

TIL6022 Proposal Project

Analysing Changes in Transportation Modes Before, During, and After COVID-19 in Different Urbanisation Level Areas

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Objectives:

- **Determine Transport Patterns Before COVID-19:**
Analyse transportation modes and usage patterns in the Netherlands prior to the pandemic.
- **Determine Transport Patterns During COVID-19:**
Examine changes in transportation modes and usage during the pandemic, considering lockdowns and mobility restrictions.
- **Determine Transport Patterns After COVID-19:**
Assess post-pandemic transportation patterns to identify lasting changes in mobility behaviour.
- **Compare Urban and Rural Areas:**
Investigate differences in transportation modes used in different urbanisation level areas across the three time periods.

Research Questions:

Primary Question:

- What are the differences in transportation modes used in different urbanisation level areas before, during, and after the COVID-19 pandemic?

Secondary Questions:

- How did passenger numbers vary across different transportation modes and periods?
- How did passenger kilometres vary across different transportation modes and periods?
- How did the number of trips vary across different transportation modes and periods?
- Are there regional differences in transport behaviour in response to the pandemic?

Data Sources:

- **Centraal Bureau voor de Statistiek (CBS):**

- **Dataset:** Transport; performance and transport means, 2018-2023
- **Description:** Includes public transportation data covering various modes (e.g., bus, train, tram) and geographical areas over different periods.
- **Link:** CBS Dataset

Time Scale:

- **2018 to 2024:**
 - **Before COVID-19:** 2018-2019
 - **During COVID-19:** 2020-2021 (from March 2020 onward, there were restrictions in the Netherlands)
 - **Transition Period:** 2022 (from May onward, the Netherlands had no restrictions)
 - **After COVID-19:** 2023

Spatial Scale:

- Based on address density per km²:
 - Extremely urbanised (2500 or more)
 - Strongly urbanised (1500-2500)
 - Moderately urbanised (1000-1500)
 - Hardly urbanised (500-1000)
 - Not urbanised (0-500)

Data Pipeline Overview:

- **Data Collection:**
 - Source data from CBS.
 - Ensure all relevant datasets are downloaded.
- **Data Exploration:**
 - Use exploratory data analysis (EDA) techniques.
 - Tools: Python (Pandas, NumPy).
- **Data Cleaning:**
 - Check for and handle missing or inconsistent data.
 - Validate data accuracy.
- **Data Transformation:**
 - Perform feature engineering for new variables.
 - Integrate data if necessary.
- **Data Analysis:**
 - Conduct statistical analysis using Python libraries (SciPy, StatsModels).
 - Visualise trends and patterns.
- **Data Visualization:**
 - Create plots and charts using Seaborn, Matplotlib, and Plotly.
 - Develop interactive visualisations if possible.