WALK↑ABILITY MEANS BUSINESS

Environment - Society - Economy

An EXPLORATORY study on the association between WALKABILITY & COMMERCIAL SUCCESS in MARICOPA COUNTY

Special thanks to the Phoenix Urban Research Lab for sharing their access to Walk Score data.

Photo taken in Tempe along Mill Avenue near Arizona State University.

Walkability

Walk Score®

The makers of WalkScore.com make measuring Walkability simple. Score any location with a numerical indicator from 0 to 100. New "Street Smart Walk Score" takes into account actual pedestrian routes, proximity, and variety of destinations.

Walk Score	Description
100 – 90	Walker's Paradise: Daily errands do not require a car.
89 – 70	Very Walkable: Most errands can be accomplished on foot.
69 – 50	Somewhat Walkable: Some amenities within walking distance.
49 – 25	Car-Dependent: A few amenities within walking distance.
24 – 0	Car-Dependent: Almost all errands require a car.

Source: http://www.walkscore.com/live-more/

Data was treated very carefully.

Standards were set to achieve a minimum number of commercial properties per block group, minimum sized parcels were created, and tests for abnormality were ran multiple times to make the data sets reliable. Fair Cash Value of Commercial Space is an unconventional variable. It combines the total space of floor square footage of the buildings as well as the square footage of the parcel itself. This was to try to capture the value of all space, whether store or parking lot. This holds businesses accountable for the space utilized for parking, and if prioritizing motorized access is profitable, then such land value should support it.

Data Sources and Treatment

WalkScore.com
United States Census Bureau
Maricopa County Assessor (Shapefile also)
  *All aggregated to the **block group resolution***
  *Businesses aggregated into **TWO "Test Groups"***
  Test Group 1: *All-inclusive set of businesses*
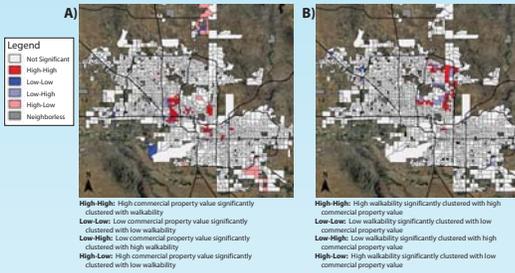 **Test Group 2:** *Seven uses excluded for unlikely pedestrian interest*

Variables

1. **Street Smart Walk Scores**
2. **Fair Cash Value per Square Foot***
3. Median Household Income
4. Population
5. Population Density
6. Business Count
7. Business Count Density

Local Indicators of Spatial Autocorrelation (LISA)

Spatial Autocorrelation measures the heterogeneous/ homogeneous landscape. These Bivariate LISA maps indicate whether there is a positive or negative spatial autocorrelation.
This analysis helps to describe the spatial patterns of walkability and commercial property values in Maricopa County.
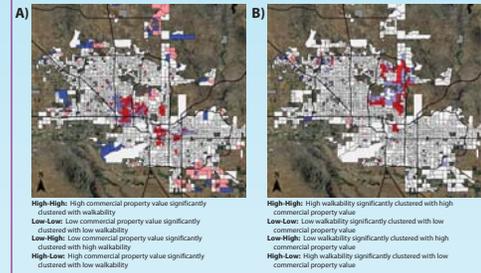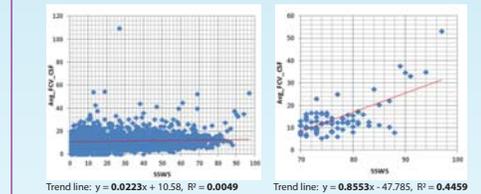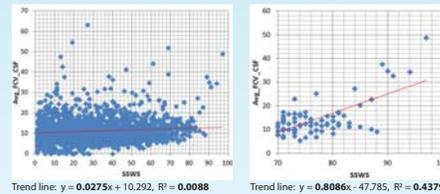Analysis used Open GeoDa and ESRI software.

Test Group 1
Performed well

A)
B)

Legend
- Not Significant
- High-High
- Low-Low
- Low-High
- High-Low
- Neighborless

High-High: High commercial property value significantly clustered with walkability
Low-Low: Low commercial property value significantly clustered with low walkability
Low-High: Low commercial property value significantly clustered with high walkability
High-Low: High commercial property value significantly clustered with low walkability

High-High: High walkability significantly clustered with high commercial property value
Low-Low: Low walkability significantly clustered with low commercial property value
Low-High: Low walkability significantly clustered with high commercial property value
High-Low: High walkability significantly clustered with low commercial property value

Test Group 2
Performed better

A)
B)

High-High: High commercial property value significantly clustered with walkability
Low-Low: Low commercial property value significantly clustered with low walkability
Low-High: Low commercial property value significantly clustered with high walkability
High-Low: High commercial property value significantly clustered with low walkability

High-High: High walkability significantly clustered with high commercial property value
Low-Low: Low walkability significantly clustered with low commercial property value
Low-High: Low walkability significantly clustered with high commercial property value
High-Low: High walkability significantly clustered with low commercial property value

Scatter Plots

All 2080 block groups that were test-worthy were tested.
The data ranges were explored and an interesting trend appeared in the range of Walk Scores of 70 or better. The commercial space value went up almost $0.81 per SF (Test Group 1) and $0.86 per SF (Test Group 2) per Walk Score point.

Trend line: $y = 0.0275x + 10.292$, $R^2 = 0.0088$

Trend line: $y = 0.8086x - 47.785$, $R^2 = 0.4379$

Trend line: $y = 0.0223x + 10.58$, $R^2 = 0.0049$

Trend line: $y = 0.8553x - 47.785$, $R^2 = 0.4459$

Pearson Correlations

Correlations between Walk Score and the value of commercial space was quite and high and significant. Correlations tests also show a test against the idea of "synergy" in contrast to walkability. While attempts to capture synergy showed some significance, walkability shows as having the stronger association both overall and when limiting the Walk Score to 70 or more.

Pearson Correlations, Test Group 1 (Excluded cases listwise)

Variables	1	2	3	4	5	6	7
1. LnSSWS	1						
2. LnFCV_CSF	.135**	1					
3. Md_HH_Inc	-.443**	.143**	1				
4. Population	-.100**	.028	.079**	1			
5. POP_DENS	.377**	-.007	-.391**	.224**	1		
6. COUNT	.160**	.003	-.194**	-.016	-.155**	1	
7. CNT_DENS	.372**	-.044*	-.393**	-.122**	.223**	.618**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Listwise N = 2073

Pearson Correlations, Test Group 1, SSWS ≥ 70 (Excluded cases listwise)

Variables	1	2	3	4	5	6	7
1. LnSSWS	1						
2. LnFCV_CSF	.571**	1					
3. Md_HH_Inc	-.133	.186	1				
4. Population	-.094	-.182	-.036	1			
5. POP_DENS	-.234	-.257	-.187	.522**	1		
6. COUNT	.536**	.357**	-.240*	-.113	-.125**	1	
7. CNT_DENS	.299**	.023	-.378**	-.206	-.034	.754**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Listwise N = 78

Pearson Correlations, Test Group 2 (Excluded cases listwise)

Variables	1	2	3	4	5	6	7
1. LnSSWS	1						
2. LnFCV_CSF	.076**	1					
3. Md_HH_Inc	-.457**	.175**	1				
4. Population	-.116**	-.008	.079**	1			
5. POP_DENS	.373**	-.056*	-.397**	.218**	1		
6. COUNT	.208**	-.029	-.220**	-.021	-.112**	1	
7. CNT_DENS	.377**	-.092**	-.383**	-.118**	.264**	.685**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Listwise N = 2042

Pearson Correlations, Test Group 2, SSWS ≥ 70 (Excluded cases listwise)

Variables	1	2	3	4	5	6	7
1. LnSSWS	1						
2. LnFCV_CSF	.574**	1					
3. Md_HH_Inc	-.133	.201	1				
4. Population	-.094	-.167	-.038	1			
5. POP_DENS	-.234	-.247	-.187	.522**	1		
6. COUNT	.512**	.361**	-.221	-.125	-.316**	1	
7. CNT_DENS	.266	.056	-.380**	-.217	-.016	.784**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
N = 78

Poster by **A. Ryan Wozniak**, MUEP, Arizona State University
Contact at Andre.Wozniak@asu.edu
Also Planning Intern at the Town of Queen Creek