Team DC21058 Summary

I was given the University of Maryland DOTS VeoRide E-scooter Transportation dataset to work with. This provided me with 40,325 rows of data, each representing a unique e-Scooter ride identified by the ride ID and customer ID. Each row gave the start and end time, the start and end coordinates, the distance traveled, the total duration of the trip, and a list of coordinates with timestamps showing the path taken by the rider. The data covered a total of 62 days in October of 2019 and 2020. The goal of this project was to see how, if at all, COVID-19 impacted student use of the scooters and how the VeoRide company and UMD could adapt to meet these new needs.

I initially found there to be errors in the dataset; some of the longitudes very far from where they should have been such as China or Spain. To correct this, I eliminated all coordinates east of 76°W and simply connected the two points on either side to complete the path. I manually calculated the distances in these cases using a function for computing arc lengths on a sphere and corrected the table data. I then proceeded to split the data from each year into four groups, trips which started and ended on campus, started on campus and ended off, started off and ended on campus, and both started and ended off campus. Using the middle two categories, I calculated the most popular entry and exit points for the campus and settled on four distinct chokepoints. These were Regent Drive, Paint Branch Trail, Paint Branch Gate, and the main entrance on Campus Drive. The most popular of these were Regent Drive and Paint Branch Trail, likely due to their proximity to the fast-food centers which lie just beyond these exits. In 2019, these two were used equally with the former closer to classes and the latter to residence halls. However, with students increasingly doing classes from their dorm, usage of the Paint Branch Trail, and to some extent the nearby main entrance, increased to the point where it was used over 50% more than the Regent Drive entrance.

For intra-campus travel pre-pandemic, the top destination for scooters was easily the Eppley Recreation Center was either the start or end point for 35% of trips contained within the campus. Other locations such as residence halls and food areas made up less than 5% each. However with the limits of COVID, trips to and from the rec center dropped to only 9.5% of the total. In its place rose the aforementioned food areas and residence halls which in 2020 made up 10% and 23% of trips respectively.

With these in mind, the solution seems to be reallocating scooter stations from the rec center to residence halls and food areas, both on and off campus, in order to cater to the common locations of students. Also, knowing that the main reason for leaving campus on a scooter is food, it would make sense to expand the service area of these scooters to include more food centers which lie just beyond the borders of where scooters can be driven without a fine.