THE PORT AUTHORITY OF NY & NJ

BICYCLE MASTER PLAN

PREPARED BY THE OFFICE OF THE CHIEF OPERATING OFFICER

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Acronyms and Abbreviations

AASHTO	American Association of State Highway Transportation Officials
BWG	Bicycle Working Group
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CTA	Central Terminal Areas
ECG	East Coast Greenway
FARS	Fatality Analysis Reporting System
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	Greenhouse gas
GOCOR	Government and Community Relations
GWB	George Washington Bridge
GWBBS	George Washington Bridge Bus Station
HSIP	Highway Safety Improvement Program
JFK	John F. Kennedy International Airport
LGA	LaGuardia Airport
MAP-21	Moving Ahead for Progress in the 21st Century Act
MBTA	Massachusetts Bay Transit Authority
MTA	New York City Metropolitan Transportation Authority
MOT	Maintenance of Traffic
MOTBY	Military Ocean Terminal at Bayonne
MPO	Metropolitan Planning Organization
NACTO	National Association of City Transportation Officials
NHPP	National Highway Performance Program
NHS	National Highway System
NHTSA	National Highway Traffic Safety Administration
NJDOT	New Jersey Department of Transportation
NJTPA	New Jersey Transportation Planning Authority
NYC DCP	New York City Department of City Planning
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYCDOT	New York City Department of Transportation
NYMTC	New York Metropolitan Planning Council
NYPD	New York City Police Department
NYSDOT	New York State Department of Transportation
OCOO	Office of the Chief Operating Officer
OEEP	Office of Environmental and Energy Programs
PABT	Port Authority Bus Terminal
PAPD	Port Authority Police Department
PATH	Port Authority Trans-Hudson

PIRF	Project Initiation Request Form
PMO	Project Management Office
Port Authority	Port Authority of New York and New Jersey
RTP	Regional Transportation Plan
SHSP	State Highway Safety Plan
SJTA	South Jersey Transportation Authority
STBG	Surface Transportation Block Grant
TAP	Transportation Alternative Program
TB&T	Tunnels Bridges and Terminals
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery
WTC	World Trade Center

Definitions

Amenity	Infrastructure (e.g., bike racks or ramps) or services (e.g., valet parking, repair, etc.) that makes cycling a more convenient and viable mode choice
Bicycle Facility	Infrastructure, such as a dedicated bike lane, that facilitates bicycle access and circulation
Capital Plan	A long-range financial blueprint that prioritizes major projects and allocates resources accordingly
Line Department	A Port Authority department responsible for operating a facility
Master Plan	A long-range visioning document that identifies needs and establishes goals that serve as a guideline for a long-range capital planning or annual budgeting process
Port Authority Facility	Infrastructure that the Port Authority designs, builds, owns, operates, and/or maintains
Staff Department	A Port Authority department that provides support services to those line departments with operational functions

Executive Summary

This Bicycle Master Plan (Plan) is an update with significant enhancements for bicycle accommodations to the Port Authority of New York and New Jersey (Port Authority)'s 2010 Bicycle Master Plan, which was developed in accordance with the formal Bicycle Policy adopted by the agency's Board of Commissioners in 2010:

In keeping with its mission to meet the critical transportation needs of the bi-state region, the Port Authority supports bicycling as an important and sustainable mode of travel. It seeks to provide its customers, tenants, visitors, and employees with safe and convenient bicycle access and secure bicycle parking at its facilities, wherever operationally and financially feasible.

This policy statement established the institutional framework and directive for bicycle planning efforts at the Port Authority. The agency's 2010 Bicycle Master Plan pre-dated the redevelopment of the World Trade Center, which is now home to a major multimodal transportation hub. This new Bicycle Master Plan reflects the growth in regional cycling trends since 2010 and includes the World Trade Center in its analysis of existing conditions and proposed strategies.

This new Bicycle Master Plan also reflects a collaborative intra-agency effort led by the Office of the Chief Operating Officer (OCOO), relying heavily on the Planning and Regional Development Department. This team formed a task force that developed the plan with significant input from a Bicycle Working Group (BWG) including representatives from Engineering, Government and Community Relations (GOCOR), Marketing, Project Management Office (PMO), Real Estate, Office of Environmental and Energy Programs (OEEP), and from line departments, including Aviation, Tunnels, Bridges, & Terminals (TB&T), Port, Port Authority Trans-Hudson (PATH), and World Trade Center (WTC).

The *Regional Context* chapter provides insight into regional cycling trends and highlights the need for bicycle planning in the New York-New Jersey metropolitan region in which the Port Authority operates. Bicycling is a rapidly growing mode of transportation in the New York-New Jersey metropolitan region. Between 2011 and 2015, the average number of weekday bicycle commute trips increased by 40.8 percent and bicycling's mode share for work trips increased by 34 percent.

The *Institutional Context* chapter explains the history of the Port Authority's bicycle planning and practices while the *Goals and Objectives* chapter outlines the agency's bicycle-friendly vision. The Port Authority has worked to provide bicycle infrastructure, improve bicycle safety, and increase bicycle access for multimodal transportation connections since 2010, when the Board of Commissioners adopted a formal Bicycle Policy for the agency.

The *Existing Conditions* chapter summarizes current bicycle accommodations, ridership data, and safety data at each of the major Port Authority facilities. This section also describes the bicycle components of relevant ongoing projects at Port Authority facilities.

The *Recommendations* chapter proposes strategies to achieve the goals of the agency's 2010 Bicycle Policy, fulfill its bicycle-friendly vision, and support the multimodal transportation needs of the New York-New Jersey metropolitan region. The strategies include both hard (i.e., infrastructure) and soft (i.e., operations and policy) measures that look inward to institutionalize bicycle planning and practices within the agency and outward to coordinate access and circulation supportive of the greater regional network.

The *Implementation* chapter identifies internal departments, external partners, sample timelines, and potential resources for executing the proposed strategies. Most strategies are low-cost initiatives that may be integrated into existing operations and maintenance budgets. However, some strategies may require significant capital expenditures that would need to be evaluated alongside the agency's other critical capital needs and budgeted accordingly. There are grant funding opportunities for which the Port Authority may be eligible to implement certain strategies.

Purpose

This Bicycle Master Plan provides a long-range vision to institutionalize bicycle planning, practices, and policies within the Port Authority to accommodate the growing modal share of bicycling within the New York-New Jersey metropolitan region. The Port Authority is committed to monitoring cycling demand at its facilities and to making improvements and investments where necessary and feasible. The Bicycle Master Plan proposes strategies and potential implementation measures to achieve this vision, but its recommendations are wholly independent of the funding and prioritization decisions outlined in the agency's Capital Plan. Many strategies identified in this Bicycle Master Plan would not require significant capital investment and could have a positive impact on cycling in the region. These strategies could be integrated into existing operations and maintenance budgets based on the priorities and available resources within each Port Authority department.

Regional Context

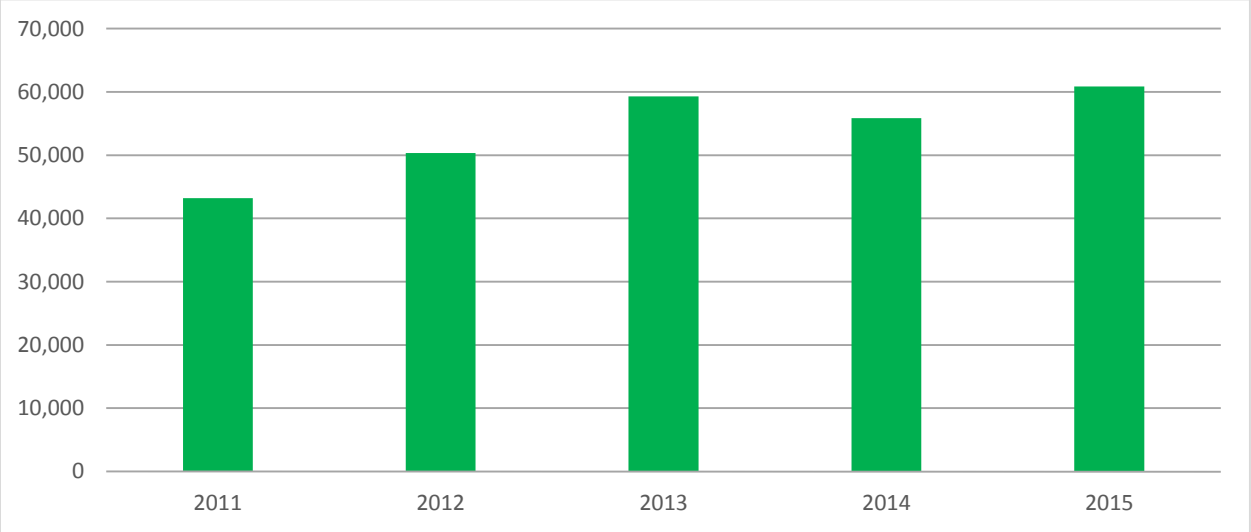
As bicycling has become a significant component of the regional transportation network, it is important to understand the regional trends and needs that affect Port Authority services and facilities. This chapter summarizes these regional trends.

For planning purposes, the New York-New Jersey metropolitan region includes the 23 counties covered by the two metropolitan planning organizations (MPOs) in this area: The New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA). The NYMTC sub-region includes 10 counties across New York City, Long Island, and the Mid-Hudson sub-region while the NJTPA sub-region includes the 13 counties in northern New Jersey. Throughout this Bicycle Master Plan, "region" refers to the 23-county area defined above and depicted on the following page in Figure 2.

Ridership Trends

Bicycling for commuting and recreation is a growing mode of transportation in the region. Specifically, as indicated in Figure 1 below, the average number of weekday bicycle commute trips in the region increased by 40.8 percent between 2011 and 2015.[1]

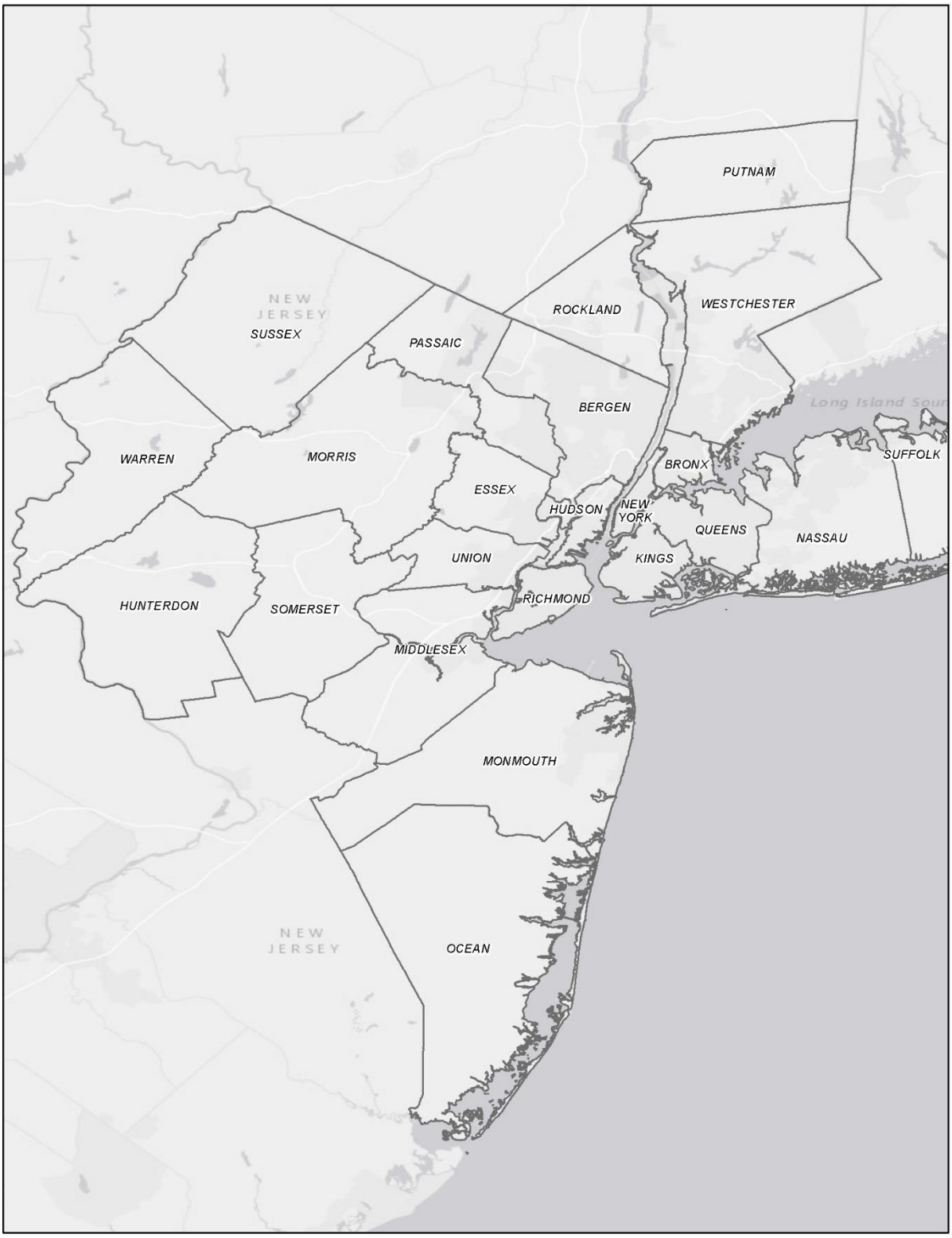
Figure 1. Average Number of Bicycle Commute Trips in the NYMTC and NJTPA Region, 2011 - 2015



Source: 2015 American Community Survey 1-Year.

[1] This information comes from the American Community Survey, conducted annually. The survey universe includes workers who are 16 or older. Thus, the data does not include children biking to work, school, or on recreational trips. In cases of multimodal travel to work, the survey asks for the mode with the longest distance. Therefore, bicycle trips are likely to be undercounted.

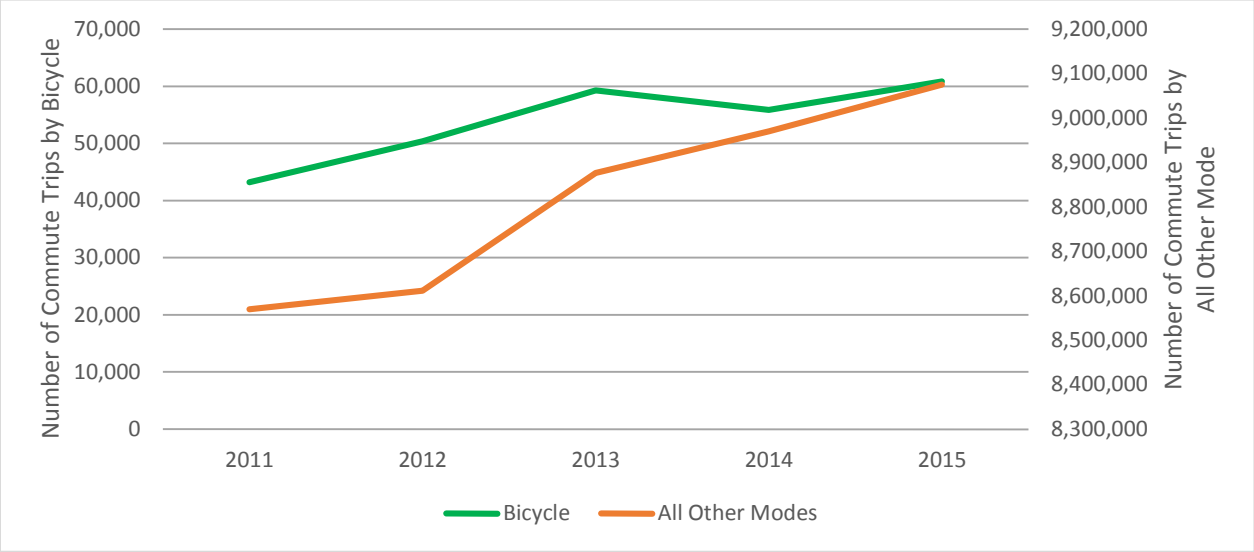
Figure 2. New York- New Jersey Metropolitan Region



Source: Port Authority Planning & Regional Development Department, 2016.

Similar to the national trends in other transportation modes, bicycle ridership experienced the greatest growth between 2012 and 2013. Despite a slight dip in the number of bicycle trips between 2013 and 2014, the overall trajectory between 2011 and 2015 has been positive. Figure 3 below compares the number of bike-to-work trips and other commute modes over the period.

Figure 3. Commute Trips in NYMTC and NJTPA Region by Mode, 2011 - 2015

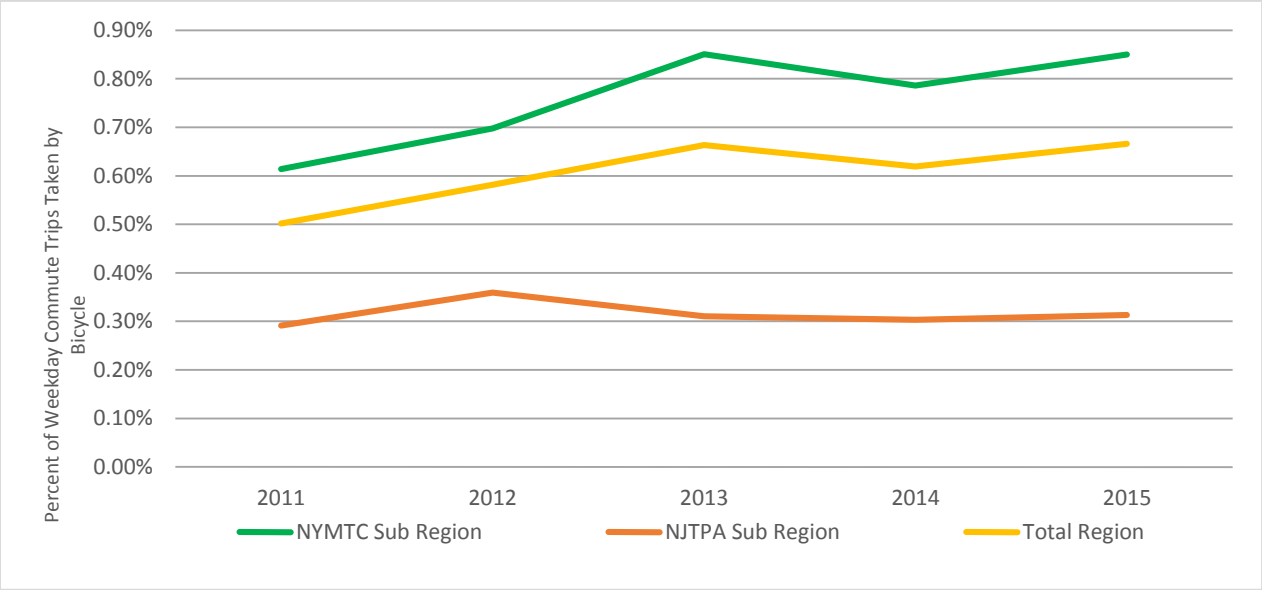


Source: 2015 American Community Survey 1-Year.

Bicycle trips in the region account for approximately 0.7 percent of all daily commuting trips, with many more bike-to-work trips occurring in the NYMTC sub-region, as compared to the NJTPA sub-region. The regional average of all daily commuting trips is above the national average of 0.6 percent. The number of daily weekday bicycle trips in the NJTPA sub-region increased by 0.8 percent between 2011 and 2015, compared to a 4.2 percent increase in the NYMTC sub-region, as can be seen in seen in Figure 4 on the following page. This follows national findings that people who live in larger cities are more likely to bike to work than those who live in smaller cities, suburbs, or rural areas[2].

[2] McKenzie, Brian. Mode less traveled – Bicycling and walking to work in the United States: 2008-2012. American Community Survey Reports. May 2014. ACS -25. https://www.census.gov/prod/2014pubs/acs-25.pdf

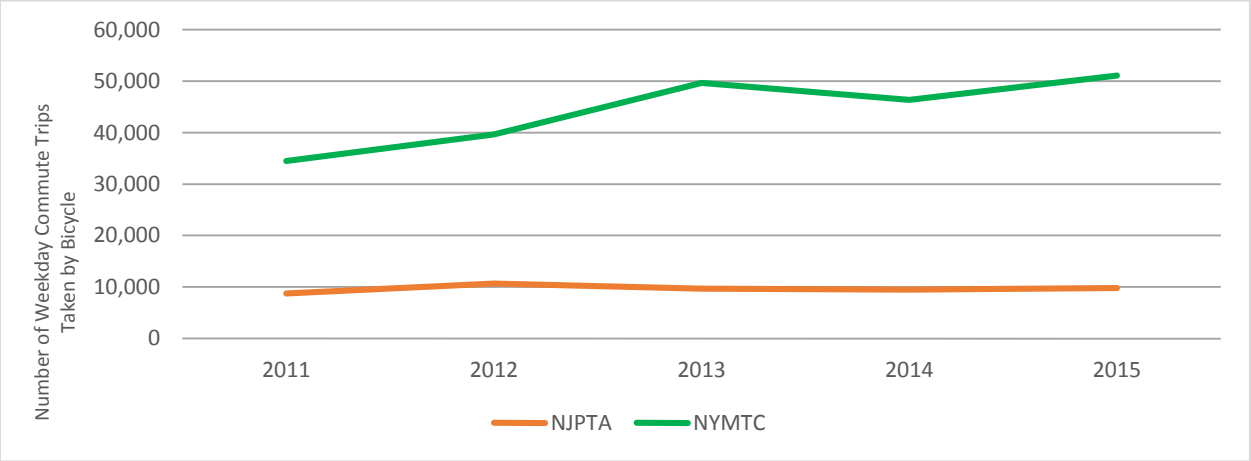
Figure 4. Bike Share of Commute Trips in the NJTPA and NYMTC Region, 2011 - 2015



Source: 2015 American Community Survey 1-Year.

In addition to the relative increase in size of the bicycle commuting population from 2011 to 2015, the NYMTC sub-region is also experiencing a faster rate of growth than the NJTPA sub-region. From 2011 to 2015, number of bike-to-work trips in the NYMTC sub-region had a growth rate of 12 percent while the NJTPA sub-region experienced a growth rate of nearly 3 percent.

Figure 5. Number of Bicycle Commute Trips in the NJTPA and NYMTC Region, 2011 - 2015

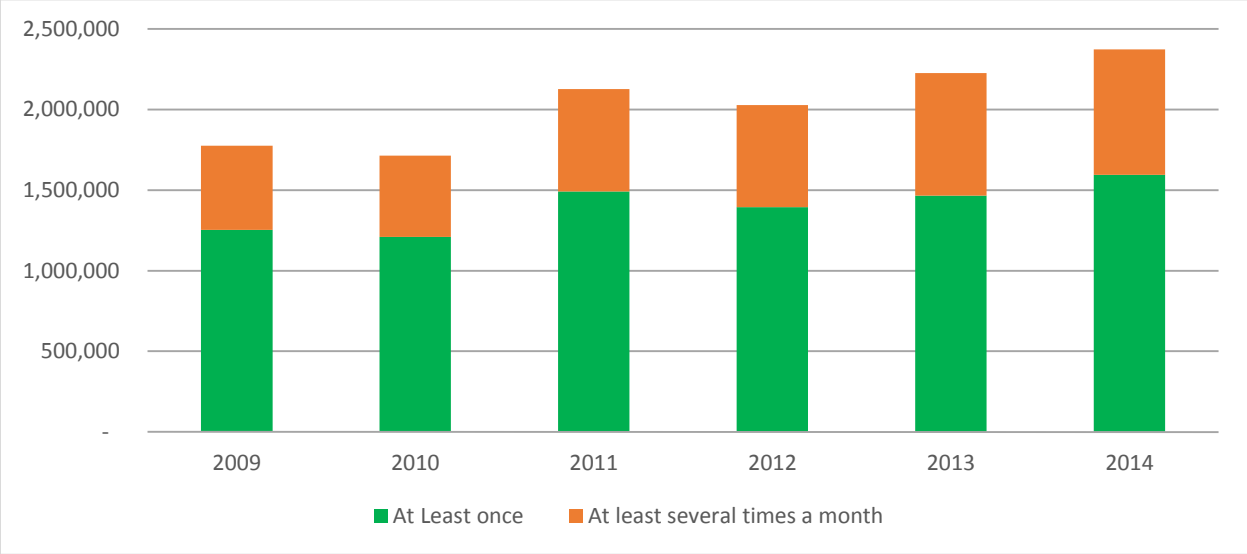


Source: 2015 American Community Survey 1-Year.

An important contributing factor as to why the NYMTC sub-region is experiencing a faster increase in bicycle commuters is the growth of cycling in New York City. Weekday commuting ridership has increased the most in New York City. Manhattan and Kings Counties have the highest daily mode share for bicycling with 2.2 percent and 1.6 percent, respectively. The growth rate of bicycle commuting in New York City is 13.1 percent, slightly higher than that in the NYMTC sub-region, as a whole.

In addition to growing rates of ridership among those who bike to work, ridership is increasing for other purposes, as well. The New York City Department of Health and Mental Hygiene (NYC DOHMH) conducts an annual Community Health Survey, in which respondents are asked how frequently they rode a bike in the past year, including for non-commuting purposes. As can be seen in Figure 6 below, there has been a substantial increase in overall bicycle ridership in New York City. From 2009 to 2014, there was a 21 percent increase in the number of people who biked in the previous year, and a 49 percent increase in those who bicycled multiple times a month[3].

Figure 6. Number of Adult New York City Residents Who Rode a Bicycle in the Last Year



Source: NYCDOT. Cycling in the City, May 2016.

One reason why ridership in New York City has increased may be the introduction and popularity of a bike share system. Bike share programs play an important role in the transportation landscape of the region, providing an inexpensive and convenient way for people to bike. These programs consist of a specially designed fleet of bicycles that dock to a network of bike racks throughout a designated area. Participants in the program can pick up a bike from any station and return it to any station, eliminating the need for users to own, maintain, and store a private bicycle. This model of bike travel also makes bicycling a viable mode for one-way trips and for a segment of a longer trip.

The Citi Bike program launched in May 2013 with docking stations in Manhattan and Brooklyn. Since then, it has expanded further into both boroughs, as well as into Queens and across the Hudson River in Jersey City, NJ. The program has become increasingly popular in the region since its introduction to the city, with the number of trips growing by 18.5 percent between 2013 and 2015[4]. Citi Bike boasts more than 100,000 annual members, accounting for more than 14 million trips in 2016, a record-breaking 4 million ride

[3] NYC DOT. Cycling in the City. May 2016. http://www.nyc.gov/html/dot/downloads/pdf/cycling-in-the-city.pdf
[4] Citi Bike daily ridership and membership data. 2013-2015. https://www.citibikenyc.com/system-data

increase from the previous year.[5] There is also a bike share program in Hoboken, the Hudson Bike Share, powered by NextBike. However, travel on a Next Bike is largely restricted to Hoboken's city limits, as the network of bikes and permitted docking locations is limited.

Regional Initiatives

Numerous regional and local agencies have been involved in bicycle planning in the region. For example, NYMTC's Regional Transportation Plan (RTP), *Plan 2045*, currently under development, will include a bicycle/pedestrian appendix[6] that will identify goals for bicyclist safety and network connectivity to improve the region's health, support economic development, and create a more sustainable community. NJTPA's *Together North Jersey 2015* Plan highlights the benefits for safe bicycle access. The report specifically prioritizes providing bicycle access to transportation hubs in the region and creating more bicycle-friendly streets to increase safety and entice more ridership. NJTPA's RTP, *Plan 2045: Connecting North Jersey* is scheduled for adoption in 2017 and will include goals related to increased bicycle access and safety in the region, as well.

In the NJTPA sub-region, two cities have created bicycle plans. The City of Hoboken published the Bicycle and Pedestrian Plan[7] in 2010 with the goal of increasing the bicycle mode share. NJTPA authored a Pedestrian and Bicycle Safety Action Plan[8] on behalf of the City of Newark in 2016 that includes a bike master plan. The document focuses on bike improvements to increase safety and reduce fatalities. Newark also seeks to adopt a Vision Zero policy, with a goal of eliminating all pedestrian fatalities by 2025 and expanding bike lane network by 90 miles.

PlaNYC[9], a New York City-wide planning document, which provides a vision and outlines projects through 2030, serves as a bicycle master plan. PlaNYC highlights many bicycling-related initiatives, including improvements to make bicycling safer and more convenient. PlaNYC establishes a goal to triple the 2007 bicycling commuting levels by 2017 and complete a citywide bike route network. Since the initiative began, New York City has installed over 72.2 miles of protected bike lanes and over 1,000 miles of unprotected bike lanes[10]. New York City has also implemented a Vision Zero Policy[11], with a goal of eliminating all traffic fatalities.

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[5] Citi Bike. 2016. https://www.citibikenyc.com/about; City of New York. Mayor de Blasio Announces That Citi Bike Rides Surged 40 Percent in 2016 -- Nearly 14 Million Trips Taken. 29 December 2016

[6] Appendix 2: Bicycles and Pedestrians. NYMTC. 2016. https://www.nymtc.org/Portals/0/Pdf/RTP/Appendix2.pdf

[7] Bicycle and Pedestrian Plan. City of Hoboken. December 2010. http://hobokennj.org/docs/transportation/City-of-Hoboken-Bicycle-and-Pedestrian-Plan-Final.pdf

[8] City of Newark Pedestrian and Bicycle Safety Action Plan. NJTPA. February 2016. http://njtpa.org/getmedia/3aa3ca1e-1055-499b-965e-95ad2848c36e/NPSAP-Final-4-7-16.pdf.aspx

[9] PlaNYC. April 2011. http://s-media.nyc.gov/agencies/planyc2030/pdf/planyc_2011_planyc_full_report.pdf

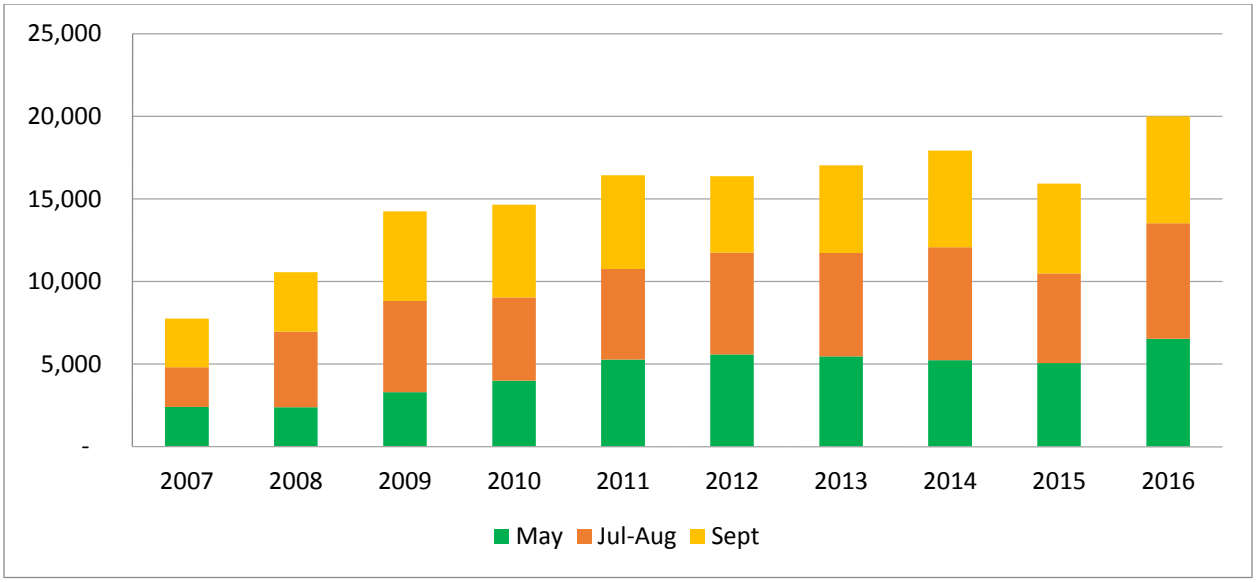
[10] NYC DOT. Protected bicycle lanes. 2016. http://www.nyc.gov/html/dot/downloads/pdf/nyc-protected-bike-lanes.pdf; Harshbarger, R. Exclusive: City to reach 1,000 miles of bike lanes on Tuesday. AM New York. 22 September 2015. http://www.amny.com/transit/new-york-city-to-reach-1-000-miles-of-bike-lanes-on-tuesday-1.10873995

[11] City of New York. 2016. http://www1.nyc.gov/site/visionzero/index.page

In addition to these local and regional initiatives, an effort is currently underway to create a bicycle and pedestrian trail connecting Florida to Maine. Once completed, this East Coast Greenway (ECG) will be "the nation's most ambitious long-distance urban trail," comprised of existing and planned bike routes along a contiguous, traffic-free route more than 3,000 miles long[12]. The ECG relies on several planned routes within the New York-New Jersey region. The route will eventually traverse Essex and Hudson counties in New Jersey as well as cross the George Washington Bridge into Manhattan and then proceed north to Connecticut. Complete maps of the ECG route are available at http://www.greenway.org/explore/maps and in Appendix B.

Manhattan's most popular bike path is a 12.4-mile stretch of the ECG, the Hudson River Greenway, which runs the entire length of the Hudson River Park from Battery Place at the southern tip of Manhattan to West 59th Street, where it connects with Riverside Park South. There are approximately 20 Citi Bike stations located along or within one block of the Hudson River Greenway. The New York City Department of Transportation (NYCDOT) has conducted 12-hour (7:00 a.m. to 7:00 p.m.) counts three times per year at the 50th Street entrance to the Hudson River Greenway since 2007. The data shows a 158 percent increase in ridership between 2007 and 2016, with 2016 representing the highest numbers in each of the three counting periods.

Figure 7. NYCDOT 12-Hour Bicycle Count at 50th Street and Hudson River Greenway, 2007 - 2016



Source: NYCDOT Midtown Bicycle Counts.

[12] East Coast Greenway. About the Greenway. 2016. http://www.greenway.org/about-the-greenway

Institutional context

The 2017 Bicycle Master Plan is consistent with existing policies and prior planning documents related to alternative transportation and sustainability at the Port Authority.

2010 Bicycle Policy

In February 2010, the Port Authority's Board of Commissioners adopted the following policy statement:

In keeping with its mission to meet the critical transportation needs of the bi-state region, the Port Authority supports bicycling as an important and sustainable mode of travel. It seeks to provide its customers, tenants, visitors, and employees with safe and convenient bicycle access and secure bicycle parking at its facilities, wherever operationally and financially feasible.

This policy statement established the institutional framework and directive for bicycle planning efforts at the Port Authority. The 2010 Bicycle Policy is included in Appendix A.

2010 Bicycle Master Plan

The Port Authority's first Bicycle Master Plan, completed in September 2010, identified ridership trends, conditions, and challenges related to bicycle infrastructure and access at or near Port Authority facilities. That Plan also proposed short- and long-term initiatives to improve bicycle access and amenities at or near Port Authority facilities. The Plan pre-dated World Trade Center redevelopment, but covered the agency's marine ports, airports, tunnels, bridges, and PATH system. The 2017 Bicycle Master Plan replaces the 2010 Bicycle Master Plan.

Sustainability Guidelines

In July 2006, the Port Authority adopted an administrative policy to:

…reduce adverse environmental impacts of the design, construction, operation and maintenance, and occupancy or leasing of new or substantially renovated buildings and facilities, reconstruction projects, and programs.

The Sustainability Design Guidelines that were developed in accordance with the above policy include provisions for bicycle amenities. The Sustainability Design Guidelines are available on page 129 of the *Sustainable Design Project Manual*, http://www.panynj.gov/about/pdf/Sustainable-Design-Project-Manual.pdf.

In March 2008, the Port Authority adopted a Sustainability Policy that established short- and long-term goals for the agency, including a goal to reduce greenhouse gas emissions by 80 percent by 2050 from 2006 levels. Supporting bicycle use as an alternative transportation mode among customers, tenants, visitors, and employees contributes towards that mandate.

Goals and Objectives

The 2010 Bicycle Policy specified six steps to advance the policy goals. Those six steps were the guiding principles for developing the 2017 Bicycle Master Plan and are re-framed here as goals. This planning effort established specific objectives for each of the goals. Some objectives appear more than once if they achieve multiple goals.

Goal 1- Bicycle Infrastructure

Integrate improved bicycle access, safe bicycle lanes, and secure bicycle parking and storage into existing buildings and facilities owned or operated by the Port Authority.

Objectives

a. Institutionalize the identification, analysis, and remediation of bicycle safety issues.
b. Provide adequate bike parking capacity.

Goal 2- New Design

Ensure that design guidelines for new construction and major renovations include sufficient bicycle access, storage, and related amenities to meet emerging demand.

Objectives

a. Institutionalize bicycle planning practice and formalize bicycle planning authority within the Port Authority.
b. Institutionalize the identification, analysis, and remediation of bicycle safety issues.

Goal 3- Multimodalism

Develop multimodal transit hubs that encourage biking and walking.

Objectives

a. Provide adequate bike parking capacity.
b. Enhance safety, accessibility, and connectivity of the local and regional bike network.

Goal 4- Safety and Convenience

Remove any unnecessary restrictions on bicycle access and promote the safe coexistence of motor vehicles, bicycles, and pedestrians at Port Authority facilities.

Objectives

a. Provide information to the public regarding public safety information, data, and resources for safe cycling at and near Port Authority facilities.
b. Enhance safety, access, and connectivity of the local and regional bike network.

Goal 5- Lead Others

Encourage tenants to expand bicycle access and accommodations.

Objectives

a. Provide information to the public regarding public safety information, data, and resources for safe cycling at and near Port Authority facilities.
b. Establish and foster a culture of bike commuting to increase the number of Port Authority and tenant employees who bike to work.

Goal 6- Coordination

Coordinate bicycle facility improvements and intermodal connections with regional planning organizations, other regional transportation providers, and local governments to promote safe and seamless travel throughout the region.

Objectives

a. Provide information to the public regarding public safety information, data, and resources for safe cycling at and near Port Authority facilities.
b. Enhance safety, access, and connectivity of the local and regional bike network.

In total there are six unique objectives. These objectives are the framework for strategies proposed in the *Recommendations* chapter. In sum, the six objectives are:

Objective 1	Formalize bicycle planning practice and authority within the Port Authority, currently under the Office of the Chief Operating Officer (OCOO).
Objective 2	Institutionalize the identification, analysis, and remediation of bicycle safety issues.
Objective 3	Provide adequate bike parking capacity.
Objective 4	Provide information to the public regarding public safety information, data, and resources for safe cycling at and near Port Authority facilities
Objective 5	Establish and foster a culture of bike commuting to increase the number of Port Authority and tenant employees who bike to work.
Objective 6	Enhance safety, access, and connectivity of the local and regional network.

Existing conditions

Most Port Authority facilities currently provide some bicycle access, parking, and storage to serve commuters, recreational cyclists, and multi-modal travelers. The following is a summary of the existing conditions of bicycle accommodations, ridership data, and safety data at each of the major Port Authority facilities.

Infrastructure

Tunnels

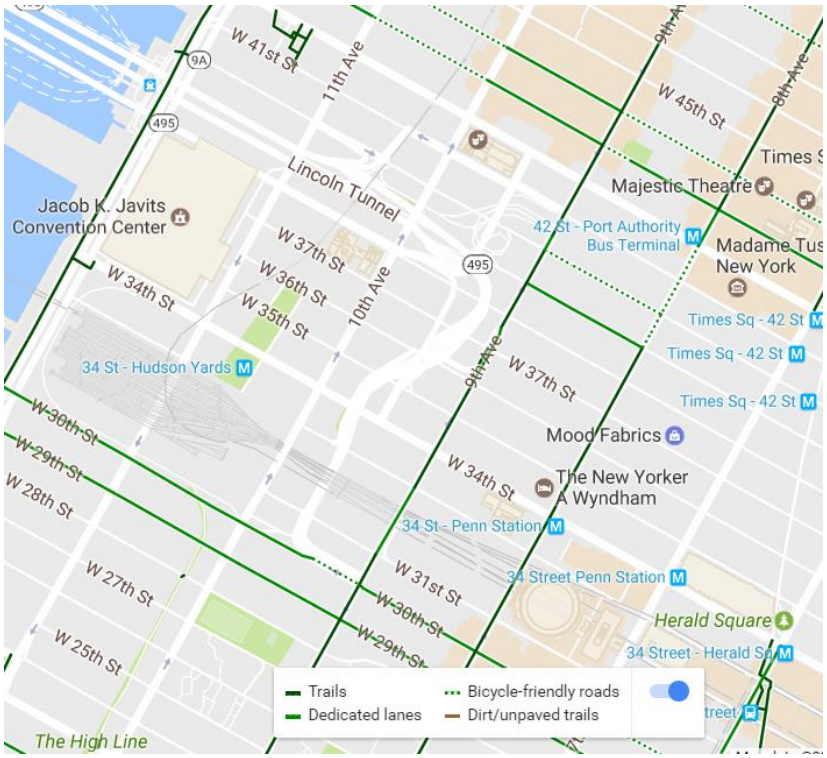
Bicycle use is prohibited inside the Lincoln and Holland Tunnels due to spatial and safety concerns. Thus, without bicycle circulation needs, the relevant bicycle issues at the tunnels include movement around the facilities, bicycle parking, and accommodation for Port Authority employees commuting by bicycle.

The Port Authority studied a potential pilot shuttle service to transport bicycles through the Holland Tunnel in 2011, but it appeared that subsidies would be necessary to support the service. The subsequent expansion of Citi Bike to Jersey City potentially reduces both demand and need for a shuttle service, as cyclists now have better opportunities to make trans-Hudson connections with frequently scheduled service from more locations via the PATH system instead of relying on a service through the tunnel.

Lincoln Tunnel

The Lincoln Tunnel connects Weehawken, NJ to Midtown Manhattan in New York City beneath the Hudson River. The center tube of the tunnel opened to traffic in 1937 and the north and south tubes followed in 1945 and 1957, respectively. Since then, traffic volumes have grown to over 18.9 million vehicles in the eastbound direction in 2015. On the New York side of the Lincoln Tunnel, there is no bicycle access along Dyer Avenue from 30th to 42nd Streets due to physical space constraints. However, with planned development on the West Side of Manhattan, particularly in the vicinity of Hudson Yards, it is anticipated that demand for bicycle and

Figure 8. The Manhattan Side of the Lincoln Tunnel



Source: Google Maps, 2016.

pedestrian access across this area will continue to grow. Therefore, the Port Authority maintains a close working relationship with NYCDOT and Community Board 4 to improve bicycle conditions on the streets around the Lincoln Tunnel, including identifying appropriate traffic controls and safe crossings. A protected bicycle lane exists on 9th Avenue, one block east of the tunnel's approach, providing safe north-south movement around the facility.

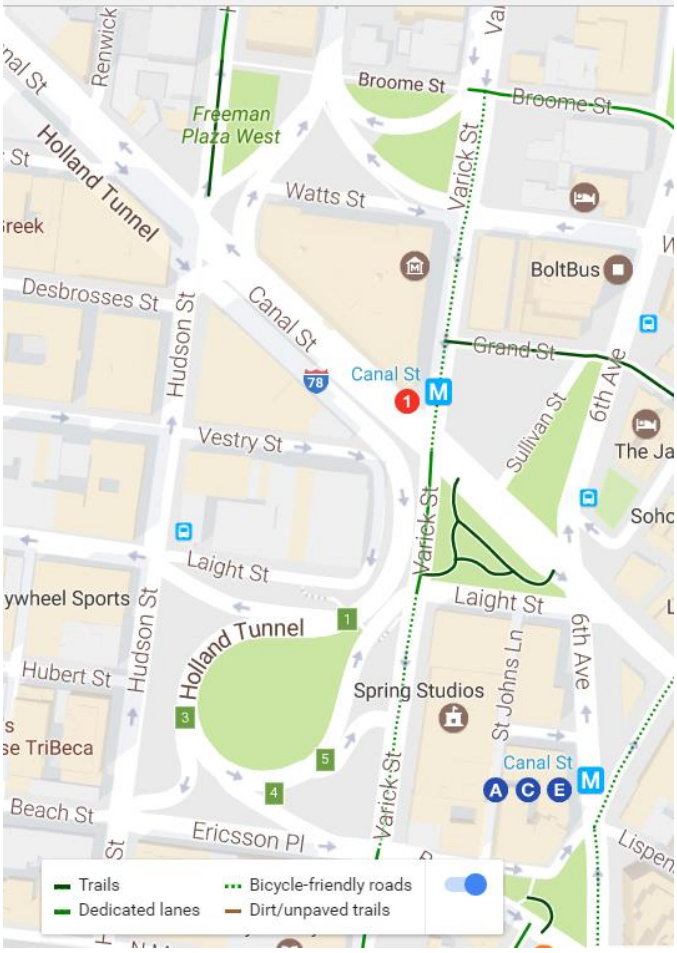
On the New Jersey side, Weehawken Waterfront Park is a major recreation destination for pedestrians and cyclists. Waterfront developments continue to generate local bicycle and pedestrian traffic, as does the continued build-out of the Hudson River Waterfront Walkway. However, the local roadways around the tunnel are designed primarily to accommodate automobiles and have no dedicated bicycle facilities.

Holland Tunnel

Constructed in 1927, the Holland Tunnel connects lower Manhattan to Jersey City, NJ beneath the Hudson River. The Holland Tunnel is located directly south of the Lincoln Tunnel and is comprised of two tubes that carried approximately 15.4 million vehicles in the eastbound direction in 2015.

There is bicycle activity on the local New York City street network around the Holland Tunnel, and New York City DOT has made additions to the bicycle network in the area in recent years. Specifically, the NYCDOT installed a bicycle lane on Varick Street past the Holland Tunnel's entrance and exit roadways to guide cyclists away from conflicts with tunnel traffic; Citi Bike installed a station on Laight Street; and the Port Authority installed bicycle racks on both sides of the pedestrian bridge and at the corner of Varick and Ericsson Place. The Port Authority also partnered with Hudson Square Connection (the Business Improvement District) to create a new park at Freeman Plaza. A request is currently pending with NYCDOT to install a bicycle rack on Hudson Street outside Freeman Plaza.

Figure 9. The Manhattan Side of the Holland Tunnel

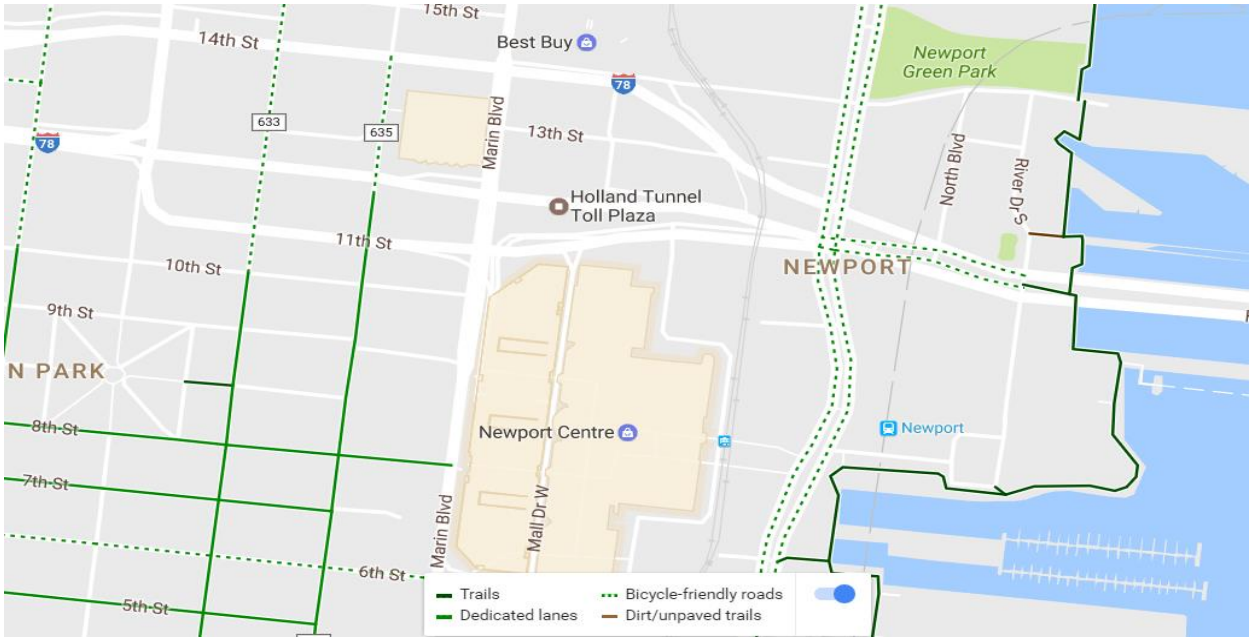


Source: Google Maps, 2016.

The area adjacent to the Holland Tunnel in Jersey City does not currently have any accommodations for bicycles, but the city is growing rapidly and becoming denser, conditions that support increasing bike

demand. A proposed development adjacent to the Holland Tunnel Administration Building would likely generate additional bicycle and pedestrian traffic across 12th and 14th Streets, if approved. There are no Citi Bike docking stations located in the immediate vicinity of the Holland Tunnel entrance or exit, though there are two stations located in the Newport area: one near the Holland Tunnel Vent Building and one adjacent to the Newport PATH station.

Figure 10. The New Jersey Side of the Holland Tunnel



Source: Google Maps, 2016.

Bridges

The Port Authority owns and operates four bridges connecting New York and New Jersey. Each bridge has unique policies regarding bicycle access, based on the design of the bridge. Three of the four bridges (George Washington, Bayonne, and Goethals) are undergoing replacement or extensive improvements. All of the projects underway will improve bicycle conditions on the crossings.

George Washington Bridge

The George Washington Bridge (GWB) connects Fort Lee, New Jersey, to upper Manhattan across the Hudson River. It opened to traffic in 1931, and a lower level was added in 1962 due to high demand. The GWB is currently the most traveled bridge in the world, with approximately 50.5 million crossings in the eastbound direction in 2015. The GWB is the only trans-Hudson crossing currently open to bicycle traffic, via the shared-use, bi-directional bicycle and pedestrian path along the south edge of the bridge. The path is approximately 10 feet wide between the railings and 7 feet wide between the sets of suspender cables, located every 60 feet along the main span. The path is normally open between 6:00 a.m. and 11:59 p.m. seven days a week. The north walkway, which has stairs, is generally closed unless the south walkway is undergoing temporary construction or maintenance. To accommodate multi-modal travelers, the Port

Authority installed bicycle parking racks at the Bridge Plaza bus stops on Lemoine Avenue in Fort Lee, New Jersey.

The existing walkways will be replaced as part of the ongoing program to replace the suspender ropes and rehabilitate the main cables. The program includes a number of bicycle-access improvements, including the removal of existing stairs on the north walkway and the tight switchback ramp on the south walkway, as well as the replacement of both to provide ADA-compliant access and an enhanced level of service for pedestrians and bicyclists on the approaches. The program also includes improved railings and lighting. In response to public comments to the Port Authority's Proposed 2017-2026 Capital Plan, in which this $1.8 billion program was included, the agency is committed to improving the geometry of the GWB path at the towers so that cyclists may comfortably navigate the path without having to dismount their bikes. The work will require long-term closure of the walkways, one side at a time, and the sequencing is planned to minimize impacts to bicyclists. Closing the north walkway first allows for the removal of the stairs before shifting bicyclists from the south walkway. Once the program is complete, cyclists will have exclusive use of the north walkway while pedestrians will use the south walkway. Separating the two user groups will enhance the current operation by eliminating conflicts between pedestrians and bicycles. Detailed design work and coordination with the municipalities on both sides of the bridge regarding specific connections to their planned bicycle networks is ongoing. Construction completion is anticipated in 2024.

Figure 11. Renderings of the Future GWB North and South Walkways

Source: Restoring the George Project

Depending on future bicycling demand and future capital capacity and agency needs, the Port Authority may make additional improvements in the long term, such as widening the path. Capital Program funding constraints preclude the addition of this enhancement to the current State of Good Repair program for the GWB.

One external factor that may impact bicycle ridership at the GWB is the ongoing construction of the New NY Bridge to replace the Tappan Zee Bridge. The existing bridge does not allow bicycle or pedestrian access, but when complete in 2018, the New NY Bridge will feature a shared-use bicycle and pedestrian path. This path will allow cyclists to complete an approximately 40-mile loop, traversing both the GWB

and the New NY Bridge. At this time, it is unknown how this expansion of the regional bicycle network will affect the volume, direction, or peak-periods of ridership at the GWB.

Bayonne Bridge

The Bayonne Bridge, opened in 1931, is one of the longest steel arch bridges in the world with a 1,675-foot central span connecting northern Staten Island, New York, to Bayonne, New Jersey, across the Kill Van Kull. The bridge had slightly over two million crossings in the eastbound direction in 2015, and provides a vital link for the region. Prior to initiation of the Bayonne Bridge Navigational Clearance Program in May 2013, the Bayonne Bridge featured a six-foot walkway that culminated in stairs in Bayonne. This walkway was open to pedestrians and cyclists, but saw fewer than 150 users a day during the peak period (summer weekends). Once completed in 2019, the rehabilitated Bayonne Bridge will include a 12-foot mixed use path with ramp access on both sides of the Kill Van Kull.

The walkway on the existing bridge closed in August of 2013 to facilitate the construction to raise the roadway. This closure is likely to extend through the duration of construction, which is anticipated to be complete in mid-2019. To accommodate pedestrians and cyclists, the Bayonne Bridge Navigational Clearance Project implemented a free shuttle bus that operated from Friday to Sunday between May and October on days when the bridge was not closed for construction. Between 2013 and 2015, it provided trips to more than 4,500 passengers with almost 1,200 bicycles. There was no shuttle service the summer of 2016 due to the large number of weekend bridge closures.

Goethals Bridge

Opened in 1928, the existing Goethals Bridge, which connects Elizabeth, New Jersey, to Staten Island, New York, across the Arthur Kill, had over 16.7 million crossings in the eastbound direction in 2015. The bridge currently does not provide access for cyclists or pedestrians. However, the bridge is being replaced, and, upon completion anticipated in late 2018, the new Goethals Bridge will include a 10-foot mixed-use path on the north side. The project developer will connect the new path to the existing transportation system in Elizabeth and Staten Island.

Figure 12. Rendering of the Mixed-use Path on the New Goethals Bridge

Source: Goethals Bridge Replacement Project

Outerbridge Crossing

The Outerbridge Crossing and the existing Goethals Bridge, which are similar in design, were the first facilities constructed by the Port Authority and opened for traffic in 1928. The Outerbridge Crossing connects southern Staten Island, New York, to Perth Amboy, New Jersey, across the Arthur Kill. In 2015, the bridge saw 14.4 million crossings in the eastbound direction. There are no facilities for pedestrians and cyclists on the existing bridge. There are no major projects for the Outerbridge Crossing included in the Port Authority's current Capital Plan, but any future plans for this crossing will be consistent with the Port Authority's bicycle policy.

Public Transportation Hubs

The Port Authority operates several transportation hubs, playing an essential role in facilitating safe and convenient travel throughout the region. Bus terminals, PATH stations, and ferry terminals allow for trans-Hudson and multimodal travel, providing space for various forms of transport to connect in a way that would otherwise be difficult to coordinate. These transportation hubs make it possible to transfer between modes and enable cyclists to complete the first- or last-mile by bike while relying on other modes for other segments of their trip.

George Washington Bridge Bus Station

The George Washington Bridge Bus Station (GWBBS), which opened in 1963, is located in upper Manhattan directly off the George Washington Bridge. The structure features direct bus ramps on and off

the upper level of the George Washington Bridge, creating a convenient mass transit connection. In 2014, close to five million passengers on 337,000 bus trips passed through the station.

The GWBBS is currently under construction for a major redevelopment that will enhance the quality of the passenger spaces. Once the renovated GWBBS opens, passengers with bicycles will have improved access to connect to bus carriers that transport bicycles. Some NJ Transit buses that serve the GWBBS are already equipped with front-mounted bicycle racks. Construction completion of the GWBBS by the private redeveloper is anticipated in mid-2017.

There was previously a bicycle rack at the GWBBS that was removed for construction. Bicycle parking will be re-installed after construction is complete. Additionally, Port Authority staff has had preliminary discussions with Citi Bike, which plans to expand to Washington Heights in the long-term and wishes to locate a docking station in the vicinity. The Port Authority will continue to coordinate with Citi Bike and NYCDOT on appropriate locations for bicycle sharing and parking at the GWBBS.

Port Authority Bus Terminal

The Port Authority Bus Terminal (PABT), located in midtown Manhattan bordered by 8th and 9th Avenues and 40th and 42nd Streets, serves as a critical trans-Hudson transportation hub. On a typical weekday, the PABT accommodates approximately 232,000 passenger trips and more than 7,000 bus movements. By 2040, peak-hour passenger traffic is expected to increase by between 35 percent and 51 percent, and peak-hour bus traffic is expected to increase by between 25 percent and 39 percent. In anticipation of this growth, the Port Authority is currently in the early phases of planning the construction of a new bus terminal.

Physical constraints and crowding limit bicycle access at the PABT and its surrounding area, though several projects have improved the bicycle network there recently. The Port Authority and NYCDOT coordinated on two key projects: installation of a protected bicycle lane on 9th Avenue and the installation and subsequent expansion of a Citi Bike station on 42nd Street on the frontage of the PABT. 8th Avenue also has a protected bicycle lane; however, the segment in front of the PABT merges into a taxi stand, creating potential conflicts.

Figure 13. The Port Authority Bus Terminal

Source: Google Maps, 2016.

The Citi Bike station replaced a public bicycle rack that was previously located at the PABT. With limited frontage space, the Port Authority prioritized Citi Bike because Citi Bike serves a greater volume of multimodal customers, with a single bike making several trips throughout the day, compared to private bicycles. Observed demand for bicycle parking around the perimeter of the PABT has remained modest, and the public bicycle rack had consistently suffered from abandoned bicycles that rendered it ineffective. NYCDOT has added bicycle parking nearby on 9th Avenue as part of the equipment for the new bicycle lane, and until recently that new bicycle parking fully satisfied demand in the area. That parking has now reached capacity (used largely by a local business for delivery bikes) and small numbers of bicycles have recently been locked to street furniture and street trees around the 9th Avenue terminal frontage. The Port Authority will continue to monitor bicycle parking demand and safety on the terminal frontages on an ongoing basis.

Figure 14. Citi Bike Station at the PABT

Figure 15. NYCDOT Bicycle Racks on 9th Ave.

Source: Port Authority Tunnels, Bridges, and Terminals Department, 2016.

PATH

The Port Authority Trans-Hudson (PATH) system is a heavy rail rapid passenger line that provides a vital mass transit connection between New Jersey and midtown and lower Manhattan. In 2015, PATH provided 78.6 million trips to passengers, and ridership is projected to grow by 20 percent in the next 15 years. Due to existing and projected ridership, there is limited access for bicycles on board PATH trains.

Specifically, folded bicycles are permitted on PATH at all times. Two non-folding bicycles are permitted per car during non-peak commuting periods. Non-peak commuting periods include any time outside the weekday morning peak (6:30 a.m. to 9:30 a.m.) and weekday evening peak (3:30 p.m. to 6:30 p.m.). A reverse commute exception was considered to allow bicycles on PATH trains traveling from Manhattan to New Jersey during the peak morning hours, and from New Jersey to Manhattan during evening peak hours. However, projected growth combined with the fact that many platforms and stairways are shared by bi-directional commuting traffic, make such an exception infeasible and potentially unsafe at this time.

As bicycle use continues to grow, so does the need for bicycle parking. To facilitate multimodal trips, bicycle parking is available at all PATH stations, and the majority of PATH stations have increased bicycle parking capacity since 2011. Some PATH station property is not owned or operated by the Port Authority, and consequently the agency has limited authority. However, agency staff work with appropriate jurisdictions to manage bicycle parking capacity as needed.

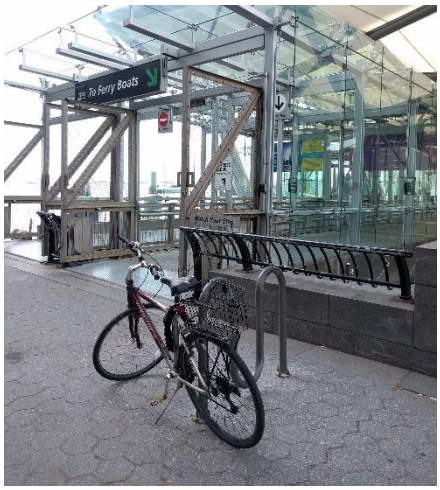
Accessing PATH stations by bicycle has also become safer and more convenient in recent years. Dedicated bicycle lanes now run along Sixth Avenue and Christopher Street in New York City, intersecting with all uptown PATH stations. In Lower Manhattan, the WTC PATH Station is within one block of the Hudson Waterfront Greenway, a physically separated bike path that extends from Washington Heights to Battery Park City along the west side of Manhattan. In New Jersey, PATH stations at Grove Street, Exchange Place and Hoboken are adjacent to dedicated bicycle lanes. Stations in Harrison and Newark are next to shared-

use lanes. Bicycle share systems (Citi Bike in Manhattan and Jersey City and Hudson Bike Share in Hoboken) are available near several PATH stations.

Ferries

The Port Authority owns or operates two ferry terminals: World Financial Center Ferry Terminal in Manhattan and Hoboken Ferry Terminal, adjacent to NJ Transit's Hoboken Train Terminal and PATH's Hoboken Station. Bicycle parking is available just outside the footprint of each terminal. Bicycle racks near World Financial Center Ferry Terminal are located along the Battery Park City Esplanade and appear to have sufficient bicycle parking capacity to meet demand. The Hoboken Ferry terminal is co-located with the Hoboken PATH station and New Jersey Transit Rail Station, where bike parking demand exceeds current capacity.

Figure 16. Bike Parking at World Financial Center Ferry Terminal



Source: Port Authority Planning & Regional Development Department, 2016.

Figure 17. Bike Parking at Pier 11/Wall Street Terminal

Source: Port Authority Planning & Regional Development Department, 2016

Bicycles are allowed on board ferries at all times for a $1.00 fee. All boats are equipped with storage space to allow for safe transport of bikes.

Airports

In 2004, the Port Authority initiated a process to develop and implement a bicycle access plan for the three largest airports in the region: John F. Kennedy International, Newark Liberty International, and LaGuardia Airports. Because Central Terminal Areas (CTA) at all Port Authority-owned airports are only accessible via roadways, the bicycle access plan did not provide for direct movement of bicycles from each airport's periphery to its center. Thus, the plan established an intermodal approach for employees in the CTA to bike and then transfer to airport shuttle buses or to AirTrain. Bicycles are permitted on the AirTrain system at all times, with limitations on the number of bicycles per train.

The majority of bicycle traffic at the airports comes from employees commuting to and from work. However, some recreational cyclists use the periphery of the airport as part of a larger route. Because of the varying populations of cyclists to be served, facilities have employed a variety of access and infrastructure improvements.

John F. Kennedy International Airport

John F. Kennedy International Airport (JFK Airport), opened in 1948, is the leading international airport in the country. With 80 airlines operating from its gates, JFK Airport served more than 53.3 million passengers in 2014. International air cargo is also an essential aspect of operations. Long-haul, direct and non-stop aircraft deliver goods that are then distributed throughout the region. The airport campus covers 4,930 acres and includes more than 30 miles of roadway. JFK Airport is located near Jamaica Bay in southwestern Queens, 15 miles from Manhattan.

Figure 18. Bicycle Parking at Lefferts Boulevard Station

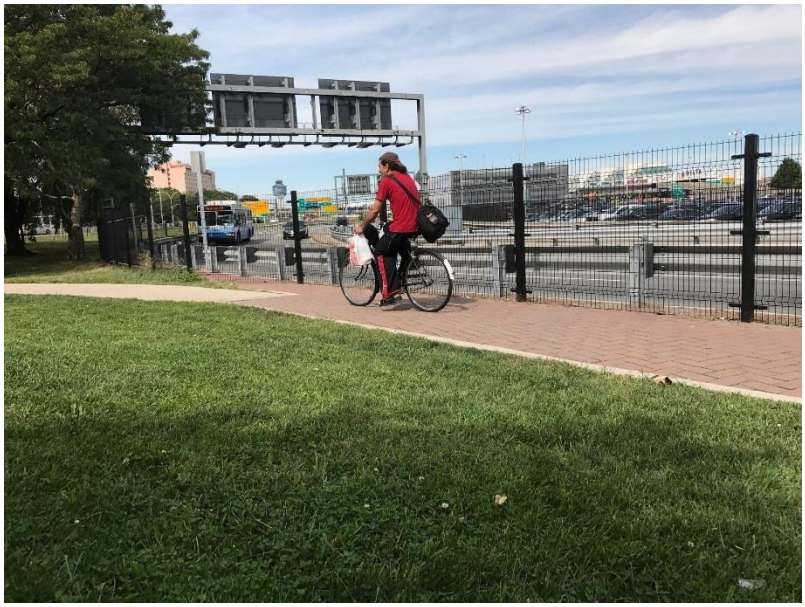
Source: Port Authority Aviation Department, 2016.

Several strategic bicycle routes provide convenient and meaningful connection for employees. One route proceeds down Lefferts Boulevard to the Lefferts Boulevard AirTrain Station. Another route connects an MTA bus stop to the Port Authority Administration Building (Building 14). See Appendix C for a complete map. The last bicycle route connects a residential community surrounding 148th/150th Street to the Port Authority employee shuttle buses, providing a way for employees to commute safely to the airport. NYCDOT also has installed a bike lane adjacent to the Howard Beach/JFK Airport subway station. Bike parking is provided on both the MTA and AirTrain areas of the station, allowing commuters to park their bicycles and continue their journey to or from the airport. Bike parking is also available on Lefferts Boulevard and at the Port Authority Administration Building (Building 14). All of the bike parking facilities, with the exception of those at the Howard Beach subway stop, are either within sight of security desks or within range of security cameras. Other improvements, such as installing bicycle-safe drainage grates and increased wayfinding and signage in front of Building 14 and some cargo areas, are also complete.

LaGuardia Airport

Since 1947, the Port Authority of New York and New Jersey has operated LaGuardia Airport under a lease with New York City. The airport sits on 680 acres, has two 7,000-foot main runways, and has four terminal buildings that house up to 72 aircraft gates. Located eight miles from Manhattan in northwestern Queens, it is the most accessible airport to and from Manhattan. LaGuardia Airport is the third busiest airport of the six owned or operated by the Port Authority, handling 28.4 million passengers in 2015.

Figure 19. Flushing Bay Promenade Adjacent to Terminal D at LGA



Source: Port Authority Aviation Department, 2016.

As demand for air travel continues, an extensive redevelopment program is underway at LaGuardia Airport to create world-class airport facilities for passengers and airlines alike. The LaGuardia Redevelopment Program, an $8 billion project, is expected to be complete in 2024. Some of the major improvements include replacing Terminal B, Terminal C, Terminal D and enhancing the ground transportation network, adding more taxiways and passenger walkways to reduce connection delays. Bike directional signage indicating a bike route along Ditmars Boulevard was installed to provide bicycle access to LaGuardia Airport. Cyclists access the airport's west side through the Marine Terminal Road entrance at Ditmars Boulevard. Bicycle parking is available in Parking Lot 7 adjacent to motorcycle parking. At the time of writing, airport shuttles are currently available at this location to access the airport central terminal area; however, as the LaGuardia Redevelopment Program progresses, bicycle access may be interrupted through 2024. There is also a paved pathway leading from the Flushing Bay Promenade along the south boundary fence of the airport, with bicycle parking available on the arrivals levels at Terminal D without the need to access the central terminal roadway.

Figure 20. Bike Route Signs along Ditmars Boulevard at LaGuardia Airport

Source: Port Authority Aviation Department, 2016.

Newark Liberty International Airport

Opened in 1928, Newark Liberty International Airport (Newark Airport) is home to the nation's first commercial airline terminal. Located only 14 miles from Manhattan, Newark Airport is located partly in Newark and partly in Elizabeth, New Jersey. Newark Airport serves a critical role as the second busiest airport for passenger travel in the New York-New Jersey metropolitan area.

The airport is bounded by the New Jersey Turnpike (I-95) and US Routes 1 & 9, which serve truck traffic at the nearby marine port terminals, and has limited options for bicycle and street access.

While it is difficult to complete an entire journey from surrounding communities to Newark International Airport by bicycle, it is possible to bike a portion of the trip. Employees taking New Jersey Transit to and from the airport can bike to their origin bus or train station and either lock their bike or, if traveling during off-peak hours, bring it on board. Upon arrival at the airport, AirTrain Newark allows up to two bikes on board at all times. To facilitate safe circulation for employees within the facility, the Port Authority installed a bike lane on Brewster Road between Airis Drive and Building 80. See Appendix D for a complete map.

Stewart International Airport

Stewart International Airport is located 60 miles north of New York City in the heart of the Hudson Valley in New Windsor, New York. The Port Authority leased the mid-sized airport from the State of New York in 2007. The airport hosts air cargo facilities, as well as modest passenger travel. Due to the airport's location

outside the urban core and bordered by interstate highways, there is no significant demand for bicycle facilities at the airport.

Teterboro Airport

Opened in 1919, Teterboro is the oldest operating airport in the New York- New Jersey metropolitan area, located nine miles from Manhattan. Designated as a "reliever" airport, Teterboro's focus is on removing the smaller and slower aircraft from the regional air traffic that would contribute to congestion at the Port Authority's commercial airports. A study in 2011 found no significant demand for bicycle routes on-airport at that time.

Atlantic City International Airport

In 2013, the Port Authority began an agreement with the South Jersey Transportation Authority (SJTA) to perform certain general management services and functions for the Atlantic City International Airport located in Egg Harbor Township, New Jersey. However, the Port Authority does not have any planning responsibility at this airport. With only one scheduled carrier serving the airport, it remains a small operation. The airport is located approximately one mile from bike lanes on Atlantic 563 and Tilton Road. There has been no indication that there is significant demand for bicycle facilities at the airport.

Marine Terminals

The Port Authority manages six marine terminal facilities that comprise the Port of New York and New Jersey: Port Newark; the Elizabeth-Port Authority Marine Terminal; the Howland Hook Marine Terminal; the Brooklyn-Port Authority Marine Terminal; the Red Hook Container Terminal; and the Port Jersey Port Authority Marine Terminal. The Port Authority leases most of its terminal space to private terminal operators that manage the daily loading and unloading of cargo ships.

All of the Port Authority's marine terminal facilities are closed to the public for safety and security reasons. Shared lanes are not recommended on the main port roadways at Newark, Elizabeth, and Port Jersey facilities. This recommendation stems from the nature of port operations involving heavy truck traffic, forecasts for sustained volume increases, and the lack of space for shoulders, walkways, or protected areas that could be utilized by cyclists. However, there are specific locations proximate to Port Authority facilities in Bayonne, New Jersey, and Brooklyn, New York, where it is safe to accommodate cyclists.

Military Ocean Terminal at Bayonne (MOTBY)

MOTBY, located in Bayonne, New Jersey, operated as a military ocean terminal from 1942 to 1999. Since then, land on the peninsula has undergone numerous residential, commercial, and recreational developments. In 2010, the Port Authority acquired approximately 130 acres of land from the Bayonne Local Redevelopment Authority with the intention of ensuring scarce waterfront land remained available for port commerce. However, some areas of the MOTBY peninsula were developed for public space prior to the Port Authority's purchase of the land. For example, the Teardrop Memorial was installed in 2005 as a memorial to victims of the 1993 World Trade Center bombing and the 9/11 terrorist attack. The area around the Memorial has open space, as well as a pedestrian and bicycle path and a bicycle rack.

Additionally, there are residential developments directly west of Port Authority property that include bike paths along the waterfront.

Red Hook Container Terminal

The Red Hook Container Terminal in Brooklyn serves as one of the major port facilities east of the Hudson River, handling a variety of containers and breakbulk cargo. In 2015, a section of the Brooklyn Greenway was completed to provide a pedestrian and bicycle corridor in the area around the perimeter of the terminal. The Greenway runs along Columbia, Degraw, Van Brunt, and Imlay Streets. The Port Authority donated a parcel of land near the Brooklyn Cruise Terminal to NYCDOT to support the continuation of the Greenway through the facility. Because the Greenway crosses the terminal's driveways in several locations, the Port Authority undertook additional safety measures by installing "hidden driveway" and flashing "active driveway" signs, as well as mirrors, to increase awareness and visibility at the Administration Building gates at 90 Columbia Street as well as at the gate to Pier 7 at the foot of Atlantic Avenue.

Figure 21. Southbound Brooklyn Gateway along Columbia Street

Source: Port Authority Port Department, 2016.

World Trade Center Campus

The World Trade Center (WTC) Campus sits on 16 acres in lower Manhattan and includes the 9/11 Memorial and Museum, several commercial office buildings, a below-grade Vehicle Security Center and Vehicle Roadway Network, Liberty Park (a green roof on top of the Vehicle Security Center), and a Transportation Hub that connects the WTC PATH station to several NYC MTA Subway lines as well as several hundred thousand square feet of retail space. The Transportation Hub, retail, Liberty Park, and commercial office towers, including One, 4, and 7 WTC are currently operational, while 3 WTC is under construction. 2 WTC and a performing arts center are also planned within the complex. Saint Nicholas Greek Orthodox Church/National Shrine, located in Liberty Park, will also be completed in 2018.

Figure 22. World Trade Center Campus at Full Build-out

Source: Port Authority World Trade Center, 2016.

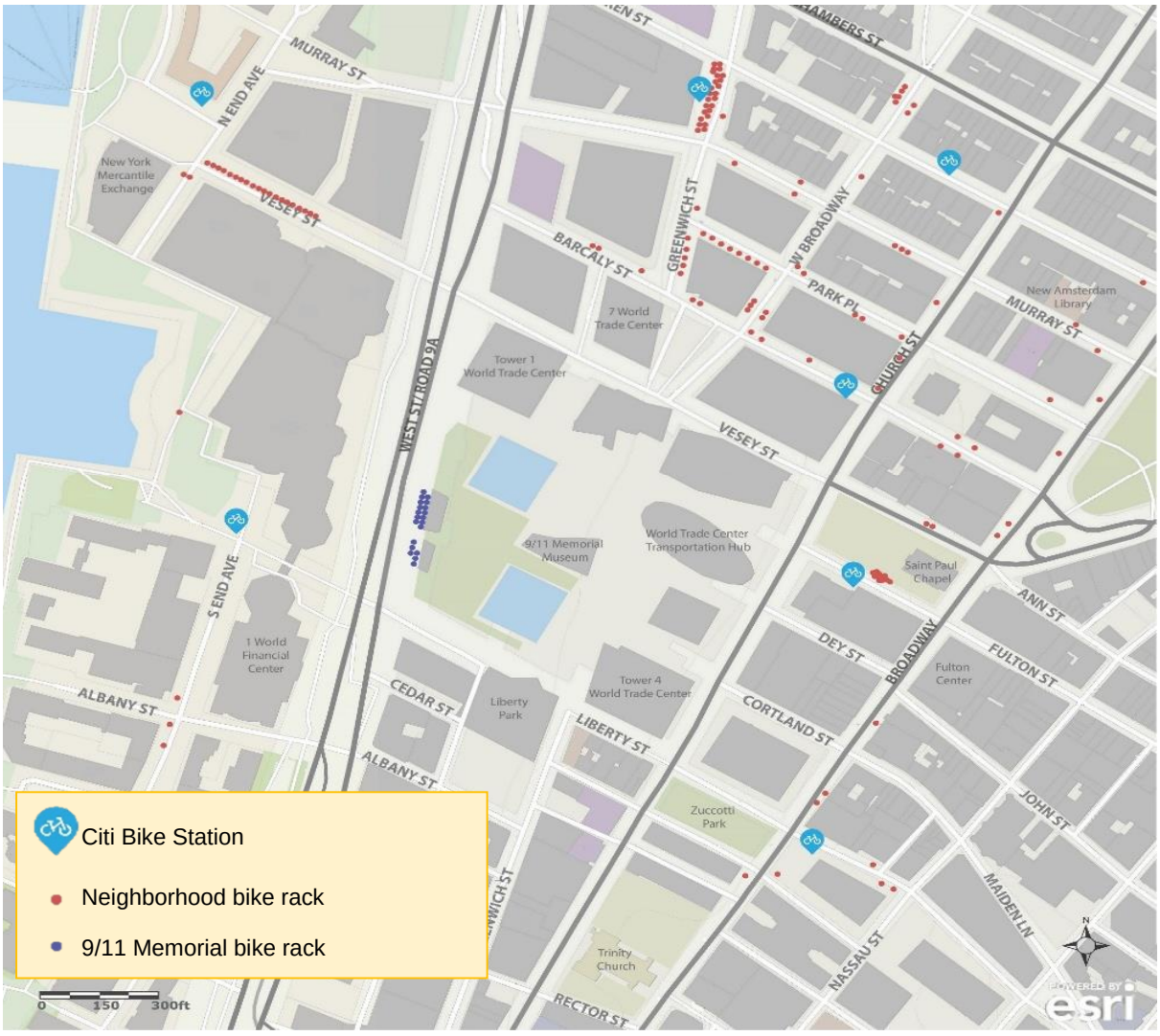
The Hudson River Greenway, which is the most popular bike path in New York City, abuts 9A on the west side of the WTC campus. Bicycles are permitted on public streets and sidewalks at the WTC. However, bicyclists are required to dismount to bypass certain on-street vehicle checkpoints safely. The Port Authority continues to work with NYCDOT to propose and implement appropriate bicycle routing signage and striping to be incorporated in the final constructed roadway network within the WTC. The New York City Bicycle Route Map, as updated on an annual basis, will reflect those proposed changes.

The 9/11 Memorial does not permit bicycles inside the museum, nor does it permit riding on the plaza or locking bicycles to trees or other plaza furniture not specifically designated for bicycle parking. However, there are publicly accessible bicycle racks available for use on the west side of the 9/11 Memorial Plaza

adjacent to the West Street sidewalk. Bicycles are permitted within the WTC Transportation Hub, but no riding or parking is permitted within the building. In general, commercial office towers at the WTC permit bicycle access and/or parking for tenants of the buildings. The Port Authority continues to work with property management of each commercial office tower to comply with any applicable codes or guidelines for tenant bicycle access.

In addition to the publicly accessible bicycle racks available on the west side of the 9/11 Memorial Plaza, several on-street bicycle racks owned and operated by NYCDOT, including several Citi Bike stations, are currently located within walking distance from the WTC Campus. Additional on-street bicycle racks within the WTC Campus are currently being coordinated with onsite stakeholders, security, law enforcement, New York State Department of Transportation (NYSDOT), and NYCDOT who will ultimately own and/or operate all streets and sidewalks within the WTC Campus.

Figure 23. Bicycle Parking Locations Near World Trade Center



Source: Port Authority World Trade Center, 2016.

Ridership

Port Authority Employees

The Port Authority conducts an annual commuter survey of management employees to understand the modes people use to travel to and from work and to identify opportunities to incentivize a modal shift to more environmentally friendly transportation. In 2015, 826 people responded to the survey. Twenty-two people, or 2.6 percent of respondents, reported biking to work during the year, which is above the national average of 0.6 percent[13]. Furthermore, when asked if they would bike if offered an incentive, such as bike share membership, 79 additional employees indicated they would do so, indicating a total potential ridership of 101 people, or a modal split of 12.2 percent. This type of modal split would be possible especially at the World Trade Center campus due to the large number of bike share stations in the area and the relatively low-stress bicycle network that exists in the surrounding area.

Table 1. Port Authority Commuter Survey Results, 2015

Primary Work Location 2015	Currently Bike	Would bike with incentive
115 Broadway	1	5
2 Montgomery Street	1	7
225 Park	1	1
Bayonne Bridge		2
Gateway Plaza II		1
Goethals Bridge		1
Journal Square Transportation Center	1	4
LaGuardia Airport		1
Newark Liberty International Airport		1
PATH station		1
Port Authority Bus Terminal	1	1
Port Authority Technical Center	1	6
Teterboro Airport		1
Waldo Yard Buildings	1	1
World Trade Center	14	46
Other (multiple locations)	1	0
Total	**22**	**79**
Total Potential Ridership	**101**	

Source: Port Authority Commuter Survey, 2015.
Note: As of this writing, Port Authority offices at 115 Broadway have moved to 80 Pine Street.

For Port Authority employees who reported cycling to or from work, the bicycle represents only a portion of the full trip, and the average total length of commute is 20.2 total miles, 5.2 of which are taken by

[13] McKenzie, Brian. *Ibid.*

bicycle. This indicates that bicycles are useful for first- and last-mile connections, providing an alternative to walking or driving to transit stations.

Bike Parking Counts

Bicycle parking counts serve as proxy data to infer how many people are traveling to, or close to, a Port Authority facility by bicycle. Based on counts Port Authority staff conducted on site visits to each facility between August and September 2016, many facilities have sufficient parking capacity to meet the current demand. Providing adequate bike parking capacity is one of the key objectives of this Bicycle Master Plan; see the Recommendations chapter for a list of strategies to address parking needs.

Most bike racks that are currently overcapacity are located at or near public transportation hubs such as the PABT and PATH stations, highlighting the growing demand for multimodal travel. At these locations in particular, there are a number of partner agencies with jurisdiction over the location, installation, and management of bicycle racks. For example, Hoboken Terminal in Hoboken, New Jersey brings together NJ Transit, PATH, and ferry services, all of which are compatible with making connections by bicycle.

The locations listed below are facilities and properties where bicycle parking is present. There are other properties and facilities within the Port Authority's portfolio where bikes were not present or were not permitted at the time of the counts.

Table 2. Bike Rack Capacity at Port Authority Facilities

	Capacity of Uncovered Racks	Capacity of Covered Racks	Total Capacity	Bikes Locked to Racks	Bikes Locked to other items	Total Bikes Locked
JFK Airport	53	0	53	19	1	20
LGA Airport	14	22	36	7	11	18
Holland Tunnel (NY side)	42	0	42	7	15	22
Lincoln Tunnel (NY side)	2	0	2	2	3	5
GWB (NJ side)	28	0	28	4	0	4
Port Authority Bus Terminal	20	0	20	8	26	34
WTC Campus	44	0	44	17	0	17
WFC Ferry Terminal	30	0	30	4	0	4
Hoboken Ferry Terminal	9	0	9	4	1	5

	Capacity of Uncovered Racks	Capacity of Covered Racks	Total Capacity	Bikes Locked to Racks	Bikes Locked to other items	Total Bikes Locked
Pier 11 Ferry Terminal	0	38	38	8	0	8
Exchange Place Station	42	0	42	35	6	41
Grove Street Station	112	0	112	114	31	145
Harrison Station	42	0	42	49	45	94
Hoboken Station	182	40	222	171	10	181
Journal Square Trans. Center	146	0	146	199	3	202
Newark Penn Station	6	58	64	67	12	79
Newport Station	68	0	68	45	1	46
9th St Station	2	0	2	0	15	15
14th St Station	31	0	31	19	12	31
23rd St Station	50	8	58	37	5	42
33rd St Station	6	0	6	6	19	25
Christopher St Station	2	0	2	0	11	11
Lower Manhattan Properties	14	0	14	5	7	12

Source: Port Authority Line Department Staff, Summer 2016.
Note: Lower Manhattan Properties include 150 Greenwich St, 4 Vesey St, 116 Nassau St, 100 Broadway, 115 Broadway, and 160 Broadway. As of this writing, offices at 115 Broadway have been relocated to 80 Pine Street.

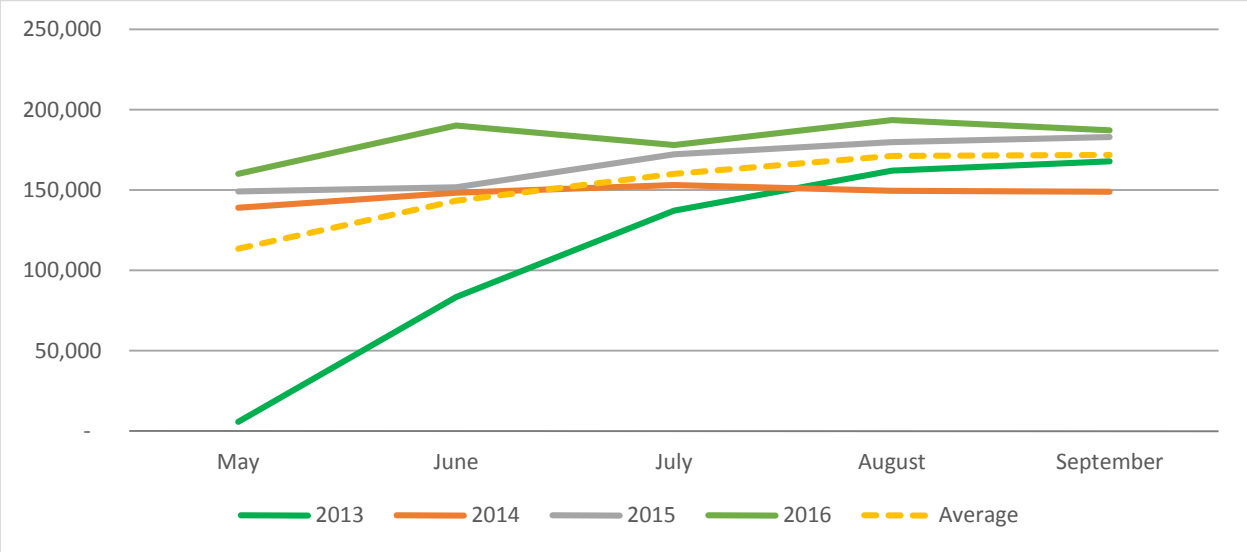
As of this writing, more than 50 covered bicycle racks (accommodating two bikes each) are being added to the Journal Square Transportation Center. The racks will be available for public use by summer 2017 upon construction completion at Magnolia Plaza.

Bike Share

Citi Bike is especially important to consider in the context of this Plan since many docking stations are co-located at or near Port Authority facilities. This is highly valuable to the public, as well as Port Authority employees, because existing transportation hubs now offer another mode of transportation. For example, people living in Hoboken can take PATH to the 33rd St station and then ride Citi Bike to their final destination in Manhattan.

All PATH stations in Manhattan, as well as the Grove Street and Exchange Place stations in Jersey City, are within walking distance (less than 0.25 miles) of Citi Bike stations. Stations are also present at all Port Authority owned or operated ferry terminals and the Port Authority Bus Terminal (PABT), thus facilitating multimodal travel. Since launching in 2013, popularity of the travel mode increased dramatically. In the summer of 2013, approximately 556,000 trips began at docking stations within 500 feet of Port Authority facilities. By the summer of 2016, the number had increased to 909,000 trips.

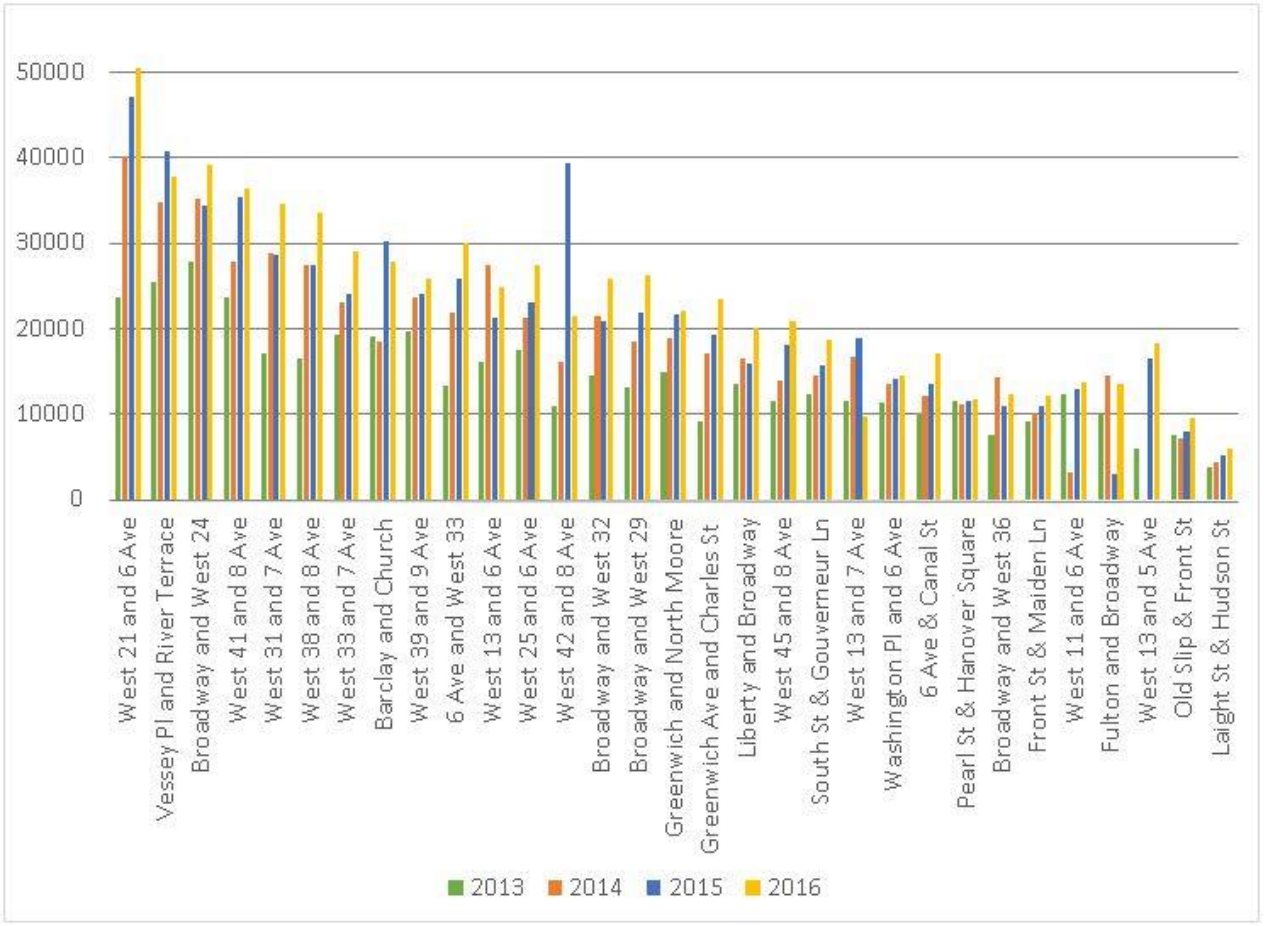
Figure 24. Number of Bikes Picked up from Citi Bike Stations Near Port Authority Facilities in New York



Source: NYC DOT, 2016.
Note: Ridership data for Citi Bike stations located near Port Authority facilities in New Jersey was not available for this analysis,

The Citi Bike station at the PABT continually ranks as one of the most heavily used stations in the entire network. The Port Authority allowed public bike racks previously located at West 42nd Street and 8th Avenue to be replaced with a Citi Bike docking station due to the much larger number of passengers it can serve. In addition to a docking station directly in front of the PABT, there is also a station on 41st Street across 8th Avenue, next to the New York Times Building. From January through December 2015, these two stations combined had more than 125,000 Citi Bike trips originate at the PABT. In 2015, Citi Bike began providing valet service at the PABT during peak hours to accommodate the large volume of users returning bicycles.

Figure 25. Summer Ridership at Citi Bike Stations at or near Port Authority Facilities in New York



Source: NYCDOT 2016.
Note: Citi Bike stations are occasionally removed from service to accommodate construction and/or events, which may affect aggregate trip numbers shown here. Ridership data for Citi Bike stations located near Port Authority facilities in New Jersey was not available for this analysis,

Trans-Hudson Movement

George Washington Bridge

The public can use various methods to cross the Hudson River by bicycle. For people seeking to bicycle between New York and New Jersey, the George Washington Bridge serves as the only existing bike route in operation via a mixed use, bi-directional bicycle and pedestrian path along the south edge of the bridge. Once the new Goethals Bridge is constructed and the Bayonne Bridge Navigational Clearance Project is complete, both bridges will also be outfitted with bicycle and pedestrian facilities.

The Port Authority installed an automated pedestrian and cyclist counting system on the George Washington Bridge in July 2014. This counter provides continuous data that is more complete and requires less labor than the occasional manual counts that the agency previously used to estimate bicycle and

pedestrian traffic at the GWB. Between July 2014 and December 2016, nearly one million bicyclists crossed the George Washington Bridge.

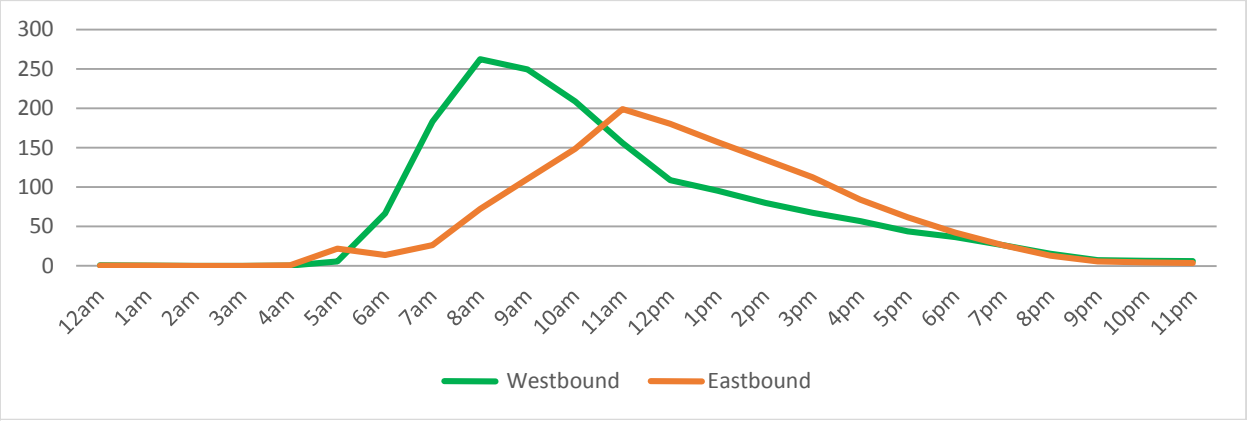
Table 3. Total Ridership at George Washington Bridge, July 18, 2014 – December 31, 2016.

	2014	2015	2016	Average per Month
January		5,904	12,046	8,975
February		2,764	14,640	8,702
March		12,586	26,220	19,403
April		29,275	36,790	33,033
May		42,884	43,972	43,428
June		45,218	51,565	48,392
July	*Counter Installed*	52,317	53,222	52,770
August	52,875	56,393	48,430	52,566
September	48,948	47,952	45,694	47,531
October	35,980	33,488	35,543	35,004
November	23,481	30,201	27,882	27,188
December	14,291	23,451	13,154	16,965

Source: EcoCounter, August 1, 2014 – December 31, 2016.
Note: This table reflects raw data collected by a counter installed on the George Washington Bridge in July 2014. Based on validation counts conducted in the summer of 2015, this data is expected to be accurate within 10 percent.

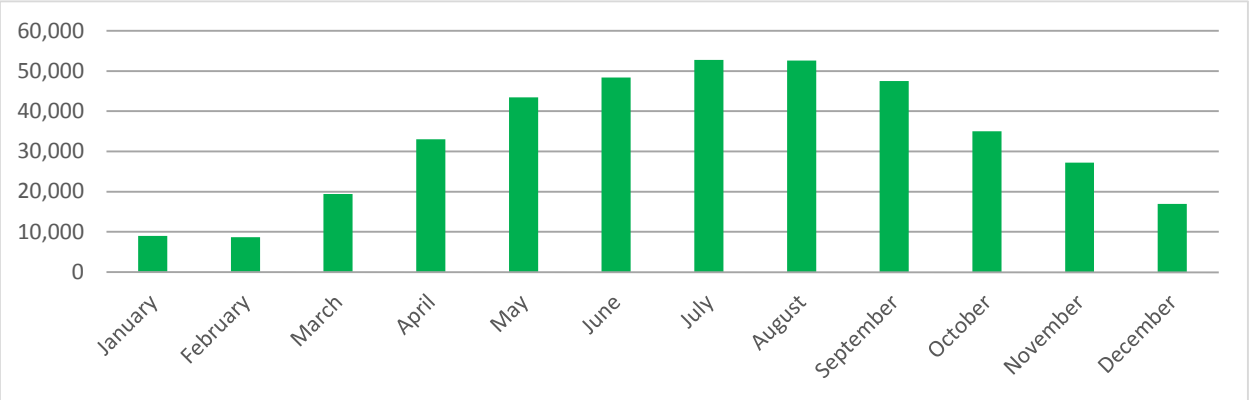
Data shows that the peak cycling usage of the GWB is summer Saturdays, illustrating that this trans-Hudson connection is used primarily for recreation, not for commuting. Weekend ridership averaged approximately 2,800 cyclists during the summer months of 2016 (May to September), while 1,090 cyclists crossed the GWB on the average weekday during the same period. Weekend mornings are the busiest times of day for cycling, with an average of 331 cyclists crossing the bridge during the 9:00 a.m. hour.

Figure 26. Average Hourly Ridership on GWB, Summer Weekends 2016



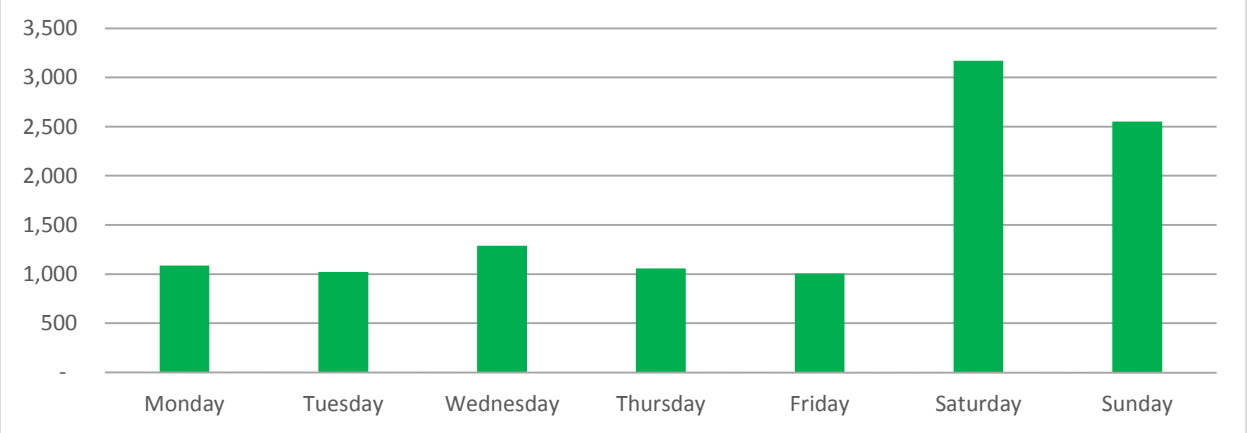
Source: EcoCounter, 2016.
Note: Average hourly ridership across the George Washington Bridge in 2016. Summer months include May 1- September 30. This graph reflects raw data collected by a counter installed on the George Washington Bridge in July 2014. Based on validation counts conducted in the summer of 2015, this data is expected to be accurate within 10 percent.

Figure 27. Average Monthly Ridership Across GWB, July 2014 – December 2016



Source: EcoCounter, 2016.
Note: Average monthly ridership across the George Washington Bridge from 2014 to 2016. This graph reflects raw data collected by a counter installed on the George Washington Bridge in July 2014. Based on validation counts conducted in the summer of 2015, this data is expected to be accurate within 10 percent.

Figure 28. Average Daily Ridership Across GWB, Summer 2016



Source: Source: EcoCounter, 2016.
Note: Average daily ridership across the George Washington Bridge in Summer 2016. Summer months include May 1-September 30. This graph reflects raw data collected by a counter installed on the George Washington Bridge in July 2014. Based on validation counts conducted in the summer of 2015, this data is expected to be accurate within 10 percent.

PATH

For those who are looking for an alternative way of bringing their bicycles with them as they cross the river, PATH trains provide a useful option. Folded bicycles are permitted on PATH at all times. Non-folding bicycles are permitted at all times except during peak hours, which are identified as weekdays between 6:30 a.m. and 9:30 a.m. and weekdays between 3:30 p.m. and 6:30 p.m. There is a limit of two bicycles per car and no bicycles are permitted in the first railcar of a train.

Because there is no ticket requirement for bicycles on PATH trains, there is no easy way to track the number of bikes that passengers bring on board. However, Origin and Destination surveys conducted in 2012 and 2014 included questions for passengers related to bicycles that provide useful information. Based on the data in the 2014 survey, 524 people brought their bicycles on board during the weekdays

when the survey was conducted and 250 did the same on Saturday. This number is down from 2012, when 737 brought their bicycles on board during the week and 940 did so on the weekend. Equally important to note, however, is the fact that the number of people who parked their bicycles at a PATH station and continued their journey without their bicycle grew dramatically over the same period.

In fact, between 2012 and 2014 commuting patterns by bicycle reversed. The majority of people in 2012 who arrived to the PATH station by bike brought their bicycles with them on the train (54.4 percent on weekdays and 72.4 percent on weekends). By 2014, the majority of people left their bikes parked at the access station (59.6 percent on weekdays and 61.7 percent on weekends). This reversal may reflect the overall increase in PATH ridership that has resulted in limited space on the platforms and trains for bicycles. This pattern may also reflect the availability of Citi Bike in both New York City and Jersey City, eliminating the need for taking a private bicycle across the Hudson River to make a last-mile connection.

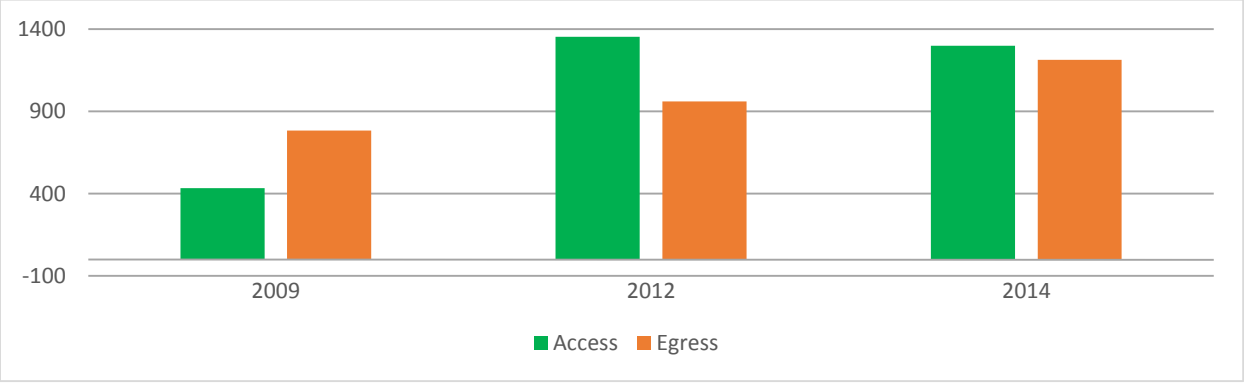
Table 4. Bicycles Parked vs. Brought on Board PATH – Bicycle as Access Mode

	2012				2014				Percent Change	
	Weekday		Saturday		Weekday		Saturday		Weekday	Saturday
Bike on Board	737	54.5%	940	72.4%	524	40.4%	250	38.5%	-28.9%	-73.4%
Parked at Station	616	45.5%	358	27.6%	775	59.6%	404	61.7%	+25.8%	+12.85%

Source: Port Authority Origin-Destination Survey, 2012 and 2014.

Finally, the number of people who arrive at PATH stations by bicycle tripled between 2009 and 2014, from 433 to 1,298. Over the same period, the number of PATH passengers who left PATH stations by bicycle on weekdays increased by nearly 55 percent, from 784 to 1,214. In 2014, the total mode share of bicycling for accessing and/or egressing PATH stations was 0.5 percent, compared to 0.4 percent in 2009.

Figure 29. Number of Passengers Accessing or Egressing PATH Stations by Bicycle (weekdays)



Source: Port Authority Origin-Destination Survey, 2012 and 2014.

Ferries

Port Authority ferry terminals also offer an opportunity for the public to bring their bicycles on board. There are no peak hour restrictions, though a bicycle ticket must be purchased for $1.00. From January 1,

2016 to August 19, 2016, the most recent data available, approximately 19,000 bikes crossed the Hudson River using Port Authority owned and operated ferry terminals.

Table 5. Bicycles Transported on Ferries, January 1, 2016 – August 19, 2016

Bike Trips on Ferry Routes	Single Trip	Monthly Trip	Total
Hoboken – Pier 11	332	252	584
Hoboken – World Financial Center	1,586	210	1,796
Belford – World Financial Center	54	0	54
Hoboken North – World Financial Center	82	126	208
Paulus Hook – World Financial Center	14,239	2,478	16,717
Port Imperial – World Financial Center	28	0	28
		Grand Total	19,387

Source: NY Waterway, 2016

Note: Monthly trip is an estimated total number assuming 42 trips per month

Safety

The Port Authority is dedicated to providing high-quality transportation facilities to ensure safe and efficient movement of people and goods throughout the region. The agency's 2010 Bicycle Policy extended this mission to include bicycle transportation.

Port Authority Police Department (PAPD) officers patrol facilities and respond to emergencies at or near Port Authority facilities. The Port Authority's Engineering Department maintains detailed crash reports for every motor vehicle crash reported by PAPD, including those involving bicycles. PAPD sends reports on bicycle crashes that do not involve a motor vehicle (e.g., bicycle-to-bicycle, bicycle-to-pedestrian, bicycle-to-fixed object, etc.) directly to the Claims Division, not the Engineering Department; however, the Engineering Department combines this information into its annual analysis of crash data.

Specifically, PAPD's crash reports include information such as crash severity, road conditions, and lighting that helps the Engineering Department understand the circumstances of each incident and identify potential safety countermeasures. Identifying the frequency and locations of crashes at or near Port Authority facilities allows for closer examination of trends to be better equipped to implement mitigations. If warranted by crash severity or frequency at a particular location, the Engineering Department will investigate the existing conditions of the facility's roadways, design, and operations. Feasible engineering solutions that may remediate the cause are implemented to prevent similar crashes in the future. The Engineering Department prepares an internal annual crash report that provides crash statistics, summarizes the status of ongoing projects to mitigate "priority crash locations" (i.e., those locations with a high volume of crashes), and measures the effectiveness of safety projects that have been completed.

It is important to note that while PAPD responds to and reports on mutual-aid calls beyond Port Authority property, the agency has limited abilities to mitigate crash locations off its own facilities. In these cases,

interagency coordination among adjacent jurisdictions is necessary to identify and address safety countermeasures.

Between 2010 and 2016, PAPD reported a total of 60 crashes involving bicycles on Port Authority properties or facilities, none of which resulted in a fatality. Over this period, the highest number of crashes reported in a single year was 12, as reported in 2015. The upward trend in the number of crashes is consistent with expectations considering the regional growth in ridership over the same period.

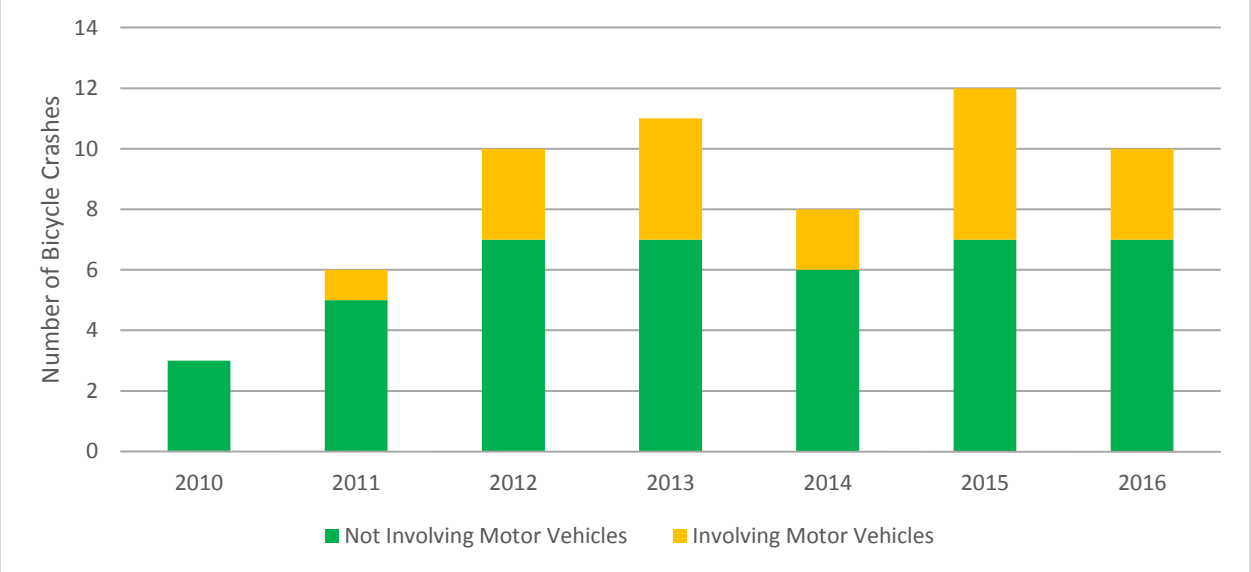
Table 6. PAPD-Reported Bicycle Crashes on Facilities, 2010 - 2016

Year	Number of PAPD Reported Crashes
2010	3
2011	6
2012	10
2013	11
2014	8
2015	12
2016	10

Source: PAPD Crash Reports, January 1, 2010 – December 31, 2016.

The majority of reported bicycle crashes on Port Authority properties or facilities between 2010 and 2016 did not involve motorized vehicles, but instead represented conflicts between cyclists and other cyclists, pedestrians, or fixed objects (e.g., lamp posts).

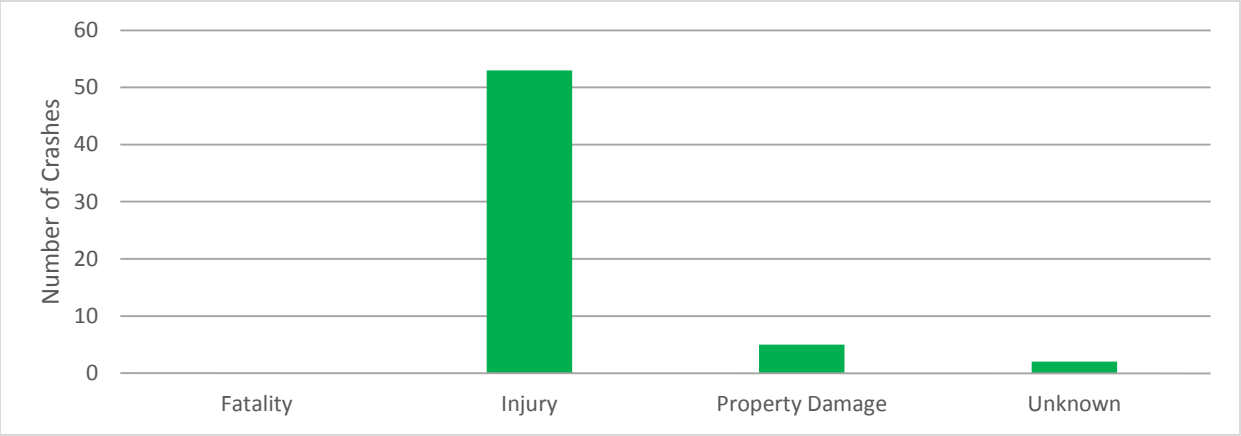
Figure 30. PAPD-Reported Bicycle Crashes on Facilities by Type, 2010 - 2016



Source: PAPD Crash Reports, January 1, 2010 – December 31, 2016

The majority of reported bicycle crashes on Port Authority properties or facilities between 2010 and 2016 resulted in an injury to at least one party involved while there were a few incidents in which property damage (but no injury) was reported. The severity of several crashes is "unknown" (i.e., either injury or property damage only) for a handful of incidents due to lack of details in the report. There were no cyclist fatalities on Port Authority properties or facilities during this period.

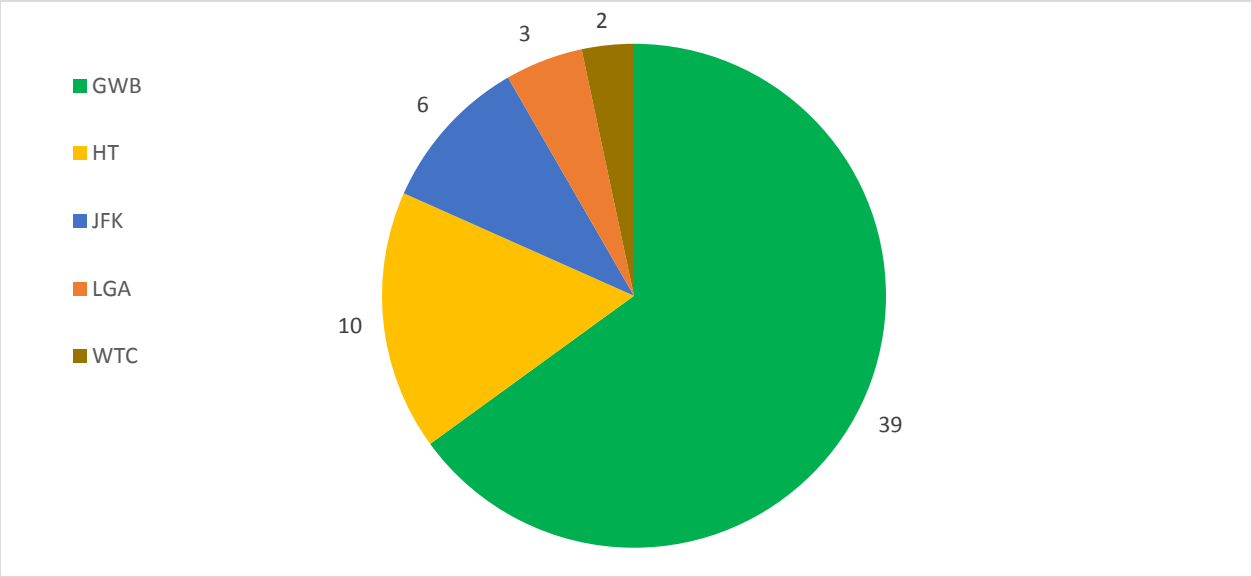
Figure 31. PAPD-Reported Bicycle Crashes on Facilities by Severity, 2010 - 2016



Source: PAPD Crash Reports, January 1, 2010 – December 31, 2016
Note: "Unknown" severity means either injury or property damage resulted from the crash, but the crash report does not provide sufficient detail to determine which.

The majority of reported bicycle crashes on Port Authority properties or facilities between 2010 and 2016 occurred on the GWB path, which is consistent with expectations based on ridership. Between July 2014 and December 2016, nearly one million cyclists crossed the GWB. As referenced earlier in this Bicycle Master Plan, the Restoring the George Program includes improvements to the path (i.e., the separation of cyclists from pedestrians and changes to the path's geometry at the towers) that will mitigate bicycle crashes not involving motor vehicles.

Figure 32. PAPD-Reported Bicycle Crashes on Facilities by Location, 2010 - 2016

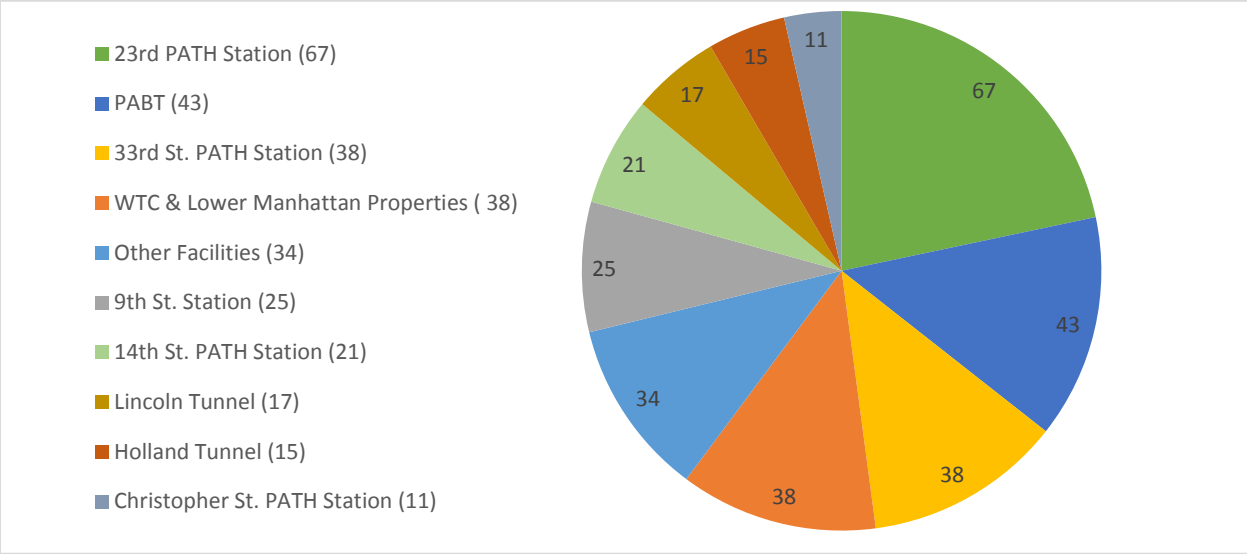


Source: PAPD Crash Reports, January 1, 2010 – December 31, 2016

PAPD patrols land owned or operated by the Port Authority and responds to mutual aid calls beyond Port Authority property. New York City Police Department (NYPD) crash data provides a greater context for bicycle-related incidents surrounding Port Authority facilities. Specifically, this analysis includes crashes reported by NYPD within 500 feet of Port Authority facilities. Approaches to the Hudson River crossings were treated slightly differently, due to the traffic patterns unique to those areas. Crashes near the Holland and Lincoln Tunnels and the George Washington Bridge were included if they occurred on roads that provide access or egress to those facilities.

Between July 2, 2012, and September 3, 2016, NYPD reported 309 bicycle crashes resulting in injuries near Port Authority facilities. During the same period, NYPD also reported two cyclist fatalities near Port Authority facilities. One fatality occurred at the corner of Laight and Hudson Streets near the Holland Tunnel rotary on February 11, 2016. The other fatality occurred on the Grand Central Parkway outside of LaGuardia Airport on September 5, 2016. The highest concentration of crashes was generally located in the most congested parts of Manhattan. While the Port Authority has no control over these roads, evaluating the areas surrounding Port Authority facilities helps to target areas where safety countermeasures could be coordinated with NYCDOT and NYPD.

Figure 33. NYPD-Reported Bicycle Crashes in Vicinity of Port Authority Facilities, July 2012 – September 2016



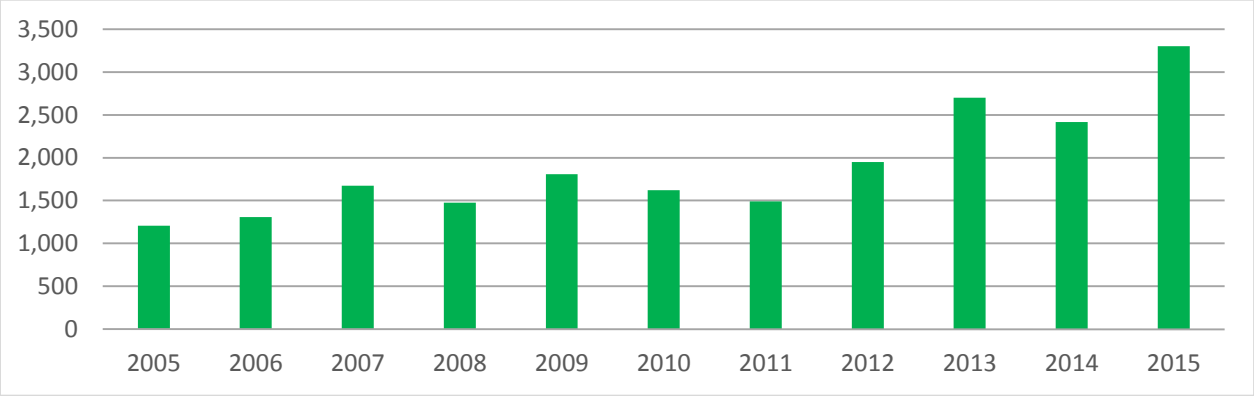
Source: NYPD Crash Reports 7/2/12 to 9/3/16.
Notes: "Vicinity" describes areas within 500 feet of Port Authority facilities and approaches to Hudson River Crossings. "Lower Manhattan Properties" include 150 Greenwich St, 4 Vesey St, 116 Nassau St, 100 Broadway, 115 Broadway, and 160 Broadway As of this writing, offices at 115 Broadway have been relocated to 80 Pine Street. "Transit Station" describes those facilities shared by both PATH and MTA lines. "Other Facilities" include those locations with fewer than 10 NYPD-reported crashes each: 65th Street Railyard (9), GWB & GWBBS (9), Bathgate (7), LGA (4), Red Hook (4), and Bayonne (1).

Ridership and Crash Trends

New York City Department of City Planning (DCP) has performed annual bicycle counts in Manhattan since 1999. These manual counts are conducted along designated bicycle routes at the same location every year. Two of these count locations are near the 14th and 23rd Street transit stations, where PATH trains and MTA subways share entrances. Using this historic count data, it is possible to compare ridership trends with the number of crashes that have occurred within 500 feet of those locations over the same period. While this data provides a useful snapshot of current conditions and trends, they do not explain the cause of any incident.

At the count conducted at 23rd Street and 6th Avenue, the location is a station entrance for PATH trains and MTA subways, cycling ridership increased by 22 percent, from 2,702 cyclists in 2013 to 3,303 cyclists in 2015. During the same period, crashes increased by approximately 43 percent, rising from 14 crashes in 2013 to 20 crashes in 2015. An increase in ridership often correlates with an increase in crashes. However, the rate at which these crashes increased is disproportionate to the rate experienced city-wide. New York City saw an overall increase in crashes of five percent, compared to this particular area surrounding the 23rd Street and 6th Avenue intersection that experienced approximately a 43 percent increase over the same period.

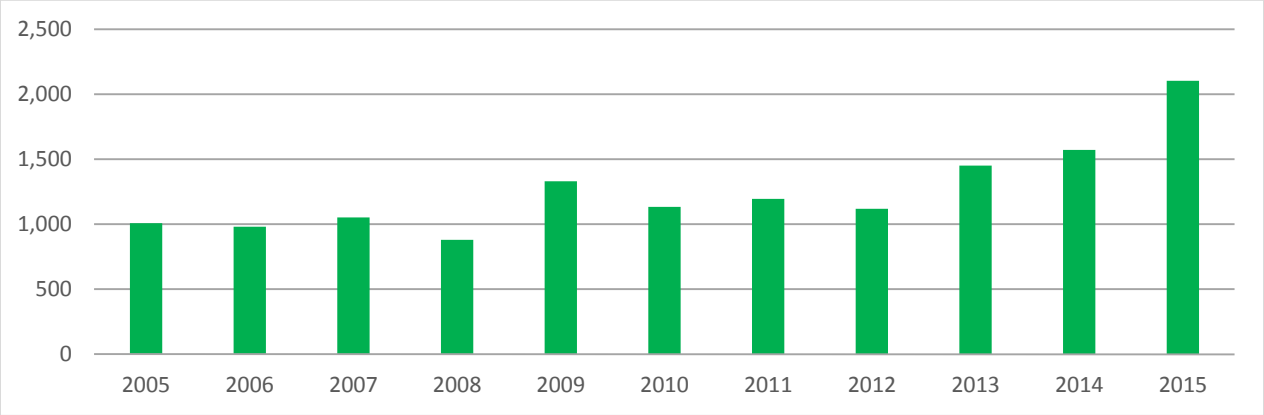
Figure 34. Bicycle Counts at West 23rd Street and 6th Avenue in Manhattan



Source: NYC DCP Manhattan Bike Counts, 2005-2015.

NYCDOT also conducted counts at East 14th Street and 5th Avenue, one avenue east of an entrance to the 14th Street transit station. At that location, ridership increased by 45 percent, from 1,451 cyclists in 2013 to 2,104 cyclists in 2015. Over the same period, crashes decreased by 50 percent, from six crashes to three crashes, in that area. Again, while the Port Authority has no control over these roads, the areas surround Port Authority facilities and target areas are evaluated where safety countermeasures could be coordinated with NYCDOT and NYPD.

Figure 35. Bicycle Counts at East 14th Street and 5th Avenue in Manhattan



Source: NYC DCP Manhattan Bike Counts, 2005-2015.

Recommendations

Based on the existing conditions of Port Authority facilities, this chapter proposes strategies to achieve the goals of the agency's 2010 Bicycle Policy, fulfill its bicycle-friendly vision, and support the multimodal transportation needs of the New York-New Jersey metropolitan region. The strategies include both hard (i.e., infrastructure) and soft (i.e., operations and policy) measures that look inward to institutionalize bicycle planning and practices within the agency and outward to coordinate access and circulation within the greater regional network. The strategies are based on national and international best practices, some of which are highlighted herein, and are tailored to various Port Authority facilities.

List of Strategies

The following tables list proposed strategies that meet the objectives identified in the *Goals and Objectives* chapter. The strategies are numbered for reference, but they are not ranked in any particular order. For example, strategy 1.1 is the first strategy listed under Objective 1. They do not reflect any ranking or prioritization system. Some strategies include example action items, which are indented below the corresponding strategy and lettered. For example, item 1.7.a is an example action for strategy 1.7.

Objective 1: Formalize bicycle planning practice and authority within the Port Authority, currently under the Office of the Chief Operating Officer (OCOO).	
	Strategy
1.1	OCOO, Capital Planning, and Real Estate jointly designate a bicycle coordinator responsible for managing implementation of the Bicycle Master Plan and future bicycle initiatives, including those identified through the Project Initiation Request Form (PIRF) approval process.
1.2	Require departments to evaluate bicycle needs and formalize facility-specific projects through the annual budget process.
1.3	Identify funding opportunities to implement bicycle improvement initiatives across Port Authority facilities.
1.4	Add a bicycle checkbox to the Project Initiation Request Form (PIRF) so that bicycle needs are considered during project development, where relevant.
1.5	Convene Port Authority's internal bike working group on a quarterly basis to advance implementation of the Bicycle Master Plan.
1.6	Revisit Bicycle Master Plan and assess bike planning needs every five years.
1.7	Develop and implement facility-level safe bicycle access and circulation plans for employees and tenants, with periodic updates as necessary.
	1.7.a Identify specific routes where bicycle access could be safely added to facilitate movement to, from, and through facilities (e.g., airports and marine ports).
1.8	Identify areas where safety and security concerns prohibit bike access.
	1.8.a Example locations include airport and marine port central terminal roads and tunnels.

Objective 2: Institutionalize the identification, analysis, and remediation of bicycle safety issues.		
	Strategy	
2.1	Improve safety of existing bike infrastructure. Develop new installations to meet or exceed guidelines set by the National Association of City Transportation Officials (NACTO) and the American Association of State Highway Transportation Officials (AASHTO) as financially and operationally feasible.	
	2.1.a	Perform bicycle safety audits as part of the five-year cycle of roadside safety audits at all facilities.
2.2	Analyze bicycle crash data separately from other modes to monitor trends, identify hotspots, and implement mitigation and improvement strategies.	
	2.2.a	In addition to engineering solutions at priority crash locations, identify and implement non-engineering solutions (e.g., enforcement, education, etc.).
	2.2.b	Update crash report forms to facilitate the identification of incidents involving bicycles and standardize crash location data to facilitate the identification of hotspots.
2.3	Maintain smooth riding surfaces for bicycle users.	
	2.3.a	Install bicycle-safe drainage grates as part of ongoing repaving projects.
2.4	Coordinate with relevant stakeholders to evaluate bike safety and access at or near Port Authority facilities within the context of the local and regional network on both a recurring and a project-by-project basis.	
	2.4.a	Work with NYCDOT to improve the bicycle network serving PABT, JFK, and LGA.
2.5	Accommodate bicycle needs in maintenance of traffic (MOT) plans for construction projects, as appropriate.	

Objective 3: Provide adequate bike parking capacity.		
	Strategy	
3.1	Identify best practices and standardize bike parking data collection methodology (including time of year conducted) and bike rack installations (e.g., design, placement, signage, and procurement) across Port Authority facilities.	
3.2	Institutionalize a system for each facility to reevaluate bike parking needs annually.	
3.3	Identify and prioritize locations at/near Port Authority facilities, particularly at transit hubs, where bike parking demand exceeds capacity, per Port Authority bike data collection methodology standards. Install new bike parking facilities, where operationally and financially feasible, based on this information.	
	3.3.a	Example locations may include Journal Square, WTC, PABT, and GWBBS.
3.4	Upgrade existing bike parking facilities to be covered, secured, or indoors, where financially and operationally feasible.	
	3.4.a	Meet with PAPD to evaluate issues of bike theft and identify any needed facility improvements.
3.5	Improve “abandoned bike” procedures across Port Authority facilities to raise public awareness and reduce internal time/cost.	
	3.5.a	Pilot program at PATH stations.
3.6	Pilot paid bike parking (e.g. bike valet or depot) programs in partnership with private sector and stakeholder groups where necessary and feasible.	

Objective 3: Provide adequate bike parking capacity.		
	Strategy	
	3.6.a	Example location may include Journal Square Transportation Center.

Objective 4: Provide information to the public regarding public safety information, data, and resources for safe cycling at and near Port Authority facilities		
	Strategy	
4.1	Support bicycle education efforts and safety campaigns of external stakeholders, as feasible.	
	4.1.a	Support the NYCDOT Bike Smart Program.
4.2	Create and maintain a public, central webpage with the agency's current bicycle resources.	
	4.2.a	Include access to count data collected by the GWB EcoCounter.
4.3	Identify potential locations for bike counter installations, as needed.	
	4.3.a	Install counters on the north walkway of the George Washington Bridge, new Goethals Bridge, and Bayonne Bridge following completion of ongoing construction projects.
4.4	Validate bike counter accuracy and work with vendor to recalibrate as necessary.	

Objective 5: Establish and foster a culture of bike commuting to increase the number of Port Authority and tenant employees who bike to work.		
	Strategy	
5.1	Continue conducting the annual commuter survey for Port Authority employees.	
	5.1.a	Develop additional bicycle-related questions and expand target audience (i.e., to include operational staff and PAPD).
	5.1.b	Estimate and extrapolate greenhouse gas (GHG) emission reduction from bicycle commuting based on employee commuter survey.
5.2	Create and implement annual commuter survey for Port Authority tenants' employees.	
5.3	Provide shower/changing facilities for Port Authority employees, where feasible.	
5.4	Incentivize bicycle commuting.	
	5.4.a	Investigate possible Port Authority corporate sponsorship of Citi Bike membership for agency employees.
	5.4.b	Partner with Citi Bike to expand bike share docking locations at Port Authority facilities.
	5.4.c	Develop program for bicycle commuter tax-benefited reimbursement for the expenses of bicycle commuting.
	5.4.d	Organize bike-to-work challenges and other activities to encourage ridership.
5.5	Identify, create, and publicize travel routes where bicycles can be integrated as part of multimodal travel.	
	5.5.a	Encourage the installation of bike racks on buses serving ports and place bike racks at NJ port bus stops where employees can leave their bikes without having to bike on any main roadways.
5.6	Encourage tenants and contractors to provide bicycle infrastructure and accommodations.	
	5.6.a	Educate tenants on environmental and economic benefits of biking as well as bike-to-work practices.

Objective 6: Enhance safety, access, and connectivity of the local and regional network.		
	Strategy	
6.1	Participate in local and regional bicycle planning and projects, where financially and operationally feasible.	
	6.1.a	Track bicycle policy and regulations at the federal, state, and local levels.
	6.1.b	Every other year, invite local stakeholders to discuss issues of concern at each relevant facility.
	6.1.c	Coordinate with local jurisdictions for regional bicycle network connections to new facilities (e.g., the new Goethals and Bayonne Bridges), where feasible.
	6.1.d	Enhance safety and connectivity of bicycle infrastructure at MOTBY, including access to the fishing pier adjacent to Building 51 and the Teardrop Memorial, as feasible.
6.2	Facilitate trans-Hudson bicycle connectivity.	
	6.2.a	Work to ensure safe bicycle access to PATH station, ferry terminals, and the George Washington Bridge.
	6.2.b	Evaluate the possibility of reducing peak-hour restrictions (i.e., shortening the peak window) for PATH's bike-on-board policy based on turnstile data.
	6.2.c	Support bike-on-bus operations where feasible with appropriate regulations and design.
	6.2.d	Specific medium- term projects to improve bicycle infrastructure at the GWB will include removal of all stairs and construction of shared-use path connections to the bridge and improvement of the path geometry at the towers.
	6.2.e	Specific long-term projects to improve bicycle infrastructure at the GWB may include widening the walkways in the main span when necessary to accommodate demand and providing bicycle access to Riverside Drive if feasible when the existing ramps to the Henry Hudson Parkway reach the end of their useful life.
6.3	Ensure all facilities are in compliance with local codes and requirements related to bicycles.	
6.4	Coordinate with NYCDOT to increase awareness and visibility of cyclists at port access/egress points.	
	6.4.a	Place signage and/or mirrors at Red Hook Marine Terminal and Brooklyn Cruise Terminal along the Brooklyn Greenway to alert drivers and cyclists of crossings.
6.5	Install wayfinding signs to direct cyclists to bike routes and parking where necessary and feasible.	
	6.5.a	Example locations include PATH stations and airports.
6.6	Provide bicycle channels at stairways along existing bicycle access routes where operationally feasible.	

Implementation

This chapter identifies internal departments, external partners, sample timelines, and potential resources for executing the strategies proposed in the *Recommendations* chapter. Most strategies are low-cost initiatives that may be integrated into existing operations and maintenance budgets. However, some strategies represent significant capital expenditures that would need to be evaluated alongside the agency's other critical capital needs and budgeted accordingly. There are grant funding opportunities for which the Port Authority may be eligible to implement certain strategies.

Internal Leaders

The Board of Commissioners adopted the agency's Bicycle Policy in 2010, which authorized the Executive Director to take necessary steps to execute the policy. In turn, the Executive Director delegated bicycle implementation responsibility to the Chief Operating Officer (COO), Chief of Capital Planning, and Chief of Real Estate.

Since 2010, the Office of the COO has led agency-wide bicycle initiatives, including coordinating the development of the 2010 Bicycle Master Plan and the 2017 Bicycle Master Plan. The Office of the COO convenes an intra-agency Bicycle Working Group (BWG) comprised of representatives from 13 line and staff departments from across the agency. Port Authority line departments are those that are responsible for operating a facility (e.g., Aviation Department manages six airports), whereas staff departments provide support services to those line departments with operational functions (e.g., Engineering Department provides technical expertise in engineering operations, design, construction management, and quality assurance).

The 13 line and staff departments, in alphabetical order, that participate in the Bicycle Working Group include:

1. Aviation
2. Engineering
3. Government and Community Relations (GOCOR)
4. Marketing
5. Office of Environmental and Energy Programs (OEEP)
6. Office of the COO (OCOO)
7. Planning and Regional Development
8. Project Management Office (PMO)
9. Port
10. Port Authority Trans-Hudson (PATH)
11. Real Estate
12. Tunnels, Bridges, & Terminals (TB&T)
13. World Trade Center (WTC)

Moving forward, representatives from the Capital Planning Department may also participate in the Bicycle Working Group to discuss bicycle-related capital projects.

This Bicycle Master Plan proposes three strategies that pertain to internal leadership of the Plan's implementation:

Objective 1: Formalize bicycle planning practice and authority within the Port Authority, currently under the Office of the Chief Operating Officer (OCOO).	
Strategy	
1.1	OCOO, Capital Planning, and Real Estate jointly designate a bicycle coordinator responsible for managing implementation of the Bicycle Master Plan and future bicycle initiatives, including those identified through the Project Initiation Request Form (PIRF) approval process.
1.4	Add a bicycle checkbox to the Project Initiation Request Form (PIRF) so that bicycle needs are considered during project development, where relevant.
1.5	Convene Port Authority's internal bike working group on a quarterly basis to advance implementation of the Bicycle Master Plan.

The Bicycle Working Group should continue to convene and each department will evaluate, prioritize, and implement relevant bicycle strategies as operationally and financially feasible, with ongoing support from the Office of the Chief Operating Officer.

External Partners

The Port Authority recognizes its role as one of many players in the regional bicycle network and acknowledges the importance of coordinating with state, regional, and local partner agencies as well as non-profit organizations and advocacy groups.

The Port Authority works closely with the State Departments of Transportation of both New York and New Jersey (NYSDOT and NJDOT) on a variety of issues related to the movement of goods and people throughout the region. Both New York and New Jersey conduct statewide bicycle planning, developing routes and addressing safety issues. The two Metropolitan Planning Organizations (MPOs) in the region, New Jersey Transportation Planning Authority (NJTPA) and New York Metropolitan Transportation Council (NYMTC) play an active role in planning and allocating federal funds for active transportation projects, including stand-alone bicycle projects and other transportation projects that have bicycle components. The Port Authority maintains a close partnership with these agencies to ensure bike planning is taken into account during the planning, development, and implementation of any project.

Local municipalities are equally important partners when addressing bicycle-related concerns. Port Authority facilities are located throughout the region and often border more than one municipality. For example, Newark Liberty International Airport is located in both the cities of Elizabeth and Newark in New Jersey. The Port Authority will continue to coordinate with municipalities regarding general transportation issues and to conduct targeted outreach as needed.

In addition to the public agency partners described above, non-profit organizations and advocacy groups play a critical role in identifying and resolving bicycle concerns. For example, volunteers from advocacy groups could help Port Authority staff to conduct bicycle counts or surveys to ensure the agency has the most robust, accurate, and recent data to plan for current and future demand.

The Bicycle Master Plan proposes several strategies regarding coordination with external partners for bicycle initiatives:

	Strategy	
2.4	Coordinate with relevant stakeholders to evaluate bike safety and access at or near Port Authority facilities within the context of the local and regional network on both a recurring and a project-by-project basis.	
	2.4.a	Work with NYCDOT to improve the bicycle network serving PABT, JFK, and LGA.
4.1	Support bicycle education efforts and safety campaigns of external stakeholders, as feasible.	
	4.1.a	Support the NYCDOT Bike Smart Program.
6.1	Participate in local and regional bicycle planning and projects, where financially and operationally feasible.	
	6.1.a	Track bicycle policy and regulations at the federal, state, and local levels.
	6.1.b	Every other year, invite local stakeholders to discuss issues of concern at each relevant facility.
	6.1.c	Coordinate with local jurisdictions for regional bicycle network connections to new facilities (e.g., the new Goethals and Bayonne Bridges), where feasible.
6.3	Ensure all facilities are in compliance with local codes and requirements related to bicycles.	
6.4	Coordinate with NYCDOT to increase awareness and visibility of cyclists at port access/egress points.	
	6.4.a	Place signage and/or mirrors at Red Hook Marine Terminal and Brooklyn Cruise Terminal along the Brooklyn Greenway to alert drivers and cyclists of crossings.

Timeline

The timeline for any given proposed strategy may depend on several factors, including demand, staff and capital constraints, operational feasibility, and construction schedules. This section includes a sample timeline for the strategies proposed herein, based on the following time spans:

- Short-term (1-3 years): quick-win projects that require little staff and resource allocation
- Medium-term (3-5 years): projects that require some substantial staff and resource allocation
- Long-term (5+ years): projects that require significant staff and resource allocation
- Ongoing: projects require continuous or scheduled maintenance and/or oversight

Short Term Initiatives (1-3 years)		
	Strategy	
1.1	OCOO, Capital Planning, and Real Estate jointly designate a bicycle coordinator responsible for managing implementation of the Bicycle Master Plan and future bicycle initiatives, including those identified through the Project Initiation Request Form (PIRF) approval process.	
1.4	Add a bicycle checkbox to the Project Initiation Request Form (PIRF) so that bicycle needs are considered during project development, where relevant.	
1.7	Develop and implement facility-level safe bicycle access and circulation plans for employees and tenants, with periodic updates as necessary.	
	1.7.a	Identify specific routes where bicycle access could be safely added to facilitate movement to, from, and through facilities (e.g., airports and marine ports).
1.8	Identify areas where safety and security concerns prohibit bike access.	
	1.8.a	Example locations include airport and marine port central terminal roads and tunnels.
3.1	Identify best practices and standardize bike parking data collection methodology (including time of year conducted) and bike rack installations (e.g., design, placement, signage, and procurement) across Port Authority facilities.	
3.5	Improve “abandoned bike” procedures across Port Authority facilities to raise public awareness and reduce internal time/cost.	
	3.5.a	Pilot program at PATH stations.
4.2	Create and maintain a public, central webpage with the agency’s current bicycle resources.	
	4.2.a	Include access to count data collected by the GWB EcoCounter.
5.2	Create and implement annual commuter survey for Port Authority tenants’ employees.	
5.4	Incentivize bicycle commuting.	
	5.4.a	Investigate possible Port Authority corporate sponsorship of Citi Bike membership for agency employees.
	5.4.b	Partner with Citi Bike to expand bike share docking locations at Port Authority facilities.
	5.4.d	Organize bike-to-work challenges and other activities to encourage ridership.
5.5	Identify, create, and publicize travel routes where bicycles can be integrated as part of multimodal travel.	
	5.5.a	Encourage the installation of bike racks on buses serving ports and place bike racks at NJ port bus stops where employees can leave their bikes without having to bike on any main roadways.
6.1	Participate in local and regional bicycle planning and projects, where financially and operationally feasible.	
	6.1.b	Every other year, invite local stakeholders to discuss issues of concern at each relevant facility.
6.4	Coordinate with NYCDOT to increase awareness and visibility of cyclists at port access/egress points.	
	6.4.a	Place signage and/or mirrors at Red Hook Marine Terminal and Brooklyn Cruise Terminal along the Brooklyn Greenway to alert drivers and cyclists of crossings.

Medium Term Initiatives (3-5 years)		
	Strategy	
3.4	Upgrade existing bike parking facilities to be covered, secured, or indoors, where financially and operationally feasible.	
	3.4.a	Meet with PAPD to evaluate issues of bike theft and identify any needed facility improvements.
3.6	Pilot paid bike parking (e.g. bike valet or depot) programs in partnership with private sector and stakeholder groups where necessary and feasible.	
	3.6.a	Example location may include Journal Square Transportation Center.
4.3	Identify potential locations for bike counter installations, as needed.	
	4.3.a	Install counters on the north walkway of the George Washington Bridge, new Goethals Bridge, and Bayonne Bridge following completion of ongoing construction projects.
5.4	Incentivize bicycle commuting.	
	5.4.c	Develop program for bicycle commuter tax-benefited reimbursement for the expenses of bicycle commuting.
6.1	Participate in local and regional bicycle planning and projects, where financially and operationally feasible.	
	6.1.d	Enhance safety and connectivity of bicycle infrastructure at MOTBY, including access to the fishing pier adjacent to Building 51 and the Teardrop Memorial, as feasible.
6.2	Facilitate trans-Hudson bicycle connectivity.	
	6.2.c	Support bike-on-bus operations where feasible with appropriate regulations and design.
	6.2.d	Specific medium- term projects to improve bicycle infrastructure at the GWB will include removal of all stairs and construction of shared-use path connections to the bridge and improvement of the path geometry at the towers.

Long Term Initiatives (5+ years)		
	Strategy	
2.3	Maintain smooth riding surfaces for bicycle users.	
	2.3.a	Install bicycle-safe drainage grates as part of ongoing repaving projects.
5.3	Provide shower/changing facilities for Port Authority employees, where feasible.	
6.2	Facilitate trans-Hudson bicycle connectivity.	
	6.2.e	Specific long-term projects to improve bicycle infrastructure at the GWB may include widening the walkways in the main span when necessary to accommodate demand and providing bicycle access to Riverside Drive if feasible when the existing ramps to the Henry Hudson Parkway reach the end of their useful life.

Ongoing Initiatives	
Strategy	
1.2	Require departments to evaluate bicycle needs and formalize facility-specific projects through the annual budget process.
1.3	Identify funding opportunities to implement bicycle improvement initiatives across Port Authority facilities.
1.5	Convene Port Authority's internal bike working group on a quarterly basis to advance implementation of the Bicycle Master Plan.
1.6	Revisit Bicycle Master Plan and assess bike planning needs every five years.

Ongoing Initiatives		
	Strategy	
2.1	Improve safety of existing bike infrastructure. Develop new installations to meet or exceed guidelines set by the National Association of City Transportation Officials (NACTO) and the American Association of State Highway Transportation Officials (AASHTO) as financially and operationally feasible.	
	2.1.a	Perform bicycle safety audits as part of the five-year cycle of roadside safety audits at all facilities.
2.2	Analyze bicycle crash data separately from other modes to monitor trends, identify hotspots, and implement mitigation and improvement strategies.	
	2.2.a	In addition to engineering solutions at priority crash locations, identify and implement non-engineering solutions (e.g., enforcement, education, etc.).
	2.2.b	Update crash report forms to facilitate the identification of incidents involving bicycles and standardize crash location data to facilitate the identification of hotspots.
2.4	Coordinate with relevant stakeholders to evaluate bike safety and access at or near Port Authority facilities within the context of the local and regional network on both a recurring and a project-by-project basis.	
	2.4.a	Work with NYCDOT to improve the bicycle network serving PABT, JFK, and LGA.
2.5	Accommodate bicycle needs in maintenance of traffic (MOT) plans for construction projects, as appropriate.	
3.2	Institutionalize a system for each facility to reevaluate bike parking needs annually.	
3.3	Identify and prioritize locations at/near Port Authority facilities, particularly at transit hubs, where bike parking demand exceeds capacity, per Port Authority bike data collection methodology standards. Install new bike parking facilities, where operationally and financially feasible, based on this information.	
	3.3.a	Example locations may include Journal Square, WTC, PABT, and GWBBS.
4.1	Support bicycle education efforts and safety campaigns of external stakeholders, as feasible.	
	4.1.a	Support the NYCDOT Bike Smart Program.
4.4	Validate bike counter accuracy and work with vendor to recalibrate as necessary.	
5.1	Continue conducting the annual commuter survey for Port Authority employees.	
	5.1.a	Develop additional bicycle-related questions and expand target audience (i.e., to include operational staff and PAPD).
	5.1.b	Estimate and extrapolate GHG emission reduction from bicycle commuting based on employee commuter survey.
5.6	Encourage tenants and contractors to provide bicycle infrastructure and accommodations.	
	5.6.a	Educate tenants on environmental and economic benefits of biking as well as bike-to-work practices.
6.1	Participate in local and regional bicycle planning and projects, where financially and operationally feasible.	
	6.1.a	Track bicycle policy and regulations at the federal, state, and local levels.
	6.1.b	Every other year, invite local stakeholders to discuss issues of concern at each relevant facility.
	6.1.c	Coordinate with local jurisdictions for regional bicycle network connections to new facilities (e.g., the new Goethals and Bayonne Bridges), where feasible.
6.2	Facilitate trans-Hudson bicycle connectivity.	
	6.2.a	Work to ensure safe bicycle access to PATH station, ferry terminals, and the George Washington Bridge.
6.3	Ensure all facilities are in compliance with local codes and requirements related to bicycles.	

Ongoing Initiatives		
	Strategy	
6.5	Install wayfinding signs to direct cyclists to bike routes and parking where necessary and feasible.	
	6.5.a	Example locations include PATH stations and airports.
6.6	Provide bicycle channels at stairways along existing bicycle access routes where operationally feasible.	

Funding Opportunities

Numerous funding opportunities are available for projects involving bicycle improvements. Grants and funds can be obtained from various sources to enable construction and program implementation that would otherwise be cost-prohibitive.

The Bicycle Master Plan included the following strategy regarding funding opportunities:

	Strategy
1.3	Identify funding opportunities to implement bicycle improvement initiatives across Port Authority facilities.

The following represents some sources that can be pursued.

Non-Profit Grants

People for Bikes: PeopleForBikes Foundation, a 501(c)(3) non-profit organization that supports investment in bicycling infrastructure and funding for bicycle initiatives across the country, awards grants to fund engineering and design work, construction costs including materials, labor, and equipment rental, and reasonable volunteer support costs up to $10,000. Projects can include (but are not limited to): bike paths, lanes, trails, and bridges; end-of-trip facilities such as bike racks, bike parking, and bike storage; and initiatives designed to increase ridership or the investment in bicycle infrastructure.

State Funding

New Jersey

Transportation Trust Fund: According to State Statute 27:1B, bicycling and walking facilities are designated as part of "public highways" and can therefore receive funding to pursue goals of expanding bicycling and walking facilities.

Safe Streets to Transit: This program provides funding to counties and municipalities in improving access to transit facilities and all modes of public transportation.

Complete Streets Legislation: This legislation was passed to create and implement a Complete Streets policy in New Jersey. This is done through the planning, design, construction, maintenance and operation of new and retrofit transportation facilities within public rights-of-way that are federally or state funded, including projects processed or administered through the Department of Transportation's Capital

Program. A complete street is defined as a means to provide safe access for all users by designating and operating comprehensive, integrated, connected multi-modal network of transportation options[14].

New York

Complete Streets Legislation: Passed in 2011, this legislation requires state agencies to consider pedestrians and bicyclists in roadway design projects that receive state and federal funding.

Federal Funding

Historically, there have been constraints on the Port Authority's ability to accept federal grants for projects on its bridges and tunnels due to federal toll-diversion structures, or the ability to move toll revenue within different departments of the agency. More broadly, the Port Authority has not traditionally competed with local jurisdictions for these limited funding resources for improvements to its facilities.

Table 7 highlights the types of projects generally eligible for federal grant programs as detailed below.

Surface Transportation Block Grant (STBG): Funded through the Fixing America's Surface Transportation (FAST) Act in December 2015, STBG replaces the Transportation Alternatives Program (TAP) that existed in the Moving Ahead for Progress in the 21st Century (MAP-21) Act in July 2012.

Transportation Alternatives (TA): Serves as the set-aside funds from the STBG for non-motorized projects.

Transportation Investment Generating Economic Recovery Discretionary Grant (TIGER): Subject to annual appropriations.

Transportation Infrastructure Finance and Innovation Act (TIFIA): Program offers assistance only in the form of secured loans, loan guarantees, or standby lines of credit, but can be combined with other grant sources, subject to total Federal assistance limitations.

Federal Transit Administration (FTA): Projects funded with FTA transit funds must provide access to transit. Bicycle infrastructure plans and projects funded with FTA funds must be within a 3-mile radius of a transit stop or station, or if further than three miles, must be within the distance that people could be expected to safely and conveniently bike to use the particular stop or station.

Associated Transit Improvement (ATI): Operates as a one percent set-aside of the FTA to fund projects that are designed to enhance public transportation service or use and that are physically or functionally related to transit facilities, including bicycle storage shelters and parking facilities and the installation of equipment for transporting bicycles on public transportation vehicles.

[14] New Jersey Department of Transportation Policy No. 703. 3 December 2009. http://www.state.nj.us/transportation/eng/completestreets/pdf/completestreetspolicy.pdf

Congestion Mitigation and Air Quality Improvement (CMAQ): Projects must demonstrate emissions reduction and benefit air quality. Several activities may be eligible for CMAQ funds as part of a bicycle and pedestrian-related project, but not as a highway project.

Highway Safety Improvement Program (HSIP): Projects must be consistent with a State's Strategic Highway Safety Plan and either (1) correct or improve a hazardous road location or feature, or (2) address a highway safety problem.

National Highway Performance Program (NHPP): Projects must benefit National Highway System (NHS) corridors. This includes a subsystem of arterial highways in rural and urban areas that provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.

State and Community Highway Safety Grant Program (NHTSA 402): Aims to improve driver behavior and reduce deaths and injuries from motor vehicle-related crashes. Only bicycle safety education programs are eligible. Project activity must be included in the State's Highway Safety Plan.

National Priority Safety Programs (NHTSA 405): The purpose is to support State efforts to decrease pedestrian and bicyclist fatalities and injuries that result from crashes involving a motor vehicle. 405 funds are subject to State eligibility, application, and award. States are eligible for the Non-motorized Safety Grant if the annual combined pedestrian and bicyclist fatalities in the State exceed 15 percent of the total annual crash fatalities in the State using the most recently available final data from the National Highway Traffic Safety Administration (NHTSA)'s Fatality Analysis Reporting System (FARS)[15]. Project activity must be included in the State's Highway Safety Plan.

[15] Federal Register. Vol. 81, No. 99. 23 May 2016. Department of Transportation. National Highway Safety Administration. 23 CFR Part 1300.

Table 7. Federal Funding Opportunities for Bicycle Related Projects.

Key: $ = Funds may be used for this activity (restrictions may apply). $* = See program-specific notes for restrictions. ~$ = Eligible, but not competitive unless part of a larger project.

Activity or Project Type	STBG	TA	TIGER	TIFIA	FTA	ATI	CMAQ	HSIP	NHPP	PLAN	NHTSA 402	NHTSA 405
Bicycle plans	$	$			$					$		
Bicycle lanes on road	$	$	$	$	$	$	$	$	$			
Bicycle parking	$	$	~$	~$	$	$	$		$			
Bike racks on transit	$	$	$	$	$	$	$					
Bicycle storage or service centers at transit hubs	$	$	~$	~$	$	$	$					
Bridges / overcrossings for pedestrians and/or bicyclists	$	$	$	$	$	$	$*	$	$			
Bus shelters and benches	$	$	$	$	$	$	$		$			
Coordinator positions (State or local)	$						$ (1 per State)					
Crosswalks (new or retrofit)	$	$	$	$	$	$	$*	$	$			
Curb cuts and ramps	$	$	$	$	$	$	$*	$	$			
Counting equipment	$	$			$	$		$	$	$*		
Data collection and monitoring for pedestrians and/or bicyclists	$	$			$	$		$	$	$*		
Lighting (pedestrian and bicyclist scale associated with pedestrian/bicyclist project)	$	$	$	$	$	$		$	$			
Maps (for pedestrians and/or bicyclists)	$	$			$	$	$			$*		
Paved shoulders for pedestrian and/or bicyclist use	$	$	$	$			$*	$	$			
Road Diets (pedestrian and bicycle portions)	$	$	$	$				$	$			
Road Safety Assessment for pedestrians and bicyclists	$	$						$		$		

Key: $ = Funds may be used for this activity (restrictions may apply). $* = See program-specific notes for restrictions. ~$ = Eligible, but not competitive unless part of a larger project.												
Activity or Project Type	**STBG**	**TA**	**TIGER**	**TIFIA**	**FTA**	**ATI**	**CMAQ**	**HSIP**	**NHPP**	**PLAN**	**NHTSA 402**	**NHTSA 405**
Safety education and awareness activities and programs to inform pedestrians, bicyclists, and motorists on ped/bike safety										$*	$*	$*
Safety enforcement (including police patrols)											$*	$*
Safety program technical assessment (for peds/bicyclists)										$*	$	
Separated bicycle lanes	$	$	$	$	$	$	$	$	$			
Shared use paths / transportation trails	$	$	$	$	$	$	$*	$	$			
Signs / signals / signal improvements	$	$	$	$	$	$	$	$	$			
Signed bicycle routes	$	$	$	$	$	$	$		$			
Spot improvement programs	$	$	$	$	$			$	$			
Stormwater impacts related to bicycle projects	$	$	$	$	$	$		$	$			
Traffic calming	$	$	$	$	$			$	$			
Trail/highway intersections	$	$	$	$			$*	$	$			
Training	$	$					$	$		$*	$*	
Training for law enforcement on ped/bicyclist safety laws												$*
Tunnels / undercrossings for pedestrians and/or bicyclists	$		$	$	$	$	$*	$	$			

Source: FHWA, August 12, 2016.

Note: See https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm for program-specific notes.

Best Practices

This section highlights best practice research that may inform the implementation of two select proposed strategies:

Objective 3: Provide adequate bike parking capacity.		
	Strategy	
3.5	Improve "abandoned bike" procedures across Port Authority facilities to raise public awareness and reduce internal time/cost.	
	3.5.a	Pilot program at PATH stations.
3.6	Pilot paid bike parking (e.g. bike valet or depot) programs in partnership with private sector and stakeholder groups where necessary and feasible.	
	3.6.a	Example location may include Journal Square Transportation Center.

Abandoned Bicycle Policy

Abandoned bicycles reduce the capacity of bike racks, limiting the availability of parking space for active users. The Port Authority's current abandoned bike policy is both labor- and time-intensive and could be revised to raise public awareness, increase compliance, and reduce internal time and cost.

Figure 36. Port Authority Zip Ties on Bikes Parked Overnight

Source: Port Authority Planning & Regional Development Department, 2016.

Existing Abandoned Bike Policy and Practice

PATH's abandoned bike policy states that any bike locked to a rack at any station longer than 24 hours is subject to removal. Port Authority staff regularly patrol PATH stations to enforce this policy, conducting nightly sweeps and marking potentially abandoned bikes with colored zip ties. Once a bike has accumulated multiple zip ties, the lock is cut and the bike is impounded. Protocol states that both a facility staff member and PAPD officer must be present for the bike removal. PAPD then stores the bike for 30 days, during which time owners can reclaim and retrieve their bikes. If the owner does not come forward, then bikes are donated to local non-profit

organizations. The 24-hour time restriction under current policy is designed to ensure that the racks serve PATH customers and are used primarily for commuting purposes instead of functioning as community racks where people store bicycles near their residence for extended periods.

Potential Improvements

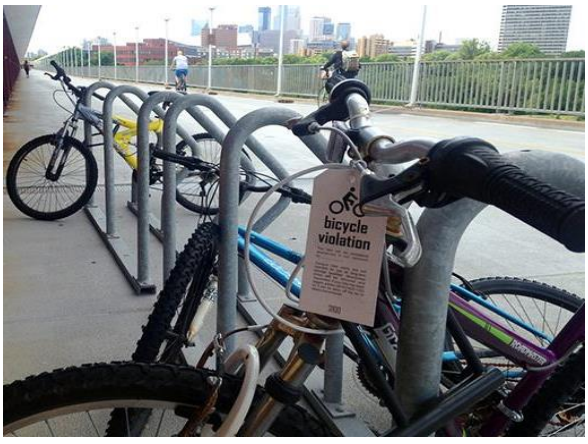
Tagging Bicycles

A new tagging system that is both informative and removable could effectively identify potential abandoned bikes, raise public awareness, and increase compliance with the bike parking policy.

There is no signage indicating that the colored zip ties currently used to tag bikes signify that a bike is identified for potential removal. There is also no information posted regarding how soon a bike will be impounded (i.e., after it accumulates how many zip ties). Because this practice is not explained and because zip ties cannot be removed without scissors, bicycle owners cannot respond to the "warning" and indicate that their bike, even if tagged, is not abandoned.

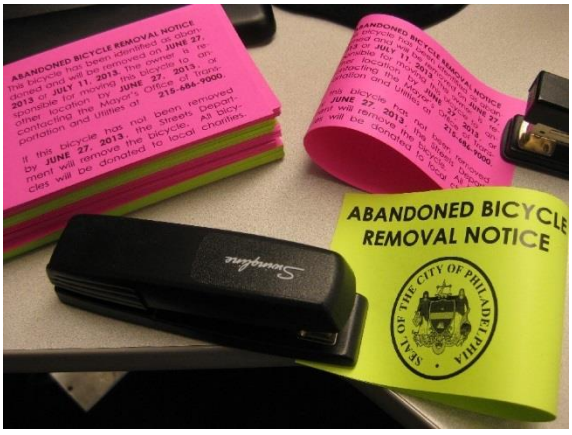
Several municipalities, including Minneapolis and Philadelphia, have developed an effective system for tagging potentially abandoned bicycles. For example, facility staff can staple a piece of paper around a bicycle handlebar that explains the policy (i.e., why the bike was marked) and the date by which the bike must be moved by the owner (otherwise it is impounded). Stickers, similar to the ones used for checked luggage at airports, can also be affixed to the handlebars. If the Port Authority prefers to use zip ties, then a paper notice that states the policy, the date of tagging, and the date of impoundment (unless the owner removes the tag and/or the bike) should be attached to the zip tie.

Figure 38. Minneapolis, MN, Abandoned Bike Tags



Source: Bill Lindeke.

Figure 37. Philadelphia, PA, Abandoned Bike Tags



Source: Philadelphia Mayor's Office of Transportation and Utilities.

Sample Tag Wording

Abandoned Bicycle Removal Notice: this bicycle has been identified as abandoned on [current date] and will be removed on [future date, a specific number of days in the future]. The owner is responsible for moving this bicycle to another location by [the future date]. If this bicycle is not removed by this date, the Port Authority will donate it to a local charity.

Identifying Abandoned Bikes

Defining the characteristics of an abandoned or derelict bike may reduce the number of bicycles that are tagged and ultimately impounded. Using greater discretion in tagging bicycles could limit the number of bikes in good working order that are incorrectly identified as abandoned.

It is possible that a cyclist actively uses his/her bike and maintains it in good condition, but parks it at the station at the time when staff patrol and tag bikes. If the tag is removable, then upon his/her return, the owner can remove the tag so that there is no misunderstanding of the bike's non-abandoned status. Consequently, staff will spend less time (and facilities will require less space for) impounding bikes.

Bikes that are clearly unusable can be tagged for a period of time (i.e., one week) and disposed of (i.e., recycled or donated) directly, thereby eliminating the need to transport and store the bicycle further. It is unlikely that anyone would come forward to claim a derelict bike if it were to be stored off-site; as long as it is tagged with a warning of removal, then there should not be any issue with disposing of the bike directly after the warning period concludes. Title 16, Section 1-05.1 of New York City's City Rule defines the characteristics of a derelict bike[16] as:

i. The bicycle appears to be crushed or not usable;
ii. The bicycle is missing parts essential to its operation, other than the seat and front wheel, including, but not limited to handlebars, pedal or pedals, rear wheel and chain;
iii. The handlebars or pedals are damaged, or the existing forks, frames or rims are bent; or
iv. Fifty percent or more of the bicycle, which includes the handlebars, pedals and frames are rusted, along with any chain affixing such bicycle to public property.

The rule also states that any bike locked to public property or areas that impede motor or pedestrian traffic will be immediately removed and disposed of, without any warning.

This proposed change would decrease the amount of storage space needed for impounded bicycles and effectively streamline the disposal process. Additionally, defining the characteristics for identifying and tagging abandoned bikes could provide justification for bicycle removal without requiring PAPD oversight.

[16] Title 16. § 1-05.1 Removal of Derelict Bicycles. New York City City Rule. http://library.amlegal.com/nxt/gateway.dll/New%20York/admin/newyorkcityadministrativecode?f=templates$fn=default.htm$3.0$vid=amlegal:newyork_ny

Impoundment/Storage

Under the current policy, multiple Port Authority staff members are involved in the impound process and a significant amount of space is required to store the impounded bicycles for 30 or more days. Additionally, Port Authority staff must coordinate the disposal or donation of unclaimed bikes.

There is no state or municipal law in either New York or New Jersey that either a) requires an impounded bike to be stored or b) stipulates a length of time an impounded bike must be held. Many public agencies and municipalities establish their own policies regarding how long they store impounded bikes. The Massachusetts Bay Transit Authority (MBTA) in Boston follows the same 30-day guideline as the Port Authority[17]. The New York City Metropolitan Transportation Authority (MTA) holds bikes for six months[18], while the Chicago Transit Authority does not specify how long a bike must be held, instead stating that bikes "will be held for a period of time."[19]

There are two options for adjusting the Port Authority's current impound policy:

1. Shorten the amount of time a bike is held, thereby reduce the space requirements for managing the impounded bikes; or
2. Extend the amount of time a bike is tagged (and include information about the tag's significance) and dispose of or donate the bike immediately thereafter, thereby eliminating the need to store the bike at all.

The Port Authority should notify its customers of any such policy change and new signage and tags should state the new policy as well.

[17] Massachusetts Bay Transit Authority. Bikes on the T. 2016. http://www.mbta.com/riding_the_t/bikes/#abandoned_bikes

[18] Phone interview with Lost and Found agent. MTA. 20 October 2016.

[19] http://www.transitchicago.com/bikeandride/#Parking

Awareness/Signage

Improvements to signage, including strategic placement within sight of bike parking racks could increase compliance. Currently, Journal Square Transportation Center is the only PATH station that has a clear sign located above a set of racks stating the parking policy. Other racks at Journal Square and at other Port Authority facilities do not post any information regarding the impound policy. Improved signage could raise awareness of the 24-hour parking limit, explain the tagging system, and notify owners of how they may retrieve their impounded bicycle if it has been removed.

Figure 39. Existing Sign at Journal Square Transportation Center

Source: Port Authority Planning & Regional Development Department, 2016

Proposed Revisions to Abandoned Bike Policy

- Improve the tagging system used to identify potentially abandoned bicycles. This should include attaching an informational flyer stating the bike parking policy, as well as the date that the bicycle will be impounded if action is not taken. The tag must be easily removable.
- Change the bike parking policy to allow derelict bicycles to be recycled or donated directly instead of being impounded.
- Reduce or eliminate the amount of time a bicycle must be impounded before it can be donated.
- Eliminate the requirements for PAPD officers to be present when cutting locks.

Bike Depots

Bike depots provide a secure storage option to people who plan to leave their bikes for multiple hours during a day or night. Some bike depots offer more amenities than other depots, based on staff and space availability, but across the board bike depots offer more protection than short-term outdoor bicycle parking. A bike depot is typically characterized as being indoors and having controlled access only by users who have a key fob or code. Bike depots reduce the threat of theft or vandalism while protecting bicycles from the elements. Additional amenities, including valet services, repairs, or rentals can be offered in concert with the depot as staff, space, and resources are available.

These facilities are especially useful when located at transit hubs to facilitate multimodal trips. For example, Montclair, New Jersey, has a depot located at the NJ Transit train station. In this instance, commuters bike to the station, lock their bicycle in a secure location, and continue their trip toward New York City by train. In Washington, DC, the reverse travel pattern occurs. The bike depot is located at Union Station, where commuters arriving by train from the suburbs can pick up their bicycles to complete the last portion of their trip within the city.

Figure 41. Bike Depot in Montclair, NJ

Source: NJ Bike & Walk Coalition.

Figure 40. Bike Depot in Washington, DC

Source: Bikestation Washington, DC.

Bike depots often alleviate demand for outdoor bike racks at transit centers. Bike depots provide an option for users to self-select a different form of storage, thereby reducing demand for short-term bicycle parking facilities. Additionally, because people pay or register to use bike depots, bike depots greatly reduce problems with abandoned bikes that are common at short-term outdoor parking facilities. However, bike depots – especially ones that charge a fee – should supplement, not substitute, outdoor parking so that users of all income levels have access to bike racks.

Agencies have different cost structures for bike depots. Boston's MBTA provides free access to its Pedal and Park facilities to all users who register their transit card[20]. In the San Francisco metropolitan area, the Bay Area Rapid Transit (BART) system provides two types of depots: (1) a daily bike valet service that is free during the day, but charges a $5.00 overnight fee; (2) unattended bike room that charges a one-time $5.00 fee for an access key card that can be preloaded with money[21]. Parking in the second type of facility costs between three to five cents per hour[22]. Other cities offer monthly or annual parking rates[23]. In most cases, bike depots are not operated by public agencies, but are managed by non-profit or for-profit businesses. In most cases, for-profit businesses operate full-service facilities with rentals and repairs available, while non-profit operations are generally more modest.

[20] Massachusetts Bay Transit Authority. *Ibid*.
[21] Bart Bike Station. 2014. http://bikehub.com/bartbikestation/
[22] Bike Link. 2016. https://www.bikelink.org/help/costs
[23] New Jersey Bike Walk Coalition. 2016. http://www.njbwc.org/bikedepot/; Bikestation. 2016 http://home.bikestation.com/join-bikestation

Table 8. Sample Costs of Bike Depot Memberships

Location	Monthly	Annual
St. Paul, MN Union Depot	$7/month	$84/year
Los Angeles Metro Bike Hub	$12/month	$60/year
Washington D.C. Bikestation	$12/month	$92/year
Pittsburgh, PA Parking Center[24]	n/a	$100/year
Montclair, NJ Bike Depot	$20/month	$220/year

Source: See footnotes

The Port Authority could pilot a bike depot at select New Jersey PATH stations to meet the needs of customers as well as reduce the current workload related to managing the abandoned bike policy. As indicated in the *Existing Conditions* chapter, many PATH stations in New Jersey are currently at or above capacity for existing bike parking facilities and some, such as the Journal Square Transportation Center, have underutilized space that could accommodate this type of operation. Partnering with a third party to create a bike depot could reduce demand on existing short-term bike parking, increase security for bicycles, reduce the number of abandoned bicycles at the station, and provide a modest revenue stream for the agency.

[24] Bike PGH. 2016. http://www.bikepgh.org/resources/bike-parking/#Where

Appendices

Appendix A. 2010 Bicycle Policy

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY PORT AUTHORITY NEWS BULLETIN

Office of the Executive Director
Bulletin #10-05

March 29, 2010

Bicycling is a rapidly growing mode of transportation and the New York-New Jersey region is facing increased demand for expanded bicycle infrastructure, safer bicycle routes, access to transit connections and secure parking facilities. While we recognize that many Port Authority facilities currently provide some accommodations for bicycle users, we need to prepare more systematically for the growing use of bicycles as a mode of travel within the regional transportation system.

On February 25, 2010, the Board of Commissioners adopted the following policy:

In keeping with its mission to meet the critical transportation needs of the bi-state region, the Port Authority supports bicycling as an important and sustainable mode of travel. It seeks to provide its customers, tenants, visitors and employees with safe and convenient bicycle access and secure bicycle parking at its facilities, wherever operationally and financially feasible.

The Board also authorized the Executive Director to take the following steps to advance the goals of this policy:

- Integrate improved bicycle access, safe bicycle lanes, and secure bicycle parking and storage into existing Port Authority buildings and facilities, owned or operated by the Port Authority.
- Ensure that design guidelines for new construction and major renovations include sufficient bicycle access, storage, and related amenities to meet emerging demand.
- Develop multimodal transit hubs that encourage biking and walking.
- Remove any unnecessary restrictions on bicycle access, and promote the safe coexistence of motor vehicles, bicycles and pedestrians at Port Authority facilities.
- Encourage tenants to expand bicycle access and accommodations.
- Coordinate bicycle facility improvements and intermodal connections with regional planning organizations, other regional transportation providers, and local governments to promote safe and seamless travel throughout the region.

The Chief Operating Officer, Chief of Capital Planning, and Chief of Real Estate and Development will be responsible for ensuring that the agency takes the preliminary steps necessary to implement this policy and will periodically report to me on the agency's progress. They will also review interim bicycle master plans and provide final versions for my approval by September 30, 2010. Affected staff will soon receive additional information and guidance from them directly.

I encourage all Port Authority staff to make the most of this opportunity to creatively meet the region's emerging transportation needs, advance the agency's environmental commitments and contribute to a more sustainable regional transportation system. We will be able to better serve our customers, foster positive relationships with our communities, and contribute to improved employee health. I look forward to seeing a wide range of plans for meeting these objectives, and to sharing them with the region.

//Original Signed By//

Christopher O. Ward
Executive Director

(Board – 2/25/10)

PORT AUTHORITY BICYCLE POLICY

Bicycling is a rapidly growing mode of transportation in the New York-New Jersey region and throughout many of the nation's metropolitan areas. Since 2000, bicycle commuting has almost tripled in New York City, and it is expected to double again by 2015.

Federal, state and local policies increasingly support cycling as transportation. Federal law requires consideration of non-motorized users during planning, development, and construction of transportation projects that receive federal aid. The Federal Highway Administration expects transportation agencies to accommodate bicycling and pedestrian use as a routine part of their planning, design, construction, operations and maintenance activities**.**

The region's metropolitan transportation planning organizations, including the North Jersey Transportation Planning Authority, Inc. and the New York Metropolitan Transportation Council, have initiated plans for improving and increasing regional bicycle infrastructure. The region's public transportation providers, including New York State's Metropolitan Transportation Authority, New Jersey Transit Corporation (NJT), the New York State Department of Transportation and the New Jersey Department of Transportation, all have developed bicycle plans and added new bicycle facilities. The New York City Department of Transportation plans to add hundreds of new lane miles for bicycles on New York City streets by 2030, which will increasingly affect Port Authority facilities. Recent local legislation requires secure indoor bicycle parking in both new and existing commercial and residential buildings in New York City. Jersey City's recent Master Plan includes the goal of a city-wide bicycle-friendly environment by 2050, and assumes Port Authority and NJT collaboration in providing bicycle access and storage.

Port Authority facilities currently provide some accommodations for bicycle users, such as bicycle access for the George Washington and Bayonne Bridges, off-peak access to the Port Authority Trans-Hudson rail system, and some bicycle routes and racks at other facilities. A formal Port Authority bicycle policy would provide staff with additional guidance and support as they respond to the growing presence of bicycles as a mode of travel within the overall regional transportation system.

Accordingly, it was recommended that the Board adopt the following policy statement: "In keeping with its mission to meet the critical transportation needs of the bi-state region, the Port Authority supports bicycling as an important and sustainable mode of travel. The Port Authority seeks to provide its customers, tenants, visitors and employees with safe and convenient bicycle access and secure bicycle parking at its facilities, wherever operationally and financially feasible."

(Board – 2/25/10)

The Executive Director may, consistent with the policy, need to take the following steps to advance this policy:

- Integrating improved bicycle access, safe bicycle lanes, and secure bicycle parking and storage into existing Port Authority buildings, roadways and other facilities owned or operated by the Port Authority.
- Ensuring that design guidelines for new construction and major renovations include sufficient bicycle access, storage, and related amenities to meet emerging demand.
- Developing multi-modal transit hubs that encourage biking and walking.
- Removing any unnecessary restrictions on bicycle access, and promoting the safe co-existence of motor vehicles, bicycles and pedestrians at Port Authority facilities.
- Encouraging tenants to expand bicycle access and accommodation.
- Coordinating bicycle facility improvements and inter-modal connections with regional planning organizations, other regional transportation providers, and local governments.

Initial steps should incur minimal incremental costs, which can be absorbed by existing operations and maintenance budgets. Costs of accommodating bicycle travel when expanding, upgrading, or constructing major new surface transportation facilities are to be included in specific project plans and in future budgets. To the extent that any of these actions requires significant additional investment, the Executive Director may seek further Board consideration and authorization.

Pursuant to the foregoing report, the following resolution was adopted with Commissioners Coscia, Grayson, Holmes, Pocino, Sartor, Silverman and Steiner voting in favor; none against:

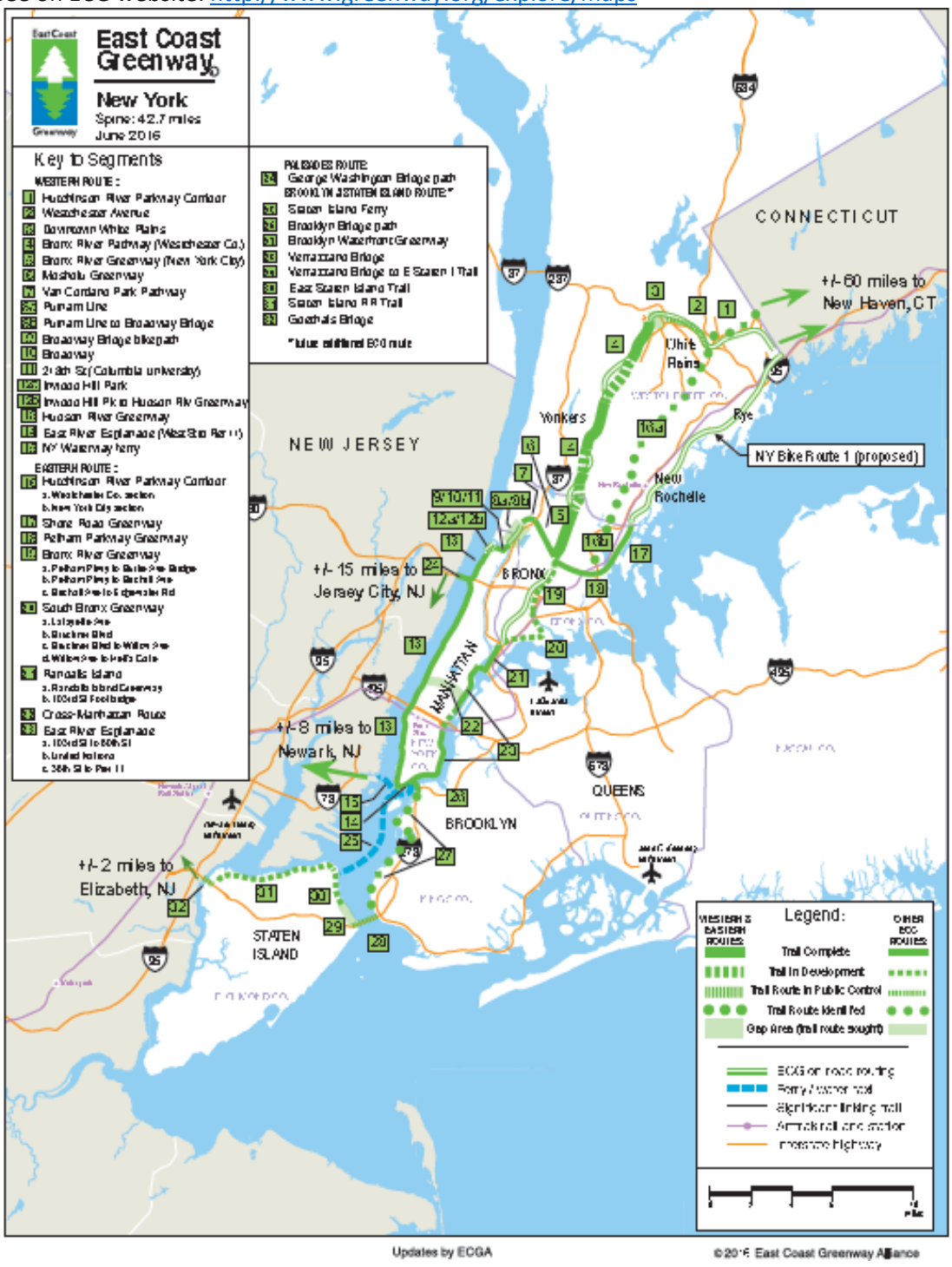
RESOLVED, that the following statement is adopted as Port Authority policy: "In keeping with its mission to meet the critical transportation needs of the bi-state region, the Port Authority supports bicycling as an important and sustainable mode of travel. The Port Authority seeks to provide its customers, tenants, visitors and employees with safe and convenient bicycle access and secure bicycle parking at its facilities, wherever operationally and financially feasible."; and it is further

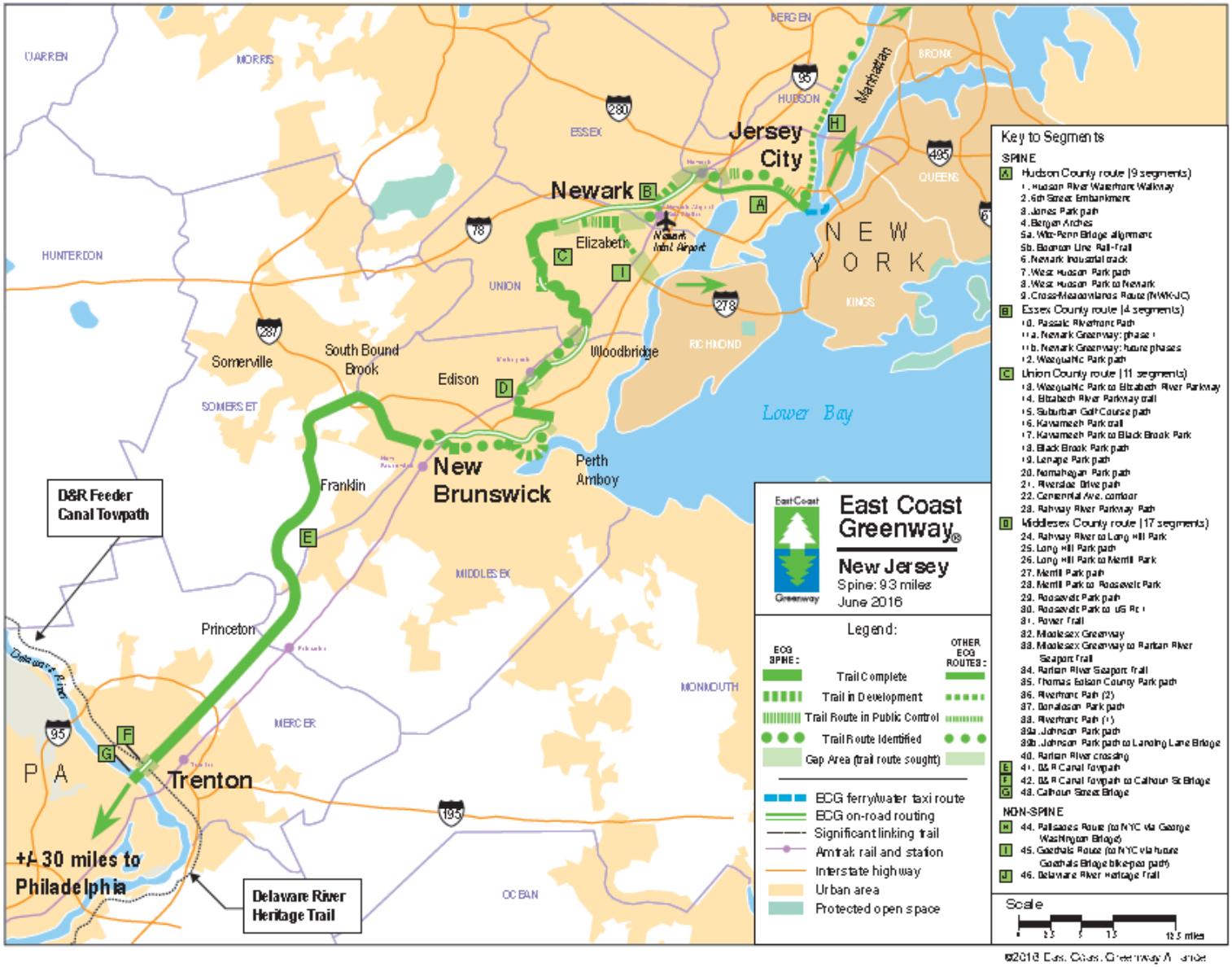
RESOLVED, that the Executive Director be and he hereby is authorized to take steps, consistent with the Port Authority's By-Laws and Budgets adopted by the Board, to effectuate this policy; and it is further

RESOLVED, that the form of any documents generated pursuant to this resolution shall be subject to the approval of General Counsel or his authorized representative.

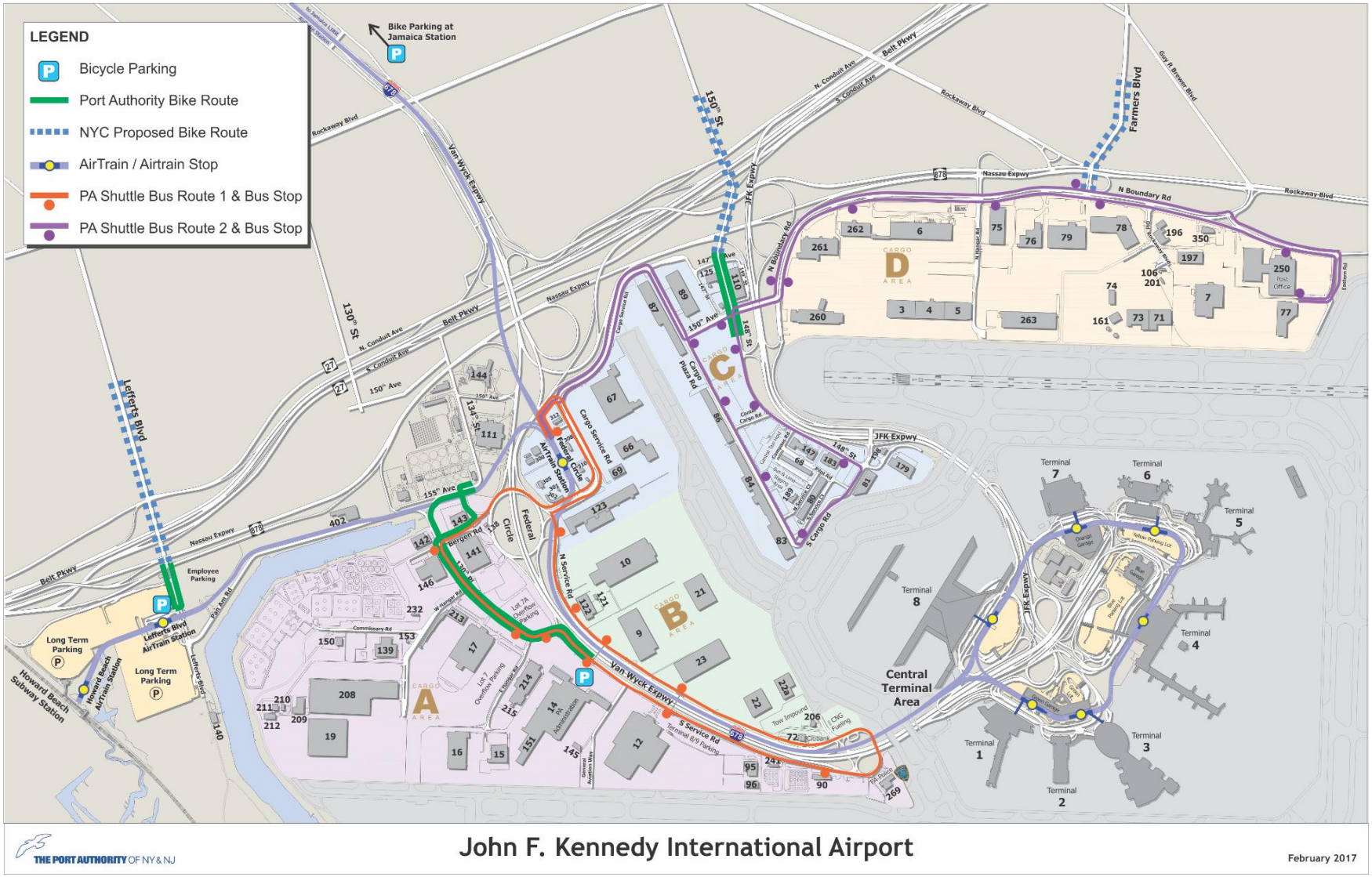
Appendix B. East Coast Greenway Maps for New York and New Jersey

See on ECG website: http://www.greenway.org/explore/maps




East Coast Greenway
New Jersey
Spine: 93 miles
June 2016
Legend:
Trail Complete
Trail in Development
Trail Route in Public Control
Trail Route Identified
Gap Area (trail route sought)
ECG ferry/water taxi route
ECG on-road routing
Significant linking trail
Amtrak rail and station
Interstate highway
Urban area
Protected open space
Key to Segments
SPINE
A Hudson County route (9 segments)
B Essex County route (4 segments)
C Union County route (11 segments)
D Middlesex County route (17 segments)
E D&R Canal towpath
F D&R Canal towpath to Calhoun St Bridge
G Calhoun Street Bridge
NON-SPINE
H 44. Palisades Route (to NYC via George Washington Bridge)
I 45. Goethals Route (to NYC via future Goethals Bridge bike-ped path)
J 46. Delaware River Heritage Trail
Scale
0 2.5 5 7.5 12.5 miles
Jersey City
Newark
Elizabeth
Newark Int'l Airport
Somerville
South Bound Brook
Edison
Woodbridge
New Brunswick
Perth Amboy
Franklin
Princeton
Trenton
Lower Bay
NEW YORK
D&R Feeder Canal Towpath
+/- 30 miles to Philadelphia
Delaware River Heritage Trail
PA
BERGEN
MORRIS
ESSEX
HUDSON
BRONX
QUEENS
KINGS
RICHMOND
UNION
SOMERSET
MIDDLESEX
MONMOUTH
MERCER
OCEAN
HUNTERDON
WARREN
Manhattan

Appendix C. Map of Bicycle Parking and Routes at JFK Airport



Appendix D. Map of Bicycle Accessible Routes at Newark Airport