

WTWY Gala NYC Subway Outreach Team Arrangement

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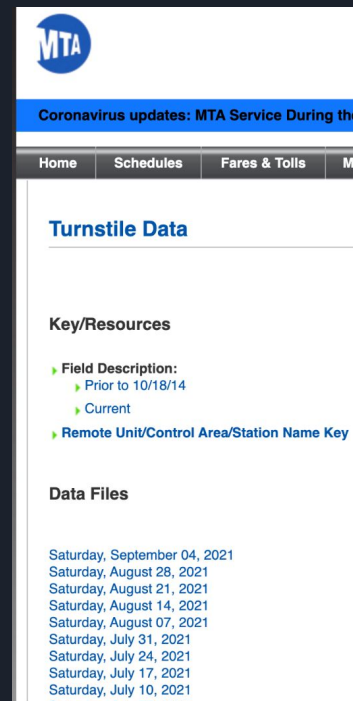
Introduction

- Motivation
 - WomenTechWomenYes (WTWY) would like to place street teams at entrances to subway stations to promote their gala at the beginning of the summer
- Objective
 - Identify the busiest subway control areas and time periods among MTA stations in New York City with the highest entries and exits between March and May in 2021
- Goal
 - Make a suggestion of the arrangement for WTWY outreach team



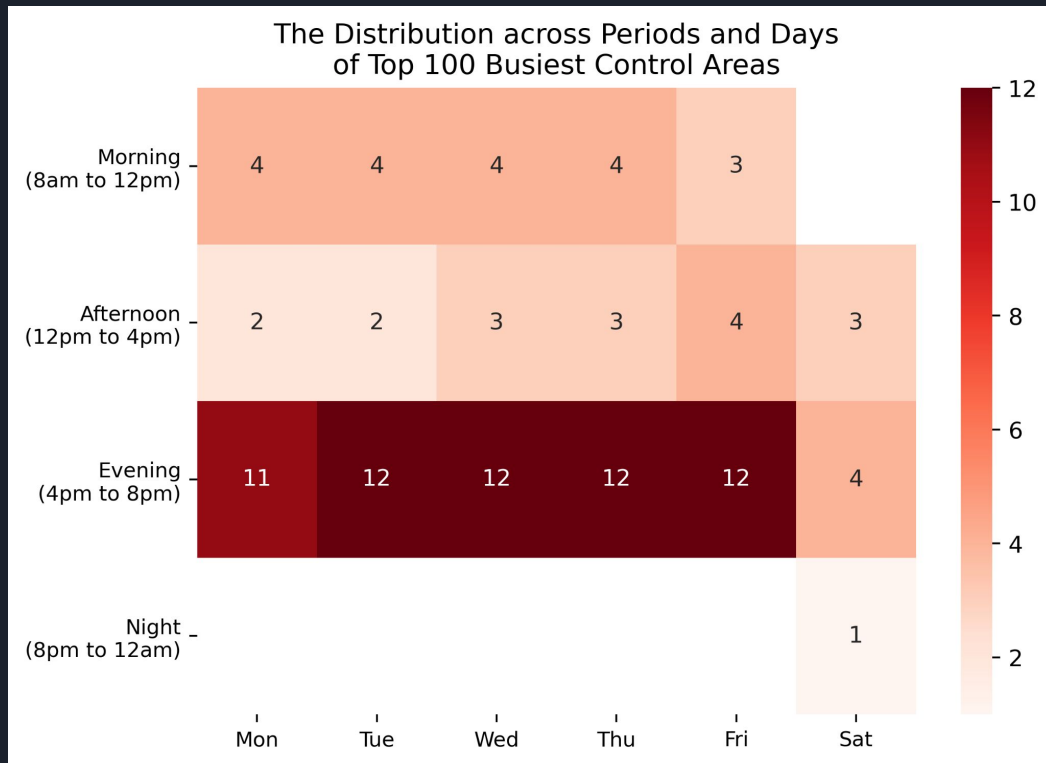
Methodology

- Data
 - MTA turnstile data between March and May in 2021
 - 2,747,757 rows with 9 columns
- Metrics
 - Sum of the entries and exits during 4-hour time period
- Tools
 - Python Pandas
 - Ingesting the raw data from MTA turnstile data into csv file
 - SQLite3:
 - Creating database and table
 - Importing csv into table
 - Python SQLAlchemy
 - Querying from the database into Python
 - Python Pandas and Numpy
 - Exploratory data analysis
 - Python matplotlib and seaborn
 - Data visualization



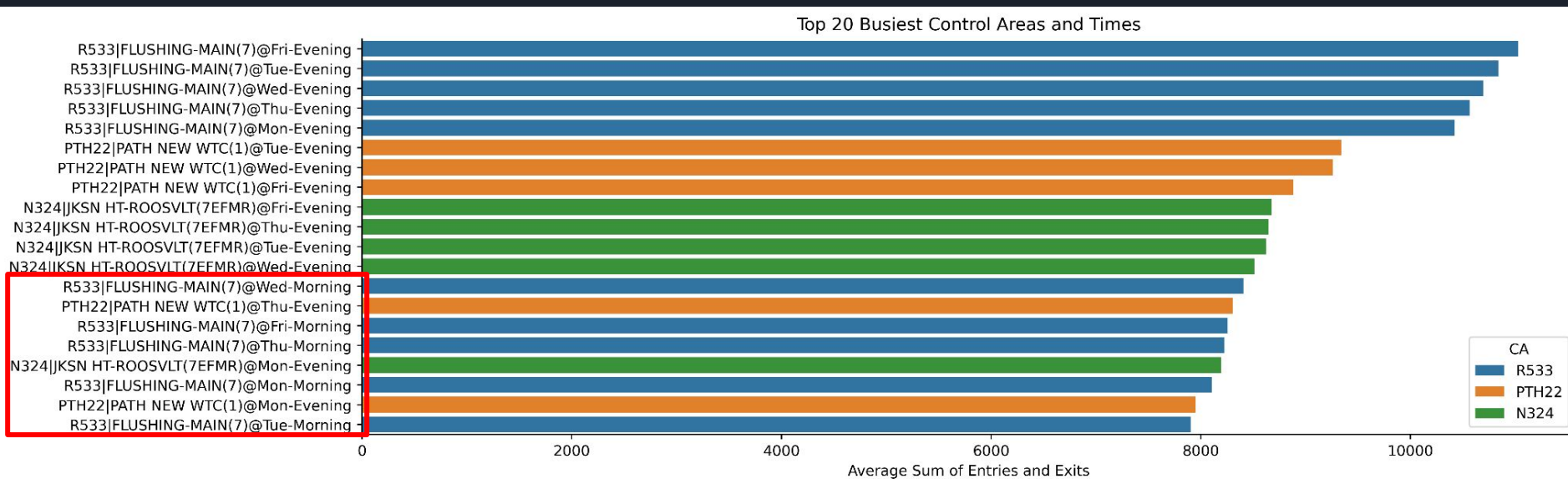
Highlight 1

- 750 Control Areas X 6 Time Periods X 7 days = 31,500 Choices
- Evening(4 pm to 8 pm) was the busiest time period
- The busiest stations in the morning and in the afternoon may still have more traffic than unbusy stations in rush hours



Highlight 2

- Top 20 Busiest Control Areas and Times were occupied by only three control area:
 - R533 at Flushing–Main Street Station
 - PTH 22 at New World Trade Center Station
 - N324 at Jackson Heights–Roosevelt Avenue/74th Street Station
- R533 at Flushing–Main Street Station was the buisest control area
 - The traffic at Flushing–Main Street Station in the morning was still higher than many other control areas in the busy evenings



Conclusion

- Plan to visit a busy control area at different time periods on one weekday and one weekend
- Use Python function to plan the schedule by inputting the outreach duration, the amount of teams, and the weekly outreach capacity per team

Week 1	Tue	Wed	Fri	Sat
Morning (8am-12pm)	PTH22@PATH NEW WTC(1) R238@GRD CNTRL-42 ST(4567S) R138@34 ST-PENN STA(123ACE)	R533@FLUSHING-MAIN(7)	N324@JKSN HT-ROOSVLT(7EFMR)	
Afternoon (12pm-4pm)			R533@FLUSHING-MAIN(7) N324@JKSN HT-ROOSVLT(7EFMR) R238@GRD CNTRL-42 ST(4567S)	
Evening (4pm-8pm)	PTH22@PATH NEW WTC(1) R529@103 ST-CORONA(7)	N063A@42 ST-PORT AUTH(1237ACENQRSW)	R533@FLUSHING-MAIN(7) N324@JKSN HT-ROOSVLT(7EFMR) N506@34 ST-HERALD SQ(BDFMNQRW)	
Night (8pm-12am)				R533@FLUSHING-MAIN(7)

example with 4 weeks of outreach, 3 teams, and 5 weekly outreaches per team



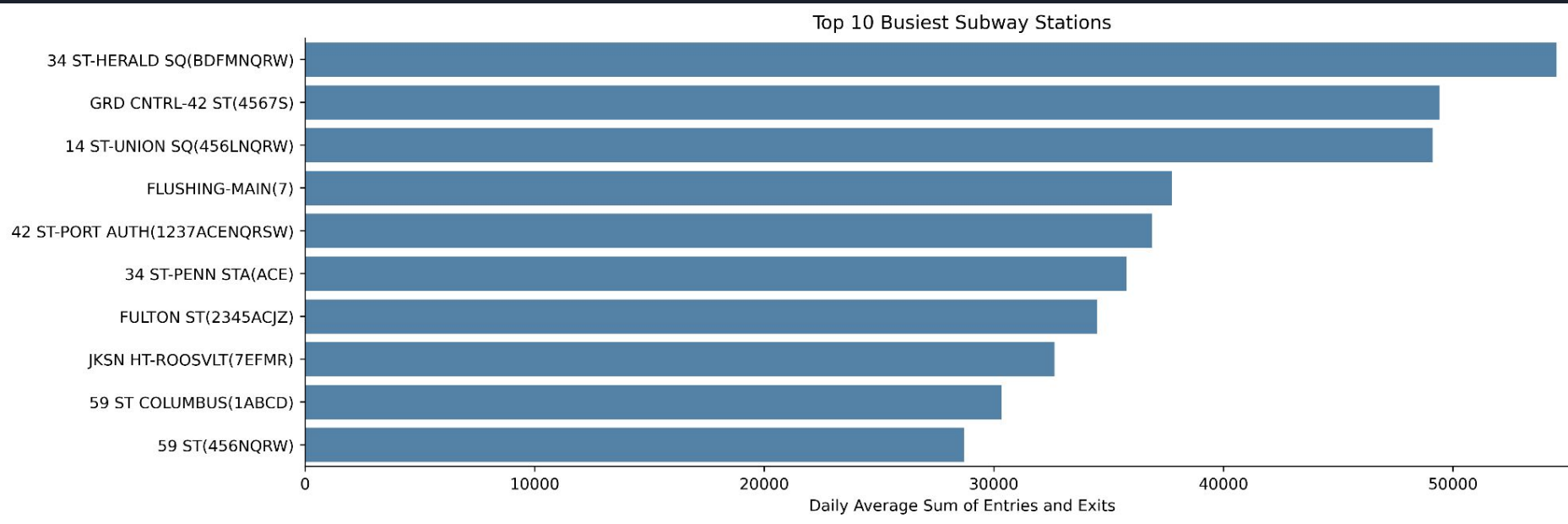
Future Work

- Find the information of the locations of each control area in the station
- Match the event calendars like sport games
- Plot by geographic data and plan the most efficient route

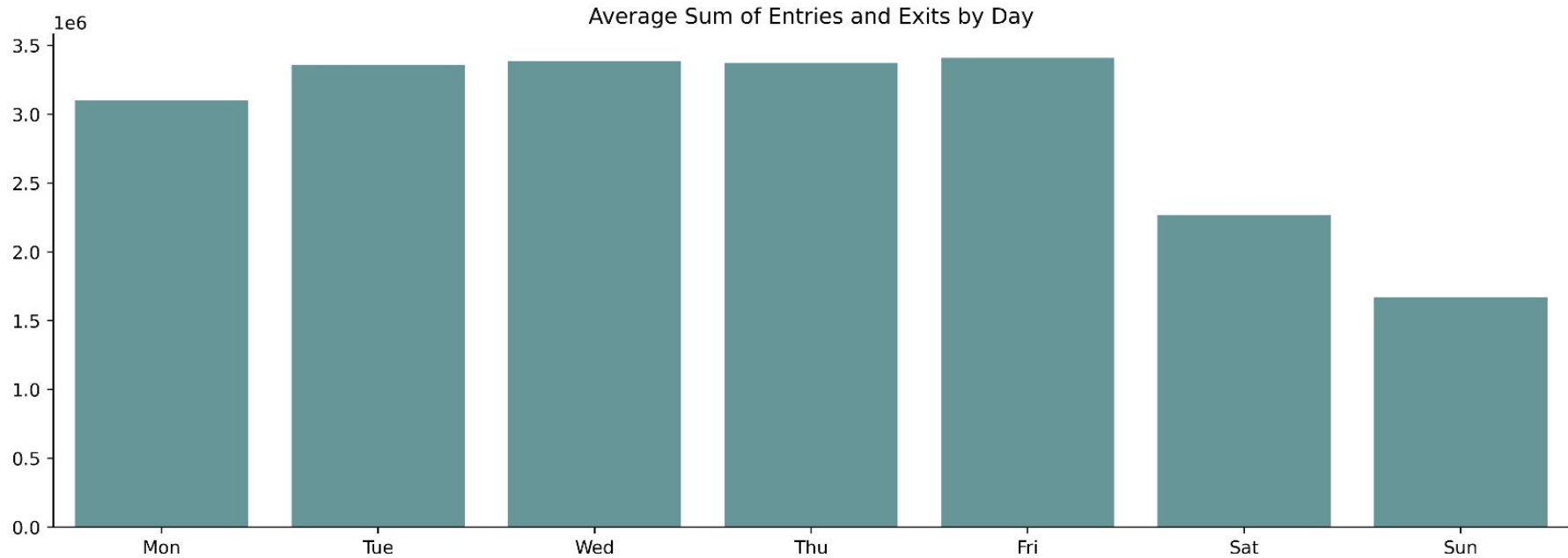


Thank you!

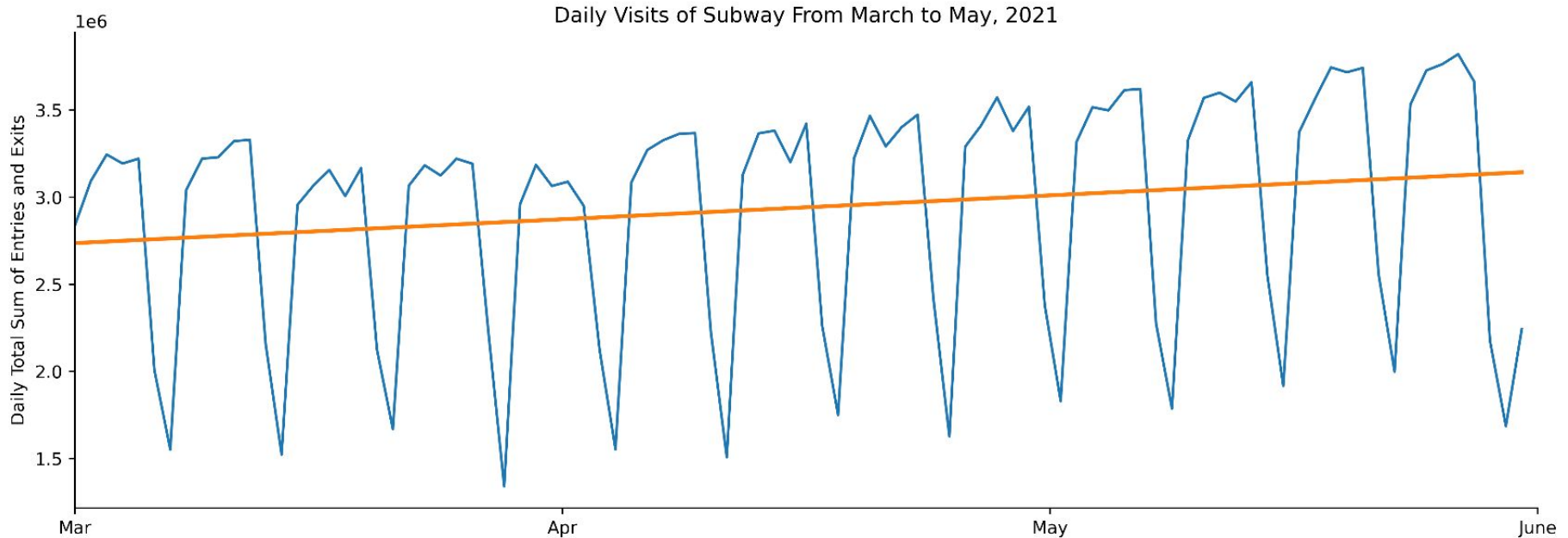
Appendix - Top 10 Busiest Subway Stations



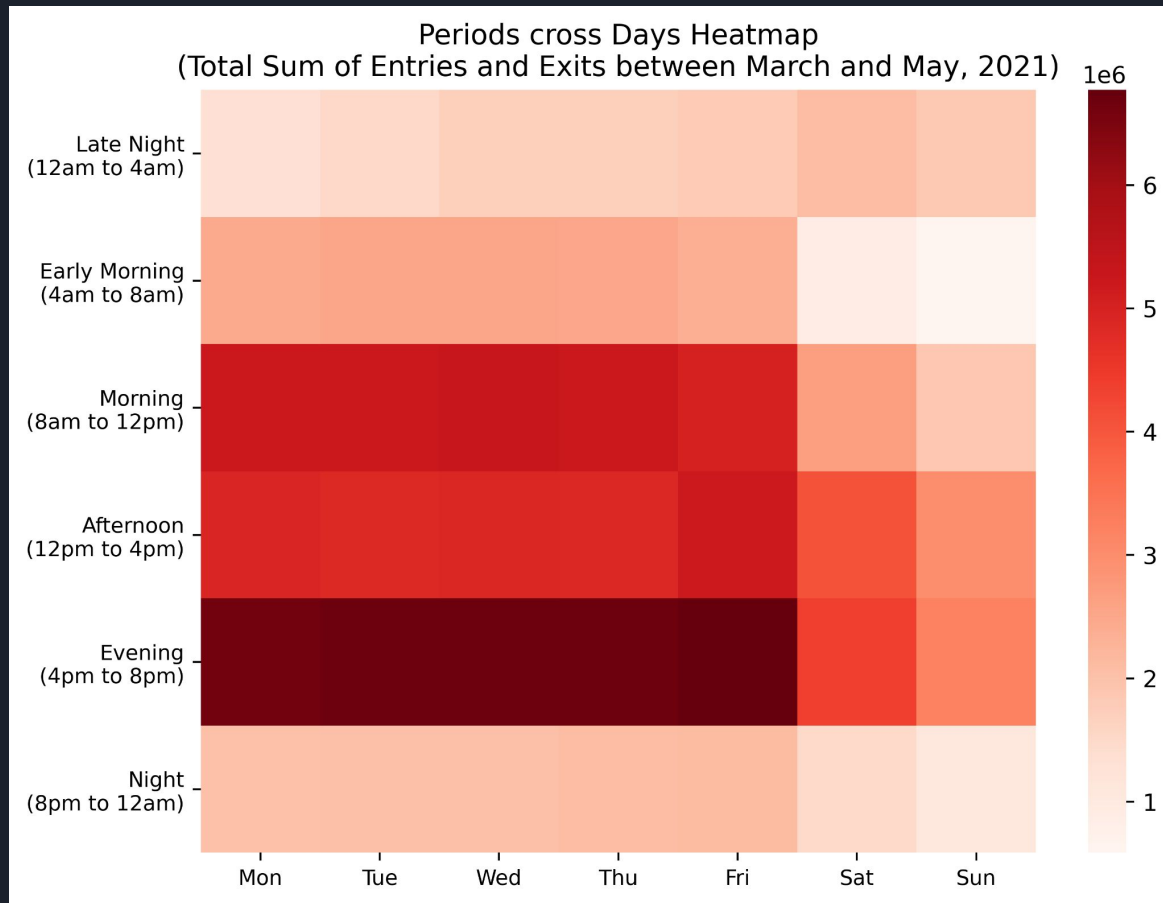
Appendix - Average Visits by Day



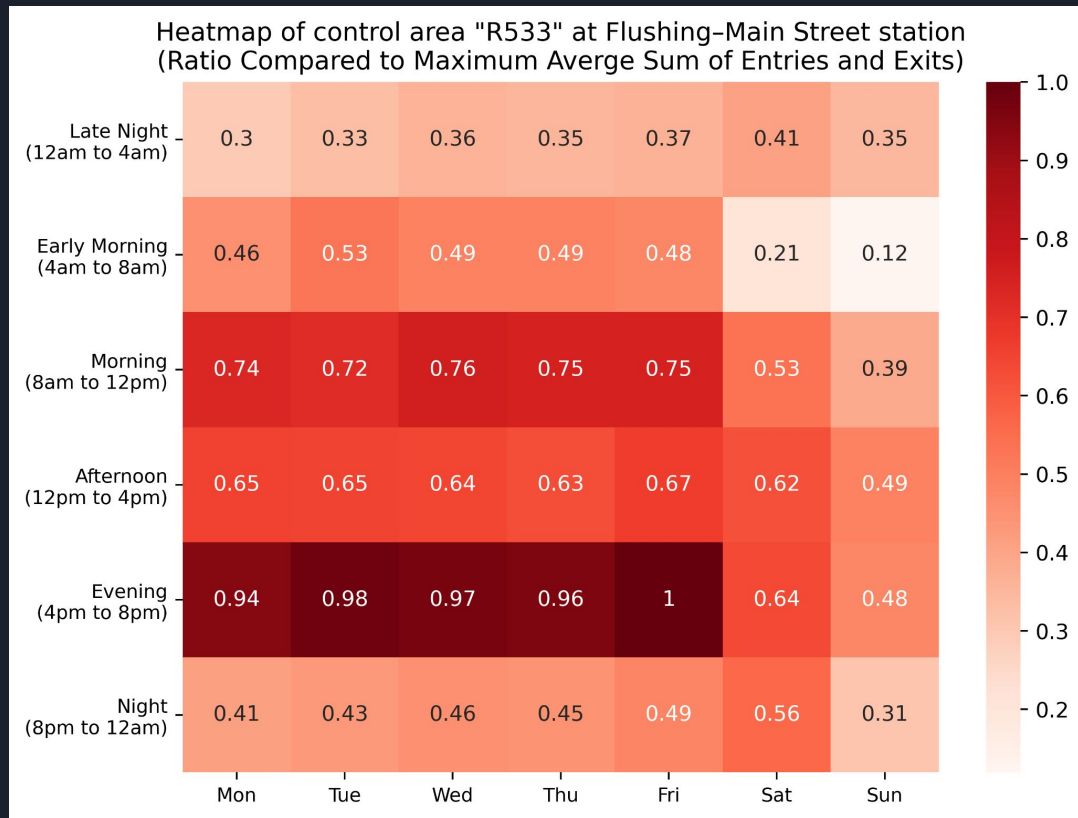
Appendix - Daily Visits of Subway From March to May, 2021



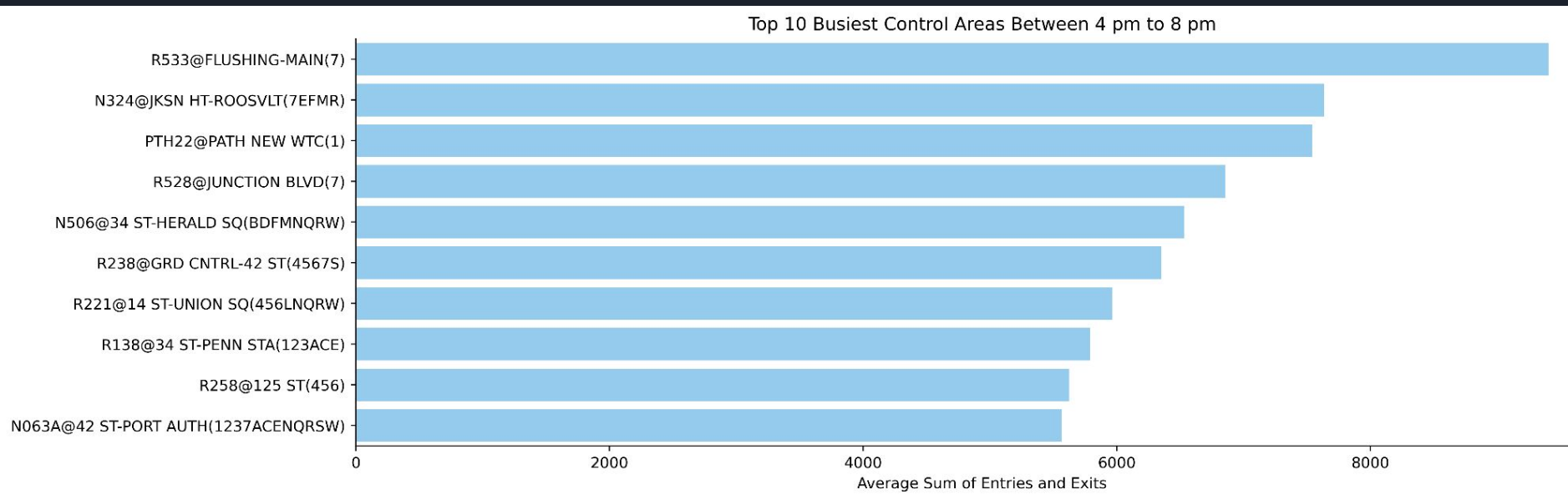
Appendix - Periods cross Days Heatmap



Appendix - Control Area "R533 " at Flushing-Main Street Station Heatmap



Appendix - Hot Control Areas in the Evening



Appendix - 1st&2nd week schedule

(Estimated by 4 weeks outreach duration, 3 teams, and 5 outreaches per team and per week)

Week 1	Tue	Wed	Fri	Sat
Morning (8am-12pm)	PTH22@PATH NEW WTC(1) R238@GRD CNTRL-42 ST(4567S) R138@34 ST-PENN STA(123ACE)	R533@FLUSHING-MAIN(7)	N324@JKSN HT-ROOSVLT(7EFMR)	
Afternoon (12pm-4pm)			R533@FLUSHING-MAIN(7) N324@JKSN HT-ROOSVLT(7EFMR) R238@GRD CNTRL-42 ST(4567S)	
Evening (4pm-8pm)	PTH22@PATH NEW WTC(1) R529@103 ST-CORONA(7)	N063A@42 ST-PORT AUTH(1237ACENQRSW)	R533@FLUSHING-MAIN(7) N324@JKSN HT-ROOSVLT(7EFMR) N506@34 ST-HERALD SQ(BDFMNQRW)	
Night (8pm-12am)				R533@FLUSHING-MAIN(7)

Week 2	Tue	Thu	Fri	Sat	Sun
Early Morning (4am-8am)	R533@FLUSHING-MAIN(7)				
Morning (8am-12pm)	R258@125 ST(456)	R249@86 ST(456)			
Afternoon (12pm-4pm)			N506@34 ST-HERALD SQ(BDFMNQRW)		R533@FLUSHING-MAIN(7)
Evening (4pm-8pm)	N606@JAMAICA CENTER(EJZ)	N026@125 ST(ABCD)	R238@GRD CNTRL-42 ST(4567S) R528@JUNCTION BLVD(7) R221@14 ST-UNION SQ(456LNQRW)	A034@14 ST-UNION SQ(456LNQRW)	R533@FLUSHING-MAIN(7)
Night (8pm-12am)			R221@14 ST-UNION SQ(456LNQRW) N083@W 4 ST-WASH SQ(ABCDEFM)		

Appendix - 3rd&4th week schedule

(Estimated by 4 weeks outreach duration, 3 teams, and 5 outreaches per team and per week)

Week 3	Tue	Wed	Thu	Fri	Sat
Morning (8am-12pm)			N501@47-50 STS ROCK(BDFM)		
Afternoon (12pm-4pm)				N026@125 ST(ABCD) PTH22@PATH NEW WTC(1) R249@86 ST(456)	R528@JUNCTION BLVD(7)
Evening (4pm-8pm)	R169@96 ST(123)	N051@59 ST COLUMBUS(1ABCD)	R250@86 ST(456) PTH03@JOURNAL SQUARE(1) R249@86 ST(456)	R138@34 ST-PENN STA(123ACE) R258@125 ST(456) R526@82 ST-JACKSON H(7)	N083@W 4 ST-WASH SQ(ABCDEFM)
Night (8pm-12am)	R258@125 ST(456)				

Week 4	Mon	Wed	Thu	Fri	Sat	Sun
Early Morning (4am-8am)		R528@JUNCTION BLVD(7) N324@JKSN HT-ROOSVLT(7EFMR)				
Morning (8am-12pm)				R528@JUNCTION BLVD(7)		
Afternoon (12pm-4pm)	R526@82 ST-JACKSON H(7)		N520@GRAND ST(BD) R221@14 ST-UNION SQ(456LNQRW)	R258@125 ST(456)		N324@JKSN HT-ROOSVLT(7EFMR) N506@34 ST-HERALD SQ(BDFMNQRW)
Evening (4pm-8pm)		N501@47-50 STS ROCK(BDFM)	R246@68ST-HUNTER CO(6)	N605@SUTPHIN-ARCHER(EJZ) N520@GRAND ST(BD)	H009@BEDFORD AV(L)	
Late Night (12am-4am)						N324@JKSN HT-ROOSVLT(7EFMR)