The preliminary data for December shows that housing prices declined for another month with the annual rate accelerating slightly to -8 percent on a year-to-year basis. Given the pattern that is emerging, it is likely that declines will continue for at least the next several months. The recent improvement in Phoenix employment is an important step in getting the housing market back to normal but the process will continue through 2011 and beyond. To put things in perspective, in December 2008 prices had declined by 33 percent from the prior year and by December 2009 they had declined another 13 percent. Those declines reflected the depressed condition of the Phoenix housing market and the Great Recession. With the economy gradually recovering and the foreclosure problem apparently past its peak, the odds are good that 2011 will be a transition year in the housing market.

Foreclosure prices also declined again with December prices taking a drop of 12 percent compared to December 2009. Non-foreclosure prices have been declining at an annual rate of 9-13 percent since March with the exception of October’s 6 percent drop. The December decline at 9 percent is the same as November’s, which is relatively good news compared to sectors where the decline is accelerating. The rate of decline for lower priced houses increased in the preliminary December data to -11 percent but the prices of more expensive houses dropped at the same rate (6 percent) for the third consecutive month. Townhouse/condos prices have been declining at the much higher rate of around 20 percent per year since March and they declined by 20 percent again in the preliminary December data.

The overall median price for sales that were included in the December index was $114,000 compared to $122,000 in November and $125,000 in October. Since June 2009, prices have fluctuated between $122,000 and $135,000 reflecting the instability that characterizes the current market so the December decline, if it holds up with revised data, would be a notable and unwelcome change. The Preliminary median price for foreclosed houses in December was $99,500, the first time it has been below $100,000 since May 2009. In contrast, the non-foreclosure median in December was $149,000 compared to a November figure of $155,000 and October’s at $148,000. The median price for townhouse/condos was $63,500 in December, which is similar to prices the past several months and may indicate that the long period of declines is finally showing signs of stabilizing.

Regions

Regional price declines in October were larger than in September with the exception of the Southwest region, where prices increased by 3.2 percent compared to a 1.8 percent gain in September. The Northeast region shows the largest decline, which has been the case recently, followed closely by the Southeast region. In terms of total declines from the 2006 peak, every region is down at least 40 percent with the Southwest down the most at over 58 percent.
### TABLE 1
CHANGE IN RESIDENTIAL PRICES
(Percent)

<table>
<thead>
<tr>
<th></th>
<th>OVERALL</th>
<th>LOWER PRICED</th>
<th>HIGHER PRICED</th>
<th>TOWNHOUSE / CONDO</th>
<th>FORECLOSURES</th>
<th>NON-FORECLOSURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. 2010 - Oct. 2010</td>
<td>-2.0</td>
<td>-2.1</td>
<td>-2.2</td>
<td>-1.9</td>
<td>-2.1</td>
<td>-1.6</td>
</tr>
<tr>
<td>1989–1992</td>
<td>-7.7</td>
<td>-3.9</td>
<td>-12.8</td>
<td>-3.9</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>2006– Oct. 2010</td>
<td>-52.0</td>
<td>-62.0</td>
<td>-43.0</td>
<td>-60.0</td>
<td>-58.0</td>
<td>-46.0</td>
</tr>
<tr>
<td>Median Price - Oct. 2010</td>
<td>$125,000</td>
<td>$95,000</td>
<td>$270,000</td>
<td>$66,000</td>
<td>$118,000</td>
<td>$148,000</td>
</tr>
</tbody>
</table>

**Cities**

The only city to show appreciation from October 2009 to 2010 was Avondale where prices were up 3.0 percent on a year-to-year basis. In every city with declines but Sun City / Sun City West and Gilbert the October declines were greater than those reflected in the September data. Total declines from the peak are still very large in all cities (Table 3), ranging from 40 percent in Scottsdale/Paradise Valley to almost 65 percent in Avondale.

### TABLE 2
CHANGE IN HOUSE PRICES BY REGION
(Percent)

<table>
<thead>
<tr>
<th></th>
<th>CENTRAL</th>
<th>NORTHEAST</th>
<th>SOUTHEAST</th>
<th>NORTHWEST</th>
<th>SOUTHWEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 2009 – Oct. 2010</td>
<td>-5.0</td>
<td>-8.9</td>
<td>-8.6</td>
<td>-6.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Sept. 2010 - Oct. 2010</td>
<td>-1.9</td>
<td>-4.0</td>
<td>-1.0</td>
<td>-1.6</td>
<td>-0.9</td>
</tr>
<tr>
<td>2006 – Oct. 2010</td>
<td>-56.0</td>
<td>-40.7</td>
<td>-49.5</td>
<td>-55.5</td>
<td>-58.2</td>
</tr>
</tbody>
</table>
TABLE 3
CHANGE IN HOUSE PRICES BY CITY
(Percent)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANDLER</td>
<td>-11.0</td>
<td>-1.4</td>
<td>-7.6</td>
<td>-47.3</td>
</tr>
<tr>
<td>GILBERT</td>
<td>-6.5</td>
<td>-0.6</td>
<td>na</td>
<td>-47.9</td>
</tr>
<tr>
<td>GLENDALE</td>
<td>-8.3</td>
<td>1.2</td>
<td>-19.6</td>
<td>-57.4</td>
</tr>
<tr>
<td>MESA</td>
<td>-6.0</td>
<td>0.3</td>
<td>-10.9</td>
<td>-52.9</td>
</tr>
<tr>
<td>PEORIA</td>
<td>-7.5</td>
<td>-3.1</td>
<td>-7.3</td>
<td>-55.7</td>
</tr>
<tr>
<td>SCOTTSDALE/VALLEY</td>
<td>-8.6</td>
<td>-3.9</td>
<td>-9.7</td>
<td>-39.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SUN CITY/ SUN CITY WEST</td>
<td>-9.7</td>
<td>-1.4</td>
<td>-10.5</td>
<td>-43.5</td>
</tr>
<tr>
<td>TEMPE</td>
<td>-15.1</td>
<td>-5.4</td>
<td>-1.9</td>
<td>-48.2</td>
</tr>
<tr>
<td>GOODYEAR</td>
<td>-3.7</td>
<td>-2.5</td>
<td>na</td>
<td>-62.2</td>
</tr>
<tr>
<td>AVONDALE</td>
<td>3.0</td>
<td>0.2</td>
<td>na</td>
<td>-64.7</td>
</tr>
<tr>
<td>SURPRISE</td>
<td>-4.0</td>
<td>1.5</td>
<td>na</td>
<td>-58.2</td>
</tr>
</tbody>
</table>

Methodology

The use of repeat sales is the most reliable way to estimate price changes in the housing market because the repeat sales approach eliminates the need to deal with the many issues associated with the heterogeneous nature of housing. Repeat sales can be used to measure the change in price of the same housing units over time. A large number of repeat sales over many years can be analyzed to develop a repeat sales index. In contrast, indices developed using regression
analysis provide estimates of price changes over time while simultaneously attempting to control for differences in house characteristics, location, demographics and market conditions, etc. within the model. Regression analysis can and does produce meaningful estimates of price changes but the results are not as reliable as those produced using repeat sales data. An even less rigorous approach would be to simply average sale prices by zip code or some other geographic area where the mix of housing sizes and ages, etc. would be different each month. The percent changes based on medians or averages would reflect not only price changes but also differences in the sizes, ages and other characteristics of the houses sold each month.

The W.P. Carey School of Business – Repeat Sales Index (RSI) tracks very closely to the S&P/Case - Shiller index for Phoenix since the same methodology is employed for calculating both indices. The S&P/ Case-Shiller index has been developed for 20 metropolitan areas and is being used as a basis for trading housing futures contracts in 10 of those markets. Any differences between the two indices are probably due to the way the data has been cleaned prior to the calculation process. The S&P/Case-Shiller index is proprietary so the cleaning procedure used in connection with that index could not be completely duplicated. However, following S&P/Case-Shiller, the cleaning process used with the ASU - RSI excludes pairs where the first sale involved new construction and pairs where sales occurred within six months of each other. Sale pairs with extremely high or low annual rates of price change are excluded since at least one of the transactions may involve a data error. The same justification is used to drop sales with extremely high or low prices or prices per square foot prior to matching the sale pairs. A more detailed explanation of the data cleaning and calculation process is contained in the ASU-RSI Methodology Report.

The house price data used in the S&P/Case-Shiller index starts in January 1989. Beginning with January 1990, the percent change from the same month in the previous year is reported. The ASU – RSI also begins with January 1989 data so the same percent change calculation also begins in January 1990 and is reported for each month since then. There is seasonality in house price data so month to month changes may not accurately reflect changes in market conditions and would cover a very short time period. Calculating a percent change from the same month last year controls for whatever seasonality may be present in the data. Annual rates of change typically are thought of applying to a calendar year but in this report the annual rates that are reported would be measuring change over the preceding twelve months. To smooth the index, the rate of return calculated from each sale pair is included in calculations for a total of three months before it is published. Results using data for the two newest months are labeled as preliminary.

The S&P/Case-Shiller index is published only for the entire Phoenix metro area. One major advantage to the ASU-RSI is that in addition to the overall index, indices have been calculated for higher and lower priced houses, smaller geographic areas (regions and selected cities) and for the housing market segmented in various ways. Price changes for the attached portion of the housing
market (townhouse / condominiums) are presented as a repeat sales index using the same methodology and indices are also estimated for higher and lower priced single-family detached houses and for foreclosure and non-foreclosure sales. The monthly data are divided into two groups based on the median price of all single-family houses sold. Sales are then paired within each of the two data sets and a repeat sales index is calculated for each. The foreclosure sale pairs are formed using two foreclosure sales or with a foreclosure sale paired with an earlier non-foreclosure sale of the house. The metro area has also been divided into five regions and an index has been calculated for each. All repeat sales used in the metro index are included in one of the five regional indices. Indices have also been calculated for eight individual cities where there are a sufficient number of repeat sales a reliable index to be estimated. A list of the cities included in each region is in Table 4.

The graphs contained in this report show the annual rate of change in house prices for the Phoenix metropolitan area on a monthly basis as well as median house prices. Figures 1 and 2 compare the change in the overall, lower and higher priced indices to the overall trend in the index, where the trend was estimated using data from January 1989 through December 2003. Figure 3 makes the same type of comparison using the median price of single-family sales that were used to form sale pairs for the current month, not the median price of all sales that occurred during the month.

Since each index is a moving three month average, preliminary estimates of the index and future median prices for the entire market are included for the next two months (November and December) in Figures 1-7. Figures 4 and 5 include the townhouse / condominium RSI compared to the single-family RSI presented earlier in Figures 1 and 2. The foreclosure and non-foreclosure RSIs are in Figure 6 while Figure 7 has median prices for foreclosure and non-foreclosure houses and townhouse / condo units. Figures 8-17 contain graphs for the regions and cities for two different time periods. Five of the graphs present the price changes from January 1990 through October 2010 while the other five graphs cover the current housing cycle beginning in January 2004. Due to data limitations, a reliable index for Gilbert could not be calculated until January 1999 so the annual changes for Gilbert in Figures 10 and 11 start in January 2000.

Limited historical data has prevented Goodyear, Avondale and Surprise from being included in the monthly reports. However, the methodology used to calculate the indices has been modified and applied to those cities, resulting in enough data to calculate a reliable index for each one. Very simply, if a sale in one of those cities cannot be paired with a prior sale of the same house, the sale is paired with the prior sale of a house that is the same model and in the same subdivision. While model pairing is not ideal, this technique allows these cities to be included in the report. When the model pairing methodology was applied to the existing cities in the report, the index values correlated almost perfectly with those calculated from the traditional sale pair methodology. However, even with the modified pairing technique, fewer pairs are available to calculate the monthly index so the indices for Goodyear, Avondale and Surprise are somewhat more volatile than those for the other eight cities.
<table>
<thead>
<tr>
<th>REGION</th>
<th>CITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTHEAST</td>
<td>CAREFREE, CAVE CREEK, FOUNTAIN HILLS, PARADISE VALLEY, SCOTTSDALE</td>
</tr>
<tr>
<td>NORTWEST</td>
<td>EL MIRAGE, GLENDALE, PEORIA, SUN CITY, SUN CITY WEST, SURPRISE, YOUNGTOWN</td>
</tr>
<tr>
<td>CENTRAL</td>
<td>PHOENIX</td>
</tr>
<tr>
<td>SOUTHEAST</td>
<td>APACHE JUNCTION, CHANDLER, GILBERT, HIGLEY, MESA, QUEEN CREEK, SUN LAKES, TEMPE</td>
</tr>
<tr>
<td>SOUTHWEST</td>
<td>AVONDALE, BUCKEYE, GOODYEAR, LITCHFIELD PARK</td>
</tr>
</tbody>
</table>
Figure 1
Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - December 2010

Trend
Metro Area
Upper Range¹
Lower Range²

November and December are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

October: 1, Upper -6%  2, Lower -5%
Figure 2
Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - December 2010

November and December are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

October: 1, Upper -6%  2, Lower -5%
Figure 3
Phoenix Median Single-Family House Prices
January 1989 - December 2010

November and December are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

October: 1, Upper $270,000   2, Lower $95,000
Figure 4
Phoenix Single-Family and Townhouse/Condominium Repeat Sales Index (RSI)
Annual Change
January 1990 - December 2010

November and December are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

October: Single-Family -6%; TH/Condo -20%
Figure 5
Phoenix Single-Family & Townhouse/Condominium Repeat Sales Index (RSI)
Annual Change
January 2004 - December 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

October: Single-Family -6%; TH/Condo -20%
Figure 6
Phoenix Single-Family
Foreclosure and Non-Foreclosure Repeat Sales Index (RSI)
Annual Change
January 2001 - December 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

October: Foreclosure -3%; Non-Foreclosure -6%
Figure 7
Phoenix Foreclosures, Non-Foreclosures and Townhouse/Condominium Median Prices
January 1989 - December 2010

November and December are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

October:  1, TH/Condo $ 66,000   2, Foreclosure $118,000   3, Non-Foreclosure $148,000
Figure 8
Regional Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 9
Regional Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 10
Chandler, Gilbert, Mesa, & Tempe Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 11
Chandler, Gilbert, Mesa & Tempe Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 12
Glendale, Peoria, Surprise & Sun City/Sun City West Repeat Sales Index (RSI)
Annual Change
January 1990 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 13
Glendale, Peoria, Surprise & Sun City/Sun City West Single-Family Repeat Sales Index (RSI) Annual Change
January 2004 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 14
Scottsdale/Paradise Valley & Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 15
Scottsdale/Paradise Valley & Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 16
Avondale and Goodyear Single Family Repeat Sales Index (RSI)
Annual Change
January 1990 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 17
Avondale and Goodyear Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - October 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data