

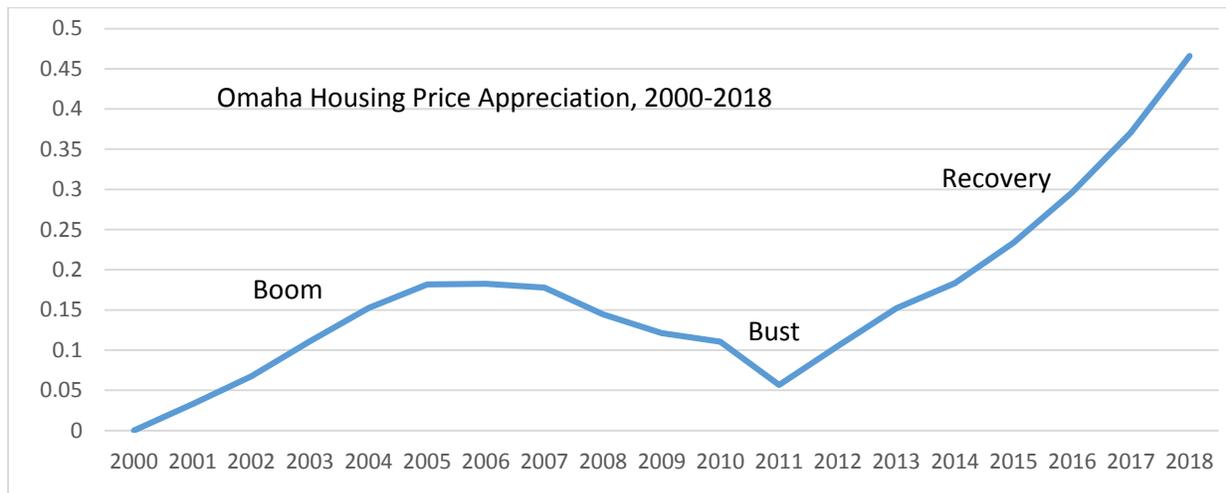
Research Report
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**Omaha Single Family Housing Prices (2000 to 2018):
Historically High Appreciation Drives Investors & First-Time Buyers East**

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Executive Summary

This study evaluates existing (non-new construction) single-family housing price appreciation across the Omaha, NE, Metropolitan Area from 2000 through the end of 2018 with an emphasis on price changes during the last two years.

Price appreciation was estimated using sales transaction data recorded by the multiple listing service of the Omaha Area Board of Realtors and two distinct approaches: 1) mass appraisal modelling that relies on multiple regression techniques to measure annual price appreciation with statistical precision while accounting for the characteristics of sold housing and 2) Median sale price changes over time while accounting for home size. Appreciation is estimated across 7 Omaha market segments and 37 zip codes.

Over the 2000 to 2018 time period, home prices have increased by 47% with a range of appreciation from 29% to 53% across 7 market segments. Since the ‘bottom’ of the 2007-2011 housing bust, prices have rebounded by 41%.

In the last two years (2016- 2018) appreciation was between 12.5% and 17% (based on alternative calculation approaches), and this last year (2017-18), appreciation was between 6.4% and 9.5%. These are the highest rates of both one and two-year housing price appreciation observed in Omaha over the last 20 years and they exceed recent housing price appreciation observed nationally and in other Midwestern Cities.

Finally, the Omaha housing market is not uniform or homogeneous: From 2016 to 2018, price appreciation ranged from 7% to 38% across 31 zip codes with the highest appreciation in the more developed eastern/urbanized parts of Omaha. Last year (2017-18), appreciation ranged from 15% to 30% across 7 Omaha sub-markets, with ‘South’ and ‘North’ Omaha, two relatively low income areas buffering downtown seeing the highest relative price increases.

Methods and Data Sources

This study relied on housing transaction data recorded by the Multiple Listing Service of the Omaha Area Board of Realtors: This incorporates 163,771 ‘arms-length’ housing sales over the 2000 through 2018 period. Utilized sales needed to be detached single-family residences, existing (not new construction), within the non-rural areas of Douglas and Sarpy County, on lots smaller than 1 acre, and within the \$20,000 to \$600,000 price range.

A ‘mass appraisal’ multiple regression model was used to estimate annual appreciation by specifying the log of sold price to be a function of structural housing and neighborhood level characteristics (home and lot sizes, home style, age, and features present). Estimated coefficients for dichotomous (dummy) variables indicating whether a home sold in a given year represent annual price appreciation. This model specification has been peer reviewed by mass appraisal experts and published in national real estate journals and compares favorably against both more simplistic and more complex appreciation estimation approaches (both average house price changes and repeat-sale indices).

Corresponding median based estimates of annual appreciation are calculated as the percentage difference in median sale price across two time periods. A limitation with median appreciation estimates is that they do not always represent homogeneous (similar) housing stock (type, age, size and price) sold over time, particularly within relatively small sub-market areas which may have small numbers of sales within particular time periods. As well, these results are considered non-parametric and their statistical significance or validity is not calculated in a multi-variate framework. Nevertheless, these median estimates are useful for evaluating the accuracy of mass appraisal estimates, and are used in this study to provide appreciation estimates in cases when mass appraisal estimates are not reported (due to statistical insignificance). To improve the accuracy of median price estimates used in this study medians are obtained for sale prices divided by home size (above grade living area) to lessen the impact of varying home sizes sold over time from biasing the appreciation estimates. For those readers interested in additional details about mass appraisal, median price changes, and

the use of repeat sale analyses to measure housing price appreciation, please see the two pages of additional background material contained in the Appendix.

Appreciation over the 2000 to 2018 period is first estimated for the entire Omaha Metro Area and then separately for 7 distinct sub-markets across distinct time periods over the last 18 years: The 2000 to 2007 time period often described as the housing boom; The housing ‘crash’ of 2007 to 2011; The initial recovery period of 2011 to 2016; The strong recovery of 2016-18; and the most recent 2017-18 period.

Sub-Markets Evaluated Across Omaha

Based on prior housing market studies in the Omaha, it is known that housing characteristics and housing price appreciation are not homogeneous. Therefore, in this present study housing price appreciation is reported by 7 geographical sub-markets based on aggregating various combinations of zip code boundaries within areas defined by their jurisdictions, location, homogeneity and familiarity (defined below). Price appreciation is reported for the last two years (2016-18) at the smaller and more detailed zip code level of analysis.

‘Sarpy County Suburbs’ include all of Sarpy County minus several zip codes (68128, 68157, 68147 and 68005) that contain older and more urbanized housing covering the La Vista, Bellevue and Old Town areas. The median age of homes sold in this area 2018 was 13 while median sale price was \$250,000 with a standard deviation of \$99,000.

‘Douglas County Suburbs’ encompass the zip codes west and north of the 480/680 interstate beltway in an attempt to capture the more recently developed areas of the County. It does however contain some areas of older developments particularly in several of the zip codes straddling the Dodge corridor just west of 480/680. Median year 2018 age here is 18 years with a median sale price of \$230,000.

‘Omaha Central’ is intended to represent the urban core of Omaha and is designated by zip codes within the 480/680 beltway with the following exclusions: the two zip codes south of L

Street in the Ralston Area (68124 and 68817), the downtown zip code (68102), the Westside School District, and the 5 zip codes making up the ‘North’ and ‘South Omaha’ market areas. Despite its relatively compact geographical focus across 7 remaining zip codes, this area still contains a high degree housing heterogeneity as demonstrated by the high year 2008 standard deviation of sale price (\$111,000) as compared to the median sale price of \$150,000.

Unfortunately, much of this age and price heterogeneity cuts across zip code boundaries which prohibits additional market segmentation by zip codes.

‘South Omaha’ is comprised of the two zip codes (68107 and 68108) immediately south of Downtown Omaha and contains some of the oldest low to moderately priced housing stock in Omaha and contains a high proportion of Hispanic residents. Its northernmost component, close to downtown Omaha, includes the ‘Little Italy’ neighborhood which has seen active redevelopment efforts in recent years. The 2018 median sale price here is \$108,000 with a relatively modest standard deviation of \$40,000. Over the 2016 to 2018 period 27% of all sales here were cash purchases (in lieu of traditional mortgages) which is markedly higher than the average cash purchase metric of 13% across the entire Omaha market. Such cash purchases are likely driven by two factors: relatively low housing prices and/or high levels of investors and house ‘flipping’.

‘North Omaha’ represented by Zip codes 68131, 68111, and 68110 has traditionally been one of the lowest income areas of Omaha and has been the subject of substantial public and private redevelopment efforts in the last few decades. Its close proximity to both downtown Omaha and the airport give this area much potential for property price appreciation yet the area has suffered from high crime rates, sub-prime lending, and foreclosures in recent years. The median 2018 sale prices is \$65,000 which is the lowest of the Omaha metro. The standard deviation for 2018 sale price is \$76,000 meaning this area has the largest relative range in sale prices in Omaha which is likely a result of the re-sale of many recently constructed homes. An astounding 47% of all homes sold over the 2016-18 period in North Omaha were purchased with cash likely due the same reasons as previously described for South Omaha (low prices and investor activity).

‘Omaha South & Sarpy County Northcentral’ incorporate the 5 zip codes straddling the

Douglas/Sarpy County boundary line meaning it is relatively close to the City of Omaha. It includes and they incorporate the cities of Ralston, La Vista, and Bellevue and the following zip codes: 68127, 68117, 68128, 68147, and 68157). In summary this can be considered the ‘non suburban’ parts of Sarpy County combined with a few neighboring Douglas County zip codes. Median sale prices (2018) are \$160,000 with a standard deviation of \$68,000.

‘Westside School District’ is bounded North-South by Center and Dodge Streets and East-West by 72 Street and interstate 480/680. Median 2018 sale price and the standard deviation are both \$180,000. Prices here have been very stable over time in large part due to the relatively high cost of housing here combined with no areas for new housing construction and high performing schools.

Table 1: Housing Sale Summary Statistics Across Omaha Sub-Markets

	Year 2018 Sale Price (thousands)		Age		# Sales (2018)	% Cash Sales (2016-2018)
	Median	Std. Dev.	Median	Std. Dev.		
All Omaha Metro	\$198	\$138	32	32	11,041	13%
Suburbs (Sarpy)	\$250	\$99	13	14	2,168	10%
Suburbs (Douglas)	\$230	\$141	18	20	4,701	6%
Omaha Central	\$150	\$111	68	24	1,661	19%
Omaha South & Sarpy North Central	\$160	\$68	47	21	692	13%
North Omaha	\$65	\$76	99	27	351	47%
South Omaha	\$108	\$41	98	28	345	27%
Westside School District	\$180	\$180	59	9	445	18%

Zip Code Level Analyses:

To provide greater insight into price appreciation for specific area, 2016- 2018 price appreciation estimates based on both mass appraisal and median price changes are reported by zip codes.

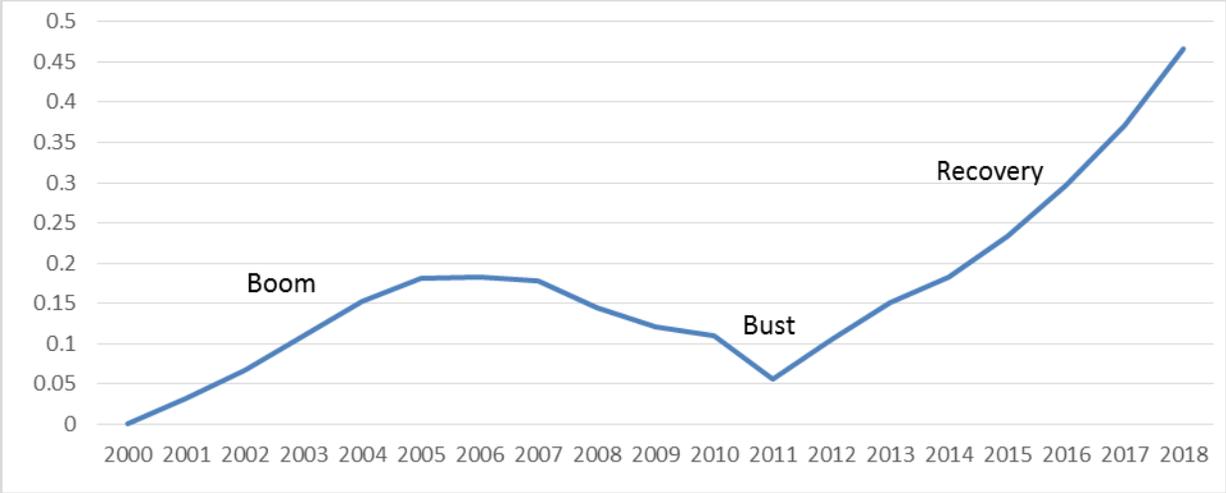
However, only statistically significant mass appraisal appreciation estimates (at the 90% confidence level or higher) are reported. It is important to point out that even though these zip codes are smaller and more homogeneous than the other submarket areas, there is still likely to be considerable housing characteristic heterogeneity within many of them. For this reason, the results of this study are not appropriate for direct use in tax protests, which should be based on smaller and more detailed neighborhood comparable sale analyses.

Results

Omaha-Wide Price Appreciation 2000-2018

From 2000 through the end of 2018, existing Omaha homes across appreciated by an average of 47%. Since the ‘bottom’, (low price point) of the 2007-2011 housing market ‘crash’, Omaha housing prices having rebounded by 41%.

Figure 1. Omaha Housing Price Appreciation 2000-2018



Comparing Recent Omaha Housing Appreciation with other Locations.

Based on mass appraisal modelling, during the last two years (2016-18) appreciation across the entire Omaha metro area was 17% and in this last year (2017-18) it was 9.5%. If appreciation is based on median sale price divided by above grade living area across these same time periods, these appreciation rates fall to 12.5% and 6.4%. If appreciation is calculated simply by comparing median prices over these time periods, Omaha appreciation was 15% (2016-18) and 8% this last year (2017-18). This means that over the 2016 -18 period Omaha appreciation exceeded the national average (based on median prices reported by National Association of Realtors) by 36% and by 56% this last year. These price appreciation advantages were even higher when Omaha is compared to other Midwestern Cities which only had appreciation rates of 9.5% (2016-18) and 2.9% (2017-18).

Table 2. Omaha Versus National Housing Appreciation (2016-17/18)

	2016-18	2017-18
Omaha Metro (Mass Appraisal)	17%	9.5%
Omaha Metro Median (Median Prices/AGLA)	12.5%	6.4%
Omaha Metro (Median Prices)	15%	8%
USA (Median Prices)*	11%	5.1%
Midwestern Cities (Median Prices)*	9.5%	2.9%

** As reported by the National Association of Realtors*

Appreciation Across Omaha Sub-Markets

Price Appreciation for the entire Omaha Metro from the baseline year of 2000 through the end of 2018 is 47% and this is very consistent across the 8 of the 9 different market segments with

appreciation rates ranging from 41% to 53%). The only exception is 'North Omaha' which appreciated by only 29% over this 18 year period in part due to the area being particularly hard hit during the housing market crash and slower than average price appreciation during the early years of the recovery.

All the market segments appreciated similarly (14% to 20%) during the housing boom years of 2000 to 2007, but several of them had markedly higher rates of price depreciation during the housing crisis/bust years of 2007 to 2011, particularly South Omaha (-38%), North Omaha (34%) and Central Omaha (-27%) in contrast to the other areas of the Omaha market when price declined by between 5% and 14% over these four years. The recovery since then has been positive and steady in all market segments but particularly strong in South Omaha which in the last two years had price appreciation of 30% which is almost double the Omaha wide average. In this last year both North and South Omaha posted the highest rates of appreciation at 19% each again almost double from the Omaha Metro average.

The convergence of price appreciation rates over time across Omaha appears to be an example of the financial theory of 'mean reversion' where asset prices and returns eventually return back to the long run average of entire portfolio of stocks. That is, when particular market segments have bargain priced properties as compared to home prices in other areas which have appreciated more strongly, buyers eventual take notice and purchase these lower cost homes which over time leads to increased price appreciation in these previously underperforming areas. This 'bargain hunting' phenomena may have been accelerated in the last two years due to the shortage of homes affordable to many first time homebuyers in the suburban reaches of Omaha due to limited supply and rapidly increasing home construction costs.

Figure 2. Omaha Price Appreciation (2000-2018) Across 7 Sub-Markets

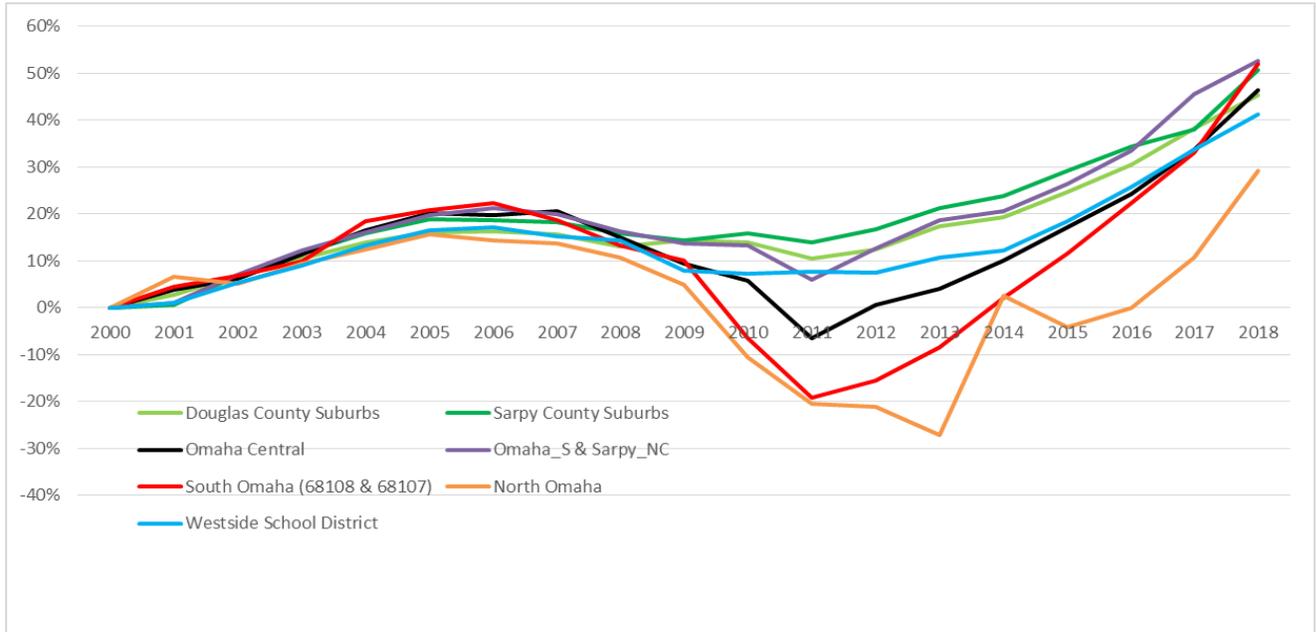


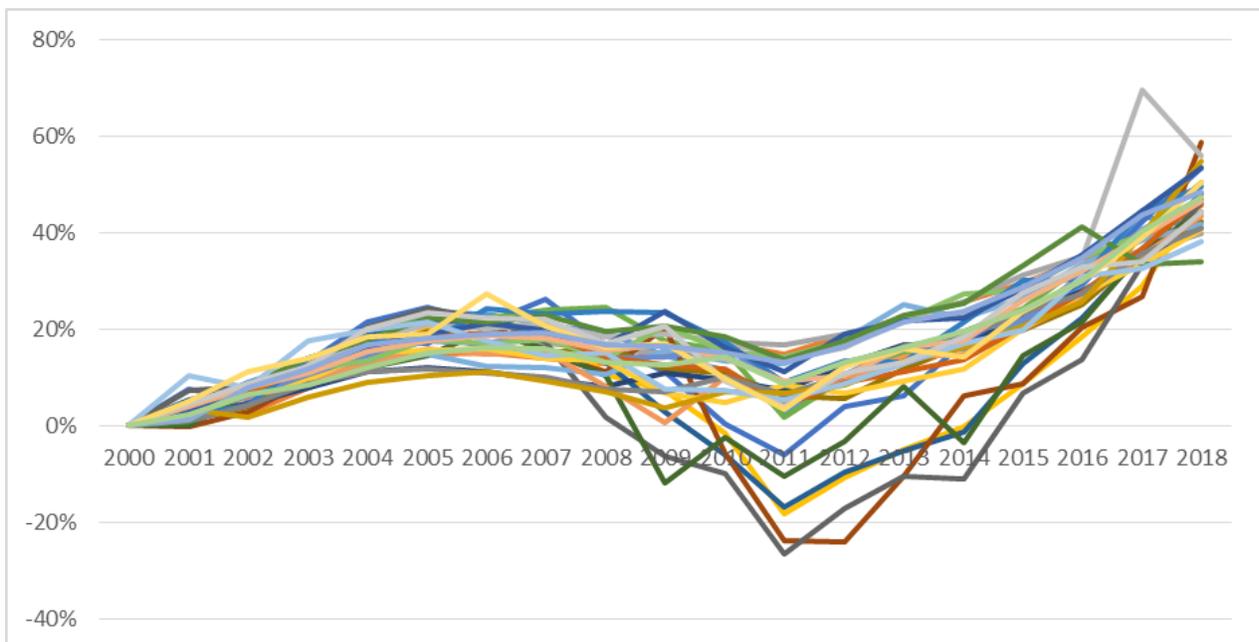
Table 3. Mass Appraisal Based Price Housing Appreciation Across Omaha By Key Timelines Over the 2000-2018 Period

	2000-18	2000-07 (Boom)	2007-11 (Bust)	2011-16 (Recovery)	2016-18 Last 2 Years	2017-18 Last Year
Omaha Metro Area	47%	18%	-12%	24%	17%	9.5%
Douglas County Suburbs	45%	16%	-5%	20%	15%	6.5%
Sarpy County Suburbs	51%	18%	-4%	20%	16%	13%
Omaha Central	46%	21%	-27%	31%	22%	13%
Omaha South & Sarpy Northcentral	53%	20%	-14%	27%	19%	7%
South Omaha	52%	19%	-38%	42%	30%	19%
North Omaha	29%	14%	-34%	21%	29%	19%
Westside School District	41%	15%	-8%	18%	15%	7%

Zip Code Level Price Appreciation.

Price appreciation based on mass appraisal over the 2000 to 2018 period for 31 different Omaha zip codes for which there were enough sales to generate reliable appreciation estimates, is shown in Figure 3. Up until the market crash of 2007, appreciation was relatively uniform and constant across the zip codes, but after this point (the market crash of 2007-2011) appreciation rates began to diverge sharply, although they have begun to converge again in the last two years.

Figure 3. Housing Price Appreciation Across 31 Omaha Zip Codes



Price appreciation over the last two years (2016-18) based on both mass appraisal and median calculation approaches are shown for all 37 Omaha zip codes in Table 4. In cases when mass appraisal results are not statistically significant for a particular zip code or year, only median price based appreciation estimates are reported. In cases where mass appraisal appreciation differs substantially from median price based appreciation, it is likely that there are differences in

the characteristics of the housing stock sold over the two years. It is also important to note that there is a high degree of housing heterogeneity across many of these zip code boundaries meaning that if readers really want to know how housing values have changed in recent years for particular homes or neighborhoods, they should investigate price changes across neighborhood market segments defined by the Douglas and Sarpy County Assessor Offices or by subdivisions.

Over the last two years, mass appraisal based appreciation rates across all Omaha zip codes is 7% to 38%. The three Omaha area zip codes with the highest appreciation are: 68126 (38%), located in 'South Omaha'; 68112 (33%) located in the far northeastern corner of Douglas County; and 68131 (30%) in the midtown Omaha area surrounding Creighton University.

The three zip codes with the lowest 2016-18 appreciation are 68142 (7%) in a suburban/rural area between Irvington and Bennington; 68118 (8%) bounded north/south Blondo and Pacific Streets and east/west by 156 and 186 streets; and 68022 (11%) which is located in the Elkhorn area at the extreme western edge of Douglas County. The pattern emerging from these last two years of housing price appreciation data, is that that urbanized (eastern) parts of the Omaha metropolitan area have experienced higher price appreciation than the more western and southern rural/suburban areas. However, the good news is that all areas of Omaha are experiencing high rates of housing price appreciation which means that unless the local taxing authorities lower tax mill levies, that tax revenues will be increasing substantially.

Table 4. Mass Appraisal and Median Price Appreciation (2016-18) by Zip Codes

Zip Code	Mass Appraisal Appreciation*	Median Price Appreciation (Median Prices/AGLA) **
68005	12%	11%
68022	11%	6%
68028		6%
68046		9%
68104	28%	26%
68105	24%	31%
68106	17%	12%
68107	26%	24%
68108	38%	40%
68110		52%
68111		37%
68112	33%	20%
68114	17%	13%
68116	13%	12%
68117	23%	15%
68118	8%	9%
68122	17%	16%
68123	21%	16%
68124	13%	15%
68127	15%	17%
68128		13%
68130	12%	7%
68131	30%	2%
68132	19%	14%
68133		5%
68134	19%	17%
68135	14%	12%
68136	29%	17%
68137	18%	14%
68138		17%
68142	7%	9%
68144	15%	13%
68147		13%
68152	20%	15%
68154	14%	11%
68157		9%
68164	17%	14%

* Blank fields represent non-statistically significant results (which are not reported)

** When mass appraisal vs. median appreciation rates differ substantially it is likely that the characteristics of sales are varied across time periods

Other/Ongoing UNO Real Estate Research Projects

Faculty and staff at the UNO Center for Real Estate and Asset Management undertakes research to provide public and private stakeholders in the Omaha community with objective and unbiased information to help assist with equitable and efficient real estate development. Funding for such research efforts has been obtained from Federal, State and local governments and agencies as well as from private benefactors. Current (ongoing and pending) research efforts include:

- Modelling the frequency and success of tax protests.
- Evaluating the accuracy of tax assessment and appraisal adjustment factors in Omaha
- Quantifying the impact of lending and community development programs on Omaha Price Appreciation.
- Understanding the extent and role of house flipping in the Omaha Market.
- Measuring the impact of TIF projects on adjacent/nearby housing prices
- The impact of alternative approaches to determining the assessment value of Low Income Housing Tax Credit Properties
- Refining the use of the cost approach to value flood damage risk.
- Relationships between apartment rents and housing price appreciation
- Predicting cost approach values for apartment buildings based on observed rents.

If readers are interested in obtaining copies of these research reports when they become available, they should request to be placed on the email distribution list of the UNO Center for Real Estate and Asset Management by emailing: realestate@unomaha.edu.

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<https://www.unomaha.edu/college-of-business-administration/center-for-real-estate-and-asset-management/research/index.php>

Appendix A.

Background: Alternative Approaches to Estimate Housing Price Appreciation

There are three commonly used approaches to calculate housing price appreciation, defined as the change in sold prices over time. The most simplistic approach which is regularly used in press releases by the National Association of Realtors is to report price appreciation as a percentage based on average price trends (either means or medians) over time using a formula such as:

$$\text{Appreciation} = \frac{P_t - P_{t^*}}{P_{t^*}}$$

where t^* is the first period in a sequence and t is the year immediately following t^* .

The advantage of this approach is that it is easy to calculate and intuitive. Disadvantages are that the results susceptible to statistical outliers and that it is difficult to ensure that same types of housing are compared over time. Therefore most analysts relying on this approach use median statistics rather than means, remove statistical outlier sales, exclude new housing, and often evaluate prices adjusted for house size. Another limitation of the approach is that it is not possible to ascertain whether or not noted appreciation rates are statistically significant (i.e. it is a non-parametric approach). This approach can be improved by dividing median sale prices by sold home size (usually above grade living area) to account for differently sized homes selling over two more time periods.

A second and usually more accurate approach for estimating housing price appreciation involves a mass appraisal model (also commonly known as hedonic price model or an automated valuation model). This requires the estimation of a multivariate statistical model where housing sale prices are specified to be a function the physical and location related characteristics of sold homes and the time period in which they are sold. A generic form of such a model is:

$$\ln P = \beta_0 + \sum_{i=1}^n \beta_j X_{ij} + \delta_t D_{it} + \varepsilon$$

where X is a vector of housing characteristics, and D is a matrix of binary variables equal to 1 if the home sold in time t and 0 if otherwise. Each estimated (reported) time-dummy variable coefficient measures the cumulative change in price up to the year of the sale. The advantage of this technique is that it controls for changing housing characteristics over time and that the statistical significance is reported for appreciation and the other explanatory variables. A disadvantage of the approach is that it requires large numbers of detailed housing sales and that model specifications often need to be complex.

The third and most widely accepted and reported approach to measure housing price appreciation is the repeat sales approach which conceptually measures price changes for individual homes when they re-sell over time. The approach is used the Federal Housing Finance Authority (FHFA) to track the performance of federally backed (Fannie Mae and Freddie Mac) mortgages and the trademarked and highly publicized Case-Shiller Repeat Sale Index. A repeat sale index

involves calculating sale and re-sale prices of individual homes. When applied to many homes re-sold over different time periods the generic specification of the repeat-sale model is:

$$(\ln P_t - \ln P_{t^*}) = \sum_{i=1}^n \delta_i D_{it} + \varepsilon$$

which involves regressing the difference in logged prices of the second and first sales against a matrix of time variables equal to -1 if the home sold for the first time in that year, equal to 1 if the home sold for the second time in that year, and 0 otherwise. These dummy year coefficients are interpreted as the logged price index.

To ensure that similar and typical homes are evaluated, the approach usually excludes housing sales in which a re-sale occurs within a single year and/or when substantial (atypical) improvements are made to homes between sales (usually identified by changing home sizes). This is the superior approach as it guarantees that similar homes are evaluated over time, and that like the mass appraisal approach, it is parametric (statistical significance is reported). A disadvantage of the approach is that it requires complex data manipulation to identify and classify repeat sales which is why the Case-Shiller indices are estimated only for 20 major U.S. cities, approximately 3 to 4 months after specific sale periods. A weakness of the approach is that there are often insufficient sample sizes of repeat sales to accurately estimate appreciation in specific sub-markets (neighborhoods) within a city over short time periods. Finally, the repeat-sale approach usually under predicts appreciation (in comparison to other approaches) since it inherently uses geometric means rather than arithmetic means to estimate appreciation.

Researchers at the UNO Center for Real Estate and Asset Management have previously evaluated the use of all three of these approaches for measuring single-family housing price appreciation in Omaha over the 2000 to 2011 time period. They concluded that during periods of steady and moderate price appreciation over intermediate time periods (around 5 continuous years) that all three approaches generate very similar appreciation estimates particularly at the Omaha-wide level of analysis with mass appraisal results in most cases generating slightly higher appreciation rates than median based estimates during years of price growth versus slightly lower depreciation rates during years of price decline. However, appreciation results over shorter time periods (between 1 and 3 year time spans) and/or longer periods (e.g. 2000-2016) vary across the two approaches especially across different neighborhoods. It was found that appreciation estimates based on repeat sales during short and long time periods were consistently lower than the median calculations particularly after 2006. It was also concluded that median based appreciation estimates were less stable (i.e. accurate) when appreciation was estimated within specific neighborhoods (i.e. based on smaller samples sizes of sales), which can result in sale prices of non-similar homes being compared.

A known problem with both mass appraisal and median appreciation calculations are they give too much weight to appreciation in areas of new housing construction (i.e. the suburbs) relative to already developed (i.e. inner city) areas. Therefore the use of repeat sales indices are warranted but they involve substantial data management/calculation effort which is one reason why UNO Real Estate researchers have not estimated repeat sale indices in Omaha since 2011.