boolean for “Booleans”

01000010011011111011011111011011000110010101100001010110

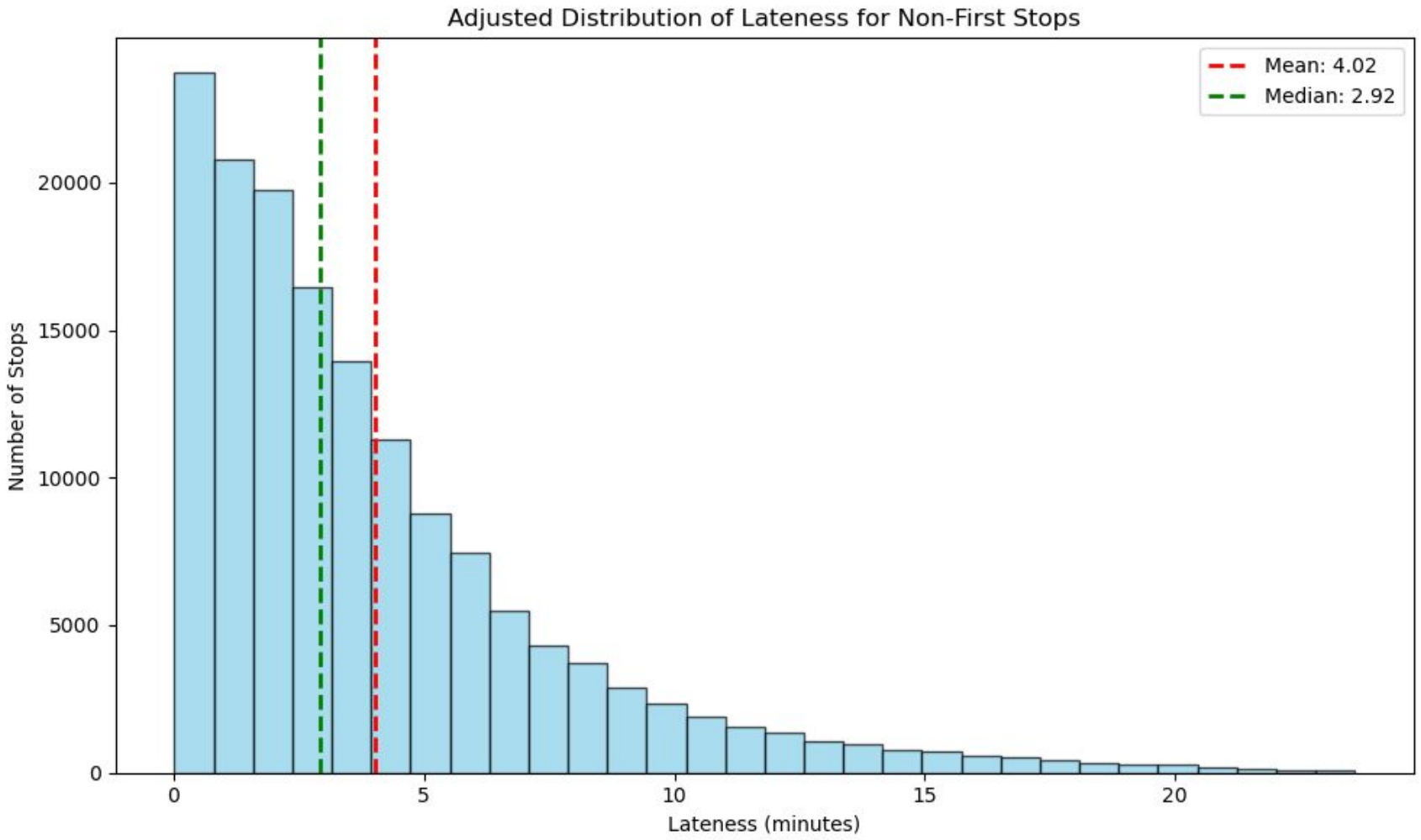
Mariel
Mike
Trey


WeGo
Public Transit

79% of the time buses arrive later than expected…

but only 22% of the time are buses more than five minutes late

only 6% of the time are buses more than 10 minutes late


Adjusted Distribution of Lateness for Non-First Stops
Mean: 4.02
Median: 2.92
Number of Stops
0
5000
10000
15000
20000
0
5
10
15
20
Lateness (minutes)

WeGo Public Transit –OLOGIES

What if a bus leaves later than expected?

ADHERENCE

What if you get to your bus stop just after a bus has left – how long might you wait for the next bus?

HEADWAY

And if you have to wait longer than you expected for that next bus to arrive?

HEADWAY DEVIATION

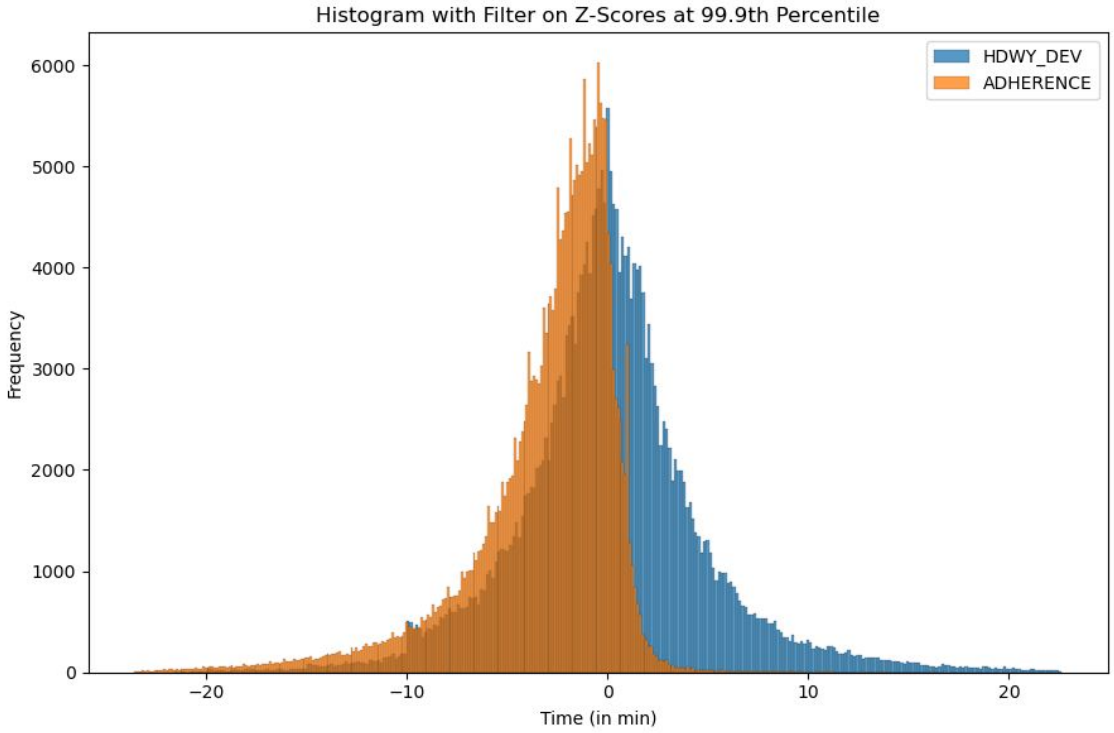
Data Cleanup

1. **Removed null values**

Statistic	ADHERENCE	HDWY_DEV
Count	265,884	265,884
Min	-948.53	-64
Max	85.66	565.43

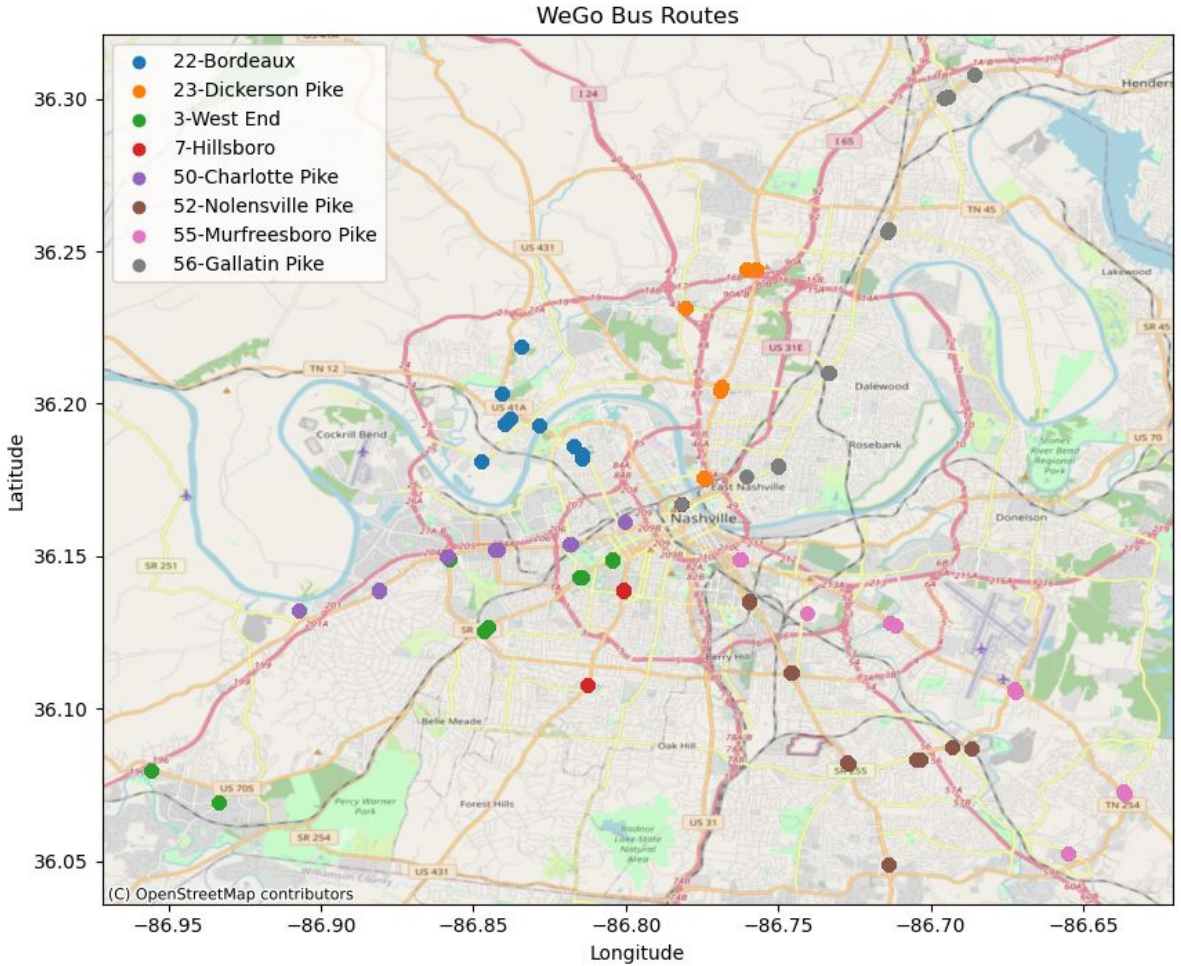
2. **Set a filter to remove entire trips if outside 99.9th percentile**

Count	254,299	254,299
Mean	-3.09	0.14
Min	-23.58	-21.6
Max	16.48	22.63



Which operators usually arrive on time?

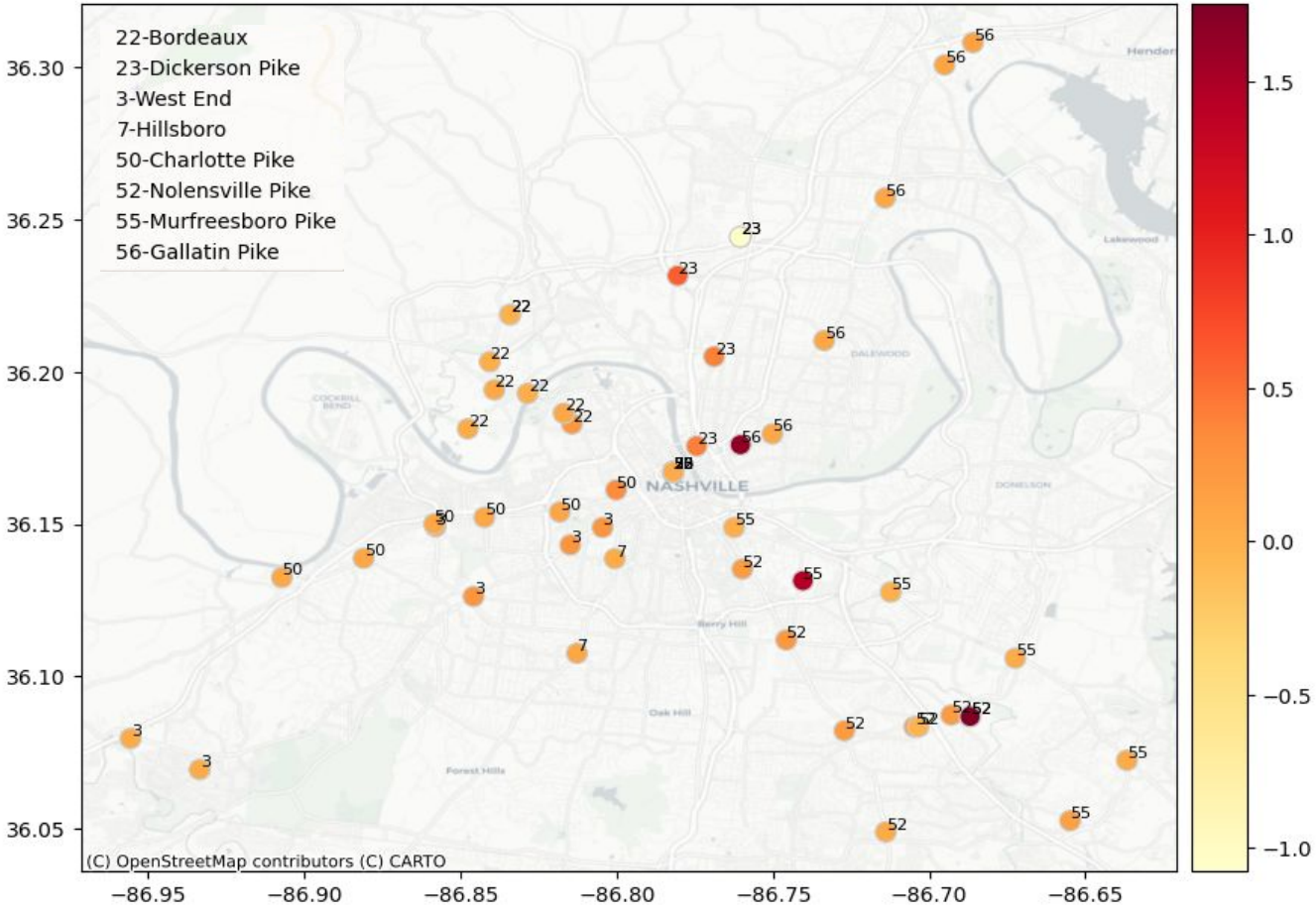
OPERATOR	Routes
559	3
1893	56, 50, 55
1208	55
2127	56, 52, 55
2040	55, 52, 50, 23



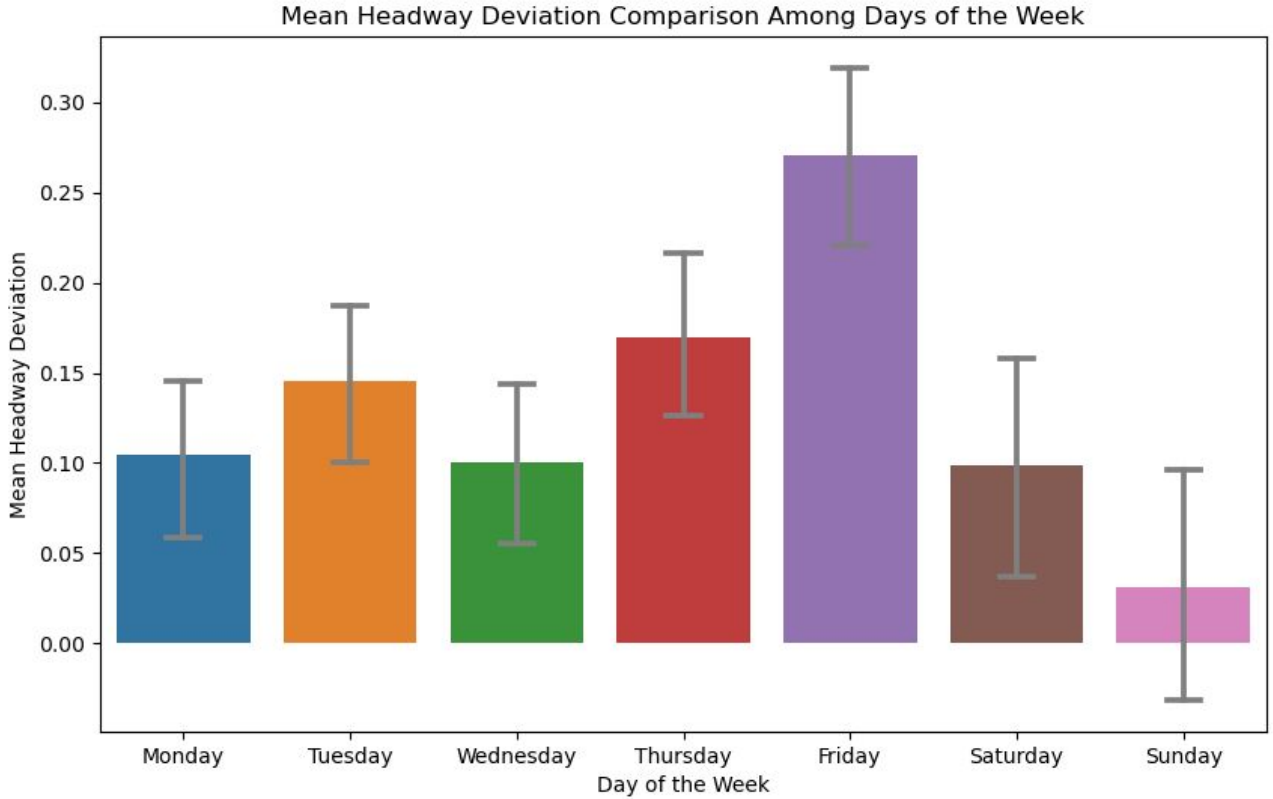
Which routes tend to be on time?

Most.

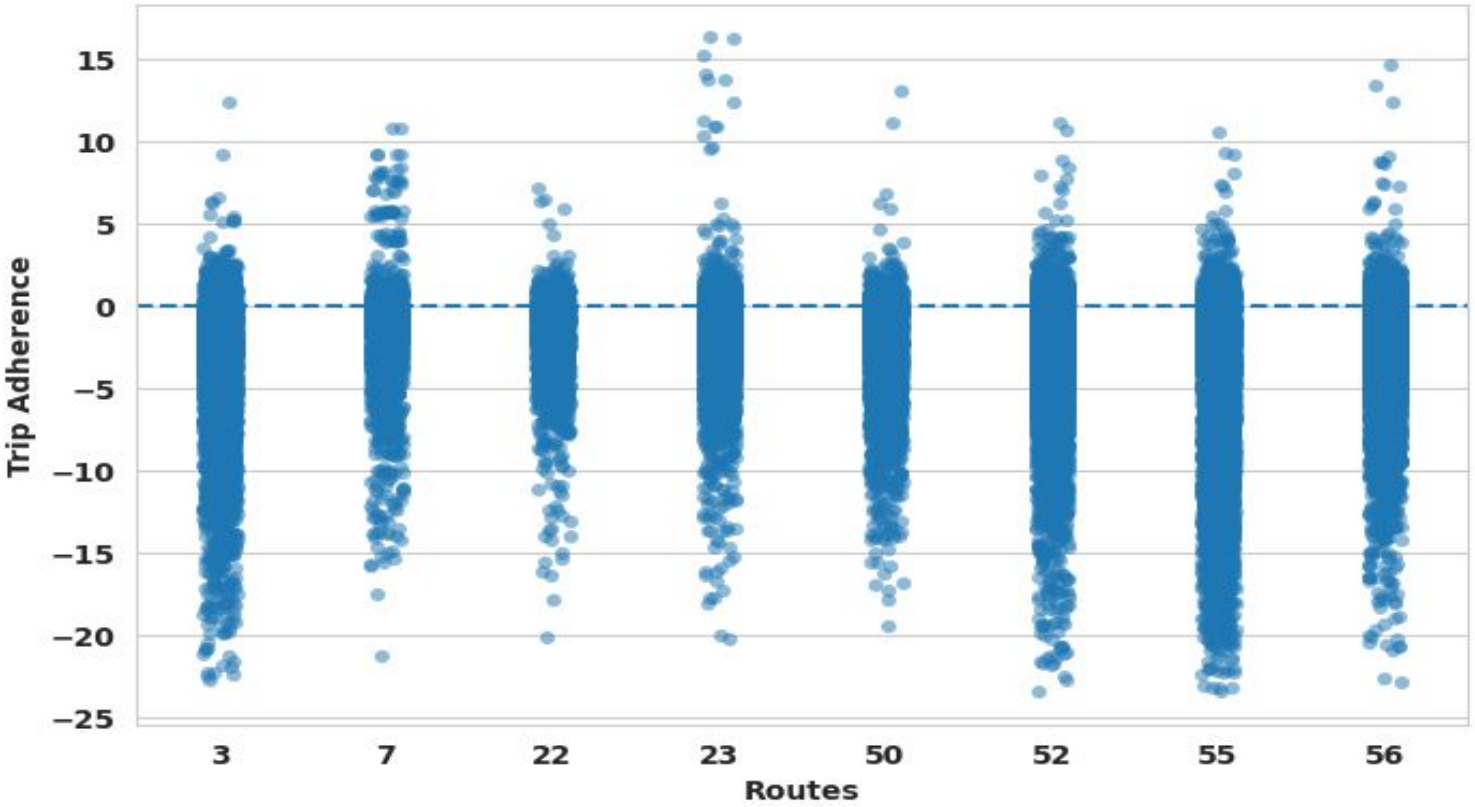
Some stops in each route tend to be later but the average range is within 1 minute of headway.



How is headway deviation spread out through the week?



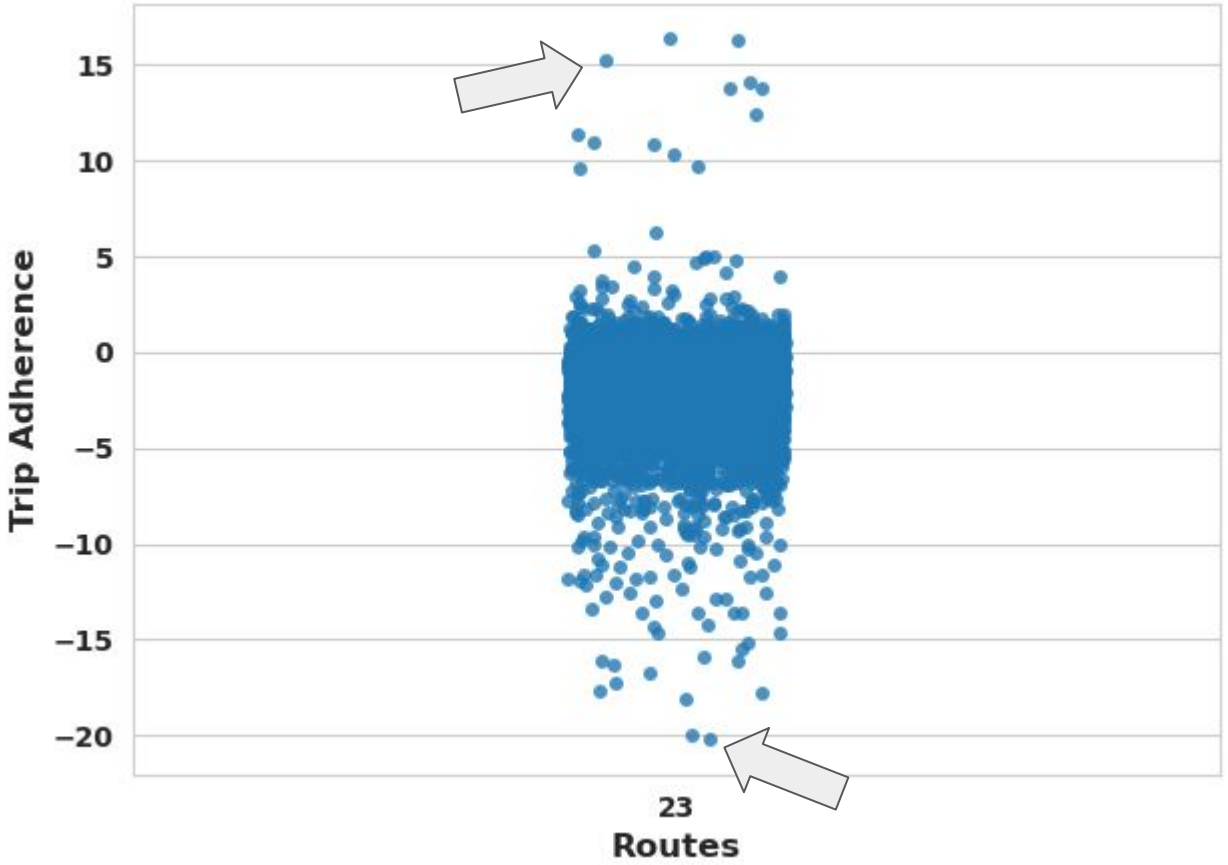
All Routes, Before 8:30am…



Route 23…Just How Late?

	ADHERENCE	Count	Mean	Min	25%	75%	Max
0	5 Minutes Early	15.0	11.725555	5.300000	9.991667	13.908333	16.333333
1	Between 5 and -5	4409.0	-1.544847	-4.983333	-2.650000	-0.383333	4.966666
2	5 Minutes Late	541.0	-6.976063	-20.200000	-7.366666	-5.350000	-5.016666

Route 23, Outliers…

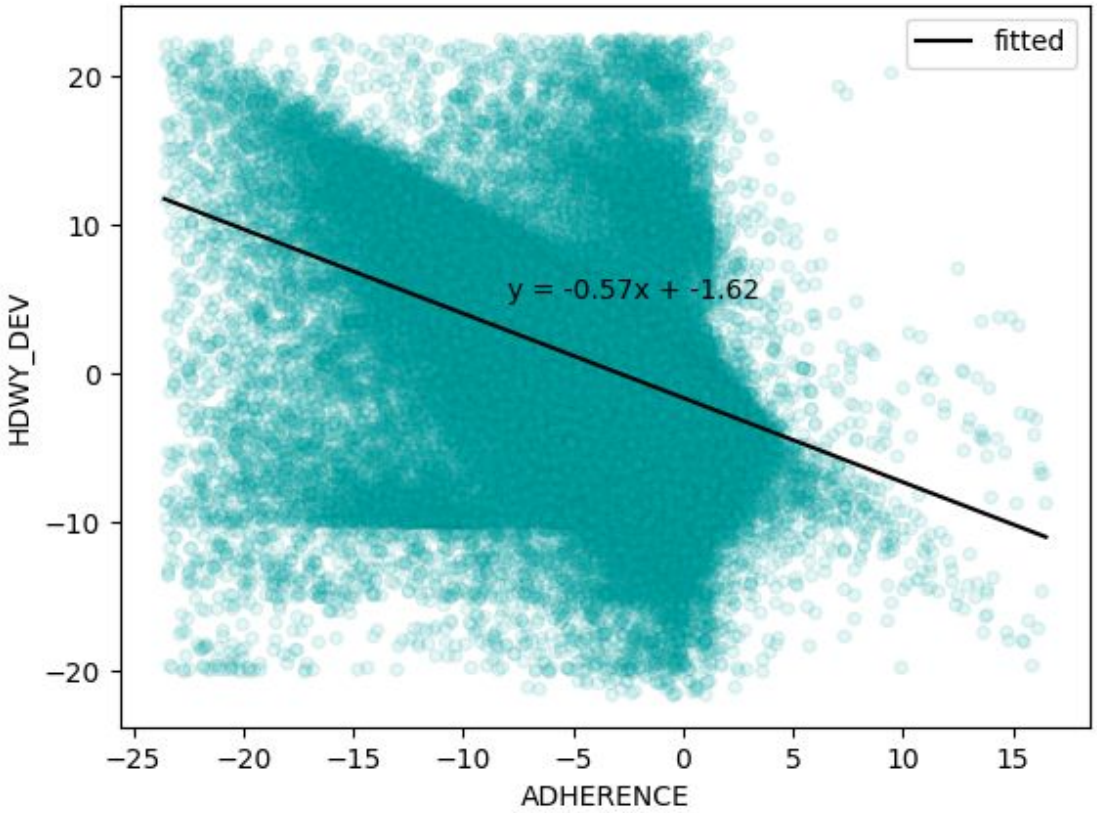


How does schedule adherence affect headway deviation?

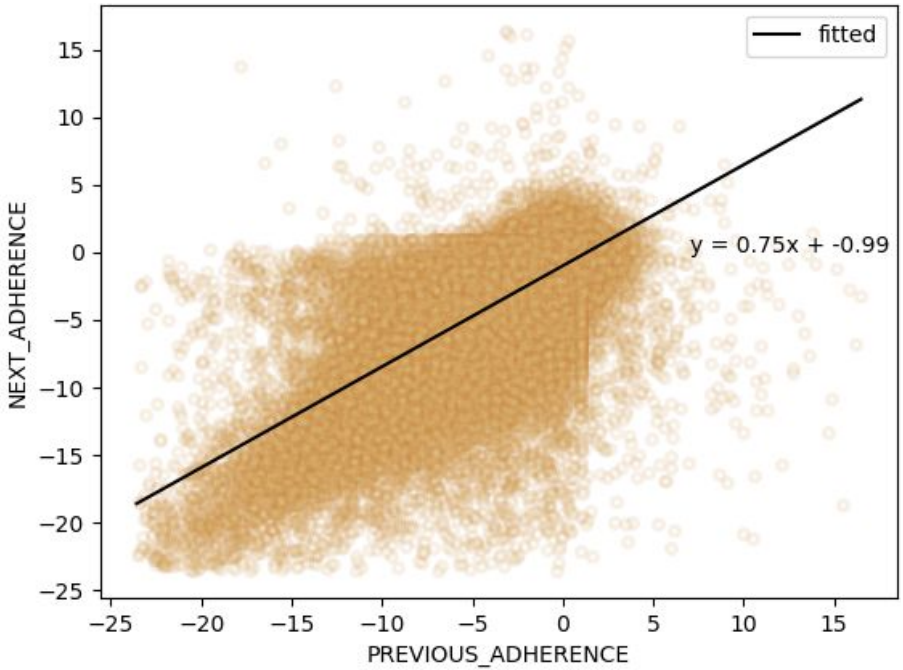
How does adherence affect headway deviation?

Linear regression model:

- **Statistically significant**
- Captures 20% of headway deviation variability
- When bus leaves on time (adherence = 0), average headway deviation is 1.62 minutes too small (some bunching).
- When bus leaves 3 mins behind, average headway deviation is 0.

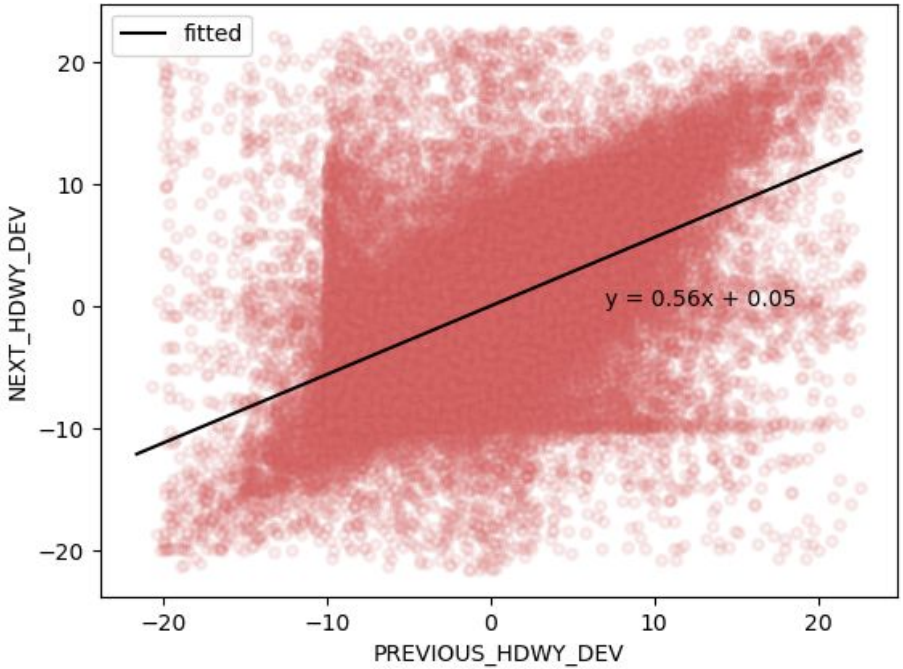


How does previous adherence/ headway deviation affect the next one?



Statistically significant

R2 = 49%



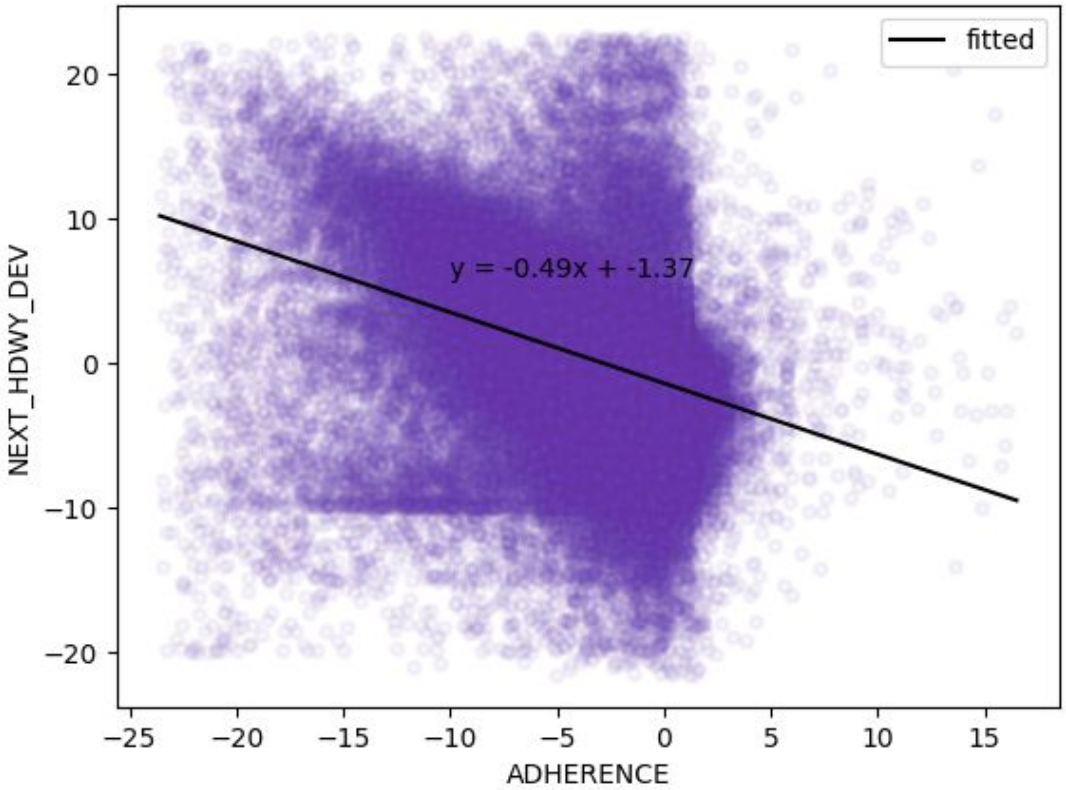
Statistically significant

R2 = 29.7%

How does adherence at previous stop affect headway deviation at next stop?

Linear regression model:

- **Statistically significant**
- When bus leaves on time (adherence = 0), the estimated headway deviation at next stop is -1.37(bus arrives earlier..some bunching).
- Generally, when adherence increases, the headway deviation at next stop decreases (shorter headway).



Summary

- If the bus leaves on time –looking at all stops - on average the headway deviation gets a minute and a half smaller (there's some bunching). Running about 3 minutes behind would put your headway deviation at 0 on average.
- If on average, I'm leaving exactly on time, the next stop will be a minute early.
- When the headway deviation from the last stop was zero, the headway deviation at the next stop is estimated to be zero
- When you leave on time at a previous stop, the headway deviation at the next stop is estimated to be 30 seconds less.

Questions?