The Riding Behavior of Cyclists in Manhattan: An Update

An Observational Study of Biking Behavior in Central Manhattan

Conducted by Students at Hunter College, City University of New York

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Introduction

Over the last several decades cities and towns across the United States have undertaken major initiatives to promote cycling. New York City has been in the forefront of efforts to encourage cycling. According to a recently-released report by the New York City Department of Transportation, there were 1,240 miles of bike lanes and 480 miles of protected bike lanes installed in the City as of 2018 (New York City Department of Transportation, 2019). Ridership has also surged within the City with an estimated 490,000 trips made on a daily basis. Moreover, between 2012 and 2017, cycling to work in the City has outpaced "peer cities" by nearly twice the rate (ibid.).

A number of compelling reasons exist for the growing popularity of cycling in urban areas in the United States. Cycling is viewed as a means of alleviating traffic congestion, reducing noise and air pollution, and providing a wide array of health benefits. Yet not all urban dwellers have embraced the growing number of cyclists and the proliferation of bike lanes. Some urban residents decry the amount of "street space" which is being allocated to bike lanes, making streets even more treacherous to navigate. They also bemoan the loss of parking places being ceded to bike lanes and bike kiosks.

Some of the opposition to cyclists is rooted in the perception that cyclists flout the rules of the road and represent a danger to motorists, pedestrians, and themselves. According to this view, a significant number of cyclists traverse the wrong way down streets, run red lights, ride on sidewalks, and, overall, show contempt for other street users.

What is indisputable is that the upsurge in the number of cyclists and the expanding network of bike lanes has changed the cycling environment in the City. The question which arises is what effect this change has had both on the composition of cyclists and their riding behavior. The present study addresses this question. The study has three major objectives. The first objective will be to construct a profile of riders based on: (1) their gender, (2) whether they are general riders, Citi Bike riders, or commercial riders, and (3) whether they ride on a regular or an electric bicycle. The second objective will be to measure the degree to which cyclists comply with standard traffic rules – stopping at red lights, riding in the direction of traffic, staying off of sidewalks, etc. The third objective is

to determine the extent to which cyclists adhere to practices which promote their own personal safety such as wearing helmets or riding without the use of distracting electronic devices.

Methodology

The results of this study are based upon observations of 4,325 bicyclists at 46 different locations in New York City. The intersections were chosen from all intersections spanning the area from 14th Street in Manhattan up to 86th Street (south to north) and bounded from east to west by the East River and the Hudson River. This area constitutes a broad swath of Manhattan and comprises what can be viewed as a large portion of central Manhattan.

The intersections were randomly selected from four different strata encompassed within this area. The four strata consisted of: (1) streets/avenues without any bike lane, (2) streets/avenues with an unprotected bike lane, (3) streets/avenues with a protected bike lane, and (4) bikeways running alongside the East River or the Hudson River. With the exception of the bikeways, each intersection had a traffic light.

All observations were carried out by Hunter College students enrolled in one of four different courses in the Spring semester of 2019. Three of the courses were undergraduate-level courses offered in the Department of Sociology (two sections of Introduction to Research Methods and the Honors Seminar). The other course was a graduate-level course offered in the Department of Urban Policy and Planning (Urban Data Analysis).

Students were given strict methodological guidelines in carrying out their observations. Importantly, students had to choose cyclists they observed at a given location on a random basis without employing subjective criteria and they had to remain as inconspicuous as possible.

Students were assigned to conduct observations at a randomly-selected location within the geographic boundaries of the study.[1] Once they arrived at their designated site, they had to flip a coin to determine if they were to conduct their observations on the avenue or the street forming the intersection. Each site was visited twice for a period of one hour in duration for a total of two hours. The

hours were staggered across the seven days of the week and ranged from 7:00 am to 7:00 pm.

The methodology was designed so that intersections which had more cyclists traversing them would have greater representation in the sample. Thus, the study is based upon a self-weighted sample of observations.

Students were instructed to record observations for *every* cyclist who passed them by within each hour interval with a few exceptions. The exceptions were as follows: First, students could only record information for a given cyclist only after sufficient time had elapsed for them to faithfully observe and record all the pertinent information for the previous cyclist. Second, for cyclists riding in parallel fashion, observations were to be carried out on the cyclist in closest physical proximity to the student. Third, no information was to be gathered on any cyclist who had an "intimidating presence." And fourth, only cyclists 14 years of age or older were to be observed.

With respect to biking behavior, students gathered data on the following variables: (1) stopping/pausing at a red light, (2) going in the same direction as traffic, (3) using the designated bike lane (if applicable), (4) use of a helmet, and (5) using a cell phone or other electronic device while cycling.

In addition to these variables, students collected the following demographic information on each rider: (1) his/her gender and (2) whether he/she was a commercial cyclist (e.g., a messenger cyclist, food delivery worker, etc.), a Citi Bike rider, or a commuter/recreational cyclist who was not a bike-share cyclist. Furthermore, data was gathered on whether the cyclist was riding a regular bike or an electric bike.

Also, information about the site of the observations was appended to each record. Site attributes included whether the observations were carried out on a street or avenue without a bike lane, a street/avenue with an unprotected bike lane, a street/avenue with a protected bike lane, and whether the site was on a bikeway. Finally, the calendar date and day of the week on which observations were conducted were recorded.

All observations were carried out between April 8 and May 1, 2019.

Findings

Overall Profile of Riders

The largest segment of the riders observed were recreational or commuter cyclists who were not Citi Bike riders (50.7%). In this study, this group shall be referred to as "general" cyclists. Citi Bike riders constituted the next largest segment of riders (27.1%) followed by "delivery riders" (20.0%), with the remainder (2.2%) being riders whose status could not be determined.

As was the case in previous studies of cyclists in mid-Manhattan, there is a sizable disparity in the gender of the riders (84.9% male vs. 14.9% female).[2] This gender imbalance in ridership diverges significantly among the different types of cyclists. Commercial cyclists are overwhelmingly male (98.3%) and general cyclists are also predominately male (84.3%). However, among Citi Bike riders, the gender imbalance narrows considerably with 75.4 percent being male and 24.6 percent being female. This last-mentioned figure corresponds closely to data gathered by the New York City's Department of Transportation pertaining to the share of Citi Bike subscriber trips undertaken by females. According to the New York City Department of Transportation, the female share of Citi Bike subscriber trips is 25.5 percent.

Stopping at Red Lights

At intersections at which there was a red light for motor vehicles and cyclists, students observed the extent to which cyclists obeyed the traffic signal. The data displayed in Table 1 shows that about one quarter of cyclists (24%) do not stop or even pause at a red light before venturing either straight thru the light or turning onto an avenue or street. Commercial cyclists are even more likely to run a red light – 28.9 percent.

Table 1. Types of Behavior at a Traffic Light

Type of Behavior at Traffic Light	Percent
Stops fully when the light is red	51.0%
Pauses when the light is red and then goes thru when the light is still red	20.2%
Does not stop or pause when the light is red and goes straight thru when the light is still red	18.0%
Pauses when the light is red and then turns onto a street/ave when the light is still red	4.8%
Does not stop or pause when the light is red and then turns onto a street/ave when the light is still red	6.0%
Total (%) Total (n)	100.0% (1076)

Use of the Unprotected Bike Lane

Among cyclists observed on streets or avenues with an unprotected bike lane, fully 77 percent rode only in the bike lane, 15.2 percent rode on the street or avenue, and the remainder (7.8%) rode on both the unprotected bike lane and the street or avenue.[3] Noteworthy is that commercial cyclists are less likely to ride within the confines of the bike lane than other cyclists. Approximately one-fourth (24%) were observed riding only on the street or avenue.

Rides With or Against Traffic

Overall, only 6.4 percent of cyclists were observed riding against traffic on the street and another 3.0 percent of cyclists were observed riding against traffic in the bike lane.

Use of Helmets

Altogether, over two-fifths of the cyclists were observed wearing helmets. The use of helmets varies considerably by type of cyclist. Fifty-four percent of male commercial cyclists, who are mandated by law to wear helmets, were found to be compliant with this law.[4] Notably, general riders were far more likely to wear a helmet than Citi Bike riders (45.2% vs. 30.3%). There is also a gender gap in the use of helmets among both general riders and Citi Bike riders. Among the general riders, females are more disposed to wearing a helmet than their male counterparts by a margin of 52.1 percent versus 44 percent. Among the Citi Bike riders, the gender gap remains but is considerably narrower (33.8% vs. 29.1%).

Table 2. Helmet Use by Type of Cyclist

	Type of Cyclist					
Helmet Use	Male General Rider	Female General Rider	Male Citi Bike Rider	Female Citi Bike Rider	Male Commer-cial Rider	Total
Yes	44.0%	52.1%	29.1%	33.8%	54.4%	43.1%
No	56.0%	47.9%	70.9%	66.2%	44.6%	56.9%
Total % Total (n)	100.0% (1831)	100.0% (328)	100.0% (875)	100.0% (284)	100.0% (837)	100.0% (4155)

Use of Electronic Devices

Almost a third (30.2%) of cyclists were observed wearing an electronic device when riding. Little discernible differences were noted in the use of electronic devices by type of cyclist.

Use of Electronic Bikes

In total, 87.4 percent of the cyclists in this study were found to be riding regular bicycles. Slightly more than one-tenth of the bicycles (10.7%) were found to be electric bikes, with the status of the remaining bicycles indeterminate.

Overwhelmingly, the use of e-bikes was associated with being a commercial cyclist. One-third of commercial riders were observed riding an electric bike.

Summary and Conclusions

The results of this study rest on observing 4,325 cyclists at 46 different intersections in Central Manhattan. The intersections were randomly selected from the universe of intersections spanning the geographic area from 86th Street to 14th Street (North to South) and the East River to the Hudson River (East to West).

Several important findings have emerged from this study. First, general cyclists constitute the largest segment of riders – making up approximately one-half of the riding population. Citi Bike riders comprise slightly more than one-fourth of the riders (27.1%), followed by messenger or commercial cyclists who comprise one-fifth of the riders.

Second, the greater prevalence of male cyclists compared to female cyclists, noted in previous research, persists in this study (85% vs. 15%). Noteworthy, though, is that the gender gap in ridership is markedly narrower among Citi Bike riders (75% vs. 25%). This suggests that the ride-sharing program in New York City has been successful in attracting a substantial number of females and made cycling in the City a more gender-neutral activity.

This study also found that the overwhelming majority of cyclists traversed in the same direction as traffic when riding City streets.

Yet this study has also produced some disturbing findings. A significant number of cyclists (24%) were observed not stopping or even pausing at a red light. Commercial cyclists were found to be even more flagrant violators of this traffic rule (28.9%). Commercial cyclists were also less likely to ride within the confines of a bike lane where bike lanes have been installed.

Furthermore, a sizable number of cyclists were observed not wearing a helmet. Fifty-five percent of general cyclists were found without wearing helmets and the figure for Citi Bike riders was even more alarming – roughly 70 percent. As Jane Brody has reported in the New York Times (October 23, 2017), one statistic should serve as a poignant reminder of the importance of using a helmet: 97 percent of cycling deaths and 87 percent of serious injuries incurred by New York

City cyclists happened to riders who were not wearing a helmet. One possible remedy might be to have helmets and helmet linings made available for rent at Citi Bike kiosks.

Another troubling finding to emerge in this study is the widespread use of electronic devices while riding. Roughly one-third of cyclists were observed riding with headphones or earbuds. This figure represents a marked increase in the number of "distracted" cyclists reported in previous studies. Navigating city streets on a bicycle is an inherently hazardous enterprise. This hazard is greatly compounded when cyclists use electronic devices, diverting their attention from riding in a safe manner.

Finally, this study (the first which the authors are aware of) has documented the use of electric bikes by cyclists. In New York City, the laws governing the use of electric bikes are confusing. Bikes in which the rider has to pedal in order to start the motor and which can traverse at a maximum speed of 20 miles per hour (Class 1 bikes) are legal in New York State. On the other hand, bikes in which the motor can be initiated simply by turning on a switch on the handlebars (throttle bikes) and which also can attain a maximum speed of 20 miles per hour are not legal. Nor are bikes which can achieve speeds greater than 20 miles per hour. (Francesca Regalado, March 26, 2019).

This study did not differentiate between the different categories of e-bikes observed on the City's streets. Altogether, approximately one-tenth of the bicycles fell into this general category. Not surprisingly, delivery cyclists were disproportionately represented among users of e-bikes with one-third of these cyclists riding electric bikes.

This past month legislation was introduced in Albany which would legalize e-scooters and e-bikes in New York State. The proposed legislation would grant e-scooters and e-bikes weighing under 100 pounds and with a maximum speed capacity or 20 miles per hour the same status as regular bikes (Nate Homan, April 26, 2019). According to State Senator Jessica Ramos (one of the co-sponsors of the legislation, "Legalizing e-bikes and e-scooters will provide New Yorkers with alternative means of transportation that are affordable and environmentally friendly. It will also ensure that we are protecting our immigrant neighbors who work in food delivery, many of whom are more comfortable and feel safer on e-bikes."

The proposed legislation would cede to local authorities considerable latitude in how to regulate these "low-speed" bicycles.

While there are many advantages which would accrue to having power-assisted bicycles, the concern is that users of these devices act responsibly. For this reason, it is imperative to continue to monitor the behavior patterns of cyclists and particularly, those who use electric bikes.

Notes

1. In a few instances, students who carried out their observations on one of the bikeways selected the geographic location along the bikeways at which they gathered their data. These instances represented a slight departure from the overall sampling methodology.

2. These figures don't add up to 100 percent because there were a few instances in which the sex of the rider could not be ascertained (0.2%).

3. Instances in which the unprotected bike lane was obstructed are omitted from this analysis.

4. On April 23, 2013, a new law took effect in the City of New York with the aim of strengthening existing ordinances requiring commercial cyclists to wear helmets.

References

1. New York City Department of Transportation, "Cycling in the City," May, 2019, accessed May 14, 2019
https://www1.nyc.gov/html/dot/downloads/pdf/cycling-in-the-city.pdf

2. ibid.

3. Jane Brody, “Buckle Up a Helmet to Save a Life,” the New York Times, Oct. 23, 2017.
https://www.nytimes.com/2017/10/23/well/buckle-up-a-helmet-to-save-a-life.html

4. Francesca Regalado, “E-Bikes and E-Scooters, Explained,” NY City Lens, March 26, 2019.
http://nycitylens.com/2019/03/electric-bikes-scooters-explainer/

5. Nate Homan, “E-scooters, e-bikes may get the green light in NYC.”
April 26, 2019.
https://www.metro.us/news/local-news/new-york/e-scooters-e-bikes-may-get-the-green-light-nyc