

An Analysis of the Ridership of Special Passengers of RTS Bus in Gainesville

Da Kuang

dakuang@ufl.edu

Department of Civil and Coastal Engineering, University of Florida



Introduction

- In Gainesville, Gainesville Regional Transit System (RTS) operates dozens of bus lines. By analyzing the ridership data from RTS, we are able to visualize more information about each site on a spatial and temporal scale, which maybe can help RTS improve the service to bring a better experience for passengers.
- This project aims to an analysis of ridership of special passengers who get on the bus with a bike or wheelchair. Once we know the distribution of these passengers, we can know where the bus facilities or bus stop facilities would better to be improved.

Methods

- Using some functions like “arrange”, “filter” and “melt” from R packages like “dplyr” or “tidyverse” to adjust the datasets to compute the data more conveniently. After getting the final datasets we want, using some functions “ggplot” from R packages “ggplot2” to visualization.

Data Description

| 1 | Route | day mo yr | TRIP | WC_ON | WC_OFF | ON_STOP | OFF_STOP | OFF_STOP | ON_STOP | TRIPTIME |
|----|-------|-----------|------|------------|------------|---------|-----------|----------|---------|----------|
| 2 | 12 | 19-Aug-19 | 646 | 6:17:17 AM | 6:54:43 AM | GARAGE | NORTHBO | 645 | 9998 | 37.4 |
| 3 | 12 | 19-Aug-19 | 710 | 6:54:00 AM | 7:11:51 AM | NORTHBO | SOUTHBO | 473 | 645 | 17.9 |
| 4 | 20 | 19-Aug-19 | 718 | 6:21:10 AM | 7:14:10 AM | GARAGE | SOUTHBO | 473 | 9998 | 52.9 |
| 5 | 8 | 19-Aug-19 | 647 | 6:49:41 AM | 7:21:22 AM | NORTHBO | NORTH 13 | 440 | 1455 | 31.6 |
| 6 | 20 | 19-Aug-19 | 718 | 7:12:09 AM | 7:27:50 AM | SOUTHBO | WESTBOU | 815 | 473 | 15.7 |
| 7 | 35 | 19-Aug-19 | 715 | 6:37:09 AM | 7:35:46 AM | GARAGE | SOUTHBO | 950 | 9998 | 58.6 |
| 8 | 35 | 19-Aug-19 | 710 | 6:44:38 AM | 7:37:03 AM | GARAGE | NORTHBO | 41 | 9998 | 52.5 |
| 9 | 13 | 19-Aug-19 | 740 | 6:56:10 AM | 7:51:19 AM | GARAGE | CVS SW 15 | 1373 | 9998 | 55.2 |
| 10 | 20 | 19-Aug-19 | 724 | 7:36:20 AM | 7:55:38 AM | EASTBOU | NORTHBO | 472 | 838 | 19.2 |

Table. 1. RTS wheelchair report on weekday from the fall 2019 in Gainesville

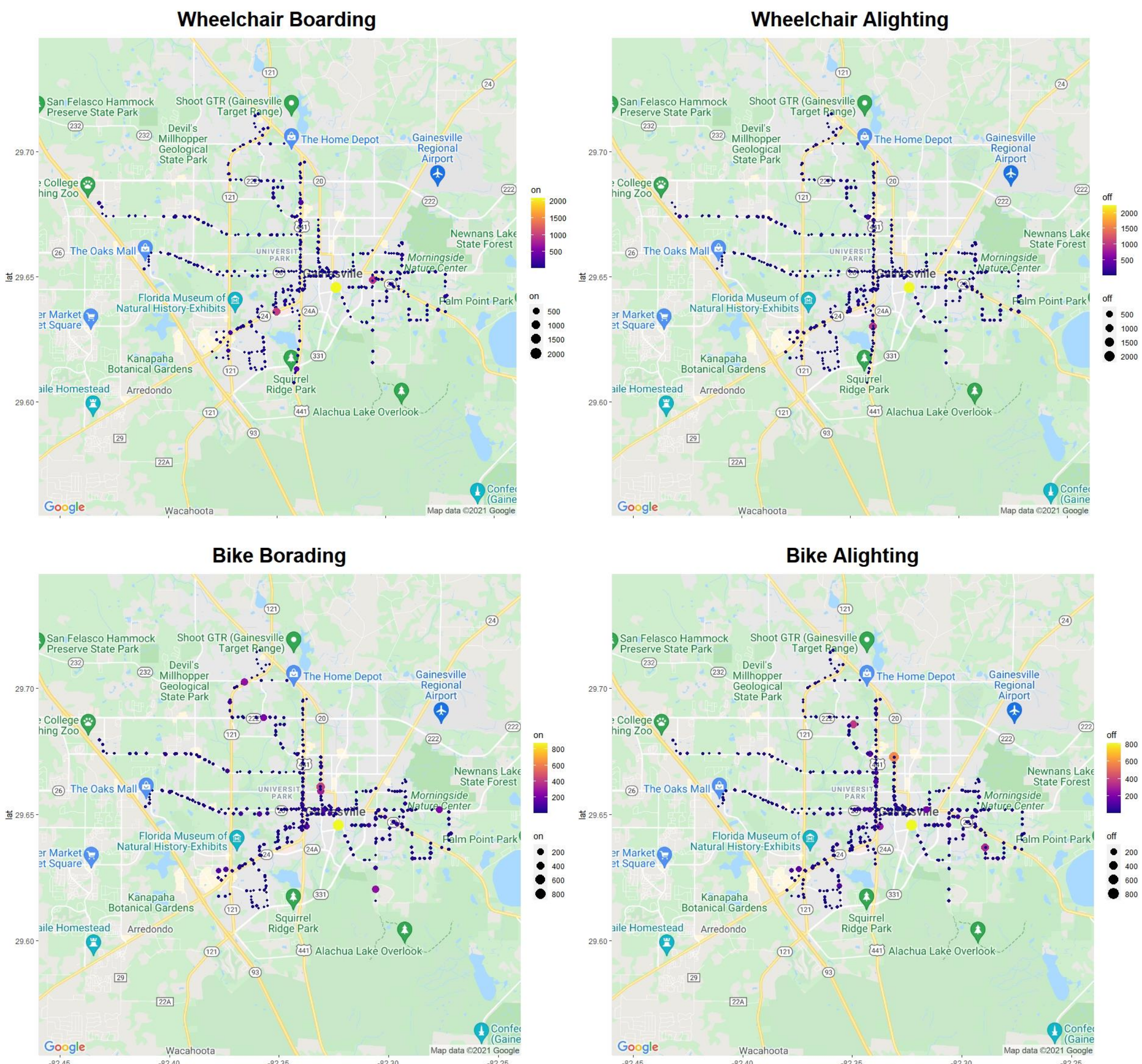
| 1 | Route | day mo yr | TRIP | BIKE_ON | BIKE_OFF | ON_STOP | ON_STOP | OFF_STOP | OFF_STOP | TRIPTIME |
|----|-------|-----------|------|-------------|-------------|---------|---------|----------|----------|----------|
| 2 | 5 | 19-Aug-19 | 700 | 6:23:20 AM | 6:57:01 AM | 171 | SOUTHBO | 1 | NORTHBO | 33.7 |
| 3 | 5 | 19-Aug-19 | 1724 | 4:53:54 PM | 5:26:18 PM | 173 | SOUTHBO | 1 | NORTHBO | 32.3 |
| 4 | 5 | 19-Aug-19 | 800 | 7:32:44 AM | 8:02:33 AM | 175 | NORTHBO | 1 | NORTHBO | 29.8 |
| 5 | 5 | 19-Aug-19 | 2130 | 9:13:24 PM | 9:23:37 PM | 197 | EASTBOU | 1 | NORTHBO | 10.3 |
| 6 | 5 | 19-Aug-19 | 1900 | 6:43:47 PM | 6:53:08 PM | 201 | EASTBOU | 1 | NORTHBO | 9.3 |
| 7 | 15 | 19-Aug-19 | 1130 | 10:40:39 AM | 11:26:53 AM | 703 | NORTHBO | 1 | NORTHBO | 46.2 |
| 8 | 0 | 19-Aug-19 | 1819 | 5:35:40 PM | 6:10:31 PM | 723 | WESTBOU | 1 | NORTHBO | 34.8 |
| 9 | 15 | 19-Aug-19 | 1030 | 9:59:20 AM | 10:26:24 AM | 742 | EASTBOU | 1 | NORTHBO | 27.1 |
| 10 | 15 | 19-Aug-19 | 930 | 9:07:03 AM | 9:27:48 AM | 743 | EASTBOU | 1 | NORTHBO | 20.7 |

Table. 2. RTS bike report on weekday from the fall 2019 in Gainesville

- These 2 datasets were got from RTS.
- Each dataset has 10 columns, which show the information about route id, date, trip id, stops, etc.
- Each dataset contains moreover 10,000 records for ridership of the whole 2019 fall.

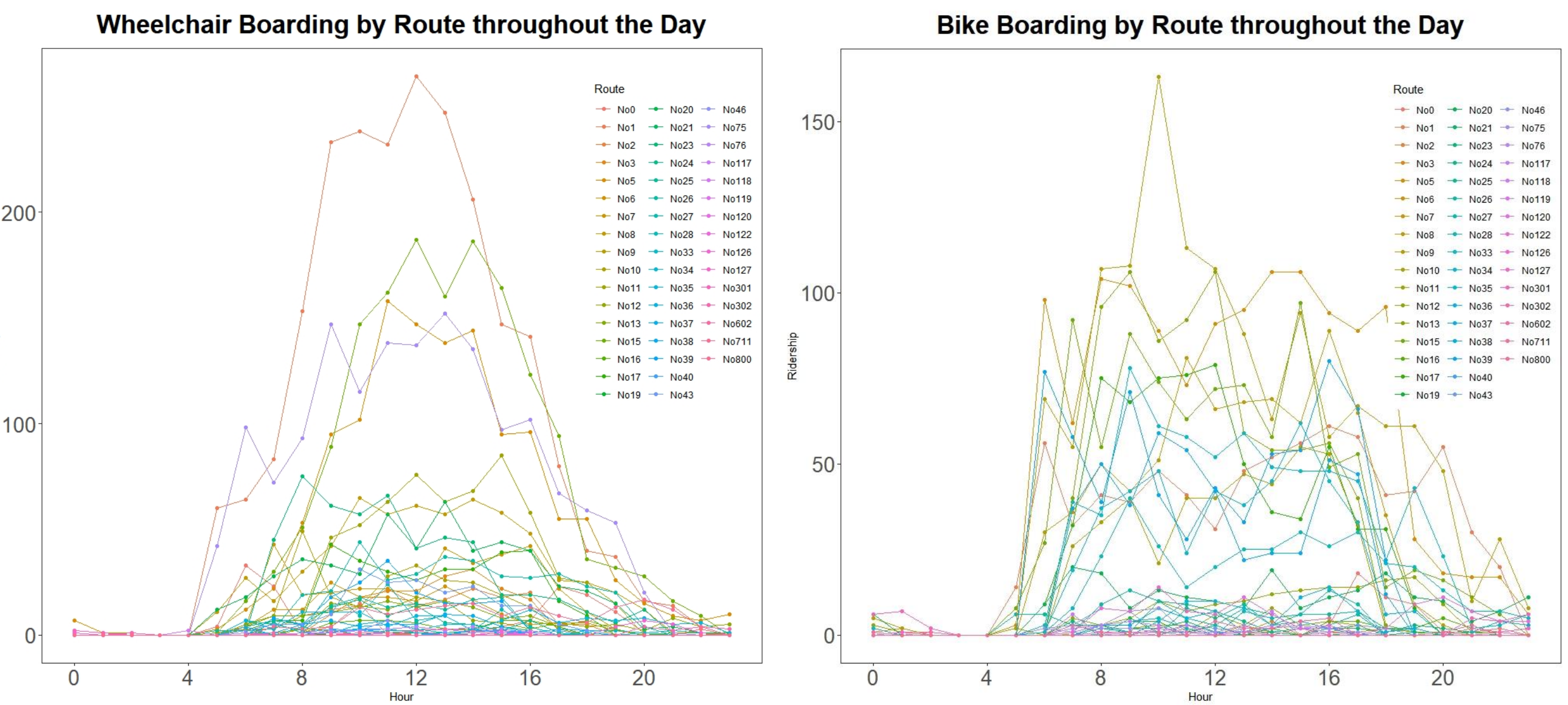
Questions and Results

1. What are the total amount of ridership at each bus stops?



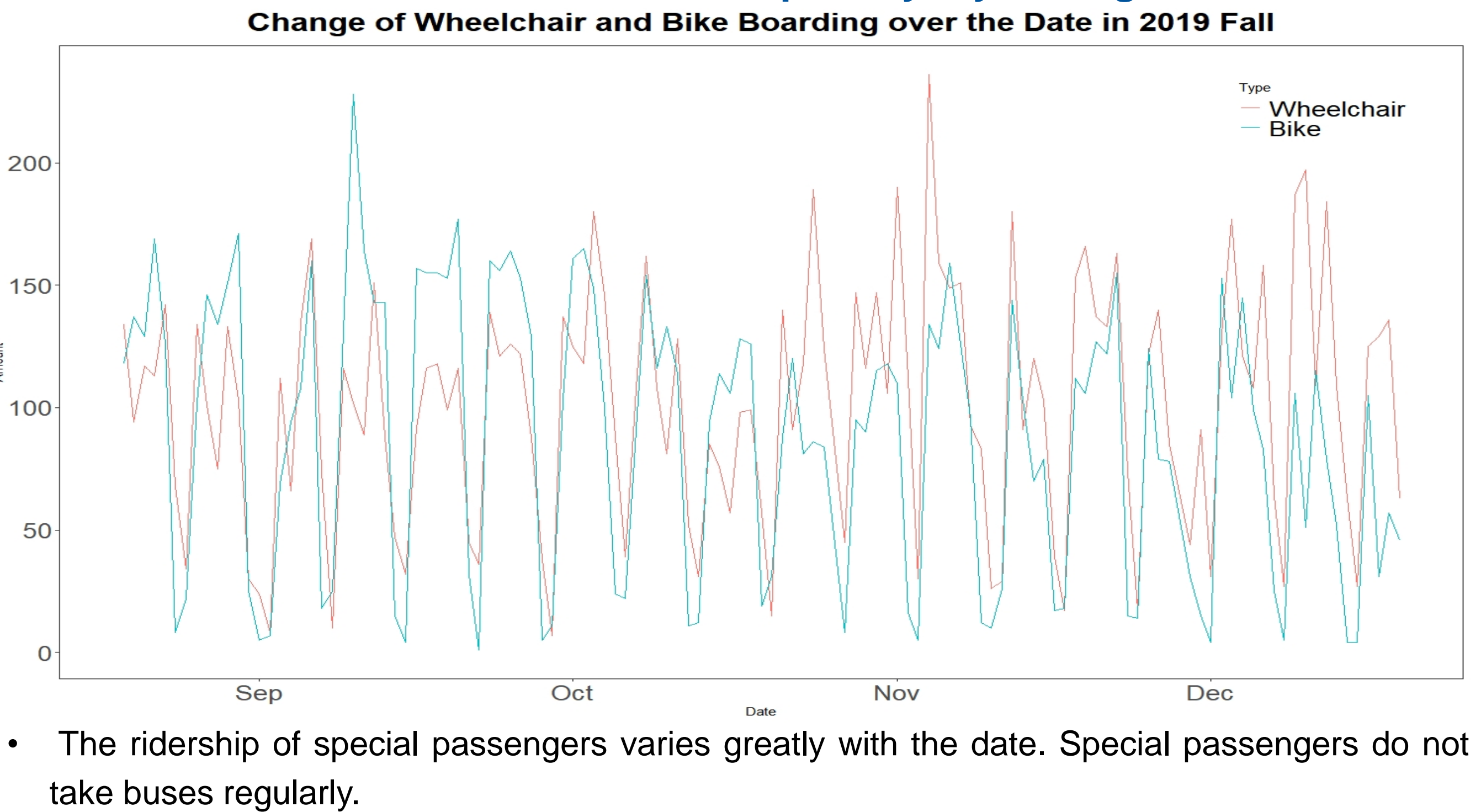
- For wheelchair, there is the most boarding and alighting in Rosa Parks RTS Downtown Station. And in these stops like Shands Hospital @ Parking Garage 9, Northbound SE 15th Street @ SE 3rd Avenue, and Lakeshore Towers Apartments, there is also a huge of boarding or alighting.
- For bike, there is the most boarding and alighting in Rosa Parks RTS Downtown Station. And in these stops like Big Ron's Yoga, Gainesville Police Department, NW 6th St NW 23rd Ave, Altrusa House of Gainesville, and Southbound SE 27th Street @ SE 15th Avenue, there is also a huge of boarding or alighting.
- Therefore, we would better to improve the facilities at such stops to provide a better experience for those special passengers.

2. What are the total amount of ridership for each bus lines over the day?



- Passengers with a wheelchair like taking buses at 9 am – 2 pm, and passengers with a bike like taking buses at 10 am.
- Passengers with a wheelchair mainly take the bus line1, line15, line5, and line75.
- Passengers with a bike mainly take the bus line9, line5, line13, line8, line39, line17, line33 and line34.

3. What are the total amount of ridership everyday throughout the 2019 fall?



- The ridership of special passengers varies greatly with the date. Special passengers do not take buses regularly.