A look at the Spatial Mismatch of Unemployment and Job Vacancies in Ramsey County, Minnesota

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Introduction

This project will center around the idea of the Spatial Mismatch Hypothesis. This concept refers to the spatial discrepancy between areas with high unemployment and areas with suitable employment opportunities, measured in not only physical distance but also temporal distance. The growing distance between job openings and available housing has been a factor in the consistently high unemployment rates experienced in inner-city neighborhoods.

The scope of our project is Ramsey County. We will be analyzing unemployment patterns of residents within the county and where Ramsey County residents typically work, either in or outside the county.

Research Questions

To assist Ramsey County Workforce Solutions with their mission of eliminating transportation barriers for low-income workers, we asked the following questions:

What are the relationships between neighborhood characteristics and areas of high unemployment?

Do low-income populations work further from home?

Do certain job sectors require additional travel?

What is the relationship between job vacancy and unemployment in Ramsey County?

Methodology

We use ArcMap and ArcGIS Pro to analyze the relationships between employment data, travel time data, and demographic data in Ramsey County.
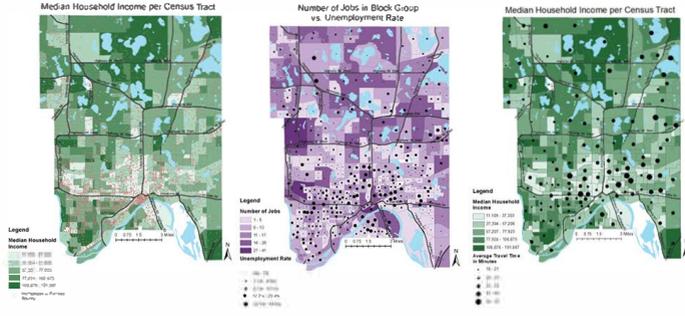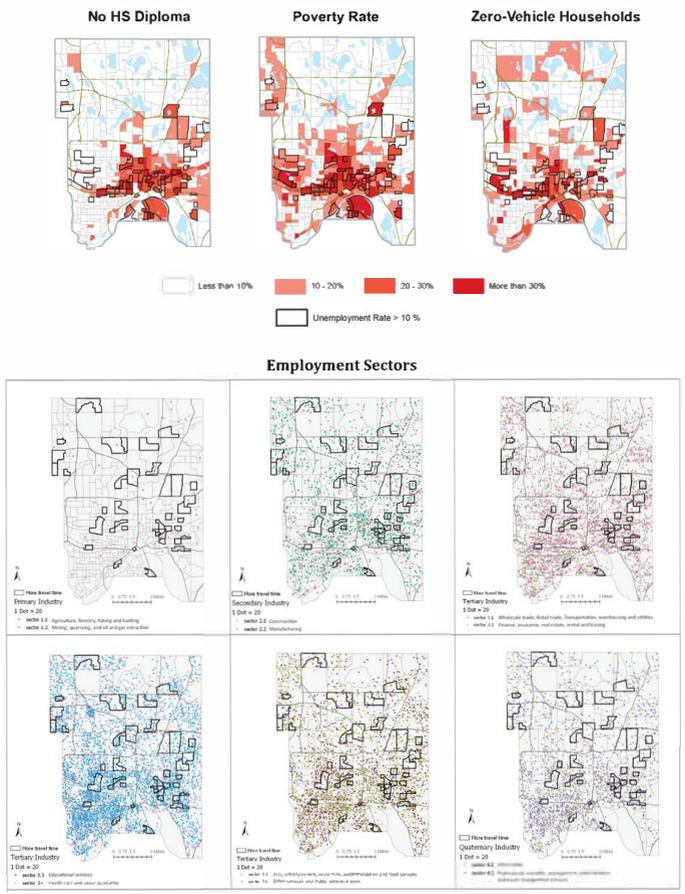
Data Sources
- Point location data of workplaces for Ramsey County residents, homes of people working in Ramsey County: U.S. Census Bureau's Center for Economic Studies (CES) through OnTheMap (2015)
- Unemployment data: MN DEED's Quarterly Census of Employment and Wages (2017)
- NHGIS demographic data: IPUMS
- BLG data and travel times to work for Ramsey County residents: U.S. Census Bureau through American Fact Finder (2017 ACS)
- Other map aspects, including parcel information, lakes and rivers, parks, and county boundaries: Ramsey County Open Source Data

Tools Used
- Dot densities
- Choropleth maps
- Preliminary statistical investigation in R

Analysis

No HS Diploma   Poverty Rate   Zero-Vehicle Households

Less than 10%   10 - 20%   20 - 30%   More than 30%

Unemployment Rate > 10 %

Employment Sectors

Median Household Income per Census Tract   Number of Jobs in Block Group vs. Unemployment Rate   Median Household Income per Census Tract

Conclusions

Unemployment is spatially correlated with higher rates of poverty and racial minorities, and lower rates of high school graduation and vehicle ownership.

Low-income workers, are more likely to be employed more than 50 miles from home and have longer average commute times.

Workers in manufacturing, education, trade, transport, and utilities are more likely to work further from home.

People who need more travel time to work also include those engaged in Educational Services, Recreation Services, Food Services, and Finance.

Unemployment in Ramsey County is clustered in the City of Saint Paul, specifically along the interstate corridors. This is also where the majority of jobs are located in Ramsey County.

Limitations and Future Research

Data Limitations
- Lack of job vacancy data
- Employment sectors classification
- Workforce Solutions data: addresses of unemployed population were not given due to privacy concerns

Ramsey County should complete a similar analysis using workforce solutions address data and job vacancy data. It would also be helpful to include data on public transportation routes in the analysis to get a better understanding of what areas of the county and job sectors are inaccessible via public transportation.

Recommendations

Ramsey County should fund economic development in areas with high unemployment, specifically near the interstate corridors in the City of Saint Paul and in a few outer ring suburbs in the North part of the County. While some of these areas in Saint Paul have high concentrations of employment opportunities, much of the workforce is likely traveling from the suburbs into the city to fill these positions. For this reason, investing in more economic development in these areas will help to improve the mismatch between areas with high unemployment and job vacancies.