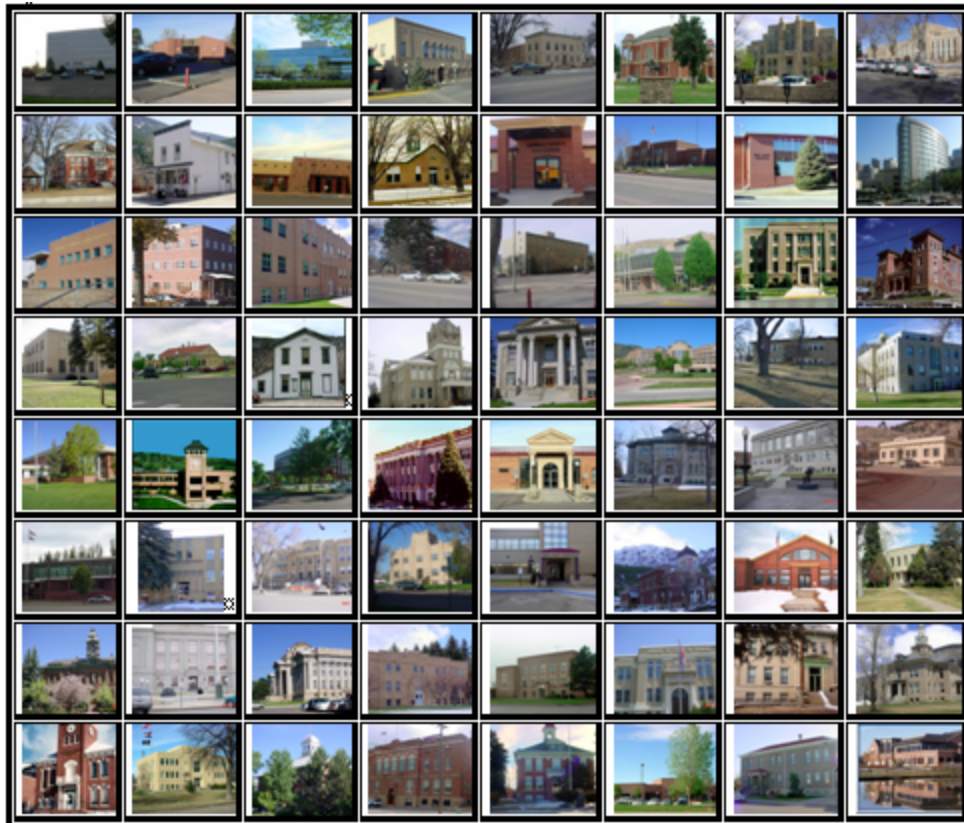




2009  
WASHINGTON COUNTY  
PROPERTY ASSESSMENT  
STUDY

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WILDROSE  
APPRAISAL, INCORPORATED  
Audit Division



September 15, 2009

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

**RE: Final Report for the 2009 Colorado Property Assessment Study**

Dear Mr. Mauer:

Wildrose Appraisal Inc.-Audit Division is pleased to submit the Final Reports for the 2009 Colorado Property Assessment Study.

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

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

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

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

A handwritten signature in black ink that reads "Harry J. Fuller". The signature is written in a cursive style.

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

Wildrose Audit has completed the Property Assessment Study for 2009 and is pleased to report its findings for Washington County in the following report.

# REGIONAL/HISTORICAL SKETCH OF WASHINGTON COUNTY

## Regional Information

Washington County is located in the Eastern Plains region of Colorado. The Eastern Plains of Colorado refer to the region on the east side of the Rocky Mountain. It is east of the population centers of the Front Range,

including Baca, Bent, Cheyenne, Crowley, Elbert, Kiowa, Kit Carson, Lincoln, Logan, Morgan, Otero, Phillips, Prowers, Sedgwick, Washington, and Yuma counties.



## Historical Information

Washington County has a population of approximately 4,630 people with 2 people per square mile, according to the U.S. Census Bureau's 2006 estimated population data.

Washington county was named in honor of United States President George Washington and is one of the largest counties in Colorado with over 2,500 sq. miles. Akron is the county seat

Washington County was once a dangerous and rugged place for both native Americans and settlers. On July 11, 1869, Summit Springs was the sight of a bloody conflict between Cavalry Soldiers, Cheyenne and Sioux Indians. Today, four stones mark the battle, which is north of Akron on Highway 63. The most current marker is for Susannah Aldrich, who had been captured and killed by chief Tall Bull who was killed in turn by Major Frank North. Buffalo Bill Cody participated in this battle and later recreated it in his Wild West Show. There is a fence that separates the monuments

from the private ground where the battle occurred and where the actual springs are located.

Although the plains are peaceful now, it's easy to imagine the scenes of history that took place in this wide-open county. Farming is a vital industry in Washington County. This county is a major dry land wheat producer. The other major crop is millet. There are two birdseed factories in the area. Akron has been home to one of the largest, for over 40 years, with the second largest located in Otis.

The museum in Akron contains a lot of the county's rich history, artifacts and memorabilia. Prewitt Reservoir, a great place for fishing and camping, is in the northwest part of the county. The county abounds with pheasant and other wildlife. Once a year in September, pilots from all over the nation visit Akron, Colorado for the National Radial Engine Exhibition. ([www.Wikipedia.org](http://www.Wikipedia.org), [www.northeastrpd.org](http://www.northeastrpd.org))



# RATIO ANALYSIS

## Methodology

All significant classes of properties were analyzed. Sales were collected for each property class over the appropriate sale period, which was typically defined as the 18-month period between January 2007 and June 2008. Counties with less than 30 sales typically extended the sale period back up to 5 years prior to June 30, 2008 in 6-month increments. If there were still fewer than 30 sales, supplemental appraisals were performed and treated as proxy sales. Residential sales for all counties using this method totaled at least 30 per county. For commercial sales, the total number analyzed was allowed, in some cases, to fall below 30. There were no sale quantity issues for counties requiring vacant land analysis or condominium analysis. Although it was required that we examine the median and coefficient of dispersion for all counties, we also calculated the weighted mean and price-related differential for each class of property. Counties were not passed or failed by these

latter measures, but were counseled if there were anomalies noted during our analysis. Qualified sales were based on the qualification code used by each county, which were typically coded as either “Q” or “C.” The ratio analysis included all sales. The data was trimmed for counties with obvious outliers using IAAO standards for data analysis. In every case, we examined the loss in data from trimming to ensure that only true outliers were excluded. Any county with a significant portion of sales excluded by this trimming method was examined further. No county was allowed to pass the audit if more than 5% of the sales were “lost” because of trimming. For the largest 11 counties, the residential ratio statistics were broken down by economic area as well.

## Conclusions

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

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

The results for Washington County are:

<b>Washington County Ratio Grid</b>					
<b>Property Class</b>	<b>Number of Qualified Sales</b>	<b>Unweighted Median Ratio</b>	<b>Price Related Differential</b>	<b>Coefficient of Dispersion</b>	<b>Time Trend Analysis</b>
Commercial/Industrial	30	0.956	1.082	14.9	Compliant
Condominium	N/A	N/A	N/A	N/A	N/A
Single Family	46	0.989	1.049	13.6	Compliant
Vacant Land	N/A	N/A	N/A	N/A	N/A

After applying the above described methodologies, it is concluded from the sales ratios that Washington County is in compliance

with SBOE, DPT, and Colorado State Statute valuation guidelines.

**Recommendations**

None

**Random Deed Analysis**

An additional analysis was performed as part of the Ratio Analysis. Ten randomly selected deeds with documentary fees were obtained from the Clerk and Recorder. These deeds were for sales that occurred from January 1, 2007 through June 30, 2008. These sales were then checked for inclusion on the Assessor’s qualified or unqualified database.

**Conclusions**

After comparing the list of randomly selected deeds with the Assessor’s database, Washington County has accurately transferred sales data from the recorded deeds to the qualified or unqualified database.

**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 methodology 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 Washington County has complied with the statutory requirements to analyze the effects of time on value in their county. Washington 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

Washington 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.

All qualified residential and commercial class properties were examined using the unit value method, where the actual value per square foot was compared between sold and unsold properties. A class was considered qualified if it met the criteria for the ratio analysis. The median value per square foot for both groups was compared from an appraisal and statistical perspective. If no significant difference was indicated, then we concluded that no further testing was warranted and that the county was in compliance in terms of sold/unsold consistency.

If either residential or commercial differences were significant using the unit value method, or if data limitations made the comparison invalid, then the next step was to perform a ratio analysis comparing the 2008 and 2009 actual values for each qualified class of property. All qualified vacant land classes were tested using this method. The sale property ratios were arrayed using a range of 0.8 to 1.5, which theoretically excluded changes between years that were due to other unrelated changes in the property. These ratios were also stratified at the appropriate level of analysis. Once the percent change was determined for each appropriate class and sub-class, the next step was to select the unsold sample. This sample

was at least 1% of the total population of unsold properties and excluded any sale properties. The unsold sample was filtered based on the attributes of the sold dataset to closely correlate both groups. The ratio analysis was then performed on the unsold properties and stratified. The median and mean ratio distribution was then compared between the sold and unsold group. A non-parametric test such as the Mann-Whitney test for differences between independent samples was undertaken to determine whether any observed differential was significant. If this test determined that the unsold properties were treated in a manner similar to the sold properties, it was concluded that no further testing was warranted and that the county was in compliance.

If a class or sub-class of property was determined to be significantly different by this method, the final step was to perform a multi-variate mass appraisal model that developed ratio statistics from the sold properties that were then applied to the unsold sample. This test compared the measures of central tendency and confidence intervals for the sold properties with the unsold property sample. If this comparison was also determined to be significantly different, then the conclusion was that the county had treated the unsold properties in a different manner than sold properties.

These tests were supported by both tabular and chart presentations, along with saved sold and unsold sample files.

<b>Sold/Unsold Results</b>	
<b>Property Class</b>	<b>Results</b>
Commercial/Industrial	Compliant
Condominium	N/A
Single Family	Compliant
Vacant Land	N/A

### **Conclusions**

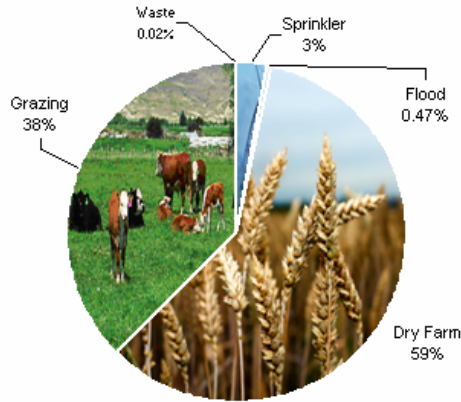
After applying the above described methodologies, it is concluded that Washington County is reasonably treating its sold and unsold properties in the same manner.

### **Recommendations**

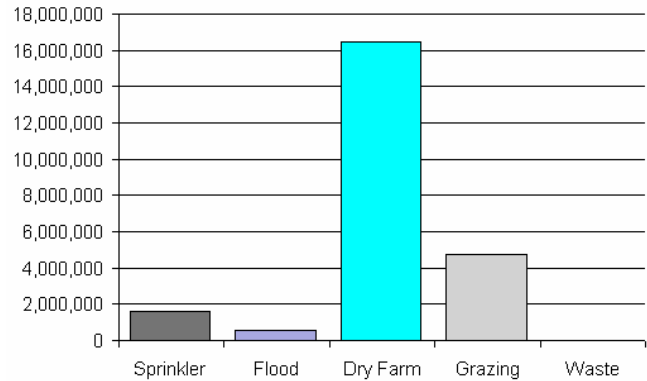
None

# 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:

<b>Washington County Agricultural Land Ratio Grid</b>						
<b>Abstract Code</b>	<b>Land Class</b>	<b>Number Of Acres</b>	<b>County Value Per Acre</b>	<b>County Assessed Total Value</b>	<b>WRA Total Value</b>	<b>Ratio</b>
4107	Sprinkler	41,034	38.42	1,576,536	1,617,410	0.97
4117	Flood	6,992	79.64	556,832	556,641	1.00
4127	Dry Farm	881,285	18.65	16,431,963	16,071,726	1.02
4147	Grazing	558,423	8.52	4,757,572	4,757,572	1.00
4167	Waste	267	1.62	431	431	1.00
<b>Total/Avg</b>		<b>1,488,001</b>	<b>15.67</b>	<b>23,323,334</b>	<b>23,003,780</b>	<b>1.01</b>

### **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.

### **Conclusions**

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

### **Recommendations**

None

## SALES VERIFICATION

According to Colorado Revised Statutes:

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

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

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

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

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

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

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

WRA reviewed the sales verification procedures in 2009 for Washington County. This study was conducted by checking selected sales from the master sales list for the Jan 1, 2007 - June 30, 2008 valuation period. Specifically WRA selected 30 sales listed as unqualified. All of the sales in the unqualified sales sample had reasons that were clear and supportable.

### Conclusions

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

### Recommendations

None



# ECONOMIC AREA REVIEW AND EVALUATION

## **Methodology**

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

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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

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**Washington County is exempt from the Vacant Land Subdivision  
Discount Study**

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# 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 39-1-103 (17)(a) (II) C.R.S. Possessory Interest is defined by the Property Tax Administrator's Publication ARL Volume 3, Section 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.

Washington 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

Washington 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

Washington 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.

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

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

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

Washington County submitted their personal property written audit plan and was current for the 2009 valuation period. The number and listing of businesses audited was also submitted and was in conformance with the written audit plan. The following audit triggers were used by the county to select accounts to be audited:

- Businesses in a selected area
- Accounts with obvious discrepancies
- New businesses filing for the first time
- 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 \$4,000 actual value exemption status
- Accounts protested with substantial disagreement

### **Conclusions**

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

### **Recommendations**

None

## WILDROSE AUDITOR STAFF

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

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

**Steve Kane**, *Audit Statistician / Field Analyst*

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

**Andy Rodriguez**, *Field Analyst*



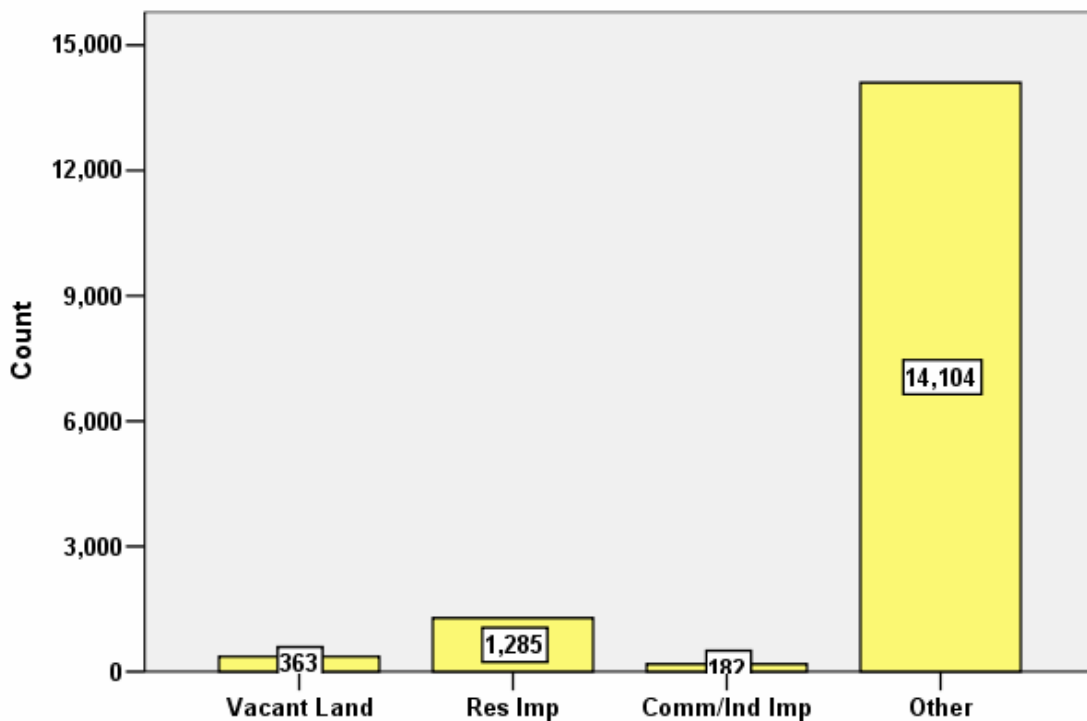
# APPENDICES

## STATISTICAL COMPLIANCE REPORT FOR WASHINGTON COUNTY 2009

### I. OVERVIEW

Washington County is an agricultural county located in northeastern Colorado. The county has a total of 15,934 real property parcels, according to data submitted by the county assessor's office in 2009. The following provides a breakdown of property classes for this county:

**Real Property Class Distribution**



The vacant land class of properties was dominated by residential land. Residential lots (coded 100 or 1112) accounted for 61% of all vacant land parcels, while mobile home land accounted for 20%. Based on the number of vacant land parcels in Washington County, we were not required to analyze this class of property for audit compliance.

For residential improved properties, single family properties accounted for 90% of all residential properties. Properties classified as mobile homes (1235) accounted for 7% of all properties.

Commercial and industrial properties represented a much smaller proportion of property classes in comparison. Commercial/industrial sales accounted for 2.8% of all such properties in this county.

## II. DATA FILES

The following sales analyses were based on the requirements of the 2009 Colorado Property Assessment Study. Information was provided by the Washington Assessor's Office on April 24, 2009. The data included all 5 property record files as specified by the Auditor.

## III. RESIDENTIAL SALES RESULTS

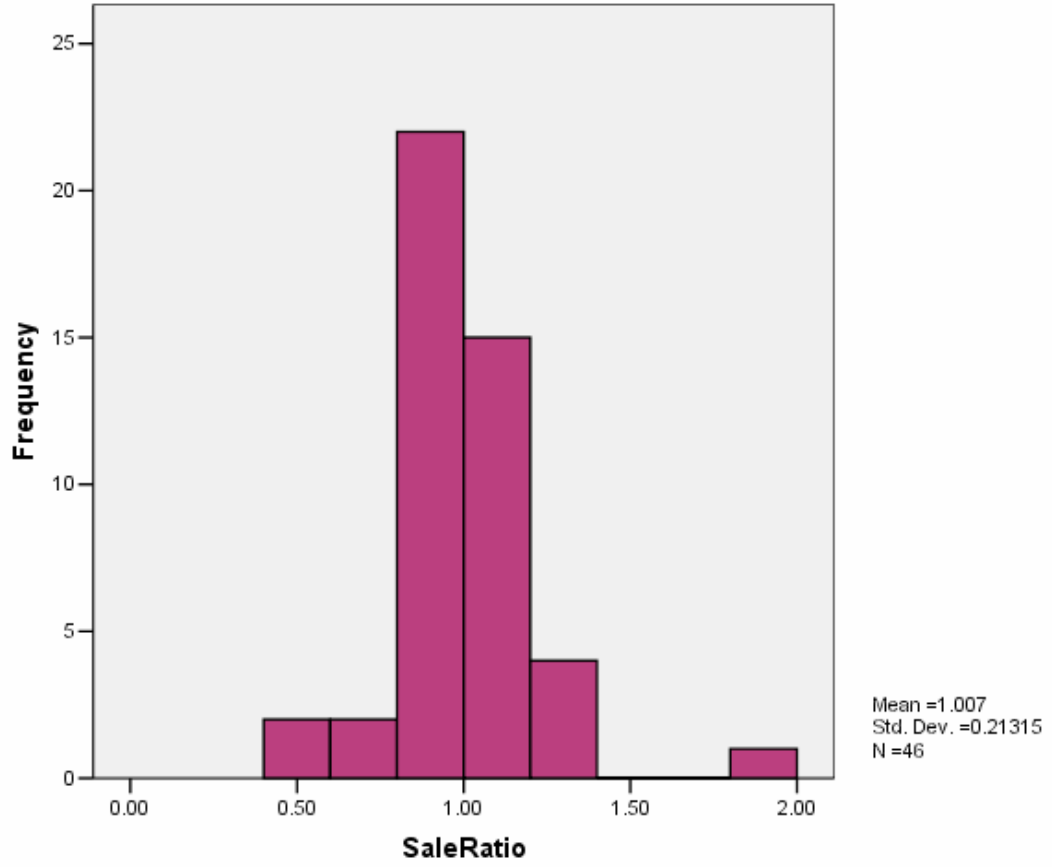
The following steps were taken to analyze the residential sales:

1. All sales	12,598
2. Select qualified sales	1,241
3. Select improved sales	1,110
4. Select non-duplicate sales	231
4. Select residential sales only	193
5. Sales between January 1, 2007 and June 30, 2008	46

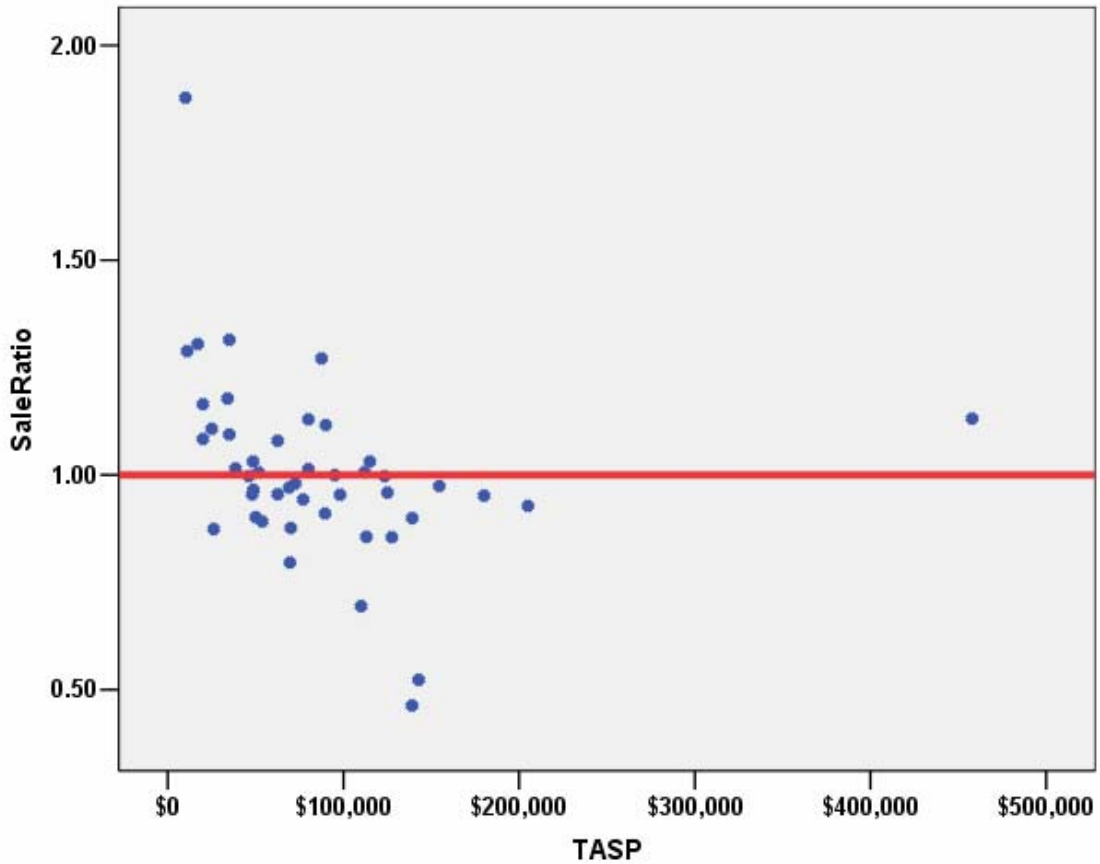
The sales ratio analysis results were as follows:

Median	<b>0.989</b>
Price Related Differential	<b>1.049</b>
Coefficient of Dispersion	<b>.136</b>

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



**Residential Sale Price by Sales Ratio**



The above graphs indicate that the distribution of the sale ratios was within state mandated limits, and that there were no significant price-related differential issues. No sales were trimmed.

**Residential Market Trend Analysis**

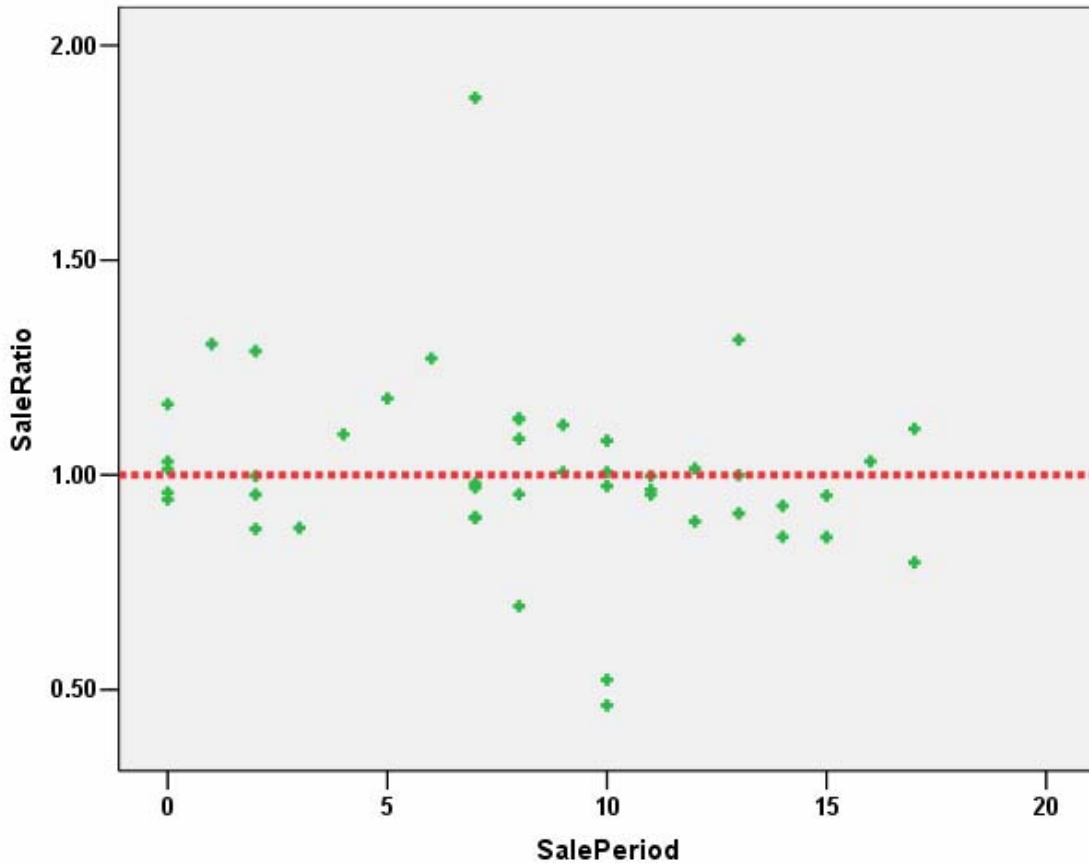
We next analyzed the residential dataset using the 18-month sale period, with the following results:

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.078	.060		17.988	.000
	SalePeriod	-.009	.006	-.204	-1.381	.174

a. Dependent Variable: SaleRatio

### Residential Sale Price Market Trend



The above analysis indicated that no market trend was present in the sale ratio data. We concur with the assessor that no market trend adjustments were warranted.

### Sold/Unsold Analysis

In terms of the valuation consistency between sold and unsold residential properties, we compared the median change in values between 2008 and 2009 between sold and unsold residential properties, as follows;

Group	No. Props	Median Act Val/SF	Mean Act Val/SF
Unsold	1,232	1.0000	1.0178
Sold	46	1.0327	1.1095

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

#### IV. COMMERCIAL/INDUSTRIAL SALE RESULTS

The following steps were taken to analyze the commercial sales:

1. All sales	12,598
2. Select qualified sales	1,241
3. Select improved sales	1,110
4. Select non-duplicate sales	231
4. Select commercial sales only	22
5. Trim one extreme sale	21

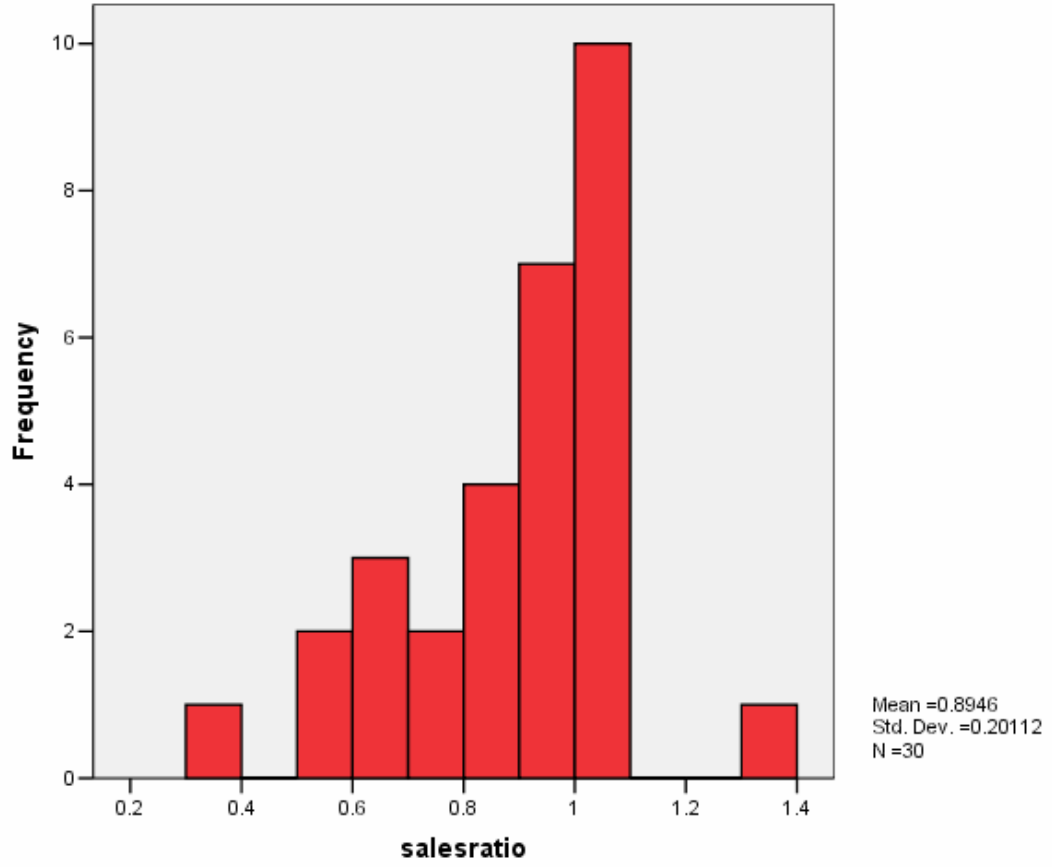
Because there were fewer than 30 sales, we augmented the sales ratio analysis with 9 supplemental sales. These supplemental appraised values will be used only for the sales ratio analysis; the market trending analysis and sold/unsold analysis will use only the 21 sold properties.

The sales ratio analysis was analyzed as follows:

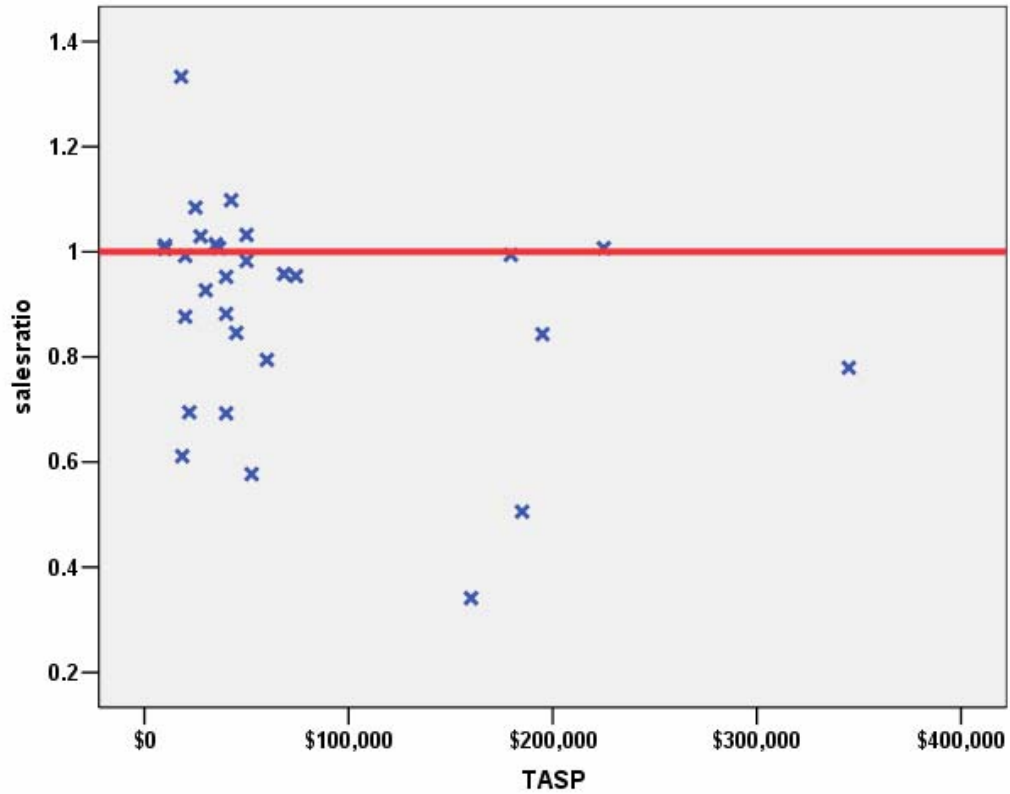
Median	<b>0.956</b>
Price Related Differential	<b>1.082</b>
Coefficient of Dispersion	<b>.149</b>

The above tables indicate that the Washington 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 Sale Price by Sales Ratio**



**Commercial Market Trend Analysis**

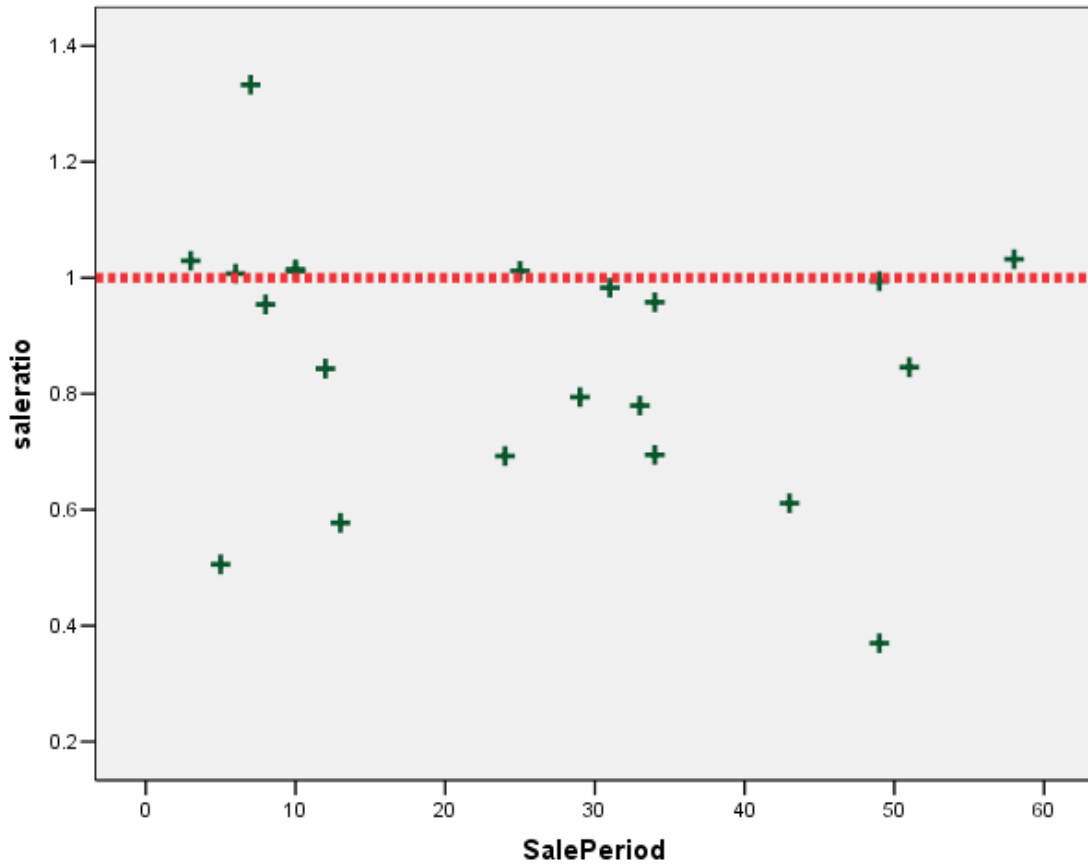
The assessor did not apply any market trend adjustment to the commercial dataset. The 21 commercial sales were analyzed, examining the sale ratios across the 5 year sale period with the following results:

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.937	.087		10.765	.000
	SalePeriod	-.003	.003	-.241	-1.081	.293

a. Dependent Variable: saleratio

### Commercial Market Trend Analysis



The above results indicate that there was no significant market trend residual in the commercial sale ratios.

### Sold/Unsold Analysis

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

ABSTRIMP	Group	N	Median	Mean
2212.00	Unsold	17	\$11	\$17
	Sold	5	\$11	\$13
2220.00	Unsold	12	\$20	\$20
	Sold	4	\$25	\$27
2225.00	Unsold	3	\$4	\$7
	Sold	1	\$7	\$7
2230.00	Unsold	62	\$10	\$17
	Sold	5	\$27	\$30
2235.00	Unsold	58	\$9	\$292
	Sold	2	\$12	\$12

The above results when stratified by subclass indicated that sold and unsold commercial properties were valued consistently.

#### V. AGRICULTURAL IMPROVEMENTS ANALYSIS

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

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

**Descriptives**

ABSTRIMP		Statistic	Std. Error		
impValSF	1212.00	Mean	\$48.04	\$4.968	
		95% Confidence Interval for Mean	\$38.29		
		Lower Bound	\$57.79		
		Upper Bound			
		5% Trimmed Mean	\$39.14		
		Median	\$37.45		
		Variance	28559.031		
		Std. Deviation	\$168.994		
		Minimum	\$1		
		Maximum	\$5,359		
		Range	\$5,358		
		Interquartile Range	\$34		
		Skewness	27.777		.072
		Kurtosis	851.799		.144
4277.00		Mean	\$269.43	\$42.791	
		95% Confidence Interval for Mean	\$185.44		
		Lower Bound	\$353.41		
		Upper Bound			
		5% Trimmed Mean	\$58.86		
		Median	\$41.75		
		Variance	1585718		
		Std. Deviation	*****		
		Minimum	\$3		
		Maximum	\$15,291		
		Range	\$15,288		
		Interquartile Range	\$42		
		Skewness	7.785		.083
		Kurtosis	68.183		.166

**VI. CONCLUSIONS**

Based on this statistical analysis, there were no significant compliance issues concluded for Washington County as of the date of this report in terms of residential, commercial/industrial and agricultural residential properties.

## STATISTICAL ABSTRACT

### Residential

#### Ratio Statistics for CURRTOT / TASP

Mean		1.007
95% Confidence Interval for Mean	Lower Bound	.944
	Upper Bound	1.070
Median		.989
95% Confidence Interval for Median	Lower Bound	.954
	Upper Bound	1.031
	Actual Coverage	97.4%
Weighted Mean		.960
95% Confidence Interval for Weighted Mean	Lower Bound	.891
	Upper Bound	1.029
Price Related Differential		1.049
Coefficient of Dispersion		.136
Coefficient of Variation	Mean Centered	21.2%

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

### Commercial/Industrial

#### Ratio Statistics for CURRTOT / TASP

Mean		.895
95% Confidence Interval for Mean	Lower Bound	.820
	Upper Bound	.970
Median		.956
95% Confidence Interval for Median	Lower Bound	.846
	Upper Bound	1.007
	Actual Coverage	95.7%
Weighted Mean		.827
95% Confidence Interval for Weighted Mean	Lower Bound	.716
	Upper Bound	.939
Price Related Differential		1.082
Coefficient of Dispersion		.149
Coefficient of Variation	Mean Centered	22.5%

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

## Residential Median Ratio Stratification

### Sale Price

#### Case Processing Summary

		Count	Percent
SPRec	LT \$25K	6	13.0%
	\$25K to \$50K	10	21.7%
	\$50K to \$100K	16	34.8%
	\$100K to \$150K	10	21.7%
	\$150K to \$200K	2	4.3%
	\$200K to \$300K	1	2.2%
	\$300K to \$500K	1	2.2%
Overall		46	100.0%
Excluded		0	
Total		46	

#### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation
				Median Centered
LT \$25K	1.227	1.051	.152	25.1%
\$25K to \$50K	1.006	1.007	.094	13.5%
\$50K to \$100K	.975	.994	.083	11.8%
\$100K to \$150K	.878	1.012	.171	23.8%
\$150K to \$200K	.963	1.001	.012	1.6%
\$200K to \$300K	.928	1.000	.000	.
\$300K to \$500K	1.131	1.000	.000	.
Overall	.989	1.049	.136	21.6%

### Subclass

#### Case Processing Summary

		Count	Percent
Preduce	11120	38	82.6%
	11140	7	15.2%
	11250	1	2.2%
Overall		46	100.0%
Excluded		0	
Total		46	

**Ratio Statistics for CURRTOT / TASP**

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation
				Median Centered
11120	.998	1.068	.129	21.3%
11140	.910	1.015	.159	22.6%
11250	1.131	1.000	.000	.
Overall	.989	1.049	.136	21.6%

**Age**

**Case Processing Summary**

		Count	Percent
AgeRec	Over 100	4	8.7%
	75 to 100	16	34.8%
	50 to 75	11	23.9%
	25 to 50	8	17.4%
	5 to 25	5	10.9%
	5 or Newer	2	4.3%
Overall		46	100.0%
Excluded		0	
Total		46	

**Ratio Statistics for CURRTOT / TASP**

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation
				Median Centered
Over 100	.986	1.024	.067	9.5%
75 to 100	.948	1.098	.147	22.8%
50 to 75	1.015	1.048	.086	13.1%
25 to 50	1.007	1.169	.233	37.7%
5 to 25	.997	1.026	.069	9.6%
5 or Newer	1.042	.964	.086	12.2%
Overall	.989	1.049	.136	21.6%



## Improved Area

### Case Processing Summary

	Count	Percent
ImpSFRec 500 to 1,000 sf	12	26.1%
1,000 to 1,500 sf	22	47.8%
1,500 to 2,000 sf	6	13.0%
2,000 to 3,000 sf	5	10.9%
3,000 sf or Higher	1	2.2%
Overall	46	100.0%
Excluded	0	
Total	46	

### Ratio Statistics for CURRTOT / TASP

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation
				Median Centered
500 to 1,000 sf	1.089	1.053	.102	13.2%
1,000 to 1,500 sf	.957	1.104	.164	28.7%
1,500 to 2,000 sf	.976	1.009	.036	4.2%
2,000 to 3,000 sf	1.007	1.024	.102	15.3%
3,000 sf or Higher	1.131	1.000	.000	.
Overall	.989	1.049	.136	21.6%

## Commercial Median Ratio Stratification

### Sale Price

#### Case Processing Summary

	Count	Percent
SPRec LT \$25K	4	19.0%
\$25K to \$50K	8	38.1%
\$50K to \$100K	4	19.0%
\$150K to \$200K	4	19.0%
\$300K to \$500K	1	4.8%
Overall	21	100.0%
Excluded	0	
Total	21	

**Ratio Statistics for CURRTOT / TASP**

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation
				Median Centered
LT \$25K	.853	1.030	.304	39.4%
\$25K to \$50K	1.009	1.004	.069	13.4%
\$50K to \$100K	.874	.977	.155	21.7%
\$150K to \$200K	.675	.993	.357	43.0%
\$300K to \$500K	.780	1.000	.000	.
Overall	.954	1.098	.183	25.6%

**Subclass**

**Case Processing Summary**

	Count	Percent
Preduse 22120	5	23.8%
22150	3	14.3%
22200	4	19.0%
22250	1	4.8%
22300	6	28.6%
22360	2	9.5%
Overall	21	100.0%
Excluded	0	
Total	21	

**Ratio Statistics for CURRTOT / TASP**

Group	Median	Price Related Differential	Coefficient of Dispersion	Coefficient of Variation
				Median Centered
22120	1.012	.978	.130	22.2%
22150	.506	.910	.270	42.7%
22200	.900	1.011	.231	33.7%
22250	1.007	1.000	.000	.
22300	.970	1.036	.119	20.1%
22360	.919	1.003	.082	11.6%
Overall	.954	1.098	.183	25.6%