

**Improving Bus Lines System in New York City by
Adding More Bus Lanes**

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Abstract

The lab was made, to find out how efficient busses are with and without bus lanes

During this lab, next measures were taken: the time it takes to complete the line by the regular bus M15 and M15 SBS to East Harlem from South Ferry; the time for the same buses, but with the bus lane added. Then comparison of times takes place and evaluation of how much quicker buses finished their lines with the bus lane than without it.

Temporary bus lane was made with cones and with MTA approval.

Introduction

Bus system in New York City is a major part of the Metropolitan Transportation Authority (MTA). There are total of 336 bus lines in NYC, 273 regular busses and 63 express (MTA official, 2021). Regular busses have a boarding only through the front door because the payment is taken only by the machine in front of the bus. It is illegal to board regular bus through other doors. Based on that fact it could take some time for the bus to get loaded on the bus stop. Everyone is going through the same door and waiting for each other to pay.

Buses from the Select Bus Service (SBS) are faster. For those buses tickets should be bought before the ride and they are reviewed inside the bus by the conductor. So, the boarding is allowed through any door, not only through the front one.

Nevertheless, buses tend to be slow. They have a lot of stops and the traffic is bad in the city. To solve this problem the bus lanes were added, but not everywhere. Bus lane is a special lane where only buses could run.

Bus lanes are in some places, but not everywhere. For example, on the M15 and M15 SBS lines there is no bus lane on the Allen St on the part from Houston St to Grand St. There are often car tolls over there so adding the bus lane could be a clever idea.

The experiment is based on the fact above. The hypothesis is: adding the bus lane on the Allen St will significantly reduce the time for M15 and M15 SBS buses to complete their line. If this hypothesis is correct, then NYC transport system should consider adding the bus lane there.

Materials

- Stopwatch or a smartphone
- Bus tickets (MetroCard)
- Pen or pencil
- Piece of paper
- Normal M15 and M15 SBS buses.
- An option to make a temporary bus lane on the Allen St (Place temporary cones)

Methods

To calculate the average time for completing the line the time measurements were taken from the M15 and M15 SBS buses full lines for five days starting on Monday, ending Friday, during the morning rush time at 7:30 am to 9:00 am. After that on the next week there were taken the same measurements but now busses were using the temporary bus lane on the Allen St.

To do those measurements buses were boarded on their first stop “South St/Whitehall St” for M15 bus and “South Ferry/Terminal” for M15 SBS. Once the bus has started its movements,

stopwatch starts. Once the bus has reached their final destination “E 126 St/ 2 Av”, stopwatch stops. After that, the time was written on a piece of paper.

To make a bus temporary bus lane we placed temporary cones on this part of the road. We assigned the day and time with MTA, and they gladly provided us this opportunity to make an experiment.

Those measurements were taken five times (every workday in the week) for each bus in each case. Five times for M15 regular line (table 1), five times for M15 bus with the bus lane (table 3), five times for SBS M15 without a bus lane (table 2), and five times for SBS M15 with the bus lane (table 4).

After that, the average time was calculated for each case and the percentage difference was taken for the results evaluation.

Results

Table 1: Normal M15 bus

Day of the week	Start Time	Finish Time	Total Time
Monday	7:03	9:34	2:31
Tuesday	7:00	9:45	2:45
Wednesday	7:03	10:00	2:57
Thursday	7:02	9:30	2:28
Friday	7:04	9:40	2:36

Table 2: Normal M15 SBS bus

Day of the week	Start Time	Finish Time	Total Time
Monday	7:02	8:10	1:08
Tuesday	7:00	8:15	1:15
Wednesday	7:03	8:30	1:27
Thursday	7:02	8:07	1:05
Friday	7:04	8:13	1:09

Table 3: M15 with a bus lane

Day of the week	Start Time	Finish Time	Total Time
Monday	7:01	9:15	2:14
Tuesday	7:02	9:30	2:28
Wednesday	7:00	9:25	2:25
Thursday	7:03	9:20	2:17
Friday	7:04	9:23	2:19

Table 4: M15 SBS with a bus lane

Day of the week	Start Time	Finish Time	Total Time
Monday	7:00	8:03	1:03
Tuesday	7:00	8:01	1:01
Wednesday	7:01	8:04	1:03
Thursday	7:02	7:55	0:53
Friday	7:03	8:04	1:01

Averages:

Average time for the M15 bus without a bus lane is 2:39

Average time for the M15 SBS bus without a bus lane is 1:13

Average time for the M15 bus with a bus lane is 2:21

Average time for the M15 SBS bus with a bus lane is 1:00

Percent difference:

M15 with the bus lane is faster on 29%

M15 SBS with the bus lane is faster on 10%

Discussion

The result of the lab shows that adding a bus lane significantly reduces the time for the line completion. First of all, from the table 1 and table 2 it come out that the SBS bus is much faster than the regular one.

After comparing the data from table 1 and table 3 it comes out that regular M15 bus is faster by 29% on average, with the bus lane than without it. And after comparing results from

table 2 and table 4, it comes out that SBS bus with the bus lane is faster by 10 % than the SBS bus without the bus lane. Those calculations and numbers prove the hypothesis, the bus lane significantly accelerate buses.

The experiment proves that bus lanes will improve the quality of the bus system in the New York City. People will save tons of time, up to 29% (which is a lot) from their bus trips. And time is money.

But there are some consequences which could take place when the bus lanes are added everywhere. The most important one is traffic jams. Bus lane takes a space from the road for regular cars, so they have less space to operate, and more cars will be on the same lane then before. It leads to the traffic jams. There are always cons and pros in the world and bus lanes are not the exception.

Conclusion

Buses are particularly important part of New York transportation. A lot of people are using them every single day. But the Bus system is far away from perfect. Buses could be more efficient than they are right now.

During this experiment there was measured the time it takes for M15 and M15 SBS buses to complete their full line from South Ferry to East Harlem with and without bus lane on the Allen St. Comparison of those results showed that, on average, the bus lane improves the time it takes to complete the full line for regular bus by 29% and for SBS bus by 10%. It is a significant difference.

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