House Price Indices 1980-2018: 1980Q1=100
Philadelphia County v. Philadelphia MSA and U.S. Average

* Empirically estimated by Kevin C. Gillen, Ph.D.
**Courtesy of the Federal Housing Finance Agency (FHFA).
These HPIs are current through 2016Q4 only.
“MSA”=Metropolitan Statistical Area, which is the entire 10-county region.
### Total House Price Appreciation Rates by Geographic Market

<table>
<thead>
<tr>
<th>Period</th>
<th>Philadelphia County*</th>
<th>Philadelphia MSA**</th>
<th>U.S.A.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>38-Year</td>
<td>171.7%</td>
<td>183.7%</td>
<td>144.2%</td>
</tr>
<tr>
<td>10-Year</td>
<td>21.0%</td>
<td>13.9%</td>
<td>15.1%</td>
</tr>
<tr>
<td>1-Year</td>
<td>0.0%</td>
<td>7.4%</td>
<td>6.6%</td>
</tr>
<tr>
<td>1-Quarter</td>
<td>0.9%</td>
<td>2.1%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

*Empirically estimated by Kevin C. Gillen Ph.D.

**Source: U.S. Federal Housing Finance Agency (FHFA). These numbers are through 2018Q1 only. “MSA”=“Metropolitan Statistical Area”, which is the entire 10-county region.
House Price Appreciation 1987-2018: Philadelphia v. 10-City Composite

*Source: S&P/Case-Shiller. The 10-City Composite index includes Boston, Chicago, Denver, Las Vegas, Los Angeles, Miami, New York, San Diego, San Francisco, and Washington, DC. It does not include Philadelphia.
This chart shows the percent change in the respective house price indices from one year ago, which proxies for the annual average house price appreciation rate in each market.

*Source: S&P/Case-Shiller. The 10-City Composite index includes Boston, Chicago, Denver, Las Vegas, Los Angeles, Miami, New York, San Diego, San Francisco, and Washington, DC. It does not include Philadelphia.
1980Q1=100

ContrCity/Fairmount
Kensington/Frankford
Lower NE Phila.
North Phila.
NW Phila.
South Phila.
Univ. City
Upper NE Phila.
West Phila.

* All indices empirically estimated by Kevin C. Gillen, Ph.D.
Philadelphia House Price Appreciation Rates by Submarket

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>38-year</td>
<td>186.8%</td>
<td>180.3%</td>
<td>157.7%</td>
<td>176.6%</td>
<td>181.6%</td>
<td>223.5%</td>
<td>216.3%</td>
<td>176.9%</td>
<td>181.0%</td>
</tr>
<tr>
<td>10-year</td>
<td>20.5%</td>
<td>27.2%</td>
<td>17.1%</td>
<td>13.3%</td>
<td>0.6%</td>
<td>44.8%</td>
<td>42.5%</td>
<td>8.6%</td>
<td>16.6%</td>
</tr>
<tr>
<td>1-Year</td>
<td>3.0%</td>
<td>5.4%</td>
<td>14.8%</td>
<td>1.9%</td>
<td>-0.1%</td>
<td>1.3%</td>
<td>8.0%</td>
<td>5.8%</td>
<td>0.4%</td>
</tr>
<tr>
<td>1-Quarter</td>
<td>0.9%</td>
<td>1.0%</td>
<td>2.3%</td>
<td>0.8%</td>
<td>0.6%</td>
<td>3.3%</td>
<td>1.7%</td>
<td>0.9%</td>
<td>-1.5%</td>
</tr>
</tbody>
</table>

This table gives the total % change in average house values by submarket, through 2018 Q2, from different starting points in time.
Philadelphia Submarket Boundaries

Submarkets/Neighborhoods:
- Center City/Fairmount
- Kensington-Frankford
- Lower NE Phila.
- NW Phila.
- North Phila.
- South Phila.
- Univ. City
- Upper NE Phila.
- West Phila.
Median Philadelphia House Price v. Indexed Philadelphia House Price
1980-2018

Median Price
Indexed Price*

* Empirically estimated by Kevin C. Gillen, PhD
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Average House Price Minus Median House Price: 1980-2018
Only arms-length transactions between private sector entities were included in these numbers.
*Only arms-length transactions between private sector entities were included in these numbers.*
Philadelphia House Sales in 2018 Q2

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.
South Philadelphia House Sales in 2018 Q2

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu
Kensington/Frankford House Sales in 2018 Q2

$Price/SqFt

- >$200
- $140-200
- $100-140
- $50-100
- <$50

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu

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West Philadelphia House Sales in 2018 Q2

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu
North Philadelphia House Sales in 2018 Q2

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu

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Northwest Philadelphia House Sales in 2018 Q2

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

Created by Kevin C. Gillen, Ph.D.
Kevin.C.Gillen@Drexel.edu
Northeast Philadelphia House Sales in 2018 Q2

Sales are color-coded by the quintiles of the distribution of $Price/SqFt. Hence, each of the five categories covers exactly 20% of all sales.

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2018 Q2 House Price Rate of Change by Submarket

North Phila: +0.8%

Lower NE Phila: +2.3%

Kensington/Frankford: +1.0%

Center City/Fairmount: +0.9%

South Phila: +3.3%

NW Phila: +0.6%

Univ. City: +1.7%

West Phila: -1.5%

Upper NE Phila: 0.9%

Note: Each submarket is extruded by its average change in house values during 2018 Q2 in order to reflect its growth (or depreciation) rate relative to other neighborhoods.
+$1 Million Dollar House Sales in 2018 Q2

<table>
<thead>
<tr>
<th>PRICE</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,025,000</td>
<td>237 MONROE ST</td>
</tr>
<tr>
<td>$1,025,000</td>
<td>332 S 15TH ST</td>
</tr>
<tr>
<td>$1,062,500</td>
<td>1920 DELANCEY PL</td>
</tr>
<tr>
<td>$1,100,000</td>
<td>212 CATHARINE ST</td>
</tr>
<tr>
<td>$1,100,000</td>
<td>615 S 20TH ST</td>
</tr>
<tr>
<td>$1,111,800</td>
<td>1009 N ORIANNA ST</td>
</tr>
<tr>
<td>$1,128,500</td>
<td>751 S 09TH ST</td>
</tr>
<tr>
<td>$1,145,000</td>
<td>818 S SWANSON ST</td>
</tr>
<tr>
<td>$1,145,000</td>
<td>8031 SEMINOLE AVE</td>
</tr>
<tr>
<td>$1,150,000</td>
<td>8205 SEMINOLE AVE</td>
</tr>
<tr>
<td>$1,170,000</td>
<td>3709 BARING ST</td>
</tr>
<tr>
<td>$1,182,500</td>
<td>2039 NAUDAIN ST</td>
</tr>
<tr>
<td>$1,189,000</td>
<td>606 S 08TH ST</td>
</tr>
<tr>
<td>$1,195,000</td>
<td>307 PEMBERTON ST</td>
</tr>
<tr>
<td>$1,200,000</td>
<td>745 S 07TH ST</td>
</tr>
<tr>
<td>$1,210,000</td>
<td>2414 SPRUCE ST</td>
</tr>
<tr>
<td>$1,225,000</td>
<td>2056 WAVERLY ST</td>
</tr>
<tr>
<td>$1,250,000</td>
<td>612 S HANCOCK ST</td>
</tr>
<tr>
<td>$1,271,300</td>
<td>1616 GREEN ST</td>
</tr>
<tr>
<td>$1,275,000</td>
<td>7737 SAINT MARTINS LN</td>
</tr>
<tr>
<td>$1,285,000</td>
<td>226 S 03RD ST</td>
</tr>
<tr>
<td>$1,294,000</td>
<td>211 SPRUCE ST</td>
</tr>
<tr>
<td>$1,300,000</td>
<td>607 W GRAVERS LN</td>
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<tr>
<td>$1,325,000</td>
<td>322 QUINCE ST</td>
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<tr>
<td>$1,330,000</td>
<td>223 S 24TH ST</td>
</tr>
<tr>
<td>$1,340,000</td>
<td>318 W HIGHLAND AVE</td>
</tr>
<tr>
<td>$1,490,000</td>
<td>2129 DELANCEY PL</td>
</tr>
<tr>
<td>$1,550,000</td>
<td>617 PINE ST</td>
</tr>
<tr>
<td>$1,595,000</td>
<td>224 LOCUST ST</td>
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<tr>
<td>$1,625,000</td>
<td>9427 MEADOWBROOK AVE</td>
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<td>$1,650,000</td>
<td>237 BAINBRIDGE ST</td>
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<td>$1,900,000</td>
<td>2138 RACE ST</td>
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<td>$1,927,300</td>
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<tr>
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<td>8703 SEMINOLE AVE</td>
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<tr>
<td>$2,045,000</td>
<td>156 CONARROE ST</td>
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<tr>
<td>$2,225,000</td>
<td>318 RACE ST</td>
</tr>
<tr>
<td>$2,500,000</td>
<td>138 S FRONT ST</td>
</tr>
<tr>
<td>$2,597,000</td>
<td>2100 LOCUST ST</td>
</tr>
</tbody>
</table>
The diffusion index measures how varied the direction of house price changes are across Philadelphia neighborhoods. It is computed as the percent difference between the number of neighborhoods in which prices rose in a given quarter, and the number of neighborhoods in which prices fell. A value of -100% indicates that prices fell in all neighborhoods in a given quarter, while a value of +100% indicates that prices rose in all neighborhoods. A value of 0% indicates that house price changes were evenly split between increases and decreases, across neighborhoods. Diffusion indexes are commonly used in financial economics as a leading indicator of turning points in a market’s direction.

This chart compares the Philadelphia House Price Index (in red) to the percent of Philadelphia neighborhoods that experienced house price declines (in blue), in each quarter from 1980-2018.
The Dispersion Index measures how varied house price changes are across the city's neighborhoods. It is computed as the standard deviation of quarterly house prices changes across submarkets. High values of the index imply large variation in house price changes between different neighborhoods, while low values imply that house price changes are relatively the same across the city. High values of the index are often an indicator that the market is reaching a turning point; i.e. a peak or trough.
Philadelphia Housing Affordability* Index: 1980-2018

*Affordability is measured as the ratio of the median Philadelphia house price to the median Philadelphia household income. High values of the index mean that housing has become less affordable to the average Philadelphian. Contact Kevin.C.Gillen@Drexel.edu for details.
Average House Price-to-Rent Ratios*: 1980-2018
Philadelphia v. U.S.

*Computed by taking the ratio of average house price to the average annual rent of a comparable housing unit. The P/R ratio is to real estate what the P/E ratio is to other assets. Contact Kevin.C.Gillen@Drexel.edu for further
Inflation-Adjusted* Philadelphia House Price Index 1980-2018
1980Q1=100

*The empirically estimated house price index is deflated by the rate of inflation over time, using the national Consumer Price Index as the proxy for the national rate of inflation. This procedure converts the house price index from "nominal" to "real" terms, and thus shows house price changes net of general inflation.
"%Absorbed" is defined as the percent of homes listed for sale in a given month that also sold in that same month.

Source: Trend MLS
Months Supply of Inventory measures how many months it would take to completely burn off the existing inventory of homes currently listed for sale, given their current pace of sales. 5-7 months is considered a normal, balanced market. More than 7 months indicates a Buyer's market, and less than 5 months indicates a Seller's market.
Average Days-on-Market* for Philadelphia Homes

*Days-on-Market (DOM) is the average number of days it takes for a listed house to sell.

Source: Trend MLS
The Index represents the current sentiment of U.S. homebuilders. The index is computed via a regular monthly survey of homebuilders. An index value above 50 indicates that more builders are optimistic than pessimistic, while an index value below 50 indicates that more builders are pessimistic than optimistic.
The PHLX Housing Sector Index is a modified cap-weighted index composed of 20 companies whose primary lines of business are directly associated with the U.S. housing construction market. The index composition encompasses residential builders, suppliers of aggregate, lumber and other construction materials, manufactured housing and mortgage insurers.

Note: the index underwent a significant rebalancing in January of 2006.
Building Permits Issued for Construction of Residential Units in Philadelphia: Single-Family v. Multifamily

*Structures with 1-4 dwelling units
**Structures with >=5 dwelling units
***Note: 2018 Numbers are YTD numbers through May 2018.

Sources: U.S. Census, Center City District

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Zillow.com is currently forecasting Philadelphia house prices to rise an average of 13.4% over the course of the next twelve months. This is a significant upgrade from its previous forecast of 3.7% made just three months ago. Zillow also currently rates the temperature of Philadelphia’s housing market as “Hot”, but its level of hotness is (confusingly) less than its level of three months’ ago. Source: http://www.zillow.com/philadelphia-pa/home-values/