

## Data Challenge 2021

### Team 35 (James Boggs, Ziqin Ni, Madeline Raith) – Abstract

The Veoride E-scooter is one of the viable sustainable transportation options advocated by the Department of Transportation Service in order to (1) reduce traffic congestion and parking demand on campus, (2) create eco-friendly environment by reducing vehicle emissions, and most importantly (3) promote flexible commutes and enable “last mile” connections. E-scooters have become a popular alternative among college students due to its fast trip, flexible schedule, and affordable rate. In a thorough examination of E-scooter data, including route starts, stops, and paths, adaptations to the COVID-19 pandemic are clearly defined. The data set was cleaned by removing e-Bike runs and outliers with respect to distance and time. The travel path of each ride was checked in python to determine the most popular route, and to classify all rides into trips within campus, trips that terminated on campus, and trip that started from campus. Rides that ended off-campus were further categorized by end location type (Residential, Commercial, Transportation). Current statistical analysis suggests E-scooter supplements campus transportation services in general at commuting distances  $< 2$  miles and duration  $< 12$  minutes; about 42 % of e-scooter trips confined within campus, while 20 % of trips connecting to off-campus and 20% of trips coming into campus. Further, a mismatch of ending coordinates to E-scooter parking lots suggest majority of e-scooter users fail to follow UMD regulations, thus implying a need of change in infrastructure (such as bike lane and parking lots) to current commute patterns. However, a reduction in the UMD shuttle services due to the pandemic has increased e-scooter usages by 43%, making it a preferred transportation mode to commute between residential areas and campus on weekdays and to commercial stores during the weekends. In addition, a spike of e-scooter usage during 1 to 8 am suggests E-scooters served as

a primary recreational mean to maintain social interactions due to canceling of in-person class and lack of social activity during the day.