
Building an Accessible, Low-Stress, and Sustainable Bicycle Infrastructure Network for the City of Pittsburgh.

*Allan Khariton, Sean Qian, Jacabo Bielak
Department of Civil and Environmental Engineering
Carnegie Mellon University*

- Research Questions:
- What **factors** are important to cyclists? How do we leverage **big data** to estimate this?
- What **factors** do current **route planning** softwares utilize?
- How can current route planning models be **improved**?
- Where is it possible **to expand/add new** bike infrastructure?

Data and Methods

- A bike scoring system is being created with data pertaining to the following factors:
 - Safety and crash risk
 - Bus coverage
 - Traffic speed
 - Traffic Volume
 - Bike Usage
 - Infrastructure
 - Slope, curvature, sharing stations, bike infrastructure

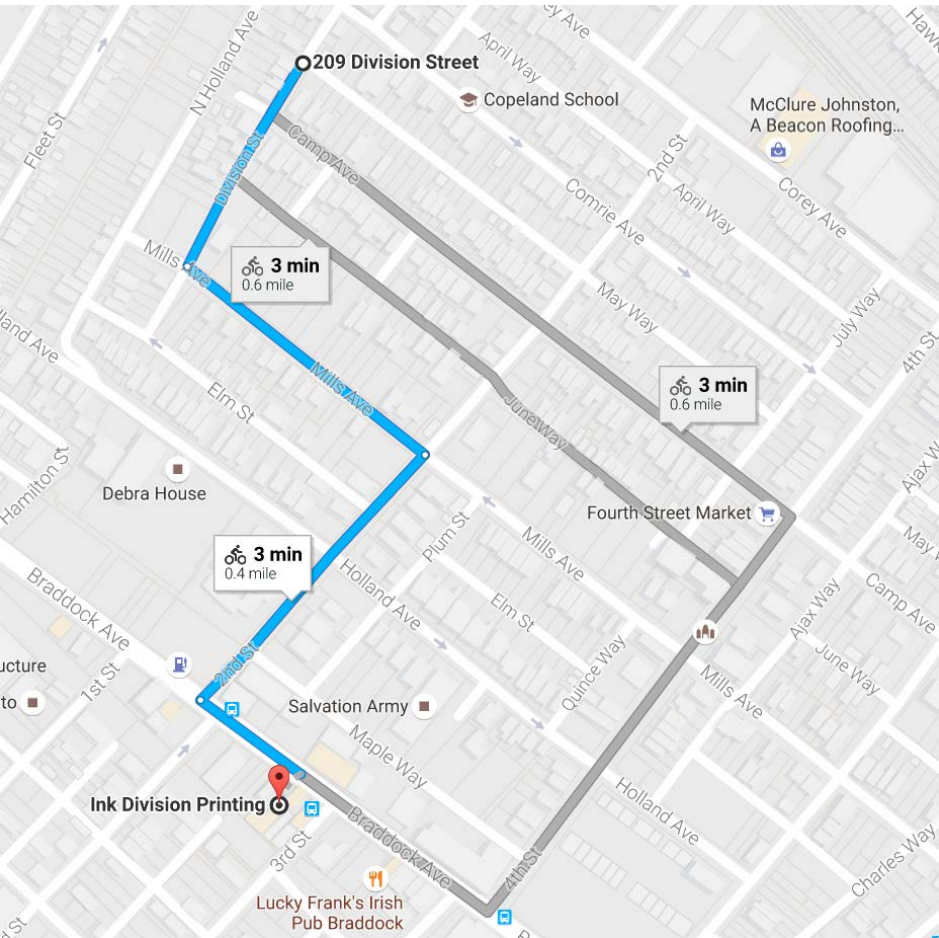
Data and Methods

- A bike scoring system is being created with data pertaining to the following factors:
 - Safety and crash risk ~ **PENNDOT**
 - Bus coverage ~ **GTFS, PAAC**
 - Traffic speed ~ **INRIX, HERE**
 - Traffic Volume ~ **City of Pittsburgh, PennDOT**
 - Bike Usage ~ **City of Pittsburgh, Bike PGH**
 - Infrastructure ~ **PennDOT/SPC**

Safety and Crash Risk Factor

- Crash risk was determined with the following parameters, using negative binomial regression:
 - Traffic speed
 - Angle of road
 - Slope of road
 - Wind
 - Temperature
 - Visibility
 - Rain and snow

Comparison to Google Maps



Conclusions and Future research

- Accessibility, stress, safety and convenience were quantified using numerous factors
- A variety of large scale data sets were used
- Cyclist preference may vary over the given factors
- Creating ‘scores’ for variables deemed important to cyclists
- Creating a user friendly user interface that provides:
 - Customizable scores and route planning
- Allowing the system to use real time data