

ACE and the Race to Class: Improving Bus Speeds for CUNY Students

Data Sultans



Background



Context

- CUNY students often experience distress from their commute
- Bus delays leads to lateness, which leads to less time spent in the classroom



Our goal

- Find out the next best CUNY bus routes to be a part of the ACE program
- Lessen the bus delays CUNY students experience



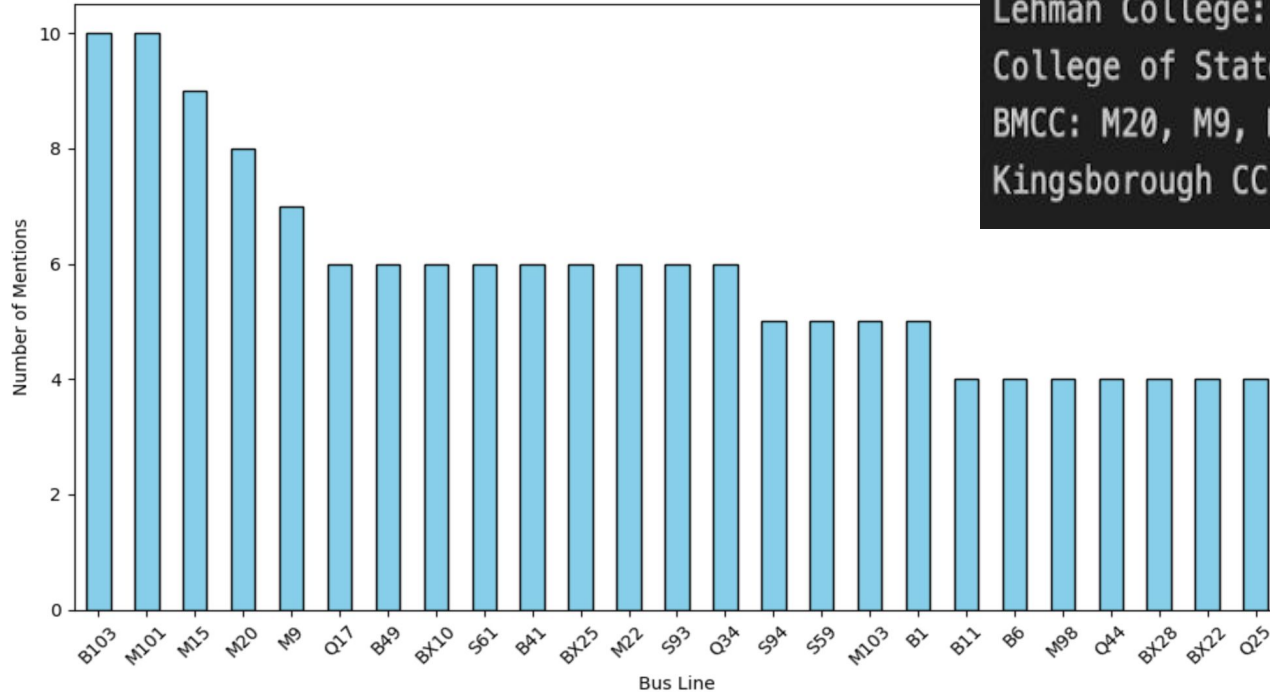
Our Question

What effect does ACE have on bus speeds?

How can it play a role in improving CUNY students' on-time arrival to class, considering frequent bus route violations and potential strategies for strengthening ACE effectiveness?

How We Chose Sample Buses

Most Common Buses Taken to CUNY Campuses



CUNY Route Utilization (Identified):

Hunter College: M15, M98, M101, M103

Brooklyn College: B11, B41, B49, B103, B6

Queens College: Q17, Q25, Q34, Q44+

Lehman College: BX10, BX28, BX22, BX25

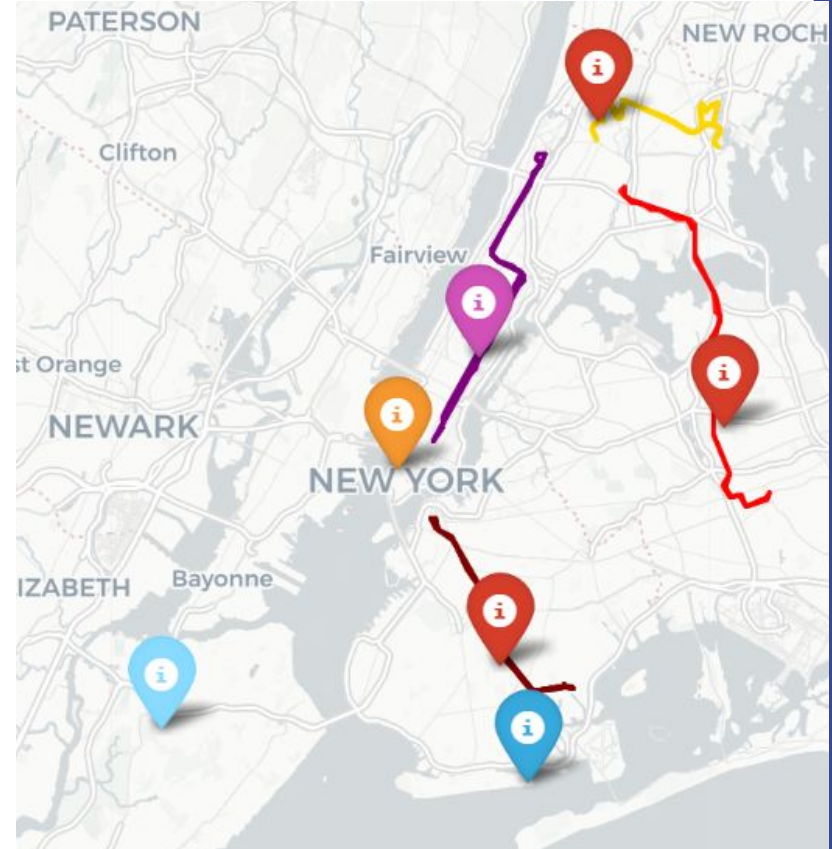
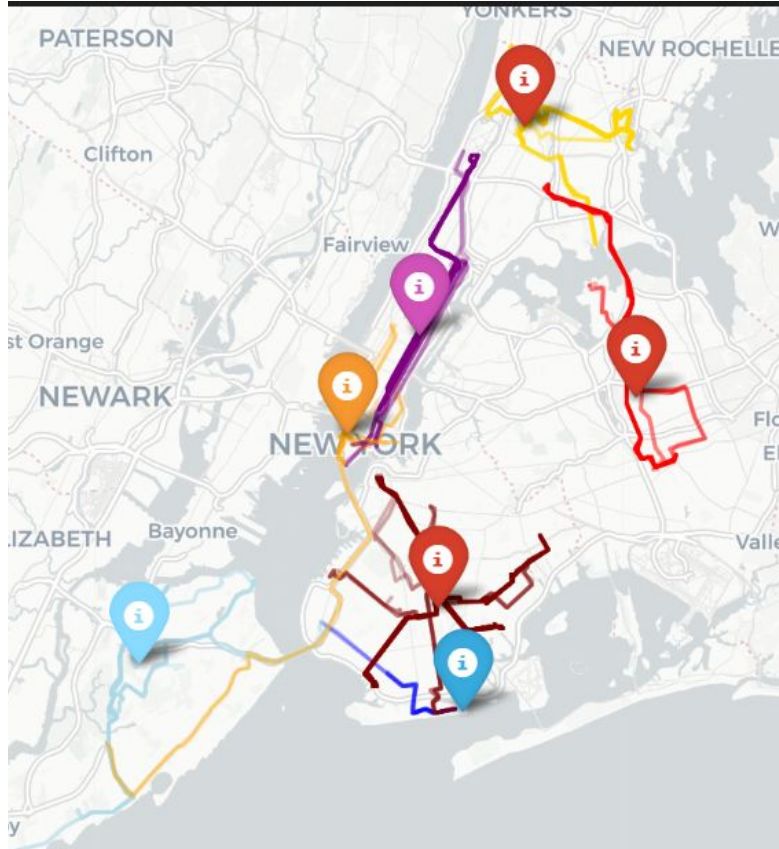
College of Staten Island: S93, S61, S94, S59

BMCC: M20, M9, M22

Kingsborough CC: B1, B49

**Only 16.7% of CUNY bus
routes are covered by
ACE**

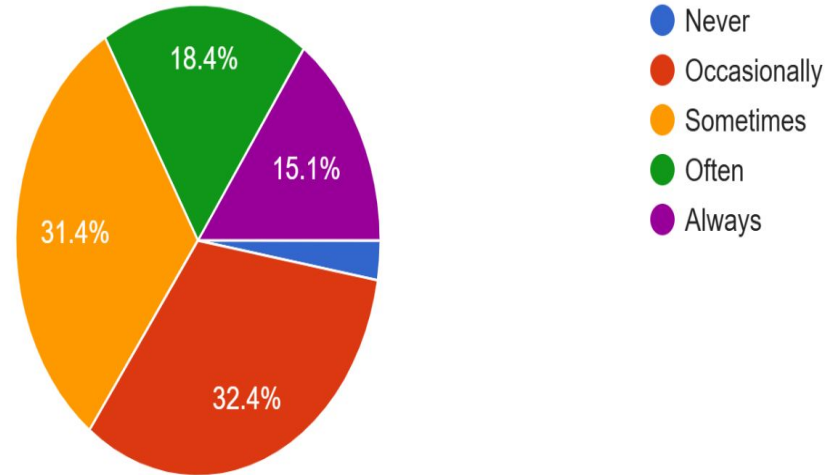
All vs ACE Buses on CUNY routes



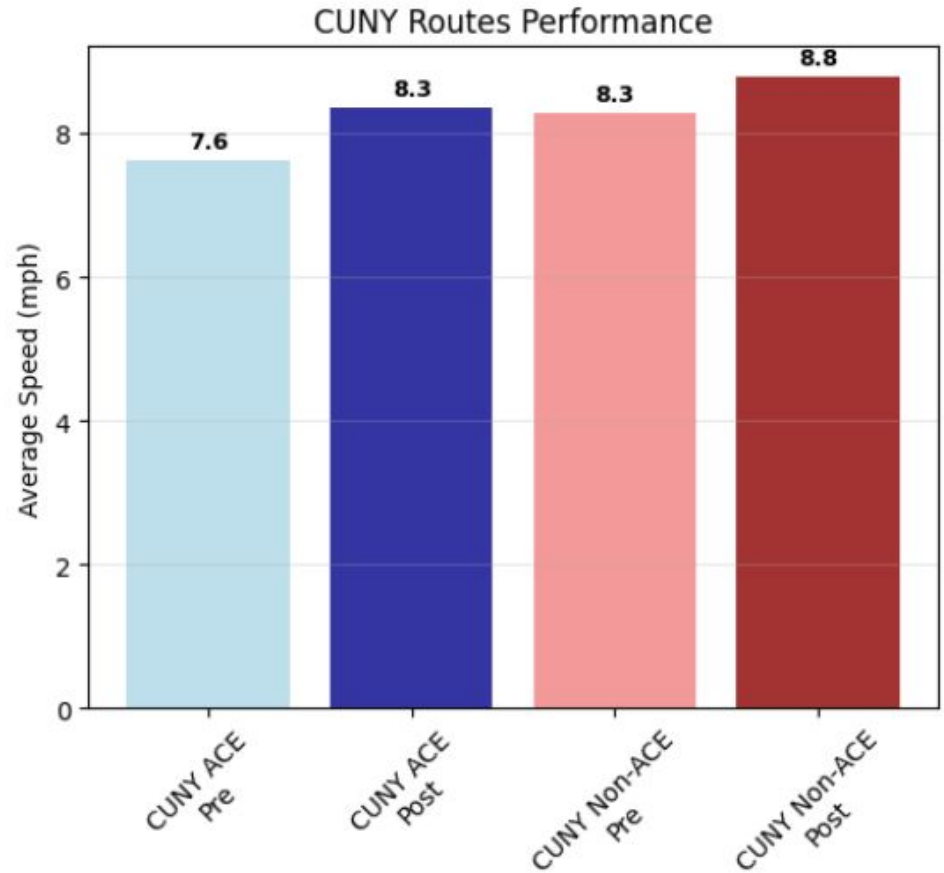
Over 50% of students reported being late due to bus delays

How often are you late to classes because of your commute

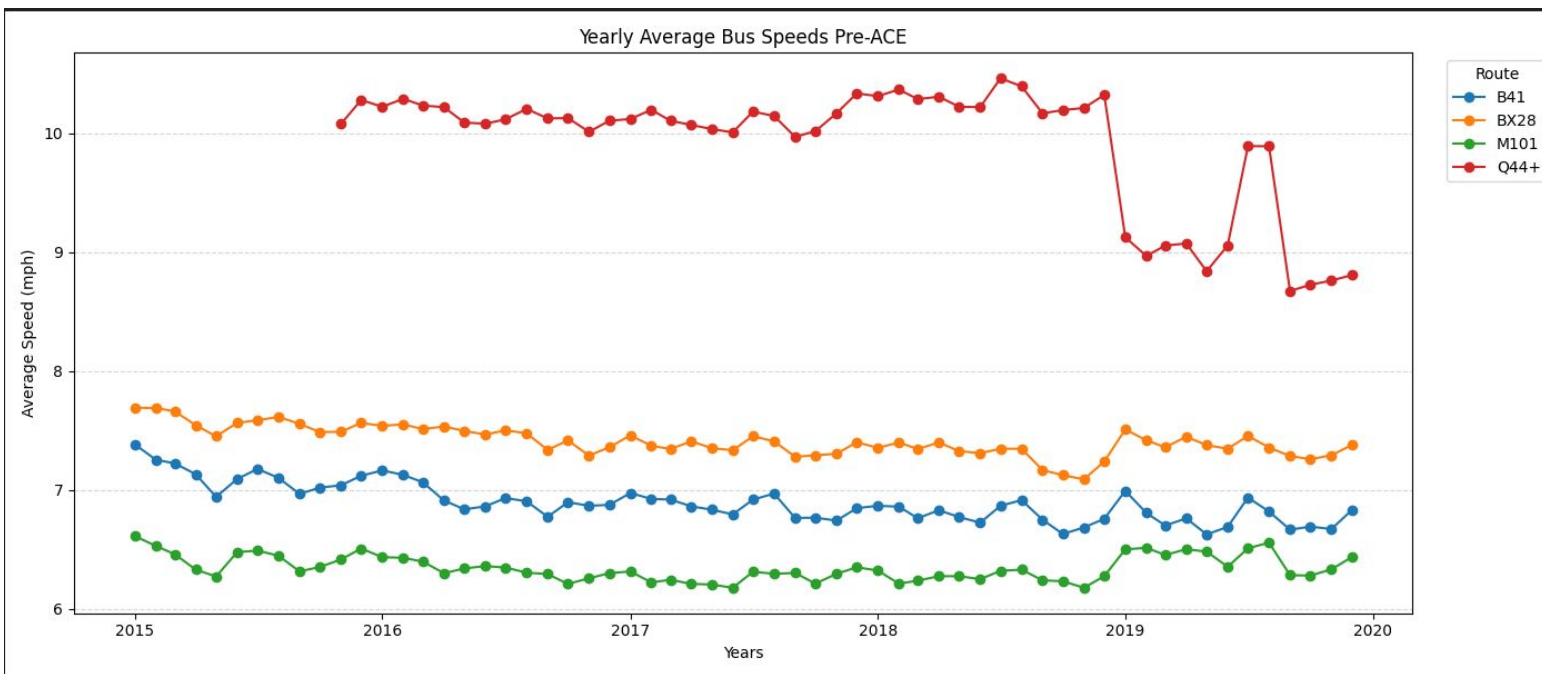
185 responses



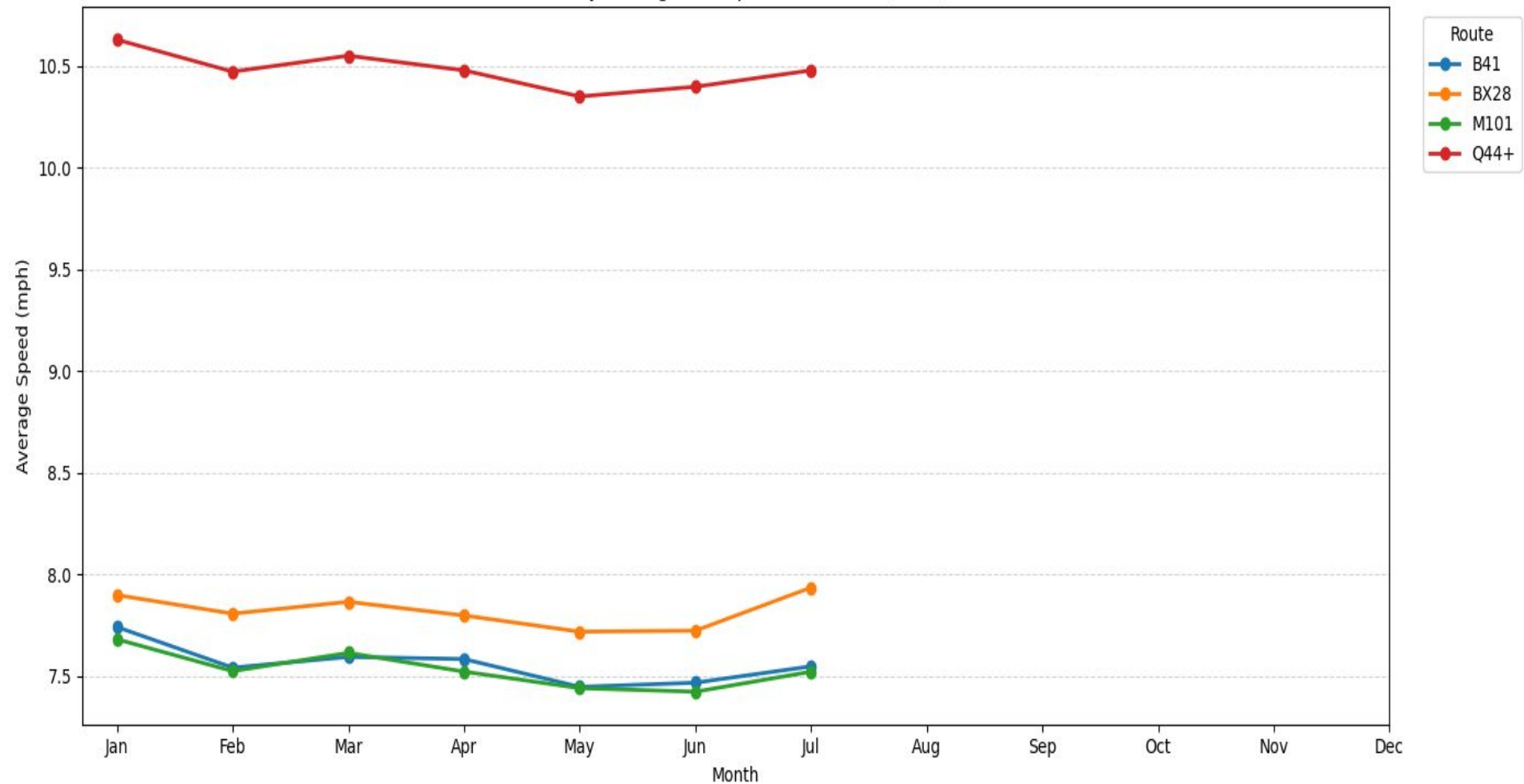
**CUNY ACE buses
experience a
10.1% increase
in speed**



Pre-ACE vs Post-ACE Effect on CUNY Bus Routes



Monthly Average Bus Speeds Post-ACE (2025)

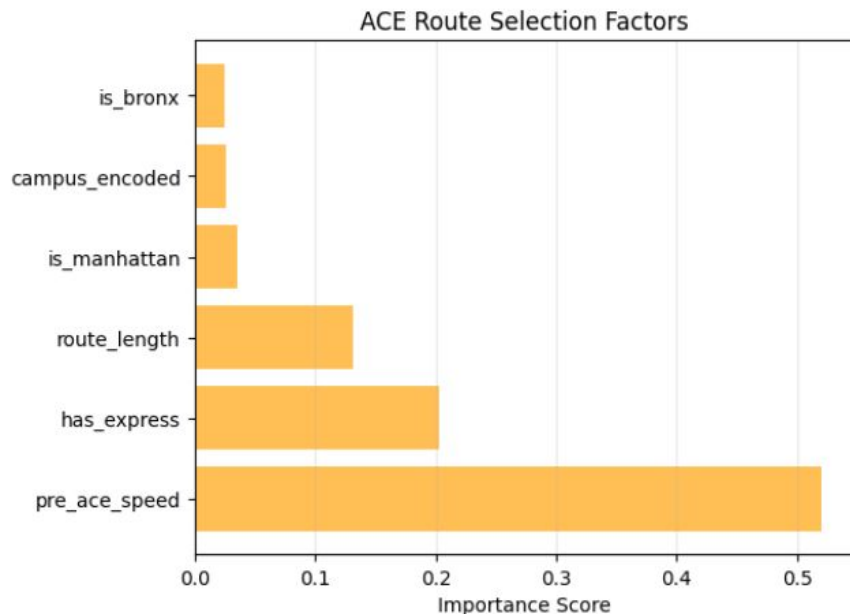




Data Analysis

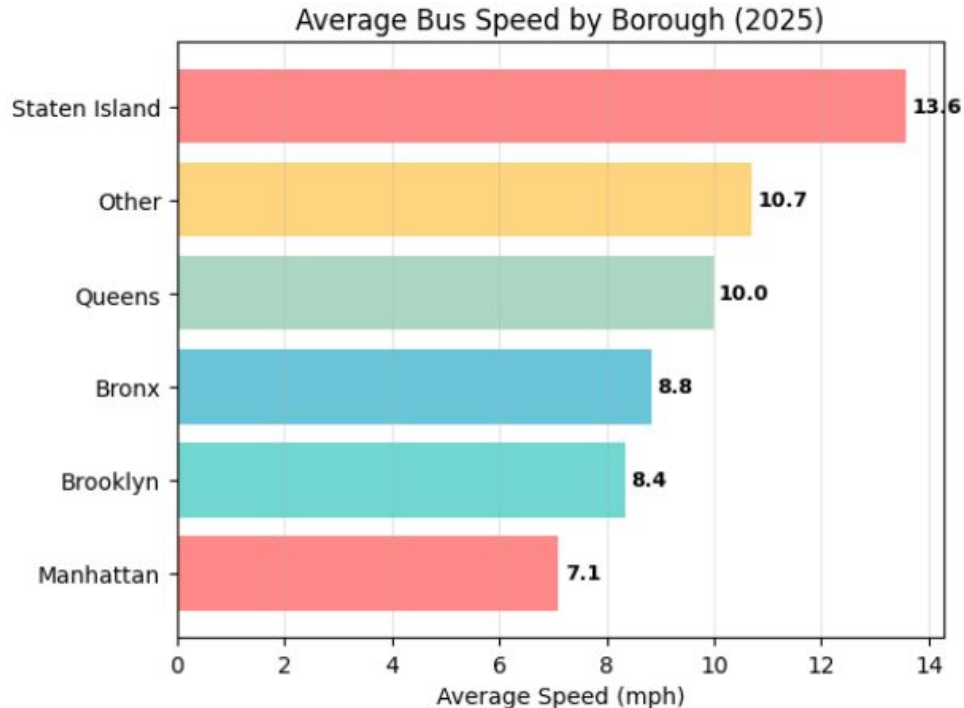
**First we took a look at
how ACE routes are
determined...**

ACE Route Determination



- We used classification models to determine whether or not the specific routes were purposely chosen to be ACE
- We saw that the pre_ace_speed factor which was the bus speed before the bus was ACE was the biggest determining factor

ACE Route Determination



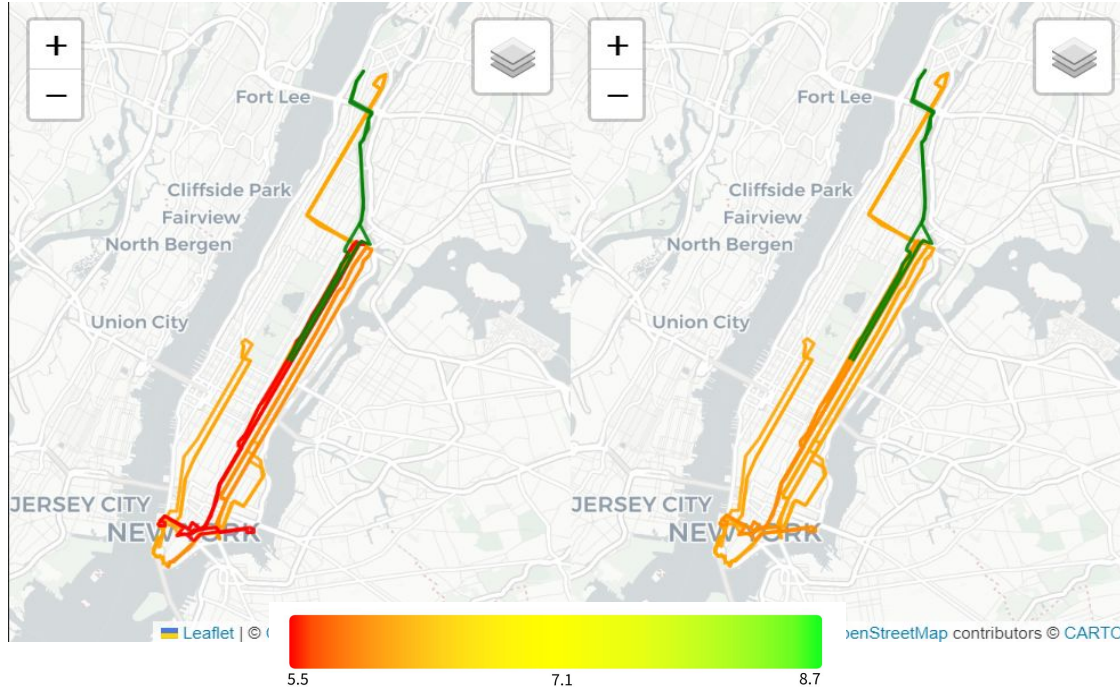
- **Manhattan has the lowest speeds**
- **Staten Island has the fastest speeds**

*Other includes cross-borough buses and special service buses such as the n6, x27, etc.

ACE Route Determination

Manhattan Peak Hrs CUNY
Pre ACE Speeds

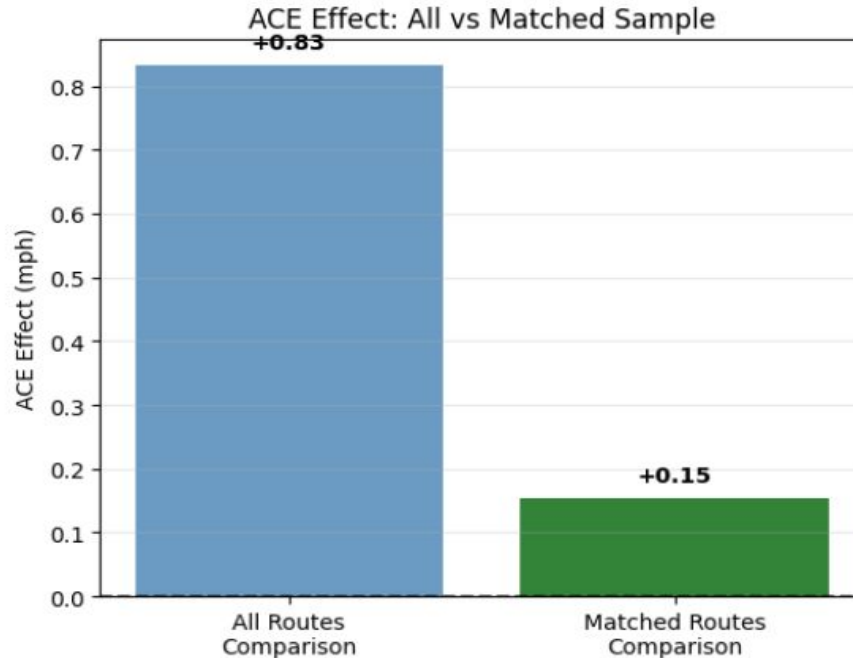
Manhattan Peak Hrs CUNY
Post ACE Speeds



- CUNY Manhattan speeds average are even lower
- Only one bus averages above 7mph

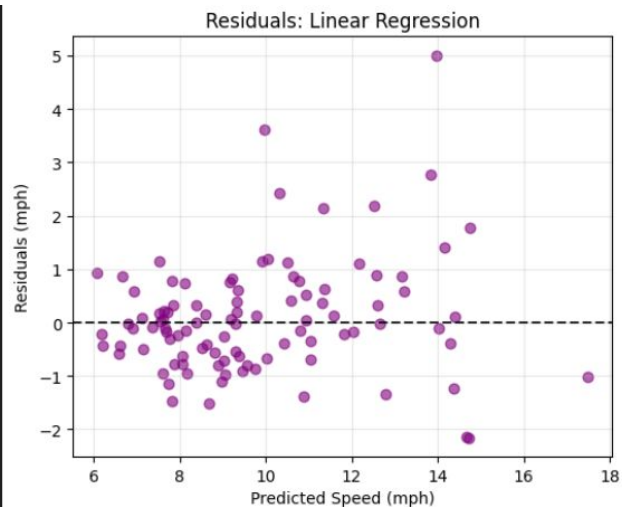
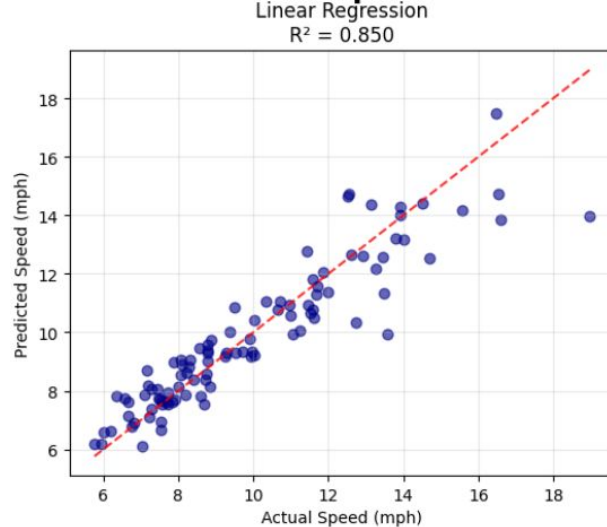
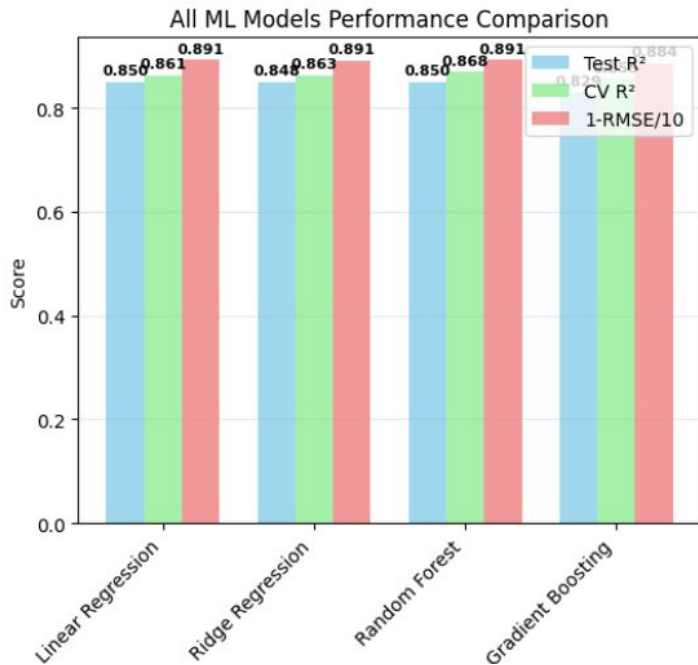
ACE Route Determination

ACE Works!



- When comparing the averages of ACE and non ACE, ACE had +0.83 mph when the routes were random.
- To make sure that ACE had the best improvement with no bias, We matched Ace and Non ACE routes using Nearest Neighbors then ACE showed +0.15 mph.

ML Validity



**Now we can give
predictions for
recommended ACE routes!**

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SECTION 11: CUNY ROUTE PERFORMANCE PREDICTIONS

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Using best model: Linear Regression ($R^2 = 0.850$)

Top 5 CUNY routes that would benefit most from ACE:

M9 (BMCC):

Current ACE: No
Current Speed: 6.4 mph
Predicted with ACE: 7.0 mph
Potential Improvement: +0.6 mph

B11 (Brooklyn College):

Current ACE: No
Current Speed: 6.7 mph
Predicted with ACE: 7.3 mph
Potential Improvement: +0.6 mph

Q34 (Queens College):

Current ACE: No
Current Speed: 7.4 mph
Predicted with ACE: 7.9 mph
Potential Improvement: +0.5 mph

S93 (College of Staten Island):

Current ACE: No
Current Speed: 12.5 mph
Predicted with ACE: 12.7 mph
Potential Improvement: +0.2 mph

Q17 (Queens College):

Current ACE: No
Current Speed: 8.8 mph
Predicted with ACE: 9.0 mph
Potential Improvement: +0.2 mph

Next CUNY ACE Routes

M9

- For BMCC Students
- Org 2025 Avg: 6.4mph
- Predicted 0.6 mph increase!

B11

- For Brooklyn College Students
- Org 2025 Avg: 6.7mph
- Predicted 0.6 mph increase!

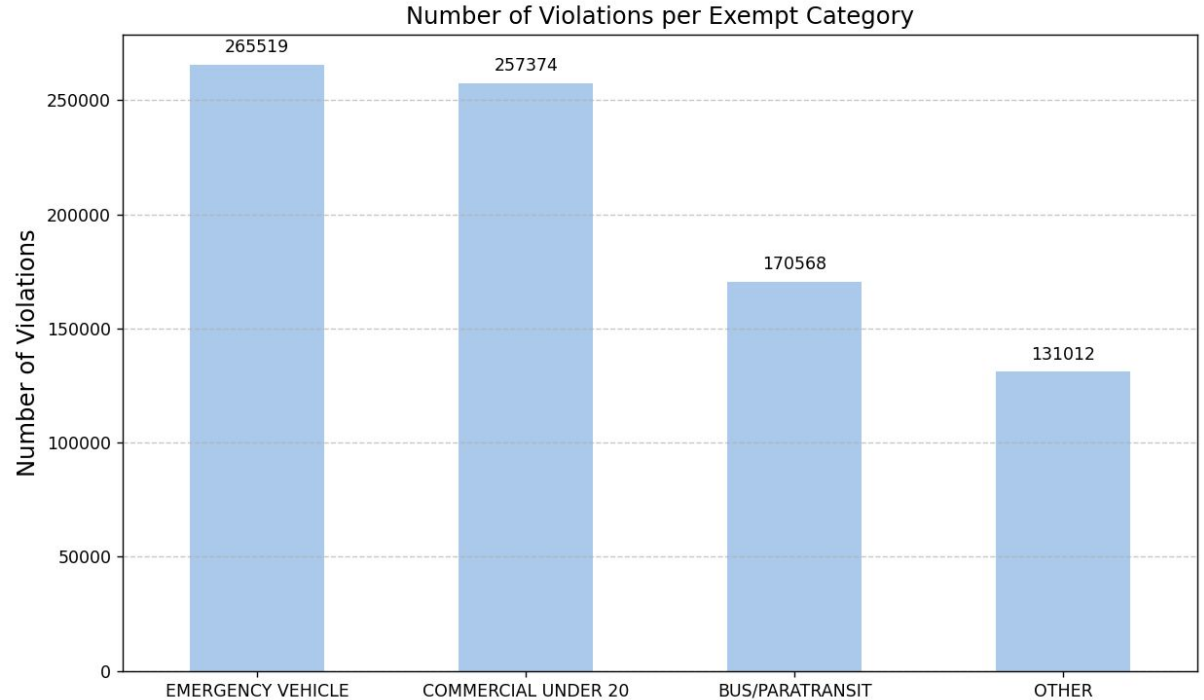
Q34

- For Queens College Students
- Org 2025 Avg: 7.4mph
- Predicted 0.5 mph increase!

What are some other factors causing slower buses for students?

ACE Violations

- Most violations are by exempt vehicles
- Emergency vehicles are one of the highest!



**46.7% of vehicles are
repeat offenders**

**One repeat
offender has
over 1377
violations!**

Top 10 repeat offenders:

479d603cb0***:	1377 violations
1feaad876c***:	1346 violations
6d7caef8bf***:	949 violations
6979a2434b***:	924 violations
2a8ac01b15***:	915 violations
e020820037***:	894 violations
ebabc58528***:	842 violations
cbebd9b5a6***:	782 violations
550bbcf6f5***:	725 violations
80e7bae594***:	691 violations

Suggestions

**Review exempt
status for chronic
offenders**

**Monitor exempt
vehicle compliance**



Conclusion

Findings

Bus delays cause chronic lateness for CUNY students

ACE routes are selected by the speed of the route before it was ACE

Manhattan and Brooklyn have the slowest bus speeds

Most ACE violators are repeat offenders

The most violations come from exempt emergency vehicles

Our Solution

**Implement ACE
in the M9, B11,
and Q34 routes**

**Review repeat
offenders for
potential abuse
of exemption**



Thank You!

Any questions?