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Washington Department of Revenue Property Tax Division

Valid Sales Study Kitsap County **2015 Sales for 2016 Ratio Year**

Sales from May 1, 2014 through April 30, 2015



January 2016

Table of Contents

Executive Summary	3
About this Review.....	3
What we found.....	3
Results.....	3
Method: E.1 Comparison of Average Value Changes	4
Parameters.....	4
Objective	4
Data	4
Method: E.2 Comparison of Average Unit Value	6
Parameters.....	6
Objective	6
Data	6
Method: E.4 Comparison of Observed versus Expected Distribution of Ratios	8
Parameters.....	8
Objective	8
Data	8
Horizontal and Vertical Uniformity	9
Parameters.....	9
Objective	9
Horizontal Equity.....	9
Vertical Equity	9
Ratio Standards:.....	11

Executive Summary

About this Review

To provide uniform taxation statewide, the Department of Revenue (Department) implements an annual study of property in each of the state's 39 counties. This piece of the 2016 ratio year study measures how closely Kitsap County's 2015 single-family residence assessed values compare to market values. The study consists of two analyses where the Department selects a random sample of 60 sales from Kitsap County's valid single-family residential sales report. These sales are then compared to comparable non-selling properties to determine if selling and non-selling properties are being assessed similarly.

The third and forth sections of this report utilizes all valid single family sales in Kitsap County. In the third section we look at the concentration of sales around a central tendency. The fourth section looks at the overall level of assessment and the uniformity of assessment both vertically and horizontally.

Corey Gunnerson did the initial data screening and collection. Mark Studer performed the statistical analysis and wrote the concluding report.

What we found

1. Kitsap County's level of assessment is 0.902, within the International Association of Assessing Officers (IAAO) recommended range of 0.90 to 1.10.
 2. Kitsap County's coefficient of dispersion (COD) at 10.44, is within the IAAO recommended range of 5 to 20 for rural residential areas and within the IAAO recommended range of 5 to 15 for urban residential areas.
 3. Kitsap County's Price-Related Differential (PRD) at 1.017, is within the IAAO recommended standard of .98 to 1.03. The more sensitive Vertical Equity Index (VEI), at 8.05 also indicates acceptable vertical equity.
 4. The 16% concentration of ratios within ± 2 percent of the median is within IAAO's "Standard on Ratio Studies"¹ standards of less than 32%.
 5. The sales group and non-sales group assessed values appear to change at similar rates and appear to be assessed at a similar rate per square foot.
 6. Based on the weight of the overall evidence, the assessor appears to treat selling and non-selling properties similarly.
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Results

Based on 2015 reported single family residential valid sales, Kitsap County meets or exceeds all IAAO standards that were tested in this study.

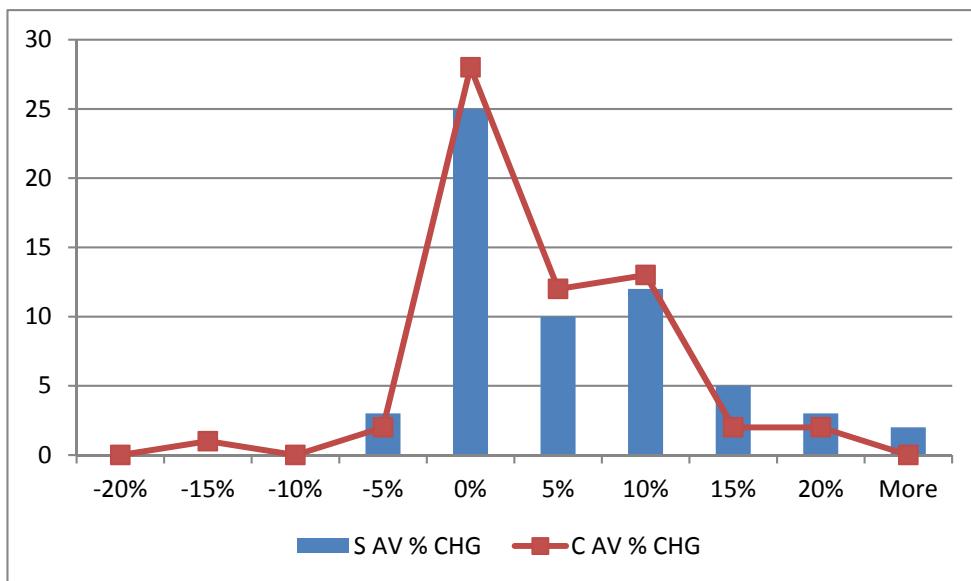
¹ IAAO "Standard of Ratio Studies" dated April 2013

Method: E.1 Comparison of Average Value Changes

Parameters A comparison of the average value change for selling versus non-selling properties was performed as prescribed by the IAAO. We drew a random sample of 60 single-family residential properties from the 2015 Kitsap County valid sales report submitted to the Department. The Department's appraiser used the county's GIS Internet application to select an additional 60 non-sale properties that are adjacent or near the sale property.

Objective Determine if there is any notable difference in the change in assessed value between selling and non-selling properties.

Data The chart below shows visually the percent change of the sample properties in both groups. Visually it appears that both selling and non-selling properties changes at similar rates.



Additional statistical tests were also used to determine if selling and non-selling properties' assessed values changed at different rates and proportions. As shown in the table to follow, the average percent change analysis confirms the visual observation. The selling and the non-selling properties' mean assessed values increased by 6.61% and 4.69% respectively. A difference of 1.92%. The median increase in assessed value for selling properties was 3.16% while non-selling properties increased by 2.37%, a difference of 0.79%. The IAAO recommends establishment of a reasonable tolerance, such as 3%, before concluding that a meaningful problem may exist.

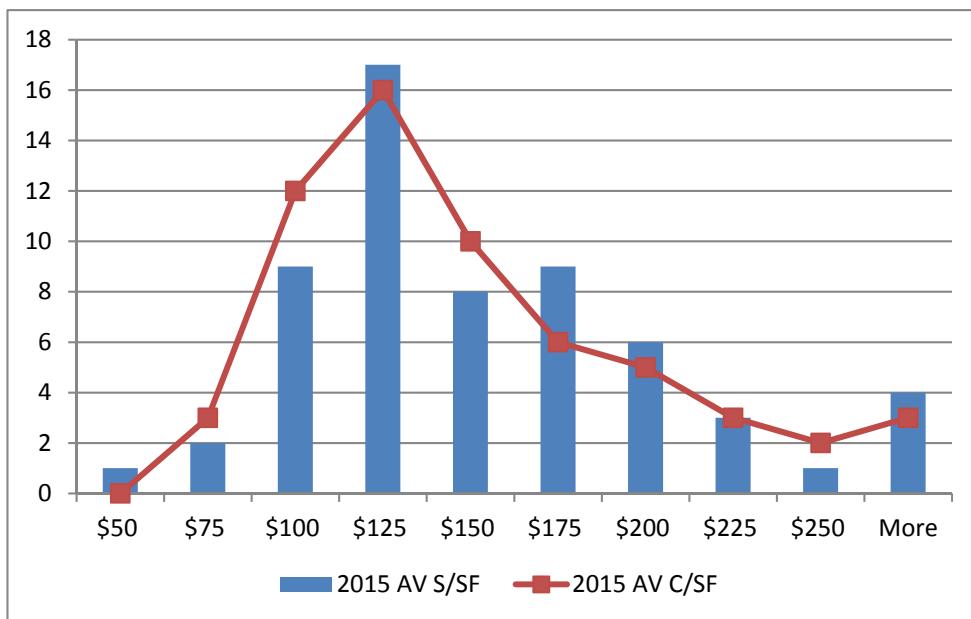
	Sale AV % CHG	Non-Sale AV % CHG	Difference
Mean	6.61%	4.69%	1.92%
Median	3.16%	2.37%	0.79%

Method: E.2 Comparison of Average Unit Value

Parameters A comparison of the average unit value for selling versus non-selling properties was performed as prescribed by the IAAO. We drew a random sample of 60 single-family residential properties from the 2015 Kitsap County valid sales report submitted to the Department. The Department's appraiser used the county's GIS Internet application to select an additional 60 non-sale properties that are adjacent or near the sale property.

Objective Determine if there is any notable difference in the assessed unit value (value per SqFt) between selling and non-selling properties.

Data The chart below shows visually the value per square foot for the sample properties in both groups. Visually it appears that both selling and non-selling properties unit values are similar.



As shown in the table below, the selling properties' mean assessed value is \$154.35 per square foot, while the non-selling properties have a mean assessed value of \$152.24 per square foot. The median assessed value for selling properties is \$142.08 per square foot, while the median assessed value for non-selling properties is \$136.67 per square foot. The IAAO recommends establishment of a reasonable tolerance, such as 3%, before concluding that a meaningful problem may exist. The mean and median difference between the two groups is 1.37% and 3.80% respectively.

	Sale AV/SF	Non-Sale AV/SF	Difference
Mean	\$154.35	\$152.24	1.37%
Median	\$142.08	\$136.67	3.80%

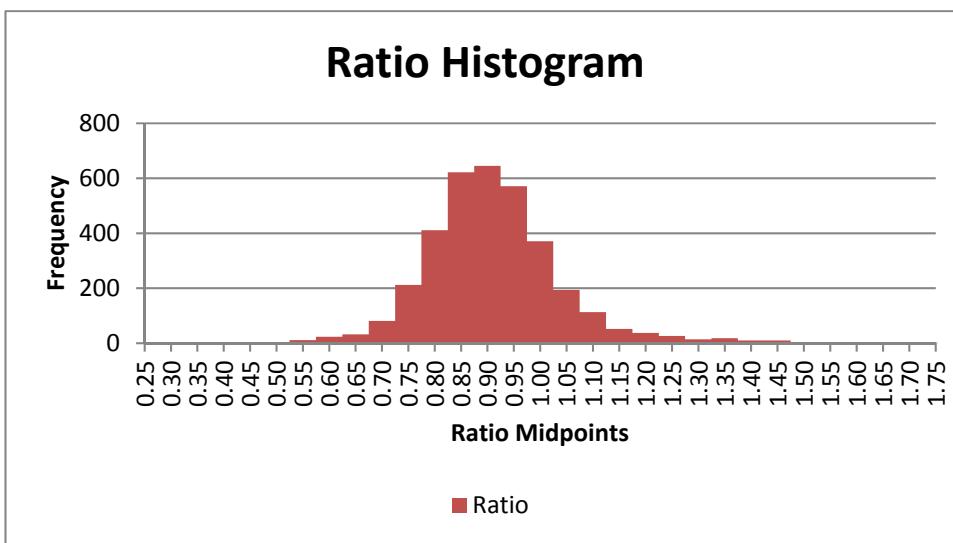
The difference in the median per square foot value exceeds 3% therefore an additional statistical test was completed to determine if the difference is statistically significant. To compare two paired values (such as in a before-after situation) where both observation are taken from the same or matched subject, we perform a paired t-test. This statistical test indicates it is unlikely that the average per square foot value of the two groups is statistically different or significant.

Method: E.4 Comparison of Observed versus Expected Distribution of Ratios

Parameters A comparison of the observed versus expected distributions of ratios. This section utilizes all valid single family residential sales in Kitsap County. Expected; IAAO suggests that the percentage of ratios within 2% of any central tendency should not exceed 32%. IAAO states “finding such a high concentration of ratios (above 32%) around any measure of central tendency is a strong indicator of sales chasing or of a non representative ratio study.”

Objective Determine the concentration of ratios around a central tendency.

Data Observed; An analyses of all valid single family sales in Kitsap County resulted in a finding of an 16% concentration within 2% of the median ratio, well within the IAAO standard. This is displayed visually in the histogram below.



On a histogram each ratio contributes to the length of a bar representing the range in which the ratio falls. Good uniformity is indicated when the highest bars are near the median (approximately the same number of observations on each side) with the bars decreasing in length the farther they are from the median (forming the shape of a bell). The graph shows that the top of the bell is in the range of 0.90, which is consistent with the .902 median ratio for Kitsap County. IAAO recommended the overall median ratio to be between 0.90 and 1.10.

A higher than expected concentration of ratios around the median would be indicated by one or two bars being much higher than any of the others.

Horizontal and Vertical Uniformity

Parameters	All valid single family sales are analyzed to determine the uniformity in assessment.
Objective	Apply statistical measures designed to provide an indication of property tax assessment equity/uniformity. Measures such as Coefficient Of Dispersion (COD) for horizontal equity, Price-Related Differential (PRD), Quintile Mean Ratios (QMR), and Vertical Equity Index (VEI) for vertical equity.
Horizontal Equity	The most generally useful measure of variability or horizontal uniformity is the COD. The COD measures the average percentage deviation of the ratios from the median ratio. The sales sample has a COD of 10.44; within IAAO recommended range of five to 20 for rural residential properties and within IAAO recommended range of five and 15 for urban areas.
Vertical Equity	PRD measures the regressivity or progressivity of the assessments. Assessments are considered regressive if high-value properties are under appraised relative to low-value properties. The most desirable PRD would be 1.00. A PRD greater than 1.00 is an indication that appraisals in a particular county are regressive. According to IAAO guidelines, a PRD should be between .98 and 1.03. In Kitsap County, the PRD for valid single family sales sample is 1.017, well within the IAAO standard range. QMR is another useful measure of vertical equity. QMR is the average of the assessed value to sale price ratios (AV/SP) for each one-fifth (quintile) grouping of the ratios being investigated, after the ratios have been sorted from lowest sale price to highest sale price and divided into equal quintile sale price groups. The mean ratio for each quintile is below. QMR is probably the easiest vertical equity measure to understand, as it visually shows the level of assessment throughout the value range of properties.

Quintile	Mean Ratio
1	0.964989
2	0.897774
3	0.902118
4	0.907102
5	0.891537

Overall the QMR offers visual support to the PRD in that the QMR data above shows that although within an acceptable range, the lowest quintile of

properties are assessed at a higher rate than the other quintiles.

Vertical Equity Index (VEI) is a method of testing for vertical inequity, however this index does not indicate if the inequity is regressive or progressive. Noted assessment expert, J. Wayne Moore proposes computing a VEI using quintile ratios. Dr. Moore believes “VEI may be more sensitive to differences in vertical equity than the PRD.” As a guideline, VEI values above 14.0 indicate vertical inequity; values between 14.0 and 7.0 indicate acceptable vertical equity; values below 7.0 indicate good vertical equity, with those below 3.5 indicating excellent vertical equity. The valid sales sample has a VEI of 8.48, indicating acceptable vertical equity.

Ratio Standards:

“If sold and unsold properties within a specified group are appraised in the same way, their appraised values should reflect similar average percentage changes from year to year. Accordingly, changes in appraised values for sold and unsold parcels are compared to determine whether sold parcels have been selectively appraised.”² “For example, if sold parcels are considered representative of a stratum and appraised values increased an average of 10 percent while appraised values for unsold parcels in the same stratum increased an average of only 2 percent, “sales chasing” is a likely conclusion.”³ The IAAO recommends establishment of a “reasonable tolerance, such as 3 percentage points (e.g., a change of 6 percent for sold properties and 3 percent for unsold properties), before concluding that a meaningful problem may exist.”⁴

If the 3-percent tolerance is exceeded, a second test, two sample t-test, is performed to determine whether the differences are statistically significant. The “P($T \leq t$) two-tail” result is the key to inferring whether or not the greater than 3-percent tolerance result is either random chance or highly probable. If the “P($T \leq t$) two-tail” number is less than .05 then it is highly probable that repeating the study will yield similar results.

“Assuming the ratio studies are based on sales that have been properly adjusted for time and other factors, a strong indication of the likelihood of “sales chasing” can be obtained by computing the proportion of ratios that would be expected to fall within a particular narrow range of the mean given the lowest likely standard deviation (although this depends somewhat on the assumption of a normal distribution). For example, with a standard deviation of 5 percent given a normal distribution, about 32 percent of the ratios would be expected to fall within ± 2 percent of the mean (for example, between 98 and 102 percent, given a mean of 100 percent). Except in highly constrained or well-behaved real estate markets, many appraisers consider such a low standard deviation, corresponding approximately to a COD of 4 percent, to be unachievable. Regardless of the distribution of the ratios, the likelihood is extremely low that there would be a sufficiently representative sample with more than this proportion of ratios in such a narrow range. If such is the case, “sales chasing” is a likely conclusion.”⁵

² Standard on Ratio Studies-2013, Appendix E.1

³ Standard on Ratio Studies-2013, Appendix E.1

⁴ Standard on Ratio Studies-2013, Appendix E.1

⁵ Standard on Ratio Studies-2013, Appendix,E.4