



# **Tucson & Pima County Housing Study**

**Neighborhood Vulnerability in the Tucson Region (Task A, Phase I)**

**Prepared for**

**The City of Tucson and Pima County**

**By**

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The City of Tucson, Pima County, and the Economic and Business Research Center at the University of Arizona have collaborated to study housing and neighborhood vulnerability within the City of Tucson and Pima County. The goal of the first phase of this study is to identify "vulnerable", or stressed, neighborhoods within our region by compiling a Neighborhood Vulnerability Index.

Vulnerability in this context refers to the differing ability of members of particular socio-demographic groups to withstand threats to their livelihoods, security, and social, economic, and political networks. <sup>1</sup> Measures of social vulnerability attempt to integrate a set of characteristics of people and places that make them especially likely to be harmed by shocks such as natural disasters or development and rising housing prices. <sup>2</sup> The Vulnerability Index may be used for geographically - targeted strategies to direct resources, policies, and programs to best meet the needs of Tucson and Pima County's unique neighborhoods.

## Vulnerability Factors

The Neighborhood Vulnerability Index was developed by calculating a composite score of these [five factors that signal vulnerability](#) in a community:

- Percent of residents that identify as anything other than "non-Hispanic white alone"
- Percent of households who rent, rather than own, their homes
- Percent of residents aged 25 and over who lack a four-year bachelor's degree or higher
- Percent of households with incomes below 80% of Area Median Income (as determined by HUD)
- Share of children that live in households below the official poverty line

More information about these five factors and the study can be found in the [Methodology](#) tab.

## Neighborhood Vulnerability Index Map

This interactive map illustrates the vulnerability findings from the most recent 2018 5-year American Community Survey data, collected and published by the U.S. Census Bureau. Scroll over the map to see more details about the status of each census tract, or zoom in to find your own neighborhood!

Note: The lightest blue color indicates the tract is "Not Vulnerable" while progressively darker colors indicate increasing levels of "Vulnerability".

[Click here for Full Screen Map](#)

## 2018 Neighborhood Vulnerability Index Summary

There are 241 total census tracts in Pima County, with 157 of those tracts within or adjacent to the City of Tucson boundary. This study found 103 vulnerable census tracts in Pima County, or

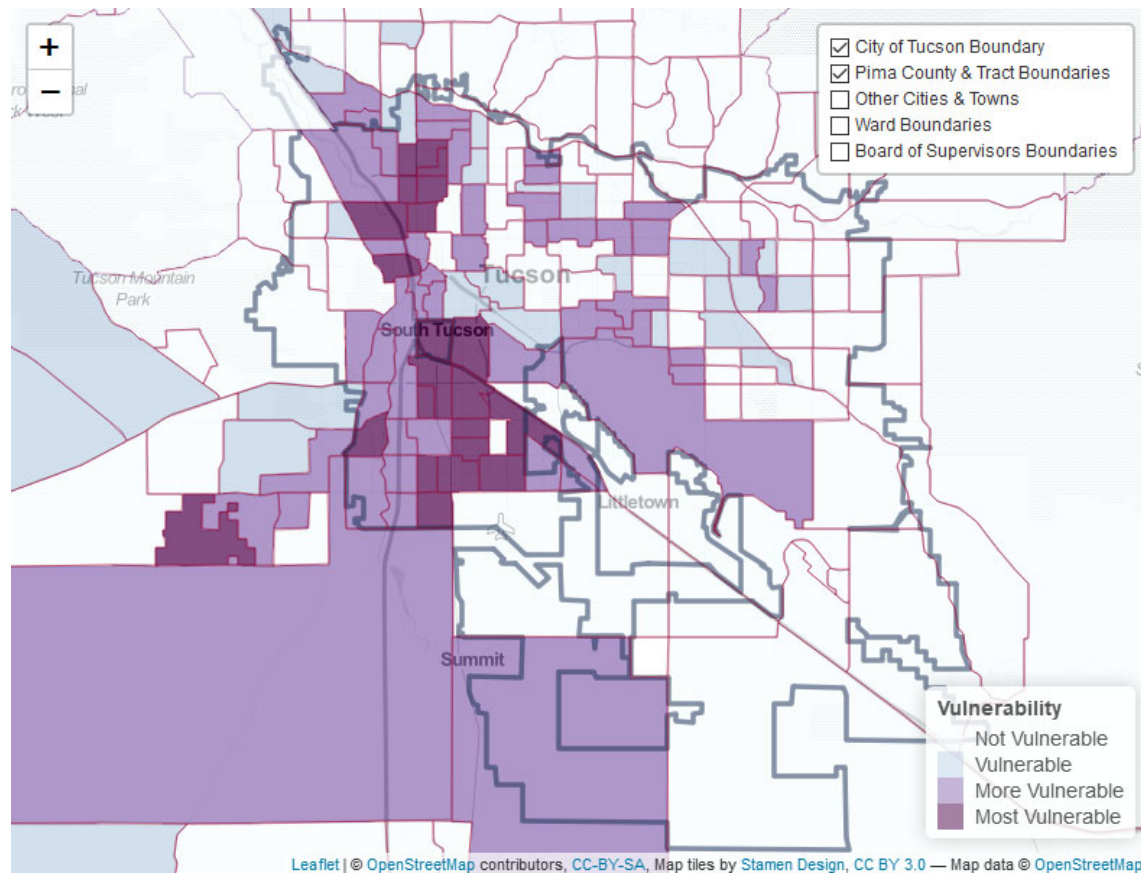
42.7%. Of the total vulnerable tracts, 87 were within the City of Tucson - this means that 55.4% of census tracts in Tucson were found to be vulnerable in some way.

### How our Neighborhoods have Changed (since 2013)

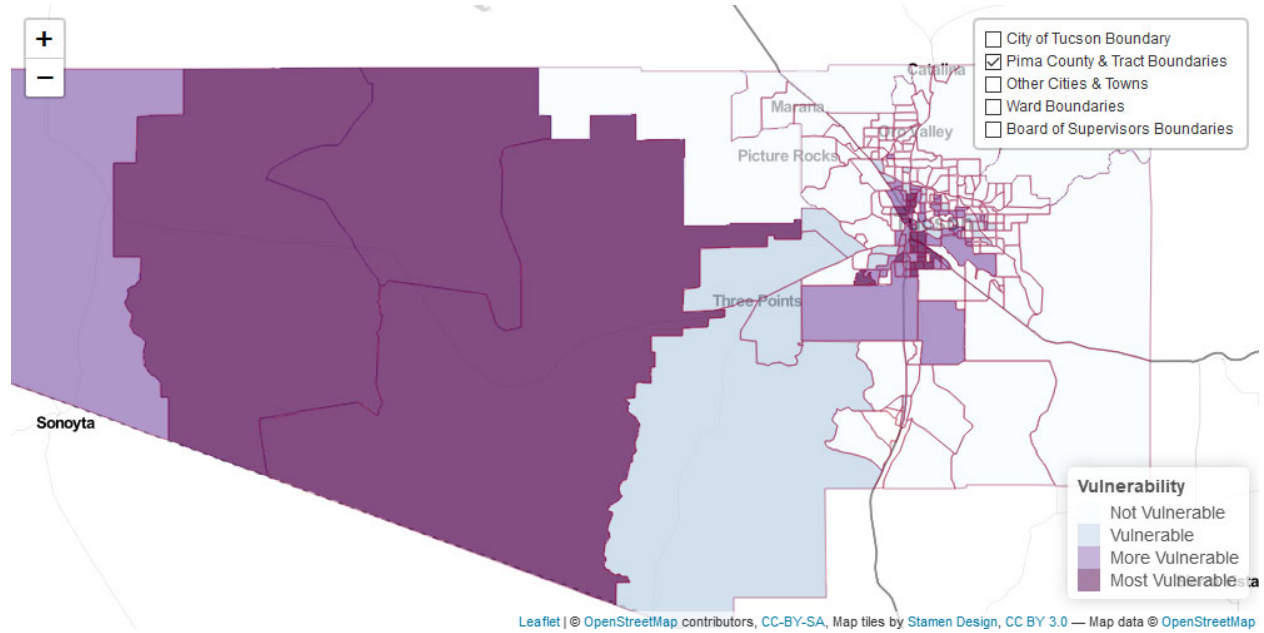
Which census tracts in the City of Tucson and Pima County changed in absolute vulnerability since the 2013 5-year American Community Survey results? Scroll over the map to see more details about the status of each changed census tract: light blue for becoming "Not Vulnerable" in 2018, purple for becoming "Vulnerable".

There are 30 tracts that experienced a change in vulnerability status: 16 went from Not Vulnerable to Vulnerable, while 13 went from Vulnerable to Not Vulnerable. See more details about these tracts below the map.

Figure 1: 2018 City of Tucson Map



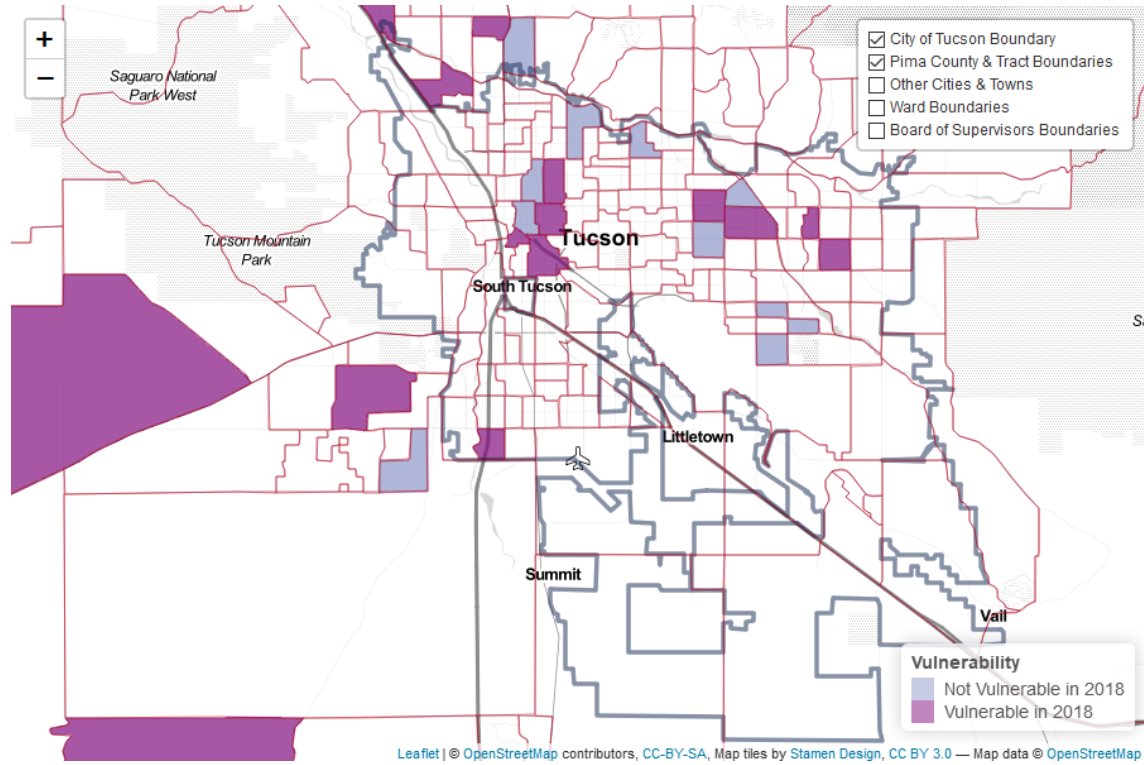
**Figure 2: 2018 Pima County Map**



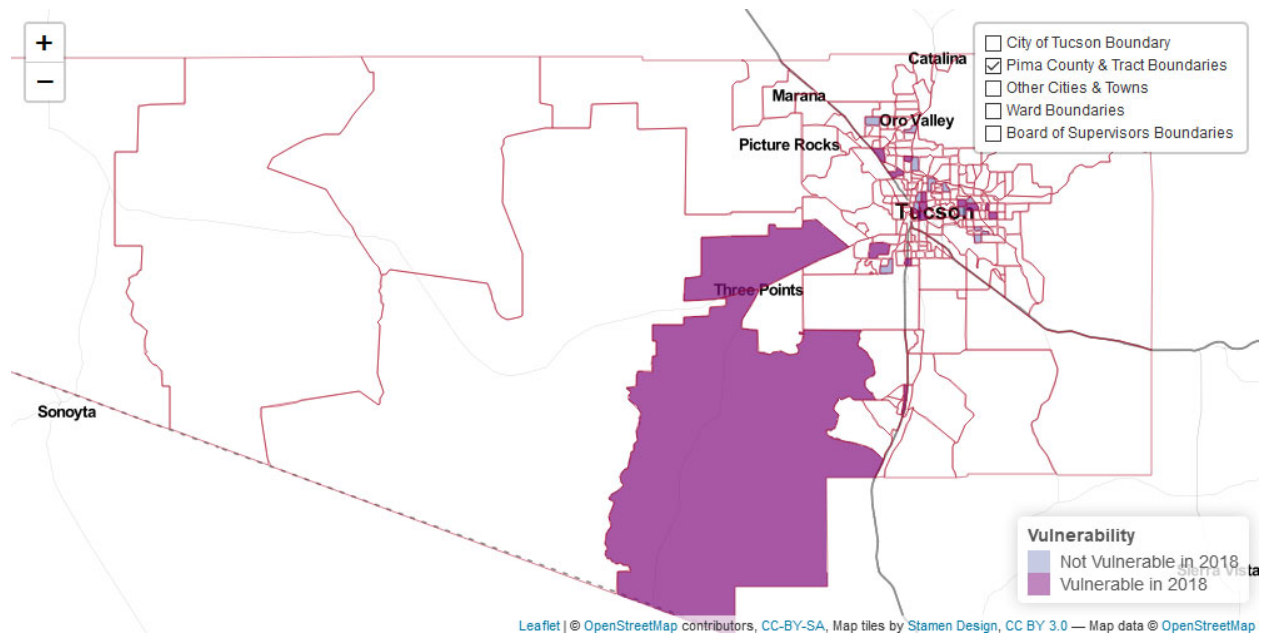
## Comparing the 2018 Index and the 2013 Index

To track change over the last decade we evaluated the exact same variables from the 2013 5-year American Community Survey and compared to the most recent data. The 2013 ACS covers the period 2009-2013 and thus allows us to see the whole decade 2009-2018. We found that in 2018, there was a net change of three more tracts classified as vulnerable than in 2013.

**Figure 3: City of Tucson Trend Map**



**Figure 4: Pima County Trend Map**



Of the five vulnerability factors - high ratio of non-white persons, high ratio of renters, high ratio of persons lacking a college degree, high ratio of households below 80% of median income, and high ratio of children living in poverty - what changed between 2009 and 2018 to make more areas of Tucson and Pima County more vulnerable?

For those 16 census tracts that changed from Not Vulnerable to Vulnerable, most tracts became vulnerable due to change in just one factor. The most changed vulnerability factor was the share of children living in poverty, with 13 of the 16 newly vulnerable census tracts becoming vulnerable due to this factor; furthermore, three of those 13 tracts also had households move to under 80% of median income to increase the vulnerability of the tract.

For the 13 census tracts that changed from some level of vulnerability to Not Vulnerable, most tracts saw improvements in either household income or the share of children living in poverty, or both - basically a mirror image of those tracts that shifted into vulnerability. Neither ratio of renters nor the ratio of persons with a college degree in a given tract were instrumental in vulnerability changes in 2009-2018 decade.

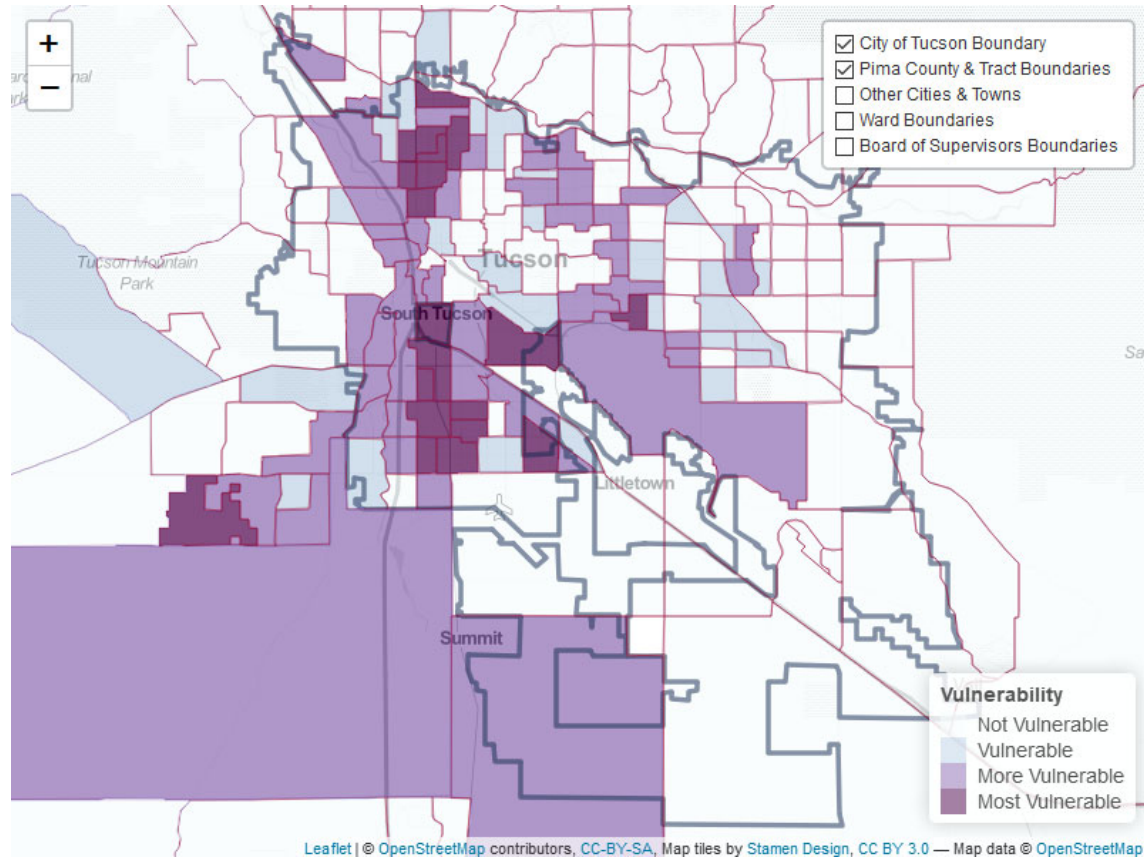
### **2013 Neighborhood Vulnerability Index**

For comparison purposes, we developed a vulnerability index using the exact same variables to show where our neighborhoods were five years ago, using data from the 2013 5-year American Community Survey. The 2013 ACS covers the period 2009-2013 and is the most directly comparable ACS survey to the 2018 data (ACS five-year estimates are produced over a five year time period and can only be compared to non-overlapping five-year estimates).

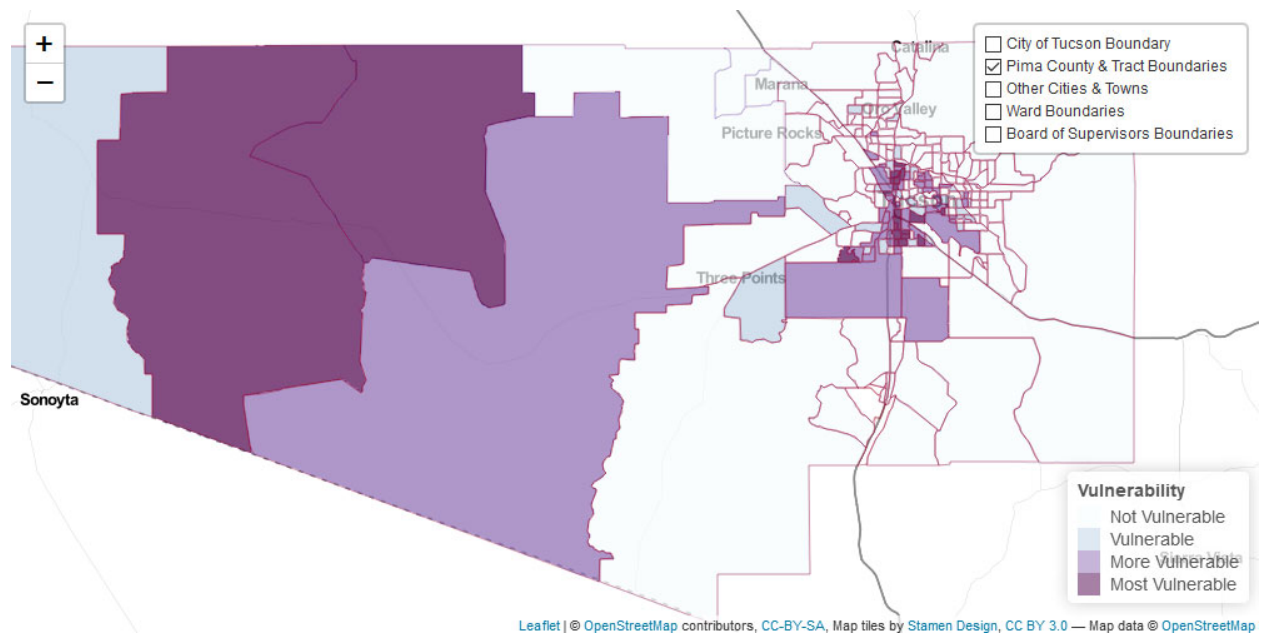
During this time period, the Tucson metro region was deep in the Great Recession. Our housing market hit a low point in January 2012 and overall employment declined from 2009 through 2013.

Scroll over the map to see more details about the status of each census tract in 2013, or zoom in to find your own neighborhood!

**Figure 5: 2013 City of Tucson Map**



**Figure 6: 2013 Pima County Map**



## 2013 Neighborhood Vulnerability Index Summary

Of the 241 total census tracts in Pima County, evaluation of the 2013 ACS data found 100 vulnerable census tracts in Pima County, or 41.5%. Of the total vulnerable tracts, 86 were within the City of Tucson - this means that 54.7% of census tracts in Tucson were found to be vulnerable in some way in 2013.

### What is neighborhood vulnerability?

The concept of social vulnerability stems from disaster mitigation research and focuses on the socioeconomic characteristics of households in neighborhoods that might determine the collective ability to prepare for and cope with a “hazard event” such as natural, public health, or economic disaster ([Highfield et al., 2016](#)). Particularly vulnerable areas may not only be disproportionately affected by the disaster itself, but also may not be able achieve long-term recovery ([Martin, 2015](#)).

### Study methodology

This phase of the City of Tucson/Pima County housing study project was modeled after the [Austin Uprooted](#) study, a peer-reviewed and generally accepted methodology for measuring neighborhood vulnerability. The preceding maps were built after calculating a composite score of five relevant indicators to determine whether a given census tract falls above or below the mean measurement of the metropolitan area. While there are certainly more than five indicators that may signal neighborhood vulnerability, many of those indicators are overlapping and may dilute findings as a greater number of indicators are added. We have found that these particular American Community Survey indicators are more dependable than most at the granular tract level.

### The five vulnerability factors

#### 1. Percent of residents that identify as anything other than “non-Hispanic white alone”

A [2014 Pew Research Center study](#) found the post-Great Recession median wealth of white households to be 13 times that of black households and 10 times the wealth of Hispanic households. We also know that density of non-white residents in low-income communities have compounding wealth effects, as well as educational and other socioeconomic effects.

#### 2. Percent of households who rent, rather than own, their homes

In terms of housing status, renters as a group are more vulnerable to hazard events that might shock a community. In the event of natural disaster, renters are generally not insured to the point of substitute housing. In the event of economic disaster, renters could be displaced by their own economic hardship or that of a landlord who might be forced to sell a property. See



this [Making Action Possible \(MAP\) dashboard article](#) for more information about how renters fare in housing affordability in Tucson.

### **3. Percent of residents aged 25 and over who lack a four-year bachelor's degree or higher**

Workers lacking a college degree are more likely to be unemployed, or to be employed in lower-wage, part-time, or seasonal jobs. This employment situation makes these workers particularly vulnerable to mass job loss and other economic events. The MAP dashboard has a deeper analysis of [educational attainment in the Tucson area](#).

### **4. Percent of households with incomes below 80% of Area Median Income (determined by HUD)**

Acknowledging that income is not wealth, households with incomes below median income are known to be more cost-burdened, thus sensitive to variable housing costs and other economic shocks. The MAP dashboard has a detailed analysis of [housing cost burden](#) phenomenon.

### **5. Share of children that live in households below the official poverty line**

Household type plays a role in vulnerability, particularly when coupled with other indicators such as low-income or lack of college degree. One point of concern is whether families most vulnerable to displacement have difficulty finding alternative housing, which is more often the case in families with children. The MAP dashboard also has a detailed analysis of [poverty rates in Tucson](#), including in families with children.

## **The composite score**

A vulnerable census tract meets two conditions: 1. it has three or more vulnerable factors, and 2. it has a composite score greater than zero.

Each of the five vulnerability factors was evaluated individually on whether its measurement fell above or below the mean of the metropolitan statistical area (Pima County). When a factor is above the mean, the tract is considered vulnerable for that factor. Each tract is then evaluated based on its number of vulnerable factors; if a tract has three or more vulnerable factors, it meets the first condition for vulnerability. Finally, the five factor scores are averaged across each tract for a composite score, with each factor weighted equally in the composite score. A tract is considered vulnerable when the composite score is more than zero; the greater the composite score is above zero, the greater the magnitude of vulnerability in that tract.

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## Footnotes

1. [Uprooted: Residential Displacement in Austin's Gentrifying Neighborhoods and What Can Be Done About It](#). p.19.
2. Turner, Margaret A., "Strengths and weaknesses of the Housing Voucher Program," in J.R. Tighe and E.J. Mueller, eds., *The Affordable Housing Reader*, Routledge, 2013, pp. 288-294