WTWY Gala NYC Subway Outreach Team Arrangement

Chien Yuan Chang 9/17/2021

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

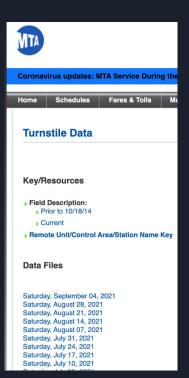
 Identify the busiest subway control areas and time periods among MTA stations in New York City with the highest entires and exits between March and May in 2021

• Go<u>al</u>

 Make a suggestion of the arrangement for WTWY outreach team

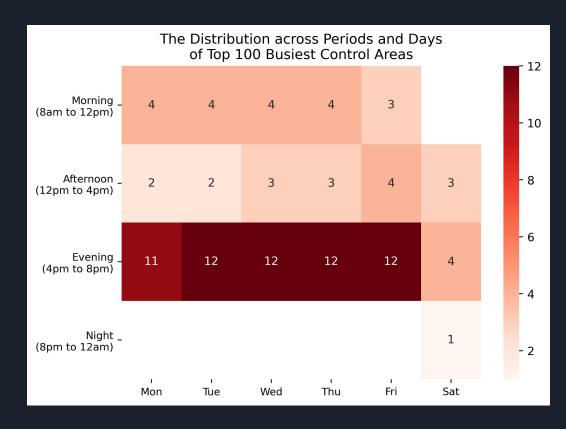
Methodology

- 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



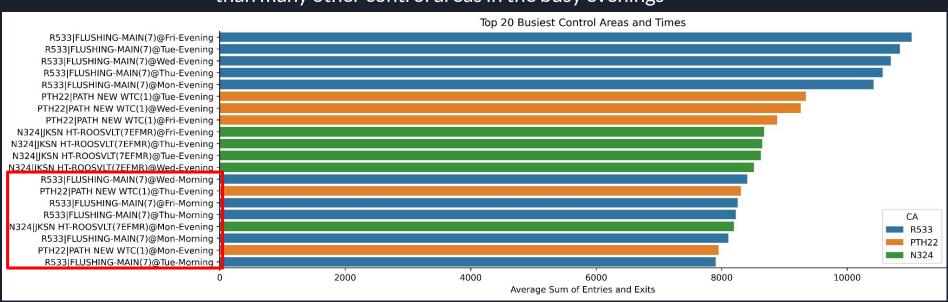
Highlight 1

- 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 buiest 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
	PTH22@PATH NEW WTC(1) R238@GRD CNTRL-42 ST(4567S) R138@34 ST-PENN STA(123ACE)		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)

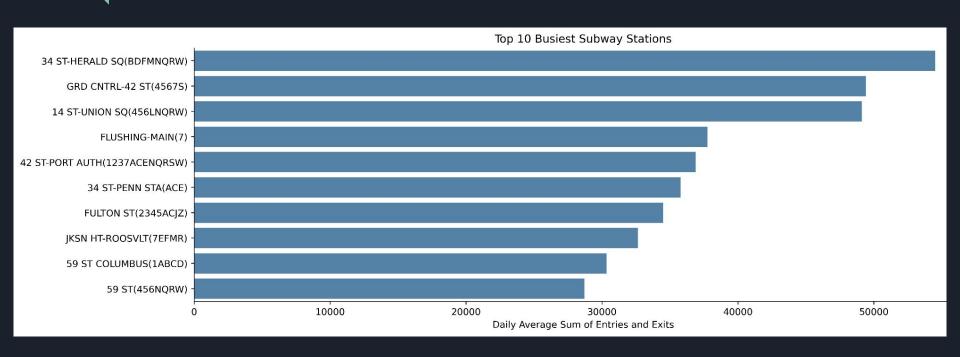
example with 4 weeks of outreach, 3 teams, and 5 weekly outreaches per team

Future Work

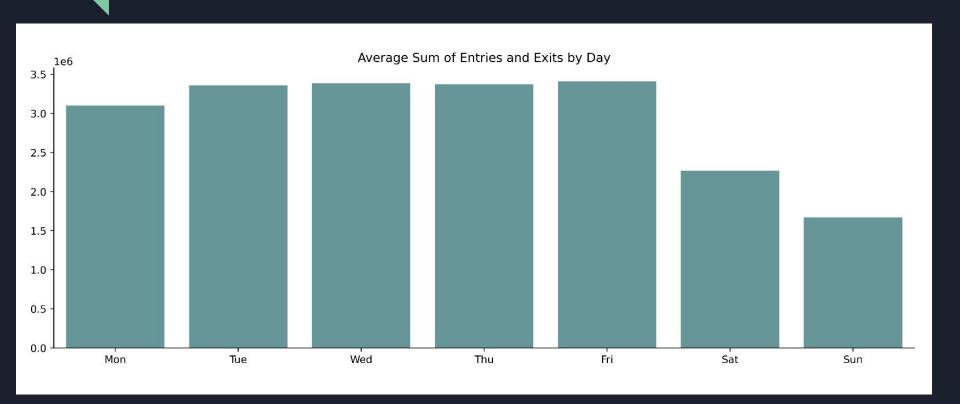
- Find the information of the locations of each control area in the station
- Match the event canlendars like sport games
- Plot by geographic data and plan the most efficient route



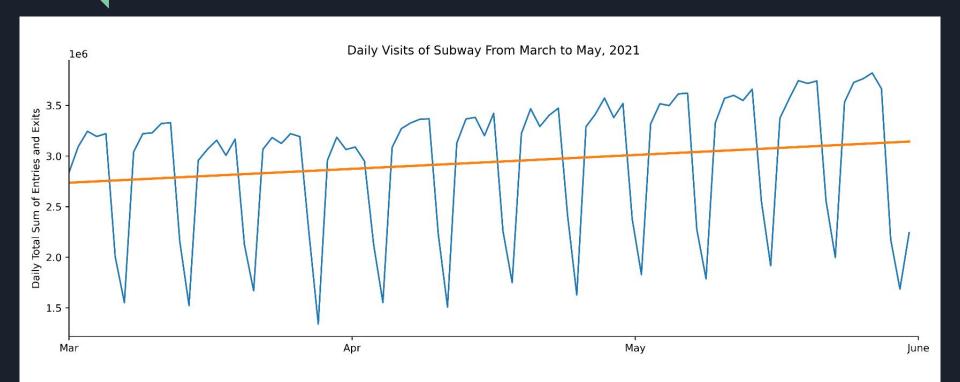
Appendix - Top 10 Busiest Subway Stations



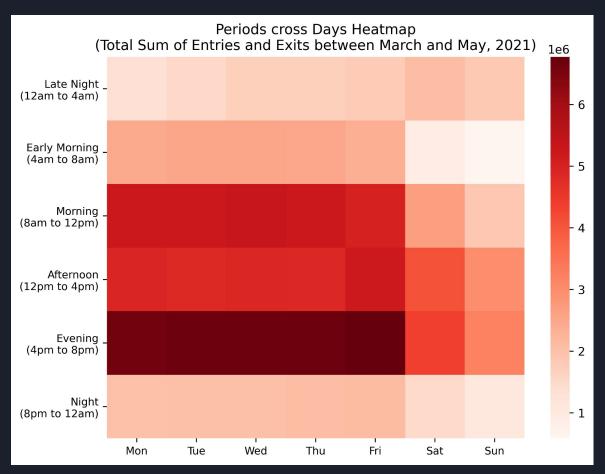
Appendix - Average Visits by Day



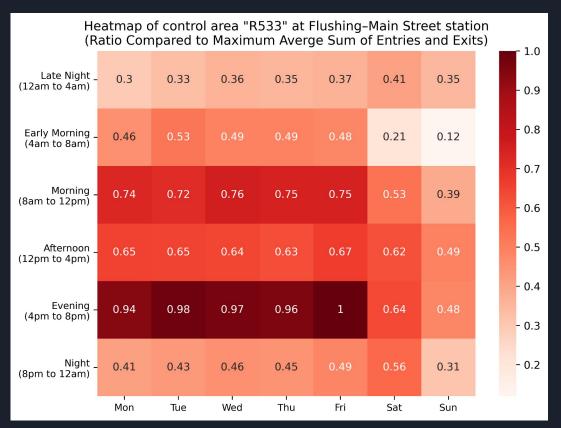
Appendix - Daily Visits of Subway From March to May, 2021



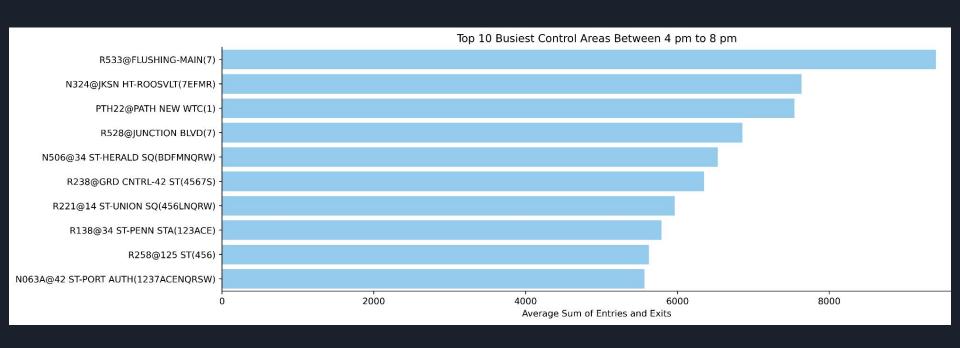
Appendix - Periods cross Days Heatmap



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		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	R258@125 ST(456) F	R249@86 ST(456)				

Night (8pm-12am)					F	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(BDFMN	IQRW)		R533@FLUSHING-MAIN(7)
Evening (4pm-8pm)	N606@JAMAICA CENTER(EJZ)	N026@125 ST(ABCD)	R238@GRD CNTRL-42 ST(4567 R528@JUNCTION BLVD(7) R221@14 ST-UNION SQ(456LNQ		A034@14 ST-UNION SQ(456LNQRW)	R533@FLUSHING-MAIN(7)
Night (8pm-12am)			R221@14 ST-UNION SQ(456LNQ N083@W 4 ST-WASH SQ(ABCDE			

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)		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)