

The seal of the Texas Comptroller of Public Accounts is visible in the background. It features a central five-pointed star surrounded by a wreath of olive and oak branches. The words "THE COMPTROLLER OF PUBLIC ACCOUNTS" and "STATE OF TEXAS" are inscribed around the perimeter of the seal.

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Texas Comptroller of Public Accounts

Report on Appraisal District Ratio Study Results for Tax Year 2021

December 2022

Overview

State law requires the Comptroller’s office to study the degree of uniformity of and the median level of appraisals by appraisal districts within each major property category. The Comptroller’s Property Tax Assistance Division (PTAD) conducts this ratio study in each appraisal district at least once every two years.¹ PTAD uses the data collected as part of the *School District Property Value Study* (SDPVS), required by Government Code Section 403.302, to complete the statistical analysis in the *Appraisal District Ratio Study*.² This streamlined data collection process allows for efficient use of appraisal district and PTAD resources.

While the data collection process is the same, the *SDPVS* and the *Appraisal District Ratio Study* are separate studies with individual purposes and each stands uniquely on its own. This report is solely focused on the methodology for and results of the most recent *Appraisal District Ratio Study*. The complete results can be found on the Comptroller’s *Appraisal District Ratio Study* Results webpage (comptroller.texas.gov/data/property-tax/ratio-study/).

For more information on the SDPVS, please see *The School District Property Value Study and How to Protest* and the SDPVS webpage (comptroller.texas.gov/taxes/property-tax/pvs/index.php).

**The charts in this publication are available
in accessible data form (Excel) at:**

<https://comptroller.texas.gov/data/property-tax/ratio-study/2021/>

¹ Tex. Tax Code §5.10

² Tex. Tax Code §5.10(a)

Purpose of Ratio Study

The leading authority in the standards for and conduct of ratio studies is the International Association of Assessing Officers (IAAO), a professional organization that provides education, standards and research on appraisal and tax policy issues. The IAAO's *Standard on Ratio Studies* was first published in 1980, with the latest revision written in 2013.³ This standard provides guidance for oversight agencies that use ratio studies to monitor appraisal performance.

The IAAO defines a ratio study as a generic term for sales-based studies designed to evaluate appraisal performance.⁴ A ratio study may also play an important role in evaluating whether constitutional uniformity requirements are met.⁵ The Texas Constitution requires taxation to be equal and uniform, and Texas law requires taxable property to be appraised at 100 percent of its market value.⁶ The *Appraisal District Ratio Study* is a tool for analyzing appraisal performance against these statutory measures to ensure that appraised values are uniform and as close as possible to values required by law. It can also be used to review and recalibrate appraisal models, reevaluate data elements and inform decision making.⁷

This report provides information on the measure of the level of appraisal performance, or accuracy, and is typically referred to as the measure of central tendency, and several common measures of uniformity. It also provides specific analysis of these measures for half of the appraisal districts in Texas, studied in the most recent year. These statistical measures and their use in the *Appraisal District Ratio Study* are discussed in further detail later in this report.

³ Available at: https://www.iaao.org/media/standards/Standard_on_Ratio_Studies.pdf

⁴ IAAO *Standard on Ratio Studies* (2013), Part 1, Sec. 2, pg. 7

⁵ IAAO *Standard on Ratio Studies* (2013), Part 1, Sec. 2.4, pg. 8

⁶ Tex. Const. art. 8 §1(a)

⁷ IAAO *Standard on Ratio Studies* (2013), Part 1, Sec. 3.7, pg. 10

Methodology

For the *Appraisal District Ratio Study*, PTAD aggregates samples collected for the *SDPVS* from all school district splits located within the appraisal district boundaries to evaluate appraisal performance at the appraisal district level.

Not every category of property is sampled and studied in every appraisal district. For the *SDPVS*, PTAD will generally sample properties in each property category in each school district if the category has a minimum percentage of school district value or a minimum dollar amount. Calculating the metrics used in the *Appraisal District Ratio Study* requires a minimum of five ratios resulting from either of the following: categories representing at least 25 percent of total appraisal district category value or five school districts or half the school districts in the appraisal district, whichever is less.

Certain property, including industrial property, special inventory property, taxable nonbusiness personal property and most property categories with 5 percent or less than a school district's tested categories' value, is excluded from the *SDPVS* and the data set for the *Appraisal District Ratio Study*. PTAD does not aggregate samples from Category D1, property categorized as qualified open-space land. The ratio derived for agricultural acreage receives a productivity appraisal utilizing an income capitalization methodology and not a median derived from a property sample. Because the method is not sales-based, PTAD does not calculate measures of appraisal uniformity for acreage receiving productivity appraisal.

For all other studied property categories that are aggregated, PTAD calculates statistical measures of appraisal level and uniformity by property category and for the appraisal district overall.

Level of Appraisal

The level of appraisal shows whether the appraisal district appraised properties at 100 percent of the legally required level — normally the market value. The median is the generally preferred measure of central tendency that measures overall appraisal level.⁸

⁸ IAAO *Standard on Ratio Studies* (2013), Part 1, Sec. 5.3.1, pg. 13

Median

The median level of appraisal measures the accuracy of an appraisal district's appraisals in relation to the standard of 100 percent of market value. According to the IAAO, the median is the appropriate measure of central tendency for evaluating appraisal performance. Because it gives equal weight to each ratio and is not influenced by extreme ratios, the median is the preferred measure for statistically determining how close appraisals are to market value. The IAAO standard states that for indirect equalization the median ratio should be between 0.95 and 1.05.

Tax Code Section 1.12(c) defines the median appraisal ratio:

The median appraisal ratio for a sample of properties is, in a numerically ordered list of the appraisal ratios for the properties:

1. *if the sample contains an odd number of properties, the appraisal ratio above and below which there is an equal number of appraisal ratios in the list; or*
2. *if the sample contains an even number of properties, the average of the two consecutive appraisal ratios above and below which there is an equal number of appraisal ratios in the list.*

The value of individual properties does not influence the median ratio, only the ranking of individual ratios within the sample. The median ratio falls at the middle of an array, which is a group of ratios ranked from highest to lowest or lowest to highest.

Exhibit 1 uses 19 sales (marked S1 to S19) and six appraisals (marked A1 to A6) to show how to identify the median ratio. The appraisal ratios are ranked from the highest ratio to the lowest. Twenty-five properties make up the sample. The median ratio, 0.81, is 13th on the list, with 12 properties ranked above it and 12 ranked below it.

EXHIBIT 1

Sample Calculation of Median Appraisal Ratio XYZ County Appraisal District
Category A: Single-Family Residential Sales and Appraisals

Number Sale or Appraisal	Adjusted Sale Appraisal Roll Value	Individual Price or Appraised Value	Appraisal Ratio
S 17	\$84,449	\$84,995	0.99
S 15	\$114,788	\$118,898	0.97
S 6	\$89,654	\$94,715	0.95
S 12	\$39,479	\$41,925	0.94
A 5	\$69,708	\$76,117	0.92
S 4	\$99,880	\$133,310	0.88
A 1	\$97,576	\$110,741	0.88
S 8	\$111,020	\$128,048	0.87
S 10	\$64,519	\$75,905	0.85
A 2	\$60,437	\$70,964	0.85
S 2	\$75,254	\$90,720	0.83
S 7	\$76,502	\$91,680	0.83
S 16	\$92,088	\$113,645	0.81*
S 18	\$21,090	\$25,988	0.81
S 19	\$22,080	\$27,398	0.81
S 11	\$64,842	\$81,127	0.8
S 1	\$65,834	\$83,113	0.79
S 13	\$193,344	\$245,700	0.79
S 14	\$98,885	\$127,493	0.78
A 6	\$76,935	\$98,327	0.78
S 5	\$82,253	\$109,250	0.75
A 3	\$107,543	\$148,828	0.72
S 9	\$44,441	\$62,370	0.71
S 3	\$94,420	\$135,610	0.70
A 4	\$60,264	\$86,303	0.70
Total = 25			

*0.81 - Median Appraisal Ratio for Category A, XYZ Appraisal District

Source: Texas Comptroller of Public Accounts

An easy way to find the median for a sample containing an odd number of properties is to divide the total count by two, then round the result up to the nearest whole number. The sample shown in **Exhibit 1** contains 25 parcels. In this example, if one divides the 25 parcels by two, the result is 12.5. Rounding up to the nearest whole number produces 13, indicating that the 13th ratio is the median.

For an even-numbered sample, the median is the average of the two middle ratios. If the sample includes 24 properties, the median is the average of ratios 12 and 13. Eleven ratios would be greater than ratio 12 and less than ratio 13.

PTAD calculates a median appraisal ratio for each studied property category in the appraisal district, provided the sample includes at least five properties.

PTAD then combines the median ratios for each sampled property category to calculate the overall median ratio for the appraisal district, as shown in **Exhibit 5**.

Uniformity of Appraisals

Appraisal uniformity indicates how much the percentage of market value varies from property to property. The measures of appraisal uniformity include the coefficient of dispersion (COD), the percentage of properties within 10 and 25 percent of the median and the price-related differential (PRD).

The COD and the percentage of properties within 10 percent and 25 percent of the median are measures of horizontal ratio dispersion. They measure how consistently appraisal districts appraise properties at the same level (percentage of market value) without regard to the value of the properties. The PRD measures appraisal uniformity in how properties of different values are handled and may reveal a form of inequity that may arise from systematic differences in the appraisal of low-value and high-value properties, known as vertical inequity.

Coefficient of Dispersion (COD)

The COD is a useful measure of variability or appraisal uniformity because it indicates how far each property's ratio is from the median ratio and is expressed as a percentage of the median. The COD measures the deviation of sample ratios from the median ratio, or how tightly or loosely the individual sample ratios are clustered around the median. A high COD indicates a high variation of ratios with few ratios close to the median, which is indicative of low appraisal

uniformity. A low COD indicates low variation with the ratios clustered tightly around the median, which is indicative of high appraisal uniformity.

The COD measures appraisal uniformity independently of the median level of appraisal. As a result, CODs allow comparison of appraisal uniformity among appraisal districts or property categories where median levels of appraisal differ significantly.

The Tax Code requires the Comptroller's office to calculate a COD around the median for each major property category.⁹ **Exhibit 2** provides the IAAO's standards for CODs.¹⁰

These property types are for general guidance only and may not represent jurisdictional requirements.

Exhibit 3 provides a sample COD calculation.

Calculating a COD requires six steps:

- Step 1:** Subtract the median ratio (Column 4) for the sample from each individual ratio (Column 3) making up the sample. This results in the deviation for each ratio (Column 5).
- Step 2:** Convert each deviation to its absolute value (Column 6).
- Step 3:** Sum the absolute values of each deviation (Total of Column 6, in this sample 162).
- Step 4:** Divide the total deviation (162) by the number of properties in the sample (25) to get the average absolute deviation, which is 6.48 in this sample.
- Step 5:** Divide the average absolute deviation (6.48) by the median ratio (81), which results in .08 for this sample.
- Step 6:** Multiply the result by 100, yielding a COD of 8.

PTAD calculates a COD for each studied property category in an appraisal district. PTAD then finds the median of these COD values to calculate the overall COD for the appraisal district.

⁹ Tex. Tax Code §5.10(a)

¹⁰ IAAO *Standard on Ratio Studies (2013)*, Part 2, Table 2-3, pg. 34

EXHIBIT 2
IAAO Standards for CODs

General Property Class	Jurisdiction Size/Profile/Market Activity	COD Range
Single Family Residential, Condominiums, Manufactured Housing and 2-4 Family Units	Very large, densely populated jurisdictions with new properties and active markets	5 to 10
	Large to mid-sized jurisdictions with some older properties in addition to newer ones and less active markets	5 to 15
	Rural and small jurisdictions with older properties and depressed markets	5 to 20
Income Producing Properties	Very large, densely populated jurisdictions with new properties and active markets	5 to 15
	Large to mid-sized jurisdictions with some older properties in addition to newer ones and less active markets	5 to 20
	Rural and small jurisdictions with older properties and depressed markets	5 to 25
Residential Vacant Land	Very large, densely populated jurisdictions with rapid development and active markets	5 to 15
	Large to mid-sized jurisdictions with slower development and less active markets	5 to 20
	Rural and small jurisdictions with little development and depressed markets	5 to 25
Other, Non-Agricultural Vacant Land	Very large, densely populated jurisdictions with rapid development and active markets	5 to 20
	Large to mid-sized jurisdictions with slower development and less active markets	5 to 25
	Rural and small jurisdictions with little development and depressed markets	5 to 30

Source: IAAO Standard on Ratio Studies (2013).

EXHIBIT 3

Sample Calculation for Coefficient of Dispersion XYZ County Appraisal District
Category A: Single-Family Residential

Sale or Appraisal (COLUMN 1)	Property Number (COLUMN 2)	Individual Property Ratio % (COLUMN 3)	10% Confidence Interval	25% Confidence Interval"	Median (COLUMN 4)	Difference from Median (COLUMN 5)	Absolute Value of Difference (COLUMN 6)
S	17	99	No	Yes	81	+18	18
S	15	97	No	Yes	81	+16	16
S	6	95	No	Yes	81	+14	14
S	12	94	No	Yes	81	+13	13
A	5	92	No	Yes	81	+11	11
S	4	88	Yes	Yes	81	+ 7	7
A	1	88	Yes	Yes	81	+ 7	7
S	8	87	Yes	Yes	81	+ 6	6
S	10	85	Yes	Yes	81	+ 4	4
A	2	85	Yes	Yes	81	+ 4	4
S	2	83	Yes	Yes	81	+ 2	2
S	7	83	Yes	Yes	81	+ 2	2
S	16	81	Yes	Yes	81	0	0
S	18	81	Yes	Yes	81	0	0
S	19	81	Yes	Yes	81	0	0
S	11	80	Yes	Yes	81	- 1	1
S	1	79	Yes	Yes	81	- 2	2
S	13	79	Yes	Yes	81	- 2	2
S	14	78	Yes	Yes	81	- 3	3
A	6	78	Yes	Yes	81	- 3	3
S	5	75	Yes	Yes	81	- 6	6
A	3	72	No	Yes	81	-9	9
S	9	71	No	Yes	81	-10	10
S	3	70	No	Yes	81	-11	11
A	4	70	No	Yes	81	-11	11
Total of Absolute Values = 162							
Number of Sample Properties = 25							

Total of Absolute Values ÷ Number of Sample Properties = Average Absolute Deviation

Average Absolute Deviation ÷ Median Appraisal Ratio × 100 = Coefficient of Dispersion

162 ÷ 25 = 6.48 ÷ 81 = .08 × 100 = 8.0

Coefficient of Dispersion = 8.0

Source: Texas Comptroller of Public Accounts

Percentage of Properties within 10 Percent and 25 Percent of the Median

Percentage of properties with 10 percent and 25 percent of the median is another useful measure of variability or appraisal uniformity because it indicates the percentage of sample properties whose ratios fall within the upper and lower range of the median ratio. A low COD and high percentages indicate equitable appraisals, while a high COD and low percentages indicate inequitable appraisals.

Calculating the percentage of properties within 10 percent:

Step 1: Multiply the median appraisal ratio by 10 percent and add the result to the median. Using the data from **Exhibit 3** [(81 x 0.10) = 8.1].

Step 2: Adding the result to the median [8.1 + 81 = 89.1] yields the ratio that exceeds the median by 10 percent.

Step 3: Subtracting the result from the median [81 – 8.1 = 72.9] yields the ratio 10 percent below the median.

Step 4: Count the number of properties in the sample with ratios equal to or between these two numbers. In **Exhibit 3**, there are 16 sample properties with ratios between 89.1 percent and 72.9 percent that are within 10 percent of the median.

Step 5: Divide that count by the total number of properties (16 ÷ 25) to calculate the percentage within 10 percent of the median.

$$(16 \div 25) = .64 = 64\%$$

In this sample, the percentage of properties within 10 percent of the median is 64 percent.

To calculate the percentage within 25 percent of the median, multiply the median by 25 percent, then add and subtract the result to find the upper and lower end of the range.

Step 1: (81 x .25) = 20.25 – 25% of the median.

Step 2: 20.25 + 81 = 101.2 – upper end of range, 25 percent above median.

Step 3: 81 – 20.25 = 60.7 – lower end of range, 25 percent below median.

In this example, properties that have ratios between 101.2 percent and 60.7 percent are within 25 percent of the median.

Step 4: Sample properties within the upper and lower range = 25.

Step 5: (25 ÷ 25) = 1 = 100%.

In this sample, all properties are within 25 percent of the median.

Price-Related Differential (PRD)

The PRD is a statistic used to measure whether higher-value properties and lower-value properties are appraised at the same ratio to market value compared with one another.

The IAAO's 2013 *Standard on Ratio Studies* states the following:

When low-value properties are appraised at greater percentages of market value than high-value properties, assessment regressivity is indicated. When low-value properties are appraised at smaller percentages of market value than high-value properties, assessment progressivity is the result. Appraisals made for tax purposes of course should be neither regressive nor progressive.¹¹

The IAAO *Standard on Ratio Studies* suggests that PRDs for each type of property should be between 0.98 and 1.03 to demonstrate vertical equity, indicating the appraisal district is treating low-value and high-value properties uniformly. PRDs below this range indicate progressivity, and measures above this range indicate regressivity.

PTAD calculates the PRD for each property category included in the appraisal district ratio by dividing a sample's mean ratio by its weighted mean ratio. **Exhibit 4** provides sample data to demonstrate this calculation.

Calculating the PRD requires three steps:

Step 1: Calculate the mean by dividing the total individual appraisal ratios (total of Column 5) by the number of properties (from Column 1) [20.71 ÷ 25 = 0.8284].

Step 2: Calculate the weighted mean by dividing the total appraisal roll value (total of Column 3) by the total adjusted sale price or appraised value (total of Column 4) [\$2,007,285 ÷ \$2,443,170 = 0.8216].

Step 3: Calculate the PRD by dividing the mean by the weighted mean [0.8284 ÷ 0.8216 = 1.01].

In this sample, a PRD of 1.01 indicates uniformity.

¹¹ IAAO *Standard on Ratio Studies* (2013), Part 1, Sec. 5.6, pg. 14

The IAAO cautions that the PRD is not a reliable statistic when the sample is small or when the sample is heavily influenced by extreme sales prices. For this reason, PTAD publishes the sample size on the Appraisal District Summary

Worksheet. The PRD is only an indicator; it alone cannot prove vertical equity or inequity. Proving vertical inequity requires additional testing that is further defined in IAAO's 2013 Standard on Ratio Studies.

EXHIBIT 4
Sample Calculation of Price-related Differential XYZ County Appraisal District
Category A: Single-Family Residential Sales and Appraisals

Sale or Appraisal (COLUMN 1)	Number (COLUMN 2)	Appraisal Roll Value (COLUMN 3)	Adjusted Sale Price or Appraised Value (COLUMN 4)	Individual Appraisal Ratio (COLUMN 5)
S	17	\$84,449	\$84,995	0.99
S	15	\$114,788	\$118,898	0.97
S	6	\$89,654	\$94,715	0.95
A	12	\$39,479	\$41,925	0.94
S	5	\$69,708	\$76,117	0.92
A	4	\$99,880	\$133,310	0.88
S	1	\$97,576	\$110,741	0.88
S	8	\$111,020	\$128,048	0.87
A	10	\$64,519	\$75,905	0.85
S	2	\$60,437	\$70,964	0.85
S	2	\$75,254	\$90,720	0.83
S	7	\$76,502	\$91,680	0.83
S	16	\$92,088	\$113,645	0.81
S	18	\$21,090	\$25,988	0.81
S	19	\$22,080	\$27,398	0.81
S	11	\$64,842	\$81,127	0.8
S	1	\$65,834	\$83,113	0.79
S	13	\$193,344	\$245,700	0.79
S	14	\$98,885	\$127,493	0.78
A	6	\$76,935	\$98,327	0.78
S	5	\$82,253	\$109,250	0.75
A	3	\$107,543	\$148,828	0.72
S	9	\$44,441	\$62,370	0.71
S	3	\$94,420	\$135,610	0.70
A	4	\$60,264	\$86,303	0.70
Totals		\$2,007,785	\$2,443,170	20.71

Number of properties: 25

Source: Texas Comptroller of Public Accounts

Summary of Results

The Comptroller's office studied 128 appraisal districts as part of the 2021 *Appraisal District Ratio Study*. The studied appraisal districts satisfied the IAAO standards with an overall statewide median ratio (the overall level of assessment) of 0.98. This means property is being appraised at 98 percent of its market value overall throughout the state.

The studied appraisal districts had a statewide COD of 14.28 and met IAAO standards across major classifications of property (defined in **Exhibit 2**) for ratio study uniformity standards recommended by IAAO. **Exhibit 5** shows the number of ratios calculated in each property category tested and the statewide median appraisal ratios, CODs and PRDs for different property categories.

EXHIBIT 5

Statewide Level and Uniformity of Appraisal by Property Category for the 2021 Tax Year

Category	Number of Ratios**	Median Ratio	Coefficient of Dispersion	Price-Related Differential
A . Single-Family Residences	68,332	0.98	10.16	1.01
B. Multifamily Residences	1,936	0.95	12.49	1.01
C1. Vacant Lots	4,361	0.96	24.21	1.00
D2. Farm/Ranch Improvements	263	1.00	15.24	0.95
E. Rural Not qualified	10,082	0.97	19.60	1.04
F1. Commercial Real	9,908	0.98	13.92	0.99
F2. Industrial Real	*	*	*	*
G1. Oil & Gas	2,893	0.98	14.38	1.10
J. Utilities	1,378	0.94	10.84	1.00
L1. Commercial Personal	3,995	1.00	7.74	1.01
L2. Industrial Personal	*	*	*	*
M. Other Personal	*	*	*	*
S. Special Inventory	*	*	*	*
TOTAL OVERALL	103,148	0.98	14.28	1.01

*Category result not calculated. Calculation requires a minimum of five ratios resulting from categories representing at least 25 percent of total property category value.

Level of Appraisal

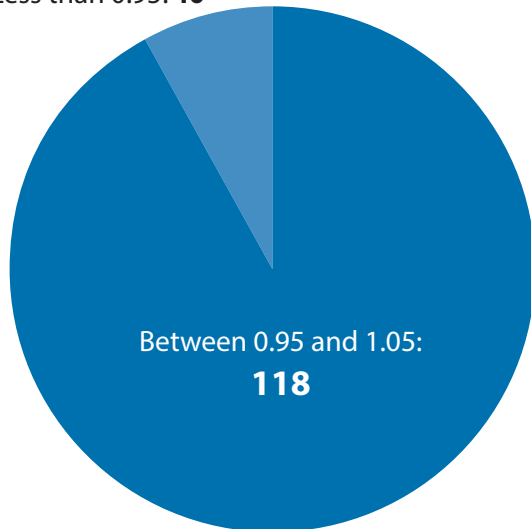
Exhibit 6 illustrates that 118 (92%) of studied appraisal districts performed within 95-105 percent of market value.

Exhibit 7 shows that 66 percent of the appraisal districts had a median level of appraisal between .95 and 1.05 for single-family residential property and 39 percent for commercial real property. **Appendix 1** summarizes the overall Category A (Single-Family Residential) and Category F1 (Commercial Real Property) results for each of the 128 appraisal districts studied in 2021.

EXHIBIT 6

Overall Median Ratios by Appraisal Districts

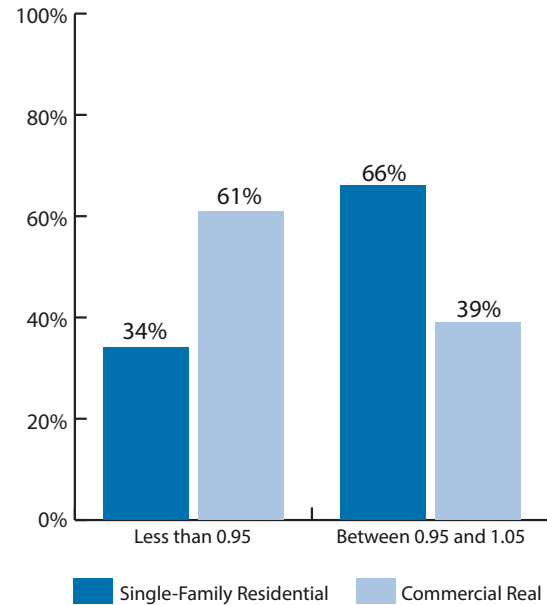
Less than 0.95: 10



Between 0.95 and 1.05:
118

EXHIBIT 7

Median Level of Appraisal for Single-Family Residential and Commercial Property



Single-Family Residential and Commercial Real Property Median Ratios

To account for different areas in the state and further examine appraisal performance, PTAD divided the appraisal districts studied into three tiers by population. The next five exhibits compare appraisal districts within each tier to compare appraisal districts of similar size, by population.

Exhibit 8 shows the overall median ratio calculated for each tier and median ratios for both residential and commercial properties.

EXHIBIT 8

Overall Median Ratio by Tier

Tier	Population	Overall Median Ratio	Residential	Commercial
1	120,000 and over	0.9713	0.9763	0.9755
2	20,000 - 119,000	0.9698	0.9773	0.9755
3	Less than 19,999	0.9695	0.9769	0.9754

Exhibit 9 and **Exhibit 10** show the percentage of appraisal districts within each tier that met the IAAO standard overall median ratio for single-family residential properties and commercial real properties, respectively.

EXHIBIT 9

Single-Family Residential Median Ratio Between 0.95 and 1.05 by Appraisal District Population

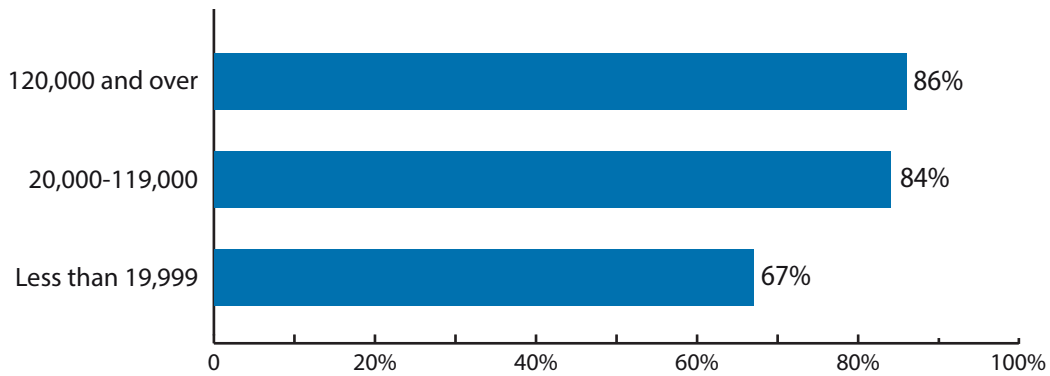
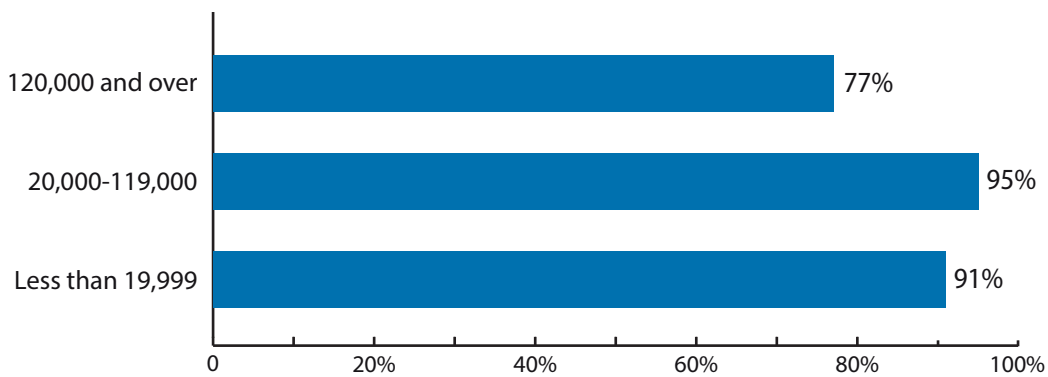


EXHIBIT 10

Commercial Real Median Ratio Between 0.95 and 1.05 by Appraisal District Population



Uniformity of Appraisals

Of the appraisal districts studied in Category A, 99 resulted in CODs less than 20 percent, as shown in **Exhibit 11**.

In 2021, all appraisal districts studied had CODs less than 25 percent for commercial property. **Exhibit 12** shows that 53 appraisal districts had CODs less than 20 percent.

Exhibit 13 shows the percentages of appraisal districts studied in the categories shown that had PRDs within the range of vertical equity.

EXHIBIT 11

Single-Family Residential COD by Appraisal Districts

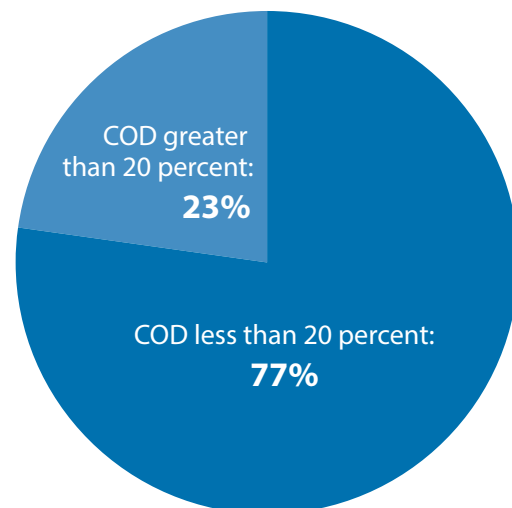
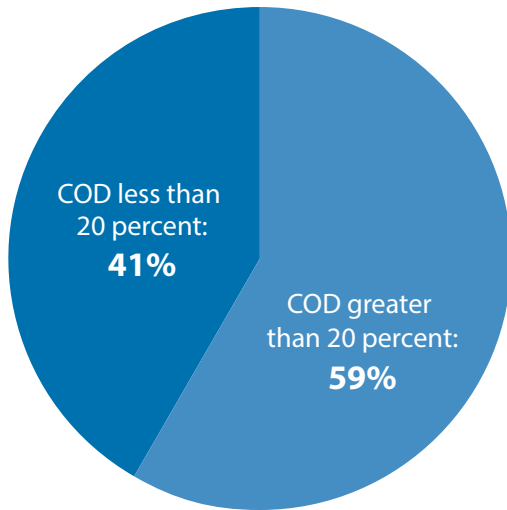
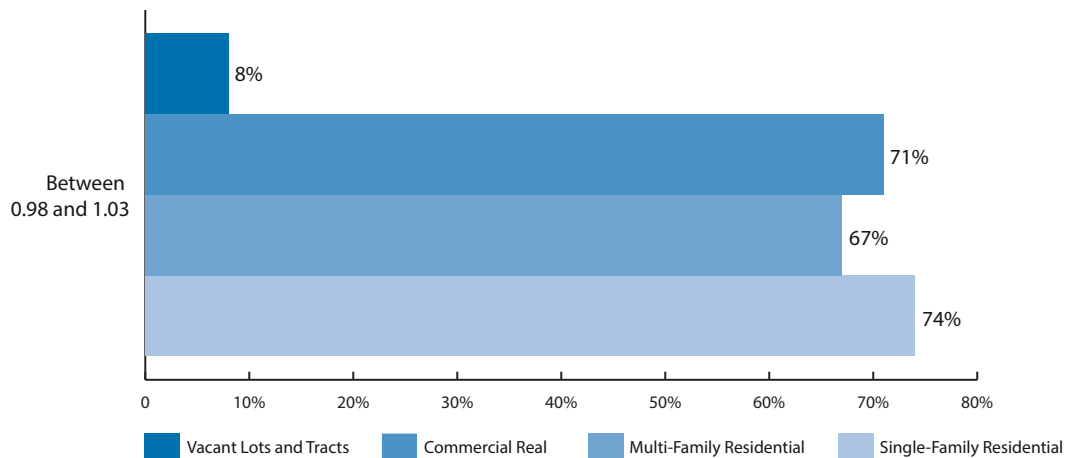


EXHIBIT 12
**Commercial Real Property COD
 by Appraisal Districts**



Unlike the *SDPVS*, the *Appraisal District Ratio Study* results are not appealable and are not reported to the commissioner of education because they are not used in determining equitable school funding. No party may protest the Comptroller’s *Appraisal District Ratio Study* findings under Tax Code Section 5.10. Tax Code Section 5.10(a) requires the Comptroller’s office to publish a report of the *Appraisal District Ratio Study* findings that includes the median levels of appraisal for each major category of property, the COD around the median level of appraisal for each major category of property and any other standard statistical measures considered appropriate.

EXHIBIT 13
Percent of Appraisal Districts with PRD between 0.98 and 1.03 Property Category



Conclusion

Statewide, the 128 appraisal districts included in the 2021 *Appraisal District Ratio Study* collectively met the IAAO standards across the major property categories and satisfied the acceptable median level of appraisal, falling within the required range of 95-105 percent of market value overall.

Within their respective population tier, more than three-quarters of Tier 1 appraisal districts fell within acceptable median range in both Single-Family Residential and Commercial Real Property. Tier 2 appraisal districts scored even higher with 84 percent and 95 percent in the respective categories. Tier 3 appraisal districts had slightly more than half of the appraisal districts meet the range in Single-Family Residential, but almost all appraisal districts met the requirements for Commercial Real Property.

Independently, just more than half of the appraisal districts studied for single-family residential properties fell within the acceptable range for median level of appraisal, and more than three-quarters of the appraisal districts were found to have a COD of less than 20 percent, implying a low variability in appraisal. Though less than half of the studied appraisal districts were within the median level of appraisal, all the appraisal districts were found to be within the allowable COD level of 25 percent for commercial real property. Additionally, almost half of these were under 20 percent. The evaluation of commercial appraisals performed exemplified a low variability in appraisal.

Overall, the PRD ratio of the state met the IAAO standards when averaging all property categories. Statewide, Category D2, Real Property: Farm and Ranch Improvements on Qualified Open-Space Land, fell below the standard ratio range, indicating property appraisals above market value, while Category E, Real Property: Rural Land, not Qualified for Open-Space Appraisal, and Residential Improvements, resulted in a ratio above the standard range, indicating property appraisals below market value. Appraisal districts studied revealed just less than three-quarters meeting the acceptable PRD range independently in the categories of Single-Family Residential, Multi-Family Residential and Commercial Real Property, while less than 10 percent met the requirements for Vacant Land and Tracts.

Appraisal districts across the state show to be consistent in the method of their appraisals through the evaluation of the COD. However, there shows to be a deficiency in these appraisals falling within the acceptable median range of market value. Two of the major categories of property show a vertical inequity in appraisal values: Category D2 property appraisals reveal a progressive tendency, and Category E reveals a regressive level of appraisal.

APPENDIX 1
Appraisal District Summary
2021 CADs Studied

	LEVEL OF APPRAISAL			UNIFORMITY OF APPRAISAL			
	Overall Median Level Appraisal between 0.95 and 1.05	Single-Family Residential Median Level Appraisal between 0.95 and 1.05	Commercial Real Median Level Appraisal between 0.95 and 1.05	Single-Family Residential COD < 20%	Commercial Real COD < 20%	Single-Family Residential PRD between 0.98 and 1.03	Commercial Real PRD between 0.98 and 1.03
Anderson	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Aransas	Yes	Yes	Yes	Yes	Yes	Yes	No
Archer	Yes	No	*	Yes	*	Yes	*
Armstrong	Yes	*	*	*	*	*	*
Atascosa	Yes	Yes	Yes	Yes	Yes	Yes	No
Bailey	No	No	Yes	Yes	Yes	Yes	Yes
Bee	Yes	Yes	*	Yes	*	Yes	*
Bell	Yes	Yes	No	Yes	Yes	Yes	Yes
Blanco	Yes	Yes	Yes	Yes	Yes	No	Yes
Borden	Yes	*	*	*	*	*	*
Brewster	Yes	Yes	Yes	Yes	Yes	No	Yes
Briscoe	Yes	Yes	*	Yes	*	Yes	*
Burnet	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calhoun	Yes	Yes	Yes	Yes	Yes	No	Yes
Camp	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cass	Yes	Yes	*	Yes	*	Yes	*
Castro	Yes	Yes	*	Yes	*	Yes	*
Cherokee	Yes	Yes	*	Yes	*	Yes	*
Chochran	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coleman	Yes	No	*	Yes	*	Yes	*
Collingsworth	Yes	Yes	*	Yes	*	Yes	*
Colorado	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Comal	Yes	Yes	Yes	Yes	Yes	Yes	No
Comanche	Yes	Yes	*	Yes	*	No	*
Coryell	No	Yes	*	Yes	*	Yes	*
Cottle	Yes	Yes	*	Yes	*	No	*
Crockett	Yes	*	*	*	*	*	*
Culberson	Yes	*	*	*	*	*	*
Dallam	Yes	No	Yes	No	Yes	No	Yes
Dawson	Yes	No	*	No	*	No	*
Deaf Smith	Yes	*	*	*	*	*	*
Delta	Yes	Yes	*	Yes	*	Yes	*
Denton	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dickens	Yes	No	*	Yes	*	Yes	*
Dimmit	Yes	*	*	*	*	*	*
Donley	Yes	Yes	*	Yes	*	Yes	*
Duval	Yes	Yes	*	Yes	*	No	*

Erath	Yes	Yes	*	Yes	*	Yes	*
Fannin	Yes	Yes	*	Yes	*	Yes	*
Fisher	No	*	*	*	*	*	*
Floyd	No	*	*	*	*	*	*
Franklin	Yes	Yes	*	No	*	Yes	*
Freestone	Yes	*	*	*	*	*	*
Frio	Yes	No	No	Yes	No	Yes	No
Gaines	No	Yes	*	No	*	No	*
Galveston	Yes	Yes	Yes	Yes	No	Yes	No
Gillespie	Yes	Yes	Yes	Yes	Yes	No	Yes
Gregg	Yes	Yes	No	Yes	Yes	Yes	No
Hall	Yes	Yes	Yes	Yes	Yes	Yes	No
Hamilton	Yes	Yes	*	Yes	*	No	*
Hansford	Yes	No	*	Yes	*	Yes	*
Hardeman	Yes	Yes	*	Yes	*	Yes	*
Harris	Yes	Yes	Yes	Yes	Yes	Yes	No
Harrison	Yes	Yes	*	Yes	*	Yes	*
Hartley	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hidalgo	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hockley	No	No	*	Yes	*	Yes	*
Howard	Yes	No	*	Yes	*	No	*
Hudspeth	No	No	*	No	*	No	*
Hunt	Yes	Yes	*	Yes	*	Yes	*
Hutchison	Yes	No	*	Yes	*	No	*
Jack	Yes	*	*	*	*	*	*
Jackson	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Jeff Davis	No	No	Yes	No	Yes	No	Yes
Jim Hogg	Yes	No	Yes	Yes	Yes	Yes	Yes
Johnson	Yes	Yes	*	Yes	*	Yes	*
Kaufman	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kendall	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kenedy	Yes	*	*	*	*	*	*
Kerr	Yes	Yes	*	Yes	*	Yes	*
Kimble	Yes	Yes	Yes	Yes	Yes	Yes	No
King	Yes	*	*	*	*	*	*
Kinney	Yes	Yes	*	Yes	*	No	*
Knox	Yes	Yes	*	Yes	*	Yes	*
Lampasas	Yes	Yes	*	Yes	*	No	*
La Salle	Yes	*	*	*	*	*	*
Limestone	Yes	Yes	*	Yes	*	Yes	*
Live Oak	Yes	Yes	Yes	Yes	Yes	Yes	No
Lubbock	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lynn	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mason	Yes	No	Yes	Yes	Yes	No	Yes
Maverick	Yes	Yes	No	Yes	Yes	Yes	Yes
McMullen	Yes	*	*	*	*	*	*

Milam	Yes	Yes	*	Yes	*	Yes	*
Mills	Yes	*	*	*	*	*	*
Mitchell	Yes	Yes	*	No	*	No	*
Montgomery	Yes	Yes	Yes	Yes	Yes	Yes	No
Morris	Yes	Yes	No	Yes	Yes	Yes	Yes
Navarro	Yes	Yes	*	Yes	*	No	*
Panola	Yes	No	*	Yes	*	Yes	*
Parker	Yes	Yes	Yes	Yes	Yes	Yes	No
Pecos	Yes	No	Yes	Yes	Yes	Yes	Yes
Polk	Yes	Yes	*	Yes	*	No	*
Potter-Randall	Yes	No	Yes	Yes	Yes	Yes	Yes
Presidio	Yes	No	Yes	Yes	Yes	Yes	Yes
Refugio	Yes	Yes	Yes	Yes	Yes	No	Yes
Robertson	Yes	Yes	*	Yes	*	No	*
San Jacinto	Yes	Yes	*	Yes	*	Yes	*
San Patricio	Yes	Yes	Yes	Yes	Yes	Yes	No
Schleicher	Yes	No	*	Yes	*	No	*
Shackelford	Yes	Yes	*	Yes	*	Yes	*
Shelby	Yes	No	Yes	No	Yes	No	Yes
Smith	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stephens	Yes	*	*	*	*	*	*
Sterling	Yes	No	*	Yes	*	No	*
Swisher	Yes	Yes	Yes	Yes	Yes	Yes	No
Tarrant	Yes	Yes	No	Yes	Yes	Yes	Yes
Taylor	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Terry	Yes	*	*	*	*	*	*
Titus	Yes	Yes	*	Yes	*	Yes	*
Tom Green	No	No	*	Yes	*	Yes	*
Trinity	Yes	Yes	*	No	*	No	*
Tyler	Yes	Yes	*	No	*	Yes	*
Val Verde	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Van Zandt	Yes	Yes	*	Yes	*	Yes	*
Walker	Yes	Yes	Yes	Yes	Yes	Yes	No
Washington	Yes	Yes	Yes	Yes	No	Yes	Yes
Webb	Yes	No	Yes	Yes	Yes	Yes	Yes
Wharton	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wheeler	Yes	Yes	*	Yes	*	Yes	*
Wichita	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Willacy	No	No	*	No	*	No	*
Wilson	Yes	Yes	*	Yes	*	Yes	*
Wise	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wood	Yes	Yes	*	Yes	*	Yes	*
Yoakum	Yes	*	*	*	*	*	*
Young	Yes	No	Yes	Yes	Yes	Yes	Yes
Zapata	Yes	Yes	Yes	Yes	Yes	No	No

*Category result not calculated. Calculation requires a minimum of five ratios from either of the following:

- Categories representing at least 25 percent of total appraisal district category value.
- Five school districts or half the school districts in the appraisal district, whichever is less.

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