



PROFESSIONAL **CONSULTING SERVICES** OF IAAO, LLC

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City of Madison

Ratio Study Report

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# Table of Contents

---

**Executive Summary      3**

**Ratio Statistics ..... 3**

**Results ..... 4**

**Appendix..... 6**



## Executive Summary

PCSIAAO was contracted by the City of Madison to conduct a ratio study of sales occurring during the current revaluation of the city. The City delivered a set of sales with identifying variables that allowed PCS to stratify the study in several meaningful ways. Overall, the study revealed a quality reappraisal effort, with both residential and commercial properties appraised within acceptable standards of appraisal level and equity.

## Ratio Statistics

This study was conducted in accordance with guidelines established within the Standard on Ratio Studies promulgated by the International Association of Assessing Officers. That standard suggests that when ratios of the appraised values of parcels to their selling prices are arrayed by value that the median value in that array should fall within a range from 0.95 to 1.10, with 1.00 representing a perfect match of appraised value to selling price. Time of the sale is always a consideration, which is why the study stratified sales by the sale year. The median ratio for both commercial and residential properties was well within the acceptable range for both 2018 and 2019.

Ratio studies cannot rely only on the median, since that ratio alone may fall within an acceptable range while the remainder of the sample varies significantly. In order to examine that variation and measure it, the analyst uses several tools. First, confidence intervals are calculated around the median. One ratio could fall at or near 1.00 purely by chance. Statisticians use what they refer to as confidence intervals to help them examine the true variation. Without going into the mathematics behind it, our study displays the 95% confidence intervals around the median. In other words, we can be 95% confident that the true median for a given sample falls between the lower bound (LB) and the upper bound (UB). We would expect those bounds to be very close to the median during the year of the reappraisal and to start to diverge in later years.

Another measure of the variation in ratios is the coefficient of dispersion which expresses the average difference between each ratio and the median as a percentage of the median. That difference is expressed



in absolute terms, in other words absent either positive or negative signs, because the analyst is only concerned with variation, whether high or low. The high end of the range for a commercial COD is 20 and that of residential property at 15.

Finally, we looked at variation relative to the value of the property, which attempts to respond to the question of whether the appraiser is treating all properties fairly relative to their value. An ongoing problem in mass appraisal is that sales do not occur with the same frequency for every value level. Instead, sales tend to cluster around a center point with fewer sales occurring at either the upper or lower levels. Unless the appraiser adjusts for this fact, that mass of sales in the middle will tend to pull the appraised value of high valued properties down while lifting the appraised value of lower value properties. This phenomenon has been called regressivity. If the opposite of that phenomenon is found, it is called progressivity, both of which are measured using the price related differential. The acceptable range for the PRD is from 0.98 to 1.03. Any measurement above 1.03 is considered regressive and anything below 0.98 is considered progressive.

## Results

The complete ratio study reports are included in the Appendix. They were completed by Paul Bidanset using the data provided and input into the R software.

The overall ratio statistics fell within acceptable ranges with the exception of the PRD for 2018 sales of commercial property. It fell one point outside the acceptable range, which indicates a need to watch that particular property class in the future, but it is not alarming. The median and COD for that class and year are excellent. The statistics for 2019 are also very good, including the PRD.

The breakdown by Assessment Area reveals some areas that need further review. The ratio statistics that appear to fall out of acceptable ranges are shaded for easier identification. For example, Area 7048 shows a COD of 16.81 and a PRD of 1.07, both of which are beyond acceptable ranges. The reader should be cautioned about drawing too fine a point however, since there were only five sales reported for that area. Smaller samples produce less reliable statistics than larger samples. In addition, this area is comprised exclusively of parking spaces, which present a unique appraisal challenge.



The one area that raises a concern involves the sales of land. There aren't very many sales involved in any of the samples, but the ratio statistics reflect significant deviation from acceptable ranges. Area 114, with the largest number of sales registered a median of 3.03 and even the lower bound of 1.75 is higher than the high point of the acceptable range and 1.1. The coefficient of dispersion is almost double the acceptable level for vacant land of 25. Further disclosure of information from the assessor's office reveals, however, that some of these land parcels are in transition from an agricultural use valuation set by the state and true market value. Because the value was established by the state, they should be excluded from further consideration in evaluating the local reappraisal effort.



## Appendix

### Overall Ratio Study

Sale Year	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	Commercial	76	\$40,000	\$25,370,000	\$1,982,254	\$876,000	\$3,427,038	0.99	1.00	1.00	1.00	2.43	1.04
2018	Residential	3301	\$1,000	\$1,400,000	\$283,555	\$258,000	\$131,842	1.00	1.00	1.00	1.00	0.93	1.00
2019	Commercial	8	\$285,000	\$1,313,000	\$611,250	\$448,000	\$347,544	0.94	0.87	0.94	1.02	5.58	0.99
2019	Residential	200	\$2,000	\$568,000	\$255,661	\$242,950	\$89,607	0.93	0.92	0.94	0.95	9.24	1.01



### Ratios by Assessment Area

Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	1	Residential	25	\$170,000	\$275,000	\$229,320	\$229,200	\$25,072	1.00	1.00	1.00	1.00	0.19	1.00
2018	2	Residential	30	\$204,000	\$350,000	\$266,970	\$259,250	\$36,880	1.00	1.00	1.00	1.00	2.11	1.01
2018	3	Residential	24	\$232,500	\$374,900	\$272,238	\$270,600	\$29,634	1.01	1.00	1.00	1.00	1.00	1.00
2018	4	Residential	23	\$230,000	\$498,000	\$362,270	\$375,000	\$71,127	1.00	1.00	1.00	1.00	0.54	1.00
2018	5	Residential	23	\$181,500	\$261,000	\$227,383	\$228,500	\$17,383	1.00	1.00	1.00	1.00	0.14	1.00
2018	7	Residential	15	\$237,100	\$625,000	\$342,373	\$324,500	\$101,727	1.01	1.00	1.00	1.00	1.87	1.00
2018	8	Residential	16	\$268,000	\$557,000	\$362,475	\$342,500	\$79,741	1.01	1.00	1.00	1.00	1.31	1.00
2018	9	Residential	19	\$192,800	\$470,000	\$310,468	\$299,900	\$92,628	1.00	1.00	1.00	1.00	0.50	1.00
2018	10	Residential	8	\$400,000	\$950,000	\$645,875	\$605,000	\$208,379	0.99	1.00	1.00	1.00	1.38	1.01
2018	11	Residential	16	\$319,500	\$527,400	\$415,275	\$415,250	\$54,657	1.03	1.00	1.00	1.00	3.43	1.01
2018	12	Residential	31	\$250,000	\$594,300	\$365,968	\$359,400	\$71,198	1.00	1.00	1.00	1.00	0.41	1.00
2018	13	Residential	28	\$245,000	\$700,000	\$399,486	\$380,500	\$101,119	1.02	1.00	1.00	1.00	2.08	1.01
2018	14	Residential	23	\$190,500	\$387,000	\$269,278	\$265,000	\$52,573	1.18	0.98	1.00	1.02	17.87	1.09
2018	15	Residential	9	\$220,000	\$266,900	\$247,178	\$250,000	\$16,014	1.00	1.00	1.00	1.00	0.41	1.00
2018	16	Residential	8	\$225,000	\$440,000	\$305,875	\$294,250	\$63,283	1.00	1.00	1.00	1.00	0.51	1.00
2018	17	Residential	38	\$225,000	\$595,000	\$371,392	\$364,300	\$85,609	1.00	1.00	1.00	1.00	0.43	1.00
2018	18	Residential	37	\$291,000	\$971,000	\$505,762	\$467,500	\$152,142	1.01	1.00	1.00	1.00	1.22	1.00
2018	19	Residential	14	\$225,000	\$554,200	\$382,479	\$361,500	\$93,806	1.00	1.00	1.00	1.00	0.33	1.00
2018	20	Residential	25	\$360,000	\$755,000	\$501,688	\$467,700	\$114,476	1.00	1.00	1.00	1.00	0.67	1.00
2018	21	Residential	15	\$155,000	\$700,000	\$329,273	\$300,000	\$135,770	1.01	1.00	1.00	1.00	0.77	1.00
2018	26	Residential	13	\$204,000	\$410,000	\$314,477	\$316,700	\$68,851	1.02	1.00	1.00	1.00	2.41	1.00
2018	27	Residential	11	\$235,000	\$680,000	\$383,636	\$394,000	\$132,400	1.02	1.00	1.00	1.00	1.80	1.00



Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	28	Residential	8	\$170,000	\$525,000	\$343,938	\$317,000	\$131,251	1.00	1.00	1.00	1.00	0.00	1.00
2018	30	Residential	18	\$118,600	\$334,500	\$252,706	\$258,500	\$55,944	0.98	1.00	1.00	1.00	1.84	0.99
2018	31	Residential	17	\$191,000	\$450,000	\$233,129	\$219,200	\$58,454	1.00	1.00	1.00	1.00	0.25	1.00
2018	32	Residential	19	\$150,000	\$354,500	\$275,753	\$276,000	\$55,950	0.98	1.00	1.00	1.00	2.21	1.00
2018	33	Residential	24	\$168,000	\$329,600	\$218,338	\$219,500	\$32,177	1.01	1.00	1.00	1.00	1.66	1.00
2018	34	Residential	29	\$75,000	\$267,500	\$194,890	\$195,000	\$34,613	1.01	1.00	1.00	1.00	1.92	1.00
2018	35	Residential	19	\$175,500	\$312,000	\$226,342	\$220,000	\$31,102	1.00	1.00	1.00	1.00	0.03	1.00
2018	36	Residential	26	\$210,000	\$298,000	\$244,062	\$241,500	\$25,173	1.01	1.00	1.00	1.00	1.72	1.00
2018	37	Residential	27	\$129,900	\$333,000	\$224,289	\$225,000	\$46,521	0.99	1.00	1.00	1.00	0.81	1.00
2018	38	Residential	39	\$145,000	\$410,000	\$260,146	\$260,500	\$70,811	1.00	1.00	1.00	1.00	0.10	1.00
2018	39	Residential	19	\$115,000	\$296,800	\$193,300	\$191,700	\$53,174	1.01	1.00	1.00	1.00	1.38	1.00
2018	40	Residential	17	\$110,000	\$230,000	\$183,771	\$185,000	\$30,797	1.04	1.00	1.00	1.00	5.10	1.02
2018	41	Residential	54	\$145,000	\$325,000	\$212,841	\$215,500	\$31,773	1.00	1.00	1.00	1.00	0.00	1.00
2018	42	Residential	24	\$159,300	\$515,000	\$274,296	\$269,200	\$84,648	1.00	1.00	1.00	1.00	0.47	1.00
2018	43	Residential	61	\$163,000	\$295,000	\$223,044	\$222,000	\$27,987	1.00	1.00	1.00	1.00	0.02	1.00
2018	44	Residential	23	\$170,000	\$320,000	\$242,426	\$243,000	\$29,856	1.00	1.00	1.00	1.00	0.00	1.00
2018	45	Residential	24	\$147,800	\$306,000	\$214,196	\$215,000	\$31,969	1.00	1.00	1.00	1.00	0.23	1.00
2018	46	Residential	15	\$165,000	\$300,000	\$226,267	\$227,500	\$30,638	1.00	1.00	1.00	1.00	0.21	1.00
2018	47	Residential	33	\$182,500	\$279,000	\$240,703	\$238,000	\$22,471	1.00	1.00	1.00	1.00	0.05	1.00
2018	48	Residential	37	\$160,000	\$240,000	\$206,305	\$206,900	\$16,825	0.99	1.00	1.00	1.00	0.58	1.00
2018	49	Residential	7	\$270,000	\$370,100	\$327,714	\$335,000	\$34,260	1.00	1.00	1.00	1.00	0.19	1.00
2018	50	Residential	26	\$145,000	\$242,500	\$187,169	\$178,300	\$27,794	0.99	1.00	1.00	1.00	0.82	1.00
2018	51	Residential	37	\$100,000	\$270,000	\$185,403	\$181,000	\$29,920	1.00	1.00	1.00	1.00	0.34	1.00





Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	53	Residential	11	\$238,500	\$425,000	\$320,182	\$305,500	\$62,716	1.00	1.00	1.00	1.00	1.42	1.00
2018	54	Residential	6	\$210,000	\$350,700	\$279,883	\$285,750	\$61,334	1.00	1.00	1.00	1.00	0.28	1.00
2018	55	Residential	8	\$255,800	\$410,000	\$326,963	\$316,500	\$55,397	1.02	1.00	1.00	1.00	1.84	1.01
2018	56	Residential	11	\$181,500	\$366,600	\$269,682	\$257,000	\$48,239	1.00	1.00	1.00	1.00	0.30	1.00
2018	57	Residential	20	\$215,500	\$555,000	\$350,335	\$348,750	\$83,166	1.00	1.00	1.00	1.00	0.75	1.00
2018	61	Residential	19	\$199,000	\$645,000	\$368,232	\$363,400	\$115,849	1.02	1.00	1.00	1.00	1.90	0.99
2018	63	Residential	23	\$345,500	\$680,000	\$472,891	\$474,000	\$82,969	1.00	1.00	1.00	1.00	0.77	1.00
2018	64	Residential	16	\$170,000	\$480,000	\$288,500	\$291,000	\$89,110	1.00	1.00	1.00	1.00	0.18	1.00
2018	65	Residential	11	\$394,000	\$735,000	\$550,355	\$528,500	\$115,249	1.00	1.00	1.00	1.00	0.19	1.00
2018	67	Residential	32	\$225,000	\$540,000	\$418,031	\$432,500	\$80,455	1.00	1.00	1.00	1.00	0.00	1.00
2018	69	Residential	24	\$200,000	\$634,600	\$399,613	\$407,500	\$93,840	1.00	1.00	1.00	1.00	1.26	1.00
2018	70	Residential	11	\$147,800	\$605,000	\$441,555	\$420,000	\$126,772	0.95	0.99	1.00	1.00	5.42	0.99
2018	71	Residential	17	\$168,000	\$365,000	\$230,041	\$222,000	\$46,065	1.00	1.00	1.00	1.00	0.07	1.00
2018	72	Residential	11	\$205,000	\$250,000	\$225,836	\$227,000	\$11,263	1.00	1.00	1.00	1.00	0.44	1.00
2018	73	Residential	46	\$120,000	\$272,000	\$189,574	\$194,850	\$38,555	1.00	1.00	1.00	1.00	0.37	1.00
2018	74	Residential	16	\$242,500	\$475,000	\$322,700	\$313,500	\$59,469	1.01	1.00	1.00	1.00	1.86	1.00
2018	75	Residential	7	\$470,000	\$685,000	\$524,300	\$495,000	\$74,375	1.00	1.00	1.00	1.00	0.47	1.00
2018	76	Residential	61	\$188,000	\$296,000	\$237,889	\$237,000	\$24,891	1.00	1.00	1.00	1.00	0.95	1.00
2018	77	Residential	7	\$158,500	\$215,000	\$186,271	\$185,000	\$22,146	1.00	1.00	1.00	1.00	0.24	1.00
2018	79	Residential	5	\$563,000	\$1,400,000	\$896,820	\$785,000	\$320,772	1.00	1.00	1.00	1.00	0.08	1.00
2018	80	Residential	23	\$80,000	\$387,000	\$218,757	\$205,000	\$64,856	1.00	1.00	1.00	1.00	0.13	1.00
2018	81	Residential	23	\$164,000	\$409,000	\$234,909	\$219,900	\$51,281	0.99	1.00	1.00	1.00	0.60	1.00
2018	83	Residential	6	\$767,000	\$1,200,000	\$969,500	\$935,000	\$184,314	0.99	1.00	1.00	1.00	1.01	1.00



Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	84	Residential	10	\$240,000	\$343,500	\$286,690	\$276,450	\$32,898	1.00	1.00	1.00	1.00	0.19	1.00
2018	85	Residential	6	\$260,000	\$502,500	\$390,250	\$396,000	\$90,460	1.00	1.00	1.00	1.00	0.17	1.00
2018	86	Residential	13	\$335,000	\$670,000	\$488,400	\$484,900	\$106,951	1.01	1.00	1.00	1.00	0.85	1.00
2018	87	Residential	31	\$218,200	\$310,500	\$253,355	\$250,000	\$22,339	1.00	1.00	1.00	1.00	0.56	1.00
2018	88	Residential	48	\$212,000	\$365,000	\$261,983	\$254,850	\$34,239	1.00	1.00	1.00	1.00	0.20	1.00
2018	89	Residential	20	\$245,000	\$385,100	\$323,925	\$342,000	\$45,577	1.00	1.00	1.00	1.00	0.20	1.00
2018	90	Residential	18	\$225,000	\$536,000	\$330,517	\$330,850	\$76,379	0.99	1.00	1.00	1.00	0.67	1.00
2018	91	Residential	12	\$265,000	\$550,000	\$390,842	\$369,400	\$97,949	1.00	1.00	1.00	1.00	0.28	1.00
2018	92	Residential	30	\$193,300	\$300,000	\$228,273	\$223,500	\$24,872	1.02	1.00	1.00	1.00	2.11	1.00
2018	93	Residential	43	\$208,000	\$370,000	\$269,165	\$260,000	\$41,578	1.00	1.00	1.00	1.00	0.71	1.00
2018	94	Residential	20	\$290,000	\$468,000	\$366,330	\$362,800	\$53,641	1.00	1.00	1.00	1.00	0.38	1.00
2018	95	Residential	31	\$224,500	\$440,000	\$316,777	\$311,800	\$55,289	1.00	1.00	1.00	1.00	0.35	1.00
2018	97	Residential	12	\$199,900	\$303,000	\$233,700	\$233,150	\$30,010	1.00	1.00	1.00	1.00	0.00	1.00
2018	98	Residential	43	\$241,500	\$324,000	\$278,549	\$280,000	\$19,995	1.00	1.00	1.00	1.00	0.48	1.00
2018	99	Residential	72	\$219,900	\$477,700	\$291,644	\$279,100	\$47,315	1.00	1.00	1.00	1.00	0.19	1.00
2018	100	Residential	24	\$420,000	\$1,050,000	\$594,304	\$551,450	\$139,672	1.00	1.00	1.00	1.00	0.33	1.00
2018	101	Residential	22	\$275,000	\$570,000	\$360,614	\$328,350	\$74,887	1.00	1.00	1.00	1.00	0.42	1.00
2018	102	Residential	28	\$213,300	\$328,000	\$261,471	\$263,000	\$25,960	1.00	1.00	1.00	1.00	0.30	1.00
2018	103	Residential	43	\$192,000	\$415,800	\$279,842	\$269,000	\$41,642	1.00	1.00	1.00	1.00	0.00	1.00
2018	105	Residential	11	\$239,200	\$260,000	\$248,736	\$245,000	\$7,229	1.00	1.00	1.00	1.00	0.12	1.00
2018	106	Residential	7	\$293,500	\$375,500	\$329,929	\$322,000	\$29,441	0.99	0.99	1.00	1.01	1.16	1.00
2018	107	Residential	53	\$235,000	\$360,000	\$297,255	\$295,000	\$30,928	1.00	1.00	1.00	1.00	0.34	1.00
2018	108	Residential	14	\$280,000	\$416,900	\$354,343	\$360,450	\$38,447	1.01	1.00	1.00	1.00	1.40	1.00



Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	109	Residential	12	\$285,000	\$420,000	\$350,033	\$363,250	\$38,772	1.00	1.00	1.00	1.00	0.26	1.00
2018	110	Residential	28	\$387,000	\$999,400	\$626,321	\$609,000	\$152,435	1.00	1.00	1.00	1.00	0.65	1.00
2018	111	Residential	45	\$262,500	\$520,000	\$353,647	\$349,100	\$61,932	1.00	1.00	1.00	1.00	0.33	1.00
2018	112	Residential	44	\$280,000	\$470,000	\$355,866	\$352,500	\$48,390	1.00	1.00	1.00	1.00	0.25	1.00
2018	113	Residential	5	\$272,000	\$329,900	\$296,980	\$299,000	\$21,734	1.00	1.00	1.00	1.00	0.33	1.00
2018	114	Residential	15	\$345,000	\$644,900	\$450,967	\$427,900	\$86,318	1.00	1.00	1.00	1.00	0.44	1.00
2018	115	Residential	19	\$235,000	\$418,000	\$298,811	\$291,000	\$48,511	1.00	1.00	1.00	1.00	0.10	1.00
2018	118	Residential	11	\$150,000	\$225,100	\$172,636	\$164,500	\$24,118	1.00	1.00	1.00	1.00	0.00	1.00
2018	119	Residential	9	\$167,000	\$259,000	\$191,022	\$180,000	\$29,804	1.00	1.00	1.00	1.00	0.12	1.00
2018	120	Residential	9	\$240,000	\$299,000	\$262,111	\$263,000	\$18,811	1.00	1.00	1.00	1.00	0.06	1.00
2018	121	Residential	8	\$256,000	\$297,500	\$280,100	\$289,950	\$16,152	1.00	0.99	1.00	1.00	0.87	1.00
2018	122	Residential	28	\$259,400	\$400,000	\$317,489	\$302,500	\$44,191	1.00	1.00	1.00	1.00	0.24	1.00
2018	123	Residential	5	\$170,000	\$225,000	\$201,020	\$208,100	\$21,386	1.00	1.00	1.00	1.00	0.18	1.00
2018	124	Residential	20	\$201,000	\$442,500	\$289,635	\$280,500	\$70,491	1.00	1.00	1.00	1.00	0.55	1.00
2018	2004	Residential	5	\$240,000	\$318,600	\$286,920	\$299,000	\$34,498	0.99	0.99	1.00	1.01	0.62	1.00
2018	2021	Residential	7	\$290,000	\$445,000	\$353,071	\$320,000	\$64,602	1.00	1.00	1.00	1.00	0.00	1.00
2018	2024	Residential	10	\$245,000	\$650,000	\$405,090	\$401,250	\$121,652	1.00	1.00	1.00	1.00	0.00	1.00
2018	2027	Residential	5	\$270,900	\$476,000	\$358,080	\$381,000	\$84,740	1.00	1.00	1.00	1.00	0.30	1.00
2018	2032	Residential	5	\$204,000	\$365,000	\$280,600	\$286,000	\$59,138	1.01	1.00	1.00	1.00	0.91	1.00
2018	2037	Residential	6	\$159,000	\$295,000	\$229,500	\$239,000	\$47,018	0.99	0.99	1.00	1.00	0.64	1.00
2018	2038	Residential	12	\$150,000	\$400,000	\$299,142	\$299,500	\$68,633	1.02	1.00	1.00	1.00	2.33	1.01
2018	2042	Residential	8	\$235,000	\$406,000	\$306,625	\$287,750	\$61,742	0.99	0.99	1.00	1.01	1.38	1.00
2018	2044	Residential	7	\$230,000	\$275,000	\$260,200	\$267,000	\$16,915	1.00	1.00	1.00	1.00	0.00	1.00



Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	2051	Residential	5	\$152,000	\$230,700	\$196,860	\$217,000	\$39,960	1.03	1.00	1.00	1.00	3.78	1.00
2018	2069	Residential	6	\$330,000	\$521,100	\$400,200	\$390,050	\$73,310	1.00	1.00	1.00	1.00	0.00	1.00
2018	2087	Residential	5	\$253,400	\$288,000	\$272,060	\$273,900	\$12,435	1.04	1.00	1.00	1.00	4.18	1.01
2018	3103	Residential	5	\$362,000	\$665,000	\$486,580	\$425,900	\$137,167	1.00	1.00	1.00	1.00	0.04	1.00
2018	3104	Residential	8	\$245,000	\$725,000	\$460,713	\$438,000	\$133,487	1.00	1.00	1.00	1.00	0.00	1.00
2018	5003	Residential	7	\$115,000	\$157,000	\$140,914	\$146,000	\$15,841	1.00	1.00	1.00	1.00	0.22	1.00
2018	5013	Residential	6	\$147,500	\$294,500	\$181,333	\$161,500	\$55,801	1.00	1.00	1.00	1.00	0.23	1.00
2018	5015	Residential	21	\$63,000	\$127,000	\$86,429	\$84,300	\$19,794	1.02	1.00	1.00	1.00	2.96	1.00
2018	5024	Residential	5	\$231,000	\$390,000	\$286,400	\$267,000	\$60,994	1.00	1.00	1.00	1.00	0.00	1.00
2018	5026	Residential	19	\$184,000	\$445,000	\$354,184	\$367,200	\$69,956	1.01	1.00	1.00	1.00	0.91	1.00
2018	5027	Residential	8	\$192,000	\$275,000	\$232,475	\$225,000	\$32,619	1.00	1.00	1.00	1.00	0.00	1.00
2018	5037	Residential	13	\$89,000	\$127,500	\$115,431	\$115,000	\$10,416	1.03	1.00	1.00	1.00	4.23	1.01
2018	5062	Residential	7	\$197,500	\$265,000	\$224,843	\$223,500	\$22,488	1.00	1.00	1.00	1.00	0.15	1.00
2018	5076	Residential	23	\$69,900	\$142,000	\$99,887	\$107,000	\$20,204	1.00	1.00	1.00	1.00	0.46	1.00
2018	5081	Residential	5	\$66,900	\$158,300	\$111,440	\$114,000	\$35,072	0.99	1.00	1.00	1.00	0.95	1.00
2018	5086	Residential	11	\$115,000	\$219,000	\$182,600	\$190,000	\$33,145	1.00	1.00	1.00	1.00	0.86	1.00
2018	5087	Residential	27	\$134,100	\$205,000	\$162,881	\$158,000	\$17,541	1.01	1.00	1.00	1.00	0.90	1.00
2018	5088	Residential	16	\$119,600	\$166,000	\$143,263	\$149,000	\$13,303	0.99	1.00	1.00	1.00	1.08	1.00
2018	5092	Residential	5	\$127,000	\$179,400	\$139,360	\$128,000	\$22,622	1.01	0.99	1.00	1.01	2.49	1.00
2018	5093	Residential	11	\$157,000	\$240,000	\$201,882	\$215,000	\$25,968	1.00	1.00	1.00	1.00	0.87	1.00
2018	5095	Residential	43	\$122,000	\$430,000	\$204,707	\$187,500	\$76,689	1.00	1.00	1.00	1.00	0.17	1.00
2018	5099	Residential	8	\$180,000	\$213,500	\$194,088	\$192,100	\$12,622	1.00	1.00	1.00	1.00	0.00	1.00
2018	5100	Residential	24	\$227,000	\$619,000	\$389,892	\$405,000	\$120,885	1.01	1.00	1.00	1.00	0.93	1.00



Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	5101	Residential	5	\$260,000	\$500,000	\$404,000	\$425,000	\$103,405	1.00	1.00	1.00	1.00	0.00	1.00
2018	5102	Residential	7	\$132,900	\$141,000	\$136,414	\$135,000	\$3,225	1.00	1.00	1.00	1.00	0.41	1.00
2018	5103	Residential	14	\$140,000	\$295,000	\$206,571	\$196,250	\$65,955	1.00	1.00	1.00	1.00	0.00	1.00
2018	5105	Residential	38	\$113,900	\$215,500	\$161,437	\$158,450	\$28,305	1.00	1.00	1.00	1.00	0.42	1.00
2018	5106	Residential	5	\$319,000	\$392,000	\$337,460	\$327,000	\$30,807	1.00	1.00	1.00	1.00	0.06	1.00
2018	5107	Residential	45	\$124,000	\$234,000	\$193,338	\$200,000	\$28,432	1.00	1.00	1.00	1.00	0.70	1.00
2018	5108	Residential	13	\$169,900	\$224,800	\$204,892	\$210,000	\$18,077	0.99	1.00	1.00	1.00	1.25	1.00
2018	5109	Residential	12	\$205,000	\$245,000	\$227,192	\$229,200	\$12,760	1.00	1.00	1.00	1.00	0.05	1.00
2018	5110	Residential	10	\$209,900	\$262,000	\$233,230	\$235,000	\$18,115	1.01	1.00	1.00	1.00	0.68	1.00
2018	5113	Residential	5	\$245,000	\$266,000	\$258,360	\$260,000	\$8,518	1.00	1.00	1.00	1.00	0.00	1.00
2018	5115	Residential	15	\$118,000	\$282,300	\$178,453	\$162,000	\$54,143	1.00	1.00	1.00	1.00	0.00	1.00
2018	5145	Residential	13	\$108,000	\$132,500	\$119,131	\$120,000	\$7,492	0.98	0.97	0.98	0.99	1.45	1.00
2018	5526	Residential	7	\$279,900	\$465,000	\$391,900	\$400,000	\$67,531	1.00	1.00	1.00	1.00	0.10	1.00
2018	5577	Residential	9	\$136,400	\$161,500	\$151,689	\$153,900	\$7,594	0.99	1.00	1.00	1.00	0.66	1.00
2018	5596	Residential	7	\$113,500	\$136,400	\$130,557	\$132,000	\$7,843	1.00	1.00	1.00	1.00	0.00	1.00
2018	5704	Residential	6	\$92,400	\$135,000	\$121,567	\$128,750	\$15,846	0.98	0.99	1.00	1.00	1.71	1.00
2018	5709	Residential	7	\$230,000	\$440,000	\$291,400	\$269,700	\$71,726	1.04	1.00	1.00	1.00	4.73	1.02
2018	5712	Residential	5	\$114,500	\$164,500	\$142,720	\$149,700	\$21,958	1.00	1.00	1.00	1.00	0.03	1.00
2018	5796	Residential	8	\$99,500	\$151,000	\$130,300	\$139,950	\$22,528	1.00	1.00	1.00	1.00	0.00	1.00
2018	5811	Residential	7	\$121,800	\$192,400	\$155,457	\$154,000	\$21,073	1.00	1.00	1.00	1.00	0.31	1.00
2018	5842	Residential	6	\$100,000	\$115,000	\$105,833	\$104,500	\$5,776	0.98	1.00	1.00	1.00	1.74	1.00
2018	5885	Residential	7	\$178,000	\$205,000	\$189,129	\$183,000	\$11,263	1.00	1.00	1.00	1.00	0.00	1.00
2018	5896	Residential	18	\$135,100	\$200,000	\$163,033	\$164,500	\$21,162	1.00	1.00	1.00	1.00	0.00	1.00



Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	5908	Residential	6	\$92,500	\$144,900	\$115,400	\$113,750	\$21,903	1.00	1.00	1.00	1.00	0.13	1.00
2018	5909	Residential	6	\$114,000	\$129,000	\$120,500	\$120,650	\$5,711	1.07	1.00	1.00	1.00	7.24	1.02
2018	5911	Residential	6	\$138,000	\$270,000	\$195,500	\$193,500	\$58,773	1.00	1.00	1.00	1.00	0.12	1.00
2018	5924	Residential	18	\$301,100	\$1,244,000	\$488,178	\$438,500	\$217,148	1.00	1.00	1.00	1.00	0.10	1.00
2018	5931	Residential	5	\$105,000	\$127,300	\$115,900	\$115,200	\$8,962	0.99	1.00	1.00	1.00	0.60	1.00
2018	5942	Residential	8	\$129,000	\$150,000	\$141,813	\$143,500	\$6,824	1.01	1.00	1.00	1.00	1.29	1.00
2018	5967	Residential	10	\$118,000	\$205,000	\$155,950	\$152,000	\$27,005	0.99	1.00	1.00	1.00	0.72	1.00
2018	5985	Residential	6	\$113,400	\$136,000	\$126,217	\$129,500	\$10,067	1.01	1.00	1.00	1.00	1.33	1.00
2018	5994	Residential	6	\$189,900	\$220,700	\$205,100	\$205,000	\$10,719	1.00	1.00	1.00	1.00	0.02	1.00
2018	5996	Residential	7	\$175,000	\$189,000	\$184,343	\$185,000	\$4,734	1.00	1.00	1.00	1.00	0.00	1.00
2018	7048	Residential	5	\$2,000	\$2,000	\$2,000	\$2,000	\$-	0.83	0.71	1.00	1.29	16.81	1.07
2018	9913	Commercial	11	\$907,000	\$9,525,000	\$3,711,409	\$3,080,000	\$2,990,584	0.99	1.00	1.00	1.00	0.73	1.00
2018	9914	Commercial	9	\$117,000	\$1,780,000	\$521,333	\$300,000	\$548,192	1.00	1.00	1.00	1.00	0.00	1.00
2018	9915	Commercial	6	\$275,000	\$975,000	\$574,583	\$552,500	\$270,113	1.00	1.00	1.00	1.00	0.00	1.00
2018	9921	Commercial	12	\$112,500	\$9,800,000	\$2,109,500	\$1,642,500	\$2,582,041	1.03	1.00	1.00	1.00	6.60	1.03
2018	9925	Commercial	10	\$320,000	\$5,157,000	\$1,692,400	\$1,155,000	\$1,565,056	1.00	1.00	1.00	1.00	0.00	1.00
2019	31	Residential	6	\$188,200	\$252,500	\$207,933	\$201,750	\$24,061	0.93	0.85	0.92	0.99	6.57	1.01
2019	32	Residential	7	\$175,000	\$314,900	\$248,843	\$263,600	\$51,368	0.92	0.90	0.94	0.97	4.75	1.01
2019	33	Residential	9	\$171,100	\$274,400	\$214,656	\$209,900	\$27,330	0.92	0.85	0.90	0.95	7.02	1.01
2019	38	Residential	28	\$134,200	\$378,600	\$256,321	\$243,100	\$55,595	0.90	0.86	0.90	0.93	7.98	1.00
2019	43	Residential	7	\$181,800	\$234,700	\$204,971	\$206,800	\$18,887	0.96	0.94	0.98	1.01	5.65	1.00
2019	47	Residential	7	\$212,900	\$282,200	\$242,843	\$229,900	\$29,200	1.00	0.95	0.99	1.03	5.35	1.00
2019	53	Residential	6	\$262,900	\$377,600	\$298,100	\$283,750	\$42,263	0.89	0.83	0.88	0.92	6.63	1.00



Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2019	69	Residential	10	\$223,700	\$431,600	\$341,520	\$345,900	\$57,573	0.97	0.90	0.95	0.99	8.17	1.01
2019	74	Residential	9	\$242,500	\$336,800	\$300,100	\$306,100	\$28,711	0.86	0.79	0.91	1.04	14.03	1.02
2019	93	Residential	9	\$219,200	\$298,500	\$252,311	\$260,000	\$27,110	0.95	0.89	0.94	0.98	5.52	1.00
2019	2038	Residential	5	\$199,200	\$354,200	\$274,840	\$255,500	\$67,154	0.84	0.65	0.87	1.10	18.38	1.00
2019	5003	Residential	5	\$139,700	\$145,500	\$142,360	\$143,200	\$2,500	0.96	0.95	0.97	0.99	2.82	1.00



## Land Ratios

Sale Year	Assmt Area	Property Class	Sale Count	Min Asmnt	Max Asmnt	Mean Asmnt	Med Asmnt	St.Dev Asmnt	Mean Ratio	LB	Med Ratio	UB	COD	PRD
2018	67	Residential	6	\$158,000	\$580,000	\$399,683	\$426,150	\$173,849	2.61	1.77	2.97	4.17	33.40	1.01
2018	71	Residential	7	\$62,000	\$230,400	\$104,043	\$65,500	\$67,972	1.5	0.48	0.95	1.41	59.35	1.00
2018	114	Residential	18	\$94,900	\$521,300	\$314,794	\$329,150	\$142,552	3.08	1.75	3.03	4.31	43.50	1.07
2018	116	Residential	5	\$85,900	\$437,500	\$200,280	\$164,400	\$138,257	1.98	0.43	1.29	2.14	71.61	1.03
2018	67	Residential	6	\$158,000	\$580,000	\$399,683	\$426,150	\$173,849	2.61	1.77	2.97	4.17	33.40	1.01