

NEBRASKA

Good Life. Great Service.

DEPARTMENT OF REVENUE

**2020 REPORTS AND OPINIONS
OF THE PROPERTY TAX ADMINISTRATOR**

EXHIBIT 94

Commission Summary Calculations

For all classes of real property

For Statistical Header Information and History: see Statistical Calculations

For Residential Real Property

% of value of this class of all real property value in the county:

$\text{Abstract \#4 value} + \text{Abstract \#16 value} / \text{Abstract Total Real Property Value}$

% of records sold in study period:

$\text{Total Sales from Sales File} / \text{Abstract \#4 records} + \text{Abstract \#16 records}$

% of value sold in the study period:

$\text{Total Value from Sales File} / \text{Abstract \#4 value} + \text{Abstract \#16 value}$

Average assessed value of the base:

$\text{Abstract \#4 value} + \text{Abstract \#16 value} / \text{Abstract \#4 records} + \text{Abstract \#16 records}$

For Commercial Real Property

% of value of this class of all real property value in the county:

$\text{Abstract \#8 value} + \text{Abstract \#12 value} / \text{Abstract Total Real Property Value}$

% of records sold in study period:

$\text{Total Sales from Sales File} / \text{Abstract \#8 records} + \text{Abstract \#12 records}$

% of value sold in the study period:

$\text{Total Value from Sales File} / \text{Abstract \#8 value} + \text{Abstract \#12 value}$

Average assessed value of the base:

$\text{Abstract \#8 value} + \text{Abstract \#12 value} / \text{Abstract \#8 records} + \text{Abstract \#12 records}$

For Agricultural Land

% of value of this class of all real property value in the county:

$\text{Abstract \#30 value} / \text{Abstract Total Real Property Value}$

% of records sold in the study period:

$\text{Total Sales from Sales File} / \text{Abstract \#30 records}$

% of value sold in the study period:

$\text{Total Value from Sales File} / \text{Abstract \#30 value}$

Average assessed value of the base:

$\text{Abstract \#30 value} / \text{Abstract \#30 records}$

Statistical Reports Query

The Statistical Reports contained in the Reports and Opinions for each county derived from the state sales file of the Department of Revenue Property Assessment Division. The state sales file contains all recorded real property transactions with an amount stated on the Real Estate Transfer Statement, [Form 521](#), for Documentary Stamp Tax greater than \$2.25 or for consideration greater than \$100. Real property transactions meeting these criteria are considered sales.

The first query performed by the state sales file is by county number. For each of the following property classifications, the state sales file performs the following queries:

Residential:

Property Class Code: Property Type 01, Statuses 1 and 3
Property Type 06, Statuses 1 and 3
Property Type 07, Statuses 1 and 3
Sale Date Range: October 1, 2017 through September 30, 2019
Qualified: All sales with Assessor Usability Code: blank, zero, 1 or 2.
If blank or zero will be considered a Usability of 1.

Commercial:

Property Class Code: Property Type 02, Statuses 1 and 3
Property Type 03, Statuses 1 and 3
Property Type 04, Statuses 1 and 3
Sale Date Range: October 1, 2016 through September 30, 2019
Qualified: All sales with Division Usability Code: zero, 1 or 2
If blank or zero will be considered a Usability of 1.

Agricultural:

Property Class Code: Property Type 05, in which the non-ag is less than 5% of the sale price.
Sale Date Range: October 1, 2016 through September 30, 2019
Qualified: All sales with Division Usability Code: zero, 1 or 2.
If blank or zero will be considered a Usability of 1.

Statistical Calculations

The results of the statistical calculations that make up the header of the Statistical Reports are:

Number of Sales	Weighted Mean	Min Sales Ratio
Total Sales Price	Mean	95% Median C.I.
Total Adj. Sales Price	COD	95% Wgt. Mean C.I.
Total Assessed Value	PRD	95% Mean C.I.
Avg. Adj. Sales Price	COV	
Avg. Assessed Value	STD	
	Avg. Abs. Dev.	
Median	Max Sales Ratio	

Coding Information & Calculations

Each real property transaction in the state sales file becomes a record in the sales file. All statistical calculations performed by the state sales file round results in the following manner: if the result is not a whole number, then the state sales file will round the result five places past the decimal and truncate to the second place past the decimal. Sales price and assessed value are whole numbers.

Number of Sales

- Coded as Count, Character, a five-digit field.
- The Count is the total number of sales in the sales file based upon the selection of Total or Qualified. For purposes of this document, Qualified and Sale Date Range is assumed.

Total Sales Price

- Coded as TotSalePrice, Character, 15-digit field.
- The Total Sales Price is based on the Total Sale Amount, shown on Line 24 of the Form 521, for each record added together.
- Calculation
 - Sum SaleAmt

Total Adj. Sales Price

- Coded as TotAdjSalePrice, Character, 15-digit field.
- The Total Adjusted Sales Price is the Total Sale Amount for each record plus or minus any adjustments made to the sale by the county assessor, Division or the Commission (from an appeal).
- Calculation
 - Sum SaleAmt + or – Adjustments

Total Assessed Value

- Coded as TotAssdValue, Character, 15-digit field.
- The Total Assessed Value is based on the Entered Total Current Year Assessed Value Amount for each record. If the record is an agricultural record, Property Classification Code: Property Parcel Type-05, then the Total Assessed Value is the Entered Current Year Total Value adjusted by any value for Non-Ag Total and Current Year Total Improvements, so that the Total Assessed Value used in the calculations for these records is the assessed value for the agricultural land only.
- Calculation
 - Sum TotAssdValue

Avg. Adj. Sales Price

- Coded as AvgAdjSalePrice, Character, 15-digit field.
- The Average Adjusted Sale Price is dependant on the TotAdjSalePrice and the Count defined above.
- Calculation

- TotAdjSalePrice/Count

Avg. Assessed Value

- Coded as AvgAssdValue, Character, 15-digit field.
- The Average Assessed Value is dependent on the TotAssdValue and the Count defined above.
- Calculation
 - TotAssdValue/Count

Median

- Coded as Median, Character, 12-digit field.
- The Median ratio is the middle ratio when the records are arrayed in order of magnitude by ratio.
 - If there is an odd number of records in the array, the median ratio is the middle ratio of the array.
 - If there is an even number of records in the array, the median ratio is the average of the two middle ratios of the array.
- Calculation
 - Array the records by order of the magnitude of the ratio from high to low
 - Divide the Total Count in the array by 2 equals Record Total
 - If the Total Count in the array is odd:
 - Count down the number of whole records that is the Record Total + 1. The ratio for that record will be the Median ratio
 - If the Total Count in the array is even:
 - Count down the number of records that is Record Total. This is ratio 1.
 - Count down the number of records that is Records Total + 1. That is ratio 2.
 - (ratio 1 + ratio 2)/2 equals the Median ratio.

Weighted Mean

- Coded as Aggreg, Character, 12-digit field.
- Calculation
 - $(\text{TotAssdValue}/\text{TotAdjSalePrice}) * 100$

Mean

- Coded Mean, Character, 12-digit field
- Mean ratio is dependant on TotalRatio which is the sum of all ratios in the sample.
- Calculation
 - TotalRatio/RecCount

COD

- Coded COD, Character, 12-digit field
- Calculation
 - Subtract the Median from Each Ratio
 - Take the Absolute Value of the Calculated Differences
 - Sum the Absolute Differences
 - Divide by the Number of Ratios to obtain the “Average Absolute Deviation”
 - Divide by the Median

- Multiply by 100

PRD

- Coded PRD, Character, 12-digit field
- Calculation
 - $(\text{MeanRatio}/\text{AggregRatio}) * 100$

COV

- Coded COV, Character, 12-digit field
- Calculation
 - Subtract the Mean from each ratio
 - Square the Calculated difference
 - Sum the squared differences
 - Divide the number of ratios less one to obtain the Variance of the ratios
 - Compute the Squared Root to obtain the Standard Deviation
 - Divide the Standard Deviation by the Mean
 - Multiply by 100

STD

- Coded StdDev, Character, 12-digit field
- Calculation
 - Subtract the Mean Ratio from each ratio
 - Square the resulting difference
 - Sum the squared difference
 - Divide the number of ratios less one to obtain the Variance of the ratios
 - Compute the squared root of the variance to obtain the Standard Deviation

Avg. Abs. Dev.

- Coded AvgABSDev, Character, 12-digit field
- Calculation
 - Subtracting the Median ratio from each ratio
 - Summing the absolute values of the computed difference
 - Dividing the summed value by the number of ratios

Max Sales Ratio

- Coded Max, Character, 12-digit field
- The Maximum ratio is the largest ratio when the records are arrayed in order of magnitude of ratio.

Min Sales Ratio

- Coded Min, Character, 12-digit field
- The Minimum ratio is the smallest ratio when the records are arrayed in order of magnitude of ratio.

95% Median C.I.

- Coded MedianConfInterval, Character, 12-digit field
- The Median Confidence Interval is found by arraying the ratios and identifying the ranks of the ratios corresponding to the Lower and Upper Confidence Limits. The equation for the number of ratios (j), that one must count up or down from the median to find the Lower and Upper Confidence Limits is:
- Calculation
 - If the number of ratios is Odd
 - $j = 1.96x\sqrt{n}/2$
 - If the number of ratios is Even
 - $j = 1.96x\sqrt{n}/2 + 0.5$
 - If the calculation has anything past the decimal, it will be rounded to the next whole number and the benefit of the doubt is given
 - If the sample size is 5 or less, then N/A is given as the confidence interval
 - If the sample size is 6-8, then the Min and Max is the given range

95% Wgt. Mean C.I.

- Coded AggregConfInterval, Character, 12-digit field
- Calculation
 - Items needed for this calculation
 - Number of sales
 - Assessed Values – Individual and Summed
 - Assessed Values Squared – Individual and Summed
 - Average Assessed Value
 - Sale Prices – Individual and Summed
 - Sales Prices Squared – Individual and Summed
 - Average Sale Price
 - Assessed Values x Sale Prices – Individual and Summed
 - The Weighted Mean
 - The t value for the sample size

- The actual calculation:

$$\sqrt{\frac{\sum A^2 - 2(A/S) \sum (A \times S) + (\sum A/S)^2}{\sum S^2}}$$

$$CI(A/S) - A/S \pm t \times \frac{\sqrt{\sum A^2 - 2(A/S) \sum (A \times S) + (\sum A/S)^2}}{\sum S^2 \sqrt{(n) (n-1)}}$$

- If the sample size is 5 or less, then N/A is given as the confidence interval

95% Mean C.I.

- Coded MeanConfInterval, Character, 12-digit field
- The Mean Confidence Interval is based on the assumption of a normal distribution and can be affected by outliers.
- Calculation
 - Lower Limit
 - $\text{The Mean} - ((t\text{-value} * \text{The Standard Deviation}) / \text{the Square Root of the Number of Records})$
 - Upper Limit
 - $\text{The Mean} + ((t\text{-value} * \text{The Standard Deviation}) / \text{the Square Root of the Number of Records})$
 - If the number of records is > 30, then use 1.96 as the t-value
 - If the number of records is <= 30, then a “Critical Values of t” Table is used based on sample size. Degrees of freedom = sample size minus 1
 - If the sample is 1 or less, then N/A is given as the confidence interval

Ratio Formulas

- Residential and Commercial Records
 - If the Assessed Value Total Equals Zero, the system changes the Assessed Value to \$1.00 for the ratio calculations. It does not make the change to the actual data.
 - If the Sale Amount is Less Than \$100.00 AND the Adjustment Amount is Zero. The system derives an Adjustment Amount based upon the Doc Stamp fee (Doc Stamp Fee/.00225).
 - Ratio Formula is: $(\text{Assessed Value Total} / (\text{Sale Amount} + \text{Adjustment Amount})) * 100$.
- Agricultural Records
 - If the Sale Amount is Less Than \$100.00 AND the Adjustment Amount is Zero. The system derives an Adjustment Amount based upon the Doc Stamp fee (Doc Stamp Fee /.00225).
 - If the Sale Amount – Assessed Improvements Amount – Entered Non-Ag Amount + Adjustment Amount = 0. The system adds \$1.00 to the Adjustment Amount.
 - If the Assessed Land Amount – Entered Non-Ag Amount Equals Zero. The system adds \$1.00 to the Assessed Land Amount.
 - Ratio Formula is:
 - a. If no special valuation: $(\text{Agland Total Amount}) / (\text{Sale Amount} - \text{Assessed Improvements} - \text{Entered NonAg Amount} + \text{Adjustment Amount}) * 100$.
 - b. If special valuation: $(\text{Market Value Amount}) / (\text{Sale Amount} - \text{Assessed Improvements Amount} - \text{Entered NonAg Amount} + \text{Adjustment Amount}) * 100$.

Glossary

Actual Value: The market value or fair market value of real property in the ordinary course of trade and the typical amount the property will sell for, either when on sale in the open market or in an arm's-length transaction between a willing seller and a willing buyer, both of whom are knowledgeable about the property and its current and possible uses. Actual value may be determined using professionally accepted mass appraisal methods, including, but not limited to the (1) sales comparison approach, (2) income approach, and (3) cost approach. In analyzing the uses and restrictions applicable to real property, the analysis shall include a consideration of the full description of the physical characteristics of the real property and an identification of the property rights being valued. [Neb. Rev. Stat. § 77-112.](#)

Adjusted Sale Price: A sale price that is the result of adjustments made to the purchase price reported on the Form 521, for the effects of personal property or financing included in the reported purchase price. If the sale price is adjusted, it is the adjusted sale price that will be used as the denominator in the assessment sales ratio.

Agricultural Land: Land that is agricultural land and horticultural land as defined in Neb. Rev. Stat. §§ [77-1343](#) and [77-1359](#).

Agricultural Land Market Area: Area with defined characteristics within which similar agricultural land is effectively competitive in the minds of buyers and sellers with other comparable agricultural land in the area within a county. These areas are defined by the county assessor.

Agricultural Property Classification: Includes all properties in the statewide sales file with Property Classification Code: Property parcel type-05 Agricultural, all Statuses. A sub-classification is defined for the Status-2: unimproved agricultural properties (see, Agricultural Unimproved Property Classification).

Agricultural Unimproved Property Classification: Includes all properties in the statewide sales file with Property Classification Code: Property parcel type-05 Agricultural, Status-2.

Arm's-Length Transaction: A sale between two or more parties, each seeking to maximize their positions from the transaction. All sales are deemed to be arm's-length transactions unless determined to be otherwise under professionally accepted mass appraisal techniques.

Assessed Value: The value of a parcel of real property established by a governmental entity that is the basis for levying a property tax. In Nebraska, the assessed value of a real property parcel is first established by the county assessor of each county. For purposes of the Division's sales file, the assessed value displays the value for land, improvements and total. The assessed value is the numerator in the assessment sales ratio.

Assessment: Listing the description of all real property, determining whether it is exempt, determining its taxable value, and placing it on the assessment roll pursuant to [Neb. Rev. Stat. § 77-126](#).

Assessment Level: The legal requirement for the assessed value of all parcels of real property. In Nebraska, the assessment level for the classes of residential and commercial real property is one hundred percent of actual value; the assessment level for the class of agricultural and horticultural land is seventy-five percent of actual value; and, the assessment level for agricultural land receiving special valuation is seventy-five percent of special valuation.

Assessment Sales Ratio: The ratio calculated by dividing the assessed value of the parcel of real property by the selling price of that parcel. Studies utilizing the assessment/sales ratio are collectively called assessment/sales ratio studies.

Average Absolute Deviation (AVG.ABS.DEV.): The arithmetic mean of the total absolute deviations from a measure of central tendency such as the median. Used in calculating the coefficient of dispersion (COD).

Average Assessed Value: The value that is the result of the total assessed value of all sold properties in the sample data set divided by the total of the number of sales in the sample data set.

Average Selling Price: The value that is the result of the total sale prices of all properties in the sample data set divided by the total of the number of sales in the sample data set.

Central Tendency, Measure of: A single point in a range of observations, around which the observations tend to cluster. The three most commonly used measures of central tendency calculated by the Division are the median ratio, weighted mean ratio and mean ratio.

Coefficient of Dispersion (COD): A measure of assessment uniformity. It is the average absolute deviation calculated about the median and expressed as a percentage of the median.

Coefficient of Variation (COV): The measure of the relative dispersion of the sample data set about the mean. It is the standard deviation expressed in terms of a percentage of the mean.

Commercial Property Classification: Includes all properties in the statewide sales file with Property Classification Code: Property parcel type-02 Multi-Family, all Statures; Property parcel type 03-Commercial, all Statures; and, Property parcel type 04-Industrial, all Statures.

Confidence Interval (CI): A calculated range of values in which the true measure of central tendency of the sales is expected to fall. The Division has calculated confidence intervals around all three measures of central tendency.

Confidence Level: The required degree of confidence in a confidence interval commonly stated as a percentage basis. For example, a 95% confidence interval would mean that one can be 95%

confident that the true measure of central tendency used in the interval falls within the indicated range.

Direct Equalization: The process of adjusting the assessed values of parcels of real property, usually by class or subclass, using adjustment factors or percentages, to achieve proportionate valuations among the classes or subclasses.

Equalization: The process to ensure that all locally assessed real property and all centrally assessed real property is assessed at or near the same level of value as required by law.

Geo Code: Each township represented by a statewide unique sequential four-digit number starting with the township in the most northeast corner of the state in Boyd County going west to the northwest corner of the state in Sioux County and then proceeding south one township and going east again, until ending at the township in the southwest corner of the state in Dundy County.

Growth Value: Reported by the county assessor on the Abstract of Assessment for Real Property, Form 45. Growth value includes all increases in valuation due to improvements of real properties as a result of new construction, improvements, and additions to existing buildings. Growth value does not include a change in the value of a class or subclass of real property as a result of the revaluation of existing parcels, the value changes resulting from a change in use of the parcel, or taxable value added because a parcel has changed status from exempt to taxable. There is no growth value for agricultural land.

Indirect Equalization: The process of computing hypothetical values that represent the best estimate of the total taxable value available at the prescribed assessment level. Usually a function used to ensure the proper distribution of intergovernmental transfer payments between state and local governments, such as state aid to education.

Level of Value: The level of value means the best estimate of the relationship of assessed value to actual value for a group of properties based upon an analysis of all information available to the Property Tax Administrator including, but not limited to, the assessment/sales ratio and the assessment practices study for each county for the various classes of real property. The Property Tax Administrator is annually required to give an opinion of the level of value achieved by each county assessor to the Tax Equalization and Review Commission. The acceptable range for levels of value for classes of real property are provided in [Neb. Rev. Stat. § 77-5023](#).

Majority Land Use: The number of acres compared to total acres by land use for agricultural land. The thresholds used by the Division are: 95% and 80%.

Maximum Ratio: The largest ratio occurring in the arrayed sample data set.

Mean Ratio: The ratio that is the result of the total of all assessment/sales ratios in the sample data set divided by the number of ratios in the sample data set and is known as the simple average of the ratios in the data set.

Median Ratio: The middle ratio of the sorted or arrayed assessment/sales ratios. If there is an even number of ratios, the median is the average of the two middle ratios.

Minimally Improved Agricultural Land: A statistical report that uses the sales file data for all sales of parcels classified as Property Classification Code: Property parcel type-05 Agricultural, which have non-agricultural land and/or improvements of minimal value, the assessed value of the improvement(s) is determined to be less than 5% of the selling price.

Minimum Ratio: The smallest ratio occurring in the arrayed sample data set.

Non-Agricultural Land: For purposes of the County Abstract of Assessment for Real Property, Form 45, land located on a parcel that is classified as Property Classification Code: Property parcel type-05 Agricultural, which is not defined as agricultural and horticultural land, pursuant to [Neb. Rev. Stat. § 77-1359](#).

Number of Sales: The total number of sales contained in the sales file that occurred within the applicable Sale Date Range for the class of real property.

Population: The set of data from which a statistical sample is taken. In assessment, the population is all parcels of real property within a defined class or subclass in the county.

Price Related Differential (PRD): The statistical measure found by dividing the mean ratio by the weighted mean ratio, and then multiplying by 100 to obtain the percentage relationship. A percentage more than 100 indicates that higher-priced properties are generally assessed at lower ratios than lower-priced properties. A percentage of less than 100 indicates that lower-priced properties are generally assessed at lower ratios than higher-priced properties.

Property Classification Code: A code that is required on the property record card of all parcels of real property in a county. The Property Classification Code enables the stratification of real property into classes and subclasses of real property within each county. The classification code is a series of numbers which is defined in [Title 350, Nebraska Administrative Code, ch.10- 005.02](#).

Property Type: The portion of the Property Classification Code that indicates the predominant use of the parcel as determined by the county assessor. The Property parcel types are:

- 01-Single Family Residential
- 02-Multi-Family Residential
- 03-Commercial
- 04-Industrial
- 05-Agricultural
- 06-Recreational

- 7- Mobile Home
- 8- Minerals, Non-Producing
- 09-Minerals, Producing
- 10-State Centrally Assessed
- 11-Exempt
- 12-Game and Parks

Purchase Price: The actual amount, expressed in terms of money, paid for a good or service by a willing buyer. This is the amount reported on the Form 521, Line 22.

Qualified Sale: A sale which is an arm's-length transaction included in the sales file as determined by the county assessor or verification process of the Property Assessment Division.

Qualitative Statistics: Statistics which assist in the evaluation of assessment practices, such as the coefficient of dispersion (COD) and the price related differential (PRD).

Quality of Assessment: The quality of assessment achieved by the county assessor for a class or subclass of real property. The Property Tax Administrator is annually required to give an opinion of the quality of assessment achieved by each county assessor to the Commission.

Residential Property Classification: Includes all properties in the state-wide sales file with Property Classification Code: Property parcel type-01 Single Family, all Statuses; Property parcel type-06 Recreational, all Statuses; and, Property parcel type-07 Mobile Home, Statuses 1 and 3.

Sale: All transactions of real property for which the Form 521, is filed and with stated consideration of more than two dollars and twenty-five cents of documentary stamp taxes are paid.

Sale Date Range: The range of sale dates reported on the Form 521, that are included in the sales assessment ratio study for each class of real property.

Sale Price: The actual amount, expressed in terms of money, received for a unit of goods or services, whether or not established in a free and open market. The sale price may be an indicator of actual value of a parcel of real property. An estimate of the sales price may be made from the amount of Documentary Stamp Tax reported on the Form 521, as the amount recorded on the deed. The sale price is part of the denominator in the assessment sales ratio.

Sample Data Set: A set of observations selected from a population.

Special Valuation: For agricultural and horticultural land receiving special valuation, the assessed value of the land if the land is qualified for special valuation. Special valuation means the value that the land has for agricultural or horticultural purposes or uses without regard to the

actual value that land has for other purposes and uses. Special valuation land is valued for taxation at seventy-five percent of its special value.

Standard Deviation (STD): The measure of the extent of the absolute difference of the sample data set around the mean. This calculation is the first step in calculating the coefficient of variation (COV). It assumes a normalized distribution of data, and therefore is not heavily relied on in the analysis of assessment practices.

Statistics: Numerical descriptive data calculated from a sample; for example: the median, mean or COD. Statistics are used to estimate corresponding measures for the population.

Status: The portion of the Property Classification Code that describes the status of a parcel:

- 1-Improved, land upon which buildings are located.
- 2-Unimproved, land without buildings or structures.
- 3-Improvement on leased land (IOLL), any item of real property which is located on land owned by a person other than the owner of the item.

Supplemental Data: Additional information that relates to sold real property as of the date of the sale.

Total Assessed Value: The sum of all the assessed values in the sample data set.

Total Sale Price: The sum of all the sale prices in the sample data set. If the selling price of a sale was adjusted for qualification, then the adjusted selling price would be used.

Usability: The coding for the treatment of a sale in the statewide sales file database.

- 1-use the sale without adjustment
- 2-use the sale with an adjustment
- 3-substantially changed sale should not be used in study
- 4-non-arm's length transactions. Exclude the sale
- 5-not reliable for use as a comparison to similarly classified parcels. Exclude the sale

Valuation: Process or act to determine the assessed value of all parcels of real property in the county each year.

Valuation Group: Valuation group means a group of parcels with similar characteristics that affect market value. Valuation groups represent the class or subclass of property that the county assessor uses to value real property in the county. These groups are defined by the county assessor.

Weighted Mean Ratio: A ratio that is determined by adding the assessed value of each parcel in a data set and dividing that number by the sum of all selling prices in the same data set. The weighted mean gives weight to each dollar value for the parcels included in the date set.