Sales Ratio Study Criteria

Minnesota Department of Revenue

Study Year 2016

Approved May 2016

The Sales Ratio Study is required by Minnesota Statute 270.12 and is used primarily to equalize assessments of property and enhance valuation uniformity across property types. The Tax Court uses the Sales Ratio Study to measure levels of unequal assessment. The Sales Ratio Study is also used for the calculation of various state aids. Finally, bonding companies use the adjusted estimated market values of cities and towns to measure fiscal capacities for bond rating calculations.

The Minnesota Sales Ratio Study adheres to the IAAO Standard on Ratio Studies whenever possible. Deviations from the IAAO Standard are outlined in this document.

The Data & Analysis Unit of the Property Tax Division of the Minnesota Department of Revenue performs the Minnesota Sales Ratio Study.

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I. Changes for the 2016 Study

- **eCRV:** The 2016 Sales Ratio Study will exclusively use sales data submitted through eCRV. Sales that occur from October 1, 2015 through September 30, 2016 will be used for ratios and assessment statistics. These sales, as well as sales that were submitted from January 1, 2015 through September 30, 2015 will be used for trend calculations and calculation of the ANTCs.
- **PRISM:** The 2016 Study will use estimated market values submitted on both the Market Value by Parcel files and on the new PRISM files. 2015 EMVs will be pulled from the final 2015 MVP file. 2016 EMVs will be pulled from the 2016 Adjusted Assessment PRISM file. 2017 EMVs will be pulled from the 2017 Preliminary Assessment PRISM file.
- **2a/2b:** For the purposes of assigning sales ratio property types, any sale with 75% or more of its acreage classed as 2a will be considered 2a, and any sale with 75% or more of its acreage classed as 2b will be considered 2b, Any sale that does not meet either of these criteria will be considered mixed. These percentages will be based on the acreage reported in the classification table on the county tab of eCRV.
- **Financing Adjustments:** Several new limits have been put in place to prevent unnecessary financing adjustments from taking place. No financing adjustment of 1% or less will be made. No financing adjustment will be made if the reported interest rate differs from the market rate by half a percentage point or less. For more information, see Financing Adjustments.
- **Regions:** Data & Analysis, in conjunction with the county's PTCO, will review any requests for revised regions for the 2016 Study. Please submit any region change requests to Data & Analysis by August 31. Requests should be based on improving the representation of your county's markets in the study.

II. Items of Note

- **Sale Submission Deadlines:** All sales that occurred between January 1, 2015 and September 30, 2016 are eligible to be included in the 2016 Study. All sales that are accepted in eCRV by November 1, 2016 will be included in the study. It is important that all sales that occurred in the study period are accepted by November 1 and that all of these sales are submitted to the state before trends are finalized to ensure that the study accurately represents the market and assessment.
- **Sales Lists and Edits:** Data & Analysis will continue to provide sales listings regularly starting in July 2016. It is important that counties work with their PTCO to review and edit their sales lists in a timely manner. The study process relies on clean sales data. Delays in providing cleaned data can slow the entire process, including the timeline for issuing trends. Sales data is also used for a variety of other purposes beyond the study, so it is important that each sale is correctly reported to the Department of Revenue.
- **MCAST v3.0:** A new version of MCAST will be available for counties to estimate their trends, ratios, and assessment statistics in July. MCAST v3.0 will use extremes as

identified by the DOR at the base region level (rather than calculating its own extremes) and will allow the user to manually adjust which sales are considered extreme. It will maintain the capability to determine extremes using different sales sets. As in MCAST v2.0, ratios can be calculated by jurisdiction with a regional trend; statistics are calculated with and without extremes; and trends and extreme ratio bounds can be manually entered.

- **PRB:** The PRB will not be enforced in State Board Orders for this study year. Rather, the PRB will continue to be an informational statistic for counties to measure their vertical equity. The Department of Revenue will be focusing on education of the PRB, including how to interpret the PRB and how to bring a PRB into compliance. The PRD and COD will continue to be enforceable by the State Board of Equalization. For more information on the PRB and other assessment statistics, go to Assessment Statistics.
- **Five-Year Study:** Data & Analysis will again issue a five-year study for counties to review those jurisdictions which do not consistently have six or more sales. This year's five-year study will include local effort as a means of understanding the assessment of a jurisdiction. More information can be found in Reports.
- **New Experimental Aggregations:** Data & Analysis will be calculating trends for two new experimental aggregations: a 2a aggregation and a 2b aggregation. The 2a trend will be based on sales of PTs 32 and 48. The 2b trend will be based on sales of PTs 34, 35, and 48.These trends will not be the officially issued as a part of the study, but they may help inform trend appeals.
- **Reject Reasons:** Several reject reasons have become irrelevant to the study due to the switch to eCRV and other changes. These reasons will remain options on eCRV, but they should no longer be used. They will be removed from eCRV in November 2016. See Appendix A: Reject Reason Definitions for more details. These reject reasons include:
  - 1—Old sale
  - 11—Skipped CRV number
  - 13—Duplicate CRV
  - 28—Nursing homes and manufactured home parks

III. Overview of the Sales Ratio Study

In order to evaluate the accuracy and uniformity of assessments within the state and to ensure compliance with property tax laws, the Minnesota Department of Revenue conducts an annual Sales Ratio Study. This study measures the relationship between appraised values and actual sale prices. As a mathematical expression, a sales ratio is the assessor's estimated market value of a property divided by its sales price, as seen here:

$$\text{Sales Ratio} = \frac{\text{Assessor's Estimated Market Value}}{\text{Sales Price}}$$

The Sales Ratio Study provides an indication of the level of assessment (how close appraisals are to market value on an overall basis), as well as the uniformity of assessment (how close individual appraisals are to the median ratio and each other).

Minnesota requires the reporting of sales information on an electronic Certificate of Real Estate Value (eCRV). Assessors must verify and review sales information before it can be used as part of the Sales Ratio Study. Certain sales are automatically removed from consideration, while others require more scrutiny and review by the assessor. When only verified sales remain, the Department of Revenue and the assessor are able to analyze them to make some generalizations about the market for the Sales Ratio Study.

The Sales Ratio Study is the culmination of the ongoing process of collecting and verifying sales information. It provides important information in planning the upcoming assessment, evaluating the existing assessment, and identifying inequities in the assessment. There are other uses, as well. The Sales Ratio Study is used by assessors in refining their valuation levels, by the tax court in adjudicating assessments, by the State Board of Equalization in determining orders, and by various aid calculations that utilize measures of equalized values. Additionally, these studies are useful to legislators in developing tax policy and determining tax rates. Property owners may also use the studies if they have concerns about unfair or inequitable treatment by assessors.

By the time the Sales Ratio Study is finalized by the Department, there is an expectation that all the underlying sales data have been reviewed and are representative of the market.

Jurisdictions that lie in multiple counties will be studied by the county components of that jurisdiction, rather than the jurisdiction as a whole.

There are five primary uses of the Sales Ratio Study in Minnesota:

1. State Board of Equalization
2. Tax Court
3. Adjusted Net Tax Capacities
4. Railroad and Utility Equalization
5. Economic and Indicated Market Values

A. State Board of Equalization

The Minnesota State Board of Equalization uses a 12-month study to judge overall levels of assessment. This study will use sales that occurred from October 1, 2015 to September 30, 2016. For this study, the median of all ratios within the reported jurisdiction and property type is considered. The study adjusts sales prices forward to

estimate what the ratio would be if the sale took place at the time of assessment (January 2, 2017). The preliminary ratios for this study compare the forward-adjusted sale prices to the 2016 estimated market values, and the final ratios for this study compare the forward-adjusted sale prices to the 2017 estimated market values. The final ratios are used to equalize values and enhance uniformity across property types and between jurisdictions.

The Commissioner of Revenue constitutes the State Board of Equalization and in that capacity is empowered to reduce wide disparities in assessment levels between counties and among the property types within counties. When the Commissioner determines that there has been an unfair or inequitable assessment, the Commissioner is authorized under Minnesota Statute 270C.94 to order a reassessment of any taxing district in order to make a correction.

This study may also help guide assessments by providing information to assessors on which to base adjustments to the assessment with respect to neighboring counties.

B. Tax Court

The Minnesota Tax Court uses a 9-month study and a 12-month study for property valuation cases. The 9-month study will use sales that occurred from January 1, 2016 through September 30, 2016. The 12-month study uses sales that occurred from October 1, 2015 to September 30, 2016. For both of these studies, the sales are adjusted to the 2016 assessment date and are compared to the 2016 estimated market values. The Tax Court prefers to use the 9-month "backward-adjusted" study because all sales used in the study occur after the assessment date. The Tax Court Studies are used to measure unequal levels of assessment (discrimination) within property types. A median ratio is considered to measure the level of assessment equity.

C. Adjusted Net Tax Capacities

A 21-month study is used to produce Adjusted Net Tax Capacities (ANTCs) for school and local government aids, as well as a variety of apportionments. The ANTC Study will use sales that occurred from January 1, 2015 through September 30, 2016. Sales that occur in calendar year 2015 are adjusted backward and compared to the 2015 assessment and sales that occur in calendar year 2016 are adjusted backward and compared to the 2016 assessment. A weighted median ratio is used for all aid calculations.

D. Railroad and Utility Equalization

The Department of Revenue's State Assessed Property Unit uses a 12-month forward adjusted study to equalize railroad and utility values. A median ratio is considered.

E. Economic and Indicated Market Values

The Economic Market Value Study is a sales ratio-adjusted measure of a community's property wealth, using estimated market values as a starting point. Bonding companies use the adjusted estimated market value of cities and towns to measure fiscal capacities for bond rating calculations. In previous years, the adjusted-ratio study was based on taxable values and was called the Indicated Market Value Study. In 2011, Minnesota created a new homestead market value exclusion, which excluded a share of homestead property from the net tax capacity calculation, leading to a reduction in taxable market value. As a result, the wealth of a community was better represented by the estimated market value, rather than the taxable market value that has been reduced by the homestead exclusion.

IV. Sales Reporting

A. Sales Submission

The 2016 Sales Ratio Study will exclusively use sales that were submitted through eCRV. Sales that occur from October 1, 2015 through September 30, 2016 will be used for ratios and assessment statistics. These sales, as well as sales that were submitted from January 1, 2015 through September 30, 2015 will be used for trend calculations and calculation of the ANTCs.

Only sales with its eCRV accepted by the county by November 1, 2016 will be included in the 2016 Study.[1]

Sales that are to be included in the 2016 Study must be submitted to the Department of Revenue no later than November 10, 2016. This cutoff date is necessary to allow county assessors and PTCOs sufficient time to review the reports issued by the Department of Revenue, for counties to appeal trends, and for the Department's appeals panel to meet and review appeals.

More information on eCRV can be found on the Department's website.

B. Sales Lists

Starting in July, the Department of Revenue will regularly send out lists of sales included in the 2016 Study. Before trends are finalized, sales from January 1, 2015 through the date of the listing will be on the list. Once trends are finalized, only sales from the 12-month study will be on the lists (October 1, 2015 through September 30,

[1] Sales that do not meet this deadline for the 2016 Study will still be used in the 21-month studies of the 2017 Sales Ratio Study.

2016). Counties should work with their PTCOs to review and edit these sales to ensure that they are being reported properly for the Sales Ratio Study.

Data & Analysis performs audits on all sale data to help identify and flag sales that may require additional review. These flags will be displayed on the sales list.

C. Sales Ratio Property Types

In the past, sales ratio property types were reported directly by the county on the sales file. Now, property types are determined for each sale based on the information reported on the eCRV. Accurate reporting of the following fields on eCRV are critical for ensuring that sales get assigned the correct sales ratio property type:

- Primary Type for Study Indicator—*County Tab*
  This indicator determines which Property Group or Type reported for a sale will be used to determine the sales ratio property type. Generally, the Property Group or Type with the most value should be the primary type, but there are many exceptions to this rule. Contact your PTCO with any questions.
- Property Type Group—*County Tab*
  For most sales, the property type group dropdown provides enough information to place the sale in the correct property type bucket. If a sale is a commercial, industrial, SRR (both commercial and non-commercial), apartment, or 2c managed forest property, the second optional property type dropdown must be selected to ensure the sale is placed in the correct sales ratio property type bucket.
- Property Type—*County Tab*
  The property types in this dropdown match the new PRISM property types. This dropdown is optional, but in order to ensure that all sales are placed in the correct sales ratio property type, **eCRVs for the following types of property sales must have the property type dropdown completed**:
  - Commercial
  - Industrial
  - SRR, commercial and non-commercial
  - Apartments
  - 2c managed forest
- Land/Building Indicator—*Property Tab*
  This indicator describes whether only land, only buildings, or both land and buildings were included in the sale to determine if the sale should be put in a bare land property type.

- Deeded Acres—*County Tab*
  The deeded acreage field describes whether an agricultural/rural vacant sale is more or less than 34.5 acres.[2]
- Classification Acreage—*County Tab*
  For sales with both agricultural and rural vacant property types, the acreage amounts from the classification table will used to determine whether a sale is considered 2a, 2b, or mixed.

For a list of the sales ratio property types and their aggregations, see Property Types and Aggregations.

If Data & Analysis cannot determine the sales ratio property type from the above fields, the property type will be determined using data from the most recent MVP or PRISM submission. These sales will be flagged on the sales list for further review.

D. Reporting Agricultural and Rural Vacant Land Sales

In addition to reporting deeded acres, the Sales Ratio Study requires reporting the number of acres in 2a and 2b land identified as tilled, pasture, meadow, woods, waste, exempt wetland, exempt native prairie, first acre site value, additional site value, ditches and roads, and other. In many parts of the state, sales will include a mixture of 2a and 2b lands. The acreage detail allows the Department of Revenue to assign the correct sales ratio property type to each sale (see Sales Ratio Property Types). Accurate reporting of the acreage detail is also critical for determining each county's Green Acres value.

Any property with 75% or more of its acreage classified as 2a will be considered 2a when assigning sales ratio property types. Any property with 75% or more of its acreage classified as 2b will be considered 2b when assigning sales ratio property types. Any property which is not at least 75% 2a or 75% 2b will be considered mixed when assigning sales ratio property types.

As we implement PRISM, we continue to encourage improved data quality in reporting 2a and 2b acres. As part of that effort, we are making the definitions we use for the 2a/2b breakdown consistent across eCRV, abstracts, and PRISM.

[2] Note: the deeded acreage field appears on both the county tab and the property tab of the eCRV application. Each of these fields automatically populates the other when a change is saved.

We recognize that the total acres reported in the classification table may not sum to the total deeded acres due to easements and classifications of properties that do not track acreages.

A table with the 2a/2b eCRV breakdown, as well as definitions for each classification type, can be found below.

2a/2b Classification Breakdown

Classification	2a Acres	2a EMV	2b Acres	2b EMV
Tilled				
Pasture				
Meadow				
Woods				
Waste				
Exempt Wetland				
Exempt Native Prairie				
Ditches and Roads				
Other				
1st Acre Site				
Non-HGA Site				

Tilled: Real estate devoted to, or cultivated productively for, the annual growing of agricultural products for sale, or that is tillable even if currently fallow.

Pasture: Non-tillable real estate on which grass or other vegetation eaten as food by grazing animals grows, which is set aside for use by domestic grazing animals as part of a farm or ranch. (This usually requires fencing to restrict animal movement. Pasture land may include stands of trees if used for grazing by domestic animals.)

Meadow: Non-tillable real estate serving as a habitat of rolling or flat terrain where grasses predominate, typically containing a significant variety of annual, biennial and perennial plants. (Meadow is grass land from which hay could be cut, distinguished from tilled land where alfalfa has been sown.)

Woods: Non-tillable real estate having stands of trees, including integral open space, and including felled areas that are awaiting restocking. Woodlands may support an understory of shrubs, herbs, or grasses. (Some stands of trees could be considered "pasture" if used for grazing by domestic animals.)

Waste: Non-tillable real estate that cannot be used economically for agricultural use or production. Such land types include blowouts, river wash, marshes, swamps, sloughs (including wetlands covered all or part of the year with water, but not so deeply or permanently as to be classified as water surface per se), badlands, steep hillside, large deep gullies (including streambeds and banks, bluffs, and rock land).

Exempt Wetland: As defined by Minnesota Statute 272.02, Subd 11, "wetlands" means:

(i) Land described in section 103G.005, subdivision 15a (as public wetlands);

(ii) Land which is mostly under water, produces little if any income, and has no use except for wildlife or water conservation purposes, provided it is preserved in its natural condition and drainage of it would be legal, feasible, and economically practical for the production of livestock, dairy animals, poultry, fruit, vegetables, forage and grains, except wild rice; or

(iii) Land in a wetland preservation area under sections 103F.612 to 103F.616.

"Wetlands" under clauses (i) and (ii) include adjacent land which is not suitable for agricultural purposes due to the presence of the wetlands, but do not include woody swamps containing shrubs or trees, wet meadows, meandered water, streams, rivers, and floodplains or river bottoms. Exemption of wetlands from taxation pursuant to this section shall not grant the public any additional or greater right of access to the wetlands or diminish any right of ownership to the wetlands.

Exempt Native Prairie: Land defined by Minnesota Statute 272.02, Subd. 12, and determined by the Commissioner of the Department of Natural Resources as native prairie. Pasture land used for livestock grazing purposes is not considered native prairie.

Ditches and Roads: Road, road right-of-way and ditch acres that are included in deeded acres.

Other: Any 2a or 2b land not included in the following categories: Tilled, Pasture, Meadow, Woods, Waste, Exempt Wetland, Exempt Native Prairie, Building Site, Additional Site, or Ditches and Roads.

1st Acre Site: First acre of a building site (1st acre of HGA)

Non-HGA Site: Building site in excess of "1st acre site"

E. Special Situations

i. Special Assessments

In most cases, the inclusion of special assessments can complicate the determination of sale prices without significantly improving the accuracy of the study. Special assessments should be reported on eCRV only if the dollar amount of the assessment is included in the consideration of the sale and the cost of the assessment has contributed value to the property which is also included in the assessor's estimated market value.

ii. Split Sales

Split sales of 2a, 2b, and 2c lands consisting of at least 34.5 acres will be considered for the study. For example, if a farmer sells 40 acres from a 160-acre farm, this would be considered a good split sale.

County assessors are asked to make sure that value is split promptly and assign a new parcel identification number after the ECRV is filed to ensure uniform treatment of split sales throughout the state.

Non-agricultural/rural vacant split sales are rejected from the study.

Agricultural/rural vacant split sales consisting of less than 34.5 acres are considered good sales if they meet the definition of arms-length transaction, although they will not be used in determining trends or ratios for the study. Information from these sales will be useful for analyzing agricultural sales and determining Green Acres values.

F. Guidelines for Accepting or Rejecting Sales

All open market, arms-length sales should be accepted for the study. An "open-market sale" is one in which the buyer and seller are acting prudently and the price is not affected by undue stimulus. Neither the buyer nor the seller are under great pressure to complete a transaction in a short time. An "arms-length sale" is between two parties, both of whom are seeking to maximize their gain from the transfer.

The terms of each sale must be verified at the county level. The Department relies on counties to verify all sales. The Department of Revenue does not verify sales.

The following list spells out the general types of sales that do not meet the acceptance criteria and should be rejected. These reject reasons are not hard and fast rules. A sale that sounds like it meets the reject criteria may still be considered an arms-length sale.

Sale Reject Reasons[3]

Code	Reject Reason
~~01~~	~~Old sale outside of the 21-month study period~~
02	Relative sale or related business
03	Government or exempt party sale
04	Partial interest sale
05	Use/class change
06	Unusual financing
07	Physical change[4]
08	Correction deed
09	Trade, gift, or estate sale
10	Prior interest sale
~~11~~	~~Skipped CRV number~~
12	Unique reject reason
~~13~~	~~Duplicate CRV or eCRV~~
14	Sale of interest in or payoff of a contract for deed or mortgage assumption
15	Distressed or forced sale
16	Assessor value for sale year not available or split property sales
17	Excessive non-real property
18	Rewrite of terms or default on contract for deed
19	Relocation/employee transfer
20	Leaseback
21	Bank sale
22	Contract for deed sale with less than minimum down payment
23	Sale for less than minimum price
24	Sale of property in more than one county
25	Agricultural Preserve or other sale subject to minimum assessment agreement
26	Not typical market or doubtful title
27	Court ordered value
~~28~~	~~Nursing home or mobile home park~~
29	Allocated sale price
30	Assessor's value restricted by plat law in first year
31	Assemblage

[3] Several of these reject reasons are stricken through because they should not be used for the 2016 Study. See Appendix A: Reject Reason Definitions for more information.

[4] See Net Improvements for more information on when these sales should be rejected

The circumstances of each sale should be considered individually. If a sale is rejected, it is rejected for all studies, including for State Boards, Tax Court, and Adjusted Net Tax Capacities. Note that several of these reject reasons are stricken through. While they are still an option on eCRV, they should no longer be used and will be removed from eCRV for the next study year. See the Appendix A: Reject Reason Definitions for a more detailed explanation of every reject reason.

i. Net Improvements

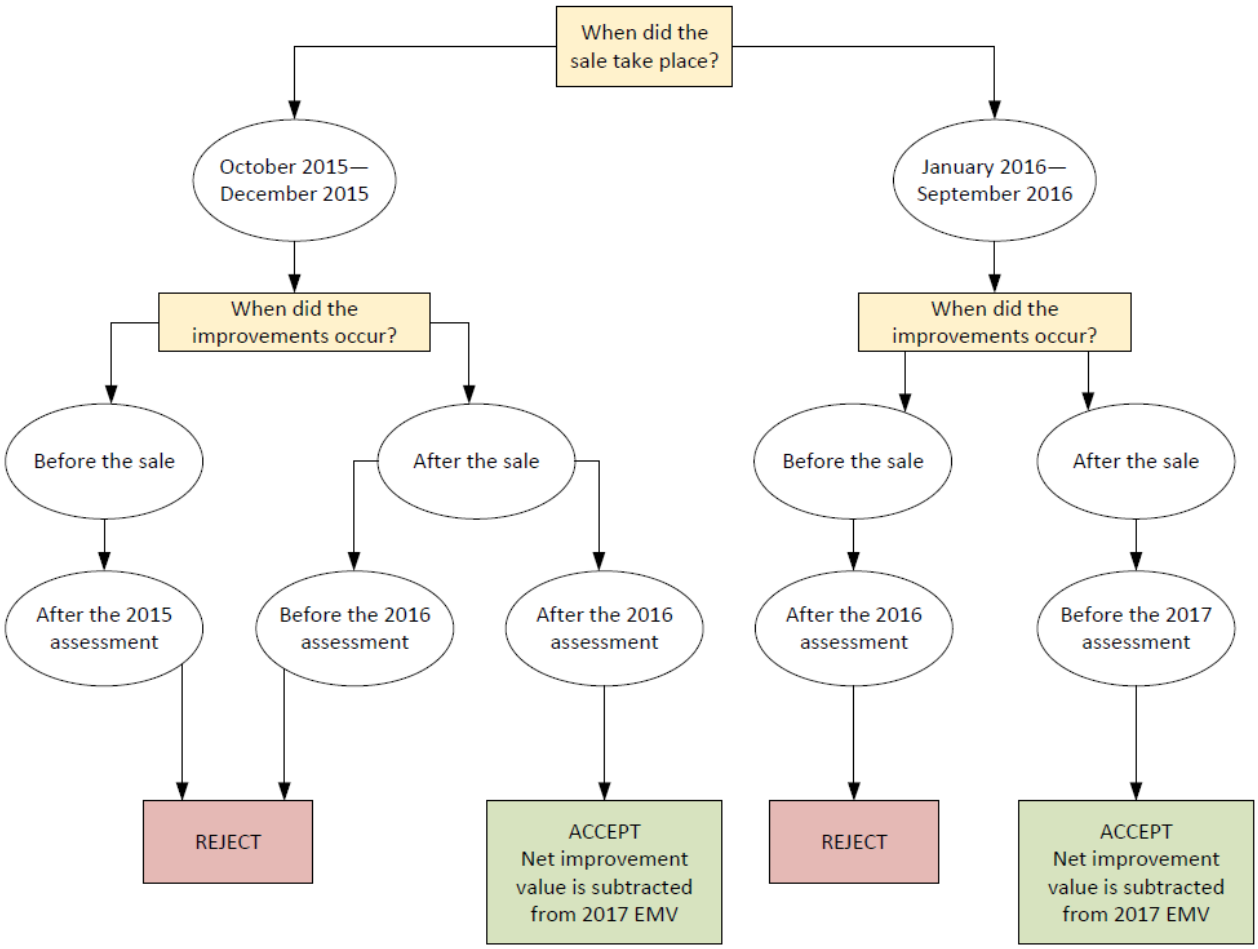
The purpose of this section is to clarify the impact new construction and other physical change of a property has on its suitability for the study.

Values for net improvements reported on the Market Value by Parcel file and PRISM should reflect net changes in value, not just gross value of new construction. For example, if a homeowner demolished a garage valued at $35,000 and built a new garage valued at $65,000, then the amount of new construction reported should be $30,000 ($65,000 of the new garage minus the $35,000 value of the old garage). Net improvements can be both positive and negative. If your county is reporting the gross value of new construction, you need to notify your PTCO so we can make the necessary corrections to those values for sold parcels.

Sales that occurred January 2015 through September 2015 that were not rejected for the 2015 Study will be included in the 2016 Study. The Department of Revenue may adjust the 2015 EMV for these sales by the amount of net improvement when calculating market condition trends. Go to Net Improvement and Market Condition Trends for more information on these adjustments.

Not all sales that occurred October 2015 through September 2016 with net improvement will be rejected from the study. Generally, a sale should be rejected for physical change only if the EMV cannot reasonably be adjusted to a value comparable to the sale price. The following flowchart and examples illustrate when a sale should be rejected from the study and how to adjust the EMV for sales that are not rejected.

Reject Criteria for Sales with Net Improvements



Example 1:
Sale Date: November 2015
Sale Price: $100,000
New Construction: $70,000 structure added in May 2015
Status: Reject
Explanation: This sale would be rejected because the improvements occurred between the January 2015 assessment date and the November 2015 sale date. This sale would be considered invalid for all 2016 studies.

Example 2:
Sale Date: November 2015
Sale Price: $100,000
New Construction: $70,000 structure added in December 2015
Status: Reject
Explanation: This sale would be rejected because the improvements occurred between the November 2015 sale date and the January 2016 assessment date. This sale would be considered invalid for all 2016 studies.

Example 3:
Sale Date: November 2015
Sale Price: $100,000
New Construction: $70,000 structure added in July 2016
Status: Good
Explanation: This sale should not be rejected because the improvements occurred after the November 2015 sale date and after the January 2016 assessment date. The sale price is comparable to the 2016 EMV. The 2017 EMV will need to be adjusted by the net improvement amount that occurred in 2016 in order to be comparable to the sale price for the State Board Study.

Example 4:
Sale Date: April 2016
Sale Price: $100,000
New Construction: $70,000 structure added in February 2016
Status: Reject
Explanation: This sale would be rejected because the new construction occurred between the January 2016 assessment date and the April 2016 sale date. This sale would be considered invalid for all 2016 studies.

Example 5:
Sale Date: April 2016
Sale Price: $100,000
New Construction: $70,000 structure added in July 2016
Status: Good
Explanation: This sale should not be rejected because the improvements occurred after the April 2016 sale date and before the January 2017 assessment date. The sale price is comparable to the 2016 EMV. The 2017 EMV will need to be adjusted by the net improvement amount that occurred in 2016 in order to be comparable to the sale price for the State Board Study.

V. Methodology

The 2016 Sales Ratio Study follows the guidelines described in the International Association of Assessing Officers' (IAAO) *Standard on Ratio Studies*, April 2013. The following section describes the methodology followed by Data & Analysis when performing the 2016 Sales Ratio Study.

The 2016 Sales Ratio Study will utilize sales that occurred from January 1, 2015 through September 30, 2016. The Sales Ratio Study only uses sales that were not rejected. It is up to the counties to ensure that the appropriate sales are used in the study and that these sales are reported correctly. In the case of a resale of a property, only the most recent, non-rejected sale is used in the study.

A. Sale Price Adjustments

In order to get to a market sales price, the Department of Revenue may adjust a sale's gross sale price by several factors included in the terms and financing of the sale. These adjustments allow the sale price to be compared to the assessor's estimated market value.

The net sale price is the gross sale price after adjusting for the terms and financing of the sale. The net sale price is used in an all ratio calculations, including those ratios used to determine market condition trends. See the equation for net sale price below.

$$\text{Net sale price} = (\text{Gross sale price} - \text{personal property} - \text{seller paid points} + \text{special assessments}) + \text{financing adjustments}$$

Seller paid points, buyer paid special assessments, and personal property are all reported on eCRV. For more information on when special assessments should be included in the consideration of the price, see Special Assessments. See below for more information on financing adjustments.

Once market condition trends are determined, they are applied the net sale price. For more information on market condition adjustments, see below.

i. Financing Adjustments

All sales in the 2016 Study will be reviewed to determine whether financing adjustments are needed. Sales recorded on contract for deed or sales recorded on warranty deeds that include an assumption of an existing mortgage or a seller-provided mortgage will be automatically adjusted to a cash equivalency using market rates (posted on our website).

Financing adjustments are calculated using the gross sales price after any personal property, seller paid points, and special assessments have been adjusted for. These adjustments may be positive or negative, as outlined in IAAO guidelines. Financing adjustments will not be made to new mortgages from third parties.

No financing adjustment of 1% or less will be made. No financing adjustment will be made if the reported interest rate differs from the market rate by half a percentage point or less. Large adjustments will be flagged on the sales list for review.

If a county considers a financing adjustment inappropriate due to uncaptured sale characteristics, they should confer with their PTCO to determine a more appropriate adjustment.

B. Stratification

Sales within the study period are stratified into representative groups for market condition trend calculations and ratio calculations. Stratification is based on property type, city, county, and water status.

i. Property Types and Aggregations

We aggregate various sales ratio property type codes to calculate market condition trends and ratios. The table on the following page shows the property types and aggregations used for the study. This table can also be found in Appendix B: Property Types and Aggregations for the Sales Ratio Study.

Property Types and Aggregations for the Sales Ratio Study

2016 SALES RATIO PROPERTY TYPES AND AGGREGATIONS				
	Aggregation	**Description**	**Property Type**	**Description**
Ratio + Trend	02	Apartments	02	Apartments
Ratio + Trend	06	Commercial	06	Commercial
Ratio + Trend	07	Industrial	07	Industrial
Ratio	90	Bare Land LESS than 34.5 acres 2a, 2b, 2c, and mixed 2a/2b	37	Agriculture 2a - bare land less than 34.5 acres
			39	Rural Vacant 2b - bare land less than 34.5 acres
			40	Managed Forest 2c - bare land less than 34.5 acres
			50	Mixed 2a, 2b - bare land less than 34.5 acres
Ratio + Trend	91*	Residential/Seasonal Recreational Residential	01	Residential (less than 4 units)
			03	Non-commercial seasonal residential recreational
Ratio	92**	Bare land MORE than 34.5 acres 2b, 2c, and mixed 2a/2b	34	Rural Vacant 2b - bare land more than 34.5 acres
			35	Managed Forest 2c - bare land more than 34.5 acres
			48	Mixed 2a, 2b - bare land more than 34.5 acres
Ratio + Trend	93	Bare land MORE than 34.5 acres 2a, 2b, 2c and mixed 2a/2b	32	Agriculture 2a - bare land more than 34.5 acres
			34	Rural Vacant 2b - bare land more than 34.5 acres
			35	Managed Forest 2c - bare land more than 34.5 acres
			48	Mixed 2a, Rural 2b - bare land more than 34.5 acres
Ratio	95**	Bare land + Land with buildings MORE than 34.5 acres 2a, 2b, 2c, and mixed 2a/2b	31	Agriculture 2a - land with buildings more than 34.5 acres
			32	Agriculture 2a - bare land more than 34.5 acres
			33	Rural Vacant 2b - land with buildings more than 34.5 acres
			34	Rural Vacant 2b - bare land more than 34.5 acres
			35	Managed Forest 2c - bare land more than 34.5 acres
			47	Mixed 2a, 2b - land with buildings more than 34.5 acres
			48	Mixed 2a, 2b - bare land more than 34.5 acres

Note: Land that is at least 75% 2a will be considered 2a. Land that is at least 75% 2b will be considered 2b. Everything else will be considered mixed.

*Trends are calculated by water status. Ratios are calculated and reported by water status and combined.

**Sales used in this aggregation are adjusted by the PT 93 trend.

Note that some property types fall within more than one aggregation and some property types do not fall into an aggregation at all. Additionally, some trends are calculated using one aggregation and are applied to other aggregations. The PT 96 aggregation is used as a catch-all for property types which are not used to calculate state-issued trends or ratios. See all PT 96 property types in the table below.

Property Grouping 96

Property Type	Description
08	Public Utility
09	Railroads
10	Mineral
14	Seasonal Recreational Commercial and Resorts
20	Personal property
21	Residential Bare Land
22	Apartment Bare Land
23	Seasonal Recreational Bare Land
26	Commercial Bare Land
27	Industrial Bare Land
30	Exempt
36	Agriculture 2a - land with buildings less than 34.5 acres
38	Rural Vacant 2b - land with buildings less than 34.5 acres
49	Mixed 2a, 2b - land with buildings less than 34.5 acres
51	Manufactured Home Parks

ii. Market Condition Regions

For the purpose of the Sales Ratio Study, regions are geographic areas, whether a jurisdiction, county, or group of jurisdictions or counties, that were identified as having similar markets. Market condition trends, or trends, are determined based on sales ratios for various property types in these regions.

Trends are calculated for the following property types or aggregations:

- PT 02—Apartments
- PT 06—Commercial
- PT 07—Industrial
- PT 91, On-Water—Residential/Seasonal Residential Recreational
- PT 91, Off-Water—Residential/Seasonal Residential Recreational
- PT 93—Agricultural/Rural Vacant Bare Land

Each property type has a base region, or the area for which a trend is initially calculated. However, if there are less than 30 sales or the trend is insignificant in the

base region, each property type may revert to the trend of a larger default region. If the default region has less than 30 sales or the trend is insignificant, that region receives no trend.

Below is a summary table of each property aggregation's base and default regions. The rest of this section will describe the specifics of each region and their market condition trends.

Base and Default Regions by Property Grouping

Property Aggregation	Base Region	Default Region
Agricultural/Rural Vacant (PT 93)	County	Agricultural/rural vacant region
Residential/Seasonal Residential Recreational (PT 91) ON-WATER	City/township, residential region, or balance of county	County on-water OR base region combined on-/off-water
Residential/Seasonal Residential Recreational (PT 91) OFF-WATER	City/township, residential region, or balance of county	County off-water
Apartment (PT 02), Commercial (PT 06), OR Industrial (PT 07)	County or first class city	None

Only the part of a joint city in the county of location is used when calculating that county's countywide trend. If a joint city must default to a countywide trend, the whole city receives the home county countywide trend. See Appendix D: Joint Cities and Regions for the list of base and default regions of joint cities and the exceptions.

County assessors should review their regions and submit any requests for revised regions, including changes to how on-water sales are considered, for the 2016 Study to their PTCO and Data and Analysis by August 31, 2016.

Agricultural/Rural Vacant Property (PT 93)

Agricultural/rural vacant regions are made up of at least two counties, and Minnesota is divided into 23 agricultural/rural vacant regions. See Appendix C: Agricultural/Rural Vacant Region Map to see the regions.

Agricultural/rural vacant trends are first calculated at the county level. If the county has a significant trend and at least 30 sales, the county receives its individual county trend. Otherwise, the county is eligible for the regional trend if the region has a

significant trend and at least 30 sales. Counties with individual trends are still included in calculating the regional trend.[5]

Agricultural/rural vacant regions are not separated by water status.

Residential/Seasonal Residential Recreational Property (PT 91)

Residential/seasonal residential recreational regions are geographic subsets of a county. Res/SRR regions are defined by county assessors and should be areas with similar markets. Res/SRR regions range in size from an individual city or township to groups of cities and townships up to the entire county.

Res/SRR is further stratified by water status, which can either be on-water or off-water. A county's PT 91 on- and off-water regions do not need to be made up of the same jurisdictions/geographic area. For example, Pine County could have four off-water res/SRR regions (North Pine, East Pine, South Pine, and West Pine) but only two on-water res/SRR regions (Inner Pine, Outer Pine). A county may also elect to not separate their PT 91 sales by water status if there is little water influence in their county.

Res/SRR trends are first calculated at the residential region level. If the residential region has a significant trend and at least 30 sales, the residential region receives its own trend. Otherwise, the residential region is eligible for the countywide trend if the trend is significant and there are at least 30 sales in the county.

The county may elect for their on-water res/SRR regions to default to that geographic region's combined on- and off-water trend. The standard default will be a countywide on-water trend unless otherwise requested.

First class cities (Minneapolis, St. Paul, Duluth, Rochester, and St. Cloud) are never included when calculating a countywide trend, as their market might be significantly different than the rest of the county.

[5] When calculating the regional trend, the ratios are normalized. All agricultural/rural vacant ratios within each county are divided by the county median ratio. This brings all median ratios equal to 1.0 and eliminates the impact of different targets for assessment. However, when we use the natural log of the inverted ratio, the procedure takes care of the normalization. In other words, when we use the natural log of the inverted ratio to calculate trends, different targets are accounted for by the natural log.

Apartment, Commercial, or Industrial Property (Property Grouping 02, 06, or 07)
Commercial, industrial, and apartment property share the same regions, but the trends for these different types of properties are calculated separately from each other.

Generally, regions for these property types are either first class cities or individual counties. Moorhead is treated as a first class city for this purpose, and Hermantown is included with Duluth. These first class cities are not included in the countywide trends.

These property types do not have a default region. If their base region does not have at least 30 sales and a significant trend, the region receives no trend.

Commercial, industrial, and apartment regions are not separated by water status.

iii. Water Status

Water status is reported on the Market Value by Parcel file and on PRISM files. There are currently six codes to indicate water status. Properties on lakes, rivers, ponds, creeks, and streams, and properties with other water influence, are considered on-water for the Sales Ratio Study. All other properties, including properties on swamps or sloughs, are considered off-water for the Sales Ratio Study. It is important for counties to accurately report a property's water status in order to perform the proper analysis for the study. Providing accurate water codes also increases the Department of Revenue's ability to stratify and analyze sales beyond the study methodology, which can be useful when considering appeals to market condition adjustments.

The following codes should be used to indicate a property's water status:

L: The water code type "L" should be used for property physically located on, or having immediate access to, a lake with a valid DNR issued Lake ID. This includes properties with egress accessibility or located across the road with a dock. If a building has shared immediate access to this water, units with shared access *and* a view should be indicated with an "L." Property with an "L" water status will be considered on-water for the Sales Ratio Study.

R: The water type code "R" should be used for property physically located on, or having immediate access to, a river or stream with a valid DNR issued River ID. This includes properties with egress accessibility or located across the road with a dock. If a building has shared immediate access to this water, units with shared access *and* a

view should be indicated with an "R." Property with an "R" water status will be considered on-water for the Sales Ratio Study.

S: The water type code "S" should be used for property physically located on a swamp or a slough. Property with an "S" water status will not be considered on-water for the Sales Ratio Study. In some instances, a swamp or slough may add value to a property. In those instances, the county should work with their PTCO to determine whether the property should be indicated with a "P".

P: The water type code "P" should be used for property physically located on a pond, creek, stream, or other small body of water. These bodies of water should not have DNR issued IDs. Anything with a valid DNR issued ID should be reported with an "L" or an "R." Property with a "P" water status will be considered on-water for the Sales Ratio Study. In some instances, these bodies of water have negative or no influence on the value of a property. In those instances, the county should work with the PTCO to determine whether the property should be indicated with an "S".

O: The water type code "O" should be used for property that does not qualify for the other indicator types but that does have some sort of water influence on value. These properties may include but are not limited to properties across the street from a body of water, with no egress accessibility or dock, or units within a building physically located on a body of water with shared access but no view. Properties with a water status "O" will be considered on-water for the Sales Ratio Study.

N: The water type code "N" should be used for properties that are not on any type of water and do not have any water influence on value. Properties with a water status "N" will be considered off-water for the Sales Ratio Study.

iv. Joint Cities

A joint city is a city that crosses county boundaries. A joint city may have parcels of properties in more than one county. There are 42 joint cities in the State of Minnesota. Joint cities may be treated differently than other jurisdictions to ensure that trends, ratios, and statistics accurately reflect the assessment of the multiple county components of the joint city.

Every joint city is assigned a home county based on the highest percentage of value or improved parcels in the city. Every joint city also has one or more non-home counties. These are the complement to the home county, the county or counties that do not make up the highest percentage of value or improved parcels in the city. The county of location refers to the county which individual parcels are located in.

Ratios and assessment statistics are reported for joint cities by county of location. Ratios for the other county components of the joint cities will also be reported for each county to review.

Details on the use of properties in joint cities for determining market condition trends can be found below.

C. Extreme Ratios

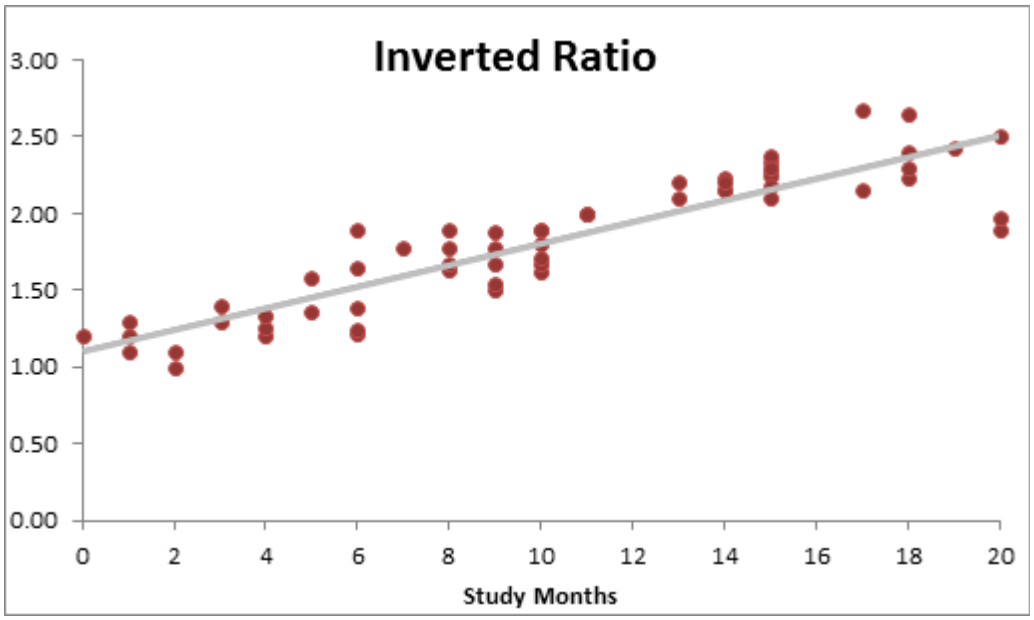
The IAAO *2013 Standard on Ratio Studies* addresses the issue of extreme ratios and acknowledges that outlier sales can cause distortion, especially when the sample is small. Data & Analysis will flag outlier sales but will not automatically remove these sales from the study. Outliers are identified on the sales listing. Calculations of mean, median, and aggregate ratios include outliers. Calculations of trends and assessments statistics do not include outliers.

Sales should not be rejected solely because of extreme ratios. Extreme ratios, whether high or low, are not a valid reason for rejecting or accepting a sale. Extreme ratios usually indicate a sale where extra verification is required. Extreme ratios could be the result of an error on the certificate, physical change to the property, or a processing error. If the extreme ratio resulted from a data error, the sale could be used after the corrections are made. If the corrected sale still has an extreme ratio, additional verification should be attempted. Sales with the most extreme ratios will be flagged for further review by the PTCOs.

Prior to the 2014 Sales Ratio Study, sales with ratios below 50% or above 200% were considered extreme ratios. These arbitrary limits were used in an effort to make our study replicable at the county level. Extreme ratios are now calculated using the interquartile range (IQR). The IQR methodology uses the distribution of the ratios to establish new boundaries for extremes.[6] With these new boundaries, ratios above 200% might be included, as long as the methodology suggests that it is part of the distribution of sales. For example, the graph below represents a region experiencing rapid increases in sales prices over the study period. In this scenario, trimming all sales greater than 2.0 would not be representative of the market.

[6] The formulas used to determine outliers are provided in Appendix B of the IAAO 2013 *Standard on Ratio Studies*.

Rapidly Increasing Market Example



Sales with ratios outside of the lower and upper boundaries determined by the interquartile range methodology are considered outliers and will be considered extreme ratios. These limits fall approximately 2 to 3 standard deviations from the mean ratio.

The steps needed to calculate the interquartile range are as follows:

1. The point for the first quartile (the point where 25% of all ratios fall below) is calculated.
2. The point for the third quartile (the point where 75% of all ratios fall below) is calculated.
3. The **difference** between the first and third quartile is calculated.
4. Lower and upper boundaries are calculated in order to identify outliers. An outlier is defined as either a ratio that is 1.5 times the **difference** below the first quartile or a ratio that is 1.5 times the **difference** above the third quartile.
5. Lower boundary=First quartile-1.5(**difference**
6. Upper boundary=Third quartile+1.5(**difference**)

For consistency purposes, extreme ratios are calculated at the base region level. For example, for agricultural/rural vacant properties, extremes will be calculated at the county level, and for residential properties at the residential regional level. These sales will continue to be considered extreme even when calculating a trend for the default region and jurisdiction or county level statistics.

Mean, median, and aggregate ratios are calculated with extremes. Assessment statistics and trends are calculated without extremes.

D. Market Condition Adjustments

The IAAO identifies market condition adjustments as a necessary component of any sales ratio study. Market condition adjustments are necessary due to the impact market conditions may have on ratios. The purpose of the adjustments is to adjust ratios so that sales prices are valued as if they had occurred at the same point in time as the assessment. For example, if values have been rising in a market and no adjustment is made for market conditions, sales that took place early in the year will have higher ratios than sales occurring around the assessment date, overstating the level of appraisal.

By adjusting the sale price, market condition adjustments ensure that the ratio for each sale better represents the assessment of that property because the two values used to calculate the ratio are at the same particular point in time. If all sales are adjusted to the same point in time, the median ratio better reflects the overall assessment level of that jurisdiction. Note that preliminary ratio reports and final ratio reports provide slightly different information. All sales will be forward adjusted to reflect the projected market price on January 2, 2017, but the preliminary ratios compare this sales price to the 2016 EMV and the final ratios compare this sales price to the 2017 EMV.

All sales in the 2016 Study will be forward adjusted to January 2, 2017 based on the trend calculated by Data & Analysis in order to reflect any changes in market conditions that occurred between the sale date and the 2017 assessment date.

Market condition adjustments are made based on a calculated market condition trend. Market condition trends are determined from sales of the various property types in their regions over a 21-month period (January 2015-September 2016). Only sales identified as good, open-market, arms-length transactions are used in the calculation of these trends. Inverted ratios (sale price/assessed value) are used in the calculation of trends in order to control for the individual characteristics of different properties, making them comparable. The use of inverted ratios in determining trends also lends to itself to ease of interpretation. [7]

[7] For example, if the market is decreasing, the standard ratio (EMV/sales price) will be increasing because the EMV remains the same and the sale value decreases over time. When we use the inverted ratio, the ratio moves in the same direction as the market.

Once calculated, these trends are tested to ensure statistical significance. If no statistically significant trend is found, the sales prices will not be adjusted for market conditions. Market condition adjustments are only made in regions where the number of sales meets or exceeds the minimum requirement of 30 sales.

See Appendix E: Calculation of Market Condition Trends and Adjustments for more information on the calculation of market condition trends and adjustments.

i. Net Improvement and Market Condition Trends

It is possible that sales from January 2016 through September 2016 had net improvements reported in 2015. However, because the 2015 EMV is used in the ratio for trend calculations, these sales will have their 2015 EMV adjusted for net improvements reported on the 2016 assessment. This adjustment is only used to calculate market condition trends.

Example:
Sale Date: June 2016
Sale Price: $200,000
Net Improvement Date: June 2015
Net Improvement as reported on 2016 MVP: $50,000
2015 EMV: $125,000
2016 EMV: $180,000

In this example, if we do not adjust the 2015 EMV, the ratio used for market condition trends would be 160% ($200,000/$125,000), because the 2015 EMV does not reflect the net improvements. This would overstate how fast the market is growing. Therefore, these sales have their 2015 EMV adjusted by the net improvement amount reported on the 2016 Market Value by Parcel file:

$$Adjusted\ 2015\ EMV = 2015\ EMV + Net\ Improvements\ reported\ on\ 2016\ MVP$$

Therefore, the adjusted ratio for trend calculation would be $200,000/($125,000 + $50,000), or 114%.

ii. Joint Cities

Market condition trends for residential properties are first calculated by the base residential region. The table in Appendix D: Joint Cities Regions lists the base region for each of the joint cities. If the base region trend is not significant or does not have at least 30 sales, a joint city will generally default to the countywide trend of the home county. Exceptions to this general rule can be found in the table in Appendix D.

Joint cities in the county of location are used to calculate the residential default countywide trend.

Example Scenarios

1. The City of Jasper is a joint city and is its own residential region. It has less than 30 sales. The home county, Pipestone County, trend is significant at the 90% level and has more than 30 sales. All sales in Jasper are subject to the Pipestone county trend.
2. The City of Pine is a joint city and is its own residential region. It has less than 30 sales. The home county, Spruce County, trend is not significant at the 90% level and has less than 30 sales. Sales in Pine will not be adjusted by a market condition trend.

Exceptions

1. The city of St. Cloud is a joint city in Benton, Sherburne, and Stearns County. It is also a first class city. Sales in St. Cloud are not a part of the Benton, Sherburne, and Stearns County trends. The city is its own residential base region and does not ever default to a county-wide trend.
2. Five joint cities, including Hanover, LaCrescent, Pine Island, and White Bear Lake do not default to the home county trend. They default to the county of location trend.

For commercial, industrial, apartments, and agricultural/rural vacant properties, properties in joint cities are only ever considered in the context of the county of location. They are part of the county of location trend and are subject to the county of location trends.

E. Assessment Statistics

Assessment statistics are calculated by Data & Analysis as measures of equity of assessment. These statistics are calculated only for property groupings within a region that have 30 or more sales. They do not include sales with extreme ratios. If the component of the calculation of the statistic is a mean, median, or aggregate ratio, these are ratios calculated without extremes. These statistics are reported on the ratio print that Data & Analysis sends to the county assessor. Counties can also use the MCAST to determine these statistics. The State Board of Equalization will consider these assessment statistics, among other things, when reviewing ratios and issuing orders.

i. Price Related Differential

The price related differential (PRD) is an *indicator* of vertical equity. The PRD is a relative comparison of all ratios in a set of sales. All ratios can be above or below one, but it is how they compare to each other that matters.

$$Price\ Related\ Differential = \frac{Mean\ Ratio}{Mean\ Aggregate\ Ratio}[8] * 100$$

The acceptable range for a PRD is between 0.98 and 1.03. A PRD less than one indicates progressivity, and a PRD greater than one indicates regressivity. While the PRD is easy to calculate and can indicate where there is an instance of inequity, it cannot quantify the extent of that inequity. It is also susceptible to error in small sample sizes and overstates the degree or regressivity or understates the degree of progressivity. For these reasons, counties are encouraged to focus their attention on the PRB.

ii. Price Related Bias

The price related bias (PRB) is a *statistical measure* of vertical equity in assessment. Like the PRD, the PRB is a relative comparison of all ratios in a set of sales. All ratios can be above or below one, but it is how they compare to each other that matters. Unlike the PRD, the PRB provides an indication of vertical equity *and* quantifies the extent of any potential inequity. The PRB is also less susceptible to outliers than the PRD. Unfortunately, the PRB is slightly more complicated to calculate. MCAST will perform this calculation for you. More information on calculating the PRB can be found in Appendix F: Calculating the Price Related Bias.

The acceptable range for a PRB is between -3% and 3%. A PRB outside of this range may indicate bias. A PRB outside of the range of -5% and 5% is cause for further inspection. A PRB below 0 indicates regressivity, and a PRB above 0 indicates progressivity.

The PRB can be interpreted as the approximation of how ratios would change as property values double. For example, a PRB of 10% suggests that the ratios for $200,000 properties tend to be 10% higher than the ratios for $100,000 properties, or the difference between a 1.00 ratio and 1.10 ratio. Likewise, the ratio for $50,000 properties tend to be 10% lower than the ratios for $100,000 properties, or the difference between a 1.00 ratio and a 0.90 ratio.

[8] The mean aggregate ratio can be found by diving the aggregate ratio by the number of sales without extremes.

Data & Analysis will continue to calculate and report both the PRD and the PRB in the 2016 Sales Ratio Study. The MCAST can also calculate the PRB.

iii. Coefficient of Dispersion

The coefficient of dispersion (COD) is a measure of variability and uniformity of assessment. The COD is the average percentage deviation of ratios from the median ratio. The COD can be calculated by determining the average absolute value of the difference between the sale ratio and the median ratio and plugging it into the following equation:

$$Coefficient\ of\ Dispersion = \frac{Average\ Difference}{Median\ Ratio} * 100$$

VI. Reports

Several different reports are created and sent to counties throughout the Sales Ratio Study process. These reports include sales lists, trend reports, and ratio prints. Sales lists will be sent at every stage in the process to ensure that the most up to date and correct sales information is always being used.

Additional reports may be issued throughout the study to provide more information or guidance to the assessor and the PTCO. These reports should help start conversations between the PTCO and the county and help improve the study and improve the assessment. More information will be provided with each report as it is issued. Reports may be issued on:

- Agricultural and rural vacant values
- Sales chasing
- Local effort/value changes
- Supplementary ratios and trends

A. Initial Reports

Starting in July, the Department of Revenue will begin regularly sending out lists of sales from January 1, 2015 through the date of the listing. Counties should work with their PTCOs to review and edit their sales.

B. Preliminary Reports

All sales in the study period must be submitted to the Department of Revenue by November 10, 2015. Once all sales go through PTCO review, the Department issues trends and preliminary ratios. Preliminary ratios are calculated using the 2016 EMV and the sales price adjusted to January 2, 2017:

$$\frac{2016\ EMV}{Net\ sale\ price, adjusted\ to\ Jan\ 2, 2017}$$

If the county assessor feels that a trend provided by the Department is not appropriate for that region or a subset of that region, within their county, they have the right to appeal. Go to Market Condition Trend Appeal Process below for more information on the appeal process.

C. Final Preliminary Reports

After appeals are processed, the Department issues a final set of trends, incorporating the results of the appeals. At this point, trends are frozen and Data & Analysis will send final preliminary ratios, which take the final trends into account. These preliminary ratios are calculated using the 2016 EMV and the sales price adjusted to January 2, 2017:

$$\frac{2016\ EMV}{Net\ sale\ price, adjusted\ to\ Jan\ 2, 2017}$$

D. Final Reports

Once a county has submitted Preliminary Assessment PRISM file in spring 2017, the Department issues their final ratios. Final ratios are calculated using the 2017 EMV adjusted for net improvements and the sales price adjusted to January 2, 2017. These are the ratios that the State Board of Equalization will review for board orders.

$$\frac{2017\ EMV - 2016\ net\ improvements}{Net\ sale\ price, adjusted\ to\ Jan\ 2, 2017}$$

At this point, all studies are issued, including Tax Court ratios, adjusted net tax capacities, state assessed ratios, and economic and indicated market values. Tax Court ratios are calculated using the 2016 EMV and the sales price adjusted to January 2, 2016:

$$\frac{2016\ EMV}{Net\ sale\ price, adjusted\ to\ Jan\ 2, 2016}$$

E. Five-Year Study

During the Final Preliminary and Final phases of the study, Data & Analysis will provide a five-year report to each county. The five-year report is provided for assessors and PTCOs to review those jurisdictions which consistently do not meet the six sale minimum for State Board ratios. The report compiles five years of median ratios and

local effort by property type and flags jurisdictions which do not meet several criteria, including:

- Jurisdictions which do not have at least two years with six or more sales.
- Jurisdictions which do not have at least two years with an acceptable median ratio
- Jurisdictions which did not make value changes for at least one year

VII. Market Condition Trend Appeal Process

If the county assessor feels that a market condition adjustment provided by the Department of Revenue is not appropriate for a trend region within their county, they have the right to appeal. To appeal a trend, a county assessor must follow the steps listed below:

1. The county assessor must notify the Department of Revenue's PTCO and Data & Analysis of their disagreement via email. Please contact Data & Analysis at DataAnalysis.MDOR@state.mn.us, and copy your PTCO on all correspondence.
   - The county assessor must list the specific cities and townships to be covered by the appeal and provide a summary explaining their reasons for believing a trend appeal is necessary. The county assessor must also submit the MCAST for each of the specific regions and property type combinations covered by the appeal, including all sales before trimming for extremes.
   - Data & Analysis will compare the county's MCAST results with the Department's results and provide an initial analysis explaining any discrepancies between the sales used by the county and the sales used in the 21-month study. This initial feedback will be given to the PTCO and the county as quickly as possible.

2. If the disagreement is not resolved by the comparison, the county assessor can also provide additional supporting documentation to Data & Analysis and the PTCO for review.
   - Supporting documentation may include third party market data or research, historical information, additional sales outside the study period, or extra property detail. The extra property detail may come from eCRV (neighborhood code, use code, lake code, etc) or can be provided to DOR for supplementary analysis (grade, unit counts, etc).
   - If the county's supporting documentation includes sales that occurred in October to December of 2016, those sales must be submitted via eCRV and processed by the PTCO. All sales from this time period in the region and of the property type under appeal must be included. No sales should be withheld from further consideration.

3. Data & Analysis will conduct an internal analysis to provide to the Department's appeals panel for review. The PTCO and Data & Analysis will participate in the review, and the county assessor is welcome to attend or call into their county's appeal review.
    - As part of the internal analysis for the review, Data & Analysis will complete a detailed summary of the regional trend. The Unit will analyze various things that may impact the trend including but not limited to:
        - extreme ratios within the data set
        - the trend when the sales are truncated to a 12-month study period
        - the trend from the previous year's 21-month data set
        - any non-linear trends within the region
        - seasonal impacts on sales in the region
        - graphical analysis
        - the trend after considering sales that occurred in October, November and December
        - stratification based on different variables

4. The Department's appeals panel will review all available information and recommend whether or not to modify a market condition adjustment. If the appeal results in an adjustment, the adjustment factors will be applied to the appropriate sales ratio study uses.

Trends will be finalized after appeal decisions are made.

It is important to keep in mind throughout the appeals process that ratios produced in the sales ratio study are used in other calculations such as adjusted net tax capacities, indicated market values, and economic market values. When final ratios don't reflect what is actually happening in the market, measures of wealth or aid payments could be adversely affected. For example, if a jurisdiction experiences an increasing real-estate market but the positive trend is not applied, the median ratio will be higher than it should be and the measure of wealth will be artificially inflated, affecting the county's ability to obtain and repay debt. Alternatively, an artificially lower ratio would increase a jurisdiction's adjusted net tax capacities, which could translate into lower state aid.

VIII. Appendix A: Reject Reason Definitions

1. **Old sales***
   Sales that do not fall within the 21-month study period.

   This reject reason is no longer relevant to the study and should not be used. Sales should not be rejected simply because they are submitted outside of the study period. If an old sale is an open market, arms-length transaction, it should not be rejected. If an old sale is not an open market, arms-length transaction, it should be rejected under the appropriate reason. This reject reason will not be available starting in November 2016.

2. **Relative sales**
   Sales between close relatives or corporate affiliates are usually non-open market transactions. The IAAO guidelines for close relatives include marital relationships, parents, children, aunts, uncles, nephews, nieces, and grandparents. Guidelines for corporate affiliates include corporate relationships between businesses.

3. **Government or exempt party sales, or sales involving charitable, religious or educational institutions**
   Sales involving governmental agencies as buyers or sellers of property and all sales involving public utilities (including railroad and pipeline companies). This also includes sales involving charitable, religious, or educational institutions.

4. **Partial-interest sales**
   Sales of less than the total interest of the property. Sales involving life estates, encumbered leases, fractional interest, and mineral rights may be rejected for this reason. If more than one sale occurs and the combined sales equal the total interest, the sale could be used. This reject reason should be supported with a comment. If the rejected sale represents one portion of a "good" transaction, the comment should refer to the eCRV that combines all portions of the sale.

5. **Use/class change**
   Sales involving a change one legal property class to another will be reviewed. Changing from residential to commercial use is an example of a class change. A class change would not be involved if a restaurant were converted to an office building, since both uses would be classified as commercial property. A change of class from seasonal-recreation residential to residential or vice versa should not be rejected. Sales should not be automatically excluded if the class changes are among the agricultural, rural vacant, or managed forest classes. The property should remain in the class it was in

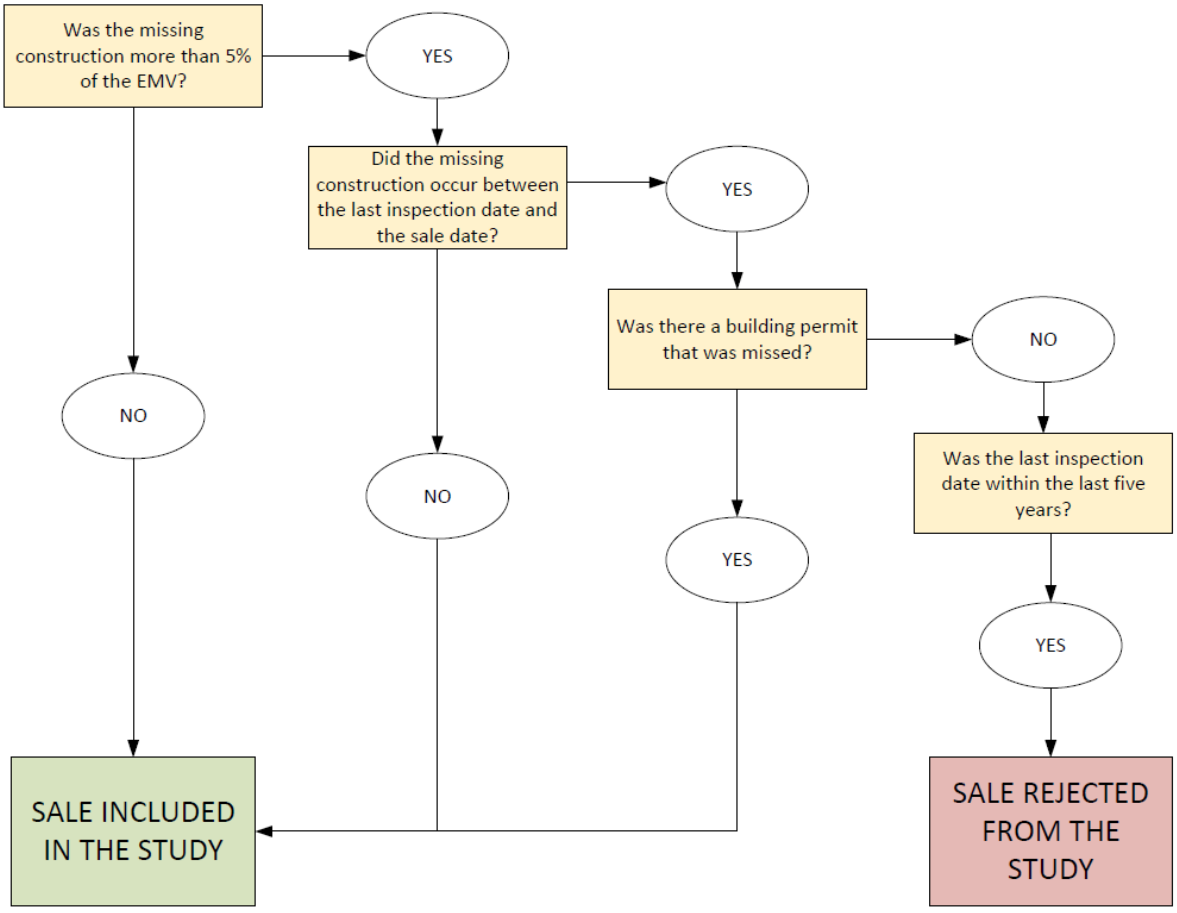
before the sale. Use change requires that most of the value will be moved to a different property classification. This reject reason should be supported with a comment.

6. **Unusual financing**
   This includes sales that have non-monetary consideration and sales that have terms that result in extremely large financing adjustments. These would include:
   - Zero interest payments for a long period
   - Non-cash financing
   - Extreme interest rates that would make the finance adjustment a large part of the sale price and move the sale into the extreme ratio range
   - Income guarantees that require the seller to pay the buyer money if a specified income is not realized from the property

   This reject reason should be supported with a comment.

7. **Physical change**
   Sales of incomplete structures or structures that were assessed prior to completion. Sales should be rejected if the property was substantially improved between assessment date and sale. Property damaged between the assessment date and sale should be rejected due to physical change. Sales in which the physical change is merely cosmetic or would not have caused the assessor to change the market value of the property should be included. Sales involving structures that are more than 5% incomplete *may* be excluded. Sales involving *missing* construction should only be rejected in very specific circumstances. See the Missing Construction flow chart below for more details. Go to Net Improvements for more information on when new construction should be accepted or rejected.

Reject Criteria for Sales with Missing Construction



Sales of properties that have not been physically inspected in the five years prior to the sale cannot be rejected using this reason. This reject reason should be supported with a comment, including when the property was last visited by an appraiser.

8. **Correction deed**

   Sales of convenience simply to correct a defect of title or to change the character of the title, including quit claim deeds.

9. **Trade, gift or estate sales**
   - Trades of properties or transfers in which nonmonetary items, such as stocks, bonds, or personal property are used as the medium of exchange.
   - Sales by representatives of estates to members of the immediate family.
   - Sales to a trustee for the benefit of some beneficiary.
   - Estate sales not exposed to the open market.
     - Transactions of residential or seasonal-recreational residential properties using a personal representative or conservator's deed are automatically rejected.
     - Sales of other property types are subject to verification and may be included.
     - Property sold by the heirs after probate must be verified and may be rejected under other criteria.

10. **Prior interest**
    Sale where the buyer exercised an option to purchase and the price was determined in the last study period or earlier. This reject reason must be supported with a comment.

11. **Skipped CRV number***
    Indicates that an auditor's number was not used.

    *This reject reason is no longer relevant to the study and should not be used. Starting with the 2015 Study, all sales are submitted and tracked through eCRV. This reject reason will not be available starting in November 2016.

12. **Unique reject reason**
    Sales with unique reasons for rejection authorized by the PTCO. Additional explanation should accompany every use of this reject reason.

13. **Duplicate CRV or eCRV***
    Sales where the buyer and seller each file a certificate for the same parcel.

    *This reject reason is no longer relevant to the study and should not be used. If two eCRVs are filed for one sale, the county should only accept one of the eCRVs or the uncombined eCRV can be rejected under R4 Partial-Interest Sale. This reject reason will not be available starting in November 2016.

14. **Sale of an interest in or a payoff of a contract for deed or mortgage assumption**

15. Distressed sales
    - Sales to avoid foreclosure, such as short sales or sales back to the bank.
    - Sales involving legal actions such as foreclosures, divorces, bankruptcies or sheriffs' sales. To be rejected, a sale must be ordered by a court. All other sales must be verified and may qualify for rejection under other criteria.

16. Assessor value for sale year not available or split property sales

    Split sales that are:
    - Classified as something other than agricultural, rural vacant land, or managed forest
    - Less than 34.5 acres of agricultural, rural vacant land or forest management.
    - Greater than 34.5 acres, of agricultural, rural vacant land or forest management and when the assessor's value is not available for the needed study years.

17. Excessive non-real property

    Non-assessed and significant or unknown non-realty sales including:
    - Sales in which a significant, but unknown portion of the total price is non-realty, such as personal property, business value, franchise fees, etc.
    - Sales in which there is a significant, known amount (50% or more) of non-realty included in the sale price, such as personal property, franchise fees, etc. If the sale includes a large but well-documented non-realty portion, it may be used in the sales ratio study.
    - Sales of non-assessed property.

    This reject reason must be supported with a comment.

18. Rewrite of terms or default on CD

    eCRVs which are rewrites of the terms of a contract for deed. If a rewrite occurs within a year of the original contract, both will be deleted. If it is more than a year, the original sale will be used.

19. Relocation/employee transfer

    Sales involving an employee transfer or relocation using a relocation company.

20. Sale – leasebacks

    Sales where the property is leased back to seller for more than six months. This does not include short-term leases, such as to get crops harvested. This reject reason must be supported with a comment.

21. Bank sales

Any sale from a bank, HUD, FMHA, or any governmental lending institution, to a private party. These sales will be considered for use in the study only in regions where they are so prevalent that they mirror the actions of buyers and sellers of non-foreclosed property. Thorough verification is necessary before the PTCO will consider including these sales.

- Resales of repossessed property may be considered for use in the study. Thorough verification is required before these sales can be used. They should only be used if the sale meets the "open market, arms-length" requirement. Resales of repossessed property by lending institutions will not be adjusted for financing terms. Only the most recent non-rejected resale will be considered.

22. Contract for deed sales with less than minimum down payment

The minimum down payment for the study is five percent, unless the sales verification proves that the chance of default was extremely low or that the term is one year or less. Many warranty deed sales, especially residential sales with nominal down payments, are insured loan sales, and the buyer is considered a good risk. No down payment can be an acceptable form of financing on a warranty deed sale.

23. Sales of real estate for less than a minimum price

Minimum Price Reject Criteria

Property Type	Minimum Price
All bare land sales	$3,000
All other property	$10,000

24. Sales in which the property is located in more than one county

Sales of property located in more than one taxing jurisdiction, which do not have separate appraisals for the components of the sale, may be excluded.

25. Ag Preserve and sales subject to a minimum assessment agreement

All sales enrolled in Agricultural Preserve and sales subject to minimum assessment agreements in which the sales price is less than the minimum assessment agreement.

26. Sales of doubtful title or other non-arms-length or non-typical market transactions

Sales that are not advertised, listed, or promoted to potential buyers. A sale with this reject reason and no explanation attached will **not** be automatically rejected by the PTCO. Additional documentation is required.

While this reject reason is valid, a blanket rejection of all sales that are "not advertised, listed or promoted" would reject many sales that still meet the Department of Revenue guidelines for sales that are open market and arms-length. IAAO recognizes the following as methods of marketing:

- Listing with a real estate broker
- Auctions
- For sale by owner
- Internet marketing
- Newspaper advertisements
- Sealed bids
- Word of mouth

Three tests have been developed in an effort to: 1) maximize the number of sales in the study sample, 2) provide appraisers with all possible sales that reflect market value and market trends, and 3) help to establish benchmarks for current and future assessments. The following three tests will help determine if the sale should be rejected or accepted for the study.

1. Was the sale exposed to the market, or announced and/or promoted through realtor listings, newspapers, or other publications, advertisements, brochures, or other promotional or informational mailings, including if the property was for sale by owner?
   - If **YES,** the sale **SHOULD NOT** be rejected.
   - If **NO,** go to test 2.
2. Was an appraisal done prior to the sale to establish the sale price or to be used as a starting point for negotiations?
   - If **YES,** the sale **SHOULD NOT** be rejected.
   - If **NO,** go to test 3.
3. Did the sale involve a willing and informed buyer and a willing and informed seller, neither of whom were under duress to buy or sell, and is the sale price typical of the market for this type of property in your assessment district?
   - If **YES,** the sale **SHOULD NOT** be rejected.
   - If **NO,** the sale **SHOULD** be rejected.

If it is determined through the verification process that the sale should be considered as a market comparable and meets all other acceptance criteria, then the sale should be included in the study.

Agricultural/rural vacant, apartment, and commercial/industrial sales should not be rejected simply because the property was not advertised. However, individual situations may warrant this reject reason on these property types.

Transfers with doubtful title should be rejected.

Sales that represent IRS 1031 exchanges should be analyzed to determine if the sale price is representative of market values. If so, the sale is valid for the study. If not, the sale should be rejected.

It may be very difficult to determine if the sale should be rejected for this reason or not. Highly unusual or questionable sales may be encountered. Questions concerning whether a sale should be rejected from or included in the study should be reviewed with the county assessor and the PTCO. **A sale rejected with this code with no explanation will not be automatically rejected. Additional documentation is required.**

27. Court ordered value

Sales with court ordered values that do not involve post-sale stipulations or abatements. The estimated market value to be used in calculating sales ratios shall be the value established by the assessor before any stipulations or abatements resulting from appeals by property owners. Sales with court established values that were not the result of pre-trial stipulations or abatements are not used in the study.

28. Sales of nursing homes or sales of mobile home parks*

*This reject reason is no longer relevant to the study and should not be used. Sales should not be automatically rejected because they are nursing homes or mobile home parks. Good mobile home park sales will be placed into the new sales ratio property type bucket, PT 51 (see Property Types and Aggregations). Good nursing home sales will be placed in the exempt bucket (PT 30) if they are exempt or another appropriate bucket. This reject reason will not be available starting in November 2016.

29. Sales with allocated sale prices

30. Assessor's value limited by Plat Law in the first year

31. Assemblage

Properties bought by one buyer to put together a package for later development or change. This reject reason must be supported with a comment.

IX. Appendix B: Property Types and Aggregations for the Sales Ratio Study

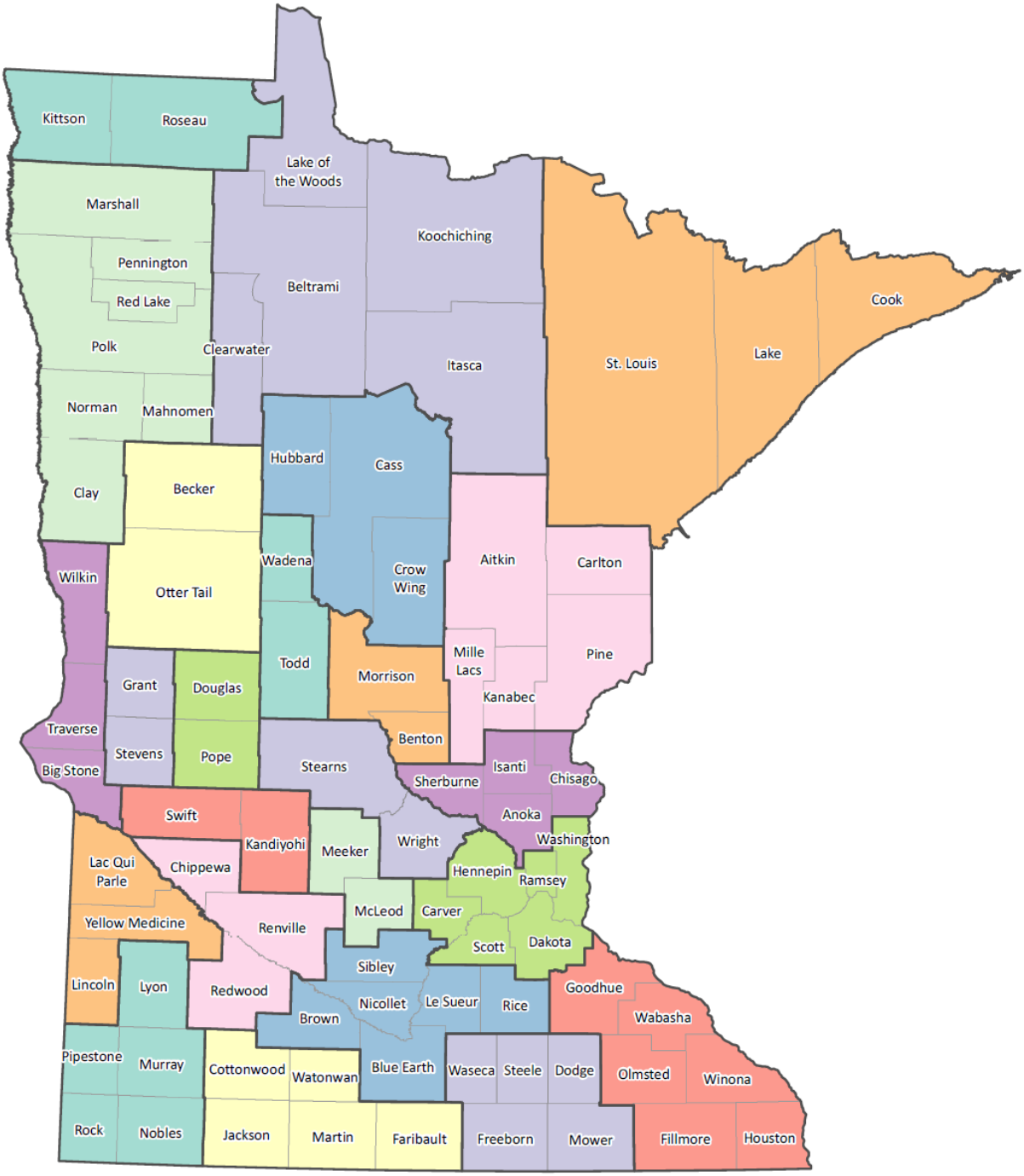
2016 SALES RATIO PROPERTY TYPES AND AGGREGATIONS				
	Aggregation	**Description**	**Property Type**	**Description**
Ratio + Trend	02	Apartments	02	Apartments
Ratio + Trend	06	Commercial	06	Commercial
Ratio + Trend	07	Industrial	07	Industrial
Ratio	90	Bare Land LESS than 34.5 acres 2a, 2b, 2c, and mixed 2a/2b	37	Agriculture 2a - bare land less than 34.5 acres
			39	Rural Vacant 2b - bare land less than 34.5 acres
			40	Managed Forest 2c - bare land less than 34.5 acres
			50	Mixed 2a, 2b - bare land less than 34.5 acres
Ratio + Trend	91*	Residential/Seasonal Recreational Residential	01	Residential (less than 4 units)
			03	Non-commercial seasonal residential recreational
Ratio	92**	Bare land MORE than 34.5 acres 2b, 2c, and mixed 2a/2b	34	Rural Vacant 2b - bare land more than 34.5 acres
			35	Managed Forest 2c - bare land more than 34.5 acres
			48	Mixed 2a, 2b - bare land more than 34.5 acres
Ratio + Trend	93	Bare land MORE than 34.5 acres 2a, 2b, 2c and mixed 2a/2b	32	Agriculture 2a - bare land more than 34.5 acres
			34	Rural Vacant 2b - bare land more than 34.5 acres
			35	Managed Forest 2c - bare land more than 34.5 acres
			48	Mixed 2a, Rural 2b - bare land more than 34.5 acres
Ratio	95**	Bare land + Land with buildings MORE than 34.5 acres 2a, 2b, 2c, and mixed 2a/2b	31	Agriculture 2a - land with buildings more than 34.5 acres
			32	Agriculture 2a - bare land more than 34.5 acres
			33	Rural Vacant 2b - land with buildings more than 34.5 acres
			34	Rural Vacant 2b - bare land more than 34.5 acres
			35	Managed Forest 2c - bare land more than 34.5 acres
			47	Mixed 2a, 2b - land with buildings more than 34.5 acres
			48	Mixed 2a, 2b - bare land more than 34.5 acres

Note: Land that is at least 75% 2a will be considered 2a. Land that is at least 75% 2b will be considered 2b. Everything else will be considered mixed.

*Trends are calculated by water status. Ratios are calculated and reported by water status and combined.

**Sales used in this aggregation are adjusted by the PT 93 trend.

X. Appendix C: Agriculture/Rural Vacant Region Map



XI. Appendix D: Joint Cities Regions

City Name	County of Location	Home County	County Wide Trend Calculation	Base Region	Default Region
Bellechester	Goodhue	Goodhue	Goodhue	Dennison, Wanamingo, Kenyon, Bellechester	Goodhue County Trend
Bellechester	Wabasha	Goodhue	Wabasha	Dennison, Wanamingo, Kenyon, Bellechester	Wabasha County Trend
Blaine	Anoka	Anoka County	Anoka	Blaine	Anoka County Trend
Blaine	Ramsey	Anoka County	Ramsey	Blaine	Anoka County Trend
Braham	Isanti	Isanti	Isanti	Balance of Isanti County	Isanti County Trend
Braham	Kanabec	Isanti	Kanabec	Balance of Isanti County	Isanti County Trend
Chanhassen	Carver	Carver County	Carver	Chanhassen	Carver County Trend
Chanhassen	Hennepin	Carver County	Hennepin	Chanhassen	Carver County Trend
Chatfield	Fillmore	Fillmore	Fillmore	Fillmore City Region One	Fillmore County Trend
Chatfield	Olmsted	Fillmore	Olmsted	Fillmore City Region One	Fillmore County Trend
Clearwater	Stearns	Wright	Stearns	Clearwater	Wright County Trend
Clearwater	Wright	Wright	Wright	Clearwater	Wright County Trend
Comfrey	Brown	Brown County	Brown	Comfrey	Brown County Trend
Comfrey	Cottonwood	Brown County	Cottonwood	Comfrey	Brown County Trend
Dayton	Hennepin	Hennepin	Hennepin	Dayton, Hanover, Rogers	Hennepin County Trend
Dayton	Wright	Hennepin	Wright	Otsego, Dayton	Hennepin County Trend
Dennison	Goodhue	Goodhue	Goodhue	Dennison, Wanamingo, Kenyon, Bellechester	Goodhue County Trend
Dennison	Rice	Goodhue	Rice	Dennison, Wanamingo, Kenyon, Bellechester	Goodhue County Trend
Eden Valley	Meeker	Meeker	Meeker	Eden Valley	Meeker County Trend
Eden Valley	Stearns	Meeker	Stearns	Eden Valley	Meeker County Trend
Elysian	Le Sueur	Le Sueur	Le Sueur	Balance of Le Sueur County	Le Sueur Country
Elysian	Waseca	Le Sueur	Waseca	Balance of Le Sueur County	Le Sueur Country
Granite Falls	Chippewa	Yellow Medicine	Chippewa	Granite Falls	Yellow Medicine County Trend
Granite Falls	Yellow Medicine	Yellow Medicine	Yellow Medicine	Granite Falls	Yellow Medicine County Trend
Hanover	Hennepin	Wright	Hennepin	Dayton, Hanover, Rogers	Hennepin County Trend
Hanover	Wright	Wright	Wright	St. Michael, Hanover	Wright County Trend
Hastings	Dakota	Dakota	Dakota	Hastings	Dakota County Trend

City Name	County of Location	Home County	County Wide Trend Calculation	Base Region	Default Region
Hastings	Washington	Dakota	Washington	Hastings	Dakota County Trend
Jasper	Pipestone	Pipestone	Pipestone	Jasper	Pipestone County Trend
Jasper	Rock	Pipestone	Rock	Jasper	Pipestone County Trend
La Crescent	Houston	Houston	Houston	Houston Region One	Houston County Trend
La Crescent	Winona	Houston	Winona	Balance of Winona County	Winona County Trend
Lake City	Goodhue	Wabasha	Goodhue	Lake City	Wabasha County Trend
Lake City	Wabasha	Wabasha	Wabasha	Lake City	Wabasha County Trend
Mankato	Blue Earth	Blue Earth County	Blue Earth	Mankato, Skyline	Blue Earth County Trend
Mankato	Nicollet	Blue Earth County	Nicollet	Mankato, Skyline	Blue Earth County Trend
Minneiska	Wabasha	Wabasha	Wabasha	Balance of Wabasha	Wabasha County Trend
Minneiska	Winona	Wabasha	Winona	Balance of Wabasha	Wabasha County Trend
Minnesota Lake	Blue Earth	Faribault	Blue Earth	Balance of Faribault	Faribault County Trend
Minnesota Lake	Faribault	Faribault	Faribault	Balance of Faribault	Faribault County Trend
Motley	Cass	Morrison	Cass	Motley	Morrison County Trend
Motley	Morrison	Morrison	Morrison	Motley	Morrison County Trend
New Prague	Le Sueur	Scott	Le Sueur	New Prague	Scott County Trend
New Prague	Scott	Scott	Scott	New Prague	Scott County Trend
North Mankato	Blue Earth	Nicollet	Blue Earth	North Mankato	Nicollet County Trend
North Mankato	Nicollet	Nicollet	Nicollet	North Mankato	Nicollet County Trend
Northfield	Dakota	Rice	Dakota	Northfield	Rice County Trend
Northfield	Rice	Rice	Rice	Northfield	Rice County Trend
Ormsby	Martin	Watonwan	Martin	Balance of Watonwan County	Watonwan County Trend
Ormsby	Watonwan	Watonwan	Watonwan	Balance of Watonwan County	Watonwan County Trend
Osakis	Douglas	Douglas	Douglas	Osakis	Douglas County Trend
Osakis	Todd	Douglas	Todd	Osakis	Douglas County Trend
Pine Island	Goodhue	Goodhue	Goodhue	Goodhue, Pine Island, Zumbrota	Goodhue County Trend
Pine Island	Olmsted	Goodhue	Olmsted	Byron, Stewartville, Pine Island	Olmsted County Trend
Princeton	Mille Lacs	Mille Lacs	Mille Lacs	Princeton	Mille Lacs County Trend
Princeton	Sherburne	Mille Lacs	Sherburne	Princeton	Mille Lacs County Trend
Rockford	Hennepin	Wright	Hennepin	Hennepin West Central	Wright County Trend
Rockford	Wright	Wright	Wright	Rockford City	Wright County Trend

City Name	County of Location	Home County	County Wide Trend Calculation	Base Region	Default Region
Roosevelt	Lake of the Woods	Roseau	Lake of the Woods	Balance of Roseau County	Roseau County Trend
Roosevelt	Roseau	Roseau	Roseau	Balance of Roseau County	Roseau County Trend
Rothsay	Otter Tail	Wilkin	Otter Tail	Rothsay	Wilkin County Trend
Rothsay	Wilkin	Wilkin	Wilkin	Rothsay	Wilkin County Trend
Royalton	Benton	Morrison	Benton	Balance of Morrison County	Morrison County Trend
Royalton	Morrison	Morrison	Morrison	Balance of Morrison County	Morrison County Trend
Sartell	Benton	Stearns	Benton	Sartell	Stearns County Trend
Sartell	Stearns	Stearns	Stearns	Sartell	Stearns County Trend
Spring Lake Park	Anoka	Anoka County	Anoka	Spring Lake Park	Anoka County Trend
Spring Lake Park	Ramsey	Anoka County	Ramsey	Spring Lake Park	Anoka County Trend
St. Anthony	Hennepin	Hennepin	Hennepin	St. Anthony	Hennepin County Trend
St. Anthony	Ramsey	Hennepin	Ramsey	St. Anthony	Hennepin County Trend
St. Cloud	Benton	Stearns	St. Cloud	St. Cloud	St. Cloud
St. Cloud	Sherburne	Stearns	St. Cloud	St. Cloud	St. Cloud
St. Cloud	Stearns	Stearns	St. Cloud	St. Cloud	St. Cloud
St. Francis	Anoka	Anoka County	Anoka	St. Francis, Bethel	Anoka County
St. Francis	Isanti	Anoka County	Isanti	St. Francis, Bethel	Anoka County
Staples	Todd	Todd	Todd	Staples	Todd County Trend
Staples	Wadena	Todd	Wadena	Staples	Todd County Trend
Swanville	Morrison	Morrison	Morrison	Balance of Morrison County	Morrison County Trend
Swanville	Todd	Morrison	Todd	Balance of Morrison County	Morrison County Trend
Wadena	Otter Tail	Wadena	Otter Tail	Wadena	Wadena County Trend
Wadena	Wadena	Wadena	Wadena	Wadena	Wadena County Trend
White Bear Lake	Ramsey	Ramsey	Ramsey	White Bear Lake	Ramsey County Trend
White Bear Lake	Washington	Ramsey	Washington	Mahtomedi, Willernie, Pine Springs, Birchwood, White Bear Lake	Washington County Trend

XII. Appendix E: Calculation of Market Condition Trends and Adjustments

The IAAO recognizes five methods of calculating market condition adjustments:

1. Paired Sales Analysis
2. Resale Analysis
3. Sales Ratio Time Trend Analysis
4. Multiple Regression Analysis
5. Comparing Per-Unit Values Over Time

Three of the methods listed above require more extensive sale and parcel level data than the Department collects. Analyzing re-sales is very difficult to do because few parcels resell in any given sales period, and the majority of jurisdictions almost never experience re-sales. This leaves one method for which data is available to the Department of Revenue that can be fairly applied throughout the state. Tracking sales ratios over time is a common method of determining market condition adjustments and is the methodology adopted by the Minnesota Department of Revenue.

The basis for this method is that changes in market conditions are represented by changes in sale prices over time. However, a simple analysis of changes in sale price is often misleading, especially in areas with few sales. A difference in median sale price of 10% from one month to the next does not usually mean that market values changed 10%; rather, this is typically a sign that different types of properties sold in each month with more valuable properties being sold in one month than the other. To find out if values actually changed, these prices need to be standardized so they can be compared on the same scale.

Using the sales ratio accomplishes this goal because it controls for individual characteristics of the properties, making them comparable. For market condition analysis, we use the inverse of the sales ratio (sale price/assessed value) for ease of interpretation. For example, using the inverted ratio allows us to compare the assessment of a home that sold for $200,000 to a newer neighboring home that sold for a higher price. The house that sold for $200,000 should have an EMV that is lower than the house that sold for a higher price, so even though the two homes sell for different prices, the inverted ratio provides an apples-to-apples comparison. Calculating trends with the inverted ratio allows us to isolate the effect of prices,[9] **given an acceptable uniformity of assessment.**

Not all sales are used in the trend analysis. Only sales identified as good, open-market, arms-length transactions are used to develop market condition adjustments. Additionally, extreme

[9] An increase in the inverse sales ratio over time indicates an increase in sale prices, and a decrease in the ratio corresponds to a decrease in sale prices relative to assessed values as of a fixed date.

ratios tend to distort the calculations used to measure market condition adjustments so they are not included in the trend analysis.

After we have grouped sales by region, property type and water status, we run the following regression equation:

$$Natural\ Log\left(\frac{Sales\ Price}{2015\ EMV}\right) = \beta_0 + \beta_1 Study\ Month + \varepsilon$$

Where the beta coefficient (β_1) is the monthly growth rate, and the intercept (β_0) is the expected value of the ratio on January 1, 2015. The estimated coefficient of beta (β_1) can be interpreted as the percentage change in the ratio for each additional month. The beta (β_1) coefficient is always accompanied by a significance value. Market condition adjustments are only applied if the beta coefficient (β_1) is statistically significant at the 90 percent confidence level. [10]

As previously noted, market condition adjustments are only applied to sales in regions with at least 30 sales. This change was made to ensure that the sample sizes fall within the IAAO guidelines regarding the adequacy of a given sample size.[11]

The fact that the Department does not issue a market condition trend does not mean that prices are not changing in a region. It means that the price-level changes were not statistically significant under the current methodology and/or the number of sales in the region was not sufficient to support regression analysis according to this study criteria.

We use the following equation to calculate the annual market condition trend[12]:

$$annual\ growth = (1 + monthly\ growth)^{12} - 1$$

[10] In statistics, three thresholds for significance are typically reported: the 99% confidence level, the 95% confidence level and the 90% confidence level.

[11] The motivation behind this threshold was rooted in the use of linear regression models to calculate trend adjustments. To ensure unbiased, consistent and efficient results, we must ensure that the sample data be representative of the population. For sales ratio studies, the sample consists of parcels sold within the region. We make the assumption that these sales are representative of the property values of all parcels within the region. To have confidence that that assumption is valid, we need to have a large enough sample size. Using a minimum of 30 sales for market condition trend calculation ensures that the confidence interval is sufficiently narrow.

[12] Starting with the 2013 Sales Ratio Study, the methodology was revised to use the natural log of the inverted ratio in the regression. In the past, the beta coefficient of the inverted ratio/the intercept indicated an average change in prices over time. Under the current methodology, the beta coefficient of the natural log of the inverted ratio indicates a percentage change in prices over time. In order to calculate the annual trend, we must use the cumulative formula instead of taking the monthly change multiplied by twelve.

To adjust a sale for time, we use the following formula:

$$\text{Adjusted Sales Price} = \text{Net Sale Price} * [(1 + monthly\ growth\ rate)^{adjustment\ months}]$$

Example 1:
A home sold for $100,000 in October 2015. The monthly growth rate for SRR/Res properties in the region was 2%. To adjust the sale forward to January 2, 2017 we use the following formula:

Adjustment Months = (25 - Month of Sale) = 25 – 10 =15

Then, the adjusted sales price in January, 2015 will be:

$\$100{,}000 * [(1 + 0.02)^{15}] = \$100{,}000 * [1.3458] = \$134{,}586.83$

Example 2:
A home sold for $100,000 in November 2016. The monthly growth rate for SRR/Res properties in the region was 2%. To adjust the sale forward to January 2, 2017 we use the following formula:

Adjustment Months = (13 - Month of Sale) = 13 – 11 = 2

Then, the adjusted sales price in January, 2016 will be:

$\$100{,}000 * [(1 + 0.02)^{2}] = \$100{,}000 * [1.0404] = \$104{,}040$

Comparing Examples 1 and 2, you can see that the value of the sale that took place in November 2016 has a lower adjusted sale value than the property sold in October 2015. After the adjustment, the adjusted sale price for both properties reflects the sale price at a common point in time (January 2017) which makes the values comparable. Once this is done, the quality of assessment can be evaluated without a bias from market trends.

The table below provides a reference for determining the number of months to adjust for when adjusting sales prices, as well as the study month used to calculate trends.

Calculating Study Month and State Board Adjustment Months

Study Month used for the 21-month study period	Sale Month	Adjustment Months (Number of months we are adjusting for)
0	January-2015	Never adjust sales that are not in the study period, we only use them for trend analysis
1	February-2015	
2	March-2015	
3	April-2015	
4	May-2015	
5	June-2015	
6	July-2015	
7	August-2015	
8	September-2015	
9	October-2015	(25-10)=15
10	November-2015	(25-11)=14
11	December-2015	(25-12)=13
12	January-2016	(13-1)=12
13	February-2016	(13-2)=11
14	March-2016	(13-3)=10
15	April-2016	(13-4)=9
16	May-2016	(13-5)=8
17	June-2016	(13-6)=7
18	July-2016	(13-7)=6
19	August-2016	(13-8)=5
20	September-2016	(13-9)=4
Not included	October-2016	(13-10)=3
Not Included	November-2016	(13-11)=2
Not Included	December-2016	(13-12)=1

XIII. Appendix F: Calculating the Price Related Bias

A. Calculating the PRB

The PRB is calculated after removing extreme ratios. Once extreme ratios are removed, sales ratios and median sales ratios are calculated using either the 2016 or the 2017 EMV, depending on if it's the preliminary phase or the final phase. The PRB, like a time trend, is obtained by running a simple linear regression.

$$\frac{(sales\ ratio - median\ sales\ ratio)}{median\ sales\ ratio} = \beta_0 + \beta_1 \frac{LN((\frac{EMV}{median})/2 + sale\ price/2)}{LN(2)} + \varepsilon$$

Reduced to its simplest form, the regression would be:

$$sales\ ratio = \beta_0 + \beta_1\ property\ value + \varepsilon$$

This regression would tell us the expected sales ratio given a property value. The β_1 coefficient can be interpreted as the expected change in sales ratio as property values increase by 1 unit. For example, in the simplified regression, if $\beta_1 = 0.01$ we would expect the sales ratio to increase by 0.01 for every $1 increase in property value. *When the other elements are added to this equation, it only changes the interpretation of the β_1 coefficient.*

The dependent variable in the analysis is:

$$\frac{(sales\ ratio - median\ sales\ ratio)}{median\ sales\ ratio}$$

This is the percentage difference between any given sales ratio and the median. By using a percent, the β_1 can be interpreted as a percent change (from the median) in ratios.

The independent variable in the analysis is:

$$\frac{LN((\frac{EMV}{median})/2 + sale\ price/2)}{LN(2)}$$

We adjust the estimated market value by dividing by the median ratio to ensure the estimated market value and the sale price is equally weighted. This is important if assessors have target ratios not equal to one.

Instead of using the sale price as the indicator of value, this side of the formula uses the average of the sale price and the adjusted EMV as a proxy for value. While not a perfect indicator of value, using the average reduces the upward bias of the PRB than if the sale price was used.

Using the natural log allows us to interpret increases in property values as a percentage. Given the dependent variable in the analysis is also a percent; it will be interpreted as percent increase in value increases ratios by a percent.

Dividing by the natural log of 2 (0.693) permits each doubling of value to be associated with an increment of 1. So, a 100% increase in the value, a doubling of value, increases the estimated ratio by $(\beta_1 * 100)\%$. This is done for interpretation. If we don't divide by the natural log of 2, the PRB would tell us how ratios change for a 1% increase in the value. This would result in very small coefficients which are hard to conceptualize.

B. Interpreting the PRB

The β_1 coefficient is the PRB. It can be interpreted as the expected change in ratios as property values double. If ratios increase as property values increase, the resulting PRB will be positive. For example, a *PRB of 0.025 indicates that if property values double, ratios increase by 2.5%*. A positive PRB indicates that assessments are progressive, meaning high value properties are over-appraised relative to low value properties.

Conversely, if ratios decrease as property values increase, the resulting PRB will be negative. For example, *a PRB of -0.055 indicates that if property values double, ratios decrease by 5.5%.* A negative PRB indicates that assessments are regressive, meaning high value properties are under-appraised relative to low value properties.

Like time trends, the PRB is a statistical measure of bias and is subject to the same criteria as time trends. The coefficient must be statistically significant at the 90% confidence level, and the jurisdiction must have 30 or more sales.

The PRB is a trend or an approximation of how ratios change as property values double. Rarely, if ever, will two sales follow the exact trend of the PRB. Additionally, just like with time trends, the default assumption is that there is no price related bias. **A PRB greater or less than 3% may indicate a bias. A PRB greater or less than 5% is cause for further inspection.**

XIV. Appendix G: Sales Ratio Study Timeline

Date	Important Deadline
July 2016	The Data & Analysis begins sending out sales lists.
August 31, 2016	Requests for revised regions should be sent to Data & Analysis and PTCO.
November 10, 2016	All sales for the study period must be submitted to the Department of Revenue.
December 2016*	Trend appeals should be sent to the Data & Analysis and PTCO.
January 15, 2017	Appeals panel reaches determination, final trends are issued.
April 1, 2017	Preliminary Assessment PRISM file is due. Final ratios are issued as files are received.
June 2017	State Board of Equalization convenes to review study results and issue orders. Final ratios are issued.

*The specific deadline will be provided in the fall.