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Report on Appraisal District Ratio Study Results for Tax Year 2022

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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/2022/

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[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 for local jurisdictions to use 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] It can also be used to review and recalibrate appraisal models, reevaluate data elements and inform decision making.[7]

Oversight agencies perform ratio studies that are designed to examine the overall degree of accuracy of appraisals among property categories, market areas and taxing jurisdictions.[8] The Appraisal District Ratio Study is a tool for analyzing appraisal district performance against statutory measures to ensure that appraised values are uniform and as close as possible to values required by law.[9]

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.

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[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

[8] IAAO *Standard on Ratio Studies* (2013), Part 2, Sec. 1, pg. 21
[9] IAAO *Standard on Ratio Studies* (2013), Part 2.1, pg. 21

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. A ratio study sample with fewer than five sales tends to have exceptionally poor reliability and is not very useful.[10]

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 also does not aggregate samples from Category D1, property categorized as qualified open-space land. Because PTAD calculates the SDPVS Category D1 ratio by dividing the appraisal district's value of all land receiving productivity appraisal in the appraisal district by PTAD's estimate of the productivity value, no median is available for determining the measures of uniformity for the Appraisal District Ratio Study. As a result, 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.[11]

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.

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[10] IAAO *Standard on Ratio Studies* (2013), Part 1, Sec. 3.4, pg. 9

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

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	0.80
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.[12]

Exhibit 2 provides the IAAO's general guidance for CODs by property type.[13]

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

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[12] Tex. Tax Code §5.10(a)
[13] 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 within 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 ÷ 25) = 0.64 = 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 0.25) = 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.[14]

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. Progressive appraisals indicate high value properties are relatively over-appraised, whereas regressive appraisals indicate high value properties are under-appraised relative to lower value properties.

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.

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[14] 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)	Property 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	0.80
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 120 appraisal districts as part of the 2022 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 13.33 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 Tested Property Category for the 2022 Tax Year

Category	Number of Ratios	Median Ratio	Coefficient of Dispersion	Price-Related Differential
A. Single-Family Residences	73,711	0.98	12.14	1.01
B. Multifamily Residences	1,991	1.00	11.47	0.99
C1. Vacant Lots	3,909	0.95	25.91	1.08
D2. Farm/Ranch Improvements	197	0.98	12.63	1.00
E. Rural Not Qualified	9,628	0.96	24.44	1.07
F1. Commercial Real	8,903	0.98	12.52	0.98
G1. Oil & Gas	3,111	1.01	5.96	1.01
J. Utilities	1,200	0.94	9.73	1.01
L1. Commercial Personal	3,816	1.00	7.96	1.02
TOTAL OVERALL	**106,466**	**0.98**	**13.33**	**0.99**

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 94 (78 percent) of studied appraisal districts performed within 95-105 percent of market value.

Exhibit 7 shows that 59 percent of the appraisal districts had a median level of appraisal between 0.95 and 1.05 for single-family residential property and 73 percent for commercial real property. **Appendix 1** shows the top 10 best and worst appraisal district level of appraisal results overall for Category A (Single-Family Residential) and Category F1 (Commercial Real Property). **Appendix 2** summarizes the overall Category A (Single-Family Residential) and Category F1 (Commercial Real Property) results for each of the 120 appraisal districts studied in 2022.

EXHIBIT 6
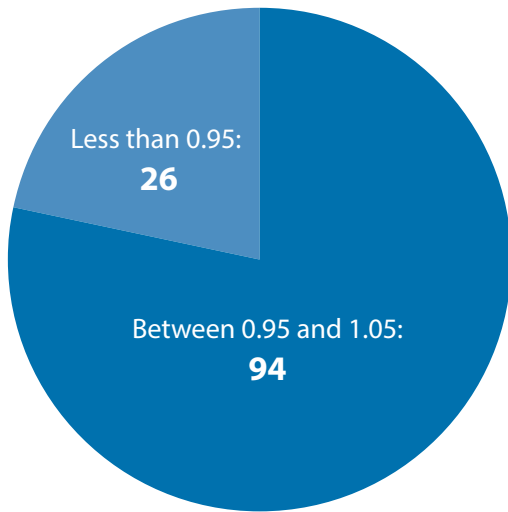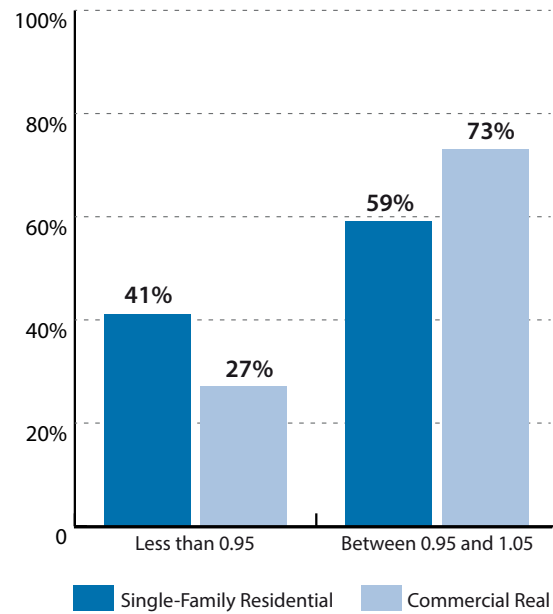## Overall Median Ratios by Appraisal Districts

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 Appraisal District Tier

Tier	Population	Overall Median Ratio	Residential	Commercial
1	120,000 and over	0.9849	0.9833	0.9877
2	20,000 - 119,999	0.9674	0.9617	0.9618
3	Less than 19,999	0.9781	0.9492	0.9771

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
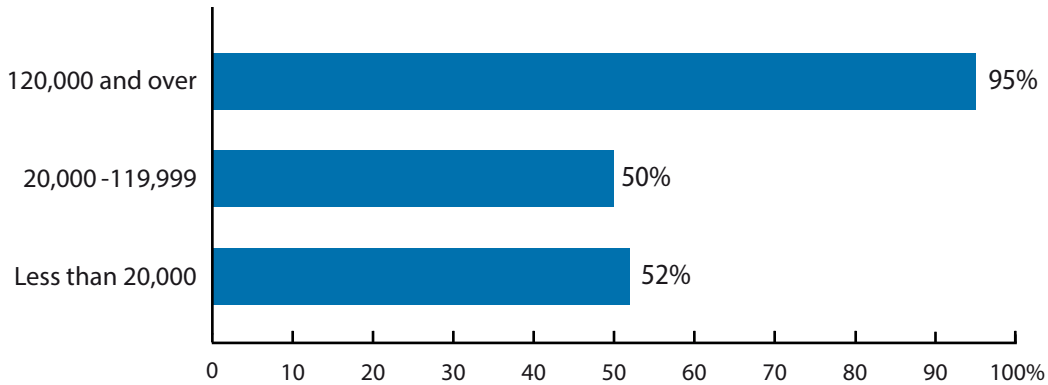
Population	Percentage
120,000 and over	95%
20,000 - 119,999	50%
Less than 20,000	52%

EXHIBIT 10
Commercial Real Median Ratio Between 0.95 and 1.05 by Appraisal District Population

Population	Percentage
120,000 and over	83%
20,000 - 119,999	61%
Less than 20,000	77%
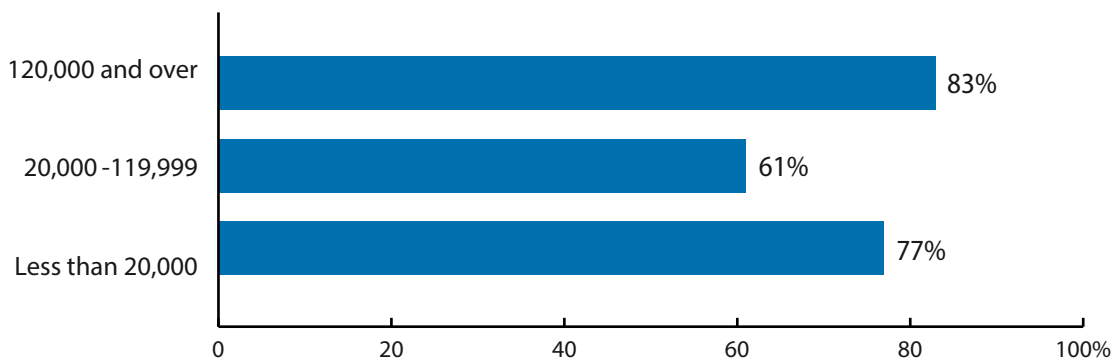
Uniformity of Appraisals

Of the appraisal districts studied in Category A, 91 resulted in CODs less than 20 percent, as shown in **Exhibit 11**.

In 2022, 49 appraisal districts studied had CODs less than 25 percent for commercial property. **Exhibit 12** shows that 46 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 14** and **Exhibit 15** show the percentages of progressive and regressive appraisal by appraisal districts in the same categories.

EXHIBIT 11
Single-Family Residential COD by Appraisal Districts

COD greater than 20 percent: **17%**

COD less than 20 percent: **83%**
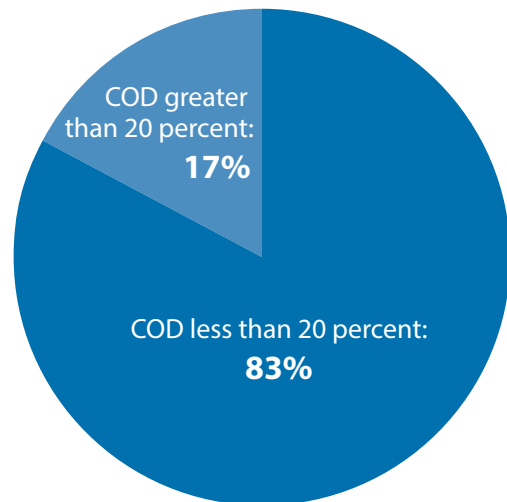
For vacant lots, 8 percent of studied appraisal districts show PRDs within the acceptable range of vertical equity. Of the remaining 92 percent of appraisal districts studied, 25 percent show progressive appraisal and 67 percent show regressive appraisal of vacant lots.

For commercial real property, 63 percent of studied appraisal districts show PRDs within the acceptable range of vertical equity. Of the remaining 37 percent of appraisal districts studied, 14 percent show progressive appraisal and 22 percent show regressive appraisal of vacant lots.

For multi-family residential property, 56 percent of studied appraisal districts show PRDs within the acceptable range of vertical equity. Of the remaining 44 percent of appraisal districts studied, 22 percent show progressive appraisal and 22 percent show regressive appraisal of multi-family residential property.

For single-family property 75 percent of studied appraisal districts show PRDs within the acceptable range of vertical equity. None of the studied appraisal districts show progressive appraisal and 25 percent show regressive appraisal of single-family property.

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

COD greater than 20 percent: **6%**

COD less than 20 percent: **94%**
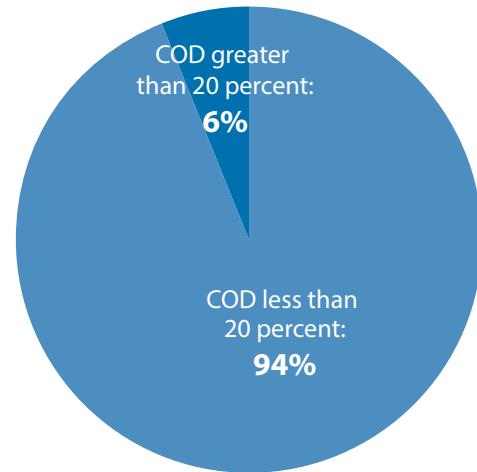
Unlike the SDPVS, the Appraisal District Ratio Study results are not appealable and are not reported to the commissioner of education because they are not used in determining equitable school funding. No party may protest the Comptroller's Appraisal District Ratio Study findings under Tax Code Section 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 by Property Category

Between 0.98 and 1.03

8.3%
63.3%
55.6%
75.2%

0   10   20   30   40   50   60   70   80%

■ Vacant Lots and Tracts   ■ Commercial Real   ■ Multi-Family Residential   ■ Single-Family Residential
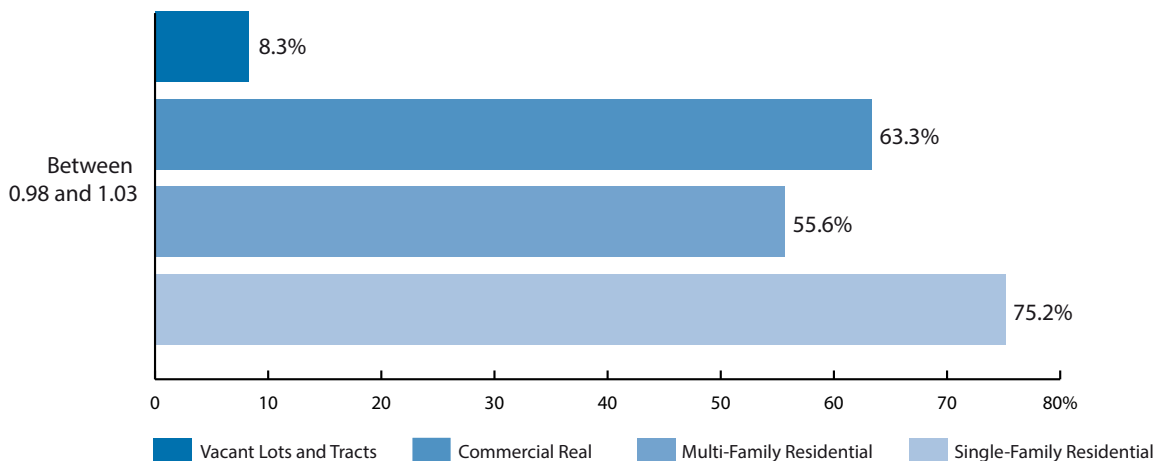
EXHIBIT 14
Percent of Appraisal Districts with Progressive Appraisals by Property Category

Progressive Appraisals
- Vacant Lots and Tracts: 25.0%
- Commercial Real: 14.3%
- Multi-Family Residential: 22.2%
- Single-Family Residential: 0.0%

Legend: Vacant Lots and Tracts | Commercial Real | Multi-Family Residential | Single-Family Residential
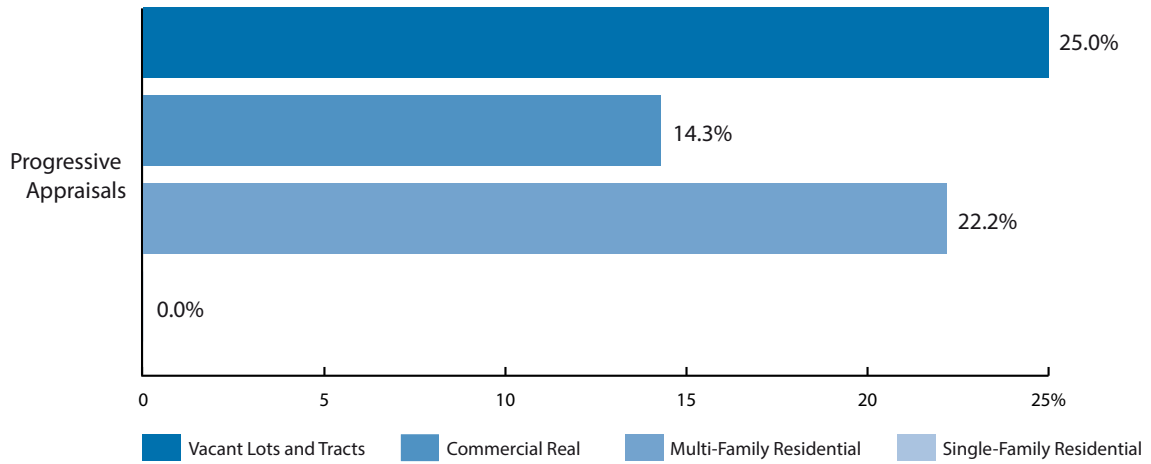
EXHIBIT 15
Percent of Appraisal Districts with Regressive Appraisals by Property Category

Regressive Appraisals
- Vacant Lots and Tracts: 66.7%
- Commercial Real: 22.4%
- Multi-Family Residential: 22.2%
- Single-Family Residential: 24.8%

Legend: Vacant Lots and Tracts | Commercial Real | Multi-Family Residential | Single-Family Residential
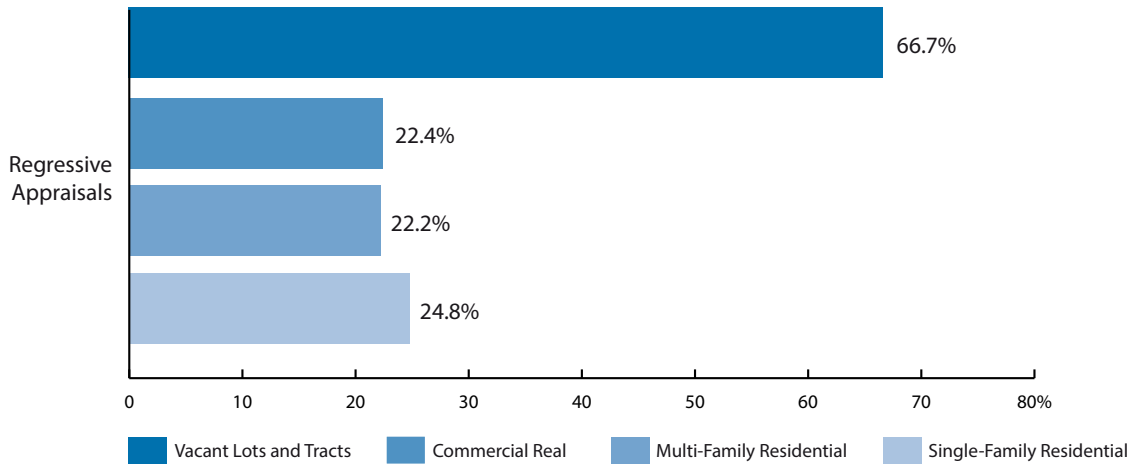
Conclusion

Statewide, the 120 appraisal districts included in the 2022 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, 95 percent of Tier 1 appraisal districts fell within acceptable median range for Single-Family Residential, while 83 percent had an acceptable median range for Commercial Real Property. Tier 2 appraisal districts had lower results with 50 percent and 61 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, and over three quarters of 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. Slightly less than three-quarters of the studied appraisal districts were within the median level of appraisal, and all of the appraisal districts were found to be within the allowable COD level of 25 percent for commercial real property. Additionally, 94 percent of these were under 20 percent. The evaluation of commercial appraisals performed exemplified a low variability in appraisal.

Overall, the statewide PRD ratio shows appraisal districts met the IAAO standards when averaging all property categories. The PRDs for Category C1, Real Property: Vacant Land and Lots, and Category E, Real Property: Rural Land, not Qualified for Open-Space Appraisal, and Improvements resulted in statewide ratios above the standard range, indicating property appraisals below market value. Of the appraisal districts studied, three-quarters met the acceptable PRD range independently in the category of Single-Family Residential, while Multi-Family Residential was just over half at 58 percent. Commercial Real Property had 63 percent meet the acceptable range, and less than 10 percent met the requirements for Vacant Land and Tracts.

None of the studied appraisal districts showed progressive appraisal of Single-Family Residential, but 25 percent showed a regressive trend indicating higher values are under appraised compared to lower value properties in 25 percent of the studied appraisal districts. For Multi-Family Residential, 22 percent of appraisal districts showed regressive appraisals and 22 percent showed progressive appraisals. For Vacant Lots, over half of the studied appraisal districts showed a regressive tendency, while about 25 percent showed a progressive tendency. For Commercial Real Property, 14 percent of studied appraisal districts showed progressive appraisal and 23 percent showed regressive appraisal.

Appraisal districts across the state show to be consistent in the method of their appraisals through the evaluation of the COD. However, there appears 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 statewide: Category C1 and Category E reveal a regressive level of appraisal.

APPENDIX 1
Level of Appraisal - Top 10 and Bottom 10 Appraisal Districts

Level of Appraisal for All Property Categories Studied

Number	Top	Bottom
1	118-Irion	203-San Augustine
2	231-Upton	012-Baylor
3	197-Roberts	193-Real
4	222-Terrell	125-Jim Wells
5	199-Rockwall	031-Cameron
6	150-Llano	010-Bandera
7	143-Lavaca	069-Edwards
8	071-El Paso	202-Sabine
9	169-Montague	140-Lamb
10	091-Grayson	155-Marion

Level of Appraisal for Category A

Number	Top	Bottom
1	091-Grayson	203-San Augustine
2	071-El Paso	155-Marion
3	154-Madison	085-Garza
4	174-Nacogdoches	148-Lipscomb
5	177-Nolan	031-Cameron
6	232-Uvalde	125-Jim Wells
7	018-Bosque	012-Baylor
8	194-Red River	193-Real
9	199-Rockwall	214-Starr
10	015-Bexar	202-Sabine

Level of Appraisal for Category F

Number	Top	Bottom
1	026-Burleson	024-Brooks
2	071-El Paso	036-Chambers
3	067-Eastland	048-Concho
4	038-Childress	237-Waller
5	155-Marion	020-Brazoria
6	171-Moore	123-Jefferson
7	057-Dallas	158-Matagorda
8	218-Sutton	100-Hardin
9	179-Ochiltree	146-Liberty
10	246-Williamson	079-Fort Bend

Appraisal District Summary
2022 Appraisal Districts

	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
002-Andrews	Yes	Yes	*	Yes	*	Yes	*
003-Angelina	Yes	Yes	*	Yes	*	No	*
008-Austin	No	No	Yes	Yes	Yes	Yes	Yes
010-Bandera	No	No	*	No	*	Yes	*
011-Bastrop	Yes	Yes	Yes	Yes	Yes	Yes	Yes
012-Baylor	No	No	*	No	*	No	*
015-Bexar	Yes	Yes	Yes	Yes	Yes	Yes	Yes
018-Bosque	Yes	Yes	*	Yes	*	Yes	*
019-Bowie	Yes	Yes	Yes	Yes	Yes	Yes	Yes
020-Brazoria	Yes	Yes	No	Yes	No	Yes	No
021-Brazos	Yes	Yes	Yes	Yes	Yes	Yes	Yes
024-Brooks	Yes	Yes	No	No	Yes	No	No
025-Brown	Yes	Yes	*	Yes	*	Yes	*
026-Burleson	Yes	Yes	Yes	Yes	Yes	Yes	Yes
028-Caldwell	Yes	Yes	Yes	Yes	Yes	No	No
030-Callahan	No	No	*	No	*	No	*
031-Cameron	No	No	Yes	Yes	Yes	Yes	Yes
033-Carson	Yes	Yes	*	Yes	*	No	*
036-Chambers	No	No	No	Yes	No	Yes	No
038-Childress	Yes	Yes	Yes	Yes	Yes	No	No
039-Clay	Yes	Yes	*	Yes	*	No	*
041-Coke	Yes	No	*	Yes	*	Yes	*
043-Collin	Yes	Yes	Yes	Yes	Yes	Yes	Yes
048-Concho	No	No	No	Yes	Yes	Yes	Yes
049-Cooke	Yes	Yes	*	Yes	*	Yes	*
052-Crane	Yes	No	*	Yes	*	Yes	*
054-Crosby	Yes	No	*	No	*	Yes	*
057-Dallas	Yes	Yes	Yes	Yes	Yes	Yes	Yes
062-Dewitt	Yes	*	*	*	*	*	*
067-Eastland	Yes	Yes	Yes	Yes	Yes	Yes	Yes
068-Ector	Yes	Yes	Yes	Yes	Yes	Yes	Yes
069-Edwards	No	*	*	*	*	*	*
070-Ellis	Yes	Yes	Yes	Yes	Yes	Yes	No
071-El Paso	Yes	Yes	Yes	Yes	Yes	Yes	Yes
073-Falls	Yes	*	*	*	*	*	*
075-Fayette	No	No	Yes	No	Yes	No	Yes
078-Foard	No	No	*	Yes	*	Yes	*

079-Fort Bend	Yes	Yes	No	Yes	Yes	Yes	Yes
085-Garza	Yes	No	*	No	*	No	*
087-Glasscock	Yes	*	*	*	*	*	*
088-Goliad	Yes	No	*	No	*	No	*
089-Gonzales	Yes	Yes	*	Yes	*	Yes	*
090-Gray	Yes	*	*	*	*	*	*
091-Grayson	Yes	Yes	Yes	Yes	Yes	Yes	Yes
093-Grimes	Yes	Yes	*	Yes	*	Yes	*
094-Guadalupe	Yes	Yes	*	Yes	*	Yes	*
095-Hale	Yes	No	*	Yes	*	Yes	*
100-Hardin	No	No	No	Yes	Yes	Yes	Yes
104-Haskell	No	No	*	No	*	Yes	*
105-Hays	Yes	Yes	Yes	Yes	Yes	Yes	No
106-Hemphill	Yes	Yes	*	Yes	*	Yes	*
107-Henderson	Yes	Yes	*	Yes	*	No	*
109-Hill	No	No	Yes	Yes	Yes	No	No
111-Hood	Yes	Yes	*	Yes	*	Yes	*
112-Hopkins	No	No	*	Yes	*	Yes	*
113-Houston	No	No	*	No	*	No	*
118-Irion	Yes	Yes	*	Yes	*	Yes	*
121-Jasper	Yes	No	*	Yes	*	No	*
123-Jefferson	Yes	Yes	No	Yes	No	Yes	No
125-Jim Wells	No	No	Yes	Yes	Yes	Yes	Yes
127-Jones	Yes	Yes	*	Yes	*	Yes	*
128-Karnes	Yes	*	*	*	*	*	*
137-Kleberg	No	No	Yes	Yes	Yes	Yes	No
139-Lamar	Yes	No	Yes	Yes	Yes	Yes	Yes
140-Lamb	No	No	*	Yes	*	Yes	*
143-Lavaca	Yes	Yes	*	Yes	*	Yes	*
144-Lee	Yes	No	*	Yes	*	Yes	*
145-Leon	Yes	Yes	*	Yes	*	Yes	*
146-Liberty	Yes	Yes	No	Yes	Yes	Yes	No
148-Lipscomb	Yes	No	*	Yes	*	Yes	*
150-Llano	Yes	Yes	*	Yes	*	Yes	*
151-Loving	Yes	*	*	*	*	*	*
154-Madison	Yes	Yes	Yes	Yes	Yes	No	Yes
155-Marion	No	No	Yes	No	Yes	No	Yes
156-Martin	Yes	*	*	*	*	*	*
158-Matagorda	No	No	No	Yes	Yes	Yes	No
160-McCulloch	Yes	*	*	*	*	*	*
161-McLennan	Yes	Yes	Yes	Yes	Yes	No	Yes
163-Medina	Yes	Yes	*	Yes	*	Yes	*
165-Midland	Yes	Yes	Yes	Yes	Yes	Yes	No
169-Montague	Yes	Yes	*	Yes	*	Yes	*
171-Moore	Yes	Yes	Yes	Yes	Yes	No	Yes
173-Motley	No	No	*	Yes	*	Yes	*
174-Nacogdoches	Yes	Yes	*	Yes	*	Yes	*
176-Newton	Yes	Yes	*	Yes	*	Yes	*

177-Nolan	Yes	Yes	*	Yes	*	No	*
178-Nueces	Yes	Yes	Yes	Yes	Yes	Yes	Yes
179-Ochiltree	Yes	No	Yes	Yes	Yes	Yes	Yes
180-Oldham	Yes	Yes	*	Yes	*	Yes	*
181-Orange	Yes	Yes	No	Yes	Yes	Yes	Yes
182-Palo Pinto	Yes	Yes	*	Yes	*	Yes	*
185-Parmer	Yes	No	*	Yes	*	Yes	*
192-Reagan	Yes	*	*	*	*	*	*
193-Real	No	No	Yes	No	Yes	Yes	Yes
194-Red River	Yes	Yes	*	Yes	*	Yes	*
195-Reeves	Yes	Yes	*	No	*	Yes	*
197-Roberts	Yes	No	*	Yes	*	No	*
199-Rockwall	Yes	Yes	Yes	Yes	Yes	Yes	No
200-Runnels	No	*	*	*	*	*	*
201-Rusk	Yes	No	*	Yes	*	Yes	*
202-Sabine	No	No	No	No	Yes	No	Yes
203-San Augustine	No	No	*	No	*	No	*
206-San Saba	Yes	Yes	*	Yes	*	Yes	*
208-Scurry	Yes	Yes	*	Yes	*	Yes	*
211-Sherman	Yes	No	*	Yes	*	Yes	*
214-Starr	Yes	No	Yes	No	Yes	Yes	No
218-Sutton	Yes	No	Yes	Yes	Yes	Yes	Yes
222-Terrell	Yes	Yes	*	Yes	*	Yes	*
224-Throckmorton	Yes	Yes	*	No	*	Yes	*
227-Travis	Yes	Yes	Yes	Yes	Yes	Yes	Yes
230-Upshur	No	No	*	Yes	*	Yes	*
231-Upton	Yes	No	*	Yes	*	No	*
232-Uvalde	Yes	Yes	No	Yes	Yes	Yes	No
235-Victoria	Yes	Yes	*	Yes	*	Yes	*
237-Waller	Yes	No	No	Yes	Yes	Yes	No
238-Ward	Yes	No	*	Yes	*	Yes	*
244-Wilbarger	Yes	Yes	*	Yes	*	No	*
246-Williamson	Yes	Yes	Yes	Yes	Yes	Yes	Yes
248-Winkler	Yes	No	Yes	No	Yes	No	No
254-Zavala	Yes	Yes	*	Yes	*	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.