Assumptions:

Bus can hold 50 scooters at once.

Scooters only charge at designated parking location.

Coordinates are by 1 mile.

Logically, it charges 1 level for every hour. I used this to find how many hours would be needed to charge all the scooters.

General Solution:

The fastest way to charge things up would be to grab bikes in group based on charge. So charge all those at 0, then all those at 1, etc. This could take as much of a third off of wait time of stopping back at the stopping point to charge. In this sense, a scooter already charged up to 4 won’t have to wait for a scooter at 1 for 3 extra hours. The distribution is pretty evenly spread, with the average scooter being at half charge.

Total time to charge all the scooters (not including back and forth drive time) would be 64,266 hours. Obviously, the best way to do this would be have multiple buses. It could be even more efficient to assign buses to pick up scooters at certain power levels and certain areas.

The areas where scooters appear are grouped together in 19 areas. None of them are very far from each other.

R Code:

> scooters=read.csv("2019-XTern-DataScience-SampeAssessment.csv", header=T)

> attach(scooters)

> names(scooters)

[1] "scooter\_id" "xcoordinate" "ycoordinate" "power\_level"

> plot(xcoordinate, ycoordinate, main="Location of Scooters")

> #labelled Location\_of\_Scooters.pdf

> sum(power\_level)

[1] 64069

> 25667\*5

[1] 128335

> 128335-64069

[1] 64266

> #hours to charge all of them

> mean(power\_level)

[1] 2.496065