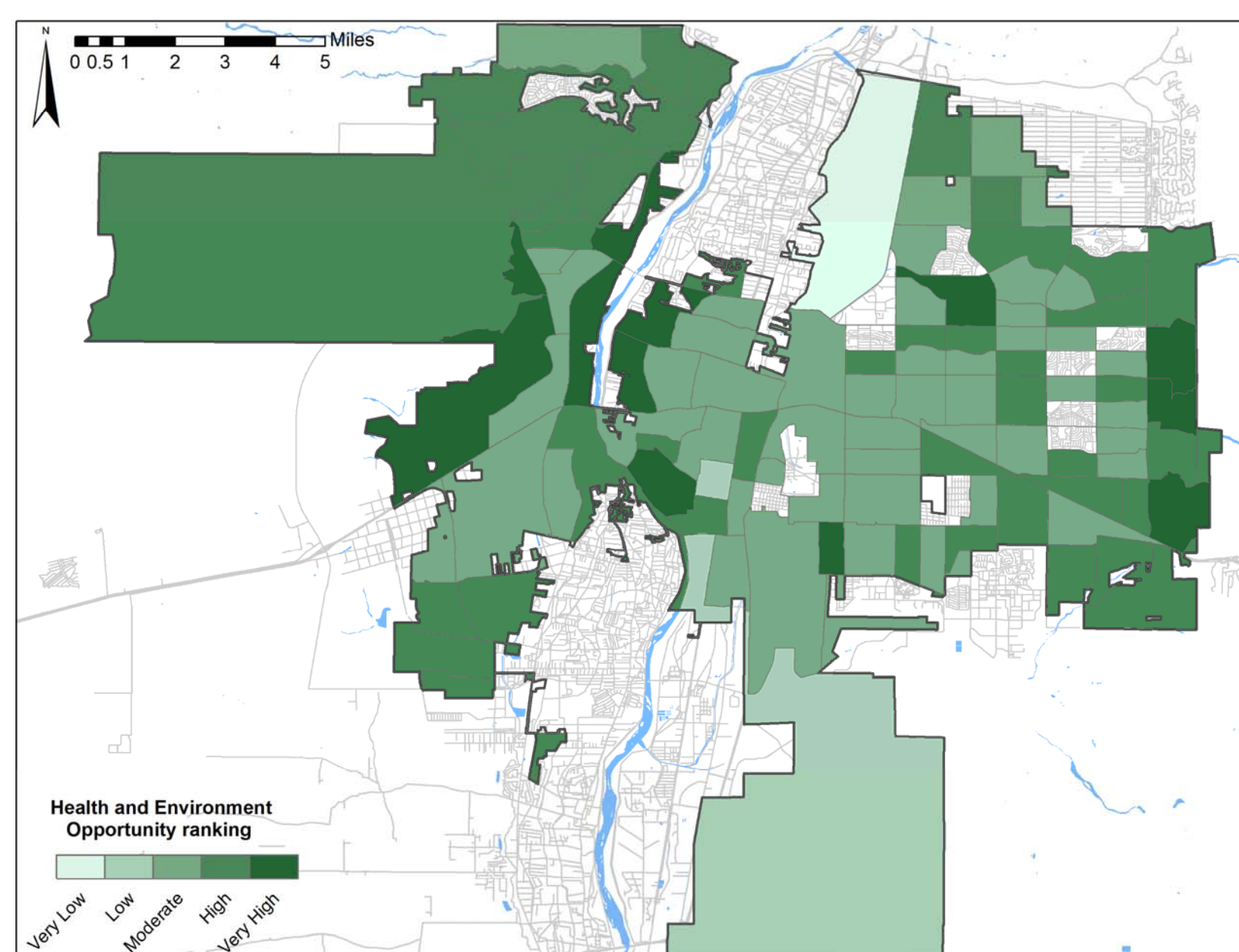# Geographic Opportunity in Albuquerque, NM

A Technique Demonstration

Rankings by Category

Neighborhood Quality and Housing Opportunity ranking
Very Low | Low | Moderate | High | Very High

Mobility Opportunity ranking
Very Low | Low | Moderate | High | Very High

Health and Environment Opportunity ranking
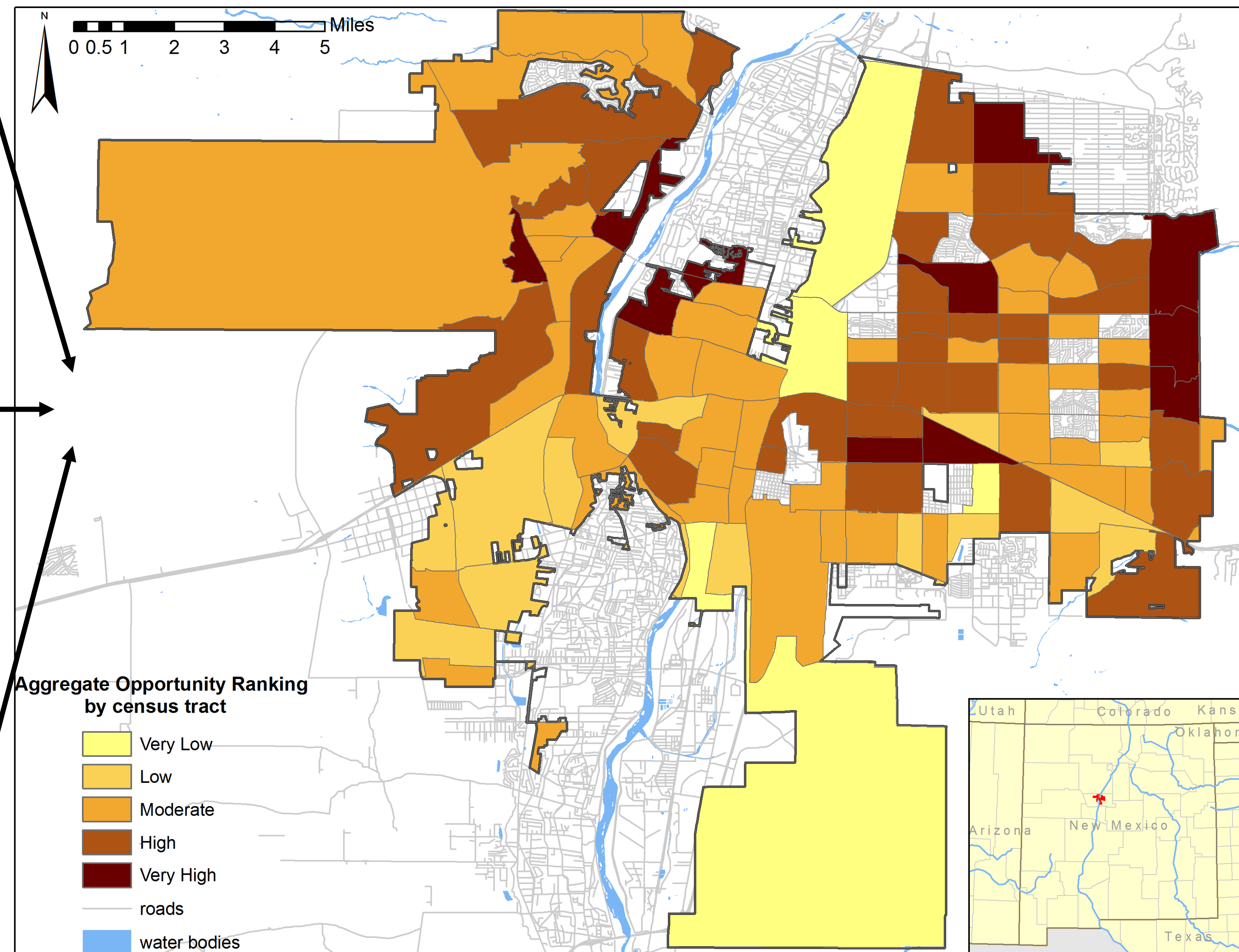Very Low | Low | Moderate | High | Very High
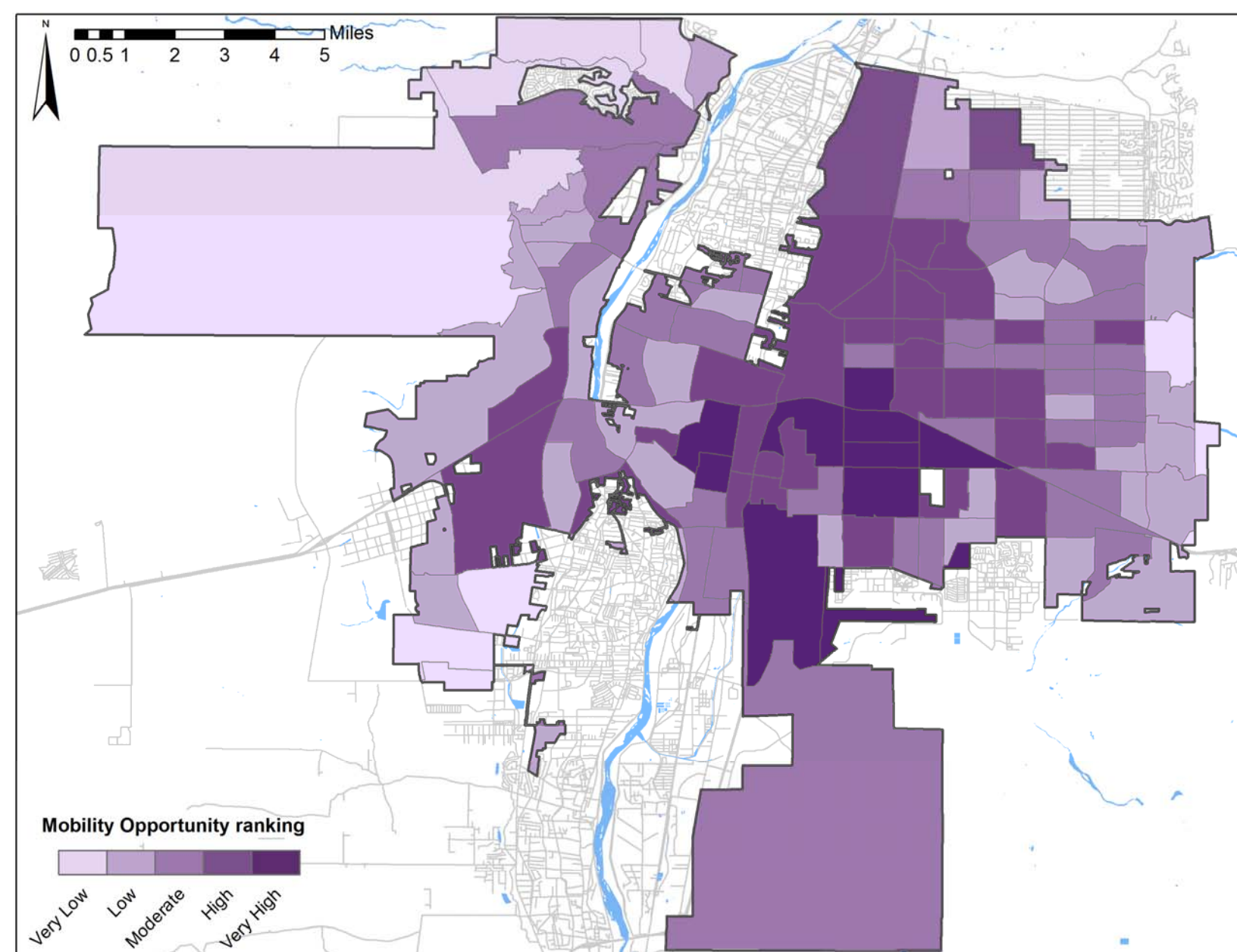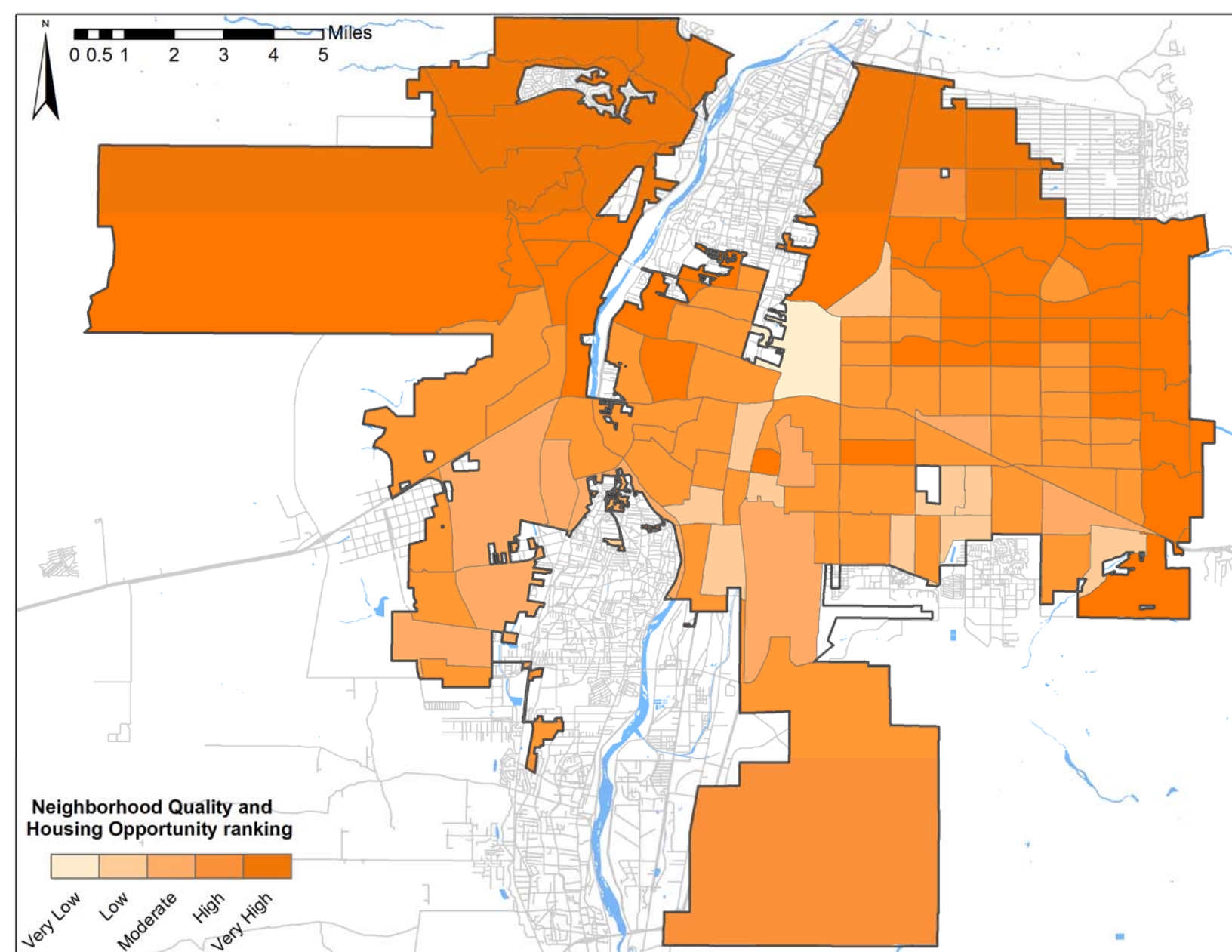
Purpose

"Opportunity Mapping" is a technique developed by the Kirwan Institute for the Study of Race and Ethnicty, at Ohio State University. By mapping many factors that pertain to both high and low opportunity, the purpose is to develop an understanding of how opportunity is geographically distributed, and who has the easiest access to it. There are numerous factors that determine opportunity, in the categories of education, health, environment, mobility, neighborhood quality, and economy. I used this framework to test out the technique of opportunity mapping on just a few factors in the city of Albuquerque, New Mexico. With nearly half the population of Albuquerque claiming Hispanic heritage, it would be especially interesting to compare the geography of opportunity to the urban locations of this growing minority population.

Aggregate Opportunity Ranking by census tract

Very Low
Low
Moderate
High
Very High
roads
water bodies

Opportunity Indicators

Neighborhood and Housing Quality	Mobility	Health and Environment
(-)Poverty rate (+) Median home value	(-) Average commute time (+) Number of bus stops	(-) Number of EPA hazardous sites (+) Percent park area

Methodology

. The evaluation was performed at the level of the census tract. A selection of variables was chosen from each of three categories of opportunity (see table to the left). Data was obtained and clipped to the Albuquerque city limits.
. Point data was aggregated to the census tract layer to obtain a count. Census data was added to the census tract layer. Calculations were made using Calculate Geometry and the Field Calculator to determine park area, average commute time, and the poverty rate as a percentage.
. Z-scores were calculated for each factor in order to compare and aggregate them. Scores were calculated using the following equation:
. $Z = (\text{data point} - \text{citywide average})/\text{standard deviation}$
. All factor layers were converted to rasters. In the case of negative opportunity indicators, raster calculator was used to invert the Z-score values (for example, a score of +10 for EPA hazardous sites became -10, as a high number of hazardous sites has a negative effect on opportunity).
. Cell Statistics were used to average together the Z-scores of the 2 raster factor layers in order to obtain the beta opportunity maps. These averaged scores were classified into 5 categories, measuring opportunity from very low to very high.
. These beta indicator maps were again averaged together to obtain the final aggregated opportunity map for the city.

Results and Limitations

The maps to the left show the distribution of opportunity in the three categories and in the aggregate. It appears that ten tracts are ranked as having very high opportunity, and five as very low.

Due to missing data from the park area layer, several census tracts were not included in the Health and Environment opportunity map, and therefore are also missing from the final opportunity ranking. It would be necessary to start again at the step in which I clipped the census tract layer to the parks layer in order to calculate area in order for these tracts to be included in the final results. However, it does make it quite easy to see which tracts to not contain any parks.

In order to truly measure the geographic opportunity of Albuquerque, far more factors in all of the possible categories would have to be considered in the analysis. Time and ability kept me from considering more variables. These maps should therefore be considered more as a demonstration of the technique than a true measure of opportunity.

The useful application of opportunity maps is for comparing information concerning the demographics of the region—such as race, ethnicity, citizenship, age, and more--with the level of opportunity in the neighborhoods in which they live.. If I were to continue this project, I would like to determine, for each opportunity ranking, the percentage of Hispanics and other minorities living in those census tracts.

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Intro to GIS, Spring 2011
Data Sources: American Communities Survey 2009; City of Albuquerque GIS, New Mexico RGIS, EPA Geospatial Data Access Service

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