How Much Faster Are We Moving?

An evaluation of bus priority measures in New York City

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Executive Summary

Since 2008 New York City's Department of Transportation (NYC DOT) and the Metropolitan Transit Authority (MTA) have been working together to improve bus speeds through priority measures. The Select Bus Service (SBS) program included, as a baseline, off-board fare collection[1] and stop consolidation. Many, but not all, SBS routes included bus lanes. Additional bus lanes and busways have been built outside of the SBS program.

The MTA has released extensive data since 2015, making it possible to analyze changing speeds on bus priority corridors, and to isolate the effects of various measures. NYC DOT has also posted numerous before/after studies assessing the impacts of their bus priority measures on different corridors with different characteristics.

Using these materials, and looking only at the morning peak for consistency, an analysis of the impact of various bus priority measures on NYC bus speeds (route end to route end) was undertaken.[2] It is important to be aware that bus speeds include moving time, as well as time stopped at traffic lights and bus stops.

1 With the exception of the S79

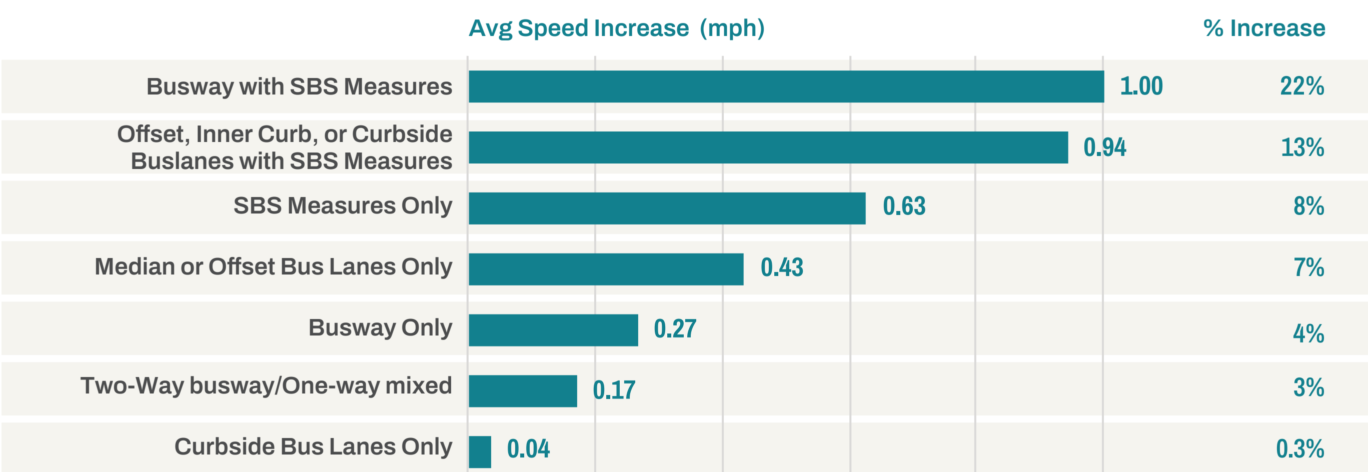
2 The individual corridor results listed in Annex 1 may vary somewhat from MTA and NYC DOT published results in some cases as there might have been greater improvements in the afternoon peak or other differences in methodology, but results are generally in a similar range.

From this analysis, the following conclusions can be drawn:

1. **Curbside bus lanes alone yield extremely minor benefits**: Curbside bus lanes alone had only a .05 mph, or 0.3% impact on bus speeds. Visual observation indicated that the lack of effectiveness is due to the curbside bus lane being frequently blocked by authorized right turning vehicles, quick (legal) drop-offs, delivery vehicles, building construction, and other obstacles. The problems are so severe that on some corridors, even with on-board bus camera enforcement, the buses rarely use the bus lanes that were designed to make them faster.

2. **NYC's busways, absent other priority measures, also yield minimal benefits**: Busways in New York City are sections of roadway where only buses, delivery vehicles, and local access vehicles are permitted. Several busways were created between 2019 – 2021 but without the other priority features generally associated with Select Bus Service (SBS), namely stop consolidation and all-door boarding. The busways improved speeds by only about 0.27 mph or 4%. This is for two reasons:

Figure 1. Summary of impact of different bus priority measures



Data: MTA Open Data (data.ny.gov) and author analysis

- The primary cause of delay in these corridors is the high volumes of passengers boarding, which was not addressed outside of SBS routes.
- Buses are often caught in increased congestion just before entering the busway, as all the mixed traffic is forced to turn off before the busway. These increased delays on the approach to the busway were equal to the increased speeds on the busway itself.

3 **Offset and median bus lanes perform better**: Offset and median bus lanes alone, which are generally painted red, perform somewhat better, increasing bus speeds by an average of 0.43 mph, or 6-7%. This is because the lanes are less likely to be obstructed by the causes of interference commonly found with curbside bus lanes. *Recent efforts by NYC DOT to shift curbside bus lanes to the offset or median position are therefore justified*.

4 **All-door boarding and stop consolidation (the base SBS features) have been more impactful than bus lanes**: When NYC DOT introduced all-door boarding and stop consolidation – the base features of SBS – with no other measures, bus speeds increased by roughly 0.63 mph, or 7.6%.

5 **SBS measures (all-door boarding, stop removal) when combined with offset, curbside, or service-lane aligned bus lanes, had a stronger impact**: When the all-door boarding and stop consolidation features associated with SBS were combined with dedicated bus lanes, whether curbside, service lane-adjacent, or offset,[3] there was an average 0.94 mph, or 13.2% improvement in bus speeds. There are no examples of central-median aligned bus lanes combined with SBS measures.

6 **SBS measures on busways performed the best of all current New York examples**: When all-door boarding and stop consolidation were combined with a busway, as occurred only on 14th Street, the results were better still, with a 1 mph, or 22.3%, speed improvement. The size of these combined impacts stems both from the effectiveness of the measures themselves, as well as from the strong choice of corridors on NYC DOT/MTA's part.

Figure 2. **The 14th Street busway in Manhattan showed the most significant speed gains by percentage.**
Photo: Walter Hook, People-Oriented Cities

7 **TSP yielded no clear benefits**: This report's analysis of the effects of Transit Signal Priority (TSP) began by reviewing the 2017 NYC DOT "Green Means Go: Transit Signal Priority in NYC" report.[4] While the DOT report concluded that the benefits of TSP have been significant, this report found the DOT report to be flawed. Most critically, the report used speeds before and after TSP measures were implemented, but SBS was also introduced in the same time span. NYC DOT also published separately an analysis of SBS on the same corridor *before TSP was implemented.* The SBS analysis showed the same percentage speed improvements as shown on the same corridor in the TSP study, but attributed them, correctly, to SBS. When the authors of this report independently analyzed the before and after speeds of routes with TSP only, to independently isolate the impacts, they found no benefits attributable to TSP.

3 Service lane adjacent is the configuration on Kings Highway and Woodhaven where the bus lanes are next to the median separating service lanes from through traffic lanes. The variance in the data corridor by corridor between offset bus lanes with SBS and curbside bus lanes with SBS was too big to make this distinction meaningful, so we combined them.

4 NYC DOT. *Green Means Go: Transit Signal Priority in NYC.* (July 2017). Retrieved from: https://www.nyc.gov/html/brt/downloads/pdf/brt-transit-signal-priority-july2017.pdf

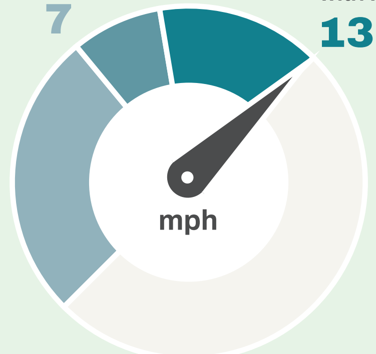
TSP is simply a technology which can be adjusted in any way a department of transportation sees fit, at any time. Indeed, if TSP is used to extend green signals for long enough on any corridor, the speed improvements shown in the *Green Means Go* report can be achieved. Yet too often, complaints from motorists cause bus-oriented traffic signals to be retimed to favor cross streets. This may or may not be the case with the TSP intersections in NYC.

8. **While on-board automated camera enforcement is bringing benefits, speed impacts were not yet observable in publicly available data**: On-board cameras have been growing in usage and have successfully resulted in hundreds of thousands of citations issued. Analysis of 16 bus routes with on-board automated camera enforcement did not find any speed impact from more rigorous ticketing of scofflaws in the bus lanes. The authors are not sure why but hypothesize that the measures are either too new to affect behavior or there are simply too many legal reasons for drivers to enter the bus lanes.

There have been some measurable benefits from the efforts taken by NYC DOT and MTA to date. However, bus ridership has been falling since 2008, and after a sharp drop during the Covid-19 pandemic, it has not recovered, unlike subway ridership. Sadly, the bus priority efforts have not been enough to reverse such significant declines in bus ridership.[5]

On average the measures on these corridors only increased bus speeds from about 7 mph to 7.5 mph. In operational terms, such improvements are significant; yet to passengers, it is not noticeable. One does not board an SBS bus on a bus priority corridor thinking that it is in any way similar to boarding a subway line.

Figure 3. Comparison of the average speed on all bus priority corridors before the implementation of any measures, the corridors with full current DOT toolbox, and the theoretical speed on all corridors, with full BRT features



Data: MTA Open Data (data.ny.gov) and author analysis

How much better could New York City be doing on bus priority?

New York City's bus priority measures have never reached the baseline rating of a Bus Rapid Transit corridor as established by the *BRT Standard*[6]. There are at least 18 full BRT corridors in the US and dozens more internationally. These full BRT corridors have generally achieved much higher average speeds, ranging from 11 to 14 mph[7]. Surely New York can do better.

To determine the potential speed benefits that full BRT measures could achieve in New York City, the potential speeds on the existing bus priority corridors were calculated using an established methodology. As a result of this analysis, it was determined that the average bus speed in New York City on its bus priority corridors could be increased from 8.5 mph to 13.2 mph, on average.

5 Full analysis included paying riders only and indicates that paying ridership is below pandemic (2020) levels. Further analysis indicated that if non-paying riders are included, ridership recovered somewhat from the COVID-19 pandemic period but did not fully rebound.

6 ITDP, *The BRT Standard, 2024 Edition.*

7 It is important to clarify that average bus speeds include stopping time, so they are lower than travel speeds.

Looking forward, NYC DOT and MTA should shift direction in the following ways:

1 Critical features of full BRT should be added to New York City's bus priority toolbox:

- Enclosed pre-paid all door boarding stations level with the bus floor used by all routes on a corridor
- Central median alignment where possible and where congestion is severe
- Full extension of bus lanes and busways through key congestion points on critical bus routes
- Physical barriers to entering the bus lanes
- Turn prohibitions across the bus lanes
- Bus stops set back from intersections by 1-2 bus lengths
- Severed cross streets
- Increased green time for buses, either through better-timed TSP, turn restrictions, or signal progression
- Corridor-specific interventions to address isolated causes of delay

All of these are achievable in New York City, though effort will be required to overcome institutional obstacles and sometimes, community resistance. Politically, most of the hard work – taking the space for a bus lane or busway – has already been done.

2 Return to packaging bus priority measures under a common brand.

SBS was an effort to package bus priority measures at the route- or corridor-level, allowing for the creation of a rapid bus network to complement the subway. Today's bus priority toolkit, as a package, is generally less effective than SBS which included all-door-boarding and stop consolidation. The bus priority toolkit also lacks a brand or a sense of any network. NYC DOT and MTA should return to packaging bus priority measures under a common brand but should aim higher by creating a true BRT network.

3 Reformulate the metrics of success for bus priority in the *NYC Streets Plan*

The "miles of bus lanes" and "number of intersections with TSP" targets in the *NYC Streets Plan* are misdirected and should be reformulated. Curbside bus lanes and TSP have lacked impact on bus speeds but are the most expedient way of meeting those targets. The 2026 update of *NYC Streets Plan* should commit NYC DOT instead to building at least five miles of bus priority corridors each year that reach at least a bronze rating under the *BRT Standard*.

The next report will discuss how and where this should be done.

Chapter 1

Introduction

Since 2008, the New York City Department of Transportation (NYC DOT) and the New York Metropolitan Transit Authority (MTA) have been working together to improve bus services for all New Yorkers. The main focus of this effort has been the aggressive addition of bus lanes and other bus priority measures as an attempt to combat the slowing speeds in the bus system.

New York City made a big effort to roll out bus lanes in the early 1980s under the first Koch Administration, but then efforts stagnated. By 2008, there were about 90 miles of standard part-time, curbside bus lanes around New York City.

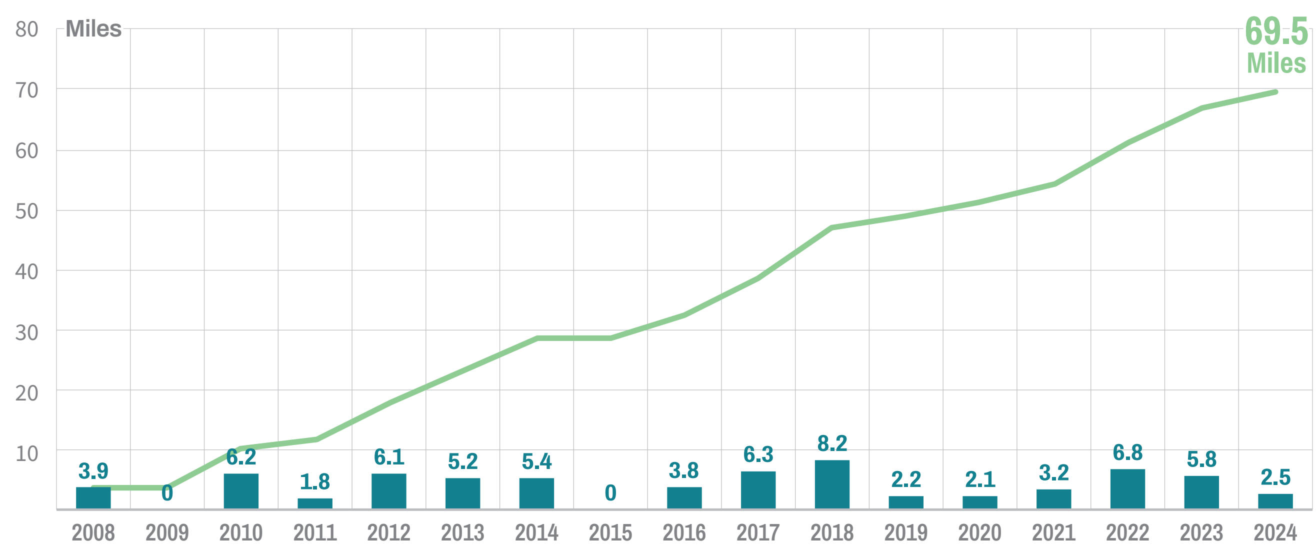
Since then, New York City has been adding roughly five miles of new bus lanes each year, relatively consistently regardless of Mayoral Administrations, and despite efforts by the City Council to speed up the process. (Figure 4)

Yet peak hour bus speeds in New York City were on a downward trajectory between 2015 and 2019. Covid-19 led to a temporary increase in bus speeds as both traffic congestion and ridership declined sharply. As both traffic and ridership began to rebound, average bus speeds correspondingly dropped again to pre-pandemic levels. (Figure 5)

Likewise, bus ridership continued to fall gradually, even before Covid-19. During Covid-19, paying bus ridership dropped from 2.16 million daily trips to only 1.19 million daily trips. Since the pandemic, paying bus ridership has been only gradually recovering. By 2023, it had only recovered to 1.36 million daily trips. (Figrue 6)

Part of this loss of ridership is the result of increasing fare evasion. According to the MTA, fare evasion rates have risen from pre-pandemic levels around 22% to current (2025) levels at nearly 46%. These are historically unprecedented

Figure 4. **NYC has consistently added roughly 5 miles of bus lanes each year since 2008**



Data compiled by the author. We started with: https://data.cityofnewyork.us/Transportation/Bus-Lanes-Local-Streets-Map-/rx8t-6euq. We then checked it against Google earth images for accuracy, and reviewed MTA project-specific documents and Google Earth historical images to determine when they were implemented. We also referenced Tri-State Transportation Campaign's bus lane map: https://tstc.org/nyc-metro-area-bus-lane-map/

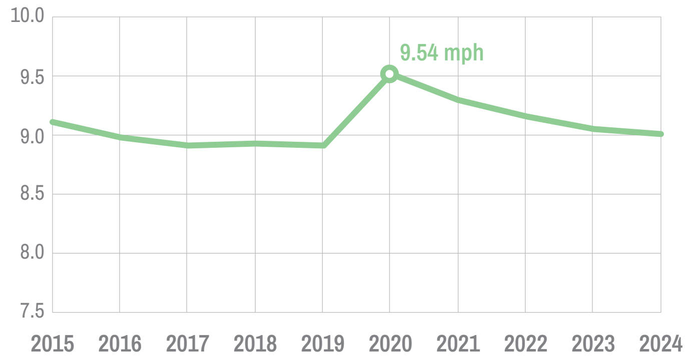
levels of fare evasion, and atypical of global evasion rates. However, fare evasion is not the main cause of loss of ridership. Even with non-paying riders accounted for, ridership is still well below pre-Covid-19 levels. Covid-19 and the changing work patterns that it engendered, as well as the growing use of ride-hailing services, had a much bigger effect. (Figure 7)

To advance the progress of bus priority in New York City, this report evaluates the effectiveness of the measures taken to date and suggests a way forward. It largely corroborates but takes a more granular approach than the "Speeding Up Slowly" 2025 report released by the NYC Independent Budget Office. Additionally, it provides much more detail with respect to:

- The level of effectiveness of specific bus priority measures;
- The continuing specific causes of delay yet to be addressed;
- The potential range of speed improvements in New York City conditions; and
- Additional proven bus priority measures from global best practice that could be deployed in New York City to further increase bus speeds.

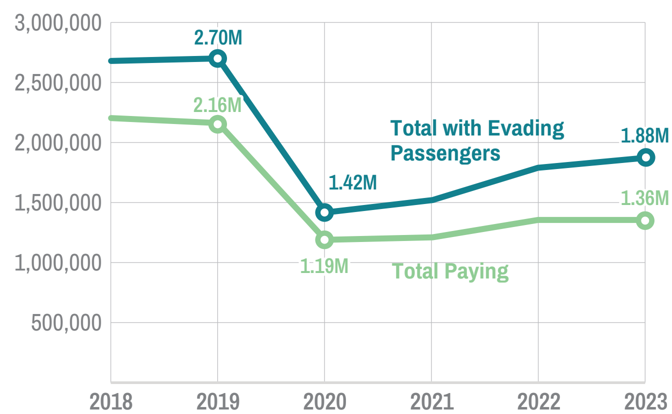
This report will serve as a baseline for a follow-up report which will help to guide the future of bus priority in New York City.

Figure 5. Average bus speeds systemwide in the peak period: 2015 – 2024.



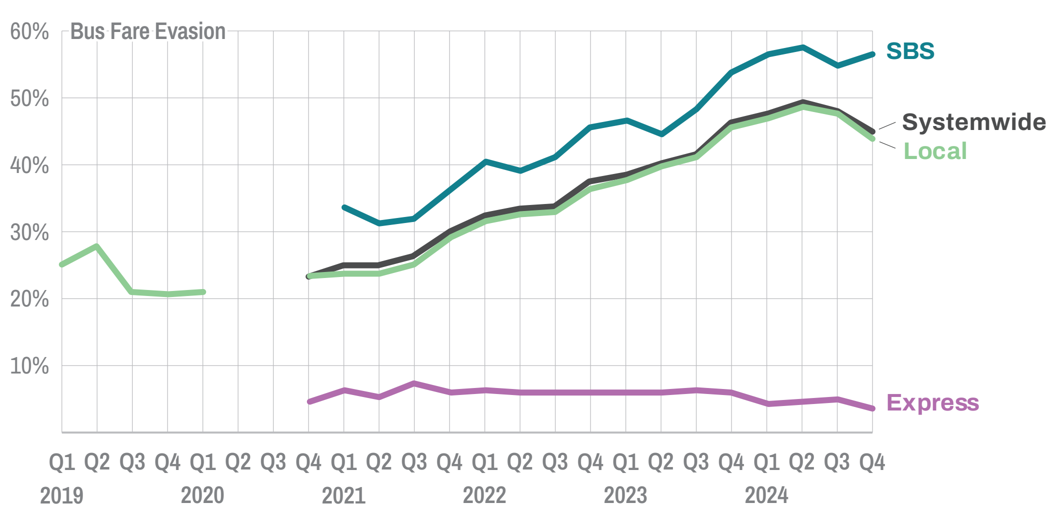
Data: MTA Open Data (data.ny.gov)

Figure 6. Bus ridership systemwide, 2018-2023.



Data: MTA, *Subway and bus ridership for 2023.* Retrieved from: https://www.mta.info/agency/new-york-city-transit/subway-bus-ridership-2023

Figure 7. Fare evasion in the New York City Transit bus system has skyrocketed to over 50% in the last several years.



Data: MTA Open Data (data.ny.gov)

Chapter 2

Background on Bus Priority Around the World

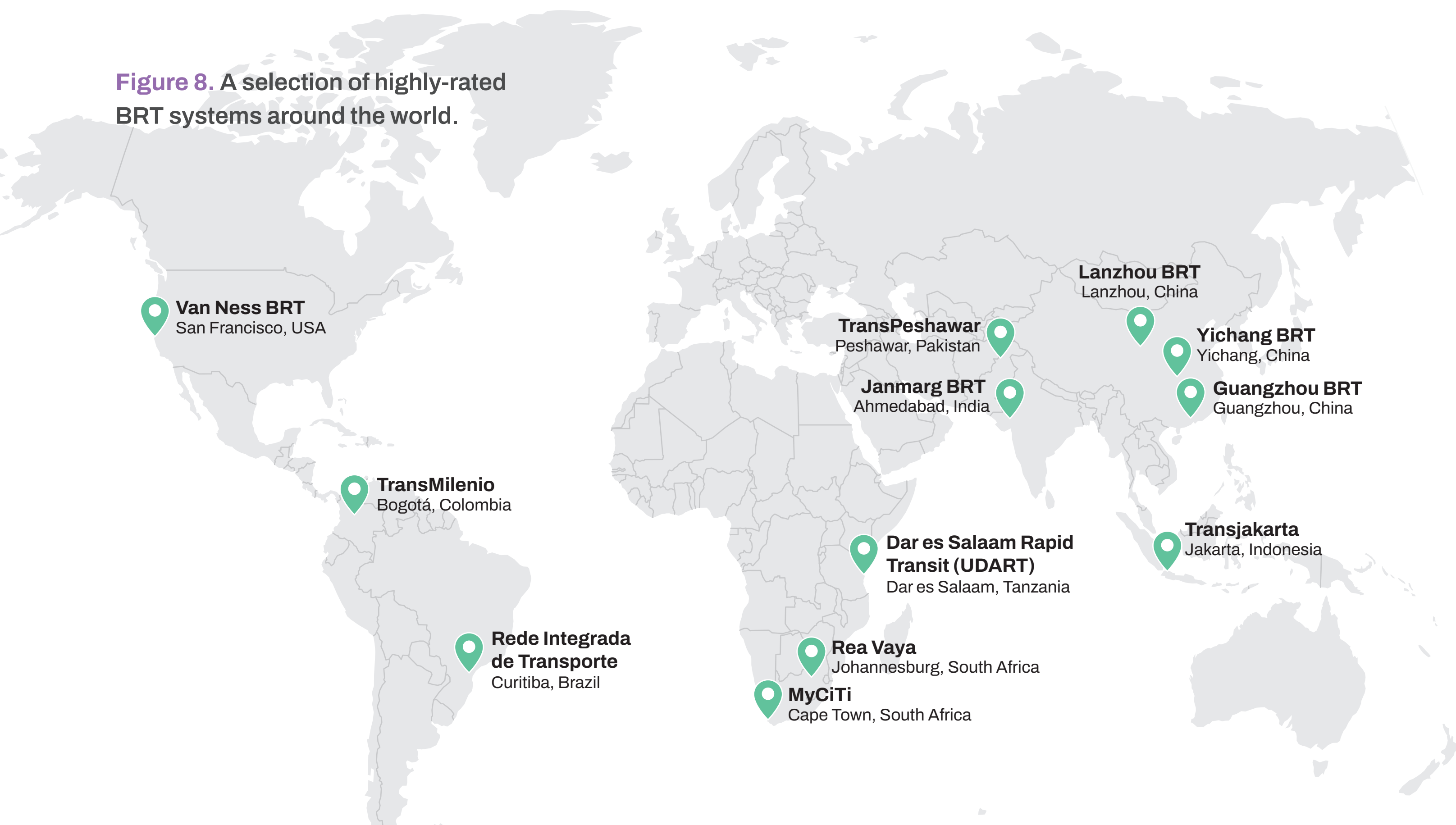


Figure 8. A selection of highly-rated BRT systems around the world.

Bus lanes and dedicated busways have been in use since 1948 when the East Side Trolley Tunnel in Providence, Rhode Island, was dedicated to buses only. In many cities throughout Europe, starting in the 1960s, bus lanes were established as tram systems closed and the dedicated tram lanes were converted for use by buses. Soon after, new bus lanes were being dedicated on former mixed traffic lanes, as in Hamburg (1963), Paris (1964)[8] and in London on the Vauxhall Bridge (1968).[9]

8 Agrawal, A., Goldman, T., Hannaford, N. *Shared-Use Bus Priority Lanes on City Streets: Case Studies in Design and Management* (2012, April). Mineta Transportation Institute.

9 Stewart, J. *Clearing the Way for London's Buses.* (2021, Dec 3). London Travelwatch, https://www.londontravelwatch.org.uk/blog/clearing-the-way-for-londons-buses/

Figure 9. BRT stations in Curitiba are well-known for their tube-like shape.
Photo: Annie Weinstock, People-Oriented Cities

Curitiba, Brazil

Starting in the 1970s, Curitiba, the capital of the Paraná state in Brazil, began experimenting with more ground-breaking bus priority measures. Taken together, these measures comprised the world's first Bus Rapid Transit (BRT) system. They included:

Full stations with pre-paid boarding

From its inception, the Curitiba BRT included full stations, in the form of an iconic "tube." Passengers enter the station by paying their fares and then passing through a turnstile. Once inside the tube, passengers can board the bus from any door. Prior to the implementation of the BRT, roughly two-thirds of the delay on buses was caused by passengers paying the driver. Thus, this innovation reduced the dwell time delay significantly.

At-level boarding

Curitiba also introduced 'at-level' boarding. The floor of the boarding tube was at the same level as the bus floor. In this way, passengers did not have to step up and into the bus; the interface between the bus and the boarding tube was the same as passengers experienced on metro systems.

This at-level boarding meant much less delay when people board and alight from the bus, particularly if the person is in a wheelchair or if they have small children in a stroller.

Dedicated, central median-aligned bus lanes

Curitiba built their dedicated bus lanes into the central verge of the roadway. This position of the dedicated right of way, which had long been used in streetcar systems in Europe, solved numerous problems. In the central median, the buses did not have to contend with delivery vehicles, taxi drop offs, building construction and right turning vehicles that frequently obstructed the curb lane.

Restriction of left turns across the busway

Once the bus lanes were in the central median, it became important to eliminate as many left turns as possible. Otherwise, vehicles turning left across the busway would obstruct the busway.

Bogotá, Colombia

In 2001, a new BRT system opened in Bogotá. TransMilenio borrowed the innovations first developed in Curitiba, but it also borrowed other innovations developed in other cities like São Paulo. TransMilenio added the following additional features:

Express bus routes inside the bus lanes

TransMilenio broke all the records for bus-based capacity and speed. Achieving over 35,000 passengers per direction per hour, while maintaining speeds of about 18 mph, one of the secrets to the high capacity was the large number of express routes. Express routes do not as readily saturate the bus stops because they don't stop at all the stops.

Sub-stops and passing lanes

A single lane busway, even with all the features of the Curitiba BRT system, can only carry a maximum of about 12,000 passengers-per-hour-per-direction (PPHPD), and generally no more than 10,000 PPHPD. Above this, the bus lane saturates at the bus stops. By introducing passing lanes at the stations, and sub-stops where different services could stop, São Paulo proved that that it could radically increase the capacity of its bus corridors. TransMilenio borrowed the concept of passing lanes and sub-stops from São Paulo but applied them with all the other BRT features initially developed in Curitiba. Bogotá was thus the first BRT system to have both the features of sub-stops and passing lanes developed in São Paulo, and all the pre-paid boarding features of Curitiba.

Later Innovations

Following the success of TransMilenio, the Institute for Transportation and Development Policy (ITDP) and other development institutions learned of the significant benefits of BRT and began promoting the concept around the world. ITDP and other organizations sent former Bogotá Mayor, Enrique Peñalosa to keynote major conferences around the world, to bring attention to Bogotá's success. This led to the initiation of numerous BRT projects around the world which ITDP then supported with technical experts. Out of these efforts and the hard work of local advocates, politicians and experts, came Transjakarta, MyCiTi and Rea Vaya BRTs in Cape Town and Johannesburg, the DART BRT in Dar es Salaam, the Guangzhou, Lanzhou, and Yichang BRT systems in China, the Janmarg BRT system in Ahmedabad, India, the TransPeshawar system in Peshawar, Pakistan, the Van Ness BRT in San Francisco, and many other BRT projects.

Because the quality of these systems was highly variable, and many governments and consultants had no idea how to design a high-quality BRT system, ITDP published the *BRT Planning Guide*[10] and the *BRT Standard*[11] with the aim of establishing design standards for BRT systems.

The *BRT Standard* was developed by a committee of technical experts who worked on many of the best BRT systems worldwide, as a simple way of evaluating projects billed as BRT to determine:

a. If they meet the minimum criteria to qualify as BRT

b. Whether they qualify as bronze-, silver- or gold-standard BRT corridors.

It is through the lens of the *BRT Standard*, as well as using various other metrics, that we evaluate the success of the New York City bus priority corridors.

10 ITDP, *The Bus Rapid Transit Planning Guide* (2017). Retrieved from: https://brtguide.itdp.org/branch/master/guide/

11 ITDP, *The BRT Standard* (2024).

Chapter

3 History of Bus Priority in New York City

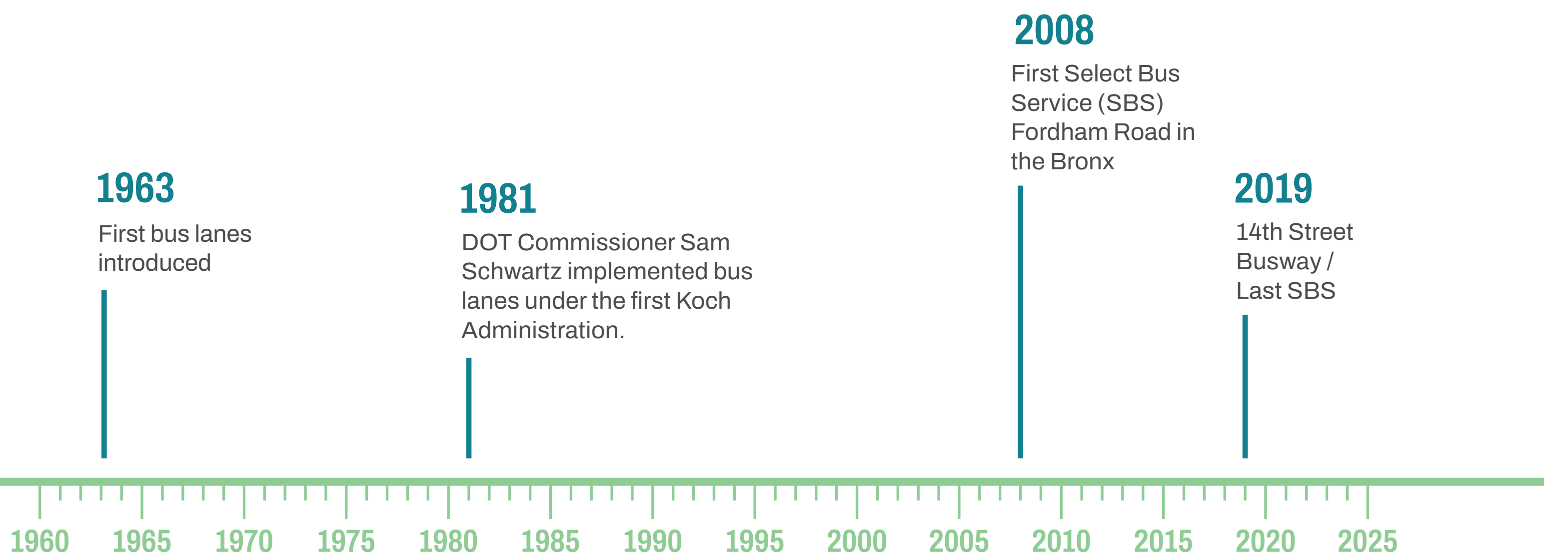


Figure 10. New York City Bus Priority Timeline (selection)

Early Bus Lanes in New York City

The history of bus priority in New York City has proceeded in fits and starts, though in recent years there has been reasonably consistent progress over three Mayoral Administrations.[12]

Buses in New York City, like in the rest of the United States, gradually replaced streetcars that operated on similar routes. The street cars operated in mixed traffic and were not widely popular at the time of their demise. They were frequently stuck behind obstacles which they could not maneuver around, and if there was a failure on the line, the whole line shut down. Starting in 1929 General Motors and the Omnibus Corporation began converting them to buses, a process which continued even after the system was taken over by New York City in 1940. By 1949, all the streetcars had been replaced with buses.

The idea of having dedicated road space reserved for buses in New York City was first mooted in 1959, but no dedicated bus lanes were implemented until 1963. In that year, they were introduced in four locations:

- Bay St and Victoria Boulevard approaching the Ferry Terminal in Staten Island
- Livingston Street in Downtown Brooklyn
- Hillside Avenue in Queens approaching the 169th Street subway station
- Long Island Expressway through Long Island City

In 1969, 42nd Street received a part time bus lane, the first in Manhattan. In June of 1979 a shared bus and taxi lane was created on the 49th and 50th Street pair in Manhattan.

Fulton Mall, the first and only full transit mall in New York City until 2019, was originally supported by Brooklyn retailers starting in the 1970s. They were losing customers

12 A broad outline of this history is available on Wikipedia at https://en.wikipedia.org/wiki/Bus_lanes_in_New_York_City and https://en.wikipedia.org/wiki/Select_Bus_Service.

to suburban shopping malls.[13] It was implemented around 1979, after receiving an FTA grant, and faced little local opposition.

In 1981, during the first Koch Administration, Sam Schwartz, the DOT Commissioner, implemented dual lane bus lanes on Madison Avenue between 42nd and 59th Streets. The speed improvements of these measures were marked, but still surprisingly slow: bus speeds went up from 2.9 to 4.8 mph. Ten more bus lanes were subsequently added under Schwartz in the first Koch Administration: First, Second, Third, Sixth, and Eight Avenues, as well as Broadway in lower Manhattan, 42nd and 57th Streets. A few of the bus lanes were temporarily demarcated with red thermoplastic strips and were enforced by special enforcement officers, but these did not survive. All of these were standard bus lanes with no other bus priority features.

Select Bus Service: 2008 – 2019

The changes that had been introduced in Bogotá in 2001 were well-known by officials and advocates in New York City. In 2002, Peñalosa had been term-limited out of office, and he became a Research Fellow at New York University. Peñalosa popularized his people-centered transportation philosophy with numerous lectures around New York City and was known to Janette Sadik-Kahn who was then at Parsons Brinckerhoff and Chair of the Tri-State Transportation Campaign.

Around the same time, Transportation Alternatives contracted Bruce Schaller, a consultant, to do the first BRT study for First and Second Avenues in Manhattan. Shortly thereafter, the MTA embarked on a corridor prioritization study. The team leading the study included experts who had worked on bus priority measures throughout the United States. This study was reasonably well done, and the corridors being prioritized today have changed relatively little since that study.

In 2007 Janette Sadik-Kahn became the NYC DOT Commissioner. She brought Tri-State Transportation Campaign alumnus Jon Orcutt and consultant Bruce Schaller in as deputies at NYC DOT. Under her administration Select Bus Service (SBS) was first developed and implemented.

SBS, when it was rolled out in 2008 on Fordham Road in the Bronx, and later, on First and Second Avenues in Manhattan, did not quite meet the minimum standard set to define a “BRT” system under the *BRT Standard*. While many key BRT elements were implemented, others proved to be too difficult. The NYC DOT Commissioner tried to push for other measures but some of these measures lay outside of NYC DOT’s jurisdiction. 17 years later, this has still not been achieved.

The roll out of SBS continued into the De Blasio Administration under the leadership of Polly Trottenberg, from 2014 – 2021. The M60, M86, Q44, B46, Q70, M23, M79, Bx6, Q52, Q53, B82, M14A, and M14D SBS routes were all implemented under Mayor De Blasio.

In the last few years, under the Adams Administration, SBS as a brand has been deemphasized by both the MTA and NYC DOT. The latest bus priority efforts are no longer linked to the roll-out of new SBS services and thus lack pre-paid all-door boarding.

Busways: 2019 – 2021

In 2016, it was announced that the L train would shut down for 18 months between Bedford Station and 8th Avenue, due to flooding caused by Hurricane Sandy in 2012. The “L Train Shutdown” would have been catastrophic for subway riders as the segment was carrying 225,000 riders each day.

During the planning for the L Train shutdown, several mitigation measures were floated, including the “14th Street PeopleWay.”[14] Ultimately, a full shutdown of the L Train never came to pass, and instead, a partial shutdown preserved some critical L Train capacity. However, the Fourteenth Street Busway went ahead, becoming New York City’s first new busway since Fulton Mall was built in 1979.

13 Kazis, N. (2011, Mar 14). *The Fulton Street Mall: Retail Success on NYC’s Original Transitway*. Streetsblog. https://nyc.streetsblog.org/2011/03/14/the-fulton-street-mall-retail-success-on-nycs-original-transitway

14 Meyer, D. *How to Keep Buses Moving on the 14th Street PeopleWay.* Streetsblog. https://nyc.streetsblog.org/2016/09/28/how-to-keep-buses-moving-on-the-14th-street-peopleway

Figure 11. **The 14th Street Busway**
Photo: Ben Oldenburg

The 14th Street Busway[15] reserves 14th Street between 3rd and 9th Avenues for buses, trucks, local access traffic, and emergency vehicles. It successfully increased bus speeds by an average of 22%.[16]

The success of the 14th Street Busway led then Mayor De Blasio to implement five more busways:

- Main Street (Flushing, Queens)
- Jamaica Avenue (Queens)
- Archer Avenue (Queens)
- Jay Street (Brooklyn)
- 181st Street (Manhattan).

One additional configuration, a two-way busway with one remaining mixed traffic lane, was implemented in 2024 by the Adams Administration on Livingston Street in Downtown Brooklyn.

It is important to note that while it took significant courage to build these busways, they are not transit malls in the global sense since they are not dedicated to buses only and still allow certain types of traffic.

15 Designation-wise, the 14th Street Busway is indeed a "busway," but it also carries two SBS routes – the 14A-SBS and the 14D-SBS. Thus, these terms are often used interchangeably.

16 See Table 2 of this report.

Bus Priority in the *NYC Streets Plan:* 2019 – Present

Since 2019, New York City has been obligated to produce a Transportation Master Plan every 5 years. Per the law, NYC DOT is required to release a report annually which shows progress towards implementation.

The first one created under this law was the *New York City Streets Plan* (*Streets Plan*) released in 2021, the final year of the De Blasio Administration, under DOT Commissioner Hank Gutman. The next version of this plan will need to be prepared by December of 2026.

The focus of the transit portion of the *Streets Plan* was dedicated bus lanes, bus stop upgrades, and transit signal priority. The target was 30 miles of dedicated bus lanes, 500 bus stop upgrades, and 1,000 intersections with transit signal priority each year.

SBS does not get a specific mention in the 2019 *Streets Plan*. However, under the transit portion of the plan, there is a list of recommendations with mentions of 'Transformative Ideas',[17] next generation 'Subway, Rail and BRT projects,' as well as an investigation into how to better control construction costs.

17 *NYC Streets Plan* 2021. P.65.

Table 1. **Bus priority targets from the NYC Streets Plan, 2021**

Benchmark Category	2022 Benchmark Targets	2022-26 Average Per Year Benchmark Targets	2022 NYC DOT Capacity
Protected Bus Lanes (Miles)	20	30	20
Protected Bike Lanes (Miles)	30	50	30
Bus Stop Upgrades (Shelters or Benches AND Bus Time Poles)	500	500	500*
Transit Signal Priority (Intersections)	750	1000	Up to 750

* Subject to new contract being executed

When Mayor Eric Adams was campaigning, he released a transportation plan known as "Moving Forward Together."[18] In it, he called for full BRT:

> "Projects like the 14th Street Busway and expanded Select Bus Service (SBS) into full Bus Rapid Transit (BRT) will help revolutionize how New York City residents move around New York City and support economic development around transit hubs. We should make SBS service the baseline for bus service, and take advantage of opportunities for true BRT. BRT is cost effective, high quality, and will do the most in the shortest amount of time to build out our transit network without depending solely on New York State. We must create a BRT system that doesn't simply connect communities to Manhattan but to communities within boroughs and interboroughs. I will identify core corridors like Linden Boulevard and 3rd Avenue in Brooklyn, as well as stretches in every borough, to bring a real interconnected BRT system to New York City, starting on roadways with service roads in transit deserts."[19]

Since Mayor Adams has been in office, there have been three progress reports issued on the transportation master plan: the *Streets Plan* 2023, 2024, and 2025 updates. In these updates, while the possibility of developing BRT has been mentioned, no concrete progress has been made toward this goal. The 2023 report mentions 7.7 miles of new or newly permanent bus lanes in 2022, and the 2024 report says that 17.3 miles of bus lanes were completed in 2023. The 2025 report mentions that 13.5 miles of protected bus lanes were completed in 2024.[20] This is well below the targets set by the City Council and reflected in the *Streets Plan*, and a far cry from true BRT.

While much has been made politically of the lack of progress towards the City Council's bus lane goal, less has been said about whether such bus lanes, and other priority measures, are actually effective at increasing bus speeds in the first place.

18 Cohen, C (2021, Nov 23). *'Moving Forward Together' For Dummies*. https://wp.nyu.edu/wagnerplanner/2021/11/23/moving-forward-together/.

19 *Adams 2021: In-depth – Moving Forward Together* (2022, Feb 20) Gotham Gazette. https://www.gothamgazette.com/city/11118-adams-2021-moving-forward-together-transportation.

20 NYC Streets Plan 2025: Update2025. p. 71.

Chapter
4 How Effective Has NYC's Bus Priority Program Been?

To gauge the effectiveness of what has been done in New York City, and to prepare the necessary groundwork for what might be done in the future, an aggregated analysis of all bus priority measures implemented to date was undertaken.

Through its Open Data Program,[21] MTA has been publishing robust sets of data which made this analysis possible.[22] This data, verified with site visits and Google Earth observation, allowed us to map all existing bus priority measures in New York City, noting the type of improvement and the year in which it was implemented.

Some of these bus priority corridors have SBS operating on them as well as several other routes; others primarily serve an SBS and a similar local route.

Figure 12. **Bus priority measures in New York City as of 2024.**
Data: MTA Open Data (data.ny.gov)

21 MTA Open Data Program. https://www.mta.info/open-data
22 https://data.cityofnewyork.us/Transportation/Bus-Lanes-Local-Streets/ycrg-ses3/data_preview

Table 2. Impact of different bus priority measures implemented in New York City, 2008 – 2023

	Average Before Speed (mph)	Current Speed (2023) (mph)	Change (mph)	% Increase	Sample Size
Curbside bus lanes	6.6	6.7	0.04	0.3%	2
Two-Way busway/One-way mixed	6.2	6.4	0.2	2.7%	1
Busway	7.2	7.5	0.3	3.7%	5
Median bus lane	6.0	6.3	0.4	6.1%	3
Offset bus lanes	7.0	7.4	0.5	6.9%	7
All-Door Boarding & Stop Consolidation only	6.9	7.4	0.6	7.6%	2
Offset bus lanes, All-Door Boarding, Stop Consolidation	6.6	7.1	0.6	10.2%	8
Service lane median-aligned bus lanes, All-Door, Stop Consolidation	10.3	10.9	0.7	10.4%	2
Busway, All-Door Boarding	4.5	5.5	1.0	22.3%	1
Curbside, All-Door Boarding, Stop Condolidation	8.1	9.6	1.5	18.9%	3
Weighted Average	**7.0**	**7.5**	**0.5**	**8.0%**	

Note: The S79-SBS does not include all-door boarding but was included in the "Curbside, All-Door Boarding, Stop Consolidation" category for ease of analysis.

Overall bus speed changes

Using the data provided by MTA, we conducted a before/after bus speed analysis on the main bus routes that operate on these corridors.[23] When considering bus speeds, it is important to note that stopping time is factored into average bus speeds. Thus, bus speeds often appear low compared to typical mixed traffic speeds, but this is simply a function of the need to make stops.

While major bus routes extend beyond the limits of the bus priority infrastructure, if the priority measures were put in the right places, they should impact the full route's speed. We did not have access to speeds at the link level before 2023, but we recorded the current link speeds as a data point, as this data became available starting in 2023.[24,25]

The results show the following conclusions:

- The overall average speed increase on affected corridors was 0.5 mph.
- Projects that included all-door boarding had the greatest benefits.
- Curbside bus lanes have had only marginal benefits.
- Offset and median-aligned bus lanes brought some benefit in the 6-7% range.[26]
- Bus lanes when combined with off-board fare collection and stop removal resulted in a 10-20% improvement in bus speeds on average.[27]
- Full busways, absent other measures, brought some modest average speed benefits of 3.7%.
- Full busways, when paired with other bus priority measures, yielded a positive impact, with a 22.3% improvement. This was based, however, on only one data point (14th Street).

23 The speed dataset provided by MTA dates from 2015. As a result, this method was only possible for measures implemented in 2015 or after. For estimates on prior years the speeds and speed impacts were taken from those NYC DOT evaluations of the project which are still available on the NYC DOT's website.

24 This analysis does not consider 2025 speeds which are not yet available for buses but more importantly, would reflect the effects of congestion pricing in Manhattan's CBD, making it difficult to control for specific bus priority measures.

25 Link speed data from: https://data.ny.gov/Transportation/MTA-Bus-Route-Segment-Speeds-Beginning-2023/58t6-89vi/about_data The segments do not fully correspond to the extension of the bus priority measures, so an estimate was made from the information available. Aggregated data from https://reports.jehiah.cz/bus_speeds/

26 Median bus lanes have yet to be paired with an SBS service

27 Given the small sample size, the variance in speed improvements between offset bus lanes with SBS and curbside bus lanes with SBS is probably not significant. The relatively strong performance of the category 'curbside bus lanes with SBS' is driven by the very strong performance of the SBS Bx12 on Fordham Road in the Bronx, which had a 33% improvement in travel times when first implemented, due mainly to big reductions of boarding dwell times.

While the data shows some speed improvements across all measures, the maximum average improvement observed resulted in a 1.5 mph speed increase. This may be helpful to MTA's operating costs, and it is also likely that the measures improved on-time performance. However, it is probably too low for most of the public to notice much of a change.

It is worth noting that these minor speed increases did not result in corresponding ridership increases. To give one example, the B44-SBS route on Bedford and Nostrand Avenues, which led to a larger 23% increase in bus speeds, had no visible impact on ridership. Ridership continued to fall, though at a slightly lower rate than systemwide averages.[28]

Comparing these bus speed improvements to what is possible

While the bus speed changes shown above appear to be marginal, a more scientific comparison was made to determine whether they are indeed marginal or whether they are within the range of what is truly possible, given the best possible toolbox of bus priority measures (i.e., full BRT).

This is done in two ways:

28 Increasing levels of fare evasion are a part of the explanation for the drop in ridership. If fare evasion is accounted for, ridership on the B44-SBS and local service fell sharply because of Covid and then stabilized. Other routes show similar trends. Ridership appears to be driven more strongly by other variables, such as the Covid-19 pandemic and competition from ride-hailing.

1. Benchmarking against theoretical maximum speeds

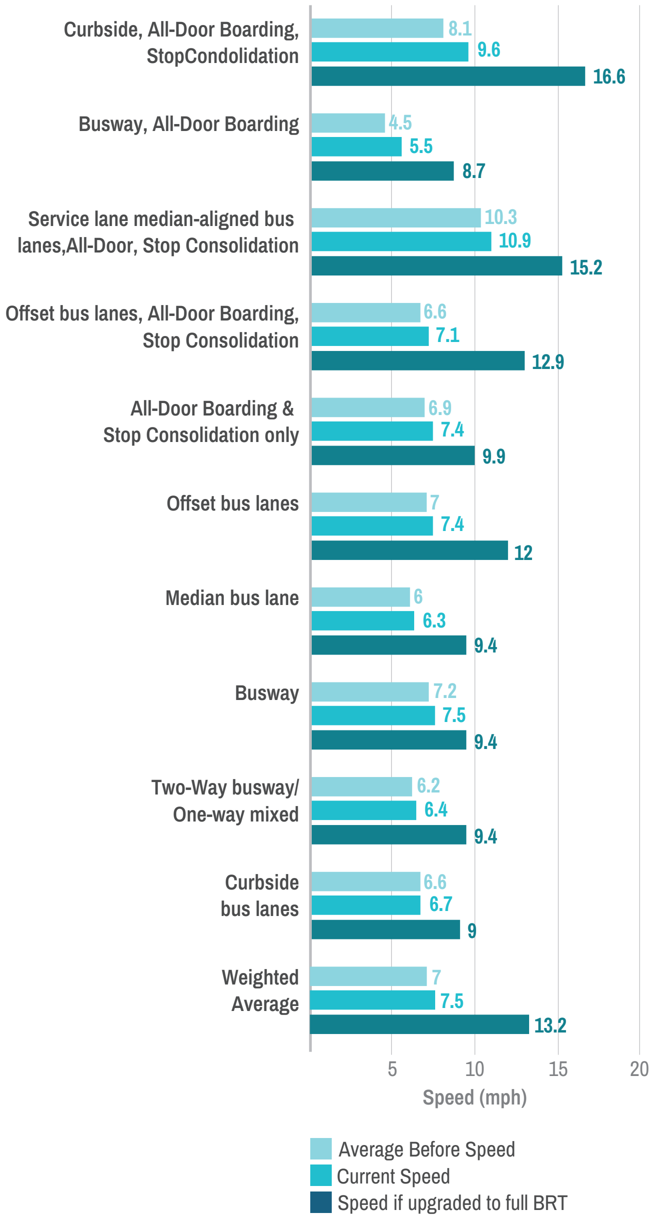
When the current speeds are compared to the theoretical maximum speeds,[29] the following observations can be made:

- The projected average speed for a full-featured BRT in New York City would be 13.2 mph. This would vary somewhat based on corridor-specific conditions.
- Speeds on almost all forms of existing bus priority corridors could be increased by a minimum of 2.4 mph, with greater impacts on corridors with the worst performance.
- The current toolbox is insufficient to reach these optimal speeds.

Of the 33 bus priority corridors analyzed, 19 have the potential to reach average peak period bus speeds of 10 mph or faster. There are likely others citywide with the potential to meet such speeds, but only those that already have priority measures were analyzed.

29 To define the theoretical maximum bus speed for each of the projects included in Table 2 above, a two-step procedure was followed: 1. The end-to-end travel time for mixed traffic on the corridor in question was calculated using Google maps at 3AM, when traffic is generally free flowing. This would automatically capture any delay associated with traffic signals. 2. To capture baseline delay for buses, a fixed dwell time of 12 seconds for each bus stop was added to the freeflow speed. This is the amount of time it takes for a bus to slow to a stop, open and close its doors, and rejoin the traffic. In the US, an average dwell time per bus stop of between 20 and 30 seconds is typically used. However, internationally, standard practice is to break down the dwell time into fixed dwell time and variable dwell time. Variable dwell time is generally reflected in seconds per passenger boarding and alighting as it changes based on number of passengers at each stop. In low volume bus systems like those of most US cities, the distinction is not that critical, but in cities like New York where some bus stops have very high boarding volumes, the distinction is critical both to diagnostics and to recommended solutions.

Figure 13. Existing bus priority corridors with the following characteristics



Data: MTA Open Data (data.ny.gov) and author analysis

2. Benchmarking against international best practice.

While SBS does not measure up to what constitutes BRT under the *BRT Standard*, plenty of other US Cities have managed to meet and surpass the mark. Table 4 includes a selection of US cities with full BRT.

There is nothing particularly exceptional about New York City from a traffic or urban form perspective. The only difference is that New York City lacks sufficient political will.

Figure 14 shows the speeds on BRT corridors in the US and internationally. Speeds range from 11mph to 26mph, all well above the average speed of 7.5mph on NYC's bus priority corridors.

After it was built, the speed on the recently-built Van Ness BRT in San Francisco increased by 36% to roughly 11 mph, and reliability increased by 45%.[30] Cleveland's HealthLine jumped a similar 34%[31] and Eugene, Oregon's Emerald Express jumped 28%[32]. Meanwhile, Mexico City's first BRT corridor, Insurgentes, through a dense street grid with high pedestrian volumes, similar to New York City's streets, jumped 50% from 8.7mph to 13mph.[33]

The higher speeds achieved in some of the other BRT systems are in corridors with a sparser street grid, on former rail lines with few crossings, and lower pedestrian volumes than are found in most New York corridors, so reaching 17 or 18 mph on average is not reasonable. In some cases, small local-access cross streets were also severed, eliminating signalized junctions. The average speed on the NYC Subway is 17 mph, and it does not have to contend with intersections. The average speed on express buses from Staten Island is around 17.2 mph, which operate on highways in an HOV lane with very few stops. However, a minimum speed of 9 mph per corridor and an average speed of 13 mph should be achievable and could be written into the 2026 Streets Plan.

30 *Van Ness Bus Rapid Transit.* SFMTA. https://www.sfmta.com/projects/van-ness-bus-rapid-transit

31 Weinstock, A., Hook, W., Replogle, M., Cruz, R. *Recapturing Global Leadership in Bus Rapid Transit: A Survey of Select U.S. Cities.* (2011, May).

32 *Assessment and Comparison of Travel Time and)Reliability of the Eugene EmX, Los Angeles Orange Line, and Snohomish County SWIFT.* (2017). Center for Urban Transportation Research.

33 *Annexure C – Long case study Metrobus: BRT of Mexico City & Carbon Financing*. UN-Habitat. unhabitat.org/sites/default/files/download-manager-files/Module%206%20-%20Annexure%20C%20long%20case%20study%20BRT%20in%20Mexico%20City.pdf

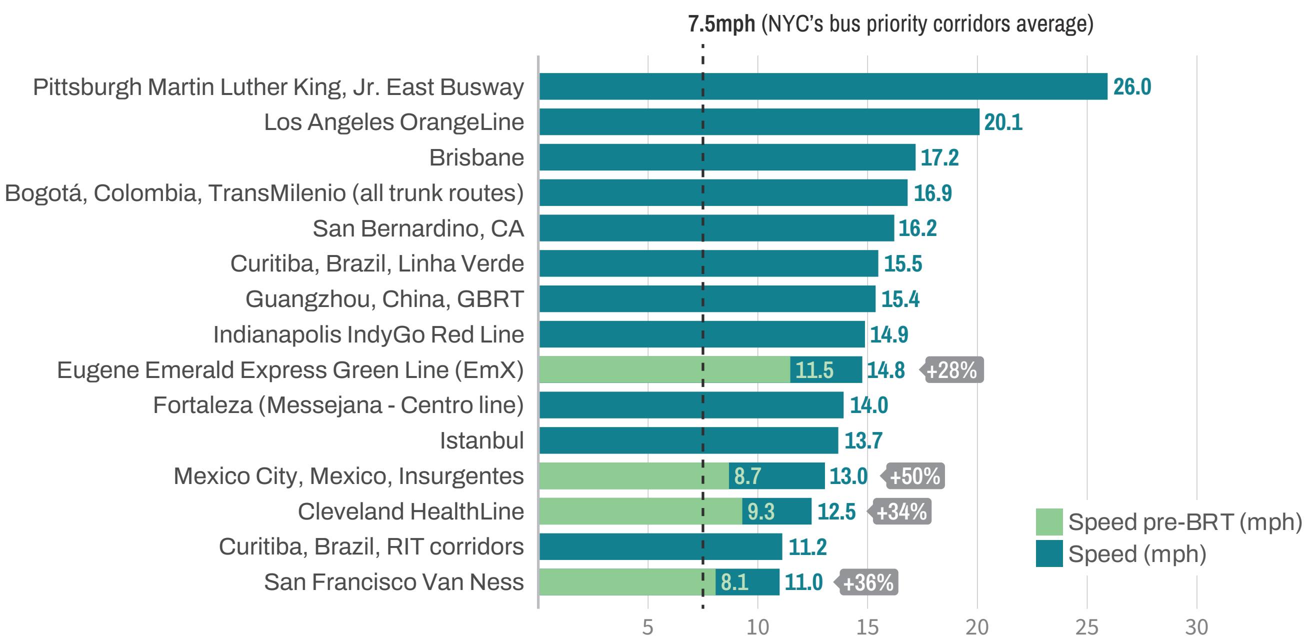
Table 4. BRT corridors in the US and their BRT Standard ratings

City	Name	BRT Standard Rating
Pittsburgh	South Busway	Basic
Pittsburgh	MLK East Busway	Bronze
Pittsburgh	West Busway	Basic
Los Angeles	Orange Line	Bronze
Eugene	Emerald Express	Bronze
Cleveland	HealthLine	Silver
Las Vegas	Strip & Downtown Express	Basic
San Bernardino	sbX – E Street	Bronze
Hartford County	CTfastrak Hartford-New Britain Busway	Silver
Richmond	GRTC PULSE	Bronze
Albuquerque	Central Ave. Corridor – Red line	Gold
San Francisco	Van Ness	Silver

Source: ITDP. BRT Scores. https://itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/brt-scores-2024/

> "A minimum speed of 9 mph per corridor and an average speed of 13 mph should be achievable and could be written into the 2026 *Streets Plan*."

Figure 14. Speeds on BRT corridors in the US and internationally



Data: Pittsburgh Regional Transit Schedule; Center for Urban Transportation Research, "Assessment and Comparison of Travel Time and Reliability of the Eugene EmX, Los Angeles Orange Line, and Snohomish County SWIFT", 2017; Recapturing Global Leadership in BRT, ITDP, 2011; ADDENDUM #1 RFI 20-08-359 Bus Rapid Transit (BRT) Electrical Bus, IndyGO; SFMTA; brtdata.org; CUSTReC, 2016 (from brtdata.org), Alcaldia Mayor de Bogota, "TransMilenio en cifras", 2023; Forteleza Prefeitura, 2019; Unhabitat "Annexure C – Long case study Metrobus: BRT of Mexico City & Carbon Financing"

Chapter 5

Effectiveness of Each Bus Priority Measure

None of NYC's bus priority corridors qualify for even the basic Bus Rapid Transit label under the *BRT Standard*. That said, various measures included in those corridors have contributed to the positive impacts described in the previous chapter.

When NYC DOT designs a bus priority corridor, they first go out to public hearings with a review of existing conditions along the corridor[34] as well as with a general presentation of their Bus Priority Toolkit, which includes the types of interventions under consideration.

The toolkit is generally based on bus priority interventions already implemented somewhere in New York City. In this chapter, we review the toolkit of bus priority measures, as well as several bus priority measures which were implemented under the SBS program but are not listed in the toolkit. Finally, we review several additional measures which would help to better prioritize buses in New York City's streets.

Bus Lanes

The NYC DOT Bus Priority Toolkit offers several bus lane configurations, as shown in Figure 15.

As a point of comparison, the bus lane configuration options which are awarded points under the *BRT Standard* are shown in Figure 16.

> "None of NYC's bus priority corridors qualify for even the basic Bus Rapid Transit label under the *BRT Standard*."

Figure 15. Bus lane cross sections listed in the NYC DOT Toolkit

Offset Bus Lane
Woodhaven Blvd, QN

Center Bus Lane/Physical Protection
161st St, BX

Curbside Bus Lane
Hylan Blvd, SI

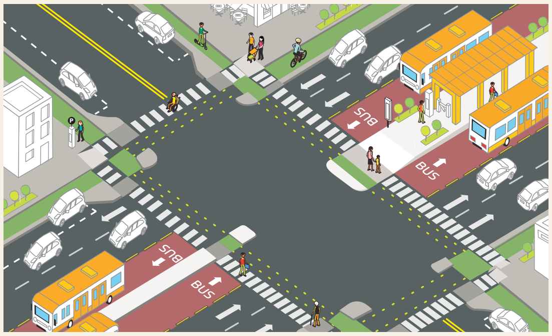
Busway/Transit and Truck Priority
14th St, MN

Source: *Hillside Av Bus Service Improvements: Springfield Blvd to Queens Blvd*. (2024, Jun 11) Community Board 12 Transportation Committee

34 The presentation of existing conditions is generally quite thorough. It first shows how the corridor relates to the bus priority corridors from the Better Bus Plan of 2019. It then shows the routes that use the corridor, and the demand on each of those routes. It also shows bus speeds, and the existing roadway conditions.

Figure 16. Cross-section recommendations in the 2024 BRT Standard

tier 1 configuration examples



Two-way, median-aligned busway that is in the central verge of a two-way road

7 points

Bus-only corridor where there is an exclusive right-of-way and no parallel mixed traffic

7 points

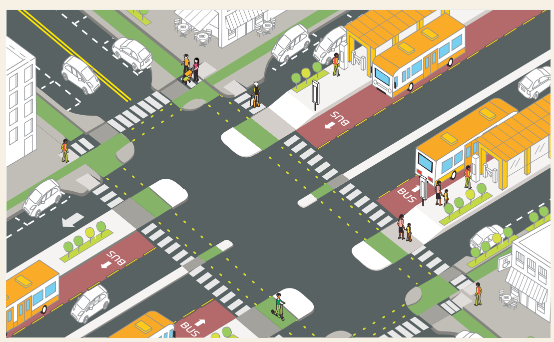
Two-way busway that runs on the side of a one-way street

6 points

tier 2 configuration examples

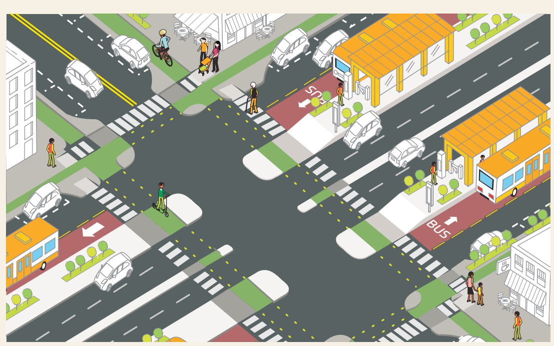
Busway that is split into one-way pairs on separate street and centrally aligned in the roadway

5 points



Busway that is aligned to the outer curb of central road section in street with a central roadway and parallel service road

4 points



Busway that is aligned to the inner curb of service road in street with central roadway and parallel service road

3 points

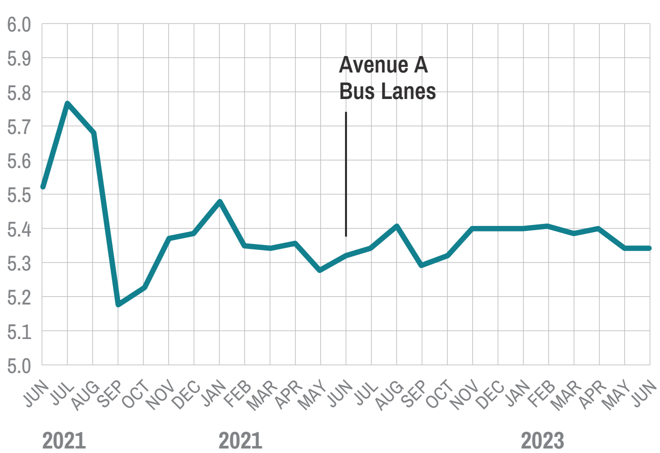
Source: ITDP, *The BRT Standard* (2024). Retrieved from: https://itdp.org/publication/the-brt-standard/

Curbside bus lanes

Most of the bus lanes that were implemented prior to 2008 were curbside bus lanes. While most of these bus lanes were too old to have before and after speed data available, the few data points that do exist from more recently indicate that *curbside bus lanes alone have almost no impact on bus speeds.*

For example, curbside bus lanes were implemented in Manhattan on Avenue A from 5th Street to Houston Street, southbound in June of 2022.[35] This was two years after the 14th Street Busway was implemented and the M14A bus route received off-board fare collection treatments. Thus, one can easily isolate the effects of the curbside bus lane implementation on Avenue A by looking at speeds on the M14A-SBS before and after June 2022. Speeds hovered between 5.3 and 5.4 mph before and after the curbside bus lane implementation with change.

Figure 17. M14A-SBS speeds before and after implementation of the curbside bus lane on Avenue A.



Data: MTA Open Data (data.ny.gov)

Curbside bus lanes, when introduced together with other SBS measures, such as on Fordham Road in the Bronx, Hylan Boulevard in Staten Island, and 79th Street in Manhattan, led on average to a 19% improvement in speeds. There was a wide variance in impact, from 8% (79th St) to 33% (Fordham Rd). Most of the speed improvement, however, resulted from the introduction of the other SBS measures.

> **"Curbside bus lanes alone have almost no impact on bus speeds."**

The *BRT Standard* does not award any points for a curb-aligned bus lane, for the following reasons:

- **Right turning vehicle obstructions**: The curb lane in New York, particularly in Manhattan, is frequently obstructed by right turning vehicles that are waiting for pedestrians to clear the intersection. This forces the bus to wait for the traffic to clear in order to proceed, causing on average a 10 second delay per intersection.
- **Drop-offs and deliveries**: The curb lane is also the most likely to be obstructed by delivery vehicles, building construction, stopping taxis and for-hire vehicles, Access-a-Ride, dollar vans, etc.

It is important to note that both of these traffic functions are entirely legal inside of New York City curbside bus lanes – drop-offs are allowed if they are "expeditious" – and thus cannot be solved through better enforcement.[36] New York City curbside bus lanes are nearly all limited to peak period operation so that deliveries may occur off-peak. While the worst traffic is indeed in the peak period, this does mean that the bus receives none of the benefits of the bus lane off-peak.

Observations of curb side bus lanes in New York City have revealed that even when the bus lane is operational, the bus does not travel in the lane at all as doing so would require it to merge into and out of the lane frequently to avoid obstructions.

Figure 18. Obstruction of curbside bus lane, Fordham Rd.

Photo: Dave Colon, Streetsblog

35 *Better Buses: What's Happening Here? M14A/D Transit Corridor, Lower East Side.* NYC DOT & MTA. https://www.nyc.gov/html/dot/downloads/pdf/m14ad-bus-priority-whh.pdf

36 *Bus Lane Camera Violations.* NYC Dept of Finance. https://www.nyc.gov/site/finance/vehicles/bus-lane-camera-violations.page

Offset bus lanes

A growing number of bus priority lanes in NYC are 'offset' bus lanes, meaning the bus lane is one lane over from the curb lane. On average, when this configuration was implemented without other SBS measures, the average improvement in speeds was 6%. *This is significantly better than the curbside bus lane.*

When introduced in combination with SBS measures, however, the results improve markedly. The speed increases averaged 15% but ranged from 13% to 23%. Most of the benefit still comes from the other SBS measures, but the offset bus lanes also bring some benefit.

Figure 19. Offset bus lane on 34th St with bus bulb occupying the curb lane.

Photo: Walter Hook, People-Oriented Cities

The bus stops, meanwhile, are generally bus bulbs occupying the curb lane for a short section, so the bus stop does not obstruct the sidewalk, and buses may pull straight forward to access them.

In October of 2024, NYC DOT shifted the bus lane on 2nd Avenue between Houston Street and 59th Street from curbside to offset. This had several big benefits:

- It facilitated 24-hour operation of the bus lanes, instead of just peak period operation.
- It allowed for more bus bulb-outs so that bus stops are not on the sidewalk. This also creates space for more ambitious bus stop/station possibilities.
- It removed the bus from the most severe types of conflict found at the curbside, such as being stuck behind right turning vehicles, by allowing the right turning vehicles to take the curb-lane.
- It created a space for the local bus to pull over, allowing the SBS route to pass.

Figure 20. M15-SBS service passing the M15 local to reach bus stop on a bus bulb, 15th St and 1st Avenue, Manhattan.

Photo: Walter Hook, People-Oriented Cities

However, while being a positive shift away from curbside bus lanes, offset bus lanes are still subject to some conflict:

- Regular parking movements: Vehicles attempting to park at the curbside must carry out their parking movement from the adjacent lane
- Right-turning vehicles may be afforded a turning lane next to the curb, but they must cross the offset bus lane to get there and often queue across the offset bus lane while waiting to turn – particularly when pedestrians are crossing
- Double parking is still rampant in New York City and often ends up occupying the lane adjacent to the curb lane – i.e., the offset bus lane.

Thus, the *BRT Standard* also does not award points to an offset bus lane alignment. An optimal solution for a wide one-way street has yet to be agreed upon.

Central median bus lanes

For the first time, NYC DOT's toolkit includes a central median bus lane as an option. Indeed, these have been partially implemented in New York City on three corridors, mostly where the existing cross section easily allows for it. This includes 0.36 miles of central median bus lanes, in only one direction on East Gun Hill Road in the Bronx, 0.55 miles on Edward L Grant Highway in the Bronx, and 0.1 miles on 161st Street.

NYC DOT is currently considering additional central median-aligned busways on Hillside Avenue in Queens, on Flatbush Avenue in downtown Brooklyn, and a few other locations. In addition to being best practice, merchants seem to prefer this alternative because it minimizes the loss of parking and curbside access for their delivery vehicles.

The central median aligned bus lanes in NYC receive full points on the *BRT Standard* in the alignment category. However, they have bus stops to the right, rather than to the left. While this does not affect their scoring for bus lane alignment, it does mean that they do not receive any points for the category Center Stations.

When a BRT station is to the left of the bus, with a single station in the central median serving both directions of travel, it receives 2 points under the *BRT Standard*. This design has several advantages:

- Only one station platform is required instead of two, which is cheaper to build, operate, and maintain.
- It takes less right-of-way than the split platform option if the stations are directly across from each other.
- If the split platforms are offset, the busway lanes cannot be straight.
- Single central stations make transfers between lines in different directions more convenient.

Figure 21. NYC's central median bus stops have one platform to the right of the bus in each direction, E.L. Grant Highway, Bronx.

Photo: Imagery @2025 Airbus, Map data @2025 Google.

New York City has favored this less optimal split station design because the preferred central median station design requires buses with doors on both the left and right sides. This type of bus is generally recommended for bus priority corridors due to its flexibility, but in New York City there has been significant resistance from the MTA.

The examples of central median bus lanes in New York yielded a 6.1% speed improvement before and after: similar to offset bus lanes. The sections, however, were short and in locations without significant existing delay, so the potential benefits of central median alignment could not be fully demonstrated yet in New York City.

Throughout the United States, numerous BRT systems have implemented central-median aligned bus lanes, and their speed advantages are well documented. A short list includes:

- San Francisco, CA, Van Ness Avenue
- Las Vegas, NV, SDX
- Indianapolis, IN, IndyGo Red Line
- Cleveland, OH, HealthLine
- Albuquerque, NM ART
- Eugene, OR
- Madison, WI

Internationally, most BRT systems receiving any rating under the *BRT Standard* have a central median alignment.

"Internationally, most BRT systems receiving any rating under the BRT Standard have a central median alignment."

Figure 22. The Silver-Standard Van Ness BRT in San Francisco increased bus speeds by about 36%.
Photo: SFMTA.

Busways

Figure 23. **Fourteenth Street Busway in Manhattan has had positive impacts. It still allows local traffic and trucks, and the public space could be more built out, including full stations.**

Photo: Walter Hook, People-Oriented Cities

Of all the new busways built in NYC in the last decade only a short section of Archer Avenue is designed to be exclusive to buses. All of the other busways introduced from 2019 to 2021 allow local access vehicles and truck deliveries. The *BRT Standard* does not award any points for nonexclusive busways. Thus, only the short section of Archer Avenue, as well as Fulton Mall in Brooklyn would get full points in the *BRT Standard*'s alignment category (7 points).

There is no appreciable difference between the bus speeds on Fulton Mall, Archer Avenue, and the other busways. The speeds on all the busways range between 5 and 6.4 mph.

In general, speeds on all of these busways increased after implementation, but only by a modest 4% on average. Where the services on the busway have other SBS features, the speed improvements were much greater, at 22%, though only 14th Street falls into this category.

Site visits indicated a few reasons for the modest performance of some of the busways, as described below:

Mixed traffic turnoff delaying buses before busway

On several busways, the speed increases on the busway itself were offset by decreases in speeds on the links just before the start of the busway, as vehicles are queued up to turn off of the busway. Thus, the same bus routes which benefit when they reach the busway experience equal and opposite delay just before the busway.

On the Jay Street Busway, for example, the speed gains on the busway are precisely equal to the speed lost in the section leading up to the busway.

Table 5. **PM peak bus speeds on the Jay Street Busway and in the link just south of the busway.**

Month	Jay Street Busway speed (PM peak)	Bus speed just south of busway (PM peak)
Oct 2019	4.3	5.6
Oct 2023	5.8	4.1
Change	**1.5**	**-1.5**

Data: 2019 speeds from *Jay Street Busway Pilot: Community Advisory Board Meeting #4* (2020, Oct 8). NYC DOT; 2023 speeds from MTA Open Data. data.ny.gov

On Flushing Main Street, observations revealed long delays for buses waiting to enter the busway while stuck in the queue of vehicles forced to turn off of Main Street at 37th Avenue.

Figure 24. **Southbound bus stuck in traffic, waiting to enter the Flushing Main Busway as general traffic is forced to turn off at 37th Avenue.**

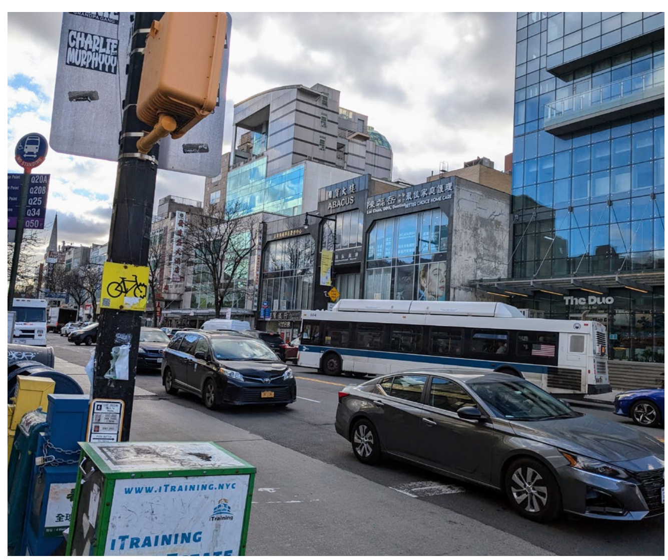


Photo: Annie Weinstock, People-Oriented Cities

Long dwell times

Many buses in these high-demand areas are experiencing long dwell times. While one route might be an SBS route and have all-door boarding, the other bus routes using the busway have very slow boarding with long queues of passengers only entering through the front door.

The slow boarding combined with high boarding volumes and high bus frequencies is contributing to bus stop saturation on some of the busways. In the image of Fulton Mall below, taken during the afternoon peak, the busway is saturated.

Figure 25. Buses backed up on Fulton Mall.

Photo: Walter Hook, People-Oriented Cities

In the image below, one of the causes of bus stop saturation is clear: Everyone is waiting to board through the front door. Bus drivers have stopped opening the rear door to try and reduce fare evasion, so all passengers must board through the front door and validate their payment. This currently takes between 1.5 to 5 seconds per passenger.

Figure 26. Passengers boarding along Fulton Mall must wait for passengers to pay their fare at the front door.

Photo: Walter Hook, People-Oriented Cities

On Fulton Mall, there is a confluence of four popular bus routes, so the traditional proof-of-payment based all-door-boarding mechanism used on SBS routes will not work unless applied to all four routes. As a result, nothing has been done to reduce the boarding delay.

The problem of boarding delay is the most pronounced on Main Street, Flushing.

Figure 27. Passengers waiting for a bus, Main Street, Flushing.

Photo: Walter Hook, People-Oriented Cities

Figure 28. Mother, child, and baby in stroller getting off a Q44-SBS bus, Main St. Flushing.

Photo: Walter Hook, People-Oriented Cities

Bus speeds along Flushing Main Street busway are only around 5 mph, mostly due to high volumes of buses and high volumes of boarding and alighting passengers. A single person in a wheelchair, or a person with a stroller, as shown above, can cause a 30-second to 3-minute delay. With a queue of 30 or 40 passengers waiting to board through the front door, this can spell disaster for bus speeds.

Other vehicles stopping

There are a number of vehicles that are permitted to use the busway, but the designs do not accommodate their stopping.

Figure 29. Postal services, Access-a-Ride, armored vehicles, and others often park in the Fulton bus mall

Photo: Walter Hook, People-Oriented Cities

The NYC busways differ from international best practice in that they allow local vehicles and deliveries, and they are limited to certain hours of the day. As a result, the space reclaimed from the street cannot be turned into permanent high quality public space.

Busways should not be bus termini

The Jay Street Busway is used as a terminus for the B61, B62, B65, and B54. The Flushing-Main Street Busway is the terminus for the Q17,Q19,Q27,Q50, and Q66. While it is important that a bus route be able to park near the beginning of its route and also that drivers be provided with a place to take a break, it would be better to find alternative locations for bus termini. This would decongest the busway, create a more pleasant environment, and allow for the possibility of repurposing some of the street for additional pedestrian space.

Figure 30. **Busways in New York tend to be used as bus termini. Example below is Jamaica Ave, Queens.**

Photo: Walter Hook, People-Oriented Cities

Having dedicated valuable road real estate to buses in dense parts of New York City, the most politically challenging task on these corridors is complete. Yet these busways could be so much more. In Denver, the 16th Street Mall is an attractive, built-out space with buses at its centerpiece.

Figure 31. **Denver's 16th Street Mall is a beautifully architected transit-only space.**

Photo: Uncover Colorado.

Internationally, a growing number of cities are building transit malls.

Figure 32. **World class station design on Belo Horizonte's downtown busway.**

Photo: The Institute for Transportation and Development Policy (ITDP)

Compare this to the quality of the streetscape on the Jay Street Busway, which already appeared degraded after one year of operation, and where no attractive public space was created.

Figure 33. **The Jay Street Busway missed a great opportunity for quality design.**

Photo: Adam Light, Streetsblog NYC

Two-way busway, one-way mixed traffic

In many cases, city streets are either one-way streets, or they are too narrow to handle central median bus lanes and mixed traffic lanes in both directions. In this case, the *BRT Standard* accepts two-way bus lanes with one lane of one-way mixed traffic. This configuration receives 6 out of 7 points.

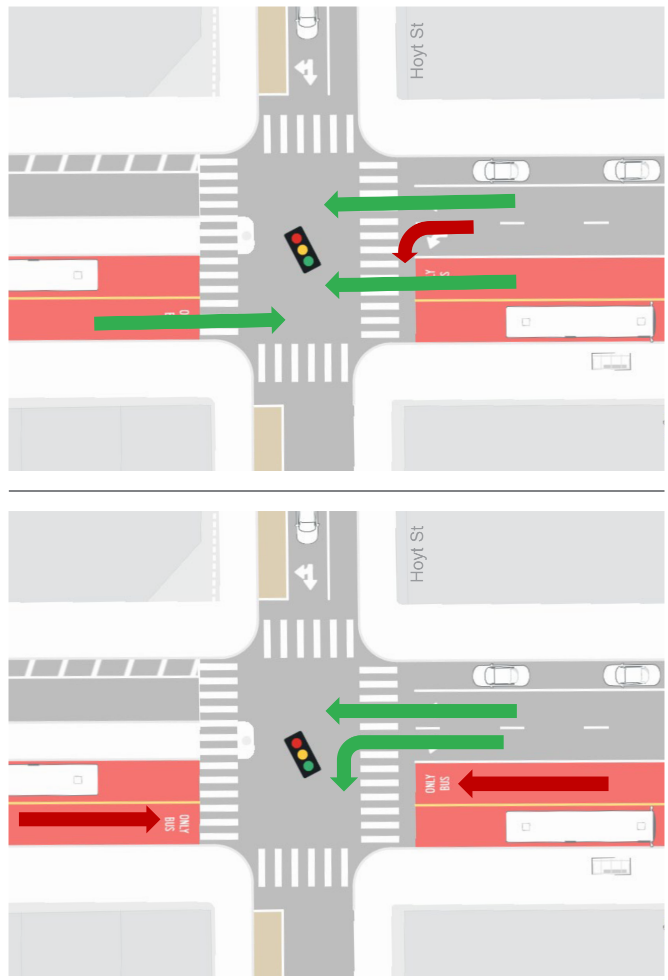
New York City opened its first bus lanes with this configuration on Livington Street in Downtown Brooklyn in 2024. If successful, this configuration could have wider application in New York.

To date, the data shows only a modest 2.7% improvement in the speeds on the route on the segment affected, and the speeds are only about 4.7 mph, not much different than before the intervention. The reasons for the lackluster performance are similar to those experienced on the busways. There are both design issues and enforcement issues. The design issues are as follows:

Left turn at Livingston and Hoyt delaying the bus

The *BRT Standard* recommends removing left turns across bus lanes to reduce delays faced by buses at signals. On Livingston Street, one left turn is allowed, and as the cross street is backing up, the left turning vehicles are getting stuck and blocking the busway.

Figure 34. The left turn on Livingston and Hoyt causes more delay to the busway than to the mixed traffic lane, and turning vehicles frequently block the bus lane.



Source: *Livingston Street Transit Priority Study, CAB Meeting #2 – Project Concept Discussion.* (2023, May 11). NYC DOT. https://www.nyc.gov/html/dot/downloads/pdf/livingston-st-bus-priority-study-cab2-may2023.pdf

Figure 35. Left turn across the Livingston Street busway blocks the busway.

Photo: Walter Hook, People-Oriented Cities

Bus stops are too close to the intersections and too short

The *BRT Standard* recommends placing bus stops 1-2 bus lengths from the intersections, and designing bus stops with at least two boarding platforms. On Livingston St, the bus platforms have been placed directly next to the intersections. As it is a popular bus lane, frequently two or more buses will arrive at the bus stop in rapid succession. If the first bus is occupying the bus stop, there is a high likelihood that the bus behind it will either miss the traffic signal or will block the cross street.

Figure 36. Livingston Busway bus stops accommodate only one bus and are right at the intersection. If two buses arrive at the stop at once, the buses end up blocking the intersection.

Photo: Walter Hook, People-Oriented Cities

No other bus priority measures

There are no SBS routes on the busway. There is, therefore, high boarding delay, which slows the buses.

Illegal parking in the bus lanes

The bus lanes are also frequently blocked by illegally parked vehicles, delivery vehicles, idling school buses, medallion-abusers, and Access-a-Ride vehicles.

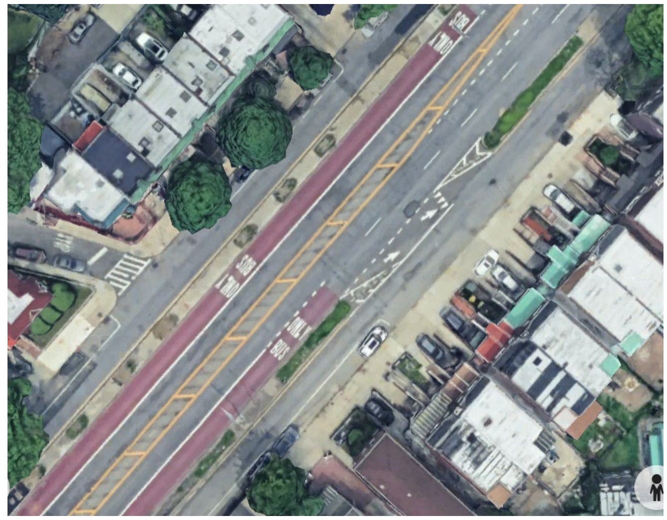
While this is primarily an enforcement problem, it is also a design problem. Before completing the design, some of these activities could have been anticipated. The road is wide enough for parking/deliveries on one side of the street, with a lot of space wasted in an unused buffer. Delivery bays and idling locations for school buses could probably have been incorporated into the design to some extent.

Figure 37. Numerous illegally parked vehicles are evident on both sides of Livingston St

Photos: Walter Hook, People-Oriented Cities

Bus lanes along a service lane median

Figure 38. Bus lanes adjacent to a median separating a service road: example from Kings Highway



Source: Imagery @2025 Airbus, Map data @2025 Google.

If a road has a service lane, many of the difficulties with a curb-aligned bus lane are revolved. Right turns, deliveries, and other frequent curb-lane obstacles all tend to occur in the service lanes, depending on the specific road design. The *BRT Standard* gives 4 points for bus lanes aligned to the curbside of the inner road.

The main downside of this configuration is that there are generally slip lanes that allow vehicles to pass from the through lanes to the service lanes. If there is a lot of traffic, these transition movements can end up blocking the bus lanes.

There are two examples of this configuration in New York City: the 1.5-mile Kings Highway bus lanes and a 1.4-mile section of Woodhaven Boulevard in Queens. The before-and-after impact data is clearer in the case of Kings Highway. The bus lanes, together with the SBS all-door boarding and stop removal, resulted in a 21% improvement in bus speeds, or 1.46 mph improvement. Some portion of this was likely due to the presence of all-door boarding. Woodhaven Boulevard's measures showed no significant improvement, the reasons for which warrant further analysis.

Bus Lane Protection

Beyond bus lane alignment, the *BRT Standard* awards various points for the way in which bus lanes are separated and enforced. These include full physical separation, on-board bus cameras and fixed on-street cameras, as well as colorization.

Table 6. The *BRT Standard*'s scoring for dedicated lane separation

Type of Dedicated Right-of-Way	Points	Weighted By
Physically separated, dedicated lanes	7	% of corridor with type of dedicated right-of-way
Dedicated lanes enforced with technological surveillance measures (i.e., closed-circuit television or CCTV, radar)	6	
Color-differentiated, dedicated lanes with no physical separation	5	
Dedicated lanes separated by a painted line	4	
No dedicated lanes	0	

When NYC DOT physically protects a bus lane, it generally uses plastic flexible bollards. These plastic bollards tend to be rapidly destroyed, leaving behind a crumpled mess of plastic.

Figure 39. Physical protection is amongst the tools in NYC DOT's bus priority toolkit.

Photo: *Hillside Av Bus Service Improvements: Springfield Blvd to Queens Blvd*. (2024, Jun 11) Community Board 12 Transportation Committee.

Figure 40. Typical lane dividers used in Latin America:

Photo: Walter Hook, People-Oriented Cities.

NYC DOT has done an impressive job rolling out red-colored pavement inside the bus lanes to indicate that the lane is for buses only. In terms of physical protection of the bus lanes, there is room for improvement. In most of Latin America, low curbs are the most common treatment.

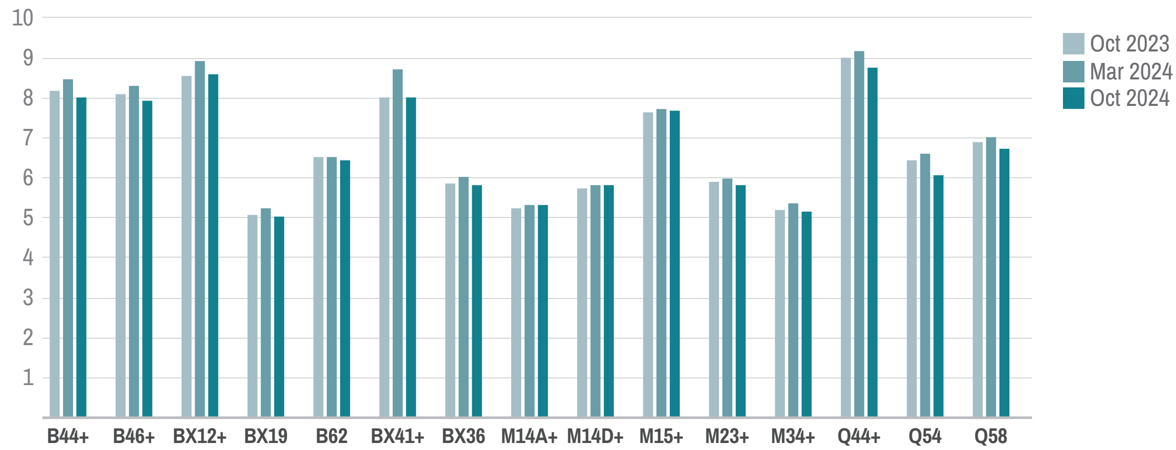
This gives protection from encroaching vehicles while not being insurmountable in case of a breakdown or obstacle. In New York these have been resisted by the Department of Sanitation as they make snow clearance more difficult. This problem also applies to the flexible bollards.

Automated Camera Enforcement (ACE)

MTA increasingly uses bus-mounted Automated Camera Enforcement (ACE) and fixed roadside-mounted cameras for enforcement of the dedicated bus lanes. As of June 2024, there were 623 buses on 14 routes equipped with ACE. Between 2019 and June 2024, the ACE program resulted in issuance of 438,660 notices of violations related to illegal usage of bus lanes.[37]

37 *MTA Announced Bus Lane Camera Enforcement Expanded to Include New Violations.* (2024, Jun 17). MTA. https://www.mta.info/press-release/mta-announces-bus-lane-camera-enforcement-expanded-include-new-violations

Figure 41. Bus speeds on 15 routes generally decreased despite the implementation of on-board cameras.



Data: MTA Open Data (data.ny.gov)

While any number of citations issued against drivers who block the bus lane can be seen as a positive, analysis of the impacts of this program reveals few, if any, speed benefits so far.

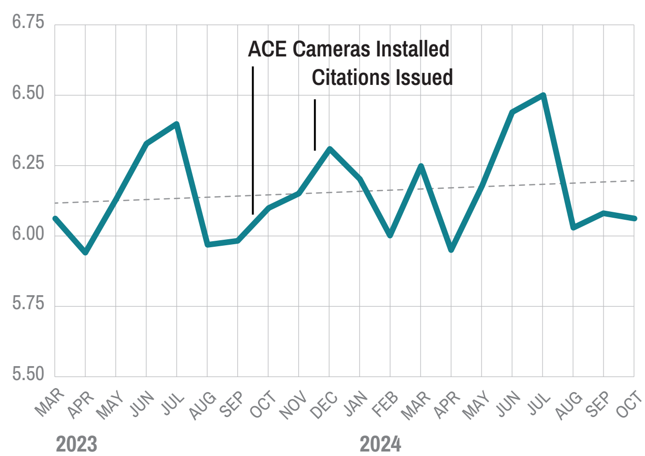
In June 2024, 15 bus routes were outfitted with bus-mounted cameras. By law, cameras may only issue warnings for the first two months of operation and citations thereafter. Thus, the full effects of the cameras on the 15 bus routes would not likely be felt until August 2024. We conducted a speed analysis on all 15 bus routes looking at average peak period speeds in October 2023 and March 2024 – before the cameras were installed, and in October 2024 – two months after the cameras began issuing citations.

On most of the bus routes, the speeds in October 2024, two months after the cameras began issuing citations, were the lowest of the three data points. Thus, this initial analysis did not reveal any speed benefits from the cameras.

One possible explanation is that drivers may need to receive one citation before changing behavior. Thus, it is possible that this dataset does not capture the longer-term behavioral changes associated with camera enforcement. Therefore, we conducted an additional analysis. We looked at the B26, a route on which cameras were installed in September 2023 and for which there is therefore more data post-implementation.

Despite the longer period of time following the issuance of citations, bus speeds on the B26 tend to hover around 6.1mph.

Figure 42. Bus speeds on the B26 hovered around 6.1mph despite implementation of on-board cameras in September 2023.



Data: MTA Open Data (data.ny.gov)

It may be that despite the cameras effectively issuing citations, if even one vehicle is stopped in a bus lane, the bus may tend to travel outside of its lane. Merging in and out of the lane is more troublesome for drivers than simply driving in the next lane over. Again, there is a range of legal reasons why a vehicle travel or stop in the bus lane[38].

38 *Bus Lane Camera Violations.* NYC Dept of Finance. https://www.nyc.gov/site/finance/vehicles/bus-lane-camera-violations.page

Bus Stops

The NYC DOT bus stop toolkit includes several features of standard New York City bus stops and is disappointing when compared to best practice.

Bus boarding islands are one of the more notable measures, particularly when built out of concrete. In general, NYC DOT refers to a bus boarding island as a bus stop that occupies what would otherwise be a parking space. This is generally combined with an offset bus lane and a bike lane. By routing the bike lane behind the bus stop, it resolves the conflict between passengers boarding the bus and cyclists. It is a good design for offset bus lanes but is not best practice which tends to discourage offset and curb-aligned bus lanes altogether.

Beyond that, the bus stop portion of NYC DOT's toolkit offers little beyond the status quo. The bus stop – or BRT station as the case may be – can be the pièce de resistance of a bus priority project. Not only does it provide a critical function in terms of speeding up passengers' trips, but it also serves an important comfort, as well as architectural, function.

Thus, critically missing from the bus stop toolkit are the following:

Figure 43. BRT Stations in Taichung are imaginative and exciting.

Photo: Neillin1202 (wikimedia commons)

All-door boarding

BRT stations allow for all-door boarding in a way that equitably allows enforcement against fare evasion. While SBS has all door boarding, it also has some of the highest fare evasion rates in the world. When inspectors perform their checks, they often stop the whole bus, rather than ride to the next stop. With OMNY this is a more cumbersome process, and no longer just a matter of checking slips of paper.

An enclosed station, on the other hand, is a pre-paid fare zone, similar to a subway station, generally through the use of turnstile entry. This removes all the delay during the boarding and alighting process associated with fare payment. It also simplifies the enforcement effort against fare evasion. An inspector only needs to watch the entrance to the station and does not need to check every passenger.

> **"The bus stop portion of NYC DOT's toolkit offers little beyond the status quo. The bus stop – or BRT station as the case may be – can be the pièce de resistance of a bus priority project."**

Additionally, an enclosed station can provide all door boarding to all the buses that use the station, not only SBS routes. This is critically important on New York City's busways which tend to accommodate a number of non-SBS routes.

Level boarding

A BRT station should have the same bus-platform interface as the subway has with the subway cars, so that people can board quickly and without difficulty.

True accessibility

The bus priority toolkit mentions accessibility as a tool, but accessibility is limited to the kneeling of the bus, which lowers the bus step-in height but does not bring it to level, or to the use of a wheelchair lift which causes an extensive delay. Level boarding provides a seamless boarding and alighting experience for passengers in wheelchairs (Figure 44). Yet better stops or stations may also include a host of other accessibility measures, such as tactile ground surface indicators like that found at the edge of a subway platform, Braille readers, and sufficient lighting.

Weather protection

High-quality stations provide full weather protection so that people are safe from the rain, wind, cold, and sun. NYC's bus shelters, including those found in the toolkit, are meager at best.

Architectural value

High-quality stations can be an architectural statement. They provide the bus-riding public with the sense that this new system is important and that they, as bus riders, are valued. While new subway stations in New York City, such as the 2nd Avenue Subway stations have received significant investment and architectural design, the SBS stops receive the same shelters as the rest of the bus system. New high-quality shelters can also add value to a neighborhood, if designed in an aesthetically pleasing manner.

Figure 44. Bus boarding can be slow, difficult, and inaccessible (SBS, top) or quick and easy and fully accessible (Ahmedabad BRT, bottom).

Photo: Annie Weinstock, People-Oriented Cities

Photo: The Institute for Transportation and Development Policy (ITDP)

> **"High-quality stations can be an architectural statement. They provide the bus-riding public with the sense that this new system is important and that they, as bus riders, are valued."**

Stop Consolidation

Though not mentioned directly in the toolkit, as it falls more under MTA's purview, bus priority projects often use stop consolidation as an important way of increasing bus speeds. In built up areas, bus stops are optimally spaced approximately every quarter of a mile, or about 1,320 feet. It is at this distance that the time spent by all the passengers on board the bus waiting at a stop tends to equal the time spent by the passengers who need to walk to the nearest station.[39] If there is sufficient demand on a route or corridor, splitting the service into a limited and a local may make sense.

In New York City, local bus routes have relatively short distances between stops. Depending on the type of service, bus stops can be as little as every 600 feet, with local buses stopping every 600 – 1,000 feet. These close stop distances reflect the fact that local routes are often used by passengers for whom walking is more difficult.

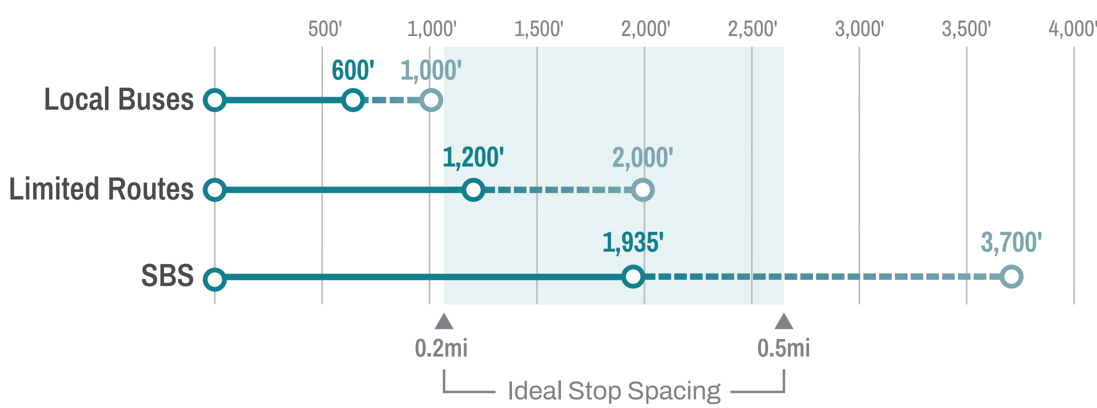
Many of the SBS routes were operated on corridors where formerly both a local and a limited stop service operated. The limited routes had average stop distances between 1,200 and 2,000 feet. The SBS that replaced them averaged between 1,935 and 3,700 feet. Usually, just a couple of stops were removed. This resulted in increased speeds for passengers looking for a faster trip, while retaining a local service for those with difficulty walking.

Some of the speed benefits of SBS were therefore the result of stop removal. On average, the removal of a stop would save between 12 and 15 seconds per stop, which is the average fixed dwell time of a bus, depending on the bus type.

The primary measure in the MTA's borough-by-borough bus network redesign program has been stop consolidation. In the first year after the Bronx Bus Network Redesign was implemented, bus speeds across the borough increased to an average of 7.83 mph, up 2% from the 7.68 mph seen in the first half of 2022. This is not a huge jump in speed, but boroughwide it yielded significant benefits.

The *BRT Standard* awards 2 points for spacing between stops on the base service that is between 0.2 and 0.5 miles (1056 and 2640). It also offers 4 extra points where both local and limited services are offered on the same corridor. These services need to be part of the BRT service and have the same amenities as the BRT service. In this sense, on SBS corridors, because the local buses do not include off-board fare collection, they would not get the points for multiple services on the corridor.

Figure 45. Bus stop spacing



39 BRT Planning Guide, Volume 2, Section 6.7.1. (ITDP, 2017)

Off-board fare collection/ All-door boarding

One of the most important elements of the SBS program was the collection of fares off-board the bus. Much of the delay on New York City buses was caused by the time consumed by passengers queuing to pay upon entering the front door of the bus. When SBS was introduced, customers validated their payment (cash or MetroCard) at kiosks at the stop and received a paper slip that could be shown to an inspector to prove they had paid. This meant that passengers could get on the bus from any of the two, and eventually three, doors at once, and there was no delay once entering the bus to stop and pay with the driver looking on.

This form of pre-payment, known as proof-of-payment, requires ticket inspectors to travel up and down the corridor checking that people have the slip of paper. The inspections often delay the bus, as they tend to stop the whole bus to perform checks.

Cash was (and still is) accepted on NYCT buses, and while rarely used, a single cash payment can cause a very significant delay.

As shown in Table 2, off-board fare collection (paired with stop consolidation) has been the most impactful of all bus priority measures implemented to date, as the projects with the greatest speed increases all included this measure.

A major change in the fare collection system took place starting in 2019: the OMNY payment system was implemented across the New York City subway and bus system. OMNY allows passengers to tap their credit card, phone, or OMNY card which is a faster process than swiping a MetroCard. This has slightly reduced the transaction time for fare validation on non-SBS buses.

However, on SBS buses, passengers using OMNY no longer validate off the bus; instead, while it is still possible to board at any door of an SBS bus, validators are on-board the bus at all doors. The SBS ticketing machines are not equipped with OMNY readers, so for the growing number of passengers who rely on OMNY to pay their fare, they have no option but to pay on board. Unfortunately, OMNY readers have been installed directly at the doors rather than further inside the buses. This means that some queuing of passengers to board has returned to SBS. Thus, while boarding an SBS bus is still faster than boarding a non-SBS bus, due to the existence of all-door boarding, the reversion to on-board validation has added new delay to SBS. This has slowed down the boarding process at high volume stations somewhat, a problem mitigated perversely by the severe growth of fare evasion.

Figure 46. OMNY readers were installed too close to the back door which will result in passenger queuing to board.

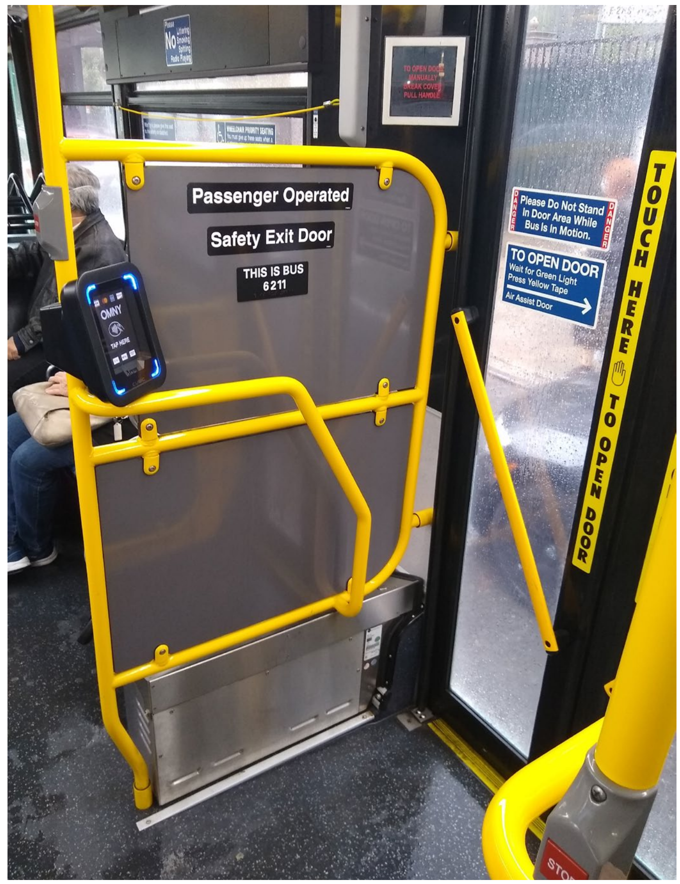


Photo: Walter Hook, People-Oriented Cities

This is also of critical importance because the deployment of OMNY was originally promised to pave the way for bus systemwide off-board fare collection – not only on SBS but on all New York City Transit buses[40]. The promise gets repeated often by the MTA.[41] Yet in an effort reduce fare evasion, non-SBS buses still do not allow passengers to enter the rear door of the bus.[42]

40 Meyer, D. *MTA Unveils a Bus Turnaround Plan We Can Believe In.* (2018, Apr 23). Streetsblog. https://nyc.streetsblog.org/2018/04/23/mta-promises-a-bus-action-plan-we-can-believe-in.

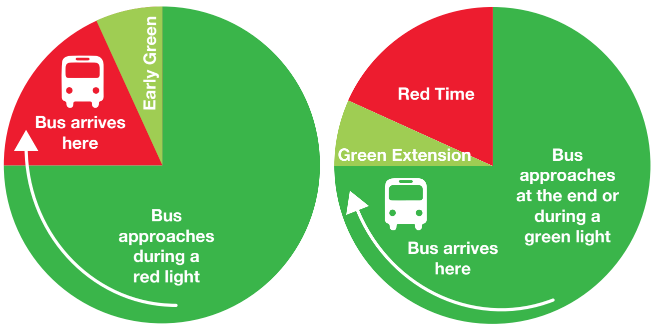
41 Duggan, K. *MTA Again Floats Back Door Boarding Once Students Get OMNY.* (2024, May 20). Streetsblog. https://nyc.streetsblog.org/2024/05/20/mta-again-floats-back-door-boarding-once-students-get-omny.

42 Colon, D. *The Dream of All-Door Bus Boarding is Victim to MTA's Fare Evasion Fears.* (2025, Jan 30). Streetsblog. https://nyc.streetsblog.org/2025/01/30/omnys-fabulous-success-means-nothing-for-all-door-bus-boarding

Transit Signal Priority (TSP)

TSP is a technology which allows a red traffic light to turn green a few seconds early, or a green traffic light to remain green for a few extra seconds, when a bus outfitted with a transponder is approaching.

Figure 47. Signal timing diagrams showing how TSP can extend green signal time for buses at the beginning or end of the signal phase.



Source: NYC DOT, "Green Means Go: Transit Signal Priority in NYC"

Over the last decade or more, NYC DOT has occasionally announced a big push to install TSP at a large number of new intersections. For example, in 2017, Commissioner Polly Trottenberg announced that "DOT will quadruple our installation rate, covering over 1,000 intersections total and 15 additional routes by 2020."[43] Indeed they exceeded this goal by installing TSP at around 648 intersections in 2020, resulting in a total of 1,382 intersections equipped with TSP.[44][45] And again in 2021, the MTA and DOT announced the expansion of TSP to an additional 750 intersections by 2022.

A lot is made over the impacts of Transit Signal Priority (TSP) in New York City. In 2017, NYC DOT released a report entitled "Green Means Go: Transit Signal Priority in NYC." The report concluded that "on average, TSP has reduced bus travel times about 14 percent during weekday peak morning and evening commuting periods. Results vary by corridor, direction, and time of day, with travel time savings ranging from less than 1 percent to up to 25 percent."[46] That report has formed the basis of the last eight years of TSP advocacy and political exaltation.

Yet a closer look at that report reveals some flaws in the analysis:

M15-SBS

Transit Signal Priority on the M15-SBS was installed in 2012, according to an NYC DOT report evaluating the effectiveness of the M15-SBS project.

The *Green Means Go* report indicates between 4.7% – 18.2% decrease in travel time on the M15-SBS between South Ferry and East Houston Street, varying by time of day.

The "before" date that DOT selected for this analysis is April 2010, while the after date is May 2014. SBS on this corridor was implemented in October 2010. In the South Ferry to East Houston Street portion of the M15-SBS route, off-board fare collection and the elimination of 9 local bus stops were included in the SBS implementation, both of which occurred after April 2010 and before May 2014 (namely in October 2010).

Off-board fare collection and stop elimination were discussed in an earlier section of this report. Both have played a large role in the speed increases on SBS routes citywide. It is, therefore, impossible to attribute the travel time decrease observed between April 2010 and May 2014 to TSP. Yet the *Green Means Go* report does just that, without even mentioning these other important factors.

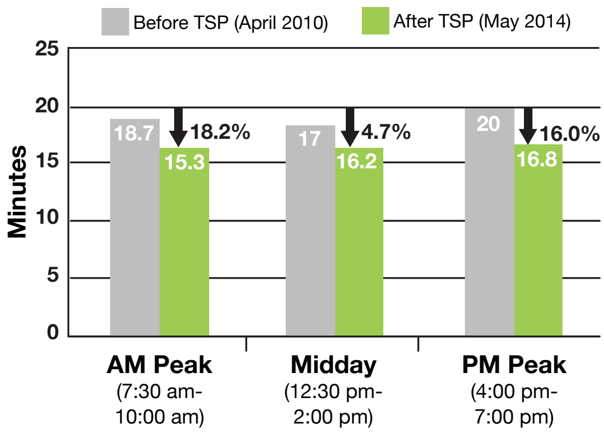
43 *DOT Releases Status Report on "Transit Signal Priority" Technology Used to Speed MTA Buses.* (2017, Jul 24). NYC DOT. https://www.nyc.gov/html/dot/html/pr2017/pr17-055.shtml

44 *MTA, NYCDOT Announce Ambitious Plan to Improve Bus Service.* (2021, Aug 16). MTA. https://new.mta.info/press-release/mta-nycdot-announce-ambitious-plan-improve-bus-service

45 Kuntzman, G. *EXCLUSIVE: Despite COVID, DOT Really Stepped Up Transit Signal Priority This Year.* (2020, Oct 9). Streetsblog. https://nyc.streetsblog.org/2020/10/09/exclusive-despite-covid-dot-stepped-up-transit-signal-priority-this-year

46 NYC DOT. *Green Means Go: Transit Signal Priority in NYC.* (July 2017). https://www.nyc.gov/html/brt/downloads/pdf/brt-transit-signal-priority-july2017.pdf

Figure 48. M15-SBS travel times before and after TSP implementation improbably attribute all time savings to TSP.



Source: NYC DOT. *Green Means Go: Transit Signal Priority in NYC.* (July 2017)

It should be noted that an earlier 2014 evaluation of this corridor[47] was conducted by a company called TransCore. This evaluation showed a 2-4-minute decrease in travel times with TSP. The methodology behind this evaluation is difficult to figure out from the information available. However, most critically, the company that did the evaluation is the same company that has the contract to operate the TSP. Thus, as that was not an independent analysis and the methodology is untransparent, one can only view the results with a grain of salt.

Bx41-SBS

As with the M15-SBS evaluation, evaluation of TSP on the Bx41-SBS on Webster Avenue before and after TSP has revealed that the "before" data was taken on November 2011, before the implementation of the Bx41 was upgraded to an SBS route in June of 2013. The "after" data was taken after both the Bx41-SBS and the TSP had been implemented in the fall of 2015.

Again, the before/after analysis captures all the SBS improvements as well as any TSP benefits. Thus, one cannot simply attribute the travel time savings to TSP, as NYC DOT has done. That NYC DOT neglected to note this methodological problem casts uncertainty on the integrity of the entire study. NYC DOT could have based its "before" data from within the two years between the launch of the Bx41-SBS and the implementation of TSP to control for TSP alone.

In fact, NYC DOT conducted a separate study, unrelated to TSP, on the impact of the other SBS measures on the Bx41 on Webster Avenue[48]. The "after" analysis dates from November 2013, *before TSP was implemented.* And yet, that study shows roughly the same degree of travel time reduction as was found in the TSP study. Thus, virtually all the benefits attributed to TSP in the TSP study were achieved before the introduction of TSP by the introduction of SBS.

Thus, had NYC DOT done a proper analysis and used "before" data between the implementation of SBS and TSP for Bx41, the results would have shown that TSP had no benefit at all.

B44-SBS

The *Green Means Go* report includes the B44-SBS and states that TSP was implemented in 2015. Yet there is no other evidence anywhere else that this occurred. In fact, the NYC DOT evaluation of the B44-SBS[49], published in June 2016, ostensibly after TSP was implemented, does not mention TSP at all and instead mentions some signal coordination which is different from TSP.

Further, the "before SBS" speeds listed in the B44-SBS evaluation report *are higher than* the "before TSP" speeds listed in the *Green Means Go* report which uses "after SBS" speeds for its "before TSP" analysis. It is thus, very difficult to corroborate the results of the *Green Means Go* report, particularly when NYC DOT's own data contradicts itself from one study to the next.[50]

B35

Beyond the *Green Means Go* report, the authors of this report analyzed data related to an additional TSP implementation along Church Avenue, affecting the B35 bus route. TSP at 51 intersections along Church Avenue was

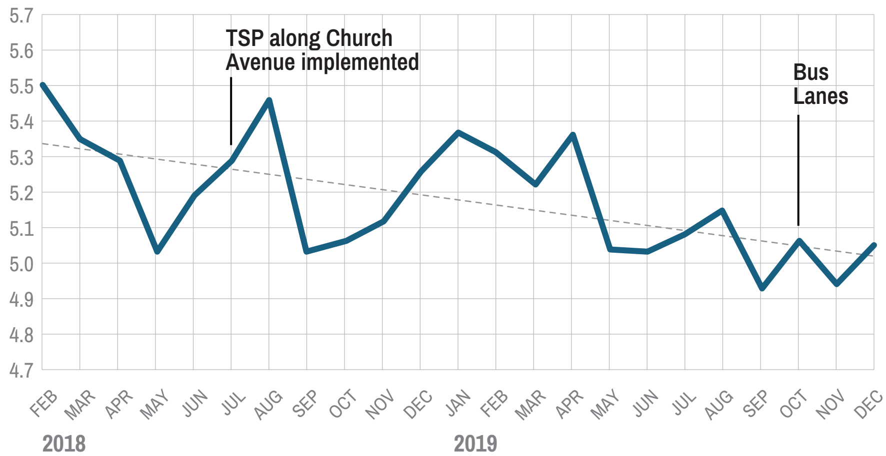
47 Zhang, L. *New York City – Manhattan Transit Signal Priority Evaluation.* (2014, Oct 14). TransCore. https://transportation.njit.edu/itsnj/2014AnnualMeeting/Traffic.Signals.Session_NYC.Manhattan.Transit.Signal.Priority.System_LihuaZhang.pdf

48 *+selectbusservice Bx41 on Webster Avenue: Progress Report.* (2014, Aug 25). NYC DOT & MTA. https://www.nyc.gov/html/brt/downloads/pdf/2014-08-25-brt-websteravenue-progressreport.pdf

49 *+selectbusservice B44 SBS on Nostrand Avenue Progress Report.* (2016, Jun). NYC DOT and MTA.

50 The final route in the *Green Means Go* report is the S79-SBS. While there were no glaring problems similar to those observed in the analysis of the other three routes, there was simply not enough data available to independently verify the results.

Figure 49. Average speeds on the B35 fell over time and continued to fall after the implementation of TSP and even after the new bus lanes.



Data: data.ny.gov (Bus speeds), NYC DOT social media feeds (TSP implementation date)

> **"There is no evidence that TSP is having a positive impact on bus speeds in NYC."**

implemented in July of 2019, according to NYC DOT's social media feeds. In October of 2019, NYC DOT painted about ½ mile of bus lanes on Church Avenue.

Average monthly speeds are available at the bus route level starting in 2016. Bus speeds on the B35 were analyzed from August of 2018 to December of 2019. (Figure 49)

The data shows that average speeds on the B35 decreased over time. The implementation of TSP did not reverse this trend, nor even did the new bus lanes on Church Avenue. There may of course be other factors accounting for the slower speeds, especially since the B35 is a long route that spans more than just Church Avenue. But the data does not provide any evidence that TSP had a positive impact on the running time of the B35.

TSP – what it all means

There is, thus, no evidence that TSP is having a positive impact on bus speeds in NYC. TSP is simply a technology that takes as inputs several parameters. One of these parameters is maximum time for green extension/red truncation. At the extreme end of this is signal pre-emption – i.e., the changing of the signal to green as soon as the bus arrives at the intersection. On the less effective end is the case in which green extension/red truncation is only 1-2 seconds.

TriMet in Portland, Oregon has recently upgraded their TSP system to a new generation which uses artificial intelligence to more intelligently adjust traffic signals to provide more green time for buses.[51] A test of this system purports to be saving riders approximately 20 seconds per trip – not nothing but still not particularly significant.

Indeed, if the parameters for TSP are set to extend green signals for long enough on any corridor, the speed improvements shown in the *Green Means Go* report, and better, can be achieved. Yet too often, complaints from motorists cause bus-oriented traffic signals to be retimed to favor cross streets. This may or may not be the case with the TSP intersections in NYC.

It is important to point out that the functioning of the TSP system in NYC is not transparent – nowhere is the number of seconds of green extension/red truncation published, as far as the authors can tell. Thus, it is recommended that NYC DOT provide greater transparency with regards to how exactly TSP is used. Further, the amount of green time allotted to buses should be increased.

51 *New bus-only signal saves time for TriMet riders.* (2024, Apr 12). TriMet. https://news.trimet.org/2024/04/new-bus-only-signal-saves-time-for-trimet-riders

Removing Turns Across the Bus Lanes

One of the most common causes of delay is bus lanes blocked by vehicles turning or delayed by dedicated turn signal phases. The specific design of the turn also matters. If it is a curb lane bus lane or an offset bus lane running down the right side of the road, as is generally the case in New York, restricting right turns across the bus lane would bring a lot of time savings benefits. Banning right turns is rarely done and is not generally something motorists are expecting.

On the 14th Street Busway, where trucks and local traffic are also allowed to travel, left turns are prohibited. Since the buses mainly travel in the central lanes of 14th Street, this helps reduce delays associated with turning vehicles as all vehicles turning off the busway must turn right.

Similarly, on the Flushing-Main Street Busway, all but one left turn is prohibited from the busway for mixed traffic.

The *BRT Standard* awards 7 out of 7 points if 80% or more of the turns across the bus lanes are prohibited.

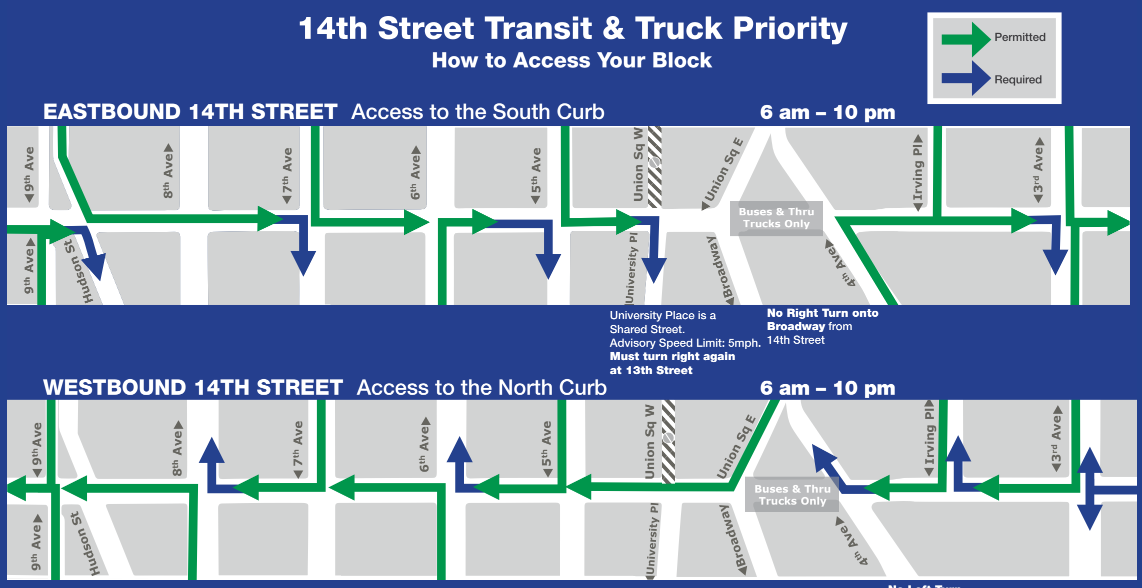
Figure 51. **Las Vegas SDX bans most left turns across the bus lanes.**

Photo: The Institute for Transportation and Development Policy (ITDP).

Figure 50. **Left turns are not permitted from the 14th Street Busway. Turning vehicles must turn right.**
Source: nyc.gov

14th Street Transit & Truck Priority

How to Access Your Block



Traveling Eastbound

If you enter 14th Street from:	You must turn right to exit on:
10th Avenue	Washington Street or Hudson Street
9th Avenue	7th Avenue
8th Avenue	7th Avenue
7th Avenue	5th Avenue
6th Avenue	5th Avenue
5th Avenue	University Place
4th Avenue	3rd Avenue

Traveling Westbound

If you enter 14th Street from:	You must turn right to exit on:
3rd Avenue	Irving Place
Irving Place	Union Square East
Union Square East	6th Avenue
5th Avenue	6th Avenue
6th Avenue	8th Avenue
7th Avenue	8th Avenue

Left turns will not be allowed off of 14th Street between 9th Avenue and 3rd Avenue.

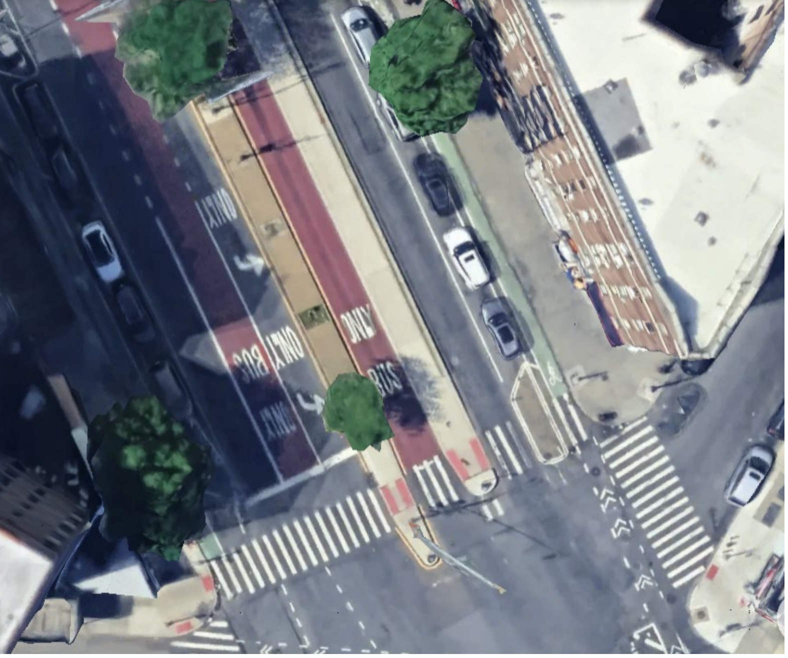


Figure 52. Left turns across bus lanes should be banned. If not possible, this configuration from the E.L. Grant highway is the next best solution.

Photo: Imagery @2025 Airbus, Map data @2025 Google.

Banning left turns is common on major arterials in the United States, as it also tends to benefit through traffic and is safer for pedestrians. On the Van Ness BRT Corridor in San Francisco, for instance, left turns were already banned when the BRT corridor was introduced.

In New York, where much of the city has a dense one-way street grid, it should be comparatively easy to ban turns across the bus lanes – especially left turns across central median bus lanes. Turning vehicles simply need to go around the block to make the turn. At many intersections, the time saved, not only for the bus lanes but also for thru traffic, could often justify the ban of the turn. An example of where a left turn is causing a problem has already been identified in the discussion of Livingston Street above.

On the Edward L. Grant Highway in the Bronx, NYC DOT attempted to ban all left turns from this central-medial aligned bus lane but yielded to community pushback. If a left turn needs to be designed, moving the left turn lane to the inside of the bus lane, as shown in Figure 52, is a good solution, particularly if turning volumes are low and the turn is unsignalized.

In general, New York City could improve its bus speeds by prohibiting more turns across its busways.

Severing cross streets

It is common for BRT and light rail projects designed on surface streets to remove minor intersections. This is done by prohibiting traffic on the minor streets from crossing the bus lanes. Instead, traffic on the local street must turn right when it reaches the bus priority corridor. This fully eliminates the traffic signal delay. This measure can be coupled with the creation of slow-speed zones. Bicycles and pedestrians should be allowed to cross the bus corridor but not mixed traffic, giving a travel time advantage to these modes.

Figure 53. In Mexico City, vehicular crossings are severed across the BRT, while pedestrians and bikes are permitted to travel across.

Photo: abalcazar (Getty Images/iStockphoto).

Sub-stops, passing lanes and station setbacks

BRT stops should be long enough to handle the expected peak hour bus demand without buses queuing up to reach the stop. The best BRT systems include multiple sub-stops and passing lanes to handle higher volumes of buses stopping at the same time. Each sub-stop is separated by 1-2 bus lengths to allow buses to easily pull around each other.

This allows several buses to load simultaneously. It also allows a bus to immediately continue its journey, even if the bus in front of it has not yet completed the loading process. Additionally, when both a limited and a local route share the same corridor, the passing lane at the station allows the limited to pass the local, while both routes enjoy the full benefits of using the station. The *BRT Standard* awards 3 points for passing lanes at most bus stops.

New York City has two bus lanes in a single direction in some locations, like along Fifth Avenue in Manhattan and at the high-volume 14th Street and 1st Avenue SBS stop.

There is typically no clear designation for where a bus stop starts and ends, and passengers are left to figure out whether a bus in the queue is going to open its doors. In addition, the functional bus stop is too short, with only one stopping bay. As such, bus queuing can occur.

Relatedly, the *BRT Standard* gives full points for setting bus stops/stations back from intersections by at least one bus length. If stops are placed directly after an intersection and two buses approach the stop at the same time, the second bus will be unable to clear the intersection even if the traffic light is green. Similarly, if the stop is placed directly before the intersection, the first bus cannot pull forward from the stop after the passengers have boarded if the signal is red. This leaves the second bus needlessly stuck before the station.

The set-back distance is a function of bus frequency. If the bus lane frequently handles three or more buses per signal phase, then two or three lengths between the bus stop and the intersection will be needed to prevent the bus stop from blocking a bus from clearing the intersection.

In New York City, bus stops in priority corridors have frequently been located directly before or after intersections, causing interference between the bus stop and the traffic signal and unnecessary bus delay. This occurs regularly on the Livingston Street bus lane.

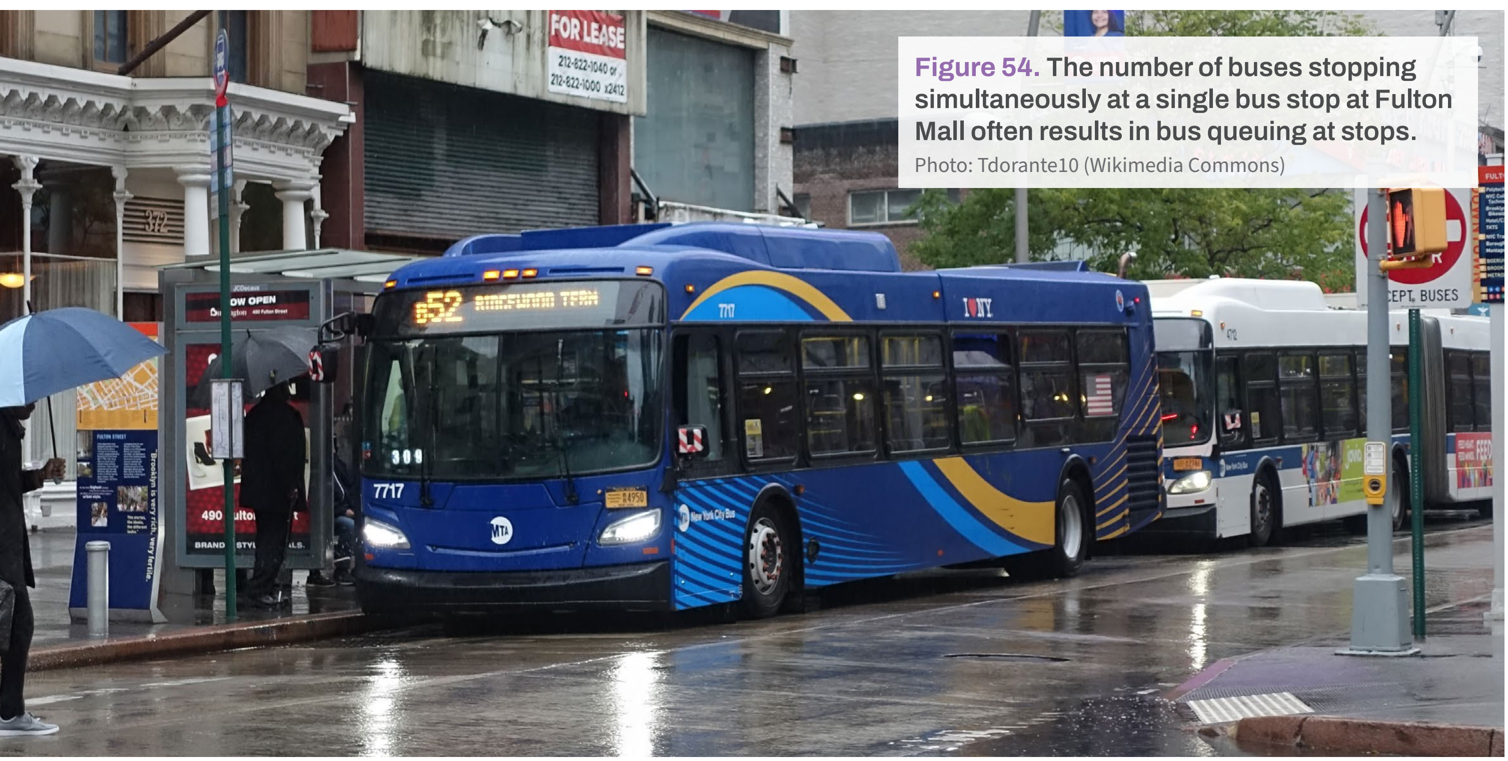


Figure 54. The number of buses stopping simultaneously at a single bus stop at Fulton Mall often results in bus queuing at stops.
Photo: Tdorante10 (Wikimedia Commons)

Chapter 6

The Future of Bus Priority in New York City

This report has revealed that despite 20+ years of significant effort toward improving bus speeds in NYC, the needle has not moved in any meaningful way. The overall average increase in speed on routes supported with bus priority measures was a mere ½ mph. Speed increases were greatest on SBS projects where all bus priority measures were combined, such as on the 14th Street Busway.

Corridors designed under the SBS program enjoyed greater speed increases than those that came later, though the average speed increase still never topped 1mph. Thus, a bolder set of improvements is needed. The analysis in this report showed that by implementing the best-in-class bus priority measures as a package, also known as Bus Rapid Transit (BRT), bus speeds on existing SBS corridors could be increased by another 4mph on average. This would bring average speeds on those corridors to over 13mph.

The bus as a truly dignified mode

The efforts made to date have failed to reposition the bus as an exciting mode of transportation in New York. Faster, more reliable buses are a key piece of this puzzle. But there are others.

SBS was a network of higher speed bus routes, complementary to the subway system. The city should not give up on this concept. Rather, they should upgrade the existing SBS corridors to full BRT and double down on branding it as a rapid transit network.

Bus stops are a critical part of a bus network and an opportunity to create a beautiful, safe, and comfortable waiting environment. On its most critical bus priority corridors, NYC DOT and MTA should move away entirely from simple bus shelters, in favor of architect-designed glass-enclosed waiting areas that are well-lit and protected from all types of weather. Passengers would pay their fare before entering, and step or roll right onto the bus. These types of stations would move New York City back onto the cutting edge, announcing to all New Yorkers an entirely new paradigm for the bus.

> **"The 2026 *NYC Streets Plan* should commit NYC DOT to building at least five miles of bronze-rated BRT each year."**

Bus priority in the *NYC Streets Plan*

The "miles of bus lanes" and "number of intersections with TSP" targets in the *NYC Streets Plan* are misdirected and should be reformulated. Curbside bus lanes and TSP have lacked impact on bus speeds but are the most expedient way of meeting those targets. The 2026 *NYC Streets Plan* should commit NYC DOT to building at least five miles of bronze-rated BRT each year.

The next volume of this two-volume report will help to prioritize where such interventions should be made. It will also suggest specific interventions.

New York City has spent too long working around the edges to make buses work and the results have been marginal. With bus speeds and ridership continuing to drop, now is the time to show that New York City can reach and surpass what many other cities have been doing for their buses for decades.

Appendix

Corridor-level speed impacts of NYC bus priority measures

	Base Info					Before/After Calculations				
Facility Type	Year	Corridor	Section	Bus Routes	Main Rt	Section Speed (mph) 2023	Avg Speed Before	Avg Speed After (mph) (Main Rt)	MPH Change	Main Rt Change
Busway No SBS	**2021**	Jay Street	Tillary St – Livingston	B57, B62, B67, B26	B26	5.6	5.9	6.18	0.28	5%
	2021	181st St, Manhattan	Broadway to Washington Bridge	Bx11, Bx13, Bx36, Bx3, Bx35	Bx11	6.4	5.31	5.55	0.24	5%
	2021	Main St Flushing	37th St – Kissena Blvd	Q4, Q5, N4, N4X, Q84, Q85, Q25, Q34, Q17, Q19, Q27, Q50, Q66, Q44 SBS	Q44 SBS	5	8.93	9.29	0.36	4%
	2021	Jamaica Ave	Sutphin – Merrick	Q6, Q8, Q9, Q41, Q54, Q56, Q30, Q31, Q34, Q110, Q25, Q65, Q112	Q25	5	6.86	6.95	0.09	1%
	2021	Archer Ave	Sutphin – Merrick	Q44SBS, Q30, Q31, Q20A, Q20B, Q4, Q5, Q84, Q85, Q42, N4, N4X, Q111, Q112,	Q44 SBS	5	8.93	9.29	0.36	4%
	Average					**5.4**	**7.19**	**7.45**	**0.27**	**4%**
Busway SBS	**2019**	14th St, Manhattan	Ave C – 9th Ave (busway 3rd Ave – 8th)	SBS M14A, D	M14SB-SA/D	**6.3**	**4.48**	**5.48**	**1.00**	**22%**
Curbside No SBS	**2022**	Story Ave	Bronx River Ave – White Plains Ave	Bx5	Bx5	6.65	7.72	7.83	0.11	1%
	2018	Fulton St	Green Ave – Bond St (WB only)	B25, B26	B25	5.00	5.51	5.47	-0.04	-1%
	Average					**5.83**	**6.62**	**6.65**	**0.04**	**0.00**
Dual Bus Lanes	**2018**	5th Avenue	23rd – 59th	M1, M2, M3, M4, M5, M55, Q32	M4	**5.7**	**5.6**	**5.45**	**-0.15**	**-3%**
Median	**2018**	161st St	Jerome Ave – 3rd Ave	SBS Bx6, BX13 (alt)	Bx6SBS	6.45	6.2	6.96	0.76	12%
	2020	E.L. Grant Highway	E.L.Grant & University – Jerome Ave	Bx35, Bx11	Bx35	6.1	5.08	5.08	0	0%
	2023	E Gunhill Rd	Bartow & Bainbridge	Bx28, Bx38	Bx28/38	5.82	6.57	6.96	0.39	6%
	Average					**6.12**	**5.95**	**6.33**	**0.38**	**6%**
Offset	**2020**	149th St, Bronx	Prospect Ave – Major Deegan	Bx19, Bx17, Bx2	Bx19	5.18	4.96	5.09	0.13	3%
	2022	Merrick Blvd	Hillside Ave to Springfield Blvd	Q4, Q5, N4, N4X, Q84, Q85	Q5	9.15	7.68	7.98	0.3	4%
	2023	Northern Blv	114th – 69th St	Q66	Q66	7.57	7.12	7.7	0.58	8%
	2024	University, Bronx	E.L. Grant Highway – W Kingsbridge Rd	Bx3	Bx3	6.8	6.20	6.82	0.62	10%
	2016	Utica	Eastern Parkway to Flatbush	B46	B46	7.2	5.8	6.29	0.49	8%
	2023	3rd Ave, Manhattan	57 – 96th St	M101, M102, M103	M101	6.3	6.3	6.7	0.40	6%
	2022	21st St Queens	Astoria Blvd – 36th	Q69, Q100	Q100	9.55	10.86	11.38	0.52	5%
	Average					**7.39**	**6.99**	**7.42**	**0.49**	**7%**

	Base Info					Before/After Calculations				
Facility Type	Year	Corridor	Section	Bus Routes	Main Rt	Section Speed (mph) 2023	Avg Speed Before	Avg Speed After (mph) (Main Rt)	MPH Change	Main Rt Change
Offset/ Inner Curb	**2017**	Woodhaven	Queens Blvd – N. Conduit (some gaps)	SBS Q52, SBS Q53, Express	Q52SBS/ Q53SBS	13.9	13.67	13.58	-0.09	-1%
	2018	Kings High-way	Ave P to Ave K	B82 SBS	B82SBS	8.27	6.83	8.29	1.46	21%
	Average					**11.09**	**10.25**	**10.94**	**0.69**	**10%**
Curbside + SBS	**2008**	Fordham Rd/Pelham Pkwy,	Southern Blvd – Sedgwick Ave: Pelham Pkwy, Boston Rd- Stillwell Ave	Bx12SBS, Bx9, Bx17, Bx22, BL60, BL61, BL62	BX12SBS	8.8	6.62	8.8	2.18	33%
	2012	Hylan Blvd,	Nelson Ave – Steuben st (inbound), Steuben St – Guyon Ave(outbound)	S79SBS, S78, SIM1, SIM5, SIM6, SIM7, SIM9, SIM10	S79SBS	12	12.47	14.47	2.00	16%
	2017	79th St	1st/2nd Ave to Columbus	M79 SBS	M79	4.8	5.2	5.6	0.4	8%
	Average					**8.53**	**8.10**	**9.62**	**1.53**	**19%**
Offset + SBS	**2013**	Nostrand/ Bedford	Nostrand: Flushing – Ave I; Bedford: Fulton – Flatbush	B44SBS	B44 SBS	8.5	6.75	8.3	1.55	23%
	2016	Utica	Eastern Parkway to Flatbush	B46+	B46+	8.3	7.82	8.1	0.28	4%
	2010	1st and 2nd Avenue,	Houston to 125	M15SBS	M15SBS	8.65	6.53	7.7	1.17	18%
	2016	23rd St	10th to 2nd Eastbound, 8th to 1st Westbound	M23 SBS	M23	5.4	4.69	5.42	0.73	16%
	2011	34th St	FDR Drive to 11th Ave	M34SBS	M34SBS	4.725	4.25	4.97	0.72	17%
	2014	125th St,	2nd Ave to Morningside Ave	M60SBS, M101, M125	M60-SBS	4.4	4.17	4.71	0.54	13%
	2022	Main St. Flushing extension	Kissena Blvd – Horace Harding	Q44SBS, Q20A, Q20B	Q44SBS	7.1	8.38	9.15	0.77	9%
	2014	Webster Avenue	E. GunHill Rd – 165th	SBS BX41	BX41SBS	8.38	10.15	8.39	-1.76	-17%
	Average					**6.93**	**6.59**	**7.09**	**0.62**	**10%**
SBS Only	**2016**	86th St	None	M86 SBS	M86	5.87	5.41	5.87	0.70	9%
	2016	Main St Flushing	n.r.	Q44+	Q44 SBS	8.93	8.38	8.93	0.55	7%
	Average					**7.4**	**6.90**	**7.4**	**0.63**	**8%**
2-way busway, 1-way traffic	**2024**	Livingston	Smith – Flatbush	B67, B45, B41, B103	B41	**4.7**	**6.19**	**6.36**	**0.17**	**3%**

Index of Figures and Tables

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