ORIE 4741 Project Proposal

Intersection Congestion Prediction

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Github: https://github.com/mianyangSharon/Intersection-Congestion-Prediction

Problem Statement

Can we predict congestion, based on an aggregate measure of stopping distance and waiting times, at intersections in major US cities?

Initiative

We've all been there: stuck at a traffic light, only to be given mere seconds to pass through an intersection, behind a parade of other commuters. If the city planners and governments could anticipate traffic hot spots ahead of time they could reduce the stop-and-go stress of millions of commuters. Harnessing the insights from this data has the power to improve safety, optimize operations, and identify opportunities for infrastructure challenges.

Data

The dataset consists of aggregated trip logging metrics from commercial vehicles, such as semi-trucks at intersections in 4 major US cities: Atlanta, Boston, Chicago & Philadelphia. The data has been grouped by intersection, month, hour of day, direction driven through the intersection, and whether the day was on a weekend or not.

Why this dataset for solving the problem

Using each grouping in this dataset, we could make predictions for three different quintiles of two different metrics covering how long it took the group of vehicles to drive through the intersection. Specifically, the 20th, 50th, and 80th percentiles for the total time stopped at an intersection and the distance between the intersection and the first place a vehicle stopped while waiting. Our goal would be summarizing the distribution of wait times and stop distances at each intersection. Based on our summaries, congestion can be anticipated and subsequently avoided.