Moving Data to Action

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### Tucson economy: MAP Dashboard

<table>
<thead>
<tr>
<th>Category</th>
<th>Change Year</th>
<th>Change Gain/Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-farm jobs 389,100</td>
<td>+1.9%</td>
<td></td>
</tr>
<tr>
<td>Unemployment rate 4.1%</td>
<td>-0.2%</td>
<td></td>
</tr>
<tr>
<td>Median home price $215,000</td>
<td>+7.6%</td>
<td></td>
</tr>
<tr>
<td>Pesos per U.S. dollar 19.20</td>
<td>+2.0%</td>
<td></td>
</tr>
</tbody>
</table>

Tucson ranks high for national park visits as growth rate doubled in 2017

In 2017, the growth rate in national park visits within the Tucson metropolitan statistical area was 16.2 percent, double the previous year’s growth. Tucson ranked second among peer western MSAs behind El Paso. Colorado Springs and Portland posted a decline in the number of visitors to national parks located in their respective regions, while the growth in visits to national parks across the U.S. remained flat. Recreational land and outdoor leisure opportunities attract visitors to a region, which can serve as an important input for local retail and service sectors. Additionally, recreation land provides communities with direct social and economic benefits and has been linked to amenity-driven economic development, increased real estate values, and positive public health outcomes.
Source of Information

• People need information not just NUMBERS
Community Comparison

MAP for Southern Arizona
Arizona Focus
SOUTHERN ARIZONA COMMUNITIES EDUCATION REPORT
How Does Your Community Compare?

Feature Article: Home Prices Continue to Rise

Tucson’s Home Prices Near Pre-Recession Levels

Explore Your County

Click map to learn more
How we use data to inform decision making in Southern Arizona

• Two Examples
  • Teacher wages
  • Housing affordability
### Education Category Overview

**Take Our Pulse With An Overview Table**

#### Tucson Metropolitan Statistical Area Education Scorecard

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>HOW ARE WE DOING?</th>
<th>HOW DO WE COMPARE?</th>
<th>RECENT CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLLEGE MAJOR</td>
<td>47.1% SCI, ENG, OR RELATED</td>
<td>☀️</td>
<td>↑</td>
</tr>
<tr>
<td>EDUCATIONAL ATTAINMENT</td>
<td>31.6% BA OR BETTER</td>
<td>⬆️</td>
<td></td>
</tr>
<tr>
<td>GRADUATION RATES</td>
<td>78.0% FOR ARIZONA</td>
<td>⬇️</td>
<td></td>
</tr>
<tr>
<td>PRE K-12 ENROLLMENT</td>
<td>40.4% IN EARLY EDUC</td>
<td>⬆️</td>
<td></td>
</tr>
<tr>
<td>STUDENT ACHIEVEMENT</td>
<td>282.2 AVERAGE MATH</td>
<td>⬇️</td>
<td></td>
</tr>
<tr>
<td>TEACHER WAGES</td>
<td>$39,010</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*MAP Scorecard “How Do We Compare?” Rankings Are Relative To The Following Peer Metropolitan Areas: Albuquerque, Austin, Colorado Springs, Denver, El Paso, Las Vegas, Phoenix, Portland, Salt Lake City, San Antonio, and San Diego*

[mapazdashboard.arizona.edu](http://mapazdashboard.arizona.edu)
Education Category

Get Perspective With a Fuel Gauge


mapazdashboard.arizona.edu
Education Category

Comparative Analysis

Median Teacher Wages (2018)

U.S. Bureau of Labor Statistics via MAP (mapazdashboard.arizona.edu)
Education Category

Get Perspective With a Fuel Gauge

Secondary School Teacher Wages Adjusted for Cost of Living (2017)
Affordable Housing in Tucson? It Depends
Median Home Price (2018)

Off the Gauge: San Diego at $634,000

mapazdashboard.arizona.edu
Median Home Price

The graph shows the median home price trends from 2000 to 2018 for Tucson, Phoenix, and the U.S. The data indicates a significant increase in prices, with peaks and troughs over the years.
Growth Rate of Home Prices (2018)

- Las Vegas
- Colorado Springs
- Phoenix
- Denver
- Salt Lake City
- Austin
- Tucson
- San Diego
- U.S.
- San Antonio
- Albuquerque
- Portland
- El Paso

Tucson: Growth Rate of Home Prices (2018): 6%
Housing Affordability (2018)

Mapazdashboard.arizona.edu
Housing Affordability

Index


Phoenix Tucson U.S.

Tucson 2018: 66.2

National Association of Home Builders via MAP (mapazdashboard.arizona.edu)
Share of Affordable Rentals (2015)

- Salt Lake City
- Austin
- Phoenix
- Denver
- San Antonio
- Portland
- Las Vegas
- Tucson
- San Diego

Tucson 2015: 76.2
Income Measures Used to Calculate Affordability

• **Housing Affordability**
  • Median Family Income (~$60,000)

• **Rental Affordability**
  • Median Household Income (~$48,000)
Housing Cost Burden

Percent of Housing Cost Burdened Households (2017)

- Salt Lake City
- San Antonio
- Phoenix
- Denver
- El Paso
- Austin
- Colorado Springs
- Albuquerque
- Tucson
- Portland
- Las Vegas
- San Diego

Tucson: Percent of Housing Cost Burdened Households: 34.1

U.S. Census Bureau via MAP (mapazdashboard.arizona.edu)
Housing Cost Burden

Percent of Housing Cost Burdened Households by Tenure (2017)

- Tucson Renter: 52.8%
- Tucson Owner: 23.4%

U.S. Census Bureau via MAP (mapazdashboard.arizona.edu)
## Housing Cost Burden by Income (2017)

<table>
<thead>
<tr>
<th>INCOME</th>
<th>TUCSON</th>
<th>ARIZONA</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $20,000</td>
<td>14.6%</td>
<td>11.8%</td>
<td>11.9%</td>
</tr>
<tr>
<td>$20,000 - $34,999</td>
<td>10.1%</td>
<td>9.4%</td>
<td>8.6%</td>
</tr>
<tr>
<td>$35,000 - $49,999</td>
<td>4.6%</td>
<td>5.2%</td>
<td>4.9%</td>
</tr>
<tr>
<td>$50,000 - $74,999</td>
<td>2.6%</td>
<td>3.2%</td>
<td>3.9%</td>
</tr>
<tr>
<td>$75,000 or more</td>
<td>1.1%</td>
<td>1.4%</td>
<td>2.7%</td>
</tr>
</tbody>
</table>
R for Data Visualization

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Housing Affordability

[Graph showing housing affordability index for Phoenix, Tucson, and the US from 2000 to 2018. Tucson's index for 2018 is 66.2.]
# Load packages

```r
library(readxl)
library(highcharter)
library(htmlwidgets)
```

# Set working directory

```r
setwd("C:\Users\kchamaro\Documents\Auber")
```

# Read Excel file

```r
housingAffordability <- read_excel("housing_affordability.xlsx")
```

# Create chart

```r
housingAffordability_graph <- highchart()
```

```r
housingAffordability_graph <- housingAffordability_graph$set_title("Housing Affordability")
```

```r
housingAffordability_graph <- housingAffordability_graph$add_series(name = "Tucson", data = housingAffordability$Tucson)
```

```r
housingAffordability_graph <- housingAffordability_graph$add_series(name = "Phoenix", data = housingAffordability$Phoenix)
```

```r
housingAffordability_graph <- housingAffordability_graph$add_series(name = "U.S.", data = housingAffordability$U.S.)
```

```r
housingAffordability_graph <- housingAffordability_graph$set_categories(housingAffordability$Date)
```

```r
saveWidget(housingAffordability_graph, "C:/Users/kchamaro/Documents/Auber/housingAffordability.html",
selfContained = TRUE, background = "white")
```

---

**Housing Affordability**

- **Tucson**
- **Phoenix**
- **U.S.**

National Association of Home Builders via MAP (mapadashboard.arizona.edu)
<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Tucson</th>
<th>Phoenix</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>61.0</td>
<td>66.5</td>
<td>59.5</td>
</tr>
<tr>
<td>2001</td>
<td>63.3</td>
<td>70.4</td>
<td>61.7</td>
</tr>
<tr>
<td>2004</td>
<td>64.6</td>
<td>67.9</td>
<td>54.3</td>
</tr>
<tr>
<td>2005</td>
<td>45.5</td>
<td>48.4</td>
<td>44.8</td>
</tr>
<tr>
<td>2006</td>
<td>32.4</td>
<td>29.0</td>
<td>40.9</td>
</tr>
<tr>
<td>2007</td>
<td>34.9</td>
<td>34.0</td>
<td>43.0</td>
</tr>
<tr>
<td>2008</td>
<td>56.2</td>
<td>69.5</td>
<td>56.0</td>
</tr>
<tr>
<td>2009</td>
<td>73.5</td>
<td>82.4</td>
<td>71.3</td>
</tr>
<tr>
<td>2010</td>
<td>79.5</td>
<td>82.3</td>
<td>72.6</td>
</tr>
<tr>
<td>2011</td>
<td>85.5</td>
<td>84.5</td>
<td>73.9</td>
</tr>
<tr>
<td>2012</td>
<td>85.6</td>
<td>80.0</td>
<td>75.0</td>
</tr>
<tr>
<td>2013</td>
<td>50.1</td>
<td>72.4</td>
<td>67.7</td>
</tr>
<tr>
<td>2014</td>
<td>76.1</td>
<td>67.5</td>
<td>63.0</td>
</tr>
<tr>
<td>2015</td>
<td>76.9</td>
<td>67.4</td>
<td>63.5</td>
</tr>
<tr>
<td>2016</td>
<td>75.3</td>
<td>66.0</td>
<td>62.0</td>
</tr>
<tr>
<td>2017</td>
<td>71.1</td>
<td>65.7</td>
<td>59.3</td>
</tr>
<tr>
<td>2018</td>
<td>66.2</td>
<td>59.4</td>
<td>57.7</td>
</tr>
</tbody>
</table>
### Run packages
```r
library(readxl)
library(highcharter)
library(htmlwidgets)
```

### set working directory
```r
setwd("C:/Users/kchamorro/Documents/Auber")
```

---

### Line graph: Housing Affordability

```r
HousingAffordability <- read_excel("Housing Affordability.xlsx")
View(HousingAffordability)
```

```r
HousingAffordability_graph <- highchart()
  hc_chart(type = "line")
  hc_title(text = "Housing Affordability")
  hc_xAxis(categories = HousingAffordability$DateTime)
  hc_yAxis(title = list(text = "Index"))
  hc_colors(c("#ff6d00", "#23c3e1", "#089014"))
  hc_add_series(name = "Tucson", data = HousingAffordability$Tucson)
  hc_add_series(name = "Phoenix", data = HousingAffordability$Phoenix)
  hc_add_series(name = "U.S.", data = HousingAffordability$U.S.)
  hc_tooltip(shared = TRUE, valueDecimals = 1)
  hc_credits(enabled = TRUE, text = "National Association of Home Builders via MAP (mapazdashboard.arizona.edu)")
  hc_exporting(enabled = TRUE, filename = "Housing Affordability")
```

### save html
```r
saveWidget(HousingAffordability_graph, "C:/Users/kchamorro/Documents/Auber//HousingAffordability.html", selfcontained = TRUE, background = "white")
```
Moving R Charts to Web

• Chart saved as html object to local folder
• Uploaded to host server using Dreamweaver
• iframe dropped into html text
• Ex: `<iframe frameborder="0" height="500" src="https://www.azeconomy.org/maps-2018/HousingAffordability.html" width="100%"></iframe>`
Why is it important?

Housing affordability is an important issue for many households. Access to affordable housing is important because the home is the largest asset for most people, and its price can affect spending in other areas such as: childcare, education, health care, and leisure activities. Since personal consumption makes up the better part of the economy, discretionary income levels are influenced by the cost of housing. Home prices are an important factor in the local economy. Several factors can influence home prices, including mortgage rates, demographics, income growth, the supply of new housing, and speculative trends. Housing affordability is determined by the share of homes sold in an area that would have been affordable to a family earning the local median income. Housing affordability data comes from the National Association of Home Builders (NAHB).

What are the key trends?

The share of homes sold in Tucson during 2019 that were affordable to a family earning the median income was 66.26%. This was 8.3 percentage points higher than the share of affordable homes in the U.S. Likewise, Phoenix had a slightly higher share of affordable homes than the U.S. at 58.49%. Tucson’s share of affordable homes has fluctuated significantly during the past nineteen years with a low of 32.49% in 2000, just before the housing boom, and a high of 76.6% in 2012. The recent trend in housing affordability has declined as home prices continue to rise faster than wages.

How is it measured?

Housing affordability data comes from the National Association of Home Builders (NAHB). The index is calculated for a given area based on two major components: income and housing. NAHB’s methodology includes using annual median family income estimates and assumes that a family can afford to spend 28% of its gross income on housing. Additionally, monthly sales transaction records are used to determine the sales price of sold homes. Further, NAHB calculates the monthly principal, interest, and taxes based on a 30 year fixed rate mortgage with a loan for 90% of the sales price. The data is reported quarterly and the Making Action Possible (MAP) research team aggregates the data to an annual index value.
Thank you!

Contact Information

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