2023
DENVER COUNTY PROPERTY ASSESSMENT STUDY

EastWest ECONOMETRICS

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.

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

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INTRODUCTION

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.

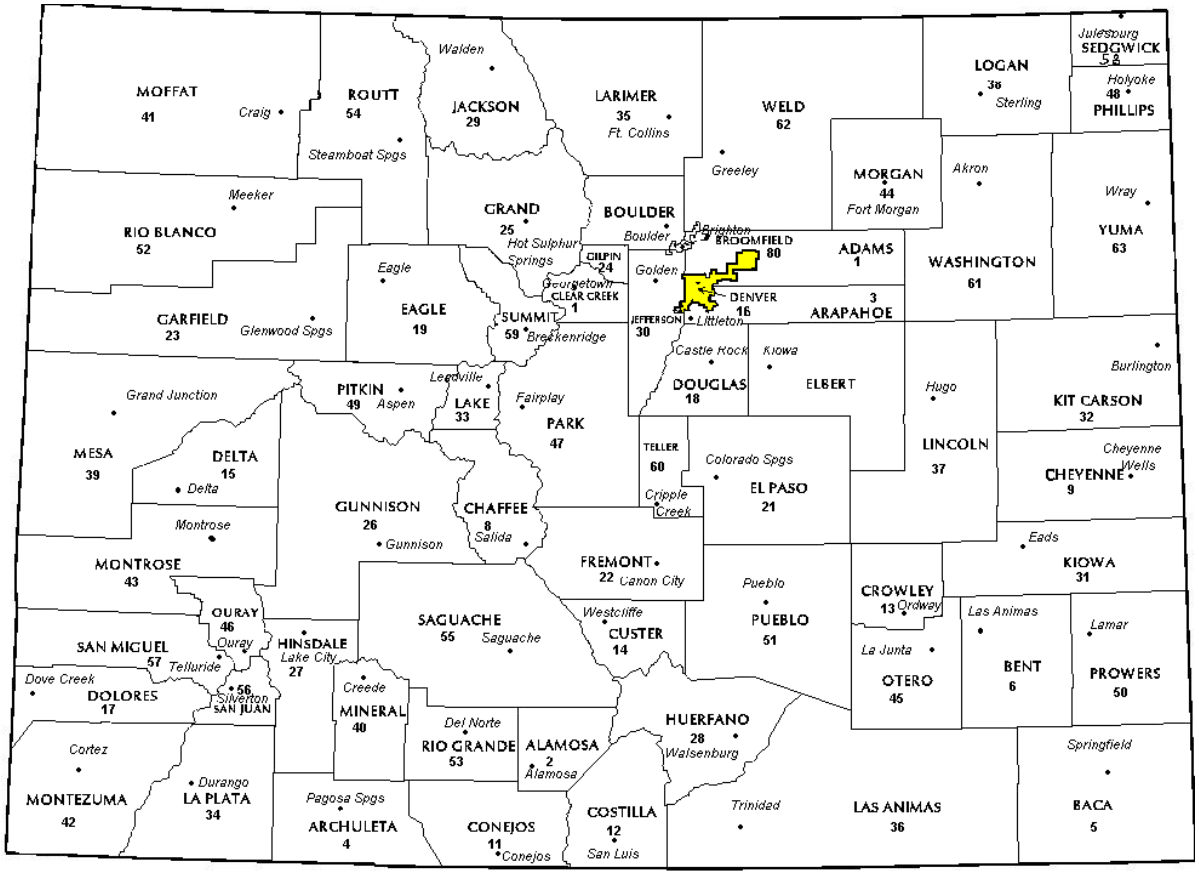
Statistical analysis is performed on vacant land, residential properties, commercial industrial properties, agricultural land, and personal property. The statistical study results are compared with State Board of Equalization compliance requirements and the manuals published by the State Property Tax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

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

REGIONAL/HISTORICAL SKETCH OF DENVER COUNTY

Regional Information

Denver 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

Denver County has approximately 153 square miles and an estimated population of approximately 727,211 people with 3,922.6 people per square mile, according to the U.S. Census Bureau's 2020 estimated census data. This represents a 21.2 percent change from April 1, 2010 to July 1, 2019.

Denver is the capital and the most populous city of the state of Colorado. Denver is a consolidated city-county located in the South Platte River Valley on the High Plains just east of the Front Range of the Rocky Mountains.

Denver City was founded in November 1858 as a mining town during the Pikes Peak Gold Rush in western Kansas Territory. That summer, a group of gold prospectors from Lawrence, Kansas, arrived and established Montana City on the banks of the South Platte River. This was the first settlement in what was later to become the city of Denver. The site faded quickly, however, and was abandoned in favor of Auraria (named after the gold-mining town of Auraria, Georgia) and St. Charles City by the summer of 1859. The Montana City site is now Grant-Frontier Park and includes mining equipment and a log cabin replica.

On November 22, 1858, General William Larimer, a land speculator from eastern Kansas, placed cottonwood logs to stake a claim on the hill overlooking the confluence of the South Platte River and Cherry Creek, across the creek from the existing mining settlement of Auraria. Larimer named the town site Denver City to curry favor with Kansas Territorial Governor James W. Denver. Larimer hoped that the town's name would help make it the county seat of Arapaho County, but ironically Governor Denver had already resigned from office. The location was accessible to existing trails and was across the South Platte River from the site of seasonal encampments of the Cheyenne and Arapaho. The site of these first towns is now the site of Confluence Park in downtown Denver. Larimer, along with associates in the St. Charles City Land Company, sold parcels in the town to merchants and miners, with the intention of creating a major city that would cater to new emigrants. Denver City was a frontier town, with an economy based on servicing local miners with gambling, saloons, livestock and goods trading. In the early years, land parcels were often traded for grubstakes or gambled away by miners in Auraria.

The Colorado Territory was created on February 28, 1861. Arapahoe County was formed on November 1, 1861 and Denver City was incorporated on November 7, 1861. Denver City served as the Arapahoe County Seat from 1861 until consolidation in 1902. In 1865, Denver City became the Territorial Capital and became the State Capital when Colorado was admitted to the Union.

In 1901 the Colorado General Assembly voted to split Arapahoe County into three parts: a new consolidated City and County of Denver, a new Adams County, and the remainder of the Arapahoe County to be renamed South Arapahoe County. A ruling by the Colorado Supreme Court, subsequent legislation, and a referendum delayed the creation of the City and County of Denver until November 15, 1902.

Denver has hosted the Democratic National Convention twice, during the years of 1908 and again in 2008, taking the opportunity to promote the city's status on the national, political, and socioeconomic stage.
(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 Denver County are:

Denver County Ratio Grid					
Property Class	Number of Qualified Sales	Unweighted Median Ratio	Price Related Differential	Coefficient of Dispersion	Time Trend Analysis
Commercial/Industrial	589	0.958	1.009	17.4	Compliant
Residential	30,310	1.002	1.004	6.0	Compliant
Vacant Land	987	0.953	1.065	15.3	Compliant

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

Denver 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 Denver County is reasonably treating its sold and unsold properties in the same manner.

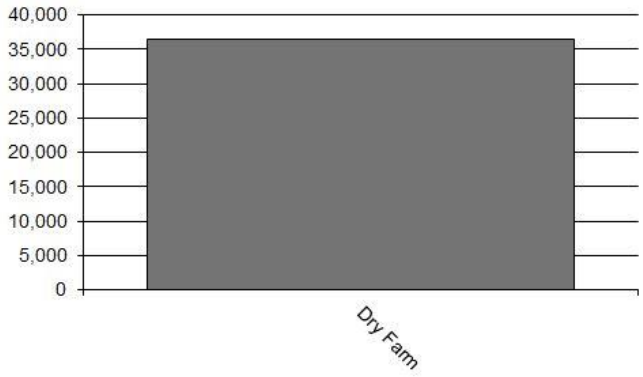
Recommendations

None

AGRICULTURAL LAND STUDY

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:

Denver County Agricultural Land Ratio Grid						
Abstract Code	Land Class	Number Of Acres	County Value Per Acre	County Assessed Total Value	WRA Total Value	Ratio
4127	Dry Farm	746	48.87	36,458	36,458	1.00
Total/Avg		**746**	**48.87**	**36,458**	**36,458**	**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

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

Recommendations

None

Denver County is exempt from theAgricultural Land Under Improvements Study

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 Denver County. This study was conducted by checking selected sales from the master sales list for the current valuation period. Specifically EWE selected 71 sales listed as unqualified.

All but 2 of the sales selected in the sample gave reasons that were clear and supportable. Two sales 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.

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

Conclusions

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

Recommendations

None

Economic Area Review and Evaluation

Methodology

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

Denver County is exempt from the Natural Resources Study.

VACANT LAND

Subdivision Discounting

Subdivisions were reviewed in 2023 in Denver 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

Denver 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.

Denver County has been reviewed for their procedures and adherence to guidelines when assessing and valuing agricultural and commercial 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

Denver 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

Denver 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.

Denver 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
- 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.

Denver 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
- Businesses with no deletions or additions for 2 or more years
- Non-filing Accounts - Best Information Available
- As part of sales tax audits

Denver 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

Denver 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 EconometricsAuditor Staff

Harry J. Fuller, *Audit Project Manager*

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Steve Kane, *Audit Statistician*

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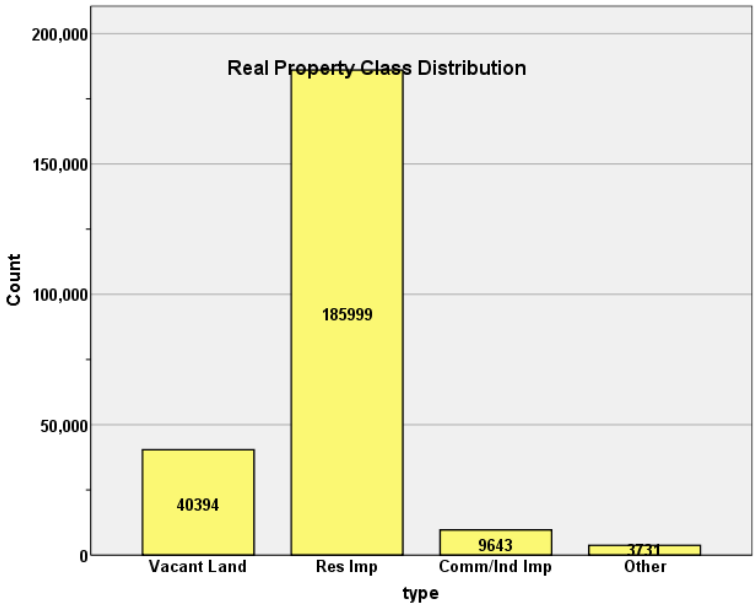
STATISTICAL APPENDIX

STATISTICAL COMPLIANCE REPORT
FOR DENVER COUNTY
2023

I. OVERVIEW

Denver County is an urban county located along Colorado's Front Range. The county has a total of 239,767 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 1112 and 1130) accounted for 63.2% of all vacant land parcels.

For residential improved properties, single family properties accounted for **78.1**% of all residential properties, while condominiums accounted for **18.9%** of all residential properties. We broke down our residential analysis by both economic area and residential subclass.

Commercial and industrial properties represented a much smaller proportion of property classes in comparison. Commercial/industrial properties accounted for 4.0% 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 Denver Assessor's Office in June 2023. The data included all 5 property record files as specified by the Auditor.

III. RESIDENTIAL SALES RESULTS

There were 30,310 qualified residential sales in the 24-month sale period ending June 30, 2022. The sales ratio analysis results were as follows:

Median	**1.002**
Price Related Differential	**1.004**
Coefficient of Dispersion	**6.0**

We stratified the sales ratio results by residential subclass and economic area, as follows:

SINGLE FAMILY Ratio Statistics for currtot / tasp
N = 21,679

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion
1.00	1.001	1.003	.041
2.00	1.001	1.004	.050
3.00	1.005	1.017	.068
4.00	1.005	1.012	.072
5.00	1.000	1.006	.068
6.00	1.001	1.003	.042
7.00	1.003	1.011	.074
8.00	1.002	1.009	.064
9.00	.999	1.008	.065
10.00	1.007	1.009	.072
11.00	1.003	1.007	.065
12.00	1.006	1.008	.073
13.00	1.002	1.008	.055
14.00	1.003	1.006	.069
15.00	1.002	1.014	.080
16.00	1.002	1.035	.058
17.00	1.006	1.014	.080
18.00	1.003	1.014	.092
19.00	1.003	1.007	.066
20.00	1.002	1.008	.066
21.00	1.007	1.005	.047
22.00	1.004	1.005	.063
23.00	1.000	1.005	.058
24.00	1.003	1.005	.055
25.00	1.001	1.004	.053
26.00	1.008	1.009	.068
27.00	1.010	1.016	.080
28.00	1.000	1.007	.064
29.00	1.007	1.007	.064
30.00	1.004	1.007	.065
31.00	.998	1.011	.068
32.00	1.003	1.007	.062
33.00	.999	1.009	.066
34.00	1.001	1.009	.066
51.00	1.006	1.007	.066
52.00	.996	1.066	.093
53.00	1.004	1.004	.055

54.00	1.000	1.006	.057
55.00	1.001	1.005	.055
56.00	1.000	1.007	.052
57.00	1.002	1.008	.057
58.00	1.002	1.007	.056
Overall	1.002	1.008	.062

ROWHOUSE/TOWN HOMES Ratio Statistics for currtot / tasp
N = 127

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion
1.00	1.020	1.017	.110
Overall	1.020	1.017	.110

1220 Ratio Statistics for currtot / tasp
N = 89

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion
1.00	1.019	1.033	.125
2.00	1.013	1.007	.076
Overall	1.017	1.023	.109

1225 Ratio Statistics for currtot / tasp
N = 161

Ratio Statistics for CURRTOT / TASP

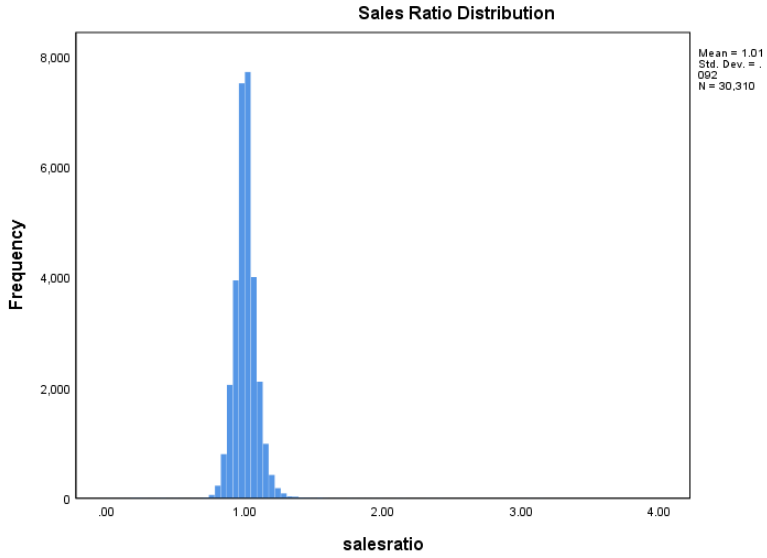
Group	Median	Price Related Differential	Coefficient of Dispersion
2.00	1.007	1.022	.093
3.00	1.028	1.003	.122
Overall	1.014	.994	.103

1230 Ratio Statistics for currtot / tasp
N = 8,254

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion
37.00	1.006	1.004	.062
38.00	1.002	1.004	.048
39.00	.997	1.007	.057
41.00	1.001	1.006	.054
42.00	1.000	1.005	.049
43.00	1.000	1.005	.049
44.00	1.002	1.008	.062
45.00	.999	1.006	.055
46.00	.999	1.006	.054
47.00	1.001	1.002	.051
48.00	1.002	1.006	.062
50.00	1.001	1.012	.056
503.00	1.010	1.000	.000
Overall	1.001	1.005	.055

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 graph describes further the sales ratio distribution for these properties:

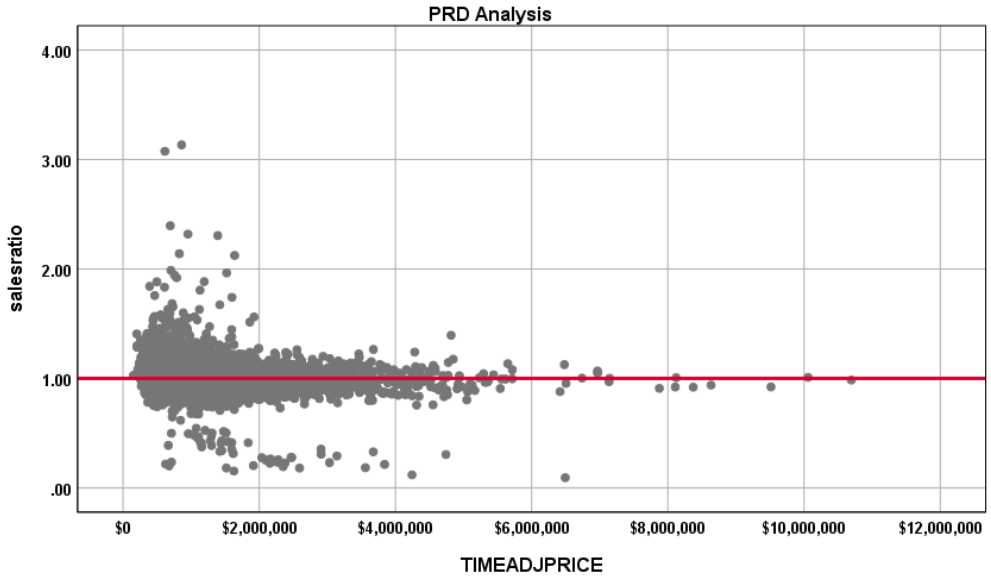


The above graph indicates that the distribution of the sale ratios was within state mandated limits.

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:

1212 SALES



The Price-Related Differential (PRD) for 1212 sales is 1.008, 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:

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.997	.001		857.266	.000
	CURRTOT	.00000000967	.000	.058	8.575	.000

a. Dependent Variable: salesratio

The slope of the line at 0.00000000967 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	80	0.4%
	$300K to $400K	874	4.0%
	$400K to $500K	2994	13.8%
	$500K to $600K	3557	16.4%
	$600K to $750K	4610	21.3%
	$750K to $1000K	4758	21.9%
	$1000K to $2000K	3918	18.1%
	Over $2000K	888	4.1%
Overall		21679	100.0%
Excluded		0	
Total		21679	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
LT $300K	1.049	1.002	.072	10.4%
$300K to $400K	1.035	1.001	.059	8.2%
$400K to $500K	1.013	1.000	.053	7.6%
$500K to $600K	1.004	1.000	.055	7.4%
$600K to $750K	1.000	1.000	.058	9.1%
$750K to $1000K	.999	1.000	.060	9.3%
$1000K to $2000K	.995	1.001	.074	11.2%
Over $2000K	.984	1.001	.084	14.7%
Overall	1.002	1.008	.062	9.5%

The above table indicates no evidence of regressivity or progressivity in the sales ratios across sale price range.

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 subclass and economic area, as follows:

SINGLE FAMILY ANALYSIS

Coefficients[a]

ECONAREA	Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1.00	1	(Constant)	.962	.004		251.988	.000
		SalePeriod	.004	.000	.480	12.547	.000
2.00	1	(Constant)	.971	.006		175.913	.000
		SalePeriod	.003	.000	.293	7.164	.000
3.00	1	(Constant)	.975	.011		90.474	.000
		SalePeriod	.002	.001	.125	2.611	.009
4.00	1	(Constant)	.992	.010		98.440	.000
		SalePeriod	.002	.001	.131	2.734	.007
5.00	1	(Constant)	.983	.014		70.375	.000
		SalePeriod	.002	.001	.191	2.321	.022
6.00	1	(Constant)	.963	.003		318.329	.000
		SalePeriod	.003	.000	.399	15.180	.000
7.00	1	(Constant)	.965	.009		106.699	.000
		SalePeriod	.004	.001	.233	5.449	.000
8.00	1	(Constant)	.982	.008		117.239	.000
		SalePeriod	.002	.001	.149	3.413	.001
9.00	1	(Constant)	.983	.010		99.108	.000
		SalePeriod	.002	.001	.138	2.684	.008
10.00	1	(Constant)	.971	.008		127.538	.000
		SalePeriod	.004	.001	.268	6.199	.000
11.00	1	(Constant)	.957	.007		127.823	.000
		SalePeriod	.004	.001	.274	6.784	.000
12.00	1	(Constant)	.979	.009		106.874	.000
		SalePeriod	.003	.001	.198	4.173	.000
13.00	1	(Constant)	.971	.007		136.137	.000
		SalePeriod	.003	.001	.214	4.974	.000
14.00	1	(Constant)	.985	.010		101.915	.000
		SalePeriod	.002	.001	.134	2.873	.004
15.00	1	(Constant)	.951	.013		73.329	.000
		SalePeriod	.004	.001	.261	4.746	.000
16.00	1	(Constant)	.974	.007		134.572	.000
		SalePeriod	.003	.001	.206	4.981	.000
17.00	1	(Constant)	.951	.014		70.438	.000
		SalePeriod	.005	.001	.222	5.120	.000
18.00	1	(Constant)	.943	.020		46.720	.000
		SalePeriod	.006	.001	.250	4.536	.000
19.00	1	(Constant)	.975	.007		135.703	.000
		SalePeriod	.003	.001	.226	5.902	.000

20.00	1	(Constant)	.975	.009		110.574	.000
		SalePeriod	.003	.001	.226	4.147	.000
21.00	1	(Constant)	.970	.009		110.723	.000
		SalePeriod	.003	.001	.351	5.169	.000
22.00	1	(Constant)	.983	.007		149.826	.000
		SalePeriod	.002	.000	.147	4.806	.000
23.00	1	(Constant)	.965	.005		202.189	.000
		SalePeriod	.004	.000	.339	9.743	.000
24.00	1	(Constant)	.969	.005		198.115	.000
		SalePeriod	.003	.000	.314	8.294	.000
25.00	1	(Constant)	.980	.006		153.550	.000
		SalePeriod	.002	.000	.236	4.890	.000
26.00	1	(Constant)	.968	.009		103.940	.000
		SalePeriod	.003	.001	.236	4.517	.000
27.00	1	(Constant)	.966	.013		73.026	.000
		SalePeriod	.004	.001	.196	4.104	.000
28.00	1	(Constant)	.972	.009		109.548	.000
		SalePeriod	.003	.001	.265	4.904	.000
29.00	1	(Constant)	.973	.010		100.569	.000
		SalePeriod	.003	.001	.230	4.317	.000
30.00	1	(Constant)	.976	.007		133.592	.000
		SalePeriod	.003	.001	.225	4.975	.000
31.00	1	(Constant)	.955	.011		83.251	.000
		SalePeriod	.004	.001	.250	4.333	.000
32.00	1	(Constant)	.980	.007		149.929	.000
		SalePeriod	.002	.000	.178	4.771	.000
33.00	1	(Constant)	.974	.010		101.262	.000
		SalePeriod	.003	.001	.223	3.789	.000
34.00	1	(Constant)	.976	.012		83.640	.000
		SalePeriod	.003	.001	.231	3.263	.001
51.00	1	(Constant)	.980	.009		103.627	.000
		SalePeriod	.003	.001	.209	3.981	.000
52.00	1	(Constant)	.941	.021		45.651	.000
		SalePeriod	.003	.002	.116	1.765	.079
53.00	1	(Constant)	.956	.007		139.505	.000
		SalePeriod	.005	.001	.333	8.587	.000
54.00	1	(Constant)	.971	.005		212.380	.000
		SalePeriod	.003	.000	.233	7.850	.000
55.00	1	(Constant)	.975	.005		197.480	.000
		SalePeriod	.003	.000	.249	7.270	.000
56.00	1	(Constant)	.961	.006		152.803	.000
		SalePeriod	.004	.000	.319	8.069	.000
57.00	1	(Constant)	.959	.006		163.641	.000
		SalePeriod	.004	.000	.325	9.194	.000
58.00	1	(Constant)	.950	.005		185.702	.000
		SalePeriod	.004	.000	.356	11.549	.000
59.00	1	(Constant)	.941	.006		165.914	.000
		SalePeriod	.006	.000	.683	13.758	.000

a. Dependent Variable: salesratio

1215 ANALYSIS

Coefficients[a]

ECONAREA	Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1.00	1	(Constant)	1.007	.024		41.110	.000
		SalePeriod	.003	.002	.145	1.631	.106

a. Dependent Variable: salesratio

1220 ANALYSIS

Coefficients[a]

ECONAREA	Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1.00	1	(Constant)	1.011	.047		21.482	.000
		SalePeriod	.002	.004	.055	.418	.677
2.00	1	(Constant)	1.008	.036		27.769	.000
		SalePeriod	.001	.003	.050	.267	.791

a. Dependent Variable: salesratio

1225 ANALYSIS

Coefficients[a]

ECONAREA	Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
2.00	1	(Constant)	.952	.024		40.328	.000
		SalePeriod	.005	.002	.236	2.552	.012
3.00	1	(Constant)	.947	.052		18.093	.000
		SalePeriod	.007	.004	.236	1.664	.103

a. Dependent Variable: salesratio

1230 ANALYSIS

Coefficients[a]

ECONAREA	Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
.	1	(Constant)	.978	.028		34.902	.000
		SalePeriod	.001	.002	.070	.629	.531
37.00	1	(Constant)	.990	.007		146.113	.000
		SalePeriod	.002	.001	.137	3.484	.001
38.00	1	(Constant)	.987	.005		185.553	.000
		SalePeriod	.002	.000	.163	4.124	.000
39.00	1	(Constant)	.969	.006		162.925	.000
		SalePeriod	.002	.000	.223	5.138	.000
41.00	1	(Constant)	.984	.005		185.662	.000
		SalePeriod	.002	.000	.167	4.607	.000
42.00	1	(Constant)	.971	.004		250.026	.000
		SalePeriod	.003	.000	.295	9.532	.000
43.00	1	(Constant)	.973	.005		209.808	.000
		SalePeriod	.002	.000	.241	6.826	.000
44.00	1	(Constant)	.980	.006		173.204	.000
		SalePeriod	.002	.000	.169	5.051	.000
45.00	1	(Constant)	.973	.005		204.583	.000
		SalePeriod	.003	.000	.224	7.066	.000

46.00	1	(Constant)	.982	.006		174.908	.000
		SalePeriod	.002	.000	.144	4.162	.000
47.00	1	(Constant)	.995	.005		204.721	.000
		SalePeriod	.001	.000	.088	2.527	.012
48.00	1	(Constant)	.985	.007		138.287	.000
		SalePeriod	.002	.001	.155	3.229	.001
50.00	1	(Constant)	.997	.015		64.601	.000
		SalePeriod	.001	.001	.081	.726	.470

a. Dependent Variable: salesratio

The above indicates that market trending was insignificant from either a statistical or a relative magnitude perspective for each subclass and economic area. Based on this analysis, we concluded that Denver County adequately addressed market trending for residential properties.

Sold/Unsold Analysis

In terms of the valuation consistency between sold and unsold residential properties, we compared the median change in value between taxable year 2020 and taxable year 2022 between sold and unsold groups. The data was analyzed by subclass and economic area, as follows:

OVERALL ANALYSIS

Report

DIFF

sold	N	Median	Mean
UNSOLD	178350	1.33	1.37
SOLD	30305	1.33	1.35

SINGLE FAMILY ANALYSIS

Report

DIFF

ECONAREA	sold	N	Median	Mean
1.00	UNSOLD	4081	1.40	1.38
	SOLD	529	1.41	1.41
2.00	UNSOLD	6478	1.32	1.33
	SOLD	547	1.34	1.35
3.00	UNSOLD	3168	1.40	1.41
	SOLD	430	1.39	1.42
4.00	UNSOLD	3355	1.42	1.42
	SOLD	423	1.46	1.49
5.00	UNSOLD	2053	1.38	1.38
	SOLD	143	1.38	1.39
6.00	UNSOLD	5205	1.38	1.37
	SOLD	1102	1.38	1.38
7.00	UNSOLD	3381	1.40	1.41
	SOLD	502	1.41	1.43
8.00	UNSOLD	3594	1.37	1.38
	SOLD	508	1.39	1.42
9.00	UNSOLD	2239	1.34	1.35
	SOLD	368	1.36	1.39
10.00	UNSOLD	3151	1.27	1.27
	SOLD	497	1.28	1.31
11.00	UNSOLD	5500	1.35	1.35
	SOLD	567	1.38	1.41

12.00	UNSOLD	2576	1.31	1.32
	SOLD	421	1.39	1.42
13.00	UNSOLD	3407	1.37	1.37
	SOLD	512	1.38	1.41
14.00	UNSOLD	2973	1.36	1.37
	SOLD	439	1.37	1.43
15.00	UNSOLD	2059	1.39	1.40
	SOLD	290	1.42	1.46
16.00	UNSOLD	5246	1.37	1.38
	SOLD	557	1.39	1.41
17.00	UNSOLD	3361	1.30	1.31
	SOLD	474	1.33	1.34
18.00	UNSOLD	2231	1.37	1.39
	SOLD	300	1.40	1.46
19.00	UNSOLD	5014	1.39	1.39
	SOLD	649	1.41	1.44
20.00	UNSOLD	1978	1.34	1.34
	SOLD	315	1.35	1.39
21.00	UNSOLD	1316	1.33	1.34
	SOLD	192	1.35	1.37
22.00	UNSOLD	4651	1.34	1.35
	SOLD	863	1.35	1.37
23.00	UNSOLD	6605	1.35	1.35
	SOLD	727	1.38	1.41
24.00	UNSOLD	5670	1.39	1.39
	SOLD	630	1.43	1.46
25.00	UNSOLD	3689	1.39	1.40
	SOLD	406	1.42	1.44
26.00	UNSOLD	2742	1.30	1.30
	SOLD	340	1.32	1.33
27.00	UNSOLD	3142	1.35	1.35
	SOLD	414	1.36	1.39
28.00	UNSOLD	3008	1.40	1.40
	SOLD	321	1.42	1.45
29.00	UNSOLD	2598	1.42	1.42
	SOLD	336	1.43	1.46
30.00	UNSOLD	2754	1.36	1.37
	SOLD	464	1.38	1.41
31.00	UNSOLD	1984	1.36	1.37
	SOLD	277	1.39	1.41
32.00	UNSOLD	5045	1.31	1.31
	SOLD	689	1.33	1.36
33.00	UNSOLD	1645	1.22	1.23
	SOLD	274	1.29	1.33
34.00	UNSOLD	1620	1.41	1.41
	SOLD	189	1.43	1.46
51.00	UNSOLD	1646	1.30	1.30
	SOLD	338	1.33	1.35
52.00	UNSOLD	781	1.27	1.29
	SOLD	213	1.28	1.31
53.00	UNSOLD	2831	1.23	1.22
	SOLD	517	1.26	1.26
54.00	UNSOLD	3769	1.27	1.27
	SOLD	994	1.27	1.28
55.00	UNSOLD	3529	1.34	1.34
	SOLD	686	1.34	1.34
56.00	UNSOLD	1837	1.32	1.34

	SOLD	443	1.32	1.33
57.00	UNSOLD	1867	1.30	1.31
	SOLD	642	1.30	1.31
58.00	UNSOLD	2285	1.32	1.32
	SOLD	819	1.32	1.33
59.00	UNSOLD	967	1.33	1.33
	SOLD	191	1.32	1.33

1215 ANALYSIS

Report

DIFF

ECONAREA	sold	N	Median	Mean
1.00	UNSOLD	2861	1.50	1.51
	SOLD	121	1.50	1.51

1220 ANALYSIS

Report

DIFF

ECONAREA	sold	N	Median	Mean
1.00	UNSOLD	492	1.52	1.53
	SOLD	52	1.50	1.52
2.00	UNSOLD	322	1.20	1.20
	SOLD	29	1.21	1.27

1225 ANALYSIS

Report

DIFF

ECONAREA	sold	N	Median	Mean
2.00	UNSOLD	1071	1.26	1.28
	SOLD	109	1.29	1.28
3.00	UNSOLD	456	1.47	1.48
	SOLD	47	1.40	1.42

1230 ANALYSIS

Report

DIFF

ECONAREA	sold	N	Median	Mean
37.00	UNSOLD	2330	1.12	1.13
	SOLD	633	1.12	1.15
38.00	UNSOLD	3179	1.14	1.14
	SOLD	624	1.15	1.16
39.00	UNSOLD	2085	1.20	1.21
	SOLD	508	1.23	1.25
41.00	UNSOLD	3491	1.30	1.30
	SOLD	741	1.31	1.31
42.00	UNSOLD	5085	1.31	1.35
	SOLD	953	1.33	1.35
43.00	UNSOLD	3452	1.29	1.29
	SOLD	753	1.31	1.32
44.00	UNSOLD	3566	1.20	1.21
	SOLD	869	1.23	1.25
45.00	UNSOLD	3419	1.21	1.21
	SOLD	942	1.21	1.21
46.00	UNSOLD	2279	1.21	1.21
	SOLD	805	1.20	1.21

47.00	UNSOLD	1638	1.15	1.17
	SOLD	668	1.12	1.14
48.00	UNSOLD	2238	1.27	1.26
	SOLD	428	1.28	1.31
50.00	UNSOLD	319	1.12	1.15
	SOLD	81	1.15	1.20

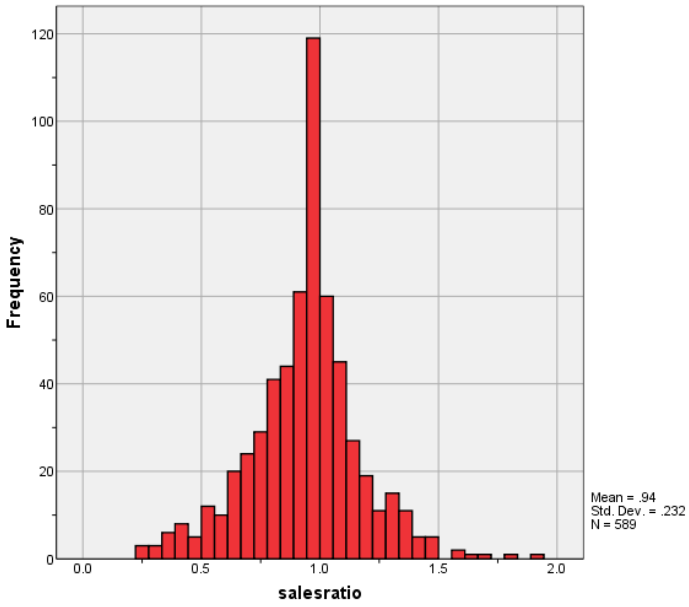
The above results indicate that sold and unsold residential properties were valued in a consistent manner.

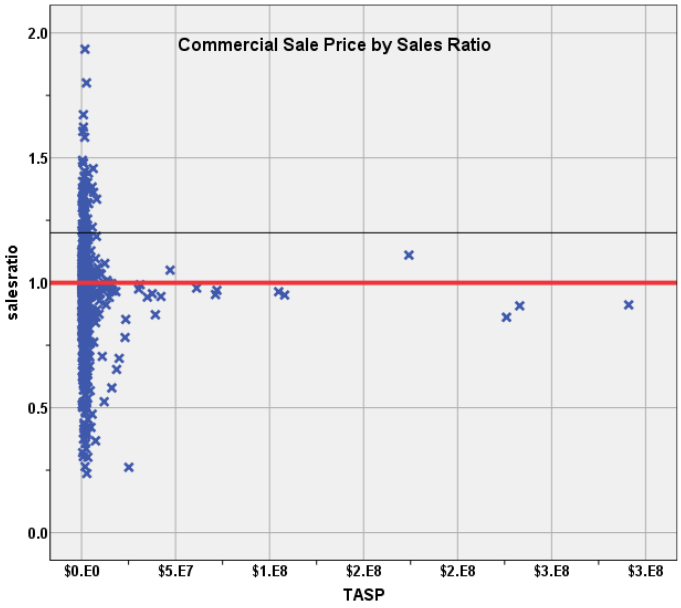
IV. COMMERCIAL/INDUSTRIAL SALE RESULTS

There were 589 qualified commercial/industrial sales in the 24-month sale period ending June 30, 2022. We performed the following sales ratio analysis, as follows:

Median	**0.958**
Price Related Differential	**1.009**
Coefficient of Dispersion	**17.4**

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





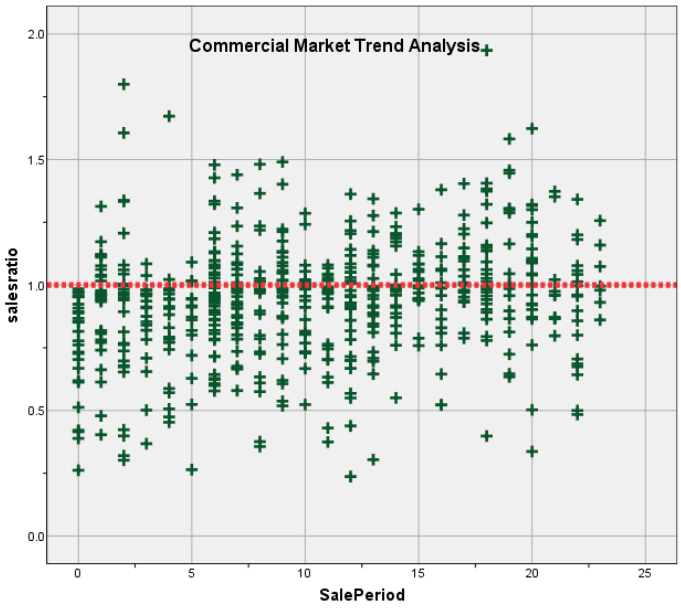
Commercial/Industrial Market Trend Analysis

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

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.856	.018		48.790	.000
	SalePeriod	.008	.001	.220	5.465	.000

a. Dependent Variable: salesratio



There was a statistically significant trend, but when the market trend analysis was stratified by subclass, 7 of the 8 commercial subclasses had market trends that were not statistically significant; therefore, we concluded that the assessor has overall adequately considered market trending adjustments as part of the commercial/industrial valuation.

Sold/Unsold Analysis

We compared the median change in value between taxable year 2020 and taxable year 2022 for unsold and sold commercial/industrial properties overall and by subclass, as follows:

Report
DIFF

sold	N	Median	Mean
UNSOLD	9526	1.17	1.21
SOLD	585	1.22	1.34

Report
DIFF

ABSTRIMPMAJOR	sold	N	Median	Mean
2212	UNSOLD	1469	1.18	1.22
	SOLD	86	1.32	1.41
2220	UNSOLD	1957	1.18	1.20
	SOLD	135	1.26	1.32
2225	UNSOLD	840	1.18	1.23
	SOLD	8	1.35	1.40
2230	UNSOLD	1538	1.15	1.18
	SOLD	67	1.22	1.38
2235	UNSOLD	2058	1.18	1.22
	SOLD	162	1.16	1.25
2245	UNSOLD	856	1.07	1.12
	SOLD	74	1.14	1.27
3215	UNSOLD	223	1.16	1.24
	SOLD	22	1.20	1.39

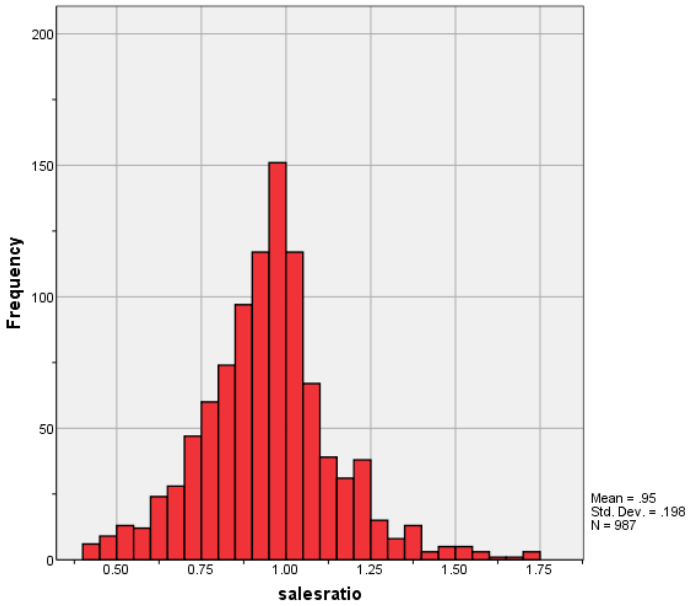
The above results indicated that sold and unsold commercial/industrial properties were valued consistently.

V. VACANT LAND SALE RESULTS

There were 994 qualified vacant land sales in the 24-month sale period ending June 30, 2022. We trimmed 7 sales using IAAO standards, resulting in a final count of 987 qualified vacant land sales. The following sales ratio analysis was performed:

Median	**0.953**
Price Related Differential	**1.065**
Coefficient of Dispersion	**15.3**

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. No sales were trimmed.

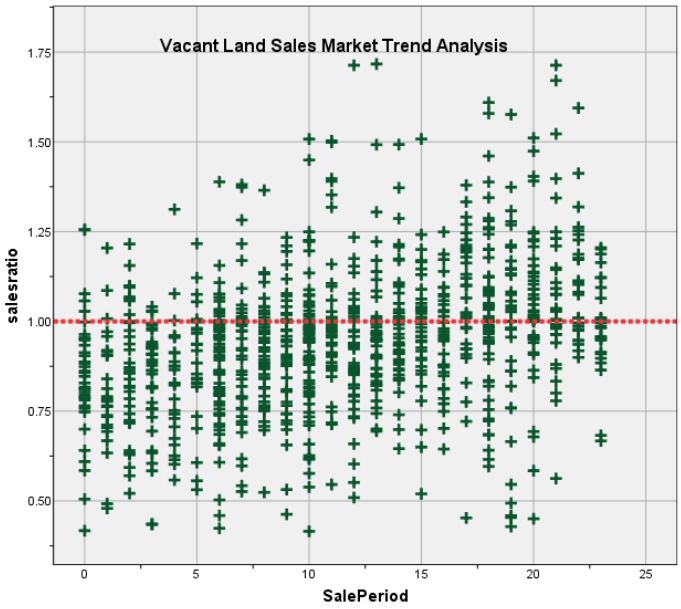
Vacant Land Market Trend Analysis

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

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.825	.012		68.444	.000
	SalePeriod	.011	.001	.348	11.645	.000

a. Dependent Variable: salesratio



There was a clear statistically significant trend in the vacant land data. **We will consult with the assessor concerning this residual market trending in the vacant land sales.**

Sold/Unsold Analysis

In terms of the valuation consistency between sold and unsold vacant land properties, we compared the median change in actual value for taxable year 2020 and taxable year 2022 between each group. We stratified the vacant land properties by neighborhoods with at least 10 sales and found overall consistency. The following results present the overall comparison results:

Report

DIFF

sold	N	Median	Mean
UNSOLD	37825	1.00	1.12
SOLD	771	1.26	1.37

Report

DIFF

NBHD	sold	N	Median	Mea
4	UNSOLD	430	1.00	1.08
	SOLD	13	1.00	1.18
101	UNSOLD	1247	1.00	1.07
	SOLD	10	1.75	1.90
134	UNSOLD	1071	1.00	1.14
	SOLD	11	1.75	2.26
211	UNSOLD	181	1.29	1.24
	SOLD	14	1.36	1.40
212	UNSOLD	176	1.36	1.21
	SOLD	16	1.36	1.28
218	UNSOLD	260	1.18	1.15
	SOLD	13	1.18	1.22
244	UNSOLD	75	1.16	1.18
	SOLD	11	1.16	1.32
266	UNSOLD	160	.84	.92
	SOLD	14	.84	.86
504	UNSOLD	548	1.09	1.13
	SOLD	13	1.16	1.55
506	UNSOLD	248	1.00	1.06
	SOLD	10	1.33	1.29
508	UNSOLD	81	1.13	1.20
	SOLD	14	1.34	1.37
526	UNSOLD	345	1.18	1.16
	SOLD	54	1.23	1.25
529	UNSOLD	76	1.26	1.25
	SOLD	13	1.26	1.27
530	UNSOLD	275	1.16	1.17
	SOLD	49	1.20	1.29
531	UNSOLD	150	1.21	1.17
	SOLD	11	1.21	1.21
532	UNSOLD	410	1.20	1.16
	SOLD	25	1.20	1.22
543	UNSOLD	228	1.00	1.10
	SOLD	16	1.31	1.47
544	UNSOLD	254	1.50	1.42
	SOLD	11	1.50	1.63
545	UNSOLD	208	1.16	1.15
	SOLD	18	1.16	1.19
606	UNSOLD	453	1.25	1.21
	SOLD	15	1.25	1.29
674	UNSOLD	167	1.29	1.26
	SOLD	15	1.29	1.29
680	UNSOLD	69	1.47	1.49
	SOLD	10	1.47	1.52
681	UNSOLD	137	1.47	1.38
	SOLD	13	1.37	1.40

There was sufficient consistency in many of the neighborhoods that indicated the assessor was valuing sold and unsold vacant land properties consistently in Denver County.

V. CONCLUSIONS

Based on this 2023 audit statistical analysis, residential, commercial, and vacant land properties were found to be in compliance with state guidelines. **As noted, we will consult with the county assessor concerning the evidence of significant market trending in the vacant land sale data.**

STATISTICAL ABSTRACT

Residential

Ratio Statistics for CURRTOT / TASP

PREDUSE	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
1212	1.006	1.004	1.007	1.002	1.002	1.003	95.1%	.998	.996	1.000	1.008	.062	9.4%
1215	1.023	.987	1.059	1.018	.991	1.038	96.7%	1.007	.974	1.040	1.016	.124	20.0%
1220	1.024	.990	1.058	1.017	.992	1.052	96.7%	1.001	.966	1.036	1.023	.109	16.0%
1225	1.008	.984	1.033	1.014	.993	1.030	96.0%	1.014	.948	1.080	.994	.103	15.7%
1230	1.004	1.002	1.005	1.000	.999	1.002	95.1%	.998	.996	1.001	1.005	.054	7.6%

The confiden ce 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

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
.937	.919	.956	.958	.945	.970	95.2%	.929	.901	.958	1.009	.174	24.7%

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

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
.945	.933	.957	.953	.942	.962	95.5%	.889	.853	.926	1.063	.153	20.9%

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.

Residential Median Ratio Stratification

Improvement Age

Case Processing Summary

PREDUSE			Count	Percent
1212	AgeRec	0	1131	5.2%
		Over 100	3350	15.5%
		75 to 100	2891	13.3%
		50 to 75	5538	25.5%
		25 to 50	1797	8.3%
		5 to 25	4229	19.5%
		5 or Newer	2743	12.7%
	Overall		21679	100.0%
	Excluded		0	
	Total		21679	
1215	AgeRec	0	5	3.9%
		Over 100	35	27.6%
		75 to 100	22	17.3%
		50 to 75	60	47.2%
		25 to 50	4	3.1%
		5 to 25	1	0.8%
	Overall		127	100.0%
	Excluded		0	
	Total		127	
1220	AgeRec	0	7	7.9%
		Over 100	21	23.6%
		75 to 100	10	11.2%
		50 to 75	43	48.3%
		25 to 50	6	6.7%
		5 to 25	2	2.2%
	Overall		89	100.0%
	Excluded		0	
	Total		89	
1225	AgeRec	0	5	3.1%
		Over 100	15	9.3%
		75 to 100	10	6.2%
		50 to 75	70	43.5%
		25 to 50	20	12.4%
		5 to 25	15	9.3%
		5 or Newer	26	16.1%
	Overall		161	100.0%
	Excluded		0	
	Total		161	
1230	AgeRec	0	248	3.0%
		Over 100	630	7.6%
		75 to 100	298	3.6%
		50 to 75	2116	25.6%
		25 to 50	2293	27.8%
		5 to 25	2166	26.2%
		5 or Newer	503	6.1%
	Overall		8254	100.0%

	Excluded	0	
	Total	8254	

Ratio Statistics for CURRTOT / TASP

PREDUSE	Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1212	0	1.002	1.012	.071	14.9%
	Over 100	1.000	1.007	.068	9.4%
	75 to 100	1.003	1.010	.070	10.9%
	50 to 75	1.005	1.009	.064	9.8%
	25 to 50	1.003	1.004	.056	7.8%
	5 to 25	1.003	1.003	.054	7.3%
	5 or Newer	1.001	1.008	.052	8.1%
	Overall	1.002	1.008	.062	9.5%
1215	0	1.059	1.035	.102	15.6%
	Over 100	1.012	1.015	.142	23.5%
	75 to 100	.990	1.009	.058	8.6%
	50 to 75	1.024	1.007	.124	20.4%
	25 to 50	1.008	1.065	.206	23.9%
	5 to 25	1.556	1.000	.000	.
	Overall	1.018	1.016	.124	20.1%
1220	0	.989	1.018	.105	15.3%
	Over 100	1.027	1.016	.118	16.1%
	75 to 100	1.030	1.015	.071	8.6%
	50 to 75	1.011	1.031	.111	17.9%
	25 to 50	1.077	.995	.117	16.9%
	5 to 25	1.005	1.019	.067	9.4%
	Overall	1.017	1.023	.109	16.1%
1225	0	.988	.899	.115	22.8%
	Over 100	1.014	1.012	.065	8.7%
	75 to 100	1.029	1.003	.045	7.0%
	50 to 75	1.008	1.043	.098	15.3%
	25 to 50	1.001	1.078	.162	25.8%
	5 to 25	1.140	1.023	.104	14.3%
	5 or Newer	1.018	.981	.088	12.1%
	Overall	1.014	.994	.103	15.6%
1230	0	.999	1.009	.033	5.3%
	Over 100	.994	1.007	.072	9.7%
	75 to 100	1.002	1.011	.062	9.2%
	50 to 75	1.000	1.006	.055	7.5%
	25 to 50	1.001	1.003	.054	7.7%
	5 to 25	1.003	1.005	.053	7.3%
	5 or Newer	1.001	1.004	.043	6.0%
	Overall	1.000	1.005	.054	7.6%

Improvement Size

Case Processing Summary

PREDUSE			Count	Percent
1212	ImpSFRec	0	1134	5.2%
		LE 500 sf	38	0.2%
		500 to 1,000 sf	4235	19.5%
		1,000 to 1,500 sf	6829	31.5%
		1,500 to 2,000 sf	4487	20.7%

		2,000 to 3,000 sf	3659	16.9%
		3,000 sf or Higher	1297	6.0%
	Overall		21679	100.0%
	Excluded		0	
	Total		21679	
1215	ImpSFRec	0	5	3.9%
		500 to 1,000 sf	1	0.8%
		1,000 to 1,500 sf	22	17.3%
		1,500 to 2,000 sf	43	33.9%
		2,000 to 3,000 sf	45	35.4%
		3,000 sf or Higher	11	8.7%
	Overall		127	100.0%
	Excluded		0	
	Total		127	
1220	ImpSFRec	0	7	7.9%
		1,500 to 2,000 sf	1	1.1%
		2,000 to 3,000 sf	19	21.3%
		3,000 sf or Higher	62	69.7%
	Overall		89	100.0%
	Excluded		0	
	Total		89	
1225	ImpSFRec	0	5	3.1%
		3,000 sf or Higher	156	96.9%
	Overall		161	100.0%
	Excluded		0	
	Total		161	
1230	ImpSFRec	0	249	3.0%
		LE 500 sf	251	3.0%
		500 to 1,000 sf	4008	48.6%
		1,000 to 1,500 sf	2738	33.2%
		1,500 to 2,000 sf	733	8.9%
		2,000 to 3,000 sf	233	2.8%
		3,000 sf or Higher	42	0.5%
	Overall		8254	100.0%
	Excluded		0	
	Total		8254	

Ratio Statistics for CURRTOT / TASP

PREDUSE	Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1212	0	1.002	1.012	.070	14.9%
	LE 500 sf	1.001	1.014	.069	10.5%
	500 to 1,000 sf	1.002	1.010	.063	9.0%
	1,000 to 1,500 sf	1.002	1.010	.061	9.7%
	1,500 to 2,000 sf	1.002	1.005	.056	7.9%
	2,000 to 3,000 sf	1.005	1.007	.064	9.3%
	3,000 sf or Higher	1.004	1.007	.067	9.3%
	Overall	1.002	1.008	.062	9.5%
1215	0	1.059	1.035	.102	15.6%
	500 to 1,000 sf	1.020	1.000	.000	.
	1,000 to 1,500 sf	.995	1.012	.103	14.2%
	1,500 to 2,000 sf	1.026	1.014	.128	22.2%

	2,000 to 3,000 sf	1.018	1.010	.139	22.9%
	3,000 sf or Higher	.999	1.007	.091	12.0%
	Overall	1.018	1.016	.124	20.1%
1220	0	.989	1.018	.105	15.3%
	1,500 to 2,000 sf	1.170	1.000	.000	.
	2,000 to 3,000 sf	1.054	1.030	.114	16.0%
	3,000 sf or Higher	1.016	1.022	.104	16.5%
	Overall	1.017	1.023	.109	16.1%
1225	0	.988	.899	.115	22.8%
	3,000 sf or Higher	1.021	.997	.101	15.3%
	Overall	1.014	.994	.103	15.6%
1230	0	.999	1.009	.033	5.3%
	LE 500 sf	1.000	1.007	.056	8.2%
	500 to 1,000 sf	.999	1.005	.052	7.2%
	1,000 to 1,500 sf	1.002	1.005	.055	7.6%
	1,500 to 2,000 sf	1.003	1.007	.057	8.0%
	2,000 to 3,000 sf	1.007	1.017	.090	12.8%
	3,000 sf or Higher	1.002	1.014	.102	13.2%
	Overall	1.000	1.005	.054	7.6%

Improvement Quality

Case Processing Summary

PREDUSE			Count	Percent
1212	QUALITY		1131	5.2%
		A	633	2.9%
		A+	5	0.0%
		B	5842	26.9%
		B-	3	0.0%
		B+	179	0.8%
		C	13567	62.6%
		C+	9	0.0%
		D	247	1.1%
		X	62	0.3%
		X+	1	0.0%
	Overall		21679	100.0%
	Excluded		0	
	Total		21679	
1215	QUALITY		5	3.9%
		B	1	0.8%
		C	118	92.9%
		C+	2	1.6%
		C-	1	0.8%
	Overall		127	100.0%
	Excluded		0	
	Total		127	
1220	QUALITY		7	7.9%
		B	4	4.5%
		C	75	84.3%
		D	3	3.4%
	Overall		89	100.0%
	Excluded		0	
	Total		89	

1225	QUALITY		5	3.1%
		A	24	14.9%
		B	15	9.3%
		C	114	70.8%
		D	2	1.2%
		X	1	0.6%
	Overall		161	100.0%
	Excluded		0	
	Total		161	
1230	QUALITY		248	3.0%
		A	298	3.6%
		A+	30	0.4%
		B	2452	29.7%
		B-	1	0.0%
		B+	78	0.9%
		C	4993	60.5%
		C+	23	0.3%
		D	101	1.2%
		X	30	0.4%
	Overall		8254	100.0%
	Excluded		0	
	Total		8254	

Ratio Statistics for CURRTOT / TASP

PREDUSE	Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1212		1.002	1.012	.071	14.9%
	A	1.007	1.010	.068	9.6%
	A+	.961	1.012	.096	12.4%
	B	1.003	1.006	.061	8.8%
	B-	.886	1.010	.067	13.6%
	B+	1.006	1.007	.059	7.8%
	C	1.002	1.009	.061	9.2%
	C+	.994	.996	.034	5.1%
	D	.994	1.005	.060	8.6%
	X	1.010	1.011	.067	8.6%
	X+	.939	1.000	.000	.
	Overall	1.002	1.008	.062	9.5%
1215		1.059	1.035	.102	15.6%
	B	1.032	1.000	.000	.
	C	1.014	1.014	.127	20.6%
	C+	.993	1.002	.064	9.0%
	C-	1.193	1.000	.000	.
	Overall	1.018	1.016	.124	20.1%
1220		.989	1.018	.105	15.3%
	B	1.072	1.039	.057	9.3%
	C	1.017	1.025	.113	16.9%
	D	.967	.997	.033	5.1%
	Overall	1.017	1.023	.109	16.1%
1225		.988	.899	.115	22.8%
	A	1.050	1.001	.096	11.6%
	B	.951	1.000	.106	15.9%

	C	1.021	1.055	.097	15.8%
	D	.898	1.152	.306	43.3%
	X	1.006	1.000	.000	.
	Overall	1.014	.994	.103	15.6%
1230		.999	1.009	.033	5.3%
	A	1.002	1.007	.061	9.3%
	A+	.996	1.003	.095	17.6%
	B	1.002	1.004	.056	7.8%
	B-	.925	1.000	.000	.
	B+	1.000	1.011	.047	6.3%
	C	1.000	1.006	.054	7.4%
	C+	1.017	1.013	.056	7.2%
	D	.996	1.008	.074	10.1%
	X	.993	1.020	.074	10.8%
	Overall	1.000	1.005	.054	7.6%

Improvement Condition

Case Processing Summary

PREDUSE			Count	Percent
1212	CONDITION	1	83	0.4%
		2	545	2.7%
		3	13125	63.9%
		4	6620	32.2%
		5	86	0.4%
		7	78	0.4%
	Overall		20537	100.0%
	Excluded		1142	
	Total		21679	
1215	Overall		0	100.0%
	Excluded		127	
	Total		127	
1220	Overall		0	100.0%
	Excluded		89	
	Total		89	
1225	Overall		0	100.0%
	Excluded		161	
	Total		161	
1230	CONDITION	1	2	0.0%
		2	30	0.4%
		3	4949	61.8%
		4	3020	37.7%
		5	2	0.0%
	Overall		8003	100.0%
	Excluded		251	
	Total		8254	

Ratio Statistics for CURRTOT / TASP

PREDUSE	Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1212	1	1.006	1.010	.086	13.3%
	2	1.002	1.011	.079	16.6%
	3	1.003	1.009	.063	9.2%
	4	1.002	1.005	.055	7.8%
	5	1.005	1.008	.071	10.4%
	7	1.011	1.000	.070	8.8%
	Overall	1.002	1.007	.061	9.1%
1230	1	1.003	1.004	.036	5.1%
	2	1.009	.998	.054	7.5%
	3	1.000	1.005	.057	7.9%
	4	1.002	1.005	.053	7.4%
	5	.964	1.009	.039	5.6%
	Overall	1.001	1.005	.055	7.7%

Commercial Median Ratio Stratification

Sale Price

Case Processing Summary

		Count	Percent
SPRec	$50K to $100K	1	0.2%
	$100K to $150K	2	0.3%
	$150K to $200K	5	0.8%
	$200K to $300K	6	1.0%
	$300K to $500K	46	7.8%
	$500K to $750K	64	10.9%
	$750K to $1,000K	72	12.2%
	Over $1,000K	393	66.7%
Overall		589	100.0%
Excluded		0	
Total		589	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
$50K to $100K	1.124	1.000	.000	.
$100K to $150K	.935	.994	.057	8.1%
$150K to $200K	.888	1.001	.076	12.3%
$200K to $300K	.840	1.011	.188	27.5%
$300K to $500K	.988	1.000	.140	19.6%
$500K to $750K	.972	.999	.180	23.7%
$750K to $1,000K	.983	1.001	.161	23.8%
Over $1,000K	.950	.988	.179	25.0%
Overall	.958	1.009	.174	24.3%

Subclass

Case Processing Summary

		Count	Percent
ABSTRIMP	1215.00	1	0.2%
	2212.00	86	15.4%
	2220.00	136	24.4%
	2225.00	8	1.4%
	2230.00	67	12.0%
	2235.00	163	29.3%
	2245.00	74	13.3%
	3215.00	22	3.9%
Overall		557	100.0%
Excluded		32	
Total		589	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
1215.00	1.481	1.000	.000	.
2212.00	.956	1.079	.145	21.3%
2220.00	.963	1.001	.137	21.0%
2225.00	.941	.996	.092	11.0%
2230.00	.906	1.096	.239	29.5%
2235.00	.979	1.018	.195	25.1%
2245.00	.940	.992	.139	20.1%
3215.00	.942	1.078	.274	38.0%
Overall	.958	1.007	.174	24.2%

Improvement Age

Case Processing Summary

		Count	Percent
AgeRec	0	32	5.4%
	Over 100	74	12.6%
	75 to 100	54	9.2%
	50 to 75	206	35.0%
	25 to 50	149	25.3%
	5 to 25	61	10.4%
	5 or Newer	13	2.2%
Overall		589	100.0%
Excluded		0	
Total		589	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
0	.974	1.017	.174	26.3%
Over 100	.913	1.005	.176	23.3%
75 to 100	.951	1.108	.172	25.1%
50 to 75	.954	1.010	.190	26.1%
25 to 50	.985	1.017	.165	23.5%
5 to 25	.954	1.037	.140	19.4%
5 or Newer	.997	.987	.094	16.0%
Overall	.958	1.009	.174	24.3%

Improvement Quality

Case Processing Summary

		Count	Percent
QUALITY		32	5.4%
	A	20	3.4%
	A-	1	0.2%
	A+	1	0.2%
	B	80	13.6%
	B-	3	0.5%
	B+	4	0.7%
	C	425	72.2%
	C-	3	0.5%
	C+	8	1.4%
	D	1	0.2%
	X	7	1.2%
	X-	1	0.2%
	X+	3	0.5%
Overall		589	100.0%
Excluded		0	
Total		589	

Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
	.974	1.017	.174	26.3%
A	.928	.968	.093	14.5%
A-	1.050	1.000	.000	.
A+	1.111	1.000	.000	.
B	.976	.999	.109	16.0%
B-	.800	.874	.270	44.8%
B+	.850	.929	.197	25.8%
C	.957	1.039	.188	25.6%
C-	1.096	1.008	.041	6.2%
C+	.975	.983	.210	36.5%
D	.973	1.000	.000	.
X	.838	.993	.231	34.5%
X-	.958	1.000	.000	.
X+	.908	.937	.091	16.6%
Overall	.958	1.009	.174	24.3%

Vacant Land Median Ratio Stratification

Sale Price

Case Processing Summary

		Count	Percent
SPRec	$50K to $100K	3	0.3%
	$100K to $150K	6	0.6%
	$150K to $200K	7	0.7%
	$200K to $300K	42	4.3%
	$300K to $500K	135	13.7%
	$500K to $750K	286	29.0%
	$750K to $1,000K	171	17.3%
	Over $1,000K	337	34.1%
Overall		987	100.0%
Excluded		0	
Total		987	

Ratio Statistics for CURRLND / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
$50K to $100K	1.493	1.004	.194	32.5%
$100K to $150K	1.029	1.002	.069	9.9%
$150K to $200K	.999	1.002	.179	27.2%
$200K to $300K	1.015	1.001	.146	21.5%
$300K to $500K	1.012	.999	.165	21.7%
$500K to $750K	.964	1.002	.121	16.5%
$750K to $1,000K	.926	1.000	.140	18.4%
Over $1,000K	.906	1.023	.172	22.7%
Overall	.953	1.065	.153	20.7%

Subclass

Case Processing Summary

		Count	Percent
ABSTRLND	0	198	20.1%
	100	69	7.0%
	101	152	15.4%
	200	44	4.5%
	300	7	0.7%
	510	2	0.2%
	520	5	0.5%
	530	1	0.1%
	540	1	0.1%
	1112	366	37.1%
	1115	10	1.0%
	1120	4	0.4%
	1125	15	1.5%
	2112	13	1.3%
	2115	2	0.2%
	2120	33	3.3%
	2125	3	0.3%

	2130	45	4.6%
	2135	13	1.3%
	3115	4	0.4%
Overall		987	100.0%
Excluded		0	
Total		987	

Ratio Statistics for CURRLND / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation Median Centered
0	.961	1.038	.157	21.1%
100	.947	1.067	.148	20.9%
101	.885	1.033	.145	18.7%
200	.959	1.070	.159	22.4%
300	.962	.910	.174	26.7%
510	1.158	1.055	.111	15.8%
520	1.000	1.110	.135	17.8%
530	1.036	1.000	.000	.
540	.959	1.000	.000	.
1112	.974	1.037	.137	18.8%
1115	.805	.983	.092	12.7%
1120	.862	1.115	.197	23.5%
1125	.943	1.344	.280	36.1%
2112	.919	1.068	.176	26.7%
2115	1.067	.998	.030	4.2%
2120	.958	1.043	.180	25.2%
2125	.934	1.109	.125	21.8%
2130	.908	1.069	.183	24.8%
2135	1.031	.926	.144	18.0%
3115	.863	.980	.095	13.1%
Overall	.953	1.065	.153	20.7%