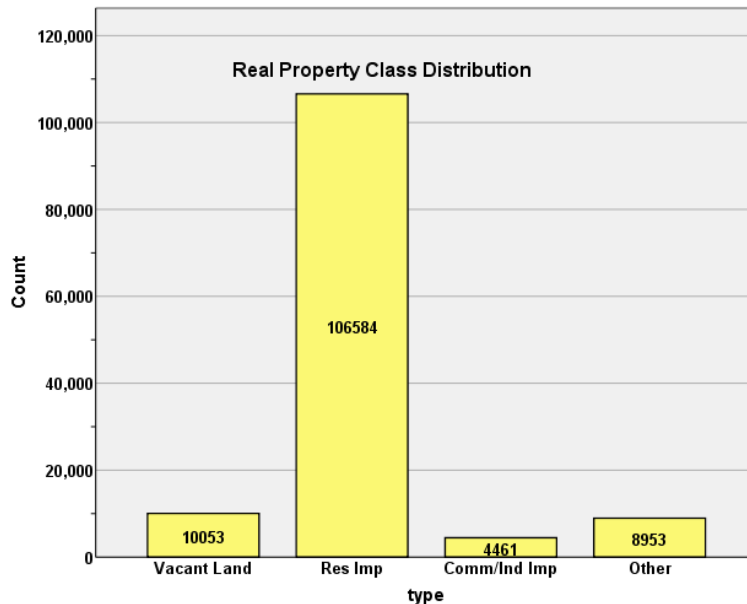
**J. Andrew Rodriguez**, *Field Analyst*

# STATISTICAL APPENDIX

## STATISTICAL COMPLIANCE REPORT FOR BOULDER COUNTY 2023

### I. OVERVIEW

Boulder County is an urban county located along Colorado’s Front Range. The county has a total of 130,051 real property parcels, according to data submitted by the county assessor’s office in 2023. 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, 1110 and 1112) accounted for 72.2% of all vacant land parcels.

For residential improved properties, single family properties accounted for 82.7% of all residential properties.

Commercial and industrial properties represented a much smaller proportion of property classes in comparison. Commercial/industrial properties accounted for 3.4% of all such properties in this county.

### II. DATA FILES

The following sales analyses were based on the requirements of the 2023 Colorado Property Assessment Study. Information was provided by the Boulder Assessor’s Office in May 2023. The data included all 5 property record files as specified by the Auditor.

### III. RESIDENTIAL SALES RESULTS

There were 11,700 qualified residential sales in the 24-month sale period ending June 30, 2022. The sales ratio analysis results were as follows:

Median	<b>0.974</b>
Price Related Differential	<b>1.043</b>
Coefficient of Dispersion	<b>9.2</b>

We next stratified the sale ratio analysis by economic area and neighborhood. The minimum count for the neighborhood stratification is 35 sales. The following are the results of this stratification analysis:

#### Economic Area Case Processing Summary

	Count	Percent
ECONAREA 0	3	0.0%
1	1880	16.1%
2	792	6.8%
3	450	3.8%
4	2944	25.2%
5	3342	28.6%
6	2287	19.6%
Overall	11698	100.0%
Excluded	2	
Total	11700	

#### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion
1	.976	1.031	.107
2	.974	1.038	.111
3	.980	1.041	.148
4	.973	1.010	.080
5	.979	1.001	.080
6	.965	1.195	.094
Overall	.974	1.043	.092

#### Neighborhoods with at least 35 sales Ratio Statistics for CURRTOT / TASP

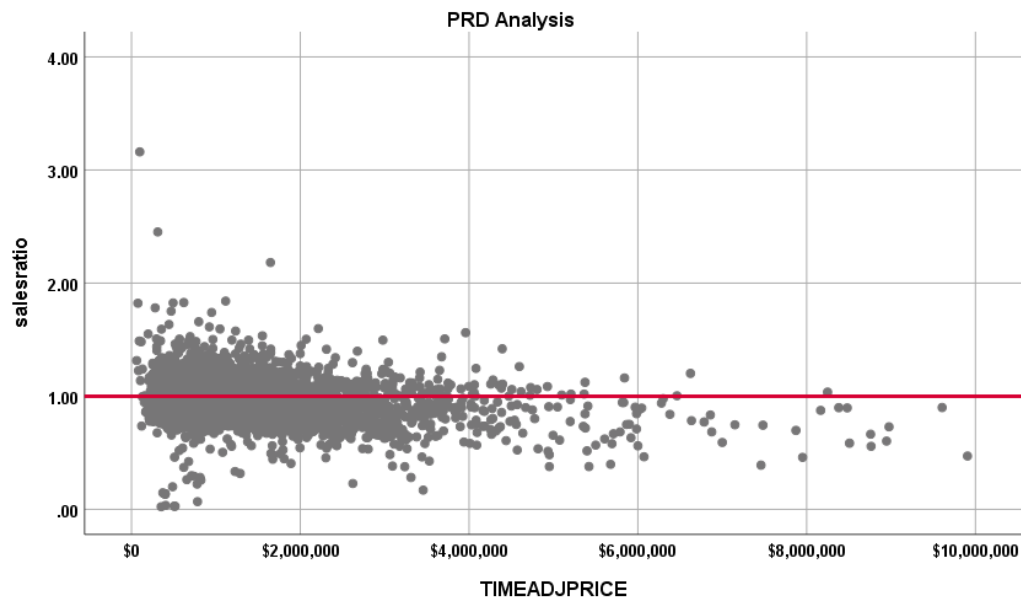
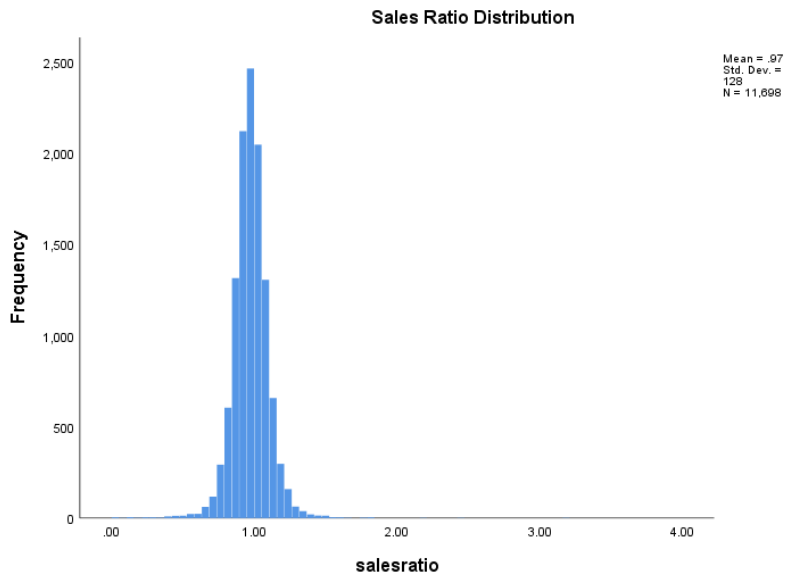
Group	Median	Price Related Differential	Coefficient of Dispersion
101	.997	.981	.136
102	.999	1.019	.100
103	.952	1.040	.159
105	.935	1.045	.130
<b>107</b>	<b>1.065</b>	1.023	.127
109	.983	1.028	.115
115	.955	1.030	.118
120	.946	1.061	.117
122	.990	1.030	.102
124	1.005	1.023	.098

126	.945	1.003	.074
128	.972	1.003	.065
130	.973	1.001	.067
132	.986	1.035	.101
133	.994	1.003	.069
135	.975	1.011	.072
140	.970	.991	.086
142	.960	1.009	.083
144	.953	1.033	.141
145	.988	1.025	.122
146	.992	1.028	.096
148	.965	1.026	.104
150	.940	1.015	.087
155	.979	1.003	.068
158	.951	1.022	.095
160	.977	1.020	.090
162	.967	1.032	.118
164	1.002	1.004	.058
170	.952	1.032	.119
172	.953	1.052	.146
174	.992	1.025	.105
178	.959	1.017	.100
201	.991	1.007	.102
202	.980	1.003	.074
203	.979	1.003	.086
204	.932	1.008	.102
205	.994	.998	.074
223	.995	1.009	.079
240	.986	.998	.088
241	.965	1.005	.077
242	.994	1.012	.074
243	.981	1.003	.066
255	.960	1.002	.070
256	.944	1.002	.087
257	.995	.997	.068
401	.953	1.036	.137
405	1.005	1.085	.091
410	.965	1.014	.075
415	.976	1.007	.075
420	1.011	1.002	.068
425	.989	1.031	.105
430	.956	.995	.107
440	.966	1.004	.069
445	.956	1.011	.075
450	.999	1.012	.078
451	1.002	1.024	.074
455	.931	.994	.092
460	.956	1.020	.101
465	.951	1.012	.073
470	.951	1.006	.064
480	.948	1.000	.074
501	.996	1.000	.084
820	.991	1.065	.161
825	.991	1.008	.126
830	.992	1.050	.158
901	.973	1.017	.098
903	.961	1.025	.103

910	.978	1.116	.129
<b>911</b>	.962	1.070	<b>.162</b>
940	.964	1.002	.105
960	.991	1.018	.094
962	1.005	1.011	.081
Overall	.974	1.015	.090

NOTE: Red above indicates outside of SBOE guidelines

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

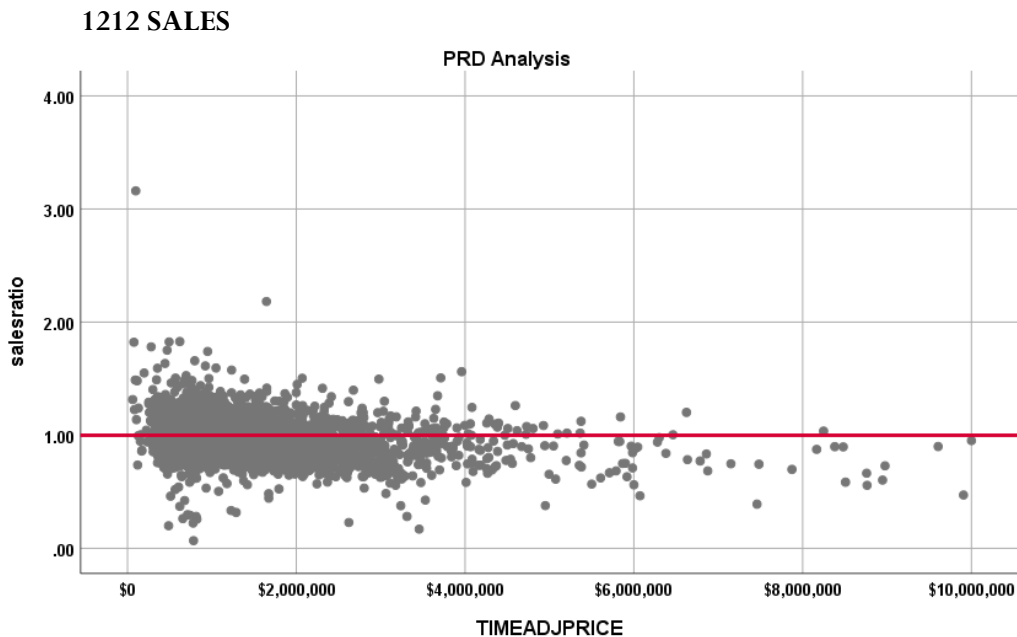


NOTE – SALES OVER \$10,000,000 EXCLUDED

The above graphs indicate that the distribution of the sale ratios was within state mandated limits.

### Subclass 1212 PRD Analysis

We next analyzed residential properties identified as 1212 using the state abstract code system. These include single family residences, town homes and purged manufactured homes. The following indicates the distribution of sales ratios across the sale price spectrum:



The Price-Related Differential (PRD) for 1212 sales is 1.019, which is within IAAO standards for the PRD. We also performed a regression analysis between the sales ratio and the assessor's current value to further test for regressivity or progressivity in the residential sales valuation, as follows:

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	.973		422.715	.000
	CURRTOT	.00000000473	.026	2.510	.012

a. Dependent Variable: salesratio

The slope of the line at 0.0000000473 indicates that there is virtually no slope in the regression line, which indicates that sales ratios are similar across the entire sale price array. This indicates no regressivity or progressivity in the residential values assigned by the assessor.



### Case Processing Summary

		Count	Percent
SPRec	LT \$300K	28	0.3%
	\$300K to \$400K	130	1.4%
	\$400K to \$500K	657	7.1%
	\$500K to \$600K	1252	13.5%
	\$600K to \$750K	1724	18.6%
	\$750K to \$1000K	2169	23.4%
	\$1000K to \$2000K	2555	27.6%
	Over \$2000K	741	8.0%
Overall		9256	100.0%
Excluded		1	
Total		9257	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LT \$300K	1.170	1.037	.227	39.7%
\$300K to \$400K	.979	1.003	.110	15.6%
\$400K to \$500K	.960	.999	.091	12.8%
\$500K to \$600K	.977	1.000	.071	9.6%
\$600K to \$750K	.987	1.000	.077	10.8%
\$750K to \$1000K	.991	1.000	.077	10.8%
\$1000K to \$2000K	.968	1.003	.097	12.9%
Over \$2000K	.901	1.014	.146	19.1%
Overall	.976	1.019	.090	12.7%

The above table indicates no regressivity in the sales ratios across sale price categories.

### Residential Market Trend Analysis

We next analyzed the residential dataset using the 24-month sale period for any residual market trending and broken down by economic area, as follows:

#### Coefficients<sup>a</sup>

ECONAREA	Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
0	1	(Constant)	.242	.661		.366	.776
		SalePeriod	.060	.064	.689	.951	.516
1	1	(Constant)	.968	.006		153.398	.000
		SalePeriod	.001	.000	.055	2.387	.017
2	1	(Constant)	.981	.012		82.837	.000
		SalePeriod	2.240E-5	.001	.001	.026	.979
3	1	(Constant)	.965	.018		53.515	.000
		SalePeriod	.001	.001	.047	1.003	.316
4	1	(Constant)	.955	.004		237.192	.000
		SalePeriod	.001	.000	.082	4.438	.000
5	1	(Constant)	.970	.004		261.428	.000
		SalePeriod	.001	.000	.058	3.331	.001

6	1	(Constant)	.964	.006		171.808	.000
		SalePeriod	4.159E-5	.000	.002	.100	.920

a. Dependent Variable: salesratio

There was no significant residual market trending present in the sale ratio data for most economic areas; the three economic areas with statistically significant residual trends were not significant in terms of the magnitude of the trend. 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 median actual value per square foot for 2023 between each group. The data was analyzed both as a whole and broken down by economic area and by neighborhoods with at least 35 sales, as follows:

#### Class

#### Report

VALSF

	N	Median	Mean
UNSOLD	94713	\$468	\$535
SOLD	11694	\$470	\$537

### 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	.032	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .01.

#### Economic Area

#### Report

VALSF

ECONAREA	sold	N	Median	Mean
1	UNSOLD	18787	\$799	\$838
	SOLD	1880	\$832	\$868
2	UNSOLD	7538	\$488	\$520
	SOLD	792	\$528	\$566
3	UNSOLD	4865	\$596	\$631
	SOLD	449	\$615	\$652
4	UNSOLD	23383	\$452	\$475
	SOLD	2944	\$450	\$475
5	UNSOLD	25691	\$367	\$382
	SOLD	3342	\$375	\$393
6	UNSOLD	14160	\$455	\$490
	SOLD	2284	\$475	\$523

## Neighborhoods with at least 35 sales

### Report

VALSF

NBHD	sold	N	Median	Mean
101	UNSOLD	1187	\$763	\$749
	SOLD	177	\$825	\$826
102	UNSOLD	1141	\$812	\$838
	SOLD	130	\$853	\$908
103	UNSOLD	521	\$1,052	\$1,111
	SOLD	46	\$1,052	\$1,120
105	UNSOLD	739	\$888	\$924
	SOLD	91	\$861	\$908
107	UNSOLD	565	\$1,114	\$1,158
	SOLD	71	\$1,136	\$1,237
109	UNSOLD	886	\$918	\$951
	SOLD	126	\$944	\$1,002
115	UNSOLD	1368	\$819	\$825
	SOLD	138	\$830	\$847
120	UNSOLD	782	\$845	\$878
	SOLD	81	\$871	\$911
122	UNSOLD	1362	\$672	\$658
	SOLD	171	\$683	\$732
124	UNSOLD	1235	\$600	\$578
	SOLD	118	\$628	\$641
126	UNSOLD	1979	\$438	\$484
	SOLD	291	\$458	\$485
128	UNSOLD	821	\$495	\$497
	SOLD	141	\$503	\$511
130	UNSOLD	591	\$422	\$463
	SOLD	78	\$429	\$447
132	UNSOLD	1229	\$478	\$495
	SOLD	153	\$466	\$493
133	UNSOLD	609	\$477	\$505
	SOLD	46	\$486	\$537
135	UNSOLD	1069	\$593	\$573
	SOLD	188	\$621	\$623
140	UNSOLD	1750	\$526	\$549
	SOLD	215	\$554	\$592
142	UNSOLD	969	\$555	\$580
	SOLD	96	\$568	\$614
144	UNSOLD	492	\$644	\$675
	SOLD	48	\$695	\$721
145	UNSOLD	936	\$620	\$636
	SOLD	93	\$629	\$652
146	UNSOLD	629	\$682	\$707
	SOLD	71	\$749	\$767
148	UNSOLD	1785	\$554	\$581
	SOLD	234	\$550	\$593
150	UNSOLD	777	\$738	\$726
	SOLD	74	\$829	\$780
155	UNSOLD	3134	\$405	\$404
	SOLD	530	\$427	\$436
158	UNSOLD	1142	\$790	\$849
	SOLD	110	\$780	\$875
160	UNSOLD	1845	\$886	\$879

	SOLD	164	\$899	\$871
162	UNSOLD	457	\$991	\$1,005
	SOLD	43	\$966	\$1,005
164	UNSOLD	856	\$709	\$701
	SOLD	80	\$729	\$731
170	UNSOLD	1595	\$1,034	\$1,049
	SOLD	191	\$974	\$1,019
172	UNSOLD	663	\$741	\$773
	SOLD	94	\$795	\$821
174	UNSOLD	1378	\$801	\$788
	SOLD	170	\$769	\$784
178	UNSOLD	797	\$592	\$618
	SOLD	101	\$654	\$665
201	UNSOLD	1703	\$457	\$469
	SOLD	174	\$494	\$514
202	UNSOLD	2597	\$399	\$402
	SOLD	295	\$422	\$424
203	UNSOLD	2040	\$364	\$377
	SOLD	266	\$392	\$401
204	UNSOLD	1597	\$355	\$369
	SOLD	188	\$390	\$391
205	UNSOLD	3273	\$314	\$318
	SOLD	429	\$320	\$327
223	UNSOLD	3089	\$368	\$375
	SOLD	338	\$381	\$391
240	UNSOLD	183	\$351	\$352
	SOLD	44	\$406	\$387
241	UNSOLD	1378	\$377	\$383
	SOLD	154	\$384	\$389
242	UNSOLD	3386	\$379	\$391
	SOLD	511	\$390	\$401
243	UNSOLD	1082	\$382	\$388
	SOLD	145	\$384	\$385
255	UNSOLD	3162	\$321	\$334
	SOLD	422	\$323	\$343
256	UNSOLD	2161	\$329	\$339
	SOLD	274	\$326	\$341
257	UNSOLD	767	\$316	\$345
	SOLD	336	\$312	\$337
401	UNSOLD	478	\$695	\$696
	SOLD	43	\$696	\$720
405	UNSOLD	233	\$527	\$542
	SOLD	55	\$434	\$511
410	UNSOLD	1384	\$540	\$578
	SOLD	133	\$583	\$618
415	UNSOLD	658	\$495	\$494
	SOLD	73	\$514	\$512
420	UNSOLD	1378	\$511	\$528
	SOLD	182	\$513	\$531
425	UNSOLD	812	\$543	\$561
	SOLD	61	\$539	\$574
430	UNSOLD	1165	\$576	\$599
	SOLD	110	\$632	\$643
440	UNSOLD	3741	\$342	\$349
	SOLD	644	\$341	\$350
445	UNSOLD	476	\$391	\$403
	SOLD	84	\$359	\$369

450	UNSOLD	2429	\$479	\$483
	SOLD	289	\$498	\$513
451	UNSOLD	421	\$454	\$459
	SOLD	47	\$473	\$495
455	UNSOLD	416	\$392	\$391
	SOLD	84	\$400	\$398
460	UNSOLD	744	\$464	\$482
	SOLD	77	\$485	\$508
465	UNSOLD	1374	\$434	\$465
	SOLD	166	\$445	\$466
470	UNSOLD	839	\$517	\$522
	SOLD	82	\$534	\$544
480	UNSOLD	2300	\$396	\$436
	SOLD	312	\$421	\$461
501	UNSOLD	1542	\$516	\$531
	SOLD	191	\$536	\$566
820	UNSOLD	993	\$562	\$594
	SOLD	79	\$565	\$609
825	UNSOLD	796	\$475	\$517
	SOLD	82	\$496	\$536
830	UNSOLD	1172	\$604	\$655
	SOLD	117	\$620	\$676
901	UNSOLD	1040	\$445	\$470
	SOLD	138	\$476	\$501
903	UNSOLD	660	\$557	\$587
	SOLD	71	\$579	\$605
910	UNSOLD	480	\$541	\$579
	SOLD	38	\$526	\$546
911	UNSOLD	510	\$399	\$409
	SOLD	57	\$400	\$419
940	UNSOLD	637	\$388	\$411
	SOLD	71	\$437	\$458
960	UNSOLD	1042	\$423	\$443
	SOLD	87	\$488	\$486
962	UNSOLD	1084	\$519	\$528
	SOLD	112	\$527	\$552

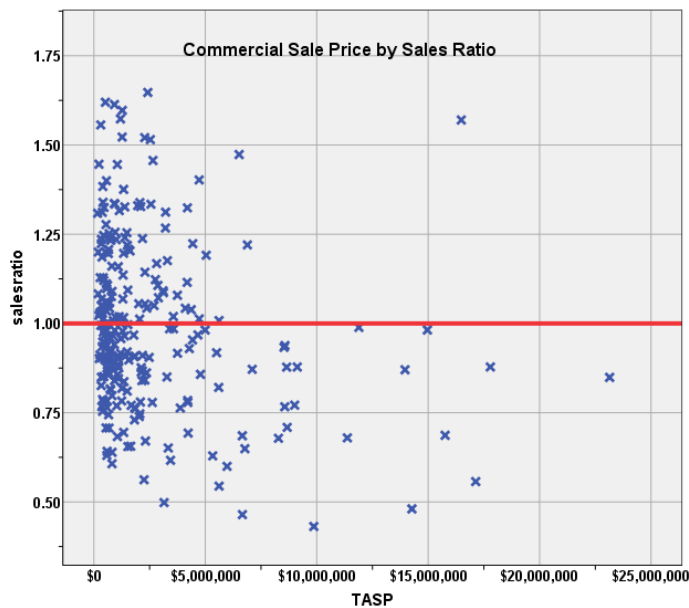
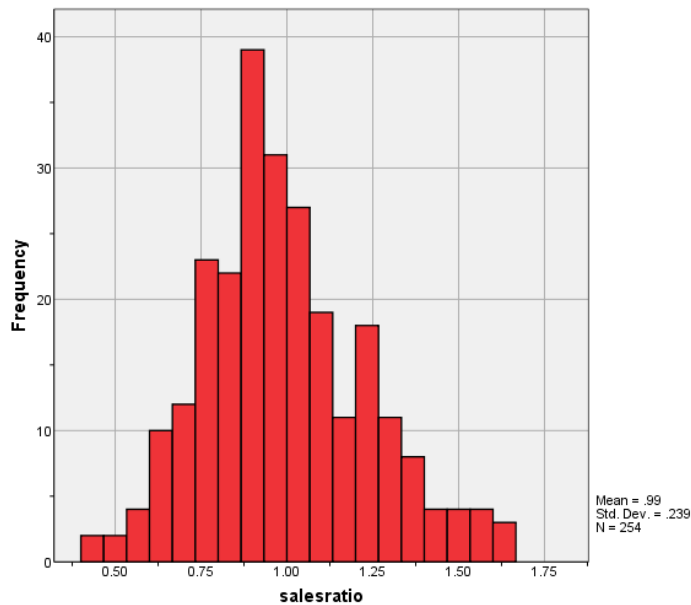
Although there was some differences seen between sold and unsold residential properties at the neighborhood level, when the second percent change in value test is employed, the difference is reduced greatly. The above overall and economic area results indicate that sold and unsold residential properties were valued in a consistent manner.

#### IV. COMMERCIAL/INDUSTRIAL SALE RESULTS

There were 258 qualified commercial and industrial sales in the 24 month sale period ending June 30, 2022. Four sales were trimmed using IAAO standards, resulting in a final total of 254 sales. The sales ratio analysis results were as follows:

Median	<b>0.966</b>
Price Related Differential	<b>1.074</b>
Coefficient of Dispersion	<b>19.2</b>

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



### Commercial/Industrial Market Trend Analysis

The commercial/industrial sales were analyzed, examining the sale ratios across the 24-month sale period with the following results:

## Coefficients<sup>a</sup>

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.988	.030		33.317	.000
	SalePeriod	.000	.002	.011	.179	.858

a. Dependent Variable: salesratio

There was no residual market trending present in the commercial sale ratios. We concluded that the assessor has adequately considered market trending adjustments as part of the commercial/industrial valuation.

## Sold/Unsold Analysis

We compared the median and mean change in actual value for valuation year 2020 and valuation year 2022 for sold and unsold commercial properties, as follows:

### Report

DIFF				
DIFF	sold	N	Median	Mean
UNSOLD		3821	1.39	1.49
SOLD		250	1.41	1.53

### DIFF \* ABSTRIMPMAJOR \* sold

DIFF	ABSTRIMPMAJOR	sold	N	Median	Mean
2212	UNSOLD		566	1.35	1.42
	SOLD		28	1.38	1.52
2220	UNSOLD		484	1.48	1.56
	SOLD		24	1.50	1.63
2221	UNSOLD		66	1.53	1.63
	SOLD		11	1.64	1.65
2230	UNSOLD		108	1.33	1.44
	SOLD		12	1.50	1.57
2231	UNSOLD		60	1.33	1.32
	SOLD		3	1.23	1.24
2234	UNSOLD		197	1.32	1.40
	SOLD		8	1.77	1.85
2235	UNSOLD		179	1.82	1.86
	SOLD		2	1.68	1.68
2237	UNSOLD		99	1.54	1.55
	SOLD		7	1.45	1.46
2238	UNSOLD		104	1.53	1.64
	SOLD		6	1.35	1.45
2239	UNSOLD		31	1.52	1.52
	SOLD		4	1.20	1.18
2245	UNSOLD		770	1.23	1.26
	SOLD		75	1.25	1.28
3210	UNSOLD		163	1.65	1.75
	SOLD		14	1.84	1.84
3215	UNSOLD		303	1.78	1.84
	SOLD		23	1.97	2.06



3230	UNSOLD	137	1.34	1.39
	SOLD	16	1.31	1.39
3235	UNSOLD	114	1.83	1.92
	SOLD	4	2.16	2.02

Based on similarities between the sold and unsold median change in value, we concluded that there was no evidence of the assessor adjusting the values of sold commercial properties by a greater amount than with unsold commercial properties between valuation years.

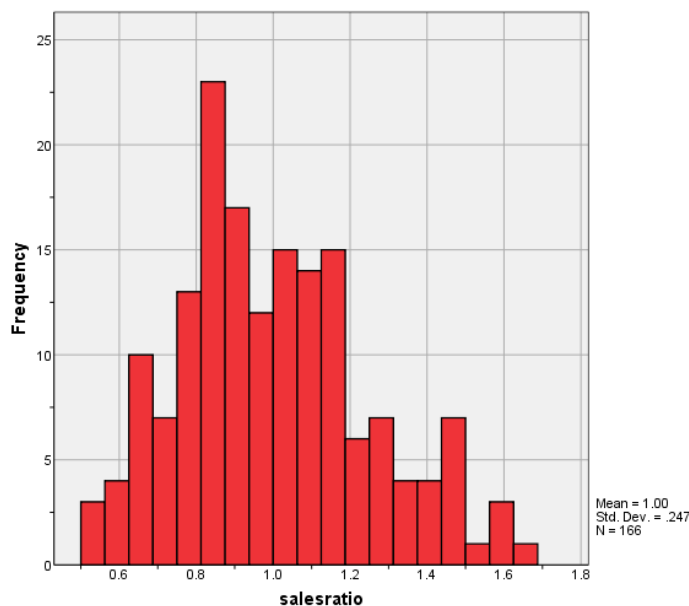
## V. VACANT LAND SALE RESULTS

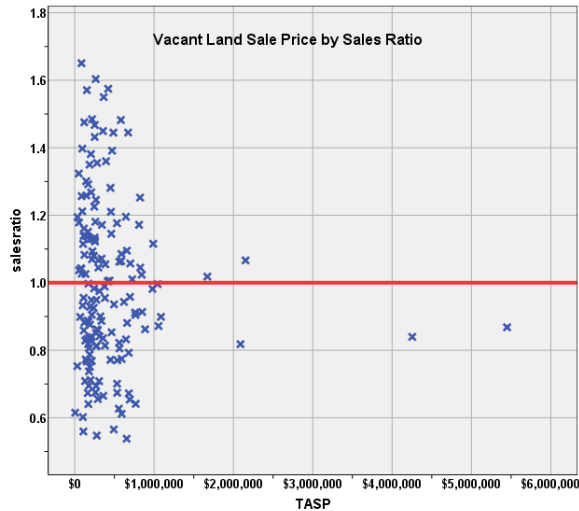
There were 171 qualified vacant land sales for the 24 month sale period ending June 30, 2022. Using IAAO standards, 5 sales were removed, resulting in 166 qualified vacant land sales for this analysis.

The sales ratios were analyzed with the following results:

<b>Median</b>	<b>0.967</b>
<b>Price Related Differential</b>	<b>1.033</b>
<b>Coefficient of Dispersion</b>	<b>20.6</b>

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





The above histogram indicates that the distribution of the vacant land sale ratios was within state mandated limits.

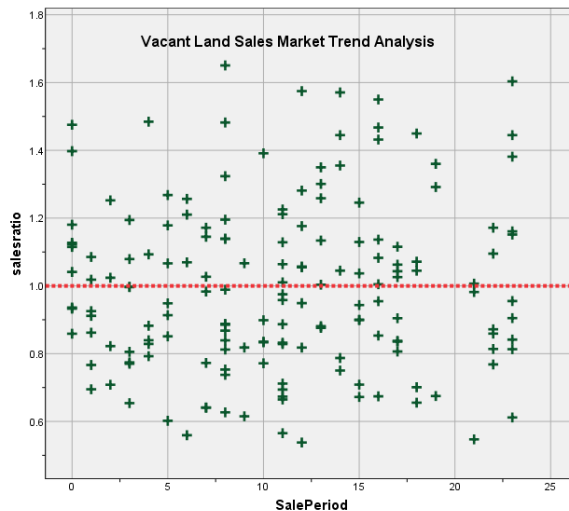
### Vacant Land Market Trend Analysis

We next analyzed the vacant land dataset using the 24-month sale period, with the following results:

#### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.974	.037		26.259	.000
	SalePeriod	.002	.003	.057	.729	.467

a. Dependent Variable: salesratio



The above analysis indicated that no significant market trending was present in the vacant land sale data. We concluded that the assessor has adequately dealt with market trending for vacant land properties.

## Sold/Unsold Analysis

In terms of the valuation consistency between sold and unsold vacant land properties, we compared the median change in value for valuation year 2020 and valuation year 2022 between each group, as follows:

### Report

DIFF			
sold	N	Median	Mean
UNSOLD	5765	1.43	1.59
SOLD	153	1.51	1.58

We also stratified the analysis by subdivision with more than 3 sales, as follows:

### Report

DIFF				
SUBDIVNO	sold	N	Median	Mean
1883	UNSOLD	3	1.42	1.52
	SOLD	3	2.20	2.09
5628	UNSOLD	2	1.96	1.96
	SOLD	4	1.98	2.05
8227	UNSOLD	9	1.56	1.68
	SOLD	4	1.59	1.98
8476	UNSOLD	10	1.67	1.68
	SOLD	3	1.72	1.68
9914	UNSOLD	58	1.17	1.25
	SOLD	7	1.85	1.69
9915	UNSOLD	83	1.17	1.26
	SOLD	6	1.26	1.28
9916	UNSOLD	103	1.30	1.48
	SOLD	8	1.70	1.66
9919	UNSOLD	51	1.17	1.52
	SOLD	5	1.51	1.64
9934	UNSOLD	71	2.23	1.96
	SOLD	3	1.61	1.52
9940	UNSOLD	101	1.18	1.38
	SOLD	4	1.39	1.37
9941	UNSOLD	27	1.28	1.39
	SOLD	4	2.11	2.14
9942	UNSOLD	137	1.64	1.68
	SOLD	4	1.53	1.62
9943	UNSOLD	64	1.44	1.64
	SOLD	4	1.13	1.12

Overall, we concluded that the county assessor valued sold and unsold vacant land properties consistently.

## V. CONCLUSIONS

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

## STATISTICAL ABSTRACT

### Residential

Ratio Statistics for CURRTOT / TASP													
ECONAREA	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 Mean Centered
		Lower Bound	Upper Bound		Lower Bound	Upper Bound	Actual Coverage		Lower Bound	Upper Bound			
0	.867	.534	1.200	.860	.737	1.004	100.0%	.877	.566	1.189	.988	.104	15.5%
1	.981	.974	.987	.976	.969	.982	95.0%	.951	.942	.960	1.031	.107	14.3%
2	.981	.969	.992	.974	.964	.984	95.7%	.945	.927	.962	1.038	.111	16.7%
3	.980	.963	.998	.980	.961	1.001	95.7%	.941	.918	.965	1.041	.148	19.5%
4	.970	.966	.974	.973	.970	.977	95.1%	.960	.955	.966	1.010	.080	11.5%
5	.981	.977	.984	.979	.975	.982	95.3%	.979	.975	.984	1.001	.080	10.8%
6	.964	.959	.970	.965	.960	.970	95.1%	.807	.694	.921	1.195	.094	14.0%

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 Land

Ratio Statistics for CURRTOT / TASP												
	95% Confidence Interval for Mean			95% Confidence Interval for Median				95% Confidence Interval for Weighted Mean				Coefficient of Variation
Mean	Lower Bound	Upper Bound	Median	Lower Bound	Upper Bound	Actual Coverage	Weighted Mean	Lower Bound	Upper Bound	Price Related Differential	Coefficient of Dispersion	Mean Centered
.993	.963	1.022	.966	.925	.999	96.2%	.924	.867	.981	1.074	.192	24.1%

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.

### Vacant Land

Ratio Statistics for CURRLND / TASP												
	95% Confidence Interval for Mean			95% Confidence Interval for Median				95% Confidence Interval for Weighted Mean				Coefficient of Variation
Mean	Lower Bound	Upper Bound	Median	Lower Bound	Upper Bound	Actual Coverage	Weighted Mean	Lower Bound	Upper Bound	Price Related Differential	Coefficient of Dispersion	Mean Centered
.996	.958	1.034	.967	.905	1.027	96.4%	.964	.924	1.004	1.033	.206	24.8%

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

### Subclass

#### Case Processing Summary

		Count	Percent
ABSTRIMP	.00	5	0.0%
	1210.67	1	0.0%
	1211.00	2	0.0%
	1211.33	1	0.0%
	1212.00	9250	79.1%
	1213.50	3	0.0%
	1214.88	1	0.0%
	1215.00	153	1.3%
	1217.50	1	0.0%
	1220.00	26	0.2%
	1225.00	13	0.1%
	1230.00	2242	19.2%
Overall		11698	100.0%
Excluded		2	
Total		11700	

#### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
.00	.028	.706	7.800	1928.5%
1210.67	1.001	1.000	.000	.
1211.00	.884	1.006	.012	1.7%
1211.33	.851	1.000	.000	.
1212.00	.976	1.019	.090	12.7%
1213.50	.893	1.001	.160	24.0%
1214.88	.672	1.000	.000	.
1215.00	.946	1.038	.139	21.4%
1217.50	.382	1.000	.000	.
1220.00	.538	1.021	.146	22.7%
1225.00	.482	1.206	.259	39.2%
1230.00	.967	.994	.086	12.0%
Overall	.974	1.043	.092	13.1%

### Age

#### Case Processing Summary

		Count	Percent
AgeRec	0	5	0.0%
	Over 100	295	2.5%
	75 to 100	243	2.1%
	50 to 75	1770	15.1%
	25 to 50	4551	38.9%
	5 to 25	3288	28.1%
	5 or Newer	1546	13.2%
Overall		11698	100.0%

Excluded	2	
Total	11700	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
0	.028	.706	7.800	1928.5%
Over 100	.964	1.049	.144	20.3%
75 to 100	.957	1.046	.143	23.7%
50 to 75	.962	1.030	.107	14.3%
25 to 50	.967	1.047	.089	12.2%
5 to 25	.985	1.048	.082	11.1%
5 or Newer	.983	1.039	.083	13.1%
Overall	.974	1.043	.092	13.1%

### Improved Area

### Case Processing Summary

		Count	Percent
ImpSFRec	0	5	0.0%
	LE 500 sf	77	0.7%
	500 to 1,000 sf	1873	16.0%
	1,000 to 1,500 sf	3441	29.4%
	1,500 to 2,000 sf	2580	22.1%
	2,000 to 3,000 sf	2651	22.7%
	3,000 sf or Higher	1071	9.2%
Overall		11698	100.0%
Excluded		2	
Total		11700	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
0	.028	.706	7.800	1928.5%
LE 500 sf	.935	1.027	.142	25.7%
500 to 1,000 sf	.949	1.010	.084	12.5%
1,000 to 1,500 sf	.967	1.008	.083	11.3%
1,500 to 2,000 sf	.987	1.015	.086	11.8%
2,000 to 3,000 sf	.985	1.023	.094	12.9%
3,000 sf or Higher	.980	1.157	.128	18.5%
Overall	.974	1.043	.092	13.1%

## Improvement Quality

### Case Processing Summary

		Count	Percent
QUALITY	0	1	0.0%
	1	7	0.1%
	2	53	0.5%
	3	5641	48.2%
	4	4642	39.7%
	5	1138	9.7%
	6	211	1.8%
Overall		11693	100.0%
Excluded		7	
Total		11700	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
0	.170	1.000	.000	.
1	1.138	1.046	.185	22.8%
2	.932	1.075	.181	24.4%
3	.957	1.055	.087	12.6%
4	.991	1.049	.085	11.8%
5	.995	1.032	.112	15.2%
6	1.004	1.053	.147	19.9%
Overall	.974	1.043	.092	13.0%

### Commercial Median Ratio Stratification

#### Sale Price

### Case Processing Summary

		Count	Percent
SPRec	\$150K to \$200K	3	1.2%
	\$200K to \$300K	7	2.8%
	\$300K to \$500K	34	13.4%
	\$500K to \$750K	42	16.5%
	\$750K to \$1,000K	23	9.1%
	Over \$1,000K	145	57.1%
Overall		254	100.0%
Excluded		0	
Total		254	

## Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
\$150K to \$200K	1.200	1.005	.063	9.4%
\$200K to \$300K	1.029	1.006	.107	18.3%
\$300K to \$500K	.989	1.005	.158	20.9%
\$500K to \$750K	.950	1.004	.161	21.7%
\$750K to \$1,000K	.981	.992	.186	24.6%
Over \$1,000K	.930	1.064	.218	28.2%
Overall	.966	1.074	.192	24.9%

## Subclass

### Case Processing Summary

		Count	Percent
ABSTRIMP	1713.50	1	0.4%
	1716.00	1	0.4%
	1716.50	1	0.4%
	1881.33	1	0.4%
	2030.40	1	0.4%
	2174.82	1	0.4%
	2212.00	25	9.8%
	2215.00	1	0.4%
	2215.33	1	0.4%
	2217.00	1	0.4%
	2220.00	24	9.4%
	2221.00	10	3.9%
	2221.67	1	0.4%
	2222.00	1	0.4%
	2223.50	1	0.4%
	2225.00	1	0.4%
	2227.50	1	0.4%
	2230.00	12	4.7%
	2231.00	3	1.2%
	2232.00	2	0.8%
	2234.00	9	3.5%
	2235.00	2	0.8%
	2237.00	7	2.8%
	2238.00	6	2.4%
	2239.00	4	1.6%
	2240.00	1	0.4%
	2245.00	75	29.5%
	2722.50	1	0.4%
	3210.00	13	5.1%
	3215.00	24	9.4%
	3230.00	16	6.3%
	3235.00	5	2.0%
	5720.50	1	0.4%
Overall	254	100.0%	
Excluded	0		
Total	254		



### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1713.50	1.069	1.000	.000	.
1716.00	1.219	1.000	.000	.
1716.50	1.241	1.000	.000	.
1881.33	.744	1.000	.000	.
2030.40	1.234	1.000	.000	.
2174.82	.917	1.000	.000	.
2212.00	.905	.987	.177	28.5%
2215.00	.982	1.000	.000	.
2215.33	1.334	1.000	.000	.
2217.00	1.620	1.000	.000	.
2220.00	.987	1.061	.240	30.7%
2221.00	1.184	1.009	.147	18.2%
2221.67	1.128	1.000	.000	.
2222.00	.764	1.000	.000	.
2223.50	.798	1.000	.000	.
2225.00	.639	1.000	.000	.
2227.50	.981	1.000	.000	.
2230.00	.901	1.140	.208	30.3%
2231.00	1.196	1.001	.117	18.8%
2232.00	.795	1.003	.373	52.8%
2234.00	1.233	1.051	.157	22.1%
2235.00	.648	.981	.048	6.7%
2237.00	1.043	1.029	.208	29.0%
2238.00	.981	1.072	.233	28.9%
2239.00	.519	1.112	.295	51.3%
2240.00	1.316	1.000	.000	.
2245.00	.979	1.030	.139	17.6%
2722.50	.683	1.000	.000	.
3210.00	.878	1.020	.202	31.7%
3215.00	1.029	1.043	.145	18.5%
3230.00	.914	1.022	.132	18.8%
3235.00	.878	1.052	.155	27.0%
5720.50	.982	1.000	.000	.
Overall	.966	1.074	.192	24.9%

### Improvement Age

#### Case Processing Summary

		Count	Percent
AgeRec	Over 100	25	9.8%
	75 to 100	9	3.5%
	50 to 75	34	13.4%
	25 to 50	78	30.7%
	5 to 25	95	37.4%
	5 or Newer	13	5.1%
Overall		254	100.0%
Excluded		0	
Total		254	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
Over 100	.978	1.006	.175	23.9%
75 to 100	1.048	.987	.249	32.4%
50 to 75	.974	1.111	.214	26.4%
25 to 50	.917	1.094	.194	26.4%
5 to 25	1.008	1.022	.178	22.9%
5 or Newer	.903	1.052	.110	15.7%
Overall	.966	1.074	.192	24.9%

### Improvement Size

#### Case Processing Summary

		Count	Percent
ImpSFRec	LE 500 sf	248	97.6%
	500 to 1,000 sf	2	0.8%
	1,000 to 1,500 sf	3	1.2%
	1,500 to 2,000 sf	1	0.4%
Overall		254	100.0%
Excluded		0	
Total		254	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LE 500 sf	.965	1.074	.192	25.0%
500 to 1,000 sf	.989	.952	.248	35.0%
1,000 to 1,500 sf	1.219	1.007	.047	8.8%
1,500 to 2,000 sf	.917	1.000	.000	.
Overall	.966	1.074	.192	24.9%

### Improvement Quality

#### Case Processing Summary

		Count	Percent
QUALITY	0	1	0.4%
	1	2	0.8%
	2	1	0.4%
	3	204	80.3%
	4	46	18.1%
	Overall	254	100.0%
Excluded		0	
Total		254	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
0	.639	1.000	.000	.
1	1.152	.968	.090	12.8%
2	.869	1.000	.000	.
3	.965	1.076	.195	25.6%
4	.971	1.073	.180	21.9%
Overall	.966	1.074	.192	24.9%

### Improvement Condition

#### Case Processing Summary

	Count	Percent
CONDITION 1	1	0.4%
2	3	1.2%
3	166	68.3%
4	73	30.0%
Overall	243	100.0%
Excluded	11	
Total	254	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1	.639	1.000	.000	.
2	.981	.989	.026	5.5%
3	.964	1.051	.187	24.5%
4	.995	1.119	.197	24.5%
Overall	.965	1.069	.191	24.6%

### Vacant Land Median Ratio Stratification

#### Sale Price

#### Case Processing Summary

	Count	Percent
SPPrec LT \$25K	1	0.6%
\$25K to \$50K	2	1.2%
\$50K to \$100K	12	7.2%
\$100K to \$150K	17	10.2%
\$150K to \$200K	24	14.5%
\$200K to \$300K	36	21.7%
\$300K to \$500K	29	17.5%
\$500K to \$750K	26	15.7%
\$750K to \$1,000K	11	6.6%
Over \$1,000K	8	4.8%
Overall	166	100.0%
Excluded	0	
Total	166	

### Ratio Statistics for CURRLND / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LT \$25K	.615	1.000	.000	.
\$25K to \$50K	.974	.987	.227	32.0%
\$50K to \$100K	1.111	.998	.153	20.2%
\$100K to \$150K	1.026	.992	.201	24.9%
\$150K to \$200K	.837	1.005	.199	30.0%
\$200K to \$300K	1.056	1.006	.197	24.4%
\$300K to \$500K	1.004	.994	.207	27.1%
\$500K to \$750K	.857	.997	.233	29.5%
\$750K to \$1,000K	.982	.996	.127	17.0%
Over \$1,000K	.885	1.023	.082	11.3%
Overall	.967	1.033	.206	25.8%

### Subclass

### Case Processing Summary

		Count	Percent
ABSTRLND	100.0	81	48.8%
	200.0	7	4.2%
	300.0	8	4.8%
	400.0	4	2.4%
	510.0	5	3.0%
	520.0	22	13.3%
	530.0	16	9.6%
	540.0	10	6.0%
	550.0	10	6.0%
	600.0	2	1.2%
	2113.5	1	0.6%
Overall		166	100.0%
Excluded		0	
Total		166	

### Ratio Statistics for CURRLND / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
100.0	.955	1.027	.194	24.6%
200.0	.955	1.103	.189	30.9%
300.0	.890	1.081	.127	19.2%
400.0	.732	1.082	.235	37.2%
510.0	.851	.984	.194	25.4%
520.0	.903	.968	.263	34.1%
530.0	1.034	1.013	.156	20.7%
540.0	.961	1.014	.261	34.8%
550.0	1.088	1.053	.241	29.2%
600.0	.896	1.024	.037	5.2%
2113.5	1.172	1.000	.000	.
Overall	.967	1.033	.206	25.8%