

# **TAMU Bike-Share Program: Demonstrating its Success**

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## **Abstract**

As TAMU Transportation Services employees, we analyzed and evaluated the positive impacts and overall success of the bike-sharing program to students, faculty and community over the course of eight months. We will be observing the following criterias to determine if the bike-sharing program is a benefit to TAMU: total utilization of bikes, hotspot locations, and commute length.

## **Purpose**

The purpose of this project is to assess how successful the bike-sharing program was for the City of College Station and Texas A&M University by examining specific metrics that will highlight how beneficial the program has been for the community in terms of convenience, and the minimization of walking or using a vehicle as a means of transportation.

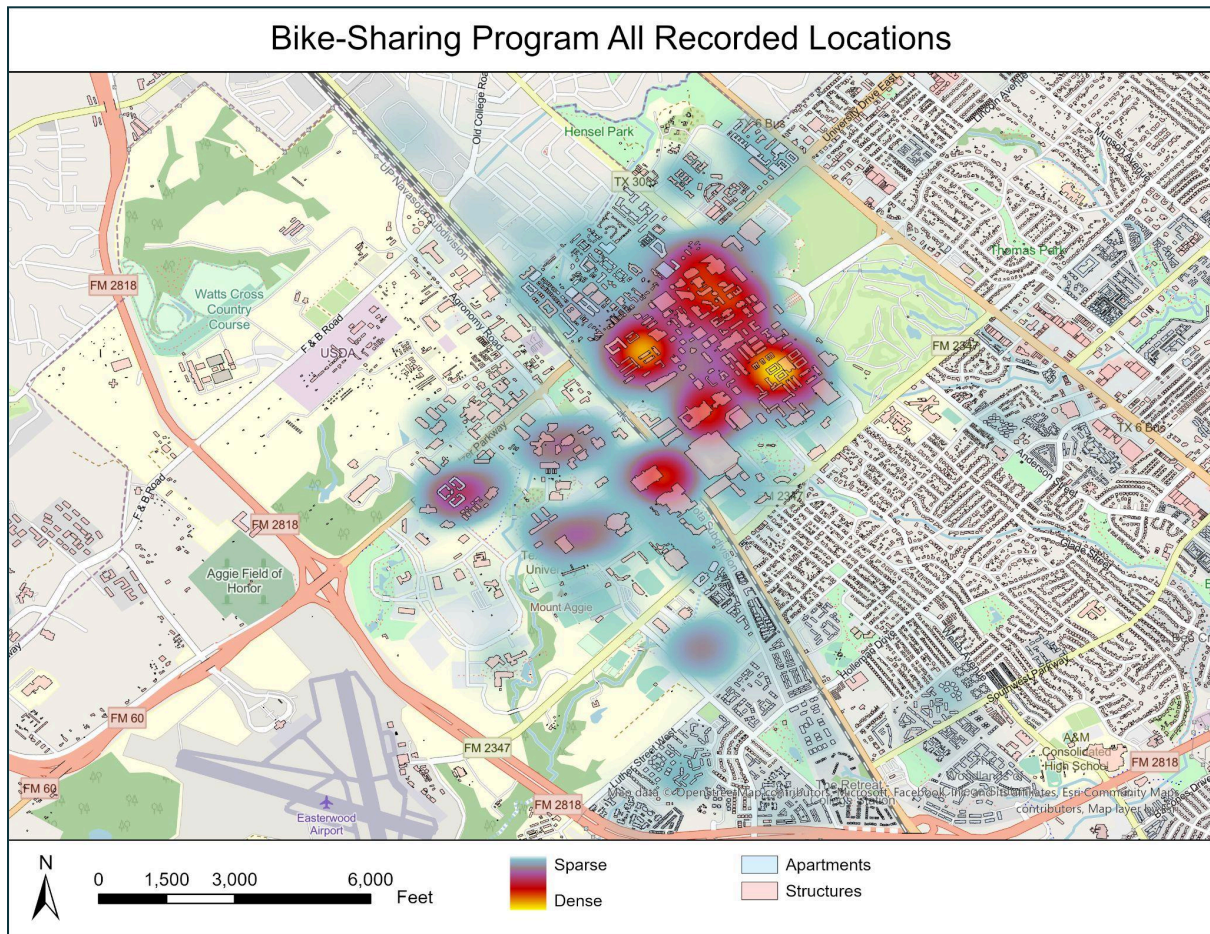
## **Methodology**

The following steps were taken to ensure accurate, informative data was collected, transformed, and presented in a way that supports the purpose outlined in this project.

1. Data Download and Preparation
2. Database Creation in Microsoft SQL Server Management Studio
3. Data Import into SQL Database and subsequent manipulation via various sql queries
4. Data Output to .txt files and Format Conversion to excel spreadsheets (.xlsx) to allow for data manipulation
5. Scripting (Python) to convert epoch (unix) time attributes into a readable format and to calculate new fields
6. Adding Database Connections in ArcGIS Pro
7. Utilizing geoprocessing tools to manipulate data and output maps (Figures 1, 2, and 3)
8. PowerBI was used to visualize the data with various charts (Figure 4)

## Results

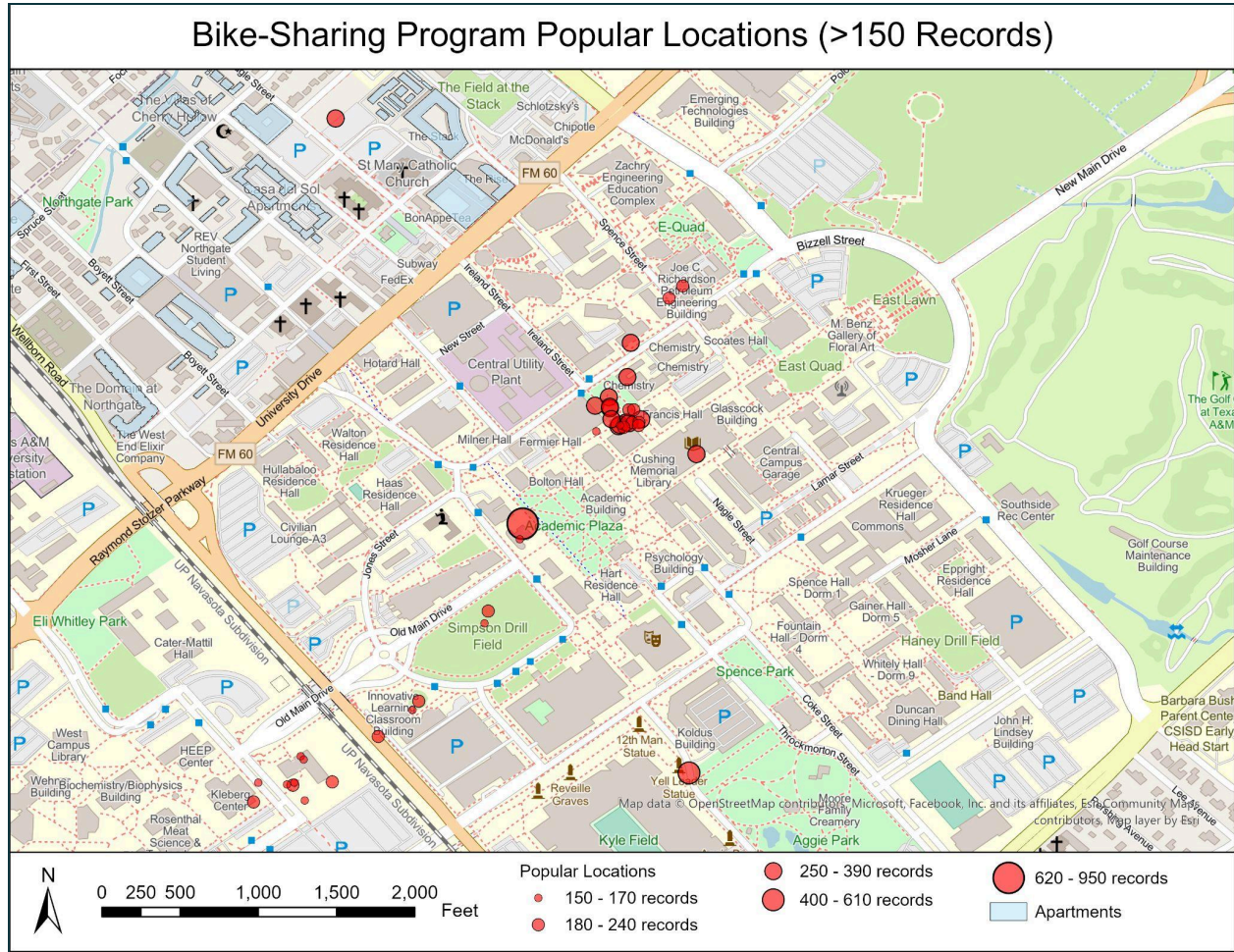
Figure 1 illustrates the density of all unique recorded locations being captured on Texas A&M University premises. The map shows that recorded locations are sparser the further away from the university, and is densely clustered across campus specifically between Wellborn Road and Bizzell Street.



**Figure 1: Heat Map of All Recorded Locations**

Figure 2 illustrates all locations that had more than 150 records, representing the locations that had the most activity for the bike-share program. Locations were primarily on the main section of campus, but there was also high activity near West Campus, Kyle Field and near Northgate.

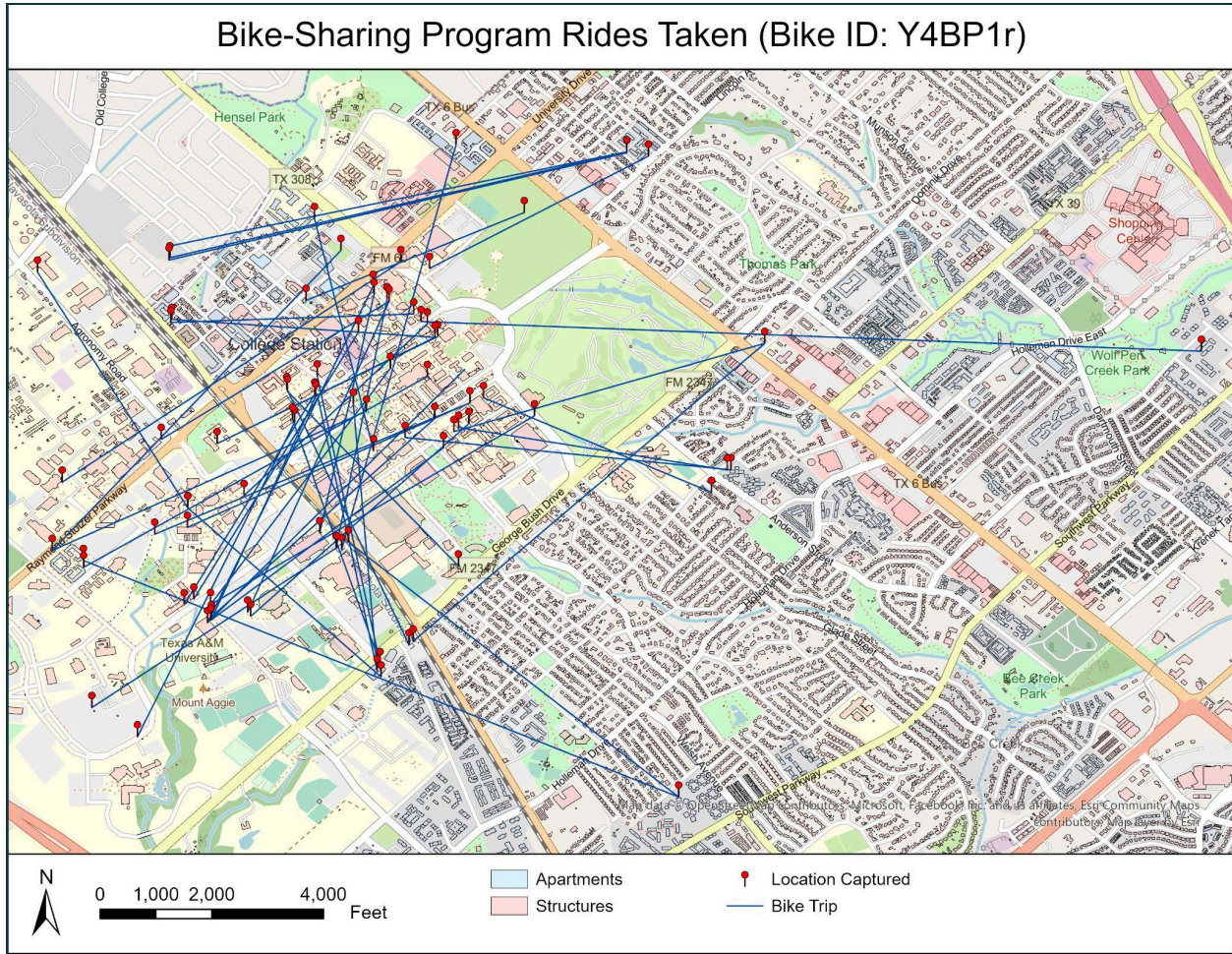




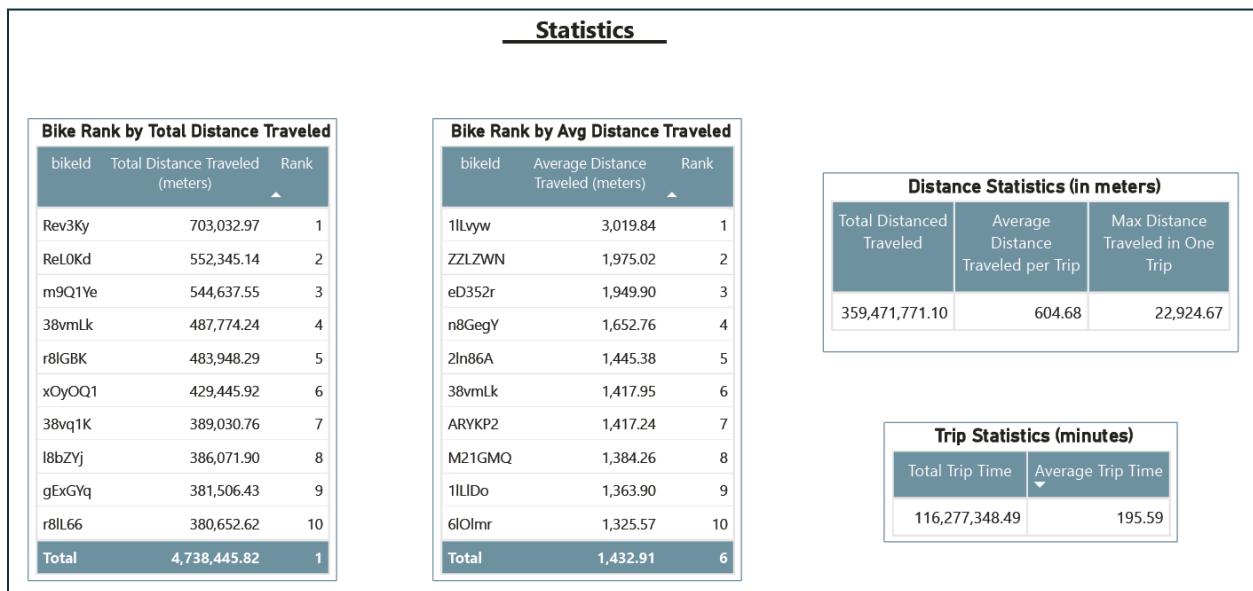
**Figure 2:** Map of Bike Locations with Over 150 Records

Figure 3 illustrates the top 50 trips with the farthest distance traveled for Bike Id: Y4BP1r. This specific bike was selected since it was the bike with the most activity out of all the bikes in the bike-sharing program. Even though bike Y4BP1r had 523 records, we only focused on the 50 longest trips to show how some bike riders were fully taking advantage of the program by using the bike for long trips to avoid walking, using a vehicle or taking the bus. We decided to only illustrate the movement of one bike to better highlight the movement in a more concise manner without overcrowding the map.





**Figure 3:** Map of the 50 Longest Rides Taken on Bike ID Y4BP1r



**Figure 4:** From Left to Right - Rank by Total Distance Traveled, Bike Rank by Average Distance Traveled, Distance Statistics (in meters), Trip Statistics (minutes)

The four charts in Figure 4 illustrate the massive degree to which these bikes were utilized by the students at TAMU. A total distance traveled of 359,471,771.1 meters was covered by these bikes. This translates to roughly 223,365 miles. To put this number into perspective, the distance to the moon is 238,000 miles. The total time spent using the bikes was also extremely high at 116,277,348.49 minutes. This is roughly equivalent to 1,937,956 hours, 80,748 days, or 481 weeks of riding time.

The two ranking charts in Figure 4 showcase just how much use some bikes receive. For example, bikeID “38vmLk” is ranked fourth for total distance traveled at over 487,000 meters and sixth for average distance traveled at 1,418 meters per trip. This lends to the idea that students are utilizing this service consistently and not only for short distances.

## **Conclusions**

In conclusion, we were able to successfully assess the overall success and benefits of the bike-sharing program to TAMU students and the community. As noted in the results, there were a noteworthy 223,365 miles traveled and a total of 481 weeks worth of riding time all of which were accrued over the span of only eight months. These stats clearly demonstrate how beneficial the bikes were for the community and should therefore be deemed a success.

## **References/Sources**

Shapefiles were sourced from [City of College Station Open Data](#). These shapefiles included: TAMU Owned Property, Apartments, Streets, Structures, and Zoning.

The original data, “was “liberated” from the Ofo service, and are not the official data of the Ofo service.”. This data included the following attributes: id, bikeId, lat, lon, added, scrapeGuid, and lastSeenAtPos.