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Omaha Single-Family Housing Price Appreciation 2000-2016

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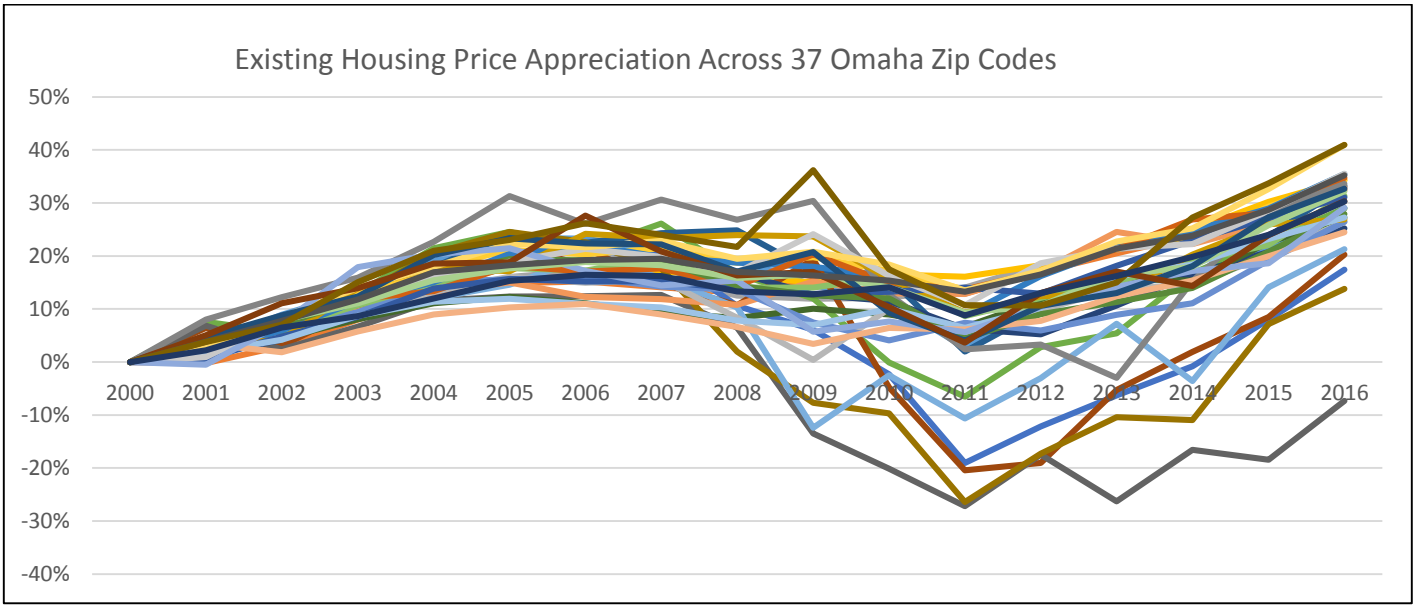

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Executive Summary

Omaha Single-family housing price appreciation is calculated over the 2000 to 2017 period. New housing construction, condominiums, rural acreage properties and extremely low and high valued property sales were excluded. The study used data from the Omaha Area Board of Realtors Multiple Listing Service and relies primarily on multiple regression based mass appraisal modelling to quantify annual appreciation while accounting for varying housing stock characteristics. More simplistic yet potentially misleading appreciation estimates based on median price changes are also reported.

Over the last 16 years (from 2000 through the end of 2016) existing home prices across the entire Omaha Metro Area (the developed portions of Douglas and Sarpy Counties) appreciated 29% based on mass appraisal or 43% based on medians, with a range of mass appraisal based calculations from -7% in North Omaha to +36% in zip code 68137 representing Millard Southeast.

Since 2011 which is the historical 16-year low point of Omaha housing prices, homes have on average appreciated by 23% Over this 5-year period of recovery, appreciation ranged from 18% to 41% across 37 different zip codes and in this last year, appreciation averaged 6.2% but ranged from 0.9% to 11.7%, which demonstrates the limitations of relying on a single Omaha-wide appreciation statistic to evaluate the state of the Omaha housing market.

This substantial recent housing price appreciation combined with sharp variations in appreciation across different neighborhoods helps explain and/or justify recent tax assessment valuation increases in the Omaha market. However the zip code level appreciation estimates reported in this study are not suitable for individual homeowners to base tax protests due to likely variations in housing market prices within certain zip codes.

Areas of Omaha which suffered the steepest price declines during the housing market crash of 2008, particularly North and South Omaha, experienced the highest relative levels of price appreciation rebound this last year (11% and 12% respectively) or nearly twice the average Omaha price appreciation from 2015 to 2016.

Homes valued at less than $75,000 (representing approximately 4% of all year 2016 sales) depreciated on average by 5% over the entire 2000-2016 period, although they appreciated by 18% since 2011 and by 6.8% this last year. In contrast, the most expensive Omaha homes ($400,000 and higher representing 2% of sale in 2016) had the highest appreciation rates both over the 2000-2016 period and this last year. However, the highest price appreciation over the 2011-2016 period was associated with homes priced between $75,000 and $120,000.

Omaha housing finance trends are also reported. Conventional mortgages are the dominant financing option over the entire 2000 to 2016 period, but since the housing market crash of 2008-2011, they have lost some market share to FHA and VA loans as well as cash purchases which are very common with the purchase of homes below $75,000, likely by investors.

Finally, a series of ongoing related research projects being pursued by the UNO Center for Real Estate and Asset Management focusing on factors influencing price appreciation are listed. This research will be disseminated to interested Omaha stakeholders in the coming months in order to provide accurate and objective information and data regarding the complexities of the Omaha real estate market.

Background: Alternative Approaches to Estimate Housing Price Appreciation

There are three commonly used approaches to calculate housing price appreciation, defined as the change in selling 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:

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

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).

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:

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

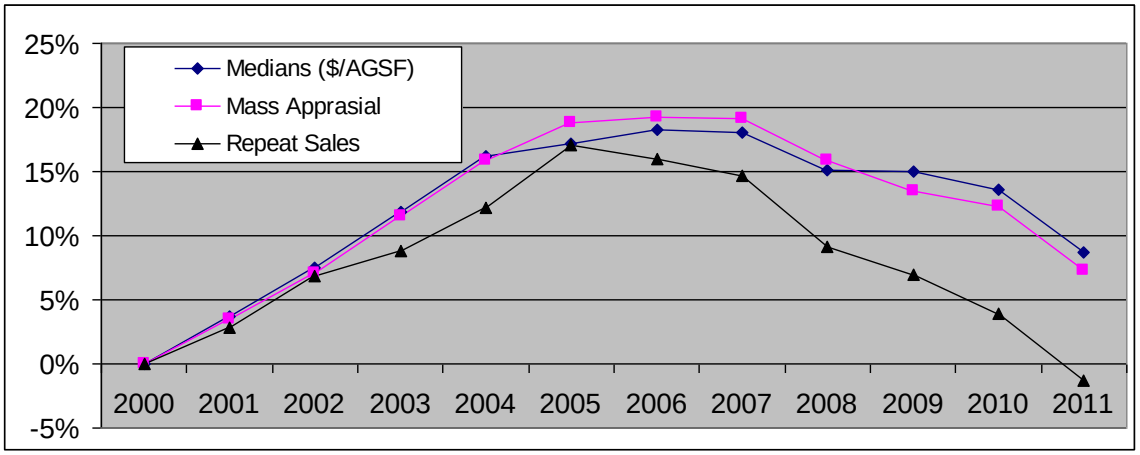
which involves regressing the difference in logged prices of the second and first sales against a matrix of time variables equal to -1 if the home sold for the first time in that year, equal to 1 if the home sold for the second time in that year, and 0 otherwise. These dummy year coefficients are interpreted 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. 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 (Figure 1). It was also found that median 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.

Figure 1. Cumulative Omaha Housing Price Appreciation Based on Three Alternative Calculation Approaches (2000-2011)



Methods and Data Sources

This study calculates mass appraisal and median based single-family housing appreciation over the 2000 to end of 2016 period. Appreciation was estimated for the entire Omaha Metropolitan Area defined as the developed portions of Douglas and Sarpy County. They were then estimated separately for each county, for suburban areas only, for particular sub-market areas of Douglas County (North and South Omaha and the Westside School District) and finally, for each of the 37 zip codes across the two counties in which sufficiently large sample sizes of sales were available. Zip codes 68110 and 68111 were combined to represent 'North Omaha', and zip codes 68007 and 68008 were combined to represent 'South Omaha'. Zip codes are used as units of neighborhood comparison in this present study because: 1) They are easy to classify (from the zip code classifications within the Omaha Area Board of Realtors' Multiple Listing Service: 2) They are large enough to contain sufficiently large numbers of housing sales to generate annual mass appraisal appreciation estimates: 3) They are recognizable to homeowners living within specific neighborhoods.

This study relied on housing transaction data recorded by the Multiple Listing Service of the Omaha Area Board of Realtors: This incorporates 140,000 'arms-length' housing sales over the 2000 though 2016 period. Data only included sales in the Omaha market, defined as the non-rural areas of Douglas, Sarpy Counties. New housing construction (sold less than 12 months after being built) and condominium sales were excluded along with: sales of less than $20,000 or more than $560,000, rural acreage sales (greater than 1 acre in size), and statistical outlier sales measured by extreme house sizes/price which resulted in a final usable dataset of 119,00 sales.

The 'mass appraisal' multiple regression model used to estimate annual is based on specifying the log of adjusted sale prices to be a function of structural housing and neighborhood level characteristics (home and lot sizes, home style, age, and features present. Dichotomous (dummy) variables indicating the year sold act as the measure of annual depreciation. The 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).

Appreciation is estimated first over the entire 2000 to 2016 period, over the 2011 to 2016 period representing the low point of Omaha housing prices associated with the 2008 to 2011 recession and housing market crash. Finally the model is estimated over this last year (2015 through to tend of 2015), and this this last year (2015 to 2016). Finally, appreciation estimates are made across 6 classes of housing values (Omaha wide).

Corresponding median based estimates are also made for comparison purposes with the caveat that this approach does not always represent homogeneous (similar) housing stock (home types and prices) sold over time, particularly within individual zip codes. Finally, it is important to point out that zip codes are not a perfect representation of homogenous housing stock within unique neighborhoods. In other words, calculated depreciation for a particular zip code may not always reflect the appreciation for specific homes and sub-areas of the zip code with different housing characteristics. For this reason the results of this study are not appropriate for use in tax protests, which should be based on smaller and more detailed neighborhood analyses.

Results

Omaha housing appreciation statistics over time (2000 through the end of 2016) based on both mass appraisal and median approaches, and by different geographical classifications, are summarized in Tables 1 through 4 and in Figures 2 through 4.

16 Year Appreciation (2000-2016)

Price Appreciation for the entire Omaha Metro from the baseline year of 2000 through the end of 2016 is 29% based on mass appraisal modelling versus 43% based on simple median comparisons. This divergence by approach indicates that different housing stock has been sold over this 16 year time period with larger, newer and more expensive homes having sold more frequently in recent years. This explains why the median appreciation values are inflated. The mass appraisal based appreciation estimates that rely on multiple regression analysis to account for (i.e. control) changing housing characteristics over time are statistically significant and considered superior to the median based appreciation calculations. Over this 16 year period, Sarpy County homes appreciated slightly more than in Douglas County (34% versus 27%) and the highest appreciation is found in the Suburban areas in contrast to older areas. Across 37 zip codes, 16-year appreciation ranged from a low of -7% (North Omaha zip codes) to a high of + 36% in zip code 68137 representing a southeastern area of Millard which demonstrates the inaccuracy of relying on single housing price appreciation estimate across Omaha.

Table 1. Price Appreciation, Existing Single Family Homes in the Omaha Metropolitan Area* (2000-2016) Based on Mass Appraisal Regression Modelling Versus Medians: By Sub-Regions

	2000 - 2016		**2011-2016**		**2015-2016**	
	Mass Appraisal	*Median*	*Mass Appraisal*	*Median*	*Mass Appraisal*	*Median*
Omaha-Metro (All)	29%	43%	23%	21%	6.2%	5.4%
Douglas County	27%	41%	24%	18%	6.5%	4.7%
Sarpy County	34%	58%	22%	25%	5.6%	5.6%
All Suburbs (N & W of 480/680 & South of Harrison)	32%	44%	22%	21%	5.7%	4.2%
Douglas County Suburbs	30%	36%	20%	17%	5.9%	4.1%
Westside School District	25%	13%	18%	12%	7%	1.3%
North Omaha (68110 & 68111 Zips)	-7%	-11%	20%	21%	11.1%	25%
South Omaha (68108 & 68107 Zips)	20%	28%	41%	56%	11.7%	9.3%

Figure 2. Existing Home Price Appreciation (2011-2016): Entire Metro and by County

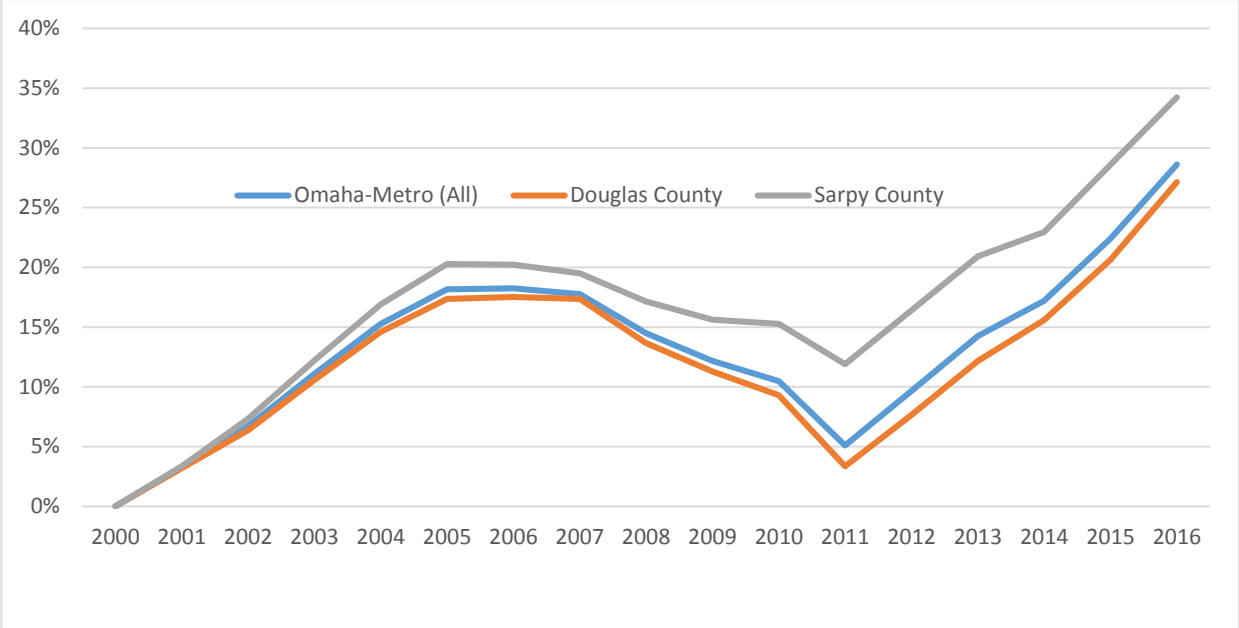


Table 2. Price Appreciation for Existing Single Family Homes (2000- 2016) Based on Mass Appraisal Regression Modelling Versus Medians: By Sarpy County Zip Codes*

	2000 - 2016		2011-2016		2015-2016	
Zip Code	*Mass Appraisal*	*Median*	*Mass Appraisal*	*Median*	*Mass Appraisal*	*Median*
68005 (Bellevue East)	29%	34%	26.3%	15%	7.4%	2.6%
68028 (Gretna)	33%	99%	19.0%	50%	3.4%	4.8%
68046 (Papillion West)	34%	77%	18.2%	24%	4.1%	3.9%
68123 (Bellevue West)	34%	40%	20.7%	23%	5.1%	2.5%
68128 (La Vista East)	35%	20%	26.6%	23%	6.5%	10.8%
68133 (Papillion East)	31%	41%	17.0%	32%	4.0%	6.2%
68136 (Chalco Hills)	24%	17%	18.3%	22%	4.5%	9.6%
68138 (Schram Rd-Warner Park)	41%	36%	27.5%	22%	8.4%	4.9%
68147 (Bellevue North)	33%	39%	28.6%	20%	5.4%	6.2%
68157 (La Vista West)	41%	59%	30.3%	41%	7.2%	8.8%
All Sarpy County	34%	58%	22%	25%	5.6%	6%

* Zip code descriptor names are for not official or definitive but rather are included for informational purposes only

Table 3. Price Appreciation for Existing Single Family Homes (2000-2016) Based on Mass Appraisal Regression Modelling Versus Medians: By Douglas County Zip Codes*

	2000 - 2016		2011-2016		2015-2016	
Zip Code	*Mass Appraisal*	*Median*	*Mass Appraisal*	*Median*	*Mass Appraisal*	*Median*
68022 (Elkhorn)	32%	120%	20%	24%	5.4%	5.9%
68104 (NW Radial)	17%	31%	36%	56%	9.4%	12.7%
68105 (Midtown/South)	29%	45%	36%	43%	6.1%	4.6%
68106 (Midtown/South)	33%	47%	31%	27%	9.5%	8.5%
68810 & 68111 Combined (North Omaha)	-7%	-11%	20%	21%	11.1%	25%
68107 & 68108 Combined (South Omaha)	20%	28%	41%	56%	11.7%	9.3%
68112 (Far Northeast)	14%	33%	40%	84%	6.6%	17.1%
68114 (West Dodge/Central)	25%	29%	19%	2%	4.5%	8.4%
68116 (West Maple)	27%	19%	21%	27%	4.7%	6.1%
68117 (Ralston-East)	21%	25%	32%	39%	7.2%	5.0%
68118 (Pacific Springs/Village Pt.)	33%	33%	20%	19%	6.8%	4.6%
68122 (NorthCentral)	26%	23%	22%	20%	6.2%	7.1%
68124 (Westside School D.)	26%	31%	19%	12%	7.3%	0.0%
68127 (Ralston-West)	31%	27%	23%	20%	9.3%	7.1%
68130 (Millard North)	35%	45%	21%	24%	6.6%	3.6%
68131 (Midtown-Central)	34%	59%	31%	53%	5.5%	9.9%
68132 (Midtown-Central)	27%	54%	18%	6%	0.9%	7.4%
68134 (NW Radial)	28%	27%	24%	22%	7.2%	9.0%
68135 (Millard Southwest)	27%	7%	21%	17%	4.1%	-0.1%
68142 (NorthCentral)	29%	-21%	23%	50%	10.5%	17.6%
68144 (Boystown-South)	32%	31%	23%	20%	6.4%	3.9%
68152 (Northeast)	30%	44%	27%	12%	6.4%	-7.5%
68154 (Boystown-North)	35%	47%	22%	20%	6.5%	7.1%
68137 (Millard Southeast)	36%	35%	25%	20%	7.0%	6.3%
68164 (Tranquility)	30%	25%	21%	17%	6.2%	6.2%
All Douglas County	27%	41%	24%	18%	6.5%	5%

* Zip code descriptor names are not official or definitive and are included only for informational purposes

Figure 3. Existing Home Price Appreciation (2011-2016): By Selected Market Areas

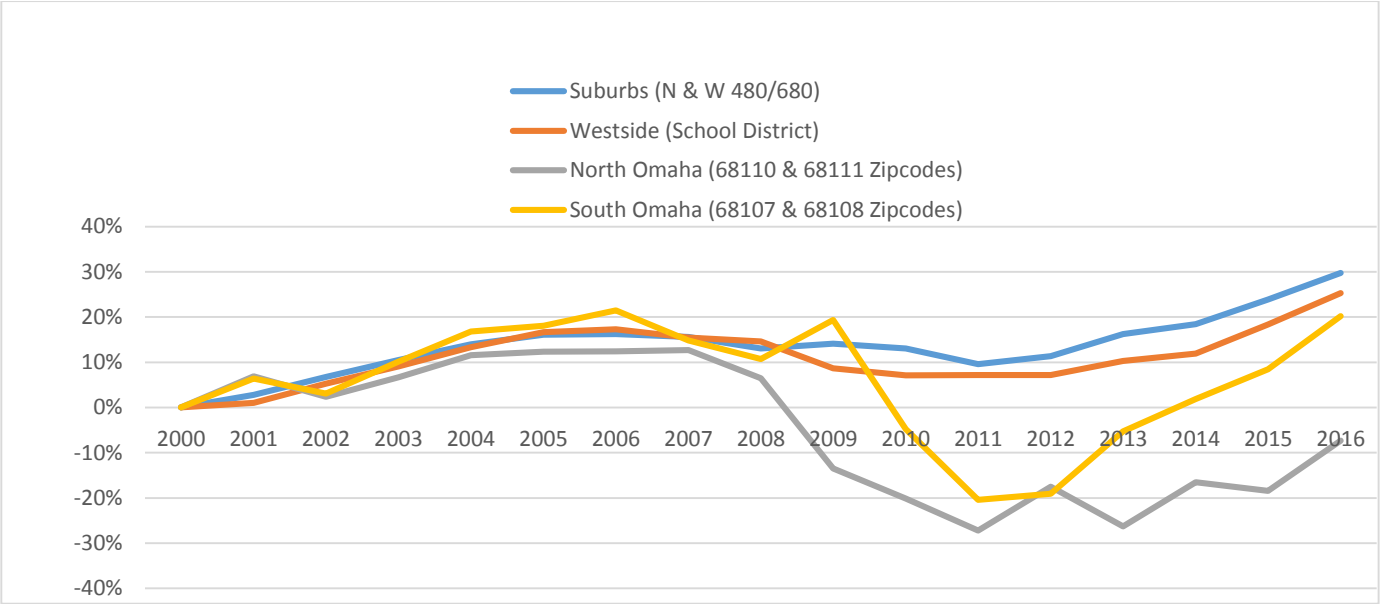
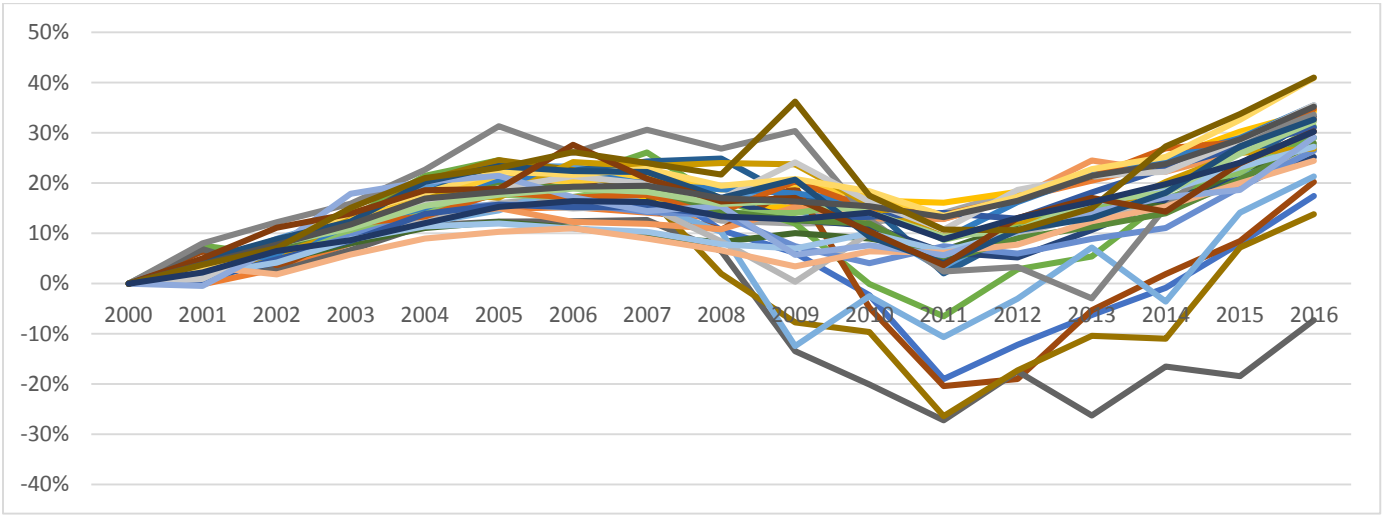


Figure 4. Existing Home Price Appreciation (2011-2016): By 37 Zip Codes



Price Appreciation Recover Since the Market Crash (2001-2016)

Over the last 6 years, from the post-crash low price in year 2011 through the end of 2016, existing housing prices across Omaha area have increased 23% based on mass appraisal, or 21% based on median calculations. This appreciation was relatively evenly distributed across the entire Metro with a range from 19% (zip code 68132 representing the midtown UNO area) to 41% in South Omaha (zip codes 68107 and 68108). This strong price re-bound for South Omaha is likely a relief to homeowners as home prices declined sharply in this area after the 2008 market crash. If local tax assessors were not able quickly re-assess properties quickly after the 2011 price lows, this would explain many of the dramatically high increases in 2016 assessments recently reported in the local press, particularly if properties receiving high valuation increases were assessed at below market values in prior years.

The Latest Appreciation (2015-2016)

For this latest year (2015 up to the end of 2016), existing Omaha home prices rose by 6.2% (6.5% in Douglas County versus 5.6% in Sarpy County. This is the highest annual Omaha price appreciation increase in almost two decades and will continue to lead to increased property taxes across the Omaha Area unless local governments reduce tax levies. Year 2016 appreciation was lowest in the midtown zip code of 68132 (0.9%) and highest in North and South Omaha zip code (11.1% and 11.7%). This is first time since the UNO Real Estate Research Center has been tracking and reporting Omaha housing price appreciation (since 2005), that the North and South Omaha areas have had appreciation growth exceeding the rest of Omaha.

Price Appreciation by Different Housing Values

Homes valued at less than $75,000 (representing approximately 4% of all year 2016 sales) actually depreciated by - 5% over the 2000-2016 period, although they appreciated by 18% since 2011 and by 6.8% this last year (Table 4). In contrast, the most expensive Omaha homes ($400,000 and higher representing 2% of year 2016 sales) had the highest appreciation rates over the 2000-2016 period and from 2015 to 2016. However, homes priced $75,000 to $120,000 showed the highest price appreciation (38%) over the 2011-2016 period.

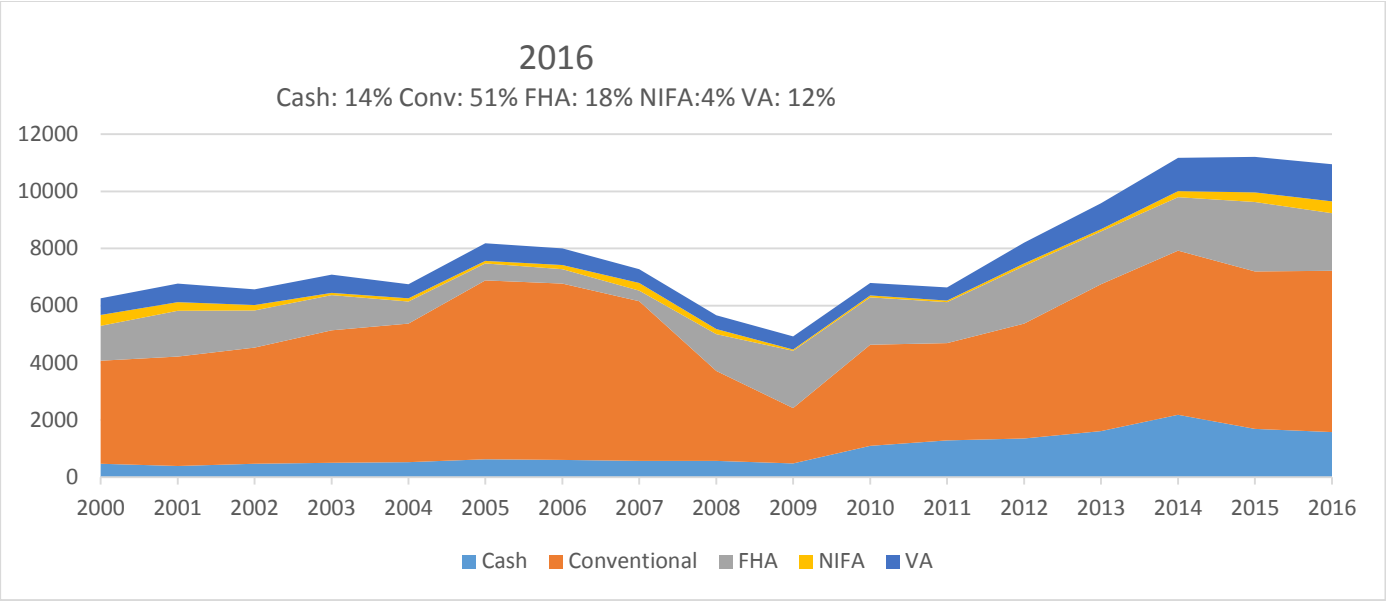
Table 4. Price Appreciation for Existing Single Family Homes (2000- 2016) Based on Mass Appraisal Regression Modelling Versus & Average (Medians): By Property Value

Home Value Class (2016)	% of all Sales (2016)	Appreciation 2000-2016	Appreciation 2011-2016	Appreciation 2015-2016
<=$75,000	4%	-5%	18%	6.8%
$75,001-$120,000	15%	21%	38%	8.1%
$120,001-$175,000	39%	27%	22%	6.6%
$175,001-$250,000	27%	30%	20%	4.9%
$250,001-$400,000	13%	32%	19%	12.9%
>$400,000	2%	35%	22%	13.2%

Omaha Housing Mortgage Trends Over Time

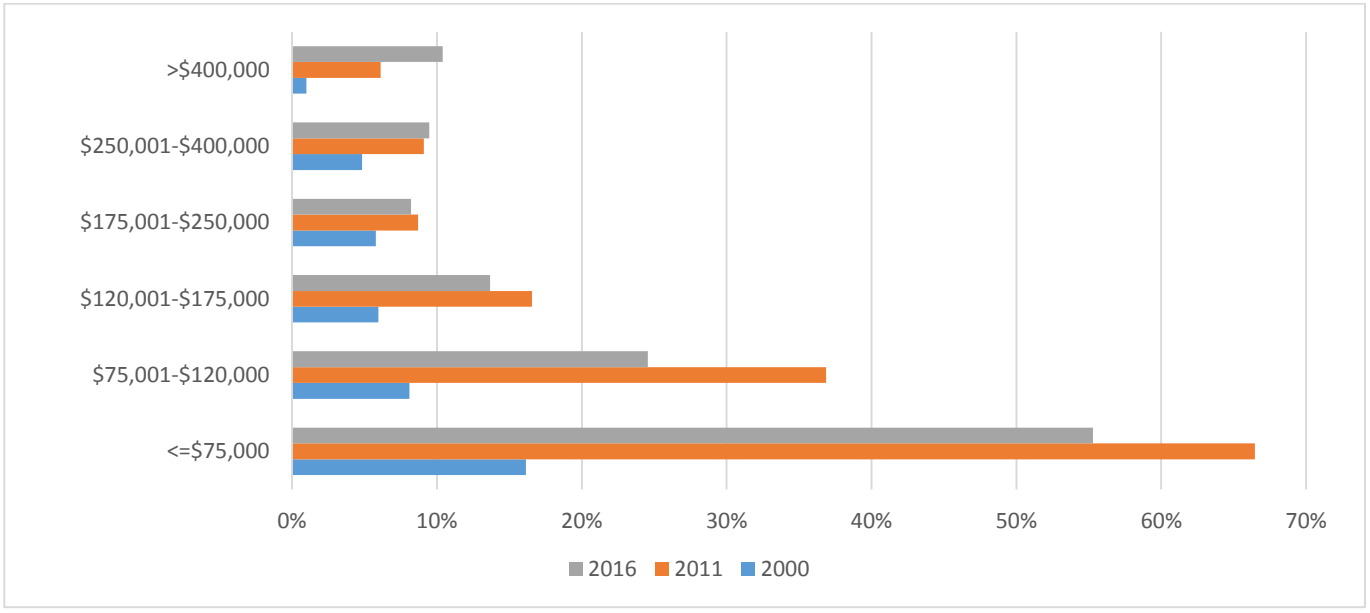
Based on data obtained from the Omaha Area Board of Realtors, Multiple Listing Service, several interesting trends regarding the financing of Omaha home purchases over time can be seen in Figure 5. Conventional mortgages (typically 15 or 30 year Fannie Mae and Freddie Mac backed loans originated by local lending institutions) have over the 2000 to 2016 period been the dominant instrument to purchase homes in Omaha. But the overall share of these conventional loans declined sharply after the housing market crash of 2008-2011 (when FHA and VA loans became more prevalent). However, since 2010 with increasing price appreciation, conventional loans have regained much of their market share. Cash purchases also increased substantially since 2009 and likely indicate investor purchases price highly depreciated homes. In 2016, 51% of all sold homes were financed by conventional mortgages followed by FHA mortgages (18%), cash (14%), VA (12%), and NIFA (4%).

Figure 5. Financing Sources for Omaha Housing Purchases Over Time



Cash home purchases are not evenly distributed across home values or time (Figure 6). The percentage of cash purchases decline as home values increase. In 2016, 55% of homes less than $75,000 were cash purchased versus 10% for homes over $400,000. Cash purchases increased noticeably across all housing values right after housing market crash of 2008 and remain relatively constant through 2016 when they were 14% of the market overall.

Figure 6. The Percentage of Cash Purchased Homes Across Home Values and Time (2000-2016)



Other Ongoing UNO Real Estate Research Projects

In addition to teaching efforts, the UNO Center for Real Estate and Asset Management regularly conducts 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 in Douglas County.

- 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 TIFF projects on adjacent/nearby housing prices.

- Developing the use of the cost approach to value flood damage risk.

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.