Analyzing the Impact of Transportation Practices on Commuter's Health Across U.S. States

Abstract: This project aims to understand the relationship between transportation modes and health outcomes of commuters across the United States. By examining a variety of indicators—ranging from commuting mode shares and complete streets policies to traffic fatality rates and physical activity levels—we aim to provide a comprehensive picture of how transportation influences public health. Through interactive mapping and predictive modeling, we will offer insights into effective policy interventions that can enhance health outcomes related to transportation.

Objectives:

1. To create an interactive map visualizing transportation and health data for each U.S. state.
2. To develop predictive models forecasting the impact of different transportation policies on health outcomes.
3. To analyze the correlation between transportation mode share changes and road traffic fatalities/injuries.

Techniques:

- Utilization of ggplot2 for static visualizations and Shiny for interactive displays.
- Application of machine learning models for predictive analyses.
- Employment of NLP and text mining for analyzing public sentiment towards transportation modes.

Data Description:

This dataset provides a comprehensive look at the transportation and health of each US state. Included are important indicators such as commute mode share (auto, transit, bicycle and walk), complete streets policies, person miles of travel by private vehicle and walking, physical activity from transportation sources, road traffic fatalities exposure rates (auto, bicycle and pedestrian), seat belt use, transit trips per capita, use of federal funds for bicycle/pedestrian efforts, vehicle miles traveled per capita and proximity to major roadways.
https://www.kaggle.com/datasets/thedevastator/us-state-transportation-health.

Visualizations:

- Interactive Maps: Using ggmap to detail state-wise transportation and health indicators, with filters for specific data points.
- Predictive Models: Visual representations of model forecasts on policy impacts, using dynamic graphs to illustrate potential future trends.
- Correlation Analysis: Charts and graphs highlighting the relationships between mode share changes and traffic safety metrics.