



# Measuring the Quality of Reappraisal

**Commercial Property – 2009 Reappraisal**

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Montana Department of Revenue

January 2010

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## Executive Summary

This report demonstrates that the Department of Revenue met statutory and industry standards for accuracy for the 2009 reappraisal of commercial property. The median assessment level is 90.87%, within the acceptable range of 90% to 110%. Confidence intervals and t-tests are used to test the quality of the commercial reappraisal. All six administrative regions also meet the assessment level requirement when confidence intervals are used.

The residential reappraisal was characterized as hitting the “bull’s eye” and confidence intervals and t-tests were unnecessary. The quality of commercial reappraisal relies on confidence intervals and hypothesis testing because of fewer sales and a more complex market. Residential reappraisal was the best possible; commercial reappraisal is the best that could be done given the available data and resources.

This report also demonstrates that the assessment level for both the cost and income approaches is the same. This is an important equity requirement. It also shows that the assessment level for residential and commercial properties is similar so that each category is paying only its fair share of property taxes.

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## Introduction

The main goal when appraising property is to appraise it at 100% of true market value (15-8-111, MCA). An appraised value represents an estimate of the true market value of property. It is important that these estimates be as accurate as possible. This analysis will provide confidence in the results of the 2009 reappraisal.

The reappraisal cycle ending December 31, 2008 is now complete. The Department of Revenue assigned a new appraised value to each residential and commercial property that replaced an appraised value assigned to each property six years ago. The new appraised value represents an estimate of the true market value of the property on July 1, 2008. The old appraised value represents an estimate of the true market value of the property on January 1, 2002.

Property values have been appreciating rapidly in many areas of Montana since January 1, 2002. The new appraised value for many properties in the state is much higher than the old appraised value of the property. For this reason, the Department must provide assurance that the reason for increases in appraised values is due to the genuine appreciation of property value and not due to faulty or poor reappraisal performance.

### **Criteria of Ratio Studies**

For any ratio study to be valid the following criteria must be met:

- Sales prices represent the market value of the property.
- Properties that sell are representative of the universe of properties.
- Both properties that sell and those that do not are valued consistently.

Especially for commercial property, the data needs to be analyzed to determine whether the sales meet this criteria.

Oftentimes, sales prices for commercial property include the real property and also the business interest or personal property located inside that property. For example, a gas station may sell for \$250,000, but the land could be purchased for \$75,000 and the building could be built for \$50,000. The cost approach to valuation would value the property at \$125,000. The other \$125,000 in the sale price is for the established business and personal property (like the gas pumps and the signs). When this is the case, the sale price is not a valid indicator of the market value of real property, but instead represents the market value of the entire business including the personal property.

The Property Assessment Division (PAD) verifies the sales that do occur to determine if the sales are usable for valuation purposes. This includes making sure that the sale price is representative of only the market value of real property and insuring that the sales are arms-length transactions.

Single-family residential property is rarely purchased for anything other than to provide housing. This means that there is significantly less distortion in the residential sales price because of business interests or personal property, as there is in commercial sales.

The second criterion is that the properties that sell are representative of all properties that are being evaluated. In this case, the Department wants to determine if the reappraisal of all commercial properties is accurate. So, the commercial sales must be representative of the commercial properties in the state. This means that the distribution in terms of geography, use, and value of the properties that sell is representative of all commercial properties in the state. Some types of properties only have a very specific use, and there may be only one or two properties of its kind in the state. It is unlikely that these properties sell in any given year, so it is hard to use sales to verify the assessed values on these types of properties. The more sales that occur, the more likely that the sample of sales is representative of the universe of properties.

Even if the sales are not representative of the universe of commercial properties, confidence intervals can be calculated. A confidence interval determines the range that the true assessment ratio is between. This acknowledges that there may be some variation between the universe and the sample. The use of confidence intervals can also make up for having fewer sales.

Because there are significantly more residential sales, it is more likely that the sales are representative of all the residential properties in the state. Also, there is less variation among residential properties.

The third criterion is that properties that sell and those that do not are valued in the same way. This is a procedural requirement. For commercial property the two most common methods of calculating the assessed value is with either the income approach or the cost approach.

- Cost Approach - the cost approach uses the value of the lot and cost of the building less depreciation to arrive at the market value of the property. This method works best with newer improvements and when income and sales of comparable property are scarce.
- Income Approach – the income approach uses the potential income of the property to determine its market value. This reflects the fact that commercial property is an investment and that investors in commercial

property buy and sell properties based on the potential return on that investment.

Both methods are used to value commercial property. Because only real property is assessed for reappraisal purposes, the cost approach is used when the income of a property is also due to the business located within the property. The income approach is the preferred method of assessing commercial property, but it is often hard to find sufficient income and sales data for similar properties.

It is also important that the models and cost tables are not tailored to provide an accurate price only for property that sold, but are accurate for other properties as well. It would be easy to assign the sales price to a property as its market value so those properties looked good, but the assessed value of all other properties would be meaningless.

Most residential property is valued using comparative sales. In a residential assessment ratio it is still important that properties that sell are valued the same as those that do not sell. This practice is followed by PAD.

Because of limited sales and the complexity of commercial real estate markets, assessing the quality of the appraisal of commercial property is more difficult than assessing the quality of reappraisal of residential property. Statistical tools and tests can be used to overcome some of the challenges in validating the commercial mass appraisal. This report relies heavily on t-tests and confidence intervals to test the quality of the Department's 2009 assessment of commercial property.

One final caveat, the results for commercial property are not directly comparable to the results presented for residential property. In acknowledging the complexity of mass appraisal for commercial property, the IAAO has different standards for assessment level and uniformity for commercial and residential property.

### Measuring the Quality of Reappraisal

Despite the limitations related to commercial property, a common method of measuring the performance of property reappraisal is the ratio study. Ideally, the ratio study compares the appraised value with the true market value of property. Because market values cannot be directly observed, sales prices usually represent true market values in ratio studies. A ratio study analyzes the relationship between the appraised value and sale value of property.

#### **Reappraisal Value**

$$\text{Sales Ratio} = \frac{\text{Appraised Value}}{\text{Sales Price}}$$

The key data element in any sales ratio study is the ratio of appraised value to sale price. To calculate this ratio, divide the appraised value of the property by the sale price of the property. This, of course, assumes that the sale of the property was an arm's-length transaction, and that the sale value is a reliable estimate of true market value. A ratio of less than 1.00 indicates that the property is underappraised. A ratio of greater than 1.00 indicates that the property is overappraised. In the following example, a property with an assessed value of \$80,000 that sold for \$100,000 has a ratio expressed as .80 or 80%.

$$\begin{array}{rcccl} & \swarrow & \text{Reappraisal Value} & & \\ & & & & \\ \underline{\$80,000} & = & .8 \text{ or } 80\% & \longleftarrow & \text{Numeric expression of the relationship} \\ \$100,000 & & & & \\ & \swarrow & \text{Sales Price} & & \end{array}$$

Ratio studies measure two primary aspects of appraisal accuracy: level and uniformity.

Appraisal level: Appraisal level refers to the overall level at which properties are appraised. In Montana, the desired appraisal level is 100% of true market value. The appraised values never exactly match the true market values of property. In good appraisal performance, the overappraisals and underappraisals will balance such that the overall appraisal level is close to 100% of true market value.

Appraisal uniformity: Appraisal uniformity refers to the magnitude of overappraisals and underappraisals. The degree to which the appraisals differ from true market value is important. In good appraisal performance, the degree to which appraisals differ from true market values is within acceptable standards.

There are standard statistical techniques for measuring and analyzing appraisal level and uniformity that apply to both commercial and residential property. Chapter 5 of *Mass Appraisal of Real Property*, published by the International Association of Assessing Officers (IAAO), outlines these measures and techniques.

## Measures of Appraisal Level

The three most common measures of appraisal level are the median, mean and weighted mean. Each measure has advantages and disadvantages. It is common practice to compute all three measures. Comparison of the measures provides useful information about the distributions of the ratios. For example, wide differences among the measures indicate undesirable patterns of appraisal performance.

Median: The median is the middle ratio when all ratios are ordered by magnitude. The median is the most common measure of appraisal level. An advantage of the median is

that it is easy to compute and easily understood. By nature, the median is not affected by extreme ratios.

The upper and lower 95% confidence intervals were calculated for the median. The median assessment level will be within the confidence interval 95 out of 100 times for a random sample of commercial property in the state.

Confidence intervals are used to determine if the appraisal level can be reasonably assumed to comply with the given standards. If the upper or lower bound of the confidence interval is within 10% of the statutory requirement of 1.0 (0.90 to 1.10), then the appraisal level is assumed to meet the IAAO standards.

Mean: The mean is the average ratio (the sum of the ratios divided by the number of ratios). Like the median, the mean is easy to compute and understand. However, unlike the median, the mean is impacted by extreme ratios. The mean is the least used measure of assessment level. For commercial properties, the upper and lower 95% confidence levels were calculated. The mean assessment ratio for both sold and unsold properties is between the lower and upper bounds of the confidence interval 95% of the time. (Think margin of error in polls.)

Weighted Mean: The weighted mean is an aggregate ratio (the sum of all the appraised values divided by the sum of all the sales values). The weighted mean is the appropriate measure for estimating the total market value of the population. The weighted mean gives equal weight to each dollar of value in the sample; the mean and median give equal weight to each parcel.

## Measures of Appraisal Uniformity

Part of determining the quality of reappraisal requires measuring uniformity. It is possible for the appraisal level to be good (close to 100%), yet still have unfavorable appraisal performance if the appraisal is not uniform. Appraisal uniformity is measured by the frequency distribution of the ratios, standard deviation, and the coefficient of dispersion. These statistics are expected to show that reappraisal is less uniform as the heterogeneity and complexity of the property being appraised increases. There is likely to be more uniformity among commercial properties than residential property.

Frequency Distribution: A frequency distribution is a display of the number of ratios falling within specified intervals. The distribution can be displayed as a table or as a graph. When observing a graph, a large percentage of the ratios close to the overall level of assessment and graph symmetry with respect to the overall level of assessment indicates a good level of uniformity.

Standard Deviation: The standard deviation is the primary measure of dispersion in scientific research and can be a powerful measure of appraisal uniformity. In a normal distribution, 68% of the observations will be one standard deviation from the mean, 95% will be within two standard deviations, and 99% will be within three standard deviations. For example, if a property group has an average mean ratio of 1.01 (101%), and a standard deviation of 0.10 (10%), it is assumed that 68% of the properties will fall between 0.91 (91%) and 1.11 (110%). In ratio studies, the larger the standard deviation, the wider the range within which a given portion of properties are appraised relative to market value.

Coefficient of Dispersion: The coefficient of dispersion (COD) is the most used measure of uniformity in ratio studies. The COD is the average absolute deviation expressed as a percentage of the level of assessment, and is calculated by dividing the average absolute deviation by the median. The average deviation is calculated by subtracting the median from each ratio, summing the absolute values of the computed differences, and dividing this sum by the number of ratios. For example, a COD of 10% means that the average percent deviation from the median is (+ or -) 10%. Good appraisal uniformity for commercial properties is associated with CODs of 15% or less for larger metropolitan areas with large samples, and 20% or less for smaller or rural areas (IAAO).

Price-Related Differential: The price-related differential (PRD) is a statistic for measuring assessment regressivity or progressivity. Assessment regressivity exists if high-value properties are underappraised relative to low-value properties. Conversely, assessment progressivity exists if high-value properties are overappraised relative to low-value properties. The PRD is calculated by dividing the mean by the weighted mean. A PRD greater than 1.00 suggests appraisal regressivity. A PRD less than 1.00 suggests appraisal progressivity. As a general rule, PRDs should range between 0.98 and 1.03 (IAAO).

## **Data**

The Department's Property Assessment Division provided the data for the analysis. The data set contained 893 commercial properties that sold from January 1 to December 31, 2008 that the Property Assessment Division considered valid sales. The Property Assessment Division used standard screening processes to determine the validity of sales. This screening insures that the first criterion, that the sales price represents the market value of the real property, is met. The screening eliminated sales where the sales price represents the market value of the real property and personal property or an established business.

Ideally, there would be enough sales in the second half of 2008 that sales from the first half of the year are not needed. Sales before July 1, 2008 were used in the models to determine assessment value so the assessed values are not strictly independent of the sales prices. The sales after July 1, 2008 are independent and would be the preferred measure of market value, given enough data.

The assessment ratio for properties that sold in the first half of 2008 were compared to properties that sold in the second half of 2008. The mean and median assessment ratio was similar and a t-test indicated that there was no statistical difference between the mean assessment levels of the two groups. In addition, the 2 properties with a perfect assessment ratio of 1.00000 were examined to insure that these values were assigned using the models and are not a result of a faulty reappraisal process. (Note: There were 5 observations in the full year that had an assessment level greater than 5.0, including one with an assessment level greater than 13.0. These 5 influential observations were excluded because they had a large impact on the distribution and the deviation of the sample.) Sales from the full year can be used to estimate the assessment level for all commercial and industrial properties.

The first criterion is that the properties that sold are representative of the commercial property in the state. To test this hypothesis, a t-statistic was calculated. The null hypothesis is that the two groups of commercial properties have the same mean 2009 reappraisal value. The T-statistic shows that we cannot reject the null hypothesis at the 95<sup>th</sup> percent confidence level. In other words, the properties that sold have similar assessed value as properties that did not sell, indicating that they are similar.

Observations that have log assessment ratios outside 1.5 inter-quartile ranges from the 25<sup>th</sup> and 75<sup>th</sup> percentile were dropped. This is standard practice in IAAO ratio studies<sup>1</sup>. Trimming the sales in this fashion eliminates ratios that are unreasonable. They can be unreasonable for a variety of reasons:

- the sales price is not accurate
- the assessed value is not accurate
- there is a mistake in the data entry, or
- the nature of the parcel changed between the sale date and assessment date.

In the case that assessment values do not represent market value, these values are likely to be adjusted by informal reviews. This screening eliminated 75 sales, 8.4% of the total, leaving 818 verified valid sales for the assessment ratio study.

## Results

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<sup>1</sup> International Association of Assessing Officers (IAAO). 2007. *Standard on Ratio Studies*. Kansas City: International Association of Assessing Officers.

## Statewide Analysis

The statewide overall level of assessment, as measured by the median ratio, is 0.9087. This is just within the IAAO standard of being within 10% of the target assessment level of 1.0. The mean assessment ratio is .9264, which is within this standard. The current 2009 assessed values are much closer to the actual market value of properties than the old 2003 reappraisal values.

The measures of uniformity show that the coefficient of dispersion is 24.75. This is outside of the IAAO standard for *residential* property of 15, but the COD is expected to increase as the complexity and heterogeneity of the appraised properties increases, as is the case with commercial property. The price-related differential is above the IAAO standard of 1.03. For the new values, the COD is much better than the COD for the old values.

<b>Table 3: Statewide Assessment Ratio Statistics Old vs. New</b>		
<b>Measures of Appraisal Level</b>	<b>New Assessment Values</b>	<b>Old Assessment Values</b>
Median Assessment Ratio	0.9087	0.4899
Lower Bound 95% CI	0.8853	0.4667
Upper Bound 95% CI	0.9288	0.5134
Mean Assessment Ratio	0.9264	0.5038
Lower Bound 95% CI	0.9059	0.4806
Upper Bound 95% CI	0.9468	0.5270
Weighted Mean Assessment Ratio	0.8768	0.4773
<b>Measures of Uniformity</b>		
Coefficient of Dispersion	24.75	51.07
Price Related Differential	1.06	1.06

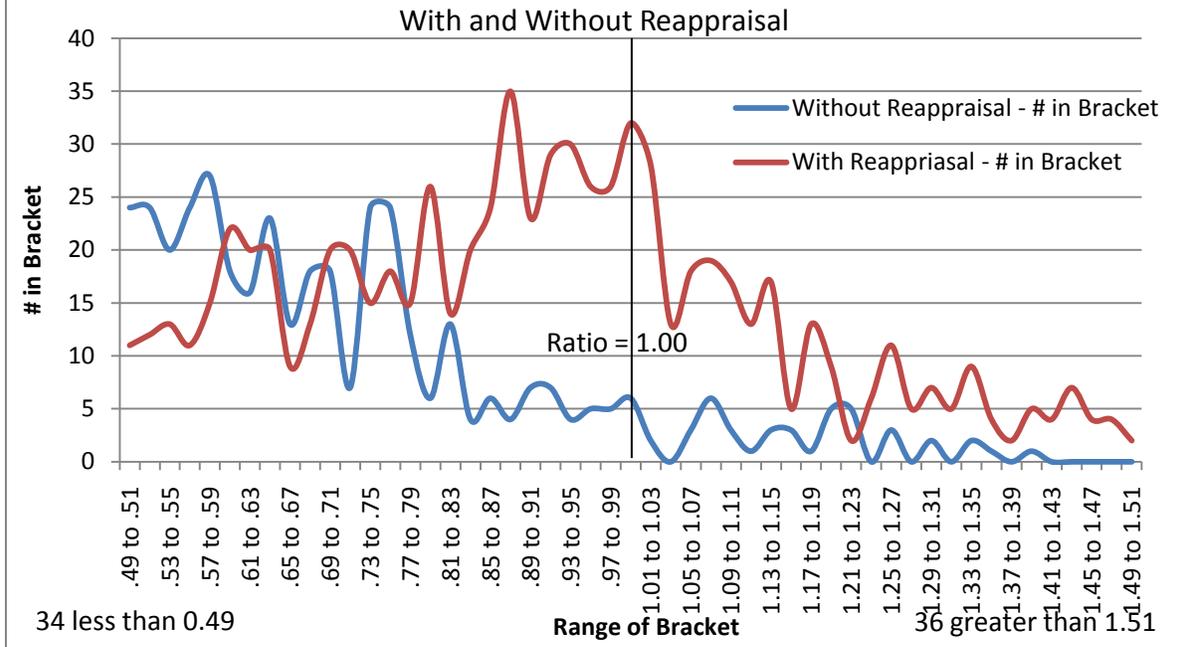
Figure 2 shows the distribution of assessment ratios for the new, 2009 values and the old, 2003 values. Ideally, the distribution would show a tight, symmetrical distribution centered around 1.0, like the residential distribution. Instead, the commercial property has more variation, and the line is not as smooth. This is the nature of commercial property assessment studies because there are fewer sales and there are more factors in determining the value of commercial property. While the distribution is not ideal, there are clearly more properties with an assessment level around 1.0. It is also clear in

the graph that the assessment ratios for the old values (blue line) peaks much lower than 1.0.

The new values are clearly more accurate and uniform than the old values. The graph also demonstrates why confidence intervals are important. Despite the variance in the sample and the fact that there is not a nice, neat standard normal distribution, confidence intervals can still be used to determine a range for the assessment level of all commercial and industrial properties in the state.

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**Figure 2: Sales Ratio Frequency Distribution**

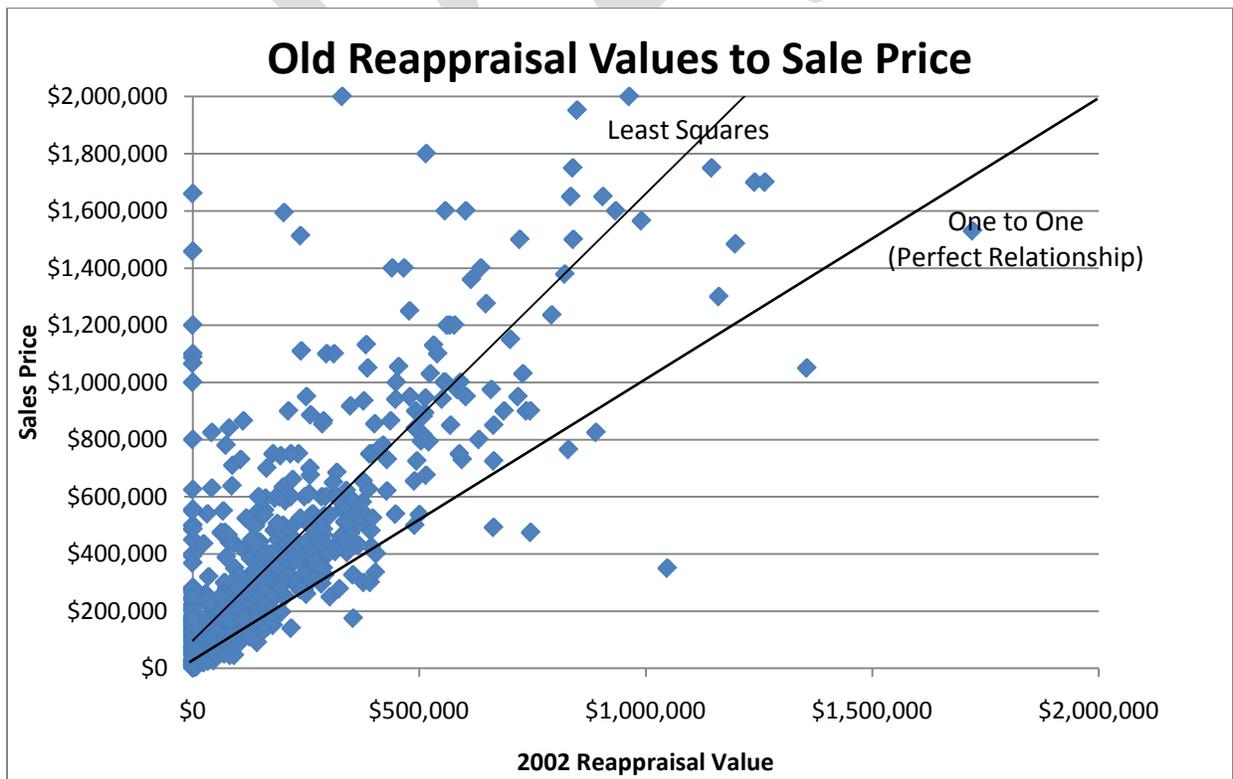
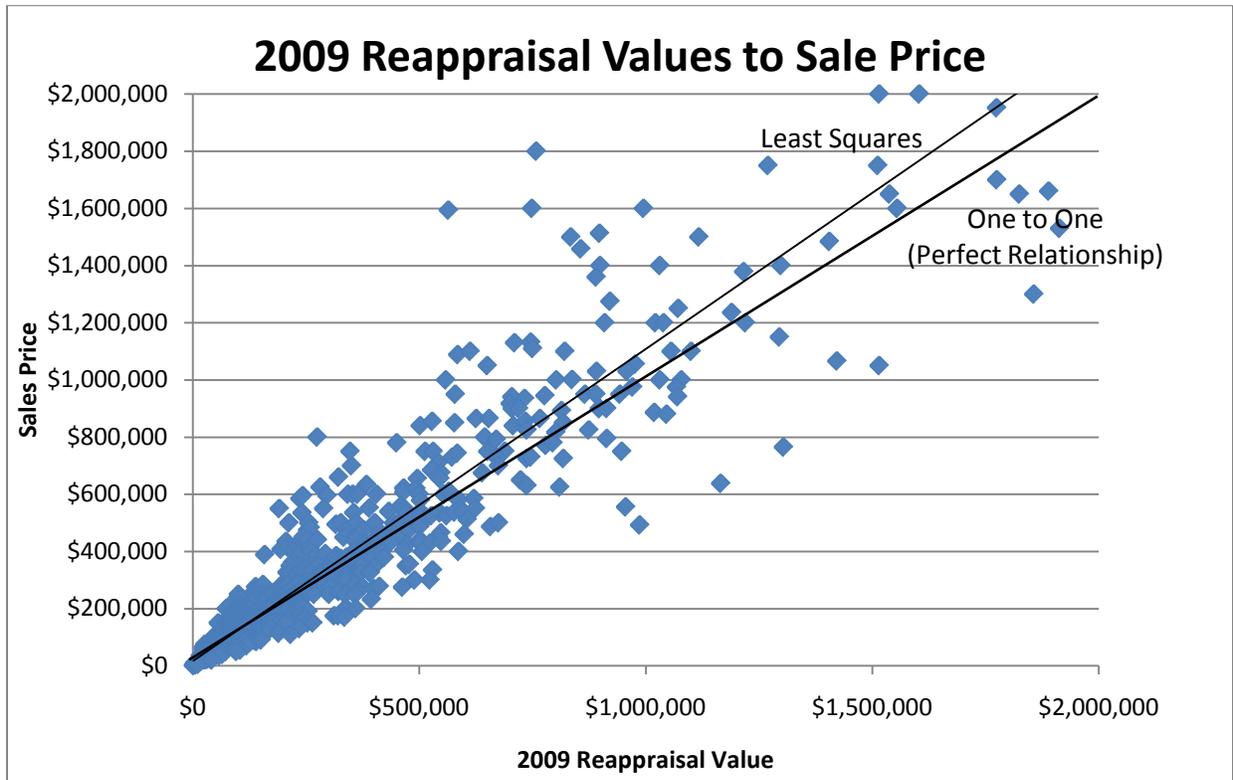


Bracket	Without Reappraisal - # in Bracket	With Reappraisal - # in Bracket	Range	Bracket	Without Reappraisal - # in Bracket	With Reappraisal - # in Bracket	Range
1	409	34	less than .49	28	2	28	1.01 to 1.03
2	24	11	.49 to .51	29	-	13	1.03 to 1.05
3	24	12	.51 to .53	30	3	18	1.05 to 1.07
4	20	13	.53 to .55	31	6	19	1.07 to 1.09
5	24	11	.55 to .57	32	3	17	1.09 to 1.11
6	27	15	.57 to .59	33	1	13	1.11 to 1.13
7	18	22	.59 to .61	34	3	17	1.13 to 1.15
8	16	20	.61 to .63	35	3	5	1.15 to 1.17
9	23	20	.63 to .65	36	1	13	1.17 to 1.19
10	13	9	.65 to .67	37	5	9	1.19 to 1.21
11	18	13	.67 to .69	38	5	2	1.21 to 1.23
12	18	20	.69 to .71	39	-	6	1.23 to 1.25
13	7	20	.71 to .73	40	3	11	1.25 to 1.27
14	24	15	.73 to .75	41	-	5	1.27 to 1.29
15	24	18	.75 to .77	42	2	7	1.29 to 1.31
16	12	15	.77 to .79	43	-	5	1.31 to 1.33
17	6	26	.79 to .81	44	2	9	1.33 to 1.35
18	13	14	.81 to .83	45	1	4	1.35 to 1.37
19	4	20	.83 to .85	46	-	2	1.37 to 1.39
20	6	24	.85 to .87	47	1	5	1.39 to 1.41
21	4	35	.87 to .89	48	-	4	1.41 to 1.43
22	7	23	.89 to .91	49	-	7	1.43 to 1.45
23	7	29	.91 to .93	50	-	4	1.45 to 1.47
24	4	30	.93 to .95	51	-	4	1.47 to 1.49
25	5	26	.95 to .97	52	-	2	1.49 to 1.51
26	5	26	.97 to .99	53	9	36	greater than 1.51
27	6	32	.99 to 1.01				

The top portion of Figure 3, on page 12, shows a (scatter) plot of the relationship between sales prices and assessed values using the *current* appraisal. The bottom half of Figure 3 has a similar plot of the sales prices, but is set against assessed values of the *old* reappraisal. Each plot, as labeled, has a 'Least Squares' line, which is the (ordinary) least squares line, sometimes referred to as the best fit, which minimizes the sum of the squared errors. The line labeled 'One to One' in each plot is the line where 100% of market value is attained, or where sales price equals the assessed value. In our example, a 'Least Squares' line above the 'One to One' line means that, typically, the sales price is higher than the assessed value. What is important about these lines is how close they lie to one another. For appraisal quality, the closer the 'Least Squares' line is to the 'One to One' line, the closer the appraisal effort is to 100%. As Figure 3 illustrates, the divergence between the two lines, 'Least Squares' and 'One to One' is a much shorter distance using current reappraisals than old reappraisals. This, along with the tighter distribution of the plots themselves, shows that, as expected, the current reappraisal is a much better determinant of current market value than the old reappraisal.

The COD using the old appraisals is 53.62%. This is above the recommended measure of 15% to 20%. Having a COD of 25.46% versus 53.62% indicates that the reappraisal effort reduced the degree to which the sales ratios differ from the overall assessment level. When using old reappraisals, it is also worth noting that the wide divergence between appraisal measures (median, mean, weighted mean), the large standard deviation, and a PRD above the suggested range all indicate poor measures of assessment. In a nutshell, these measurements and charts demonstrate the need for the 2009 reappraisal.

**Figure 3: Plot of Sales Price and Assessed Value**  
With and Without Reappraisal



The statistics for each administrative region were calculated. Five of the six regions had a median assessment ratio between 90% and 110%. Using the confidence interval, all six regions have a median assessment ratio within the accepted range. The highest COD was 29.79 in Region 3 and the lowest was 14.81 in Region 1. The PRD was 1.05 or lower in each region except Region 3.

**Table 4: Assessment Level and Uniformity**

For Selected Geographies

	N	Median	Measures of Appraisal Level						Measures of Uniformity		
			95% Median Confidence Interval		Mean	95% Mean Confidence Interval		Weighted Mean	COD	Standard Deviation	Price Related Differential
			Lower Bound	Upper Bound		Lower Bound	Upper Bound				
<b>Statewide</b>	<b>818</b>	<b>0.9087</b>	<b>0.8853</b>	<b>0.9288</b>	<b>0.9264</b>	<b>0.9059</b>	<b>0.9468</b>	<b>0.8768</b>	<b>24.75</b>	<b>0.298234</b>	<b>1.06</b>
Region 1	107	0.9551	0.9005	0.9856	0.9448	0.9161	0.9941	0.9488	14.81	0.2035	1.00
Region 2	126	0.9887	0.8880	1.0058	0.9567	0.9324	1.0450	0.9161	24.06	0.3191	1.04
Region 3	48	0.9463	0.7230	1.1653	0.8990	0.8495	1.0432	0.7134	29.79	0.3335	1.26
Region 4	166	0.9245	0.8678	0.9562	0.9174	0.8799	0.9691	0.8734	23.66	0.2911	1.05
Region 5	164	0.8889	0.7577	0.9162	0.8265	0.8384	0.9394	0.8389	28.08	0.3278	0.99
Region 6	207	0.9002	0.8382	0.9288	0.8887	0.8599	0.9406	0.8777	24.83	0.2944	1.01
<b>Counties</b>											
Yellowstone	141	0.8588	0.8098	0.9080	0.8819	0.8305	0.9333	0.7172	25.90	0.3089	1.30
Gallatin	99	0.8905	0.8294	0.9562	0.9147	0.8582	0.9712	0.9228	19.87	0.2831	1.05
Missoula	98	0.8691	0.7872	0.9869	0.9165	0.8558	0.9772	0.8744	26.61	0.3028	1.12
Cascade	84	0.9442	0.9036	0.9856	0.9471	0.9063	0.9879	0.8529	24.52	0.1881	1.16
Flathead	63	0.9378	0.9090	0.9970	0.9568	0.8869	1.0268	0.9061	21.27	0.2777	1.13
Lewis & Clark	45	0.9186	0.8818	1.0176	0.9198	0.8346	1.0050	0.8711	26.58	0.2836	1.15
Silver Bow	33	0.6647	0.6040	0.8052	0.7340	0.6578	0.8102	0.9549	13.49	0.2149	0.85

Table 4 (above) also shows the measures of quality for the seven largest counties. All but Silver Bow County have a confidence interval indicating that the median lies within the accepted range for assessment level. The PRD in Yellowstone County is 1.30, meaning that there is regressivity in the commercial reappraisal in that county. In this case, regressivity means that high-value property tends to be undervalued for tax purposes compared to lower value property.

Table 5 shows the same measures of reappraisal for properties valued using the income and cost methods of appraising property. Both methods are similar in all measures of the quality of reappraisal. In addition to comparing the summary statistics, a t-test was performed indicating that there is no difference in the assessment levels between the two valuation methods.

<b>Table 5: Assessment Level and Uniformity</b>											
Comparing Income and Cost Methods of Appraisal											
	N	Measures of Appraisal Level							Measures of Uniformity		
		Median	Confidence Interval		Mean	Confidence Interval		Weighted Mean	COD	Standard Deviation	Price Related Differential
			Lower Bound	Upper Bound		Lower Bound	Upper Bound				
Cost	599	0.8960	0.8733	0.9258	0.9202	0.8958	0.9445	0.8661	25.62	0.3035	1.06
Income	214	0.9215	0.8843	0.9511	0.9321	0.89537	0.9687	0.8927	22.16	0.2721	1.04

Clearly, the residential reappraisal produces a more satisfying set of reappraisal statistics; that is because residential property is much more homogeneous compared to commercial. It can be expected that reappraisal of commercial property is more complicated, so the measures of appraisal level and the measures of uniformity are likely to be farther from the ideal.

The final question for judging the quality of commercial reappraisal is whether there exists a meaningful difference between the assessment ratios of residential and commercial property. A t-test was used to test if residential and commercial property have a statistically significant difference in assessment ratios. The null hypothesis is that the difference between the mean assessment level for residential and commercial property equals 0. The null hypothesis cannot be rejected at the 95% confidence level, meaning that there is not a statistically significant difference in the assessment levels. Residential and commercial properties are assessed at similar levels of value.

## Conclusion

The Department attempted to measure the quality of the reappraisal of commercial property using a sales assessment ratio study. The results are not as satisfying as the residential reappraisal, but that is because of the differences between commercial and residential appraisal. The valuation of commercial property is much more complicated and there is less available data to use when deriving a market value. This is reflected in the IAAO guidelines. There is more variation and fewer sales so more exacting

statistical measures were used to evaluate the reappraisal, but there is no reason to expect the Department could produce better results with another reappraisal.

Statewide, the assessment level is within accepted standards. All regions are within the IAAO standards for assessment level when confidence intervals are used. The uniformity measures are not ideal, but still acceptable given the limitations of a commercial assessment study. Overall, the reappraisal of commercial property is within the legislative required assessment level. There is no bias to either the cost or income approach to value, and there is no statistical evidence that the assessment levels for commercial and residential properties are different.

Preliminary results from the House Bill 658 report being prepared by Robert Gludemans are similar to the results included in this report. The statistics presented here are the Department's best attempt to measure the quality of the reappraisal of commercial property. In the HB 658 report, Gludemans uses time adjusted sales prices and more sophisticated measures of uniformity, which are beyond the scope of this report. The final HB 658 report is scheduled to be presented at the Revenue and Transportation Interim Committee's September meeting.