Investigating the role of shared mobility during public transport disruptions

Problem description

Public transport (PT) disruptions can lead to passenger inconveniences due to delays and cancellations. In PT systems with limited redundancy, finding efficient alternative routes becomes challenging for passengers. One way to address this challenge is to foster the collaboration of PT systems with other transportation modes. This project particularly focuses on shared mobility to investigate whether it contributes to mitigating the adverse effects of PT disruptions on passengers. In this project, you are expected to perform empirical analysis based on the PT and bike-sharing data of Washington DC.

Assignment

You will have access to comprehensive datasets for this analysis. The PT datasets contain passenger movement (smart card) data (tap in and tap out), rail movement data and planned and unplanned disruption files for the entire period covering August 2019 to December 2022. Additionally, the bike-sharing data includes trip histories of both classical and e-bikes during the same period. Your tasks include

- Analyze the temporal and spatial patterns of demand shift between the public transport system and bike-sharing services during disruptions
- Empirically assess whether incorporating bike-sharing as an alternative mode or bridging service reduces additional travel time during disruptions.

Candidate background

You have completed CIEQ6232 and interested in pursuing your thesis in the public transport domain. You have affinity with data analysis and mathematical modelling and do not shy away from working with large datasets and the associated programming skills.

Research group

Smart Public Transport Lab, the project is performed in cooperation with the Rail group in Washington Metropolitan Area Transit Authority (WMATA), a government agency that operates transit service in the Washington Metropolitan Area in the US.

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