

"Protected" Bike Lane Design in New York City

An Observational Study

Gil Ferguson Hunter College Urban Studies Capstone



Introduction

Cycling, as a form of transportation, has been practiced in New York City since the late 19th century. Over the past half century, cycling has become increasingly more popular and in the last two decades the City of New York has experienced somewhat of a “cycling renaissance”, characterized by infrastructure improvements, advocacy efforts, and an increasingly diverse and vibrant growing cyclist community. In order to accurately capture the scope of the cyclist community in NYC today, the Department of Transportation (DOT) has developed estimates of total cycling trips per year and number of commuters that regularly cycle to work. Regularly is defined as an average of 3 times a week. In 2022, it is estimated that 580,000 individual cycling trips were taken each day within the 5 boroughs. The DOT approximates that up to 60,000 New Yorkers utilize bicycles to regularly commute to work.(DOT)

Now that we have established how relevant the demand is for cycling in New York City, let’s take a look at the infrastructure that’s currently available to these riders. As of 2021, the city and the DOT had installed and maintained at least 1,456 miles of bike lanes throughout the 5 boroughs. The DOT had also designed and installed at least 590 miles of protected bike lanes by the end of 2021. The DOT defines a protected bike lane as “A bike lane with a physical separation from motorized vehicle traffic by a parking lane or barrier... Separation can take the form of floating parking, a curb or raised median, or other vertical elements preventing motor vehicles from accessing the

bikeway.” (*Transportation Alternatives*) Protected bike lanes aim to physically separate cyclists from motor vehicles and create a safer ecosystem for cyclists and pedestrians.

In 2014, the DOT announced the implementation of their Vision Zero Initiative. As the DOT’s headlining traffic safety program, Vision Zero set an ultimate goal of eliminating all traffic fatalities and severe injuries on NYC streets. Over the past decade the Vision Zero Initiative has claimed to focus their resources on improving street design, enhancing traffic enforcement, raising public awareness, and facilitating legislative changes that lead to a safer transportation landscape for pedestrians, cyclists, and motorists. The DOT cites that the initiative “convenes agencies from all over the City to work together, break down barriers, and save lives.” (*DOT Press Release*)

As of May 1, fourteen cyclists have been killed on New York City streets in 2023. If the rate of cyclist deaths sustains its current pace, 2023 will conclude as the deadliest year for cyclists in New York City since the birth of the Vision Zero Initiative in 2014.

(*Transportation Alternatives*)

During the late 70s and 80s, the first protected bike lane projects were explored by the Koch administration. Koch was particularly supportive and receptive to the needs of the cycling community, proposing projects involving the earliest designs of separated bike lanes. The latter years of the Beame administration saw record breaking numbers of traffic deaths in New York City. Koch aimed to create safer streets for all through the activation of sufficient cycling infrastructure. Unfortunately none of the projects developed by the Koch administration were ever executed. (*Pedal Power*)

20 years after Koch’s tenure as mayor, the city designed and built the first recognized protected bike lane on Ninth Avenue in Chelsea. 2007, the inaugural year for New York City’s protected bike lane program, saw the one mile of protected bike

lanes roll out. The pilot design on 9th Avenue employed parked cars and buffer zones to protect cyclists from moving traffic.(DOT)

Since 2007, the city has rapidly expanded its network of protected bike lanes, with every project possessing their own unique and specific design qualities. Today, protected bike lanes now occupy space in all 5 boroughs and the DOT has set aggressive goals to build a total of 50 miles of protected bike lanes in 2023 and 250 additional miles by 2026.(DOT) The DOT claims that their implementation of protected bike lanes “make our streets safer by encouraging New Yorkers to get out of their cars and choose carbon-free modes of transit.”(DOT Press Release) I believe it is time to truly evaluate the efficacy of the DOT’s protected bike lane designs. There are currently over 600 miles of protected bike lane in New York City. Fourteen cyclists have died on New York City streets this year. The current approach must be thoroughly evaluated and amended in order to save the lives of countless cyclists.

Origin of Research & Hypothesis

I have lived in the Sunset Park neighborhood of Brooklyn for the last year and a half, during which I have become increasingly familiar with the protected bike lane infrastructure present in the neighborhood. I was raised in the Flatbush section of Brooklyn and have been cycling in New York City for most of my life. As a resident of Sunset Park I experience the dangerous and chaotic environment triggered by the 4th Avenue protected bike lane. Like the pilot lane on 9th Avenue, the 4th Avenue bike lane employs parked cars and buffer zones to shield traveling cyclists from motorists. I feel strongly that the 4th Avenue protected bike lane possesses major design flaws that

create a dangerous environment for cyclists. I feel that many unprotected lanes throughout the borough including but not limited to, 5th Avenue in Park Slope, Bedford Avenue and Ocean Avenue; create safer conditions for cyclists than the protected lane on 4th Avenue. These feelings served as the origin for my observational research this semester.

My observational research began with two core questions:

- *Why does the 4th Avenue protected bike lane feel so much more dangerous for cyclists than unprotected alternatives? Is this feeling based in reality?*
- *Why are cyclists on New York City streets being killed at a record clip, 10 years on from the implementation of Vision Zero? Why are hundreds of miles of protected bike lanes failing to ensure the safety of cyclists?*

Leading up to my processes of data collection, I developed a hypothesis that attempted to predict the specific policy recommendations that my subsequent research would produce:

I foresee recommending, yield oriented, blinking right hand turn signals for all intersections where protected bike lanes are present. I also envision recommending a clear plan of protected bike lane enforcement that eliminates all motorist occupation of protected bike lanes.

Methods of Observation

For this observational study, I focused my attention on two distinct and unique stretches of protected bike lane infrastructure in western Brooklyn. The first stretch ran 2.5 miles along 4th Avenue, from 36th street in Sunset Park to Atlantic Avenue. The second second protected bike lane I observed was a 0.5 mile stretch along 9th Street in Park Slope, running from 4th Avenue/9th Street to Prospect Park West/9th Street. To avoid confusion, for this study, stretch one is referred to as the 4th Ave protected lane and stretch two is referred to as the 9th Street protected lane.

My observational methods and consisted of both walking and driving parallel to the 3 miles of subject protected lanes. I walked the lengths of both stretches in each direction several times, attempting to capture traffic interactions at various times of the day and levels of congestion. In total, I spent 26 hours collecting data as a pedestrian and countless more observing both stretches as a motorist.

I recorded detailed notes during my observation sessions and compiled various time-limited data sets, in an attempt to create a clear understanding of how these two protected bike lanes are functioning to create safer environment for cyclists. I recorded the various components of each bike lane design and noted the varying design qualities of each segment of cycling infrastructure.

My research also employed field interviews with cyclists, motorists and uniformed city employees. The goal of my, mostly short and casual interviews, was to build an understanding of how all relevant parties interact with protected bike lane infrastructure and how they personally evaluate the efficacy of the DOT's protected bike lane designs. I feel it is important to note that I relied on my own previous experience,

as well as interviewees previous experience, with various bike lane designs throughout New York City to assist my observational analysis. Data collection for this study occurred over a 2.5 month period from February to April of 2023.

Sample Data

7 DSNY Vehicles (3 full size disposal trucks)
13 NYPD Vehicles (11 marked patrol vehicles)
4 On-Duty FF Medallions
1 FDNY Engine
3 Con-Edison Work Vehicles
12 Commercial Trucks and Vans
7 Private Vehicles (No tags or sleeve in the windshield)

OVER 70% of the blocks on the northbound side from 36th Street to Atlantic Avenue had at least one motor vehicle obstructing the bike path.

Above is a sample data set that outlines the number and type of obstructions observed on the northbound side of the 4th Ave bike lane. Thursday March 9th.

Sample Testimonials

“Protected lanes are just more parking spots for cars and free space for businesses.... I don’t bike on 4th Avenue for the feelings of security.” Cyclist

“Going from 5th ave to 4th ave I’m sacrificing safety for speed, it’s that simple... If a driver takes the right-handed turn blind there’s really not much for me to at that point.” Cyclist

“There has to be more physical protections, I still feel like a sitting duck, protected lane or not.... I want to bike with my kids in this city, but that’s a long way off. ” Cyclist

“I gotta deliver this shit, where I’m supposed to be? You tell me?”
Commercial Doritos Truck Driver

Sample Photographs





Data Summary

My first-hand observations and photography highlight the consistent and gross abuse and occupation of the 4th ave protected bike lane by motorists. Cars park regularly in the protected bike lane and surrounding buffer zones. Enforcement is non-existent. The same data showed limited abuse and occupation of the 9th street protected bike lane. The interviews I conducted with cyclists within the observational zones, indicating consistent distrust of the 4th Ave bike lane, where cyclists often opt for unprotected alternatives to the 4th Ave protected lane. My first-hand observations and interviews both highlight the dangerous nature of right-handed turns performed by motorists on 4th ave.

My interviews exposed the largely dismissive attitudes of motorists and commercial workers towards cyclists traveling in protected bike lanes. My observations also highlighted the consistent presence of motor bikes and other micromobile vehicles that surpass speeds of 40 mph utilizing the 4th ave bike lane. This occurrence was not nearly as common when I observed the 9th street lane.

My observations of the design features of each protected bike lane revealed clear size and structural differences between the 4th ave lane and 9th street lane. The 4th ave lane has a greater width and includes generous buffer space with additional cyclist islands at most intersections. 9th street is much more narrow with most blocks possessing limited to no buffer space between the cyclist lane and parked cars. Most of the blocks on 4th Ave have extended buffer space at each intersection. Most blocks on 9th street do not. From the limited data I collected through first hand observations and

testimonials, it is apparent that the 4th Ave protected bike lane presents a far more dangerous environment for cyclists, compared to the 9th street lane.

Analysis & Discussion

I worked to compile, sort and analyze all of the information I gathered over the 75 day data collection period. Through the analysis of the anecdotal data I collected, I am confidently able to identify several clear and consistent patterns of behavior that impact the efficacy of protected bike lanes.

The data collected shows that the presence buffer zones and cyclist islands lead to more dangerous conditions for cyclists. Motorists will idle and park in spaces that they are easily able to access. With no plans or strategies for bike lane enforcement, “protected” bike lanes, with excess buffer zones will be abused by motorists and create environments where cyclists must weave in and out of traffic in order to travel linearly. I dub this the “subway surfer effect.” There is no realistic path to sufficient standards of safety for protected bike lane designs, like 4th ave, without a commitment to diligent and sustained bike lane enforcement.

The danger presented by right-hand turns on 4th ave is a product of two problems First, auxiliary buffer spaces result in an expanded blind spot for motorists turning right. Secondly, the presence of parked and idling vehicles in buffer zones and island areas, lead to obstructed views of oncoming cyclists for right hand turning motorists. My observations revealed an environment where motorists take blind right hand turns at high rates of speed and therefore the responsibility end up solely on the cyclist to recognize the vehicle and adjust. This allocation of responsibility here is

backwards. It should always fall on the motorist to be naturally cautious, recognize cyclists and adjust accordingly.

Both the 4th Ave and 9th Street lanes fail to employ physical infrastructure to guard cyclists. In my assessment, green paint on concrete, designating a cyclist lane, does not constitute real protection for riders. Without “concrete” infrastructure and physical barriers; that separate cyclists from flows of traffic; “protected” bike lanes like 4th ave and 9th street will continue to serve as additional space for parking, storage space for city agencies and loading zones for commercial use. “Protected” bike lanes that lack physical barriers, employed in environments where traffic and parking regulations are not enforced, create uniquely dangerous ecosystems for cyclists. Protected bike bike lane obstructions lead to the “subway surfer effect” and greatly increase the likelihood of major injury or death for traveling cyclists.

I observed that due to its wider characteristics, the 4th Ave bike lane creates an environment where a high concentration of micromobile, motorized vehicles travel and pass cyclists at speeds surpassing 40 mph. The 9th street lane’s more narrow design, seems to not attract these micromobilists, who are clearly seeking to travel at high rates of speed and regularly pass cyclists.

Policy Recommendations

From the limited vantage point I was granted through this observational study, I feel confident in offering two concrete policy recommendations to the Department of Transportation and the City of New York. At this juncture, the DOT’s Vision Zero initiative does not possess a functional Theory of Change, with plans to continue

spending taxpayer dollars on subpar pieces of cycling infrastructure, through 2026. As the department witnesses cyclist deaths set a record pace in 2023, it is time to take a step back and reevaluate how the city can keep riders safe and create an accessible cycling ecosystem for riders of all ages and experience levels. The department needs to prioritize outreach and dialogue with cyclists who experience and manage the dangers produced by dysfunctional bike lane designs. The design of bike lane infrastructure is clearly a matter of life and death. It is time that we see a commitment from the DOT, to comprehensively evaluate the efficacy of all bike lane designs. This policy issue is a matter of life and death.

Policy Recommendation 1

The Department of Transportation should mandate that all protected bike lanes in the city employ Jersey Barriers to shield cyclists from moving traffic. Jersey Barriers should be added to all existing protected bike lanes and required for the any new protected lanes that are built. Jersey Barriers are cost effective and can be installed by a truck in seconds.*(Flagstaff)* Jersey Barriers physically separate riders from flows of traffic and make it impossible for motorists to utilize bike lane space for parking or idling. Cyclists in New York City need to be protected by real, physical infrastructure that prohibits motorists from occupying protected lanes and colliding with cyclists while in motion. I believe the implementation of Jersey Barriers for protected bike lanes will reduce the rates of severe injuries to cyclists. Without proper traffic enforcement, protected bike lanes without physical barriers, create a chaotic and deadly environment for cyclists. Supplementary to this core recommendation, I believe that Jersey Barriers should be

used to create space for specialty lanes that cater to other micromoblists and specifically delivery workers, who are traveling at speeds exceeding 20 MPH. These travelers deserve proper infrastructure that independent of bike lanes.





Policy Recommendation 2

If the DOT chooses to remain reliant on soft infrastructure to protect riders, and the DOT and NYPD continue to ignore their responsibility to enforce traffic regulations, the department should prioritize eliminating buffer zones and super sidewalks from all protected bike lanes. It is clear from my anecdotal comparison of the 4th ave and 9th street bike lanes, that supplemental space leads to a much more dangerous environment for cyclists. Trucks and cars will drive and park wherever they can fit. Eliminating buffer spaces and super sidewalks creates or more narrow lane for cyclists to travel through. A more narrow lane, like 9th street, prohibits vehicles from parking and idling within the bike lanes and also deters other micromobilists from traveling at high speeds, as they are unable to pass cyclists. The elimination of buffer zones at intersections will also work to create a safer environment for right hand turns performed

by motorists. Decreasing the distance between turning motorists and travelling cyclists, will work to decrease the severity of collisions.

Conclusion

I believe the Department of Transportation's has employed poorly designed protected bike lanes that have worked to create a more dangerous environment for cyclists riding in New York City. The city has made it clear that the Vision Zero Initiative is aimed at increasing metrics of safety for cyclists of all ages and experience levels. I believe an environment like this is only achievable with the implementation of physical barriers of protection for cyclists

This observational study was anecdotal in nature and only depicts a small sample of cycling infrastructure in New York City. However, I believe it is important that the DOT collect data utilizing the methods I employed throughout this Spring. The department needs to overhaul the way they interact with cyclists and look to tap into their experiences and valuable opinions. Cyclist participation is crucial for policy and design decisions relating to cycling infrastructure. The city should want to hear what everyday users have to say about their product. I am hopeful that specific and targeted adjustments to protected bike lane design, will save countless innocent lives in New York City.

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