

# Final Report

**Project Name:** Influence of Changes in Human Mobility on Covid-19 spread in Wisconsin

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## Introduction

Human mobility patterns and changes could be one indicator for understanding Covid-19. Currently, the Wisconsin government is focusing on making policy to prevent the spread of Covid-19. Our project is going to detect infected cases in each county in Wisconsin, analyze the infected cases distribution after implementation of travel ban. We will consider various factors including population density, mobility trends for places like grocery markets, food warehouses, farmers markets, specialty food shops, drug stores, and pharmacies. Mobility trends for places like local parks, national parks, public beaches, marinas, dog parks, plazas, and public gardens. Mobility trends for places like public transport hubs such as subway, bus, and train stations. Mobility trends for places like restaurants, cafes, shopping centers, theme parks, museums, libraries, and movie theaters. Mobility trends for places of residence and for places of work. We will use those changes to determine what the influences are of the travel ban on each county and how it will make impacts on the COVID-19 spread.

## Data Source

1. [Google COVID-19 Community Mobility Reports](#)
2. [COVID-19 United States Cases by County](#)
3. [WiDNR Open Data](#)
4. [COVID-19: County Data](#)
5. [Coronavirus Locations: COVID-19 Map by County and State](#)

## Method

1. Spatial Clustering: Apply K-Medoid Clustering method to identify the cluster of infected cases
2. We will also use Kepler.gl, geopandas and other tools to do data visualization to show the impact of travel bans on each county.

## Results and Findings

After our analysis on mobility changes among counties in Wisconsin, clustering of confirmed cases of Covid-19 and time space analysis on changes of flights associated with all airports in Wisconsin, we found out that the travel ban policy have an important impact on the spread of coronavirus, this policy restricted on people's travels, reduced the mobility, therefore cut off the opportunity of spread of the virus.

Mobility trends for retail, recreation, grocery, pharmacy, workplaces and transit stations dropped a lot compared to the baseline, which means that governments' travel ban and "stay at home" policies have prevented people from going out to those places for recreation or travelling. At the same time, mobility trends for parks and residential have increased compared to the baseline, it also proved that the mobility's decrease.

When analysing the flight changes trend, we can see that after March, international flights between Wisconsin and other counties have reduced. At the same time, domestic flights have also dropped significantly. Average flights in April have dropped almost 50% compared to January, February and March. Major flights are concentrated in the middle east of America, flights to other states have reduced a lot.