

Case Study

Bike Lanes in New York City

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Introduction

Bicycle riding has many positive qualities: it is an enjoyable leisure activity; it promotes a healthy lifestyle; it is low in cost (once you own a bike); and bike usage reduces demand on other sources of transportation, including transit that uses fossil fuels. However, safety and availability of space limits bike usage, particularly in areas with both vehicular and human congestion. A city has several ways of promoting bike usage, including increasing bike lanes and offering bike share programs. Both of these strategies have been implemented in New York City and are described below.

Impetus and Goals for New York City's Bike Master Plan

In 2006 a joint report entitled *Bicyclist Fatalities and Serious Injuries in New York City 1996-2005* was issued by the New York City Departments of Health and Mental Hygiene, Parks and Recreation, Transportation, and the New York City Police Department. This report provided the impetus for the New York City Department of Transportation (NYC DOT) to embark on an ambitious plan, known as the Bike Master Plan, to remake the city's streets and increase bike ridership. The first phase of the plan included the construction of 200 bike-lane miles as part of 88 projects over a three year period. By 2009, this mile-mark was reached in addition to the installation of 4.9 miles of bike paths physically separated from car traffic lanes, 20 sheltered bike parking structures and 6,100 bike racks. As of June 2012, a total of 314.3 total bicycle lane miles had been completed, with 36 miles planned for by the end of 2013.¹² Some project that at the end of this initiative New York City could report substantial growth (more than 45%) in commuter cycling³.

The plan sets out to make the city's streets safer for the city's cycling community while also encouraging other residents to use bicycling as a primary mode of transport. New bike lanes that are clearly marked can also serve to moderate the speed of traffic, which further increases street safety for pedestrians and motorists. In addition to increasing safety, New York City Health Commissioner Thomas Farley highlights the health

¹ The City of New York. "PlaNYC Bicycle Network Expansion." NYC.gov. 2013. Accessed June 13, 2013. Available at: <http://www.nyc.gov/html/dot/downloads/pdf/bikeroutedetailsfy07-fy12.pdf>

² The City of New York. "Bicycle Route Projects." Nyc.gov. 2013. June 13, 2013. <http://www.nyc.gov/html/dot/html/bicyclists/bike-projects.shtml>

³ NYC DOT Press Release. "DOT Completes Unprecedented Three-Year, 200-mile Installation of Bike Lanes, Making City Streets Safer for All Users." 8 July 2009. http://www.nyc.gov/html/dot/html/pr2009/pr09_030.shtml.

benefits of bicycling by stating that “regular physical activity not only helps prevent heart disease but also reduces your risk of diabetes, colon cancer, breast cancer and depression⁴.” Increasing bike ridership can contribute to the city’s efforts to reduce greenhouse gas emissions.

In addition to all of these positive societal and environmental benefits, creating safer streets might also encourage more residents to start riding their bicycles around the city for the sheer joy of it. As David Byrne pointed out in his piece *This Is How We Ride* in the New York Times⁵:

I got hooked on biking because it’s a pleasure, not because biking lowers my carbon footprint, improves my health or brings me into contact with different parts of the city and new adventures. But it does all these things too – and sometimes makes us a little self-satisfied for it; still, the reward is emotional gratification, which trumps reason, as it often does.

Local business success is also a benefit of increased bicycle lanes, a new study from the New York Department of Transportation shows. For instance, the 9th avenue bike lane is correlated with an increase in retail sales in local businesses by 49%, while there was only a 3% growth in other local businesses throughout Manhattan.⁶ While there are probably other factors leading to retail growth on the far west side, the bike lanes seem to play a role as well.

As Transportation Commissioner Sadik-Khan observed, “With the completion of this initiative, we can now state firmly that New York City is the bicycling capital of the United States. This two hundred mile growth spurt has transformed our bike network into a robust transportation system, a true backbone that connects the City’s neighborhoods and helps get cyclists to their destinations safely⁷.” The City’s plan has been applauded by America’s bike-riding community. The League of American Bicyclists named New York City the only big city on the Eastern seaboard to receive the “Bicycle Friendly Community” designation and Bicycling Magazine wrote that New York is one of the most improved cities for cycling in the nation. A comprehensive look at the

⁴ NYC DOT Press Release. “DOT Completes Unprecedented Three-Year, 200-mile Installation of Bike Lanes, Making City Streets Safer for All Users.” 8 July 2009. http://www.nyc.gov/html/dot/html/pr2009/pr09_030.shtml.

⁵ Byrne, David. “This Is How We Ride.” The New York Times. 26 May 2012.

<http://www.nytimes.com/2012/05/27/opinion/sunday/this-is-how-we-ride.html?pagewanted=all>.

⁶ Hall, Mary Laurant. “NYC Study Finds Protected Bicycle Lanes Boost Local Business.” America Bikes. November 1, 2012. Accessed June 13, 2013. Available at:

http://www.americabikes.org/nyc_study_finds_protected_bicycle_lanes_boost_local_business

⁷ NYC DOT Press Release. “DOT Completes Unprecedented Three-Year, 200-mile Installation of Bike Lanes, Making City Streets Safer for All Users.” 8 July 2009. http://www.nyc.gov/html/dot/html/pr2009/pr09_030.shtml.

accomplishment of the city's bike plan in the first three year phase of implementation can be found in the appendix of this case study.

Despite these advances, New York City is still not an ideal urban bicycling metropolis. According to research conducted by the University Transportation Research Center, New York City, compared with other large cities in the U.S., has the lowest bike share of commuters, the highest cyclist fatality and injury rate, and the lowest rate of cycling by women, children and seniors. We can learn a lot from other cities that have implemented integrated, comprehensive bicycle plans. The models used in this study suggest that there is inelastic demand with respect to the supply of cycling facilities; therefore, the authors of the report suggest that in order to successfully increase bike ridership the addition of cycling paths must be increased along with other programs and policies that include "intersection modification and priority traffic signals for cyclists, bike parking, coordination with public transportation, traffic education and training, and bike promotion and public awareness campaigns⁸."

The Plan in Practice: Prospect Park West Bike Lane and Ninth Avenue Bike Lane

Despite the benefits of increased bike riding, a number of the city's bike projects have been opposed by the public. One example of public opposition occurred in response to the new 1.8 mile two-way bike lane that was installed in the summer of 2010 on Prospect Park West. A group with close ties to former city Transportation Commissioner Iris Weinshall filed a lawsuit in the State Supreme Court in Brooklyn in 2011. The lawsuit accused the NYC DOT of misleading residents about the benefits of the lane, cherry-picking statistics on safety improvements and collaborating with bicycle activists to crush community opposition⁹.

The main cause of public opposition and ensuing lawsuit was that the new two-way bike lane was constructed on a portion of the street that used to be dedicated to parking spaces, which are already sparse in the area. Residents of the Park Slope neighborhood also observed that the lane made it more difficult for pedestrians to cross the street. On the other hand, DOT officials reported that the Prospect Park bike lane reduced speeding, crashes and injuries while doubling weekend bike ridership and tripling weekday bike ridership. The Supreme Court's final ruling allowed the bike lane

⁸ Pucher, John and Buehler, Ralph. University transportation Research Center. "Final Report: Analysis of Bicycling Trends and Policies in Large North American Cities: Lessons for New York." March 2011.

<http://www.utrc2.org/research/assets/176/Analysis-Bike-Final1.pdf>.

⁹ Grynbaum, Michael. "Lawsuit Seeks to Erase Bike Lane in New York City." The New York Times. 7 March 2011. <http://www.nytimes.com/2011/03/08/nyregion/08bike.html>.

to remain on Prospect Park West¹⁰. This case highlights the concerns of many New Yorkers about the expansion of bike lanes. They worry about the safety of pedestrians and access to store fronts and parking. A number of design techniques have been used by the NYC DOT at other locations in order to combat these problems.

A significant project completed under New York City's Bike Master Plan is the Ninth Avenue Bicycle Path and Complete Street project, which was awarded the Institute for Transportation Engineers "Program of the Year" award in 2008. This addition to the city's infrastructure has been called the "first urban on-street parking-and signal-protected bicycle facility in the United States"¹¹. Ninth Avenue is one of the most dense, congested, mixed-use thoroughfares in the nation, and this posed both challenges and opportunities for innovation in the design of the new bike path.

There are a wide range of stakeholders who use the street on Ninth Avenue including cyclists, pedestrians, motorists, bus riders, delivery persons and emergency response personnel. The project sought to accommodate the interests of these various groups in the final design of the bike lane by holding design meetings with relevant NYC DOT units as well as community boards. As a result of this extensive process the Ninth Avenue Complete Street project incorporates specific design standards that are unique to the specific needs of the area.

The project was successful in creating a safe space for cyclists by separating the path from the vehicular road with an 8-foot barrier. Unlike the Prospect Park project, the design maintained the parking spots that were originally available along Ninth Avenue. This may be one reason that the 9th Avenue bike path did not receive the same level of opposition we saw in other areas. Even though the design was crafted specifically for Ninth Avenue, the parking-and signal-protected aspects of the path are flexible and can be adopted for use in other locations. The Ninth Avenue lane is also a pioneer in the use of bike parking corrals, which were installed in April 2013 in the Chelsea and Hell's Kitchen sections of the lane.¹² These parking corrals promote the use of the lane and encourage bike usage in the city.

Despite many accolades, Commissioner Sadik-Khan's success in expanding the city's bicycle infrastructure has been criticized by journalists, politicians and business people. Anthony Weiner expressed his distaste for the added bike lanes in 2011, when he told

¹⁰ Cassidy, John. "Battle of the Bike Lanes." The New Yorker. 8 March 2011.

<http://www.newyorker.com/online/blogs/johncassidy/2011/03/battle-of-the-bike-lanes-im-with-mrs-schumer.html>.

¹¹ Russo, Ryan; Wade, Randy; Benson, Joshua; and Lucas, Christopher. "Ninth Avenue Bicycle Path and Complete Street." NYC Department of Transportation. http://www.nyc.gov/html/dot/downloads/pdf/rr_ite_08_9thave.PDF.

¹² Miller, Stephen. "Eyes on the Street: Bike Corrals Protect Ninth Avenue Bike Lane." StreetsBlog. April 5, 2013. Accessed June 14, 2013. Available at: <http://www.streetsblog.org/2013/04/05/eyes-on-the-street-bike-corrals-along-9th-avenue-bike-lane/>

Mayor Bloomberg that he would spend his first year as mayor tearing out bike lanes and holding ribbon cutting ceremonies to do so.¹³ In a recent blog post in the New Yorker, John Cassidy questions the cost effectiveness of adding so many bike lanes. He makes the case that perhaps the city has invested more money in bike lanes than the benefits they generate. This type of argument points out that given the limited number of cyclists in the city, the additional benefits gained from continued bike lane expansion are not sufficient to justify the financial and social costs of constructing those new lanes. He is an advocate of limiting bike lanes to “heavily used and clearly defined routes to and from the city – and on popular biking routes within the city and the boroughs.” Perhaps Cassidy is correct and the city should consider altering its expansion plan and wait for bike ridership to increase before making such a large capital investment¹⁴. On the other hand, without the initial investment, increased bike use could also result in increased bike accidents.

New York City’s Bike-Share System: Citi Bike

In 2009, the New York City Department of City Planning (NYC DCP) recognized the success of bike-share programs such as Washington DC’s Capital Bikeshare and Paris’s Velib systems. The Department of City Planning decided to conduct a feasibility study to determine whether or not a bike-share system could benefit the city. In order to make this determination, the report analyzed existing bicycling conditions in the city, estimated the number of potential bicyclists as well as options for funding of a bike-share program. This study found that in order for such a program to be successful, the bike-share locations should be highly concentrated in medium- and high-density areas of the city¹⁵. These areas are defined as areas with 32,000 people/square mile or more and encompass areas that are home to about two thirds of the city’s population¹⁶. In the long run, the bike-share system would be expanded to all five boroughs, and the Department of City Planning report suggested using three phases, as indicated below:

¹³ Walljasper, Jay. “Bike Backlash Quiets Down in New York and Elsewhere.” *Huffington Post*. June 10, 2013. Accessed June 12, 2013. Available at: http://www.huffingtonpost.com/jay-walljasper/bike-backlash-quiets-down_b_3416550.html

¹⁴ Cassidy, John. “Battle of the Bike Lanes.” *The New Yorker*. 8 March 2011. <http://www.newyorker.com/online/blogs/johncassidy/2011/03/battle-of-the-bike-lanes-im-with-mrs-schumer.html>.

¹⁵ NYC Department of City Planning. “Bike Share Opportunities in New York City.” Spring 2009. http://www.nyc.gov/html/dcp/pdf/transportation/bike_share_part1.pdf.

¹⁶ NYC Department of City Planning. “NYC Department of City Planning. “Bike Share Opportunities in New York City.” Spring 2009. http://www.nyc.gov/html/dcp/pdf/transportation/bike_share_complete.pdf.

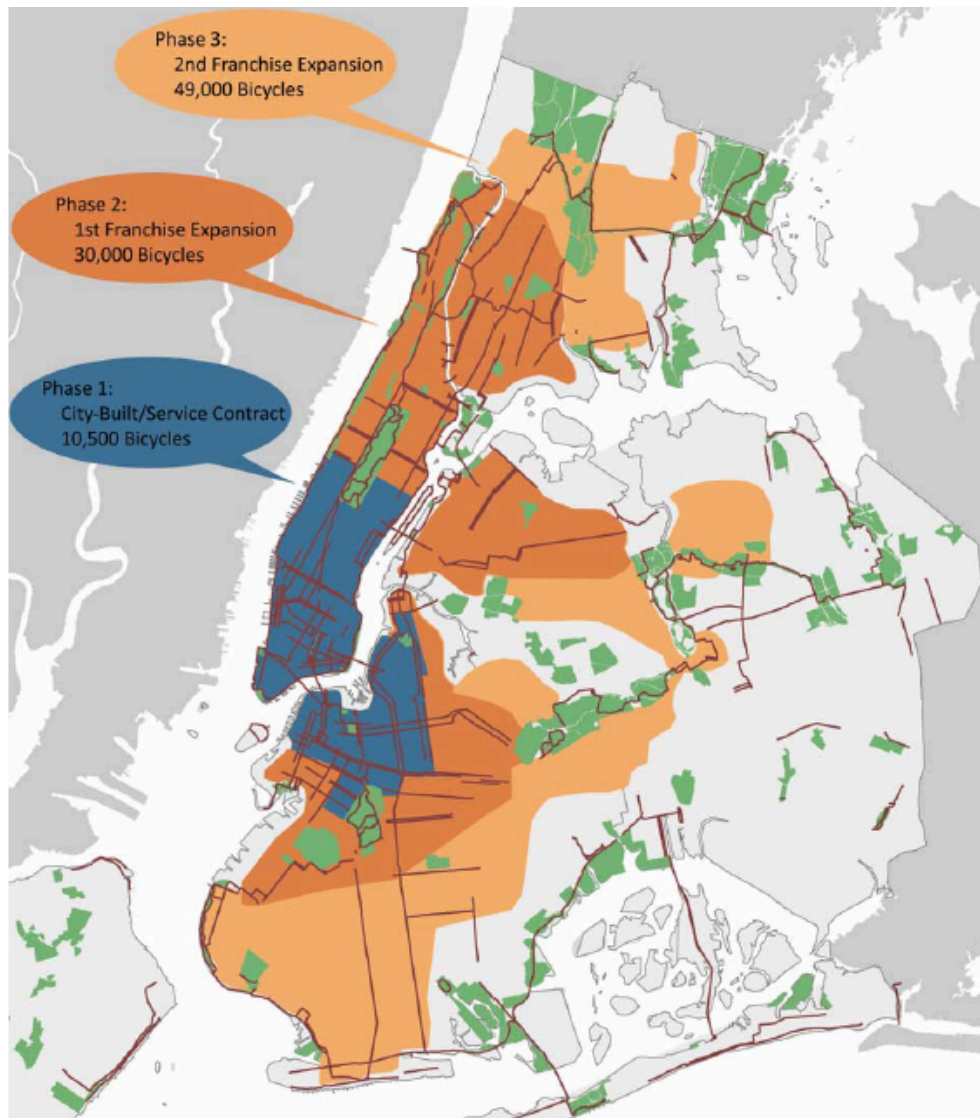


Image Source: http://a841-tfpweb.nyc.gov/bikeshare/files/2011/08/bike_share_part1.pdf

Building on the Department of City Planning report, the NYC Department of Transportation began a public-private partnership bike share program with Citigroup and Mastercard.

The Montreal-based company Public Bike System Co. supplies the bikes and stations while the company Alta installs, develops software and operates the bike systems¹⁷. Citigroup committed \$41 million over five years in order to sponsor the program in return for Citi's logo being displayed on the system's bikes and docking stations throughout the five boroughs. Mastercard agreed to pay \$6.5 million to install all of the docking

¹⁷ Riga, Andy. "After Chattanooga, New York city delays launch of its Bixi bike-sharing system". The Montreal Gazette. 17 July 2012. <http://blogs.montrealgazette.com/2012/07/17/after-chattanooga-new-york-city-delays-launch-of-its-bixi-bike-sharing-system/>

stations with “PayPass Tap & Go” payment points and traditional magnetic-stripe terminals¹⁸.

The bike-share system is meant to serve both residents and tourists offering an annual membership as well as a daily or weekly membership. Users can take the bicycles out for a minimum of 45-minutes or longer periods. At the end of each time allotment, bikes must be returned to any Citi Bike station across the city or an additional fee will be charged for the remainder of the time that the bicycle is out¹⁹. As of June 9, 2013, 15 days after its launch, 162,248 trips and 476,285 miles had been traveled with Citi Bike, with a total of 35,879 Annual members.²⁰

To help sell the bike-share system, the NYC DOT held 33 bike share demonstrations, some of which were held in foreign languages; presented to Community Boards and Community Board leadership 54 times; held 13 community planning workshops; met over 150 with other stakeholders, institutions and business improvement districts; and collected over 10,000 location suggestions and 60,000 support votes on a suggestion map on their website. Mayor Bloomberg referred to the feedback collection process as “the most extensive outreach effort ever done for a transportation project,” and it was all conducted between September 2011 and April 2012.^{21,22}

The project was initially scheduled to launch on July 31, 2012, but the launch was delayed because Alta had difficulties developing the software for the bike share system. It had previously outsourced its software development to a third party for its projects in Washington and Boston. The launch was further delayed by Hurricane Sandy in October of 2012. Mayor Bloomberg had expressed minimal concern about the delay of the launch date as it was not a city-funded project, and there was no direct taxpayer investment in the initiative. The mayor had emphasized the fact that they would not prematurely launch the program and would wait for the businesses involved to perfect the system.

¹⁸ Goldman, Henry. “Citigroup Pays \$41 Million to Sponsor NYC Bike-Share Program.” Bloomberg. 7 May 2012. <http://www.bloomberg.com/news/2012-05-07/citigroup-pays-41-million-to-sponsor-nyc-bike-sharing-program.html/>.

¹⁹ NYC Department of Transportation. “New York City Bike Share.” <http://a841-tfpweb.nyc.gov/bikeshare/>.

²⁰ Citi Bike. “Citi Bike June 9 Recap: Quick Stats.” NYC Bike Share, LLC. June 9, 2013. Accessed June 13, 2013. Available at: <http://citibikenyc.com/blog/2013/06/09/citi-bike-june9-recap>

²¹ Flegenheimer, Matt. “City Unveils Locations of Bike-Share Stations.” The New York Times. 11 May 2012. <http://www.nytimes.com/2012/05/12/nyregion/city-unveils-locations-of-bike-share-stations.html>.

²² NYX Department of Transportation. “New York City Bike Share: Suggestion Archive.” <http://a841-tfpweb.nyc.gov/bikeshare/suggestion-archive/>.

Citi Bike was officially launched on May 27, 2013 with 6,000 bikes at 330 stations across the city.²³ In May of 2012, the first 420 proposed locations for Citi Bike were revealed to the public, which are marked in the adjacent image A.²⁴ Due to the damage that occurred from Hurricane Sandy, not all of these stations were built.²⁵ The updated, current map of the locations is labeled imaged B.²⁶ All locations in gray are in progress set to be opened later in 2013. All of the locations are in lower and midtown Manhattan, Brooklyn and a select few areas of Queens along the East River.

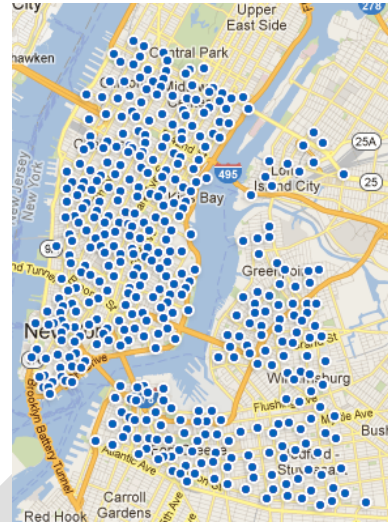


Image source: <http://a841-tfpweb.nyc.gov/bikeshare/station-map/>

These locations are the densest areas of the city. In order for a program like this to be a success, it must be convenient for users to gain access to stations to pick up and drop off bikes while also including desirable points of destination in-between. This posed a challenge for a city as congested as New York because these areas are typically those that are the least safe for bicyclists. For example, there are no bike-share locations along the innovative Ninth Avenue bike lane, or near Columbia University's campus in Morningside Heights. There are many areas of the city that remain bike-less, including Queens, the Bronx, Staten Island, the majority of Brooklyn and much of upper Manhattan.²⁷



Image source: <http://a841-tfpweb.nyc.gov/bikeshare/station-map/>

²³ CBS New York. "Citi Bike Formally Launches For Daily, Weekly Members." CBS Local Media. June 2, 2013. Accessed June 12, 2013. Available at: <http://newyork.cbslocal.com/2013/06/02/citi-bike-formally-launches-for-daily-weekly-members/>

²⁴ The City of New York a. City Bike Station Map. New York City Department of Transportation. 2013. Accessed ???. Available at: <http://a841-tfpweb.nyc.gov/bikeshare/station-map/>

²⁵ Miller, Stephen. "Eyes on the Street: Bike Corrals Protect Ninth Avenue Bike Lane." StreetsBlog. April 5, 2013. Accessed June 14, 2013. Available at: <http://www.streetsblog.org/2013/04/05/eyes-on-the-street-bike-corrals-along-9th-avenue-bike-lane/>

²⁶ The City of New York b. City Bike Station Map. New York City Department of Transportation. 2013. Accessed July 10, 2013. Available at: <http://a841-tfpweb.nyc.gov/bikeshare/station-map/>

²⁷ CBS New York. "Citi Bike Formally Launches for Daily, Weekly Members." CBS Local Media. June 2, 2013. Accessed June 12, 2013. Available at: <http://newyork.cbslocal.com/2013/06/02/citi-bike-formally-launches-for-daily-weekly-members/>

Few city programs are without controversy and Citi Bike is no exception. In addition to lack of expansion across all areas and boroughs, there have been complaints from citizens across the city. Some auto drivers have complained of improper ticketing in areas where docking stations have been set in place without prior warning. Street vendors fear the program will decrease business for them as it will “cut into their territory.”²⁸ Lastly, inactivity has been observed to be an issue at 35 stations, accounting for 10 percent of the total 330 stations. In the early stages of the program, these stations did not have activity for four or more hours each day. This could imply lack of interest, despite the fact that some of these stations were in popular areas.²⁹ An important issue is also safety, as this program targets light bike users, who may not own helmets, or be knowledgeable about bike safety rules and practices.

Opportunities in Bike Parking and Transportation System Integration

Citi Bike undoubtedly helps to combat issues related to bicycle access as well as bicycle parking and will do some work to address the lack of connection between bicycle transport and New York City’s expansive bus and subway system. However, New York also has much work to be done in terms of infrastructure integration in order to truly establish itself as one of the top cities for bicycling. Other cities, such as Chicago and Toronto, have nearly five times as much bike parking as New York City. While Chicago and Toronto are not nearly as large and densely populated as New York, many cycling advocates believe that increased availability of bike parking will encourage a transition from personal automobile transport to bicycling. Another critical aspect to this transition is integrating bicycle infrastructure with the city’s existing transportation infrastructure³⁰. Chicago has established itself as a leader in integrating bike racks into transportation systems and San Francisco and Washington are leading the way by providing reliable bike lockers at transit stations.

Despite the work that has been made to improve bike ridership in New York City, there is still much work to be done. New York has been the leader in bike lane and path expansion since 2000 and has used innovative design strategies and program

²⁸ CBS New York. “Citi Bike Formally Launches For Daily, Weekly Members.” CBS Local Media. June 2, 2013. Accessed June 12, 2013. Available at: <http://newyork.cbslocal.com/2013/06/02/citi-bike-formally-launches-for-daily-weekly-members/>

²⁹ Bernstein A, Melendez S, Hinds, K. “Ten Percent of Citi Bike Docks Appear to Fail Each Day.” Transportation Nation. June 11, 2013. Accessed June 12, 2013. <http://www.wnyc.org/blogs/transportation-nation/2013/jun/11/problems-what-problems-ny-officials-bat-citi-bike-complaints-away-adjustment-period/>

³⁰ Pucher, John and Buehler, Ralph. University transportation Research Center. “Final Report: Analysis of Bicycling Trends and Policies in Large North American Cities: Lessons for New York.” March 2011. <http://www.utrc2.org/research/assets/176/Analysis-Bike-Final1.pdf>.

implementation strategies including public and private stakeholder involvement. On the other hand, the city has overlooked many opportunities for innovation in terms of bike parking and bike-transit integration³¹. It also needs to address business concerns, access to outer boroughs, and safety issues.

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³¹ Pucher, John and Buehler, Ralph. University transportation Research Center. "Final Report: Analysis of Bicycling Trends and Policies in Large North American Cities: Lessons for New York." March 2011. <http://www.utrc2.org/research/assets/176/Analysis-Bike-Final1.pdf>.

Appendix³²

- New York City was recognized as a "Bicycle Friendly Community" by the League of American Bicyclists, making it the only big city on the eastern seaboard to receive the prestigious designation.
- Bicycling magazine named New York City one of the most improved cities for cycling in the nation.
- A first of its kind protected bike path was installed on Ninth Avenue in Manhattan, physically separating cyclists from motor vehicle traffic. The Institute of Transportation Engineers has given their "Program of the Year" award to this re-design of Ninth Avenue
- DOT completed a companion path along Eighth Avenue this spring.
- DOT distributed nearly 680,000 free bike maps over the three-year period, and more than 1.6 million since 1997. DOT also enhanced the look and design of the cycling map, adding details such as historic districts.
- DOT reconfigured major, complex intersections at key locations such as Grand Army Plaza Brooklyn; at the Manhattan Bridge bike path entrance in Chinatown; and at Madison Square where Broadway, Fifth Avenue and 23rd Street converge around the historic Flatiron Building.
- DOT rolled out an ambitious pilot of high-visibility green bicycle lanes, including recently on Christopher and West 10th Streets and on Washington Square North and MacDougal Street in the popular cycling neighborhood of Greenwich Village.
- The City held "Summer Streets," a 7-mile car-free route on Park Avenue for cyclists and pedestrians, on three consecutive Saturdays in August 2008. Summer Streets was expanded to all five boroughs in 2009 and the 7 mile Park Avenue route will return in August 2009.
- To increase cyclist safety DOT has fitted and provided free of charge, over 23,000 official NYC bicycle helmets.
- 204 "bike boxes" which help cyclists advance to the front of vehicle queues and safely turn from one street on the bicycle network to another

³² NYC DOT Press Release. "DOT Completes Unprecedented Three-Year, 200-mile Installation of Bike Lanes, Making City Streets Safer for All Users." 8 July 2009. http://www.nyc.gov/html/dot/html/pr2009/pr09_030.shtml.

- Over 1,000 intersections were marked with dashed lines and chevrons which guide cyclists through intersections and make turning vehicles aware that cyclists may be present
- 4.9 miles of protected bicycle lanes that provide physical separation from traffic
- DOT launched the "LOOK" public awareness media campaign to promote bicycle safety.
- DOT developed an attractive bicycle parking shelter that prominently displays the NYC Bike Map and the LOOK public awareness campaign. To date, 20 of these have been installed.
- DOT installed over 6,100 bike racks over the past three years. A new iconic NYC bicycle rack design was chosen through DOT's international design competition last year. The new rack design will go into production this year. Bicycle Rack installations will continue until there is sufficient bike parking citywide.
- DOT designed a new, sleek bicycle guide sign for use at intersections in the bicycle network and to route cyclists to major destinations. Nearly 1,000 of these signs have been installed including over 600 to route cyclists to the four East River Bridges