Ghost Bikes Project
Data+ 2017

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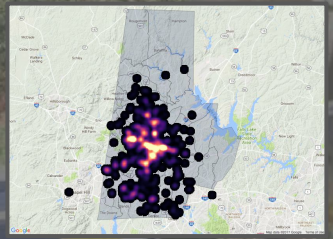
Background

- Our project was a continuation of a seminar taught by Dr. Harris Solomon in Spring 2017
- Ghost Bikes are white painted bikes that represent an international movement to memorialize cyclist deaths (4 are currently in Durham)
- Our project used Ghost Bikes and bicycle crashes as our starting point, but expanded our focus to pedestrian and motor vehicle crashes as well
- Our main goal was to assess, analyze, and map pedestrian, bike, and motor vehicle crash data for our community partner, Durham’s Department of Transportation

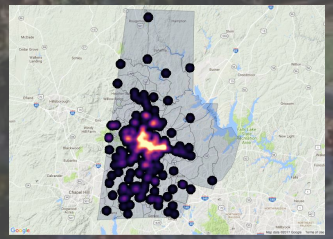
Methodology

We cleaned, filtered, and analyzed more than 20 data sources of varying formats and coding structures using RStudio, QGIS, and hand coding.

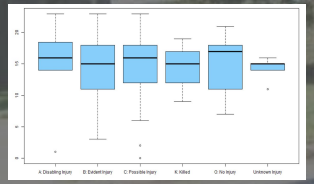
Pedestrian Crashes



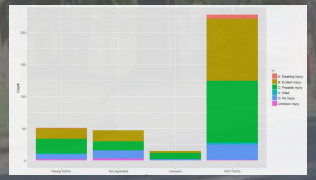
Bike Crashes



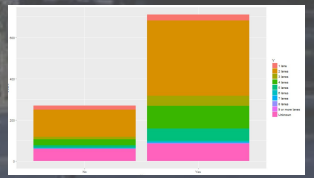
Using QGIS, we were able to create additional visualizations for our R Shiny App. These maps allow users to compare high crash areas with nearby roads and geographic landmarks. The base maps are interchangeable and come in a wide variety of options.



Bike injury v. Bike Direction



Bike injury v. Bike Direction



Bike injury v. Bike Direction

To visualize the data that we cleaned and analyzed, we created an app through R Shiny. The app is user-friendly, educational, and is a comprehensive view of our work this summer on Durham traffic safety. The app can be easily expanded to include other data sets when they become available, and also has the potential to graph and forecast data.

<u>This app allows the user to:</u>

- View background information on Ghost Bikes and pedestrian safety in Durham
- View trends in user-selected variables
- Compare variables (such as time of day, weather conditions, etc.) through multiple visualization methods
- View and interact with crash maps, created in QGIS (see right)

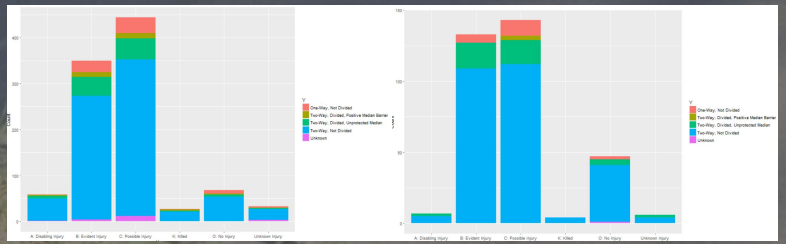
Limitations and Conclusions

Limitations:

1. Without baseline data on the biking, pedestrian, and motor vehicle populations, we cannot draw statistically significant conclusions.
2. We were only able to obtain limited population data on commuters 16 and over, categorized solely by sex.
3. Certain categories in our data, such as race, have limited options that may not fully capture the identities of the individuals involved in these crashes. For example, “Hispanic” is incorrectly listed as a race.
4. The data is captured by police, and thus injury data is coded through police regulations and not by medical standards.

Conclusions:

- From our findings, we would suggest the installation of more crosswalks on two way streets where “mid block crossings” are common, since the plurality of pedestrians are struck in the travel lane.
- We would also suggest the remodeling of many high-density crash streets into “complete streets” (streets that include median islands, bike lanes, and/or crosswalks) since the majority of bike and ped crashes occur on two-way, not divided streets. The histograms below show the
- ER Data could be used by future researchers to study injury severity and injury progression



Bike (Right) and Pedestrian (Left) Injury v. Road Configuration