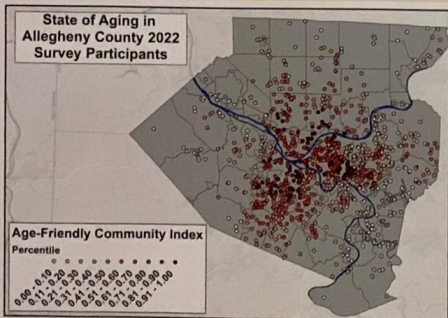
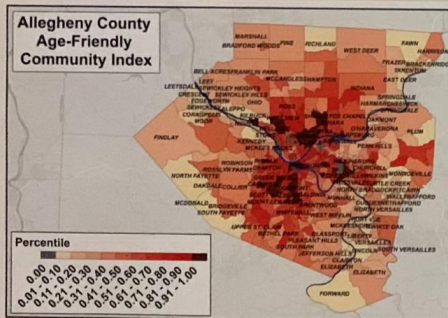


Spatial Similarity Between Objective and Perceived Measures of Age-Friendly Community

Introduction

Secondary spatial data are often used to characterize the neighborhood environment, which is associated with quality of life. Qualitative surveys provide a measure of resident perceptions. This study aims to assess where objective spatial measures and subjective survey assessments of the neighborhood environment agree and where they diverge.

- The Allegheny County Age-Friendly Community Index (AFC)* is designed as an objective measure of neighborhood qualities which support the ability of older adults to thrive. The AFC, shown in the map below, consists of tract-level percentile ranks calculated from spatial indices of built environment, transportation, housing, community services and social participation.
- UCSUR conducted the *Survey of Older Adults in Allegheny County*** from November 2021 to May 2022. A total of 1,299 adults age 55 and older completed 60-minute telephone surveys. The survey instrument was designed to include questions that measure perceptions of neighborhood environment. Participant locations are shown in the second map below.



Methods

This study is designed to compare the agreement between two measures of representative Age-Friendly Community (AFC) indicators. Paired measurements extracted from the Age-Friendly Community Index and State of Aging survey are used to generate spatial clusters of high (positive) and low (negative) values and analyzed to assess the similarity between their spatial patterns.

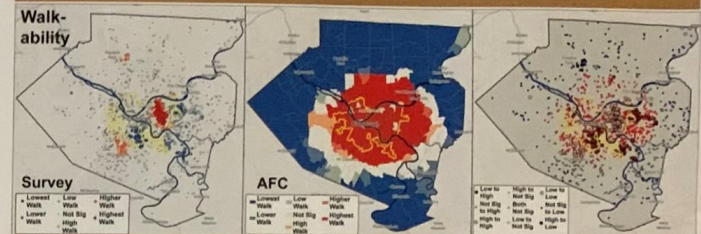
Three spatial indicator/survey response pairs were selected based on the comparability of the values being measured:

AFC Spatial Indicator	AFC Metric	State of Aging Survey Question
National Walkability Index	Walkability	How good is your neighborhood as a place to walk and be physically active?
Average homicide rate	Public Safety	How safe do you feel in your neighborhood?
Age-Friendly Community Index	Age-Friendliness	Thinking about your neighborhood, in general how good is it for older people to live?

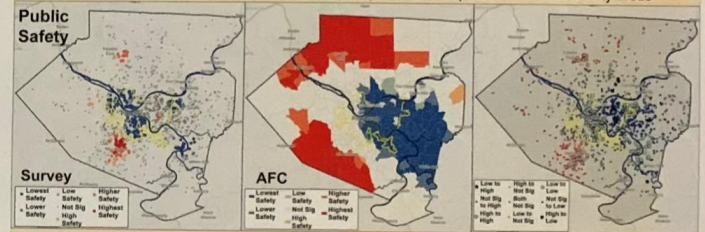
Data Processing and Spatial Analysis

- First, the two sets of measures were synthesized to match their value scales:
 - Survey responses to State of Aging questions were recorded at each participant residence using a five-point Likert scale with values from 1 to 5. Participant residential point locations were geocoded to the nearest cross street. Answer scales for each measure were re-classified to arrange all responses from low (negative response) to high (positive response).
 - Spatial indicator values were ranked according to degree of age-friendliness from low to high values for each Census Tract.
- Next, an *Optimized Hot Spot Analysis (OHS)* was run in ArcGIS Pro 6.2** on each of the response and spatial indicator measures to generate spatial clusters. The OHS creates statistically significant hot (high or positive) and cold (low or negative) spots using the Getis-Ord G_i^* statistic, revealing geographic patterns of measurement concentration.
- Finally, the *Hot Spot Analysis Comparison (HSCA)* tool was run using the OHS outputs for each of the measurement pairs. This tool compares two hot spot analysis results and generates their degree of similarity by comparing the significance level between corresponding cluster features and their neighbors in both input layers. Results are shown for all survey response locations and are classified to highlight areas where both measures are similar and where they disagree.

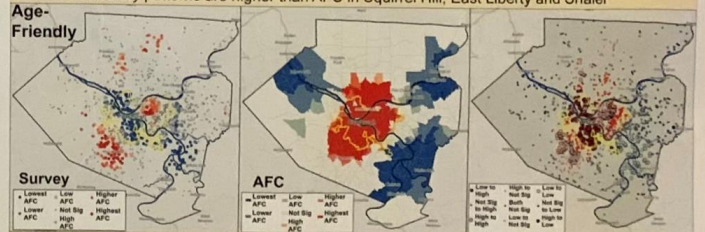
Results



- Survey shows high walkability in Oakland and suburbs; low in South Side, Penn Hills and Mon Valley
- The AFC clusters walkable areas around the city and close suburbs; rural areas have low walkability
- Perceived walkability is lower than AFC in steep slope and lower perceived Public Safety areas



- Low perceived safety in North/South Sides, Mon Valley; high safety in Oakland and suburbs
- AFC has low public safety in city, East, Mon Valley; high safety clusters in suburbs and outer county
- Perceived safety patterns are higher than AFC in Squirrel Hill, East Liberty and Shaler



- Oakland, suburbs perceived Age-Friendly; North/South Sides, Mon Valley not Age-Friendly
- AFC shows city and suburbs as Age-Friendly; Mon Valley, and outer county are least Age-Friendly
- Perceived Age-Friendliness lower than AFC in city core, North/South Sides, McKees Rocks

Discussion:

- Results suggest that perceived and objective measures can complement and inform each other to provide a more complete picture of neighborhood environment.
- Urban/Rural differences between measurements persist across all indicators.
- Matching the spatial and value scales of objective data and perceived survey responses remains a methodological challenge and complicates comparisons. For improved analysis:
 - Survey questions should be worded to more closely align with spatial indicator measures.
 - Spatial indicators can be improved by merging neighborhood demographics (income, race) and environmental features (topography, barriers) to better reflect the lived experience.

*Allegheny County Age-Friendly Community Index <https://afci.ucsur.pitt.edu/>

**State of Aging, Disability and Family Caregiving in Allegheny County https://ucsur.pitt.edu/state_of_aging_2022.php