JUNE 2018

Orangetown BIKE STUDY

A COMMUNITY PLAN FOR A SAFER AND MORE WELCOMING CYCLING ENVIRONMENT ON ORANGETOWN'S ROADS AND TRAILS

FINAL REPORT
PREPARED BY PARKS & TRAILS NEW YORK

PARKS & TRAILS NEW YORK

PARKS & TRAILS NEW YORK

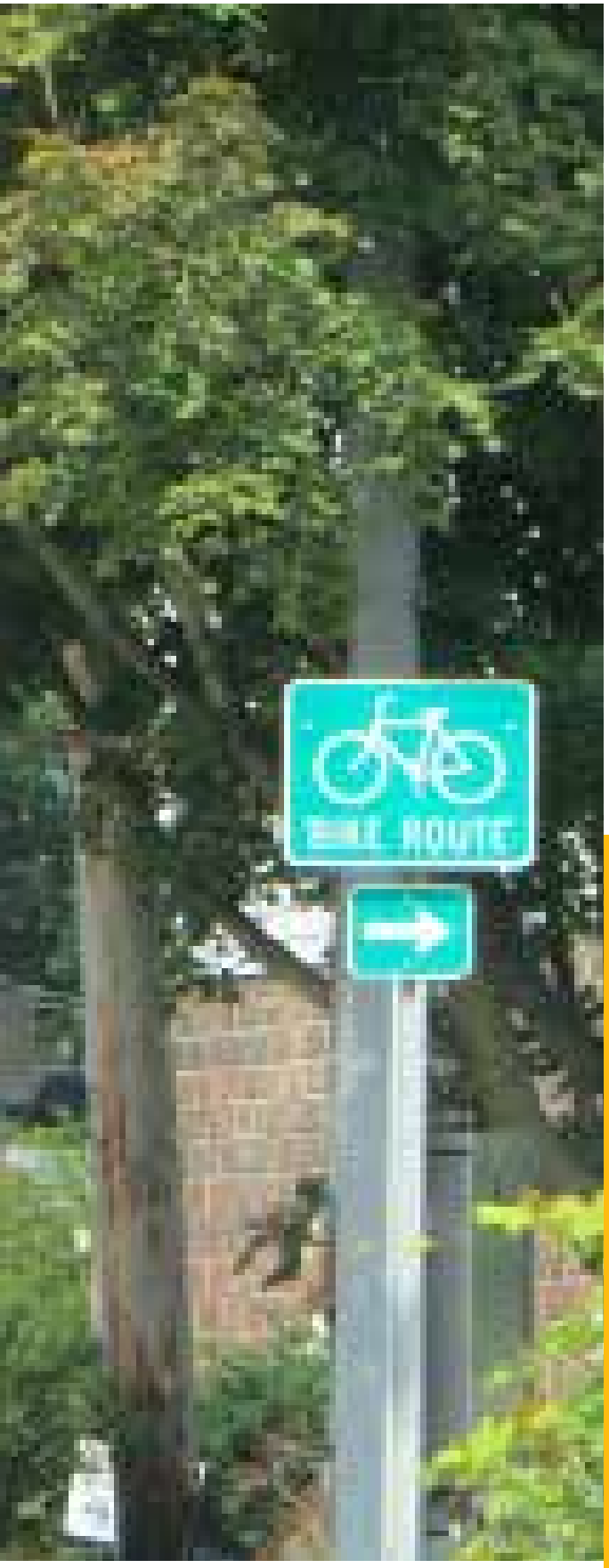
About Parks & Trails New York

Parks & Trails New York (PTNY) is a non-profit organization working since 1985 to expand, protect, and promote a network of parks, trails, and open spaces throughout New York State for the use and enjoyment by all.

The PNTY project team includes:
Robin Dropkin
Gregory Francese
Fran Gotcsik
James Meerdink

For more information about PTNY's work visit www.ptny.org.

INFORMATION ABOUT THE ORANGETOWN BIKE STUDY CAN BE FOUND AT WWW.ORANGETOWN.COM/BIKESTUDY



Contents

2 ..... Executive Summary
4 ..... Introduction
6 ..... Context
16 ..... Previous Planning
20 ..... Public Engagement
26 ..... Recommended Bikeway Network
44 ..... Education, Encouragement & Enforcement
48 ..... 5-Year Vision & Implementation Plan
59 ..... Additional Resources
66 ..... Acknowledgments
67 ..... Appendix

Executive Summary

THE ORANGETOWN BIKE STUDY IS A COMMUNITY PLAN FOR CREATING A SAFER AND MORE WELCOMING CYCLING ENVIRONMENT ON THE TOWN'S ROADWAYS AND MULTI-USE TRAILS.

In the fall of 2017, the Town of Orangetown hired Parks & Trails New York, a non-profit organization that has assisted communities around New York State in developing trails and planning bike and pedestrian networks, to conduct the Bike Study.

Orangetown's road are well-known to recreational cyclists, and the opening of the Shared Use Path on the new Tappan Zee Bridge promises even more cyclists. Despite cycling's popularity, Orangetown residents have access to relatively few safe cycling facilities, and these are generally confined to the eastern half of the Town, where the J. B. Clarke and Esposito Rail Trails provide convenient off-road connections.

The Bike Study began with a review of existing conditions, including site visits and a survey of local roads, and a public outreach campaign that asked local cyclists and the wider Orangetown community what they desired in a cycling network. The response was overwhelming, and several themes emerged. One was the need for safe on-road facilities that complement and connect to the local trail system. Another was making connections between neighborhoods and important community destinations such as parks, schools, and business districts. Survey respondents and others were also concerned about road behavior, both on the part of local motorists and groups of cyclists who travel through town.

The Bike Study's primary deliverable is a proposed network of cycling facilities along routes that provide access to Orangetown's various destinations, with an emphasis on connecting residents with priority destinations. This includes concept-level planning for new multi-use trails, protected and unprotected bike lanes and shared use lanes. The recommended network also offers treatments and techniques for improving cycling safety at busy intersections, and important transition points within the network. Enhancements to the existing multi-use trail system are also provided, and will help further integrate these off-road assets into the larger network.

Beyond physical infrastructure and enhancements, the Bike Study also provides recommendations for programming, policies, and enforcement steps that will activate the network's facilities and promote safety throughout the system. This is an important part of the Study, as the lack of bike lanes or intersection treatments may not be the only reason why local residents decline to try cycling. Creating a supportive environment, building awareness, and ongoing evaluation and feedback related to the cycling network will ensure that the town's investments are well-placed.

The Study puts these recommendations on a timeline in the 5-Year Vision & Implementation section, and provides cost estimates and additional resources to achieve this goal.

“I’d like to be able to reach more destinations via off-road routes like the Esposito Trail.”

- ORANGETOWN RESIDENT

Introduction

THE ORANGETOWN BIKE STUDY IS A COMMUNITY PLAN FOR A SAFER AND MORE WELCOMING CYCLING ENVIRONMENT ON ORANGETOWN'S ROADS AND TRAILS

What is the Orangetown Bike Study?

The Orangetown Bike Study will create a safer and more welcoming bicycling environment for bicyclists of all ages and abilities by recommending improvement to the Town's roadway network and proposing new connections between neighborhoods and important community destinations such as parks, schools, and business districts.

The desire to encourage cycling and to address safety needs for cyclists comes at a critical time for Orangetown. Town roads already host thousands of cyclists during any given week, many of whom ride from New York City or Northern New Jersey through the Palisades and onto New York State Bike Route 9 (Route 9W in Orangetown). These bicyclists tend to be more experienced but are seeking recreational routes that incorporate Orangetown's wonderful riverside views and destinations to the north including Hook and Bear Mountain. Orangetown's existing trail network includes two multi-use trails, the JB Clarke and Esposito Rail Trails. These trails are well-used by cyclists, joggers and walkers, and the recent completion of the trail link under Orangeburg Road brings improved connectivity to an important off-road bicycling network. The opening of a multi-use path on the Mario Cuomo Bridge is expected to bring a wide range of bicyclists to local roads.

In 2017, the Town of Orangetown hired Parks & Trails New York (PTNY) to conduct the Bike Study. PTNY is a non-profit organization that has more than 30 years of experience assisting communities around New York State with developing trails and planning bike and pedestrian networks.

TIMELINE

AUG 2017

- **Parks & Trails New York selected as project consultant**
- **Initial project scope and timeline drafted**

Goals

The Bike Study's primary goal is to create a community vision for the local cycling network. This vision will take the form of a proposed network of cycling facilities along routes that provide access to Orangetown's various destinations, with an emphasis on connecting residents with local business districts and community facilities such as schools, libraries and parks.

In addition, the Bike Study seeks to strengthen links to the existing multi-use trail system, and make enhancements to better integrate existing and planned trail facilities into the local and regional cycling network. Improving connections for Orangetown residents to neighboring communities, through both on-road and trail routes, is also top priority.

The Bike Study recommends policies and programming that support this network by encouraging increased participation in cycling among residents. Finally, the Bike Study provides recommendations for funding to implement the proposed improvements, conducting ongoing evaluation of the cycling network as it develops, and continuing engagement of the town's residents to ensure that the developing network responds to Orangetown's needs.

Funding

Funding for the Orangetown Bike Study was provided by The New NY Bridge Community Benefits Program, the community outreach component of the Tappan Zee Bridge replacement project.

The "5 E's" Essential Elements of a Bike-friendly Community

Education
Instructing cyclists of all ages in the skills necessary to ride safely

Encouragement
Creating a welcoming and supportive environment for cycling

Enforcement
Ensuring safety for all users by enforcing rules of the road

Engineering
Creating safe facilities that allow users to reach community destinations

Evaluation & Planning
Ongoing planning and feedback to ensure that facilities and programming meet local needs

ADAPTED FROM LEAGUE OF AMERICAN BICYCLISTS, HTTPS://BIKELEAGUE.ORG/CONTENT/5-ES

SEPT 2017

- Initial stakeholder and public meeting held in Orangetown
- Bike counts conducted by local volunteers
- Site visit by PTNY
- Bike Study webpage created

OCT - DEC 2017

- Existing conditions review, including data gathering and stakeholder interviews
- 2nd site visit
- Community Survey and Feedback Map opened for comment

JAN - FEB 2018

- Feedback summarized
- Draft plan created and posted for comment
- February public meeting in Orangetown

MAR - JUNE 2018

- Revision of Plan based on community feedback
- Pop-up bikeway demonstration
- Spring bike counts
- Final Plan presented to Town Board

1 Context

History & Government

Orangetown was originally settled around 1680 by Dutch merchants who purchased the land from the Tappan Native American tribe. When New York's first twelve counties were established in 1683, Orangetown lay within Orange County. Orangetown became the first incorporated town in Rockland County when that county was split off from Orange County in 1798.

Orangetown and the wider Hudson River Valley played a critical role in the American Revolution. Notably, the Orangetown Resolutions, a protest of the imposition of duties and the closing of the port of Boston by the British Parliament and a precursor to hostilities, were passed in Tappan on July 4, 1774. Tappan was also the headquarters of General George Washington for part of 1780.

Orangetown is part of the New York–Newark–Jersey City, NY-NJ-PA metro area (NY-NJ-PA Metro), and lies 30 miles northwest of New York City. The Hudson River forms Orangetown's eastern border, with Westchester County across the river. Bergen County New Jersey lies to the south, while the New York Towns of Ramapo and Clarkstown border to the west and north.

Orangetown is home to four incorporated villages – Grand View-on-Hudson, Nyack, Piermont, and South Nyack – and 11 unincorporated hamlets. Orangetown is represented by a council-form of government, with an elected Supervisor.

Population

Orangetown's population was 49,212 as of 2010. Orangetown's average household size is smaller than Rockland County's and even smaller than the wider region. The Town's age cohorts skew younger, with over 30% of the town's residents under the age of 25. Orangetown also has a slightly smaller Hispanics and Black populations , per capita, at 9.7% and 6.0%, than the county and the wider region.

The median household income in Orangetown is $92,257, significantly higher than Rockland County and the wider region. This affluence is also reflected in the small percentage of households that are living below the poverty line, only 4.6%.

Orangetown has higher levels of educational attainment than its county or region, with 50.6% of its population having a bachelor's degree or higher.

Land Use & Development

The largest land use in Orangetown is residential, totaling 5,689 acres or 36.7% of the total land. The majority of the residential areas are zoned for one-or two family residential. The second largest land use is agriculture/parks/open space, which occupies 4,030 acres or 25.6% of the total land in Orangetown. Within this category, there are approximately 24 town parks and open space areas, including two golf courses, two state parks, and eight historic sites.

Located just 30 miles northwest of New York City, Orangetown's prime location and rich history make it a great place to live, work and play

Transportation, Employment & Affordability

Orangetown's transportation system can be described by a variety of measures, each giving a unique insight into into how residents are moving around, how much they are spending on transportation, and how the availability of infrastructure for biking, driving, and walking may be influencing their transportation choices.

COMMUTING PATTERNS

More than a quarter (26.9%) of Orangetown residents work in New York City, and 21.8% commute within Orangetown.

The Employment Inflow and Outflow graphic shows that Orangetown also serves as a regional employment center, with over 20,000 commuters coming in on a daily basis, more than actually leave the area for work.

CAR AVAILABILITY AND USE

Orangetown residents have similar access to automobiles compared to others in Rockland County and the wider region. About 9% of Orangetown households do not have access to a vehicle. The average number of miles driven annually is higher among Orangetown households, at 23,553 miles, than Rockland County or the metro area.

HOUSING & TRANSPORTATION COSTS

The Center for Neighborhood Technology (CNT) has developed the Housing and Transportation (H+T) Affordability Index which examines the cost of housing as well as the cost of transportation associated with a given location. An affordable area, according to CNT, is one where combined housing and transportation costs are no more than 45 percent of the average household income.

While Rockland County, the wider region, and Orangetown all fall above the 45 percent affordability threshold, Orangetown's housing and transportation costs are especially high.

H & T COSTS

77%

ORANGETOWN

65%

ROCKLAND COUNTY

50%

REGION

EMPLOYMENT INFLOW & OUFLOW

Traveling to and from work is often the largest component of travel behavior,, so improving safety and accessibility for cylists who wish to bike commute can make a big impact on local and regional transportation patterns.

SOURCE: LONGITUDINAL EMPLOYMENT HOUSEHOLD DYNAMICS

WALKABILITY

Orangetown neighborhoods have an average Walk Score of 33, which is described as a "car- dependent" area, meaning that most errands require a car. For comparison purposes, Nyack's neighborhoods average a Walk Score of 92, and Haverstraw 77. Walk Scores are not available for larger areas such as counties or regions.

TRANSIT ACCESSIBLE JOBS

The number of jobs that are accessible by transit from Orangetown is 11,850, which nearly matches the County's overall total, indicating that Orangetown is relatively well-served by public transportation.

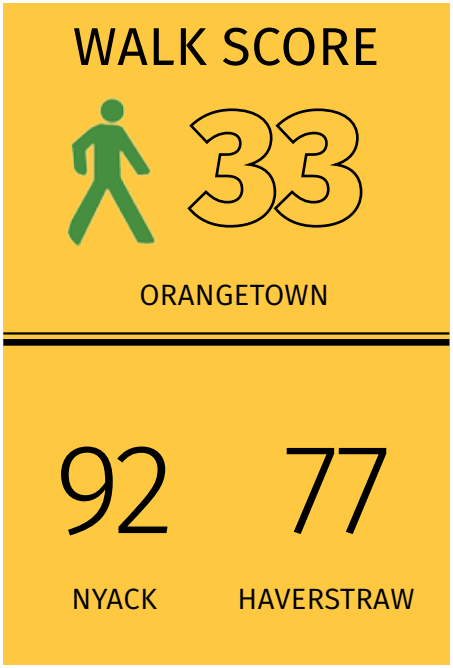
BIKE SHARE

There are currently no bike share programs operating in Orangetown or Rockland County.

COMMUTING MODE SHARE

Mode share indicates what percentage of trips taken are using a specific type of transportation, such as driving alone or transit. While the majority of Rockland residents drive alone to work, a small portion carpool, and an even smaller segment of workers walk to their employment.

SEE APPENDIX A FOR ADDITIONAL INFORMATION ON LAND USE, DEMOGRAPHICS, AND THE EXISTING TRANSPORTATION NETWORK.



MODE SHARE, AS PERCENTAGE OF WORK TRIPS

	ORANGETOWN	ROCKLAND COUNTY	NY – NJ – PA METRO
Total workers	**23,321**	**142,565**	**9,309,951**
Worked at home	*1,346*	*6,738*	*381,910*
Total commuting population*	**21,975**	**135,827**	**8,928,041**
Drive alone	**75.3%**	**70.7%**	**50.3%**
Carpool	**7.8%**	**11%**	**6.7%**
Public Transportation	**7.2%**	**8.6%**	**30.8%**
Walked	**3.2%**	**3.5%**	**6.1%**
Bicycle	**0.1%**	**0.1%**	**1.05%**
Taxicab, motorcycle, or other means	**0.6%**	**1.3%**	**1.05%**

***Mode shares are expressed as percentages of the working population that did not work from home**

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates. (DP03)

Public Transportation

ORANGETOWN IS WELL SERVED BY PUBLIC TRANSPORTATION, WITH BOTH BUS AND RAIL SERVICE TO NORTHERN NEW JERSEY AND NEW YORK CITY, AND BUS SERVICES THROUGHOUT ROCLKLAND COUNTY AND TO WESTCHESTER COUNTY.

TRANSPORTATION OPTION	SERVICE OFFERED	AVAILABLE BICYCLING AMENITIES
Transport of Rockland (BUS)	The primary public transportation service in Orangetown and the surrounding areas is the Transport of Rockland (TOR) bus system. TOR has 10 routes, providing service along major corridors.	Rockland County offers bicycle racks on all new TOR buses. The remainder of the fleet has not yet been equipped with racks.
Tappan Zee Express (BUS)	Tappan Zee Express (TZx) is Rockland County's commuter bus system. Operated by Transport of Rockland, TZx provides service across the Hudson River between Rockland and Westchester Counties.	Newer TZx buses have specialized slide-out bike racks that can be used by bicyclists. In addition, customers are welcome to put their bicycles in the luggage bay of coach-style TZx buses.
New Jersey Transit (RAIL)	NJ Transit is New Jersey's public transportation corporation. Orangetown residents have access to the NJ Transit Network via the Pascack Valley Line, a commuter rail line that runs north from Hoboken Terminal through Hudson and Bergen Countines in New Jersey and into Rockland County. The Pascack Valley Line passes through Pearl River in Orangetown and Nanuet in Clarkstown, finally terminating at Spring Valley in the town of Ramapo.	NJ Transit supports and encourages bicycle access to its terminals, facilities and services. Bicycles can be brought aboard NJ Transit trains at no extra charge, access is allowed from all station platforms, and permits are not required. However, bikes cannot be taken on trains during rush hour.
Metropolitan Transit Authority (RAIL)	Orangetown residents have access to the Metropolitan Transit Authority's Metro North Rail (MNR) Hudson Line, with the Tarrytown Station, across the Hudson River in Westchester County, accessible via the Mario Cuomo Bridge. Currently, Orangetown residents have the option of driving or taking the Tappan Zee Express bus service to reach the station. In 2018, the opening of the Shared Use Path will add a cycling option. The Hudson Line provides direct access to Grand Central Station in New York City, and north from Tarrytown to Poughkeepsie.	Bicycles are allowed aboard MNR trains at most times outside of rush hours and major holidays. A $5 lifetime MNR Bicycle Permit is required. On weekdays, a maximum of four bicycles per train is allowed. On weekends, a maximum of eight bicycles per train is allowed. Special weekend "bicycle trains" can accommodate more than eight bicycles; these trains are indicated on the published timetables. Folding bicycles are allowed onboard trains at all times and do not require a permit.

Bicyclist Safety

CRASH STATISTICS: Orangetown

The Town of Orangetown has experienced traffic crashes involving cyclists, as well as at least one cyclist fatality. In addition, at least two pedestrian fatalities occurred in 2018 in the Nyack area. Crashes are concentrated in areas where there there is high bicycle and pedestrian activity but a lack of bicycle accommodations, such as Sparkill Depot and Pearl River.

CRASH STATISTICS: Rockland County

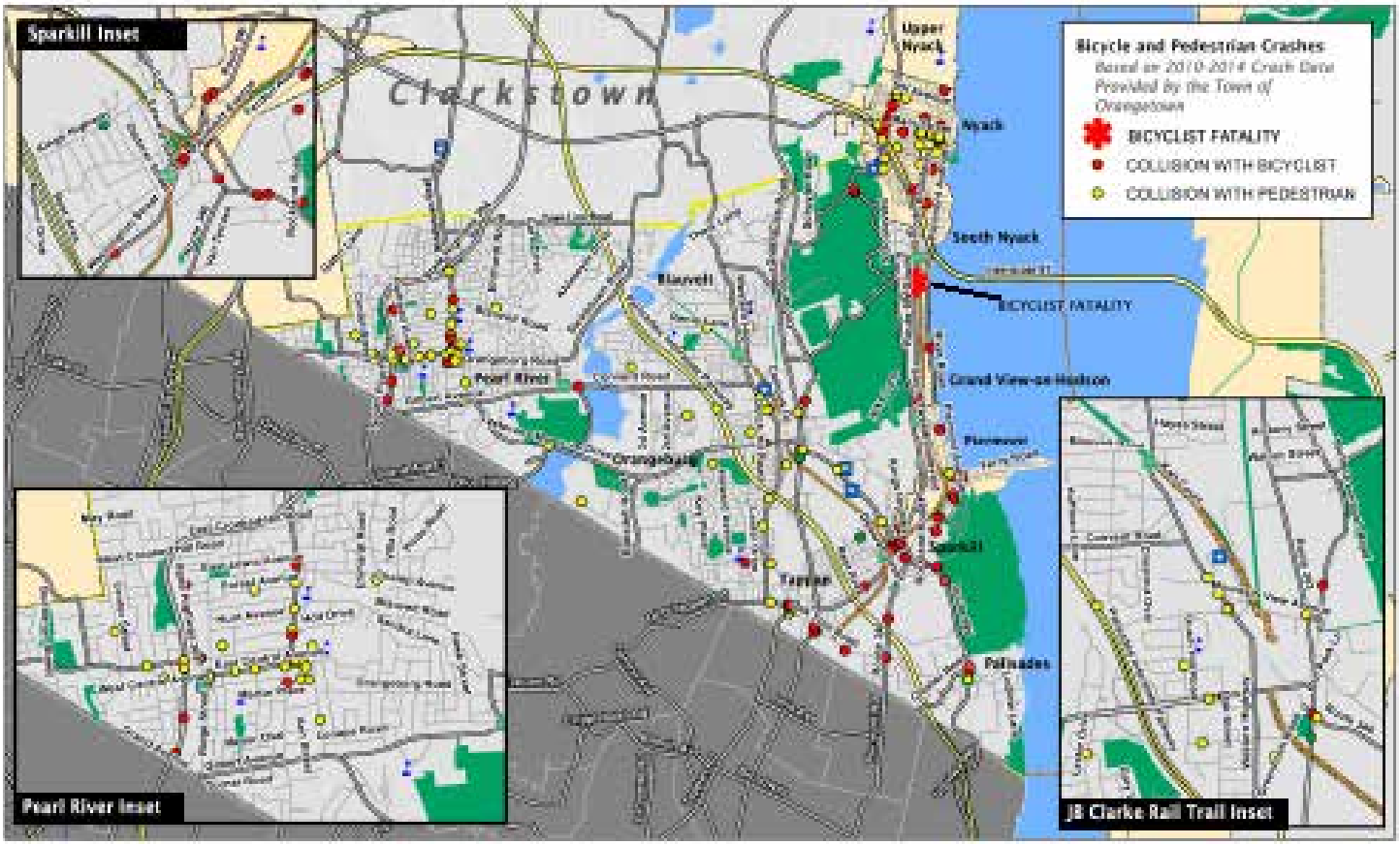
Rockland County reported 744 total crashes involving pedestrians from 2011-2015, with 22 of these incidents resulting in fatalities. Due to pedestrian safety issues, the Town of Ramapo, west of Orangetown in Rockland County, was included as a Focus Community in the State's Pedestrian Safety Action Plan (PSAP). The PSAP provides tools and funding to focus communities to improve specific intersections and pedestrian facilities, as well as public awareness materials and other support to local agencies. In Rockland County, the Department of Health is coordinating the PSAP-related activities, with Complete Streets featuring prominently.

In addition to the county-level Complete Streets Executive Order and working group mentioned previously, the PSAP effort has led the Towns of Clarkstown, Ramapo, Spring Valley and West Haverstraw to pass town-level Complete Streets resolutions.

Existing Bicycling-related Policies

In Rockland County all cyclists are required to wear a helmet. Rockland is one of only two counties in New York State with this requirement; Erie County in Western New York is the other.

Rockland County also has a law on the books pertaining to cycling on sidewalks. The practice is allowed for cyclists up to 14 years of age. Beyond this age, cycling on the sidewalk is prohibited.



Existing Conditions

DESPITE HIGH LEVELS OF ROAD CYCLING, ORANGETOWN'S EXISTING CYCLING FACILITIES CONSIST EXCLUSIVELY OF OFF-ROAD TRAILS

Raymond G. Esposito Trail/Old Erie Path

The Esposito Rail Trail and Old Erie Path provide a continuous off-road link from Sparkill Depot through Piermont, Grand-View-on-Hudson, South Nyack, and terminating at Franklin Street Park on Cedar Hill Avenue in Nyack. There are several trailheads and parking areas along this stretch, including Sparkill Depot, Ash Street Station and First Street in Piermont.

The trail's surface is stonedust of various gauge. Upon completion of the Mario Cuomo bridge, the Esposito Trail will connect to the bridge's Shared Use Path, with the trail leading to a parking facility and landing plaza sited at the location of the current NYS Thruway Exit 10.

Joseph B. Clarke Rail Trail

In eastern Orangetown, parts of the abandoned Erie Railroad line have been converted to the Joseph B. Clarke Rail Trail. With construction recently completed to bring the trail under Orangeburg Road, the trail now provides a continuous off-road link between Oak Tree Road and the Blauvelt Library. Total trail mileage is 3.8 miles. Trailheads with parking exist at the Blauvelt Library and Sparkill Depot. There are also trail kiosks and benches at several other locations. The trail surface is asphalt, with several road crossings paved in brick.

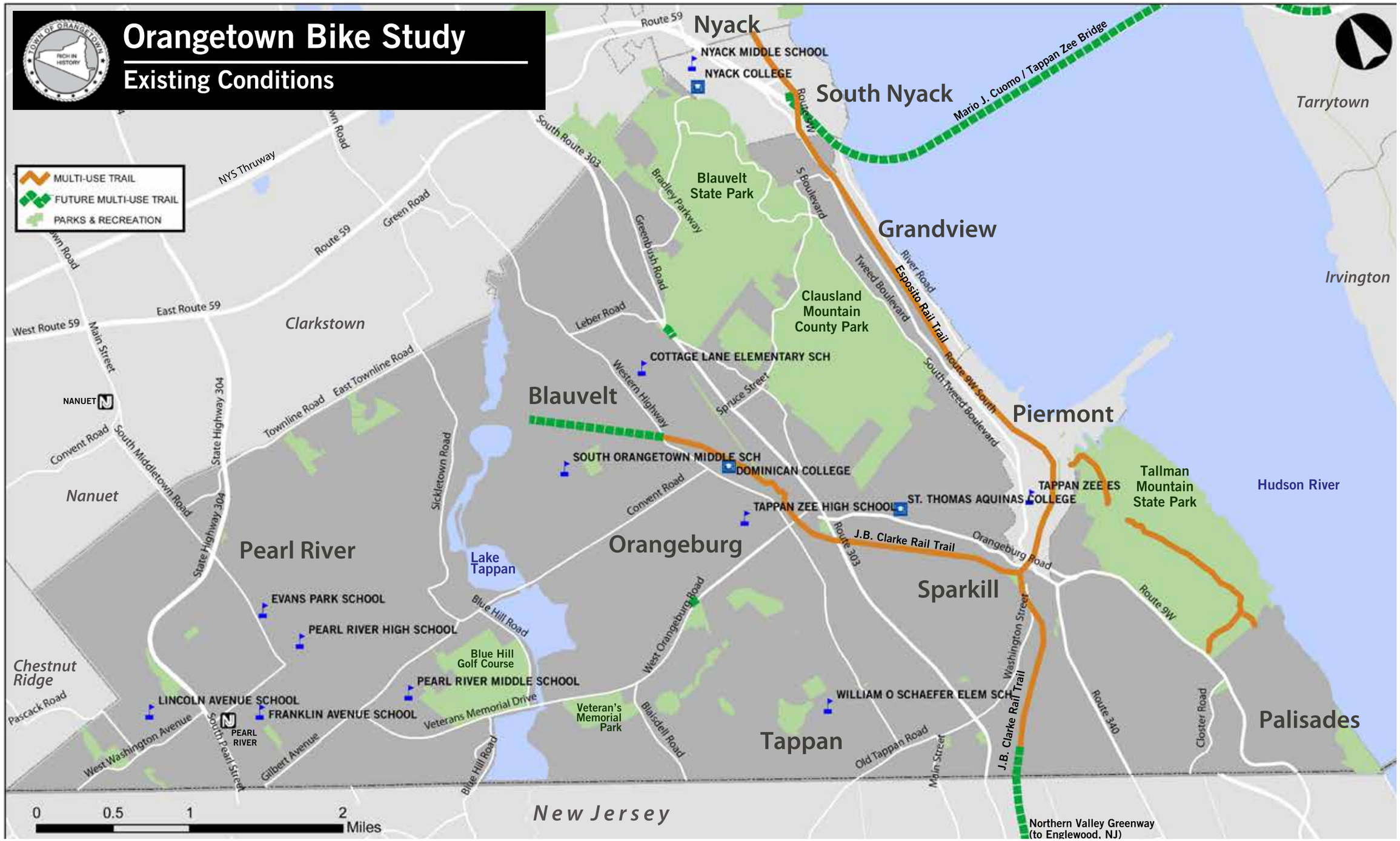
Tallman Mountain State Park Multi-Use Path

The multi-use path in Tallman Mountain State Park is part of Hudson River Greenway Trail. It is a primarily off-road route with a stonedust surface between Route 9W and Ferdon Avenue. Short roadway connections are on low-stress state park roads. The trail's length is 2.2 miles.

State Bike Route 9

The primary north-south route through Orangetown, State Bicycle Route 9 is a signed on-road bicycle route that extends 345 miles from New York City to Rouses Point on the New York - Quebec (Canada) border. Cyclists using SBR 9 from the Palisades (south) enter Orangetown on Route 9W. The route leaves Route 9W in Sparkill, following Highland Avenue, then Ferndon Avenue to Piermont. From Piermont, SBR 9 heads north on Piermont/River Road through Grand-View-on-Hudson, South Nyack and Nyack. There are currently no formal cycling facilities on SBR 9 in Orangetown, so cyclists use available shoulders or the travel lane itself. In general, the sections of SBR 9 on Route 9W have ample shoulders, whereas there is less room on sections of the route between Sparkill and Nyack.

STATE BIKE ROUTE 9 IN PALISADES

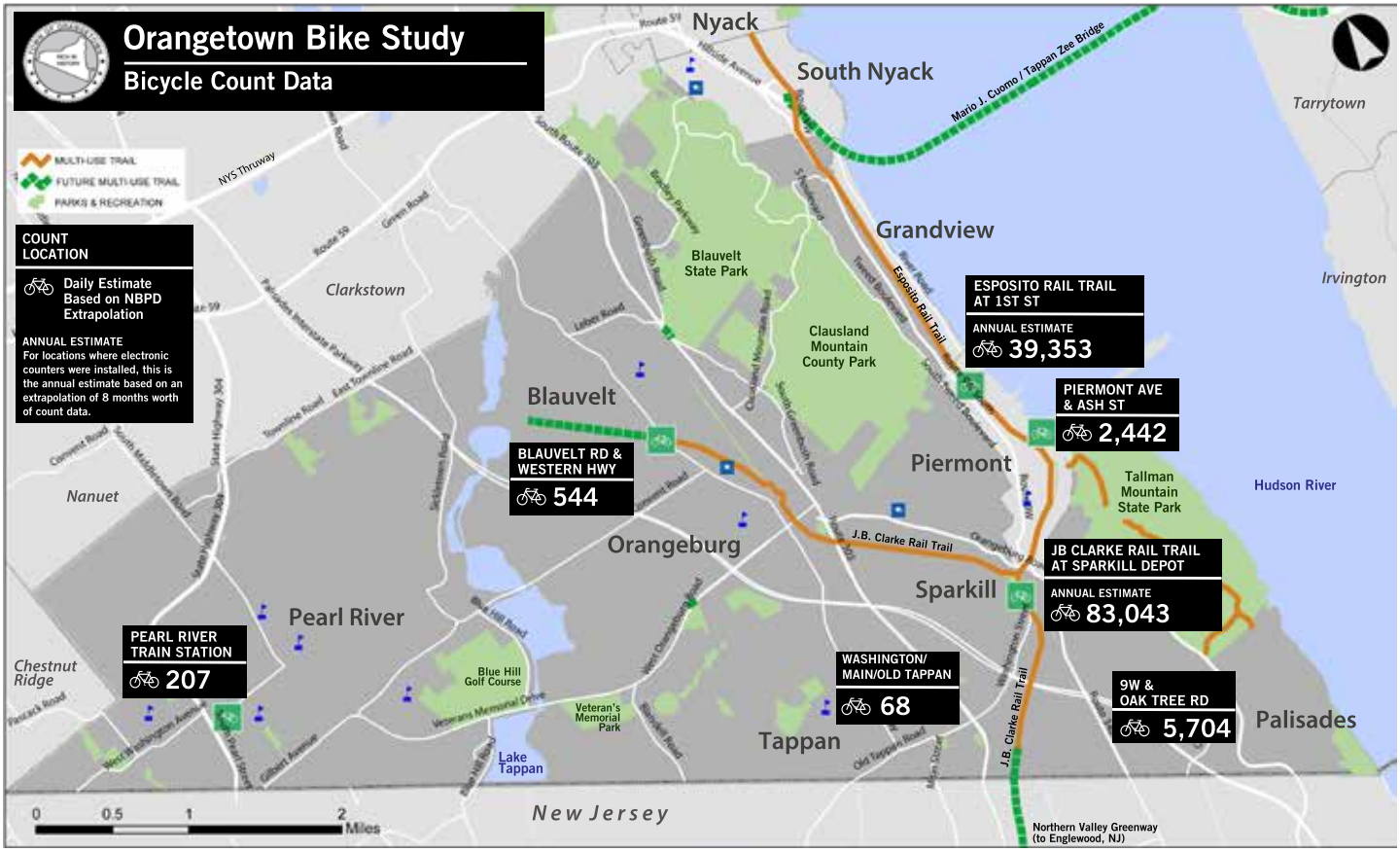

Orangetown Bike Study
Existing Conditions
MULTI-USE TRAIL
FUTURE MULTI-USE TRAIL
PARKS & RECREATION
Nyack
NYACK MIDDLE SCHOOL
NYACK COLLEGE
South Nyack
Mario J. Cuomo / Tappan Zee Bridge
Tarrytown
Irvington
Route 59
NYS Thruway
South Route 303
Bradley Parkway
Blauvelt State Park
Greenbush Road
S Boulevard
Grandview
Tweed Boulevard
River Road
Esposito Rail Trail
Route 9W South
Clausland Mountain County Park
South Tweed Boulevard
Piermont
Green Road
Route 59
East Route 59
West Route 59
Main Street
Clarkstown
Leber Road
COTTAGE LANE ELEMENTARY SCH
Western Highway
Spruce Street
Blauvelt
NANUET
Convent Road
South Middletown Road
State Highway 304
Townline Road
East Townline Road
Sickletown Road
SOUTH ORANGETOWN MIDDLE SCH
DOMINICAN COLLEGE
TAPPAN ZEE ES
ST. THOMAS AQUINAS COLLEGE
Tallman Mountain State Park
Hudson River
Nanuet
TAPPAN ZEE HIGH SCHOOL
Convent Road
Route 303
J.B. Clarke Rail Trail
Orangeburg Road
Pearl River
Orangeburg
Lake Tappan
Sparkill
EVANS PARK SCHOOL
Blue Hill Road
West Orangeburg Road
Washington Street
Route 9W
PEARL RIVER HIGH SCHOOL
Blue Hill Golf Course
Chestnut Ridge
PEARL RIVER MIDDLE SCHOOL
LINCOLN AVENUE SCHOOL
FRANKLIN AVENUE SCHOOL
WILLIAM O SCHAEFER ELEM SCH
Pascack Road
Veterans Memorial Drive
Veteran's Memorial Park
Blaisdell Road
Route 340
Closter Road
Palisades
PEARL RIVER
West Washington Avenue
South Pearl Street
Gilbert Avenue
Tappan
Old Tappan Road
Main Street
J.B. Clarke Rail Trail
Northern Valley Greenway (to Englewood, NJ)
Bite Hill Road
New Jersey
0
0.5
1
2
Miles

THIS PAGE INTENTIONALLY LEFT BLANK

Bike Counts

BIKE COUNTS WERE CONDUCTED IN SEPTEMBER 2017 AND MAY 2018 BY LOCAL VOLUNTEERS, REVEALING A WIDE RANGE OF CYCLING USE ON LOCAL ROADS AND EXISTING MULTI-USE TRAILS

On roads, the intersection of Piermont Avenue & Ash Street experienced a huge volume of cyclists during the weekend count, reflecting high recreational use. Other locations experienced more modest cycling volumes. On local trails, counts revealed that the use on the J. B. Clarke Rail Trail is more than double the Esposito Rail Trail, most likely due to the smooth asphalt surface on the Clarke.



Previous Planning

THE BIKE STUDY DRAWS ON PREVIOUS PLANNING IN ROCKLAND COUNTY, THE LOWER HUDSON VALLEY, AND THE WIDER NEW YORK METROPOLITAN REGION

2

Previous Planning

Plan 2045 - Appendix 2: Pedestrian and Bicycle Plan (2017) from New York Metropolitan Transportation Council (NYMTC)

Plan 2045 is the regional transportation plan for the ew York City, suburban Long Island and the Lower Hudson Valley, produced by the metropolitan planning organization with jurisdiction for the region, NYMTC. The Plan's bicycle and pedestrian appendix serves as the current regional pedestrian and bicycle plan for Putnam, Rockland, and Westchester counties.

NYMTC's Safety Advisory Working Group (SAWG) is a forum for coordination among transportation agencies in the region, and NYMTC organizes Walkable Community Workshops, used to increase awareness of pedestrian and bicycle safety issues. These events help communities develops recommendations for improving the pedestrian and cycling environment. As part of its role as programmer of federal funding, NYMTC maintains an inventory of fiscally "constrained" bike/ped projects, those short-listed for available funding, and "vision" projects that are aspirational and dependent on the availability of additional funds.

INNOVATIVE PAVEMENT MARKINGS FROM GREATER NYACK PLAN

Greater Nyack Bicycle and Pedestrian Master Plan (2018)

Like the Orangetown Bike Study, the Greater Nyack Bicycle and Pedestrian Master Plan is a planning effort funded by the New NY Bridge Project's Community Benefits Program. The Plan is a joint effort of the Village of Nyack, South Nyack and Upper Nyack, as well as the Nyack School District.

The Draft Plan includes innovative facility ideas, such as center running bike lanes and zig zag markings, as well as a host of policies and programming to facilitate safer walking and biking in Nyack. The Plan points out the need for enhancements to the road crossing of the Esposito Rail Trail on North Broadway, which serves as a connection to Orangetown. There are several other recommendations which could be pursued jointly with Orangetown or through Rockland County, including creation of a bike share program.
Beyond infrastructure, policies and programming, the Draft Plan also emphasizes the use of pop-ups and other temporary installations to introduce and test infrastructure such as bike lanes.

Mario Cuomo Bridge Project

The Mario M. Cuomo Bridge, commonly referred to as the "New Tappan Zee Bridge", is a twin cable-stayed bridge that spans 3.1 miles over the Hudson River, and carries the both direction of traffic on I-87/ I-287. The bridge replaced the original Tappan Zee Bridge, which operated from 1955 to 2017.

Besides its status as the largest bridge project in New York State history, the Mario M. Cuomo Bridge is a critical component in the regional transportation network. The bridge provides a direct link between Rockland and Westchester counties, as well as allowing Rockland County residents to

access MTA's Metro North Railroad services. Beginning in 2018, the new bridge will be outfitted with a shared use path for pedestrians and cyclists (SUP). Beyond the convenience this facility will offer cyclists on either side of the river, the SUP also opens up new routing opportunities for cyclists doing extended rides from the New York City area. In particular, the ability to bike up one side of the Hudson, and back down the other is expected to significantly increase the number of on-road cyclists on either side of the bridge.

Northern Valley Greenway Concept

Several communities in Northern New Jersey are advocating for conversion of an eight-mile stretch of abandoned railroad line to a multi-use trail, referred to as the Northern Valley Greenway. The corridor in question extends into Orangetown, and aside from the short stretch from the New Jersey border to Oak Tree Road, is used for the J. B. Clarke Rail Trail.

Northvale, Norwood, Demarest, Closter, Cresskill and Tenafly have passed resolutions in support of conversion of the corridor to a rail trail, and a representative from each town serves on the Greenway board. New Jersey Department of Transportation is conducting a feasibility study for trail development. Adding to the project's momentum, it was also included in the Bergen County Park System's 5-Year Master Plan, and may eventually become part of the County Park system. In order for the project to come to fruition, towns would need to enter into an agreement with CSX, which owns the railroad tracks. More information on the initiative can be found at www.northernvalleygreenway.org

NORTHERN VALLEY GREENWAY CONCEPT

Route 303 Bypass at Greenbush Avenue in Blauvelt

Orangetown was awarded a $100,000 state grant to build a quarter-mile path along Route 303 at Greenbush Avenue in Blauvelt. The bypass will follow the east side of Route 303 connecting two legs of North Greenbush Road, a favored route for Rockland County and New York City cyclists. The bypass will run along the western edge of Blauvelt State Park, and allow cyclists to travel north-south through Orangetown while avoiding traffic-heavy, high-speed Route 303. The project is expected to be completed in Summer 2018.

Rockland County Complete Streets Executive Order and Framework Guidelines (August 2015)

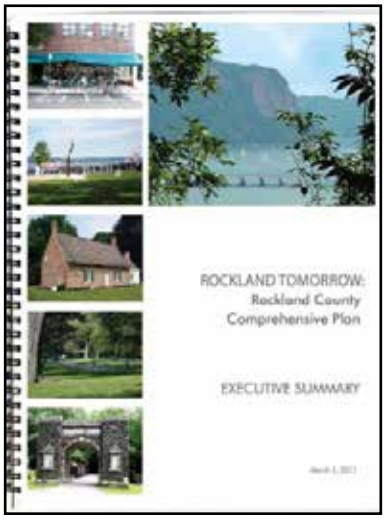
In August 2015, Rockland County Executive Ed Day directed that all County departments and commissioners consider Complete Streets features as they design, build, and maintain the County's roadway network. The directive, referred to as the Complete Streets Initiative, established an Interdepartmental Work Group with representatives from several county departments. This group was tasked with implementing Complete Streets as proposed in the Comprehensive Plan. The group meets monthly, and representatives from Towns within Rockland County have participated.

Orangetown Comprehensive Plan (2003) & Suggested Updates (2012)

The 2003 Orangetown Comprehensive Plan recommends improving the Town's walking and biking trails, as well as making connections between major open space areas, recreation facilities and village centers. The 2012 update of the plan includes no significant additions with regard to biking infrastructure or safety.

Route 303 at Erie Street – Intersection Improvement Project (2009)

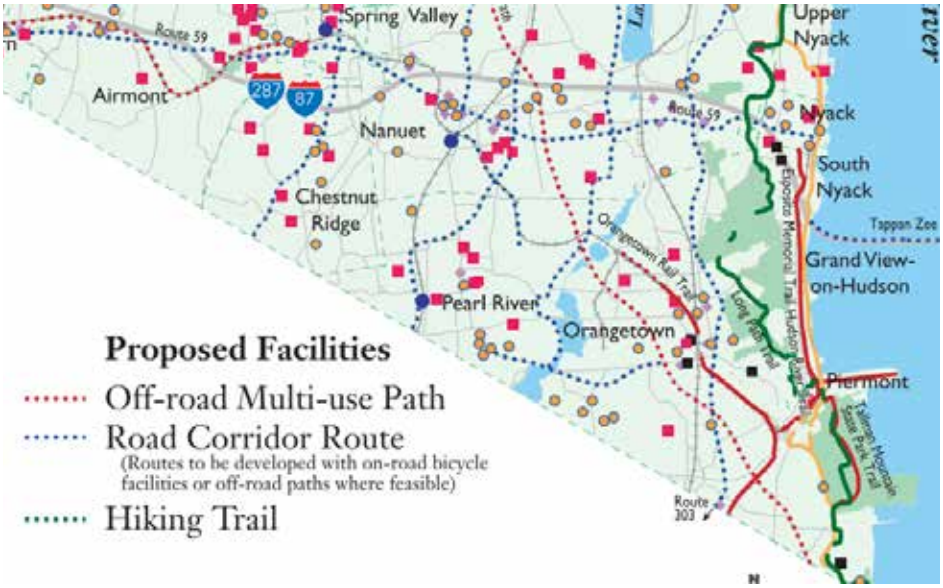
The Intersection Improvement Project was a public, community driven planning and conceptual design process meant to address safety issues at this busy intersection, including bicyclist and pedestrian concerns. New York State Department of Transportation proposed changes to the intersection that relate to bike/ped include shared lane markings for cyclists on one 14' travel lane on Route 303, a raised 15' wide median on Route 303, improved sidewalks and crosswalks, and signal upgrades including pedestrian signals and push-to-walk buttons.



Rockland Tomorrow: Rockland County Comprehensive Plan (2011)

The County's Comprehensive Plan includes several priorities relating to the cycling network. The Plan recommends concentrating growth in existing village centers, and upgrading infrastructure and amenities in these locations - including bike lanes. The transportation section includes a call for additional off-road facilities along abandoned rail corridor and local waterways. The Plan advises that all roadway users be considered in street design and construction, or Complete Streets. This section of the Plan also brings up the issue of cul-de-sacs and dead ends, describing them as discontinuities in the transportation system that could be mitigated through linkage to nearby trails or low-stress roads. Additional bike parking and bike lockers at transit stations and other venues are recommended, as is continued adherence to Safe Routes to School principles. The Plan also recommends use of incentive programs and cooperation with transit providers to increase use of alternative transportation including bicycles.

PROPOSED FACILITIES FROM MID-HUDSON SOUTH REGION BICYCLE AND PEDESTRIAN MASTER PLAN



Mid-Hudson South Region Bicycle and Pedestrian Master Plan – Rockland County (2001)

The bicycle and pedestrian master plan was prepared jointly with Westchester, Rockland and Putnam Counties, a study area known the Mid-Hudson South Region of the New York Metropolitan Transportation Council (NYMTC). The plan documents existing (at the time of publication) off-road cycling facilities, including the Esposito and Orangetown (now J. B. Clarke) Rail Trails, and the major north-south on-road bike route in Orangetown, State Bike Route 9. Several Orangetown roads are marked as future "road corridor routes," to be developed with on- or off-road cycling facilities. These include Veterans Memorial Drive/W. Orangeburg Road, Route 303, Blue Hill Road/Sickletown Road, and S. Pearl Street/Route 304. The report also mentions the possibility of an off-road facility to parallel the Palisades Interstate Parkway.

Town of Clarkstown Comprehensive Plan – Transportation Section (2009)

Clarkstown's Comprehensive Plan identifies several roadway connections to Orangetown as high- or medium-priority routes. The Plan labels Middletown Road, SR 304, Western Highway and Route 303 as high-priority. Sickletown Road is considered a medium-priority connection.

3

Public Engagement

THE BIKE STUDY'S AIM IS TO CREATE AN INCLUSIVE, COMMUNITY VISION FOR THE CYCLING NETWORK, ONE THAT CYCLISTS OF ALL AGES AND ABILITIES ARE ABLE TO SAFELY USE . TO THAT END A ROBUST OUTREACH CAMPAIGN WAS CONDUCTED, SOLICITING FEEDBACK FROM CYCLISTS AND THE WIDER ORANGETOWN COMMUNITY.

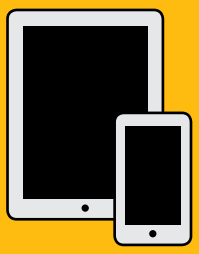
Public Engagement

GOALS

- Engage a broad spectrum of Orangetown community members and other users of the cycling network in discussion regarding safety and accessibility of local roads and trails
- Provide a range of outreach and feedback opportunities, with varying levels of time commitment requirements
- Use Bike Study communications and outreach to educate Orangetown residents and community stakeholders about the Bike Study and the Town's efforts to develop a cycling network

OUTREACH HIGHLIGHTS

- Dedicated project page at Orangetown.com with links to engagement tools
- Press release announcing project and inviting participation in September bike counts
- Separate kickoff meetings – one for Town department heads and one for members of the public
- Orangetown Bike Study 5-Minute Community Survey, completed by nearly 500 respondents
- Two site visits by PTNY staff to inventory roads and existing trail facilities
- Outreach to local businesses, presentations, and tabling at events by local project intern
- Stakeholder interviews with local cyclists, regional Complete Streets working group members, traffic safety representatives and others
- Posting maps at Town Hall and libraries
- Regular updates to project list via social media and email
- Media coverage of project in Nyack News & Views, LoHud, and Rockland Times among other outlets



Online Community Feedback Map

PTNY created an online tool for the project team and local cyclists to identify specific needs, and to facilitate discussion about the local cycling network. Commenters had the ability to place comments on the map, to post photos and like or respond to previous comments.. Overall, the map generated more than 60 postings.

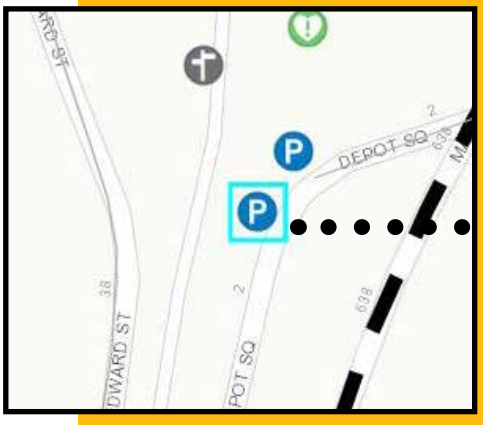
POSTED 9/8/17 AT 12:39 PM

"Need bike parking for commuters who bike to the bus stop here."

PHOTO UPLOADED

POSTED ON 10/18/17 AT 1:37 PM

"Bike parking for commuters is a great idea. This is done in many other towns and cities. It would reduce the use of autos."



Orangetown 5-Minute Survey Results

IN OCTOBER 2017, PTNY AND THE ORANGETOWN SUPERVISOR'S OFFICE SURVEYED RESIDENTS AND OTHER USERS OF ORANGETOWN'S ROADS AND TRAILS IN ORDER TO INFORM THE BIKE STUDY'S PRIORITIES AND RECOMMENDATIONS

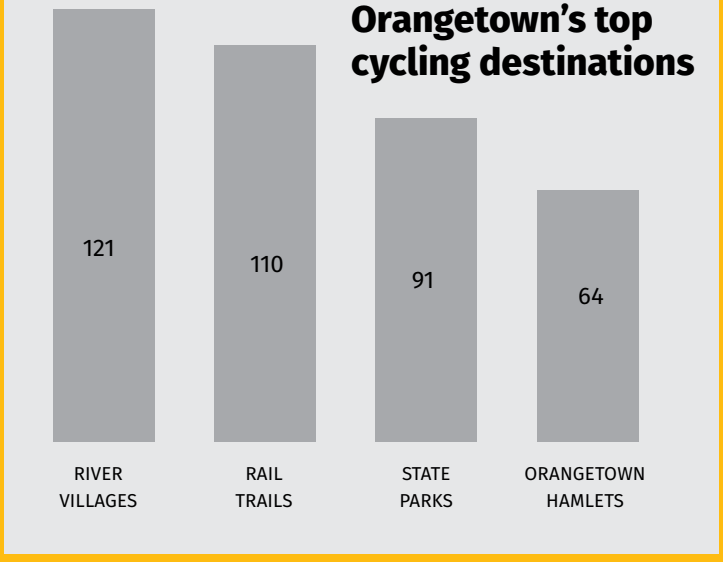
491

RESPONSES FROM ORANGETOWN AND NEIGHBORING COMMUNITIES

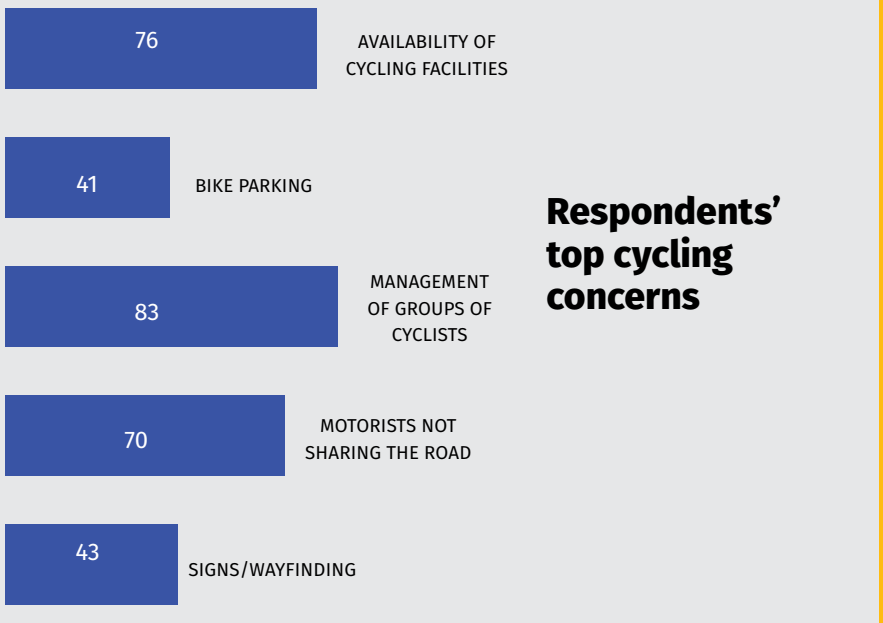
76%

SUPPORTED FUNDING FOR BIKE LANES AND TRAILS

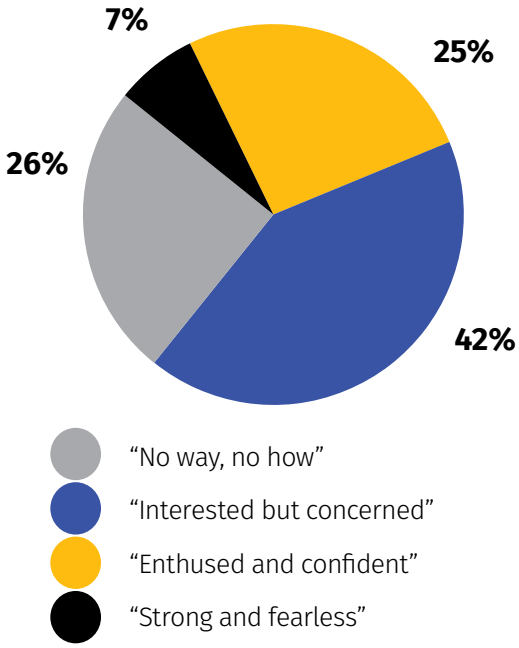
Orangetown's top cycling destinations



Respondents' top cycling concerns



When asked, Most Orangetown cyclists describe themselves as "interested but concerned"



KEY LEARNINGS

- **Safety is a primary concern and motivating factor for Orangetown residents as they consider biking**
- **Connectivity within and between Orangetown's various business districts was identified as a priority, as were connections to neighboring communities**
- **Cyclist are also looking for safe access to town, county and state parks in and around Orangetown**
- **Orangetown's existing multi-use trails are appreciated by residents; increasing safe connections to these facilities is a priority among residents**
- **The sheer numbers, and large group sizes, of recreational cyclists on Orangetown roads have generated complaints among motorists and residents who live along well-travelled bike routes**

"We have to load bikes on the car and drive to a park. I would like to bike from my house to downtown or just along local roads for exercise."

PEARL RIVER RESIDENT

"I would love to ride more with my children, but it's just too dangerous."

ORANGEBURG RESIDENT

Bike to School Day Demonstration

MAY 9, 2018

Parks & Trails New York and the Town of Orangetown Highway Department created temporary cycling facilities on Erie Street near South Orangetown Middle School in Blauvelt and on Franklin Avenue near Franklin Elementary School in Pearl River. Students and parents were encouraged to use the facilities on their morning and afternoon commutes. School administrators and the Supervisor's Office assisted in getting the word out beforehand while the Orangetown Police Department provided traffic control during the event. Other event partners included Rockland County Department of Health, Rockland Bicycling Club, and the National Highway Traffic Safety Administration.

PTNY estimated that between 70 and 100 children rode bicycles to Franklin Elementary, where PTNY and other partners staffed an information table. User numbers for the Erie Street facility are not known, but police officers and others reported that the facilities were used by students and nearby residents.

THIS PAGE INTENTIONALLY LEFT BLANK

4

Bike Network Recommendations

RECOMMENDED INFRASTRUCTURE LINKS ORANGETOWN'S MULTIPLE ACTIVITY CENTERS, RESIDENTIAL NEIGHBORHOODS, AND COMMUNITY FACILITIES SUCH AS PARKS AND SCHOOLS. THIS NETWORK WILL ALSO CONNECT ORANGETOWN TO NEIGHBORING VILLAGES, TOWNS, AND NEARBY BERGEN COUNTY, NEW JERSEY.

Network Recommendations

INFRASTRUCTURE RECOMMENDATIONS ARE CENTRAL TO THE BIKE STUDY'S OVERALL SAFETY AND CONNECTIVITY GOALS

Methodology

Creating the Priority Network

The project team developed a priority network based on connectivity to important destinations in order to organize further analysis of local roadways for suitability for on- and off-road bicycle enhancements. This network includes Primary Bikeways, which provide the most direct access to important community destinations throughout Orangetown, as well as connectivity improvements to the existing multi-use trail system and neighboring communities. The network includes a mix of state-, county-, and locally-owned roadways. In addition to prioritizing connectivity, Primary Bikeways were selected with consideration of roadway characteristics, such as daily traffic volume, traffic speed, roadway width, and surrounding land. The priority network includes a second set of routes called Neighborhood Bikeways. These roadways are located within or adjacent to residential neighborhoods. They provide less direct access to community destinations, however, they often serve as critical "last mile" connections between neighborhoods, schools, and parks.

In addition to evaluating roadway characteristics and connectivity, PTNY relied on town officials' guidance, site visits, and feedback obtained during the public engagement process to select these Primary and Neighborhood Bikeways. Survey feedback confirmed prioritization of safely accessing recreational facilities, including local and regional parks and multi-use trails, for residents of all ages. Of equal importance was making safe connections between Orangetown's activity centers and employment, shopping, and entertainment destinations in neighboring communities.

Analysis of crash data pointed to a need for a high density of cycling facilities in Orangetown's village centers, such as Pearl River and Sparkill, where compact, mixed-use development means rates of bicycle and walking are higher relative to the rest of the town.

Determining Suitability for Bike Facilities

In order to determine compatibility of Primary and Neighborhood Bikeways for various bicycle treatments, each selected roadway was evaluated based on a bicycle level of stress analysis that considered the following roadway characteristics - traffic speed and volume, roadway width (travel lane plus shoulder), and number of travel lanes. Additionally, the analysis considered the presence of on-street parking.

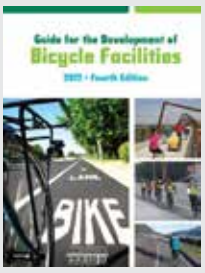
The AASHTO and NACTO guides provide thresholds for the various facility types that are coordinated with the results of this bicycle level of stress analysis. In general, higher speeds and greater traffic volumes require greater levels of physical separation and increased lateral distance between cyclists and motorists. However, there are methods for increasing cycling safety and comfort on narrow and/or high-speed roadways, namely the use of shared lane or advisory lane markings.

PTNY used data obtained through site visits and the New York State Department of Transportation Roadway Inventory System dataset for this analysis, among other sources.

A roadway width of 32 feet for a two-lane street was used as a minimum threshold for "compatibility" for a bike lane. This equates to two, 4-foot bike lanes plus two, 12-foot travel lanes. Roadways with this necessary width, speed limits under 35 mph, and average daily traffic volume under 6000 are considered "compatible" for bike lane treatments. Roadways that fall below this width threshold but still satisfy the speed and volume requirements are candidates for shared use treatments such as enhanced sharrows or advisory bike lanes, described as "shared lane eligible." Roadways labeled "compatible with protection" are those that have the necessary width but that exceed the 35 mph posted speed limit and/or the upper daily traffic volume limit of 6,000 VPD, and therefore require a protected facility. Roads "not compatible" for traditional bike lanes or shared-lane treatments may be improved through enhancement of their shoulders,

About Bike Study Recommendations

The Bike Study uses treatments described in detail in the National Association of City Transportation Officials' (NACTO) Urban Bikeway Design Guide and in the American Association of State Highway Transportation Officials (AASHTO) Guide for Development of Bicycle Facilities (2012, Fourth Edition). New York State Department of Transportation's Bicycle Facility Design Guide was also consulted. Each of these guides is compatible with the Federal Government's Manual on Uniform Traffic Control Devices (MUTCD).



or through widening of sidewalks to create multi-use trails.

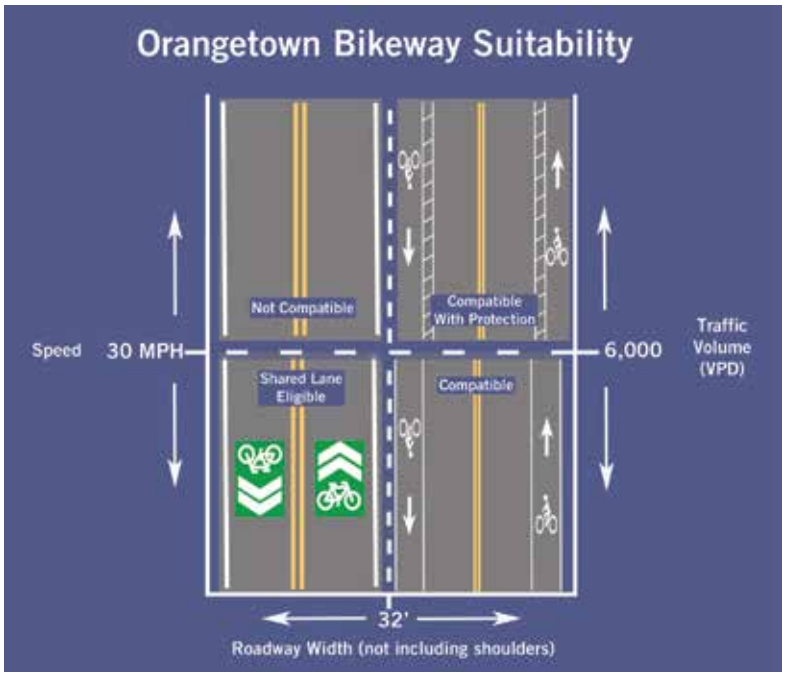
It is important to note that findings from the suitability analysis do not amount to recommendations of specific facilities or treatments. Instead, a suitability finding indicates the general type of improvements that will lead to a higher level of comfort and safety for bicyclists. Actual implementation should consider these treatments based on feasibility on a given roadway or stretch of road based on existing characteristics and constraints, available funding, and ability to alter the right of way.

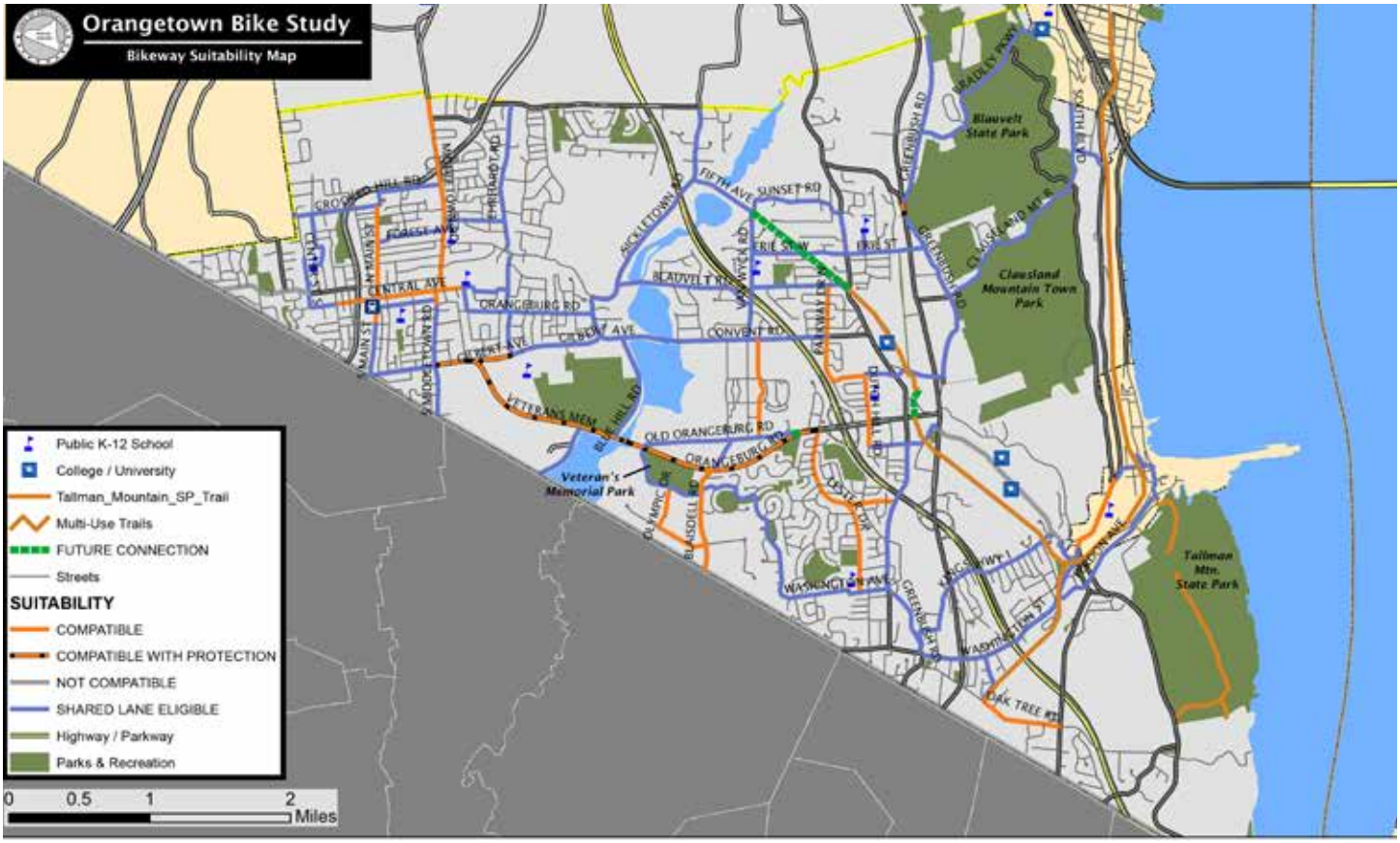
Recommended Network

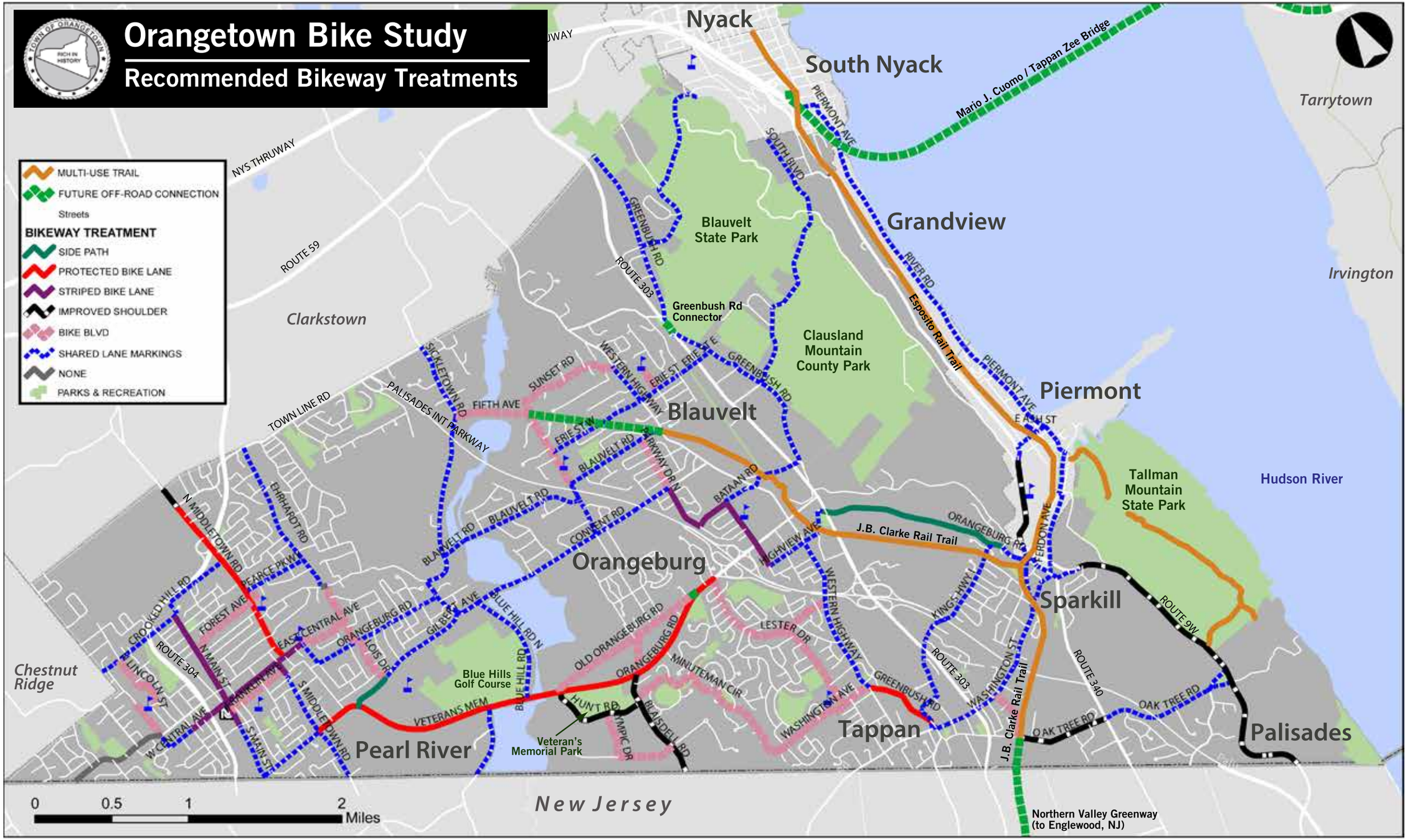
The varying characteristics of streets and surrounding land uses across Orangetown resulted in a range of proposed treatment types. These recommendations are grouped into three general treatment categories: Bike Lanes, Shared Roadways, and Bicycle Boulevards. A range of treatment options accompanies each bikeway classification. Choosing the best option for a specific street takes into account on-the-ground characteristics including traffic speed and volume, roadway and shoulder width, surrounding land use, and connectivity.

These recommendations are conceptual in nature. Implementation of recommended treatments may require additional engineering. Recommended improvements to the multi-use trail system constitute an additional classification. Additional recommendation including policies, programming, and ongoing evaluation of the cycling network are also included in a separate section.

Several roadway or roadway sections included in the Priority Network were determined to be unsuitable for any bike treatments, and at least one requires additional inquiry as to its suitability. These are listed separately.






Orangetown Bike Study
Recommended Bikeway Treatments
MULTI-USE TRAIL
FUTURE OFF-ROAD CONNECTION
Streets
BIKEWAY TREATMENT
SIDE PATH
PROTECTED BIKE LANE
STRIPED BIKE LANE
IMPROVED SHOULDER
BIKE BLVD
SHARED LANE MARKINGS
NONE
PARKS & RECREATION
Nyack
South Nyack
Grandview
Piermont
Blauvelt
Orangeburg
Sparkill
Tappan
Pearl River
Palisades
Clarkstown
Chestnut Ridge
Tarrytown
Irvington
Hudson River
New Jersey
Blauvelt State Park
Clausland Mountain County Park
Tallman Mountain State Park
Blue Hills Golf Course
Veteran's Memorial Park
Greenbush Rd Connector
Mario J. Cuomo / Tappan Zee Bridge
Esposito Rail Trail
J.B. Clarke Rail Trail
Northern Valley Greenway (to Englewood, NJ)
NYS THRUWAY
ROUTE 59
ROUTE 303
ROUTE 304
ROUTE 340
ROUTE 9W
PIERMONT AVE
RIVER RD
SOUTH BLVD
GREENBUSH RD
WESTERN HIGHWAY
ERIE ST
FIFTH AVE
SUNSET RD
TOWN LINE RD
PALISADES INT PARKWAY
SICKLETOWN RD
BLAUVELT RD
PARKWAY DR N
BATAAN RD
CONCERT RD
HIGHVIEW AVE
ORANGEBURG RD
OLD ORANGEBURG RD
LESTER DR
MINUTEMAN CIR
WASHINGTON AVE
KINGS HWY
WASHINGTON ST
OAK TREE RD
N MIDDLETOWN RD
EHRHARDT RD
PEARCE PKWY
CROOKED HILL RD
FOREST AVE
EAST CENTRAL AVE
LOIS DR
GILBERT AVE
BLUE HILL RD N
BLUE HILL RD
HUNT RD
OLYMPIC DR
BLAISDELL RD
LINCOLN ST
N MAIN ST
FRANKLIN AVE
W CENTRAL AVE
S MAIN ST
S MIDDLETOWN RD
VETERANS MEM
JEFFERSON AVE
EARL ST
0
0.5
1
2
Miles

THIS PAGE INTENTIONALLY LEFT BLANK

Protected Bicycle Infrastructure

Protected cycle tracks offer the greatest level of perceived comfort and safety among on-road bicycle treatments by placing a barrier between cyclists and motorists.

Cycle tracks can be both two-way and one-way and usually consist of a conventional bike lane separated from moving traffic by a curb, bollards, painted buffer, or on-street parking. The benefits of cycle tracks are numerous. In addition to physical separation from moving vehicles, cycle tracks increase safety by lowering the risk of injuries associated with "dooring," which is caused by an unsuspecting motorist opening their vehicle door into the path of an oncoming cyclist.

ONE-WAY CYCLE TRACK

Ideal for streets where traffic flows in one-direction or on both sides of a two-way street. They require a minimum of eight feet of roadway width, which includes a three-foot-wide buffer. On streets where bicycle traffic is high, a minimum width of 10 feet is recommended to give cyclists enough room to safely pass each other.

TWO-WAY CYCLE TRACK

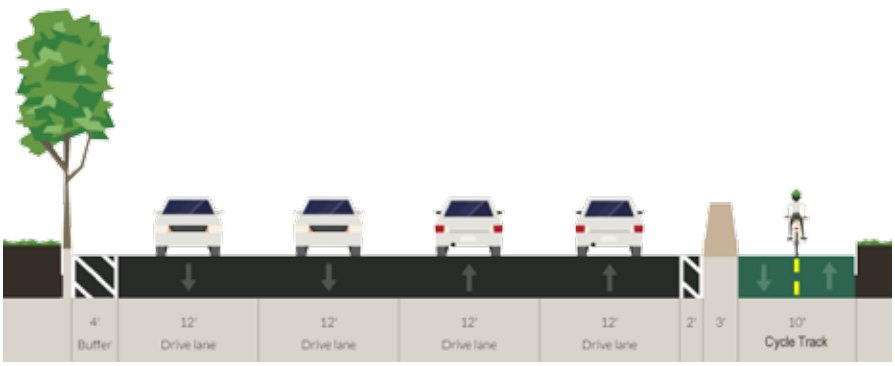
Ideal for major one-way streets on which bicyclists commonly ride against traffic and for two-way streets where one side of the street has fewer driveways, bus stops, and high parking turnover. They require 8-12 feet of roadway space and additional 3 feet for a painted or concrete buffer.

RECOMMENDED LOCATIONS

VETERAN'S MEMORIAL DRIVE/WEST ORANGEBURG ROAD

A cycle track along the roadway would significantly improve east-west connectivity. With vehicle speeds on stretches of this road higher than elsewhere in Town, a physical barrier would be required to provide for cyclist comfort and safety. Fortunately, there is available roadway width for a two-way protected facility (see diagram below). Further design and engineering will be necessary to inform this decision. Adding and/or Improving crossings at Lester Drive/Edgewood Drive, Blaisdell Road/Chief Bill Harris Way, and Hunt Road/Old Orangeburg Road will facilitate better access between the cycle track and other elements of the cycling network and important destinations such as Veterans Memorial Park.

The pronounced narrowing at the crossing of Lake Tappan, between Hunt Road and Blue Hill Drive, presents one significant obstacle to installation of a cycle track. A short, prefabricated bridge or cantilevering a sidepath off of the existing road bridge may be options but will add to the project cost. Veteran's Drive is a county road, with no plans for a scheduled bridge replacement.



GREENBUSH ROAD

Greenbush Road is is unique in that it is one of few one-way streets in Orangetown, yet is also quite wide (> 32 feet). It is not surprising then that the road experiences high cycling levels. The Plan recommends installation of a painted buffer and flexible delineator posts, at a minimum, to create a one- or two-way protected facility here. If there is width available (approximately 11 to 15 feet for a painted buffer and two cycling travel lanes) a two-way facility is preferred, as few other available opportunities to link Tappan and the larger network.

Protected Bicycle Infrastructure

Buffered bike lanes make the most of available width to provide separation between cyclists and motorists.

Buffered bike lanes can offer a compromise between protected cycle tracks and striped bike lane on streets where roadway widths are wide enough to accommodate a 7-foot-wide bicycle lane or when snow-removal procedures would not allow for plows to maneuver around bollards or curbs required for protected cycle tracks.

There are also safety benefits to using buffered bike lanes. The relatively wide zone of separation between moving vehicle traffic and bicyclists ensures a high level of comfort among bicyclists and reduced stress levels among bicyclists and motorists.

BUFFERED BIKE LANES

A buffered bike lane is a striped bike lane that is separated from roadway traffic by a separation zone that is significantly wider than a bike lane's line of demarcation. The separation zone can be a painted line pattern or a line of parked cars. Each separation zone typically requires at least 18" of roadway space in addition to 3-4 feet of roadway space for the bike lane. If the buffered bike lane is next to the parking lane, it should be at least 5 feet wide to provide enough space for bicyclists to avoid the door zone.

RECOMMENDED LOCATIONS

NORTH MIDDLETOWN ROAD

North Middletown Road is an important connection between Pearl River in Orangetown and Nanuet in the neighboring Clarkstown, which experiences moderately high traffic volumes (>6000 VPD). The stretch of North Middletown between Central Avenue and Townline Road offers sufficient width for additional protection in the form of a painted buffer, on both sides of the roadway. North of Townline Road, North Middleton narrows while maintaining high average traffic volumes, so an improved shoulder may be the only available option. North Middletown is also a bus route, so attention needs to be paid as to how the buffer is painted so as not to impede transit function or safety. NACTO offers guidelines for incorporating bus stops into a buffered bike lane right of way.

No Recommendation/ More Inquiry Needed

Roadways listed below were included in the priority network, reflecting their importance in Orangetown's transportation network. However, they were found not to be compatible for on-road bike treatments given existing roadway and traffic volume conditions. Due to their importance in the overall transportation network, and in some cases the direct connections they offer, these roadways may be candidates for separated sidepaths.

- **WEST WASHINGTON/SOUTH MAIN/EAST CENTRAL (NEW JERSEY BORDER TO MAIN STREET)**
- **BLAUVELT ROAD (SICKLETOWN TO MIDDLETOWN)**
- **ORANGEBURG ROAD @ PALISADES INTERSTATE PARKWAY**
- **OLD MIDDLETOWN ROAD (MIDDLETOWN TO GILBERT)**

TOWNLINE ROAD between Ehrhardt Road and Sickeltown Road requires further inquiry to determine its suitability for bike treatments. The roadway experiences high traffic volume, and it is too narrow for bike lanes. However, finding a treatment solution for this road could add another important east west connection.

Sidepaths

Sidepaths offer the highest levels of separation, and serve pedestrians as well as cyclists.

A NEWLY-CONSTRUCTED SIDEPATH

Sidepaths are multi-use trails located adjacent to a roadway, and generally constructed within the roadway right-of-way. Sidepaths do offer separation from traffic; however, they also are prone to conflicts with driveways and other road cuts. Therefore they are generally recommended for road stretches with few curb cuts, and as short connectors between other facilities. As most sidepaths are two-way, transitions to roads or other facilities need to take into account sidepath users exiting the facility against the flow of traffic. This can be done with proper signage as well as providing pavement marking directing exiting cyclists to access the next facility or shared roadway.

Maintaining adequate separation from the roadway is important for sidepaths, with five feet of clearance between the edge of the path and the roadway a minimum, not including any paved shoulder. Greater separation is preferred, especially if speeds are higher than 30 mph.

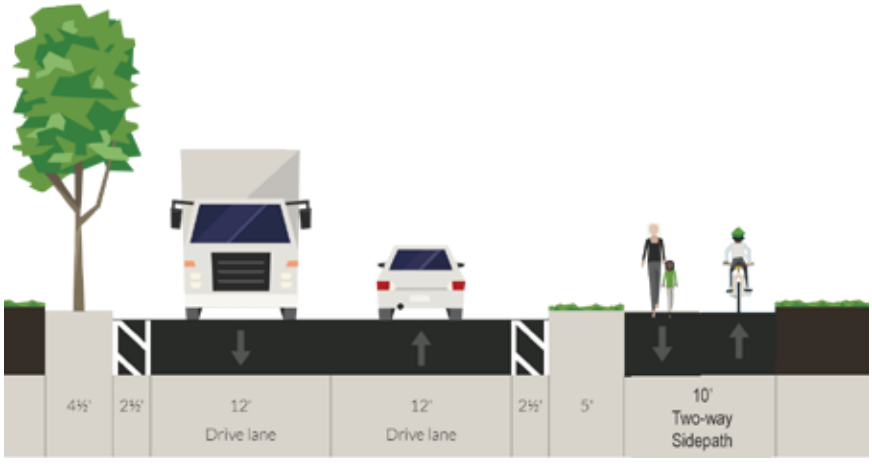
RECOMMENDED LOCATIONS

GILBERT AVENUE

Offers a direct connection from Pearl River Middle School to the proposed cycle track on Veteran's Memorial Drive, and the wider network. A sidepath created by enhancing the existing sidewalk would extend the protected environment to the school entrance, as well as mitigating sidewalk riding that could be expected from high student usage.

ORANGEBURG ROAD

An Orangeburg Road sidepath would create another connection between Sparkill and Orangeburg, parallelling the existing rail trail alignment. A sidepath would also provide a safe connection to the multiple schools and businesses on Orangeburg Road.



Unprotected Bicycle Infrastructure

Striped bike lanes provide a dedicated space for cyclists.

Striped bike lanes provide a basic level of protection that is appropriate for streets with more than 3,000 vehicles per day and have a posted speed of greater than 25 mph. Bike lanes require at least 6 feet of road width, however, for narrower streets, a 3-4-foot-wide lane may suffice if there is a line of demarcation between traffic that is at least 6 inches wide and vehicle traffic does not exceed 35 mph.

STRIPED BIKE LANES

Recommended Locations

- **CENTRAL AVENUE**
- **NORTH MAIN STREET**

Central Avenue and North Main Street in the vicinity of Pearl River offer important connections to local businesses, and the New Jersey Transit station. Both roadways are sufficiently wide for placement of bike lanes, although the configuration of parking is different for each meaning the final placement of bike lanes may be different in each case.

- **DUTCH HILL ROAD**
- **CARLTON DRIVE**
- **PARKWAY DRIVE**

In the Orangeburg, Dutch Hill Road, Carlton Road, and Parkway Drive are recommended candidates for striped bike lanes. These streets provide an important north south connection, and will allow cyclists to avoid busy Western Highway. They also provide a direct link to Tappan Zee High School and Dominican College.

Parking Considerations

In places where parallel, on-street parking is permitted, such as downtown Pearl River, in order for a bike lane to feel comfortable enough for riders the total amount of space between the outer edge of the bike lane and the curb should be at least 12 feet wide, with 14.5 feet considered ideal. This will provide enough space to accommodate a bike lane, parking lane, and a buffer between them to protect cyclists from dooring. If roadways are too narrow to accommodate this width, narrowing the parking lane is the best solution to provide greater protection for cyclists from vehicle traffic.

There are two main options for placement of the bike lane, with advantages and drawbacks that need to be considered carefully. Locating the bike lane between the curb and the parking lane allows parked cars or empty parking spaces to serve as a buffer between cyclists and traffic. This configuration also lessens risk of doorings, as cyclists pass on the passenger side of parking and parked cars, which is used less frequently. Downsides include less visibility for cyclists, as parked cars can shield them. Curb-side lanes are also prone to gather debris.

The alternate configuration, with the bike lane placed between the parking and travel lane adds visibility for cyclists, and allows them more maneuverability when confronted with a car door opening.

The presence of diagonal parking, which exists along Central Avenue in Pearl River, somewhat complicates the decision-making process for bike lane placement. There are still two main options, placing the bike lane next to the curb or between parking and the travel lane. However, AASHTO (4.6.5) does not recommend placing the bike lane between “front-in” diagonal parking and the travel lane. Instead, parking should be changed to “back-in” and a dashed line should be used to demarcate the bike lane to indicate a merging area.

Shared Roadways

Shared lanes aid in wayfinding, as well as alerting motorists to the presence of cyclists.

Shared Lanes constitute the most commonly recommended facility type in the network, mainly due to the narrow width that is typical of Orangetown's roads.

While shared roadways and improved shoulders do not offer cyclists the level of safety and protection other treatments offer, they contribute to the larger network by offering direct connections for confident riders. Shared lane markings, commonly referred to as "sharrows," are the primary means of denoting a shared roadway; however, bike route signage also plays and important role. Since shared lanes are fully outfitted with confirmation and decision signage, they serve an important wayfinding function.

Shared lane markings have been demonstrated to increase distance between cyclists and parked cars, minimizing risk of dooring. They also encourage safe passing, and reduce the incidence of sidewalk riding and wrong-way biking. This Study recommends the use of enhanced shared lane markings, where colored backgrounds or white dotted lines are used to increase the marking's visibility. This shared lane variant further increases awareness among drivers that bicyclists are in the road. Advisory lanes, where the centerline is removed and continuous shared lanes are marked on both sides of the road are another option for low-volume streets.

SHARED LANE MARKINGS

Shared lane marking or "sharrows" alert motorists to the potential presence of bicyclists, and provide cyclists with a recommended navigation path, especially through difficult or potentially hazardous situations areas. Enhanced sharrows incorporate color or additional markings to increase visibility.

ADVISORY LANES

Advisory lanes consist of a dotted line suggesting to bicyclists where they should ride, but do not go as far as to dedicate roadway space like a striped bike lane. advisory lanes work well under the same conditions as shared lane markings.

Paved/Improved Shoulders

Paved shoulders improve the cycling experience on streets where other options are limited.

A treatment most often used on rural roadways, paved shoulders can improve cycling comfort on roads where traffic speed and/or volume are high. Paved shoulders are not a dedicated travel lane, and therefore are maintained on the far right side of turning lanes at intersections. This can make cyclists vulnerable, so shoulders are sometimes used in combination with striped bike lanes through intersections. In some instances bike lane markings are applied directly to the shoulder to create a facility similar to a striped bike lane. In other cases, signage alone is used to direct cyclists to use the shoulder.

The following roads or road stretches, although categorized as "not compatible" in the suitability analysis, are considered important connections to the overall cycling network. Therefore, the recommended treatment is improved shoulders, along with bicycle route signage and intersection treatments as necessary.

- **BLAISDELL ROAD (NEW JERSEY BORDER TO VETERAN'S MEMORIAL DRIVE)**
- **HUNT ROAD**
- **NORTH MIDDLETOWN ROAD (CLARKSTOWN BORDER TO TOWNLINE ROAD)**
- **OAK TREE ROAD**
- **ROUTE 9W**

PAVED / IMPROVED SHOULDERS

Many roadways have travel lanes too narrow to accomodate protected infrastructure or striped bike lanes, or they have speeds and volumes too high for shared lane markings or advisory lanes. For these roadways where shoulder space is available within the right of way, paving or improving the shoulder with pavement markings is appropriate. Four feet is the minimum width for paved shoulders, with 5 or more feet preferred in the presence of guardrails or curbs, or on roadways with speeds above 50 MPH. The minimum width should be maintained at intersections and on the outside of bypass lanes.

Neighborhood Bikeways

A NETWORK OF LOW STRESS BIKE ROUTES THAT SUPPORT BIKE LANES AND MULTI-USE TRAILS, AND PROVIDE DIRECT ACCESS TO ORANGETOWN'S RESIDENTIAL NEIGHBORHOODS AND SCHOOLS

Neighborhood Bikeways, also known as bike boulevards, are recommended for many residential streets and lower volume roads in Orangetown. These facilities rely less on physical infrastructure and more on a connected network of low-traffic, low-stress secondary streets. Neighborhood bikeways prioritize bicycle and pedestrian movements over vehicle movements, though they do not restrict local vehicle access. It is important to note that these routes do not replace more protected infrastructure such as multi-use trails and protected bike lanes; instead they are used to supplement other facilities and more direct routes.

Neighborhood bikeways should generally have traffic volumes of less than 3,000 vehicles per day, with an ideal volume of less than 1,500 vehicles per day, and the 85th percentile of traffic traveling between 20-25 mph.

Roads chosen for neighborhood bikeways should be provided with directional pavement markings and bicycle route signage. Speed and volume management techniques and intersections treatments should also be used, although the exact configuration or techniques used may vary from one roadway to the next based on conditions on the ground. School and park zones, where targeted speeds are already lower than 30 mph, should be prioritized. Speed and volume manangement can be an alternative to the need for reducing posted speed limits to 20 mph, which may require passing local legislation.

NEIGHBORHOOD BIKEWAY NETWORKS IN BLAUVELT AND PEARL RIVER INDICATED BY

Volume Management

Some stretches of neighborhood bikeways may exceed the 3,000 vehicles per day threshold. There are several volume management techniques that can maintain or reduce vehicle volume to the 1,500 to 3,000 vehicles per day range. These techniques may involve physically cutting off vehicle flow at an intersection or a sign that simply restricts vehicle flow through an intersection.

It's important to consider the effect these techniques may have on accessibility for neighborhood residents and the ability of the city to carry out snow removal. Signage warning drivers of limited access at the choke points are also important to include throughout the block. Moreover, these treatments should only be installed where a clear understanding of what, if any, impacts they may have on adjacent streets.

MEDIAN ISLANDS/DIVERTERS

Vehicle through movement is prohibited by a concrete median also known as a "snake diverter." Bicycles can move through the intersection by two separate openings in the snake diverter corresponding to each direction. Each opening must be at least 5 feet wide. This technique can also reasonably accommodate snow removal, especially if removable bollards are used instead of a concrete median. Another alternative, which can also benefit emergency vehicle through movement and snow removal, is to lower curb heights to less than 6 inches.

PARTIAL CLOSURES

A contra-flow bike lane, at least 4 feet wide, allows bicycle traffic to cross through the intersection but signage and pavement markings require vehicles to turn right or left. Cross-street vehicle traffic must continue straight. This technique best accommodates snow removal.

Bicycle-friendly Vertical Deflection Techniques

Vertical deflection techniques require drivers to slow down to negotiate pavement elevations.

SPEED HUMPS

Pavement raised 3-4 inches for 12-14 feet. Speed humps are often referred to as speed bumps, but should not be confused with abrupt speed management techniques often found in parking lots or driveways, which are dangerous to bicyclists.

SPEED CUSHIONS

Speed humps that have cutouts for emergency vehicles' wheels, making them ideal for key emergency response routes.

SPEED TABLES

Plateaued pavement raised 3-3.5 inches for 22 feet. They typically reduce speeds to within the 25-35 mph range and are best suited for streets that already accommodate buses and emergency response routes. Speed tables may also incorporate raised crosswalks.

Bicycle-friendly Horizontal Deflection Techniques

Horizontal deflection involves visually narrowing the roadway or adding an obstacle to the path of direct travel that requires drivers to slow down to navigate. Horizontal deflection techniques should not be used if the travel lane is narrowed to less than 12 feet.

CURB EXTENSIONS

Also called "bulb-outs." As their name suggests, curb extensions extend the sidewalk into an intersection's parking lane, narrowing the lane width at an intersection. Curb extensions also benefit pedestrians because they decrease crossing distances and increase pedestrian visibility due to the lack of parked cars at the intersection. Curb extensions also provide space for benches, kiosks, public art, and rain gardens.

NEIGHBORHOOD TRAFFIC CIRCLES

Small roundabouts located at intersections reduce speeds by narrowing turning radii and the travel lane. Neighborhood traffic circles with plants and trees can further reduce traffic speeds by reducing sight lines.

Neighborhood Bikeways at Intersections

Special accommodations should be made for bicyclists at intersections between neighborhood bikeways and other streets. Since it's critical that neighborhood bikeways prioritize bicycle through traffic, several treatment types should be considered depending on the type of intersection. Determining factors include daily traffic volume, intersection geometry, and the presence of a signalized crossing.

Minor street crossings

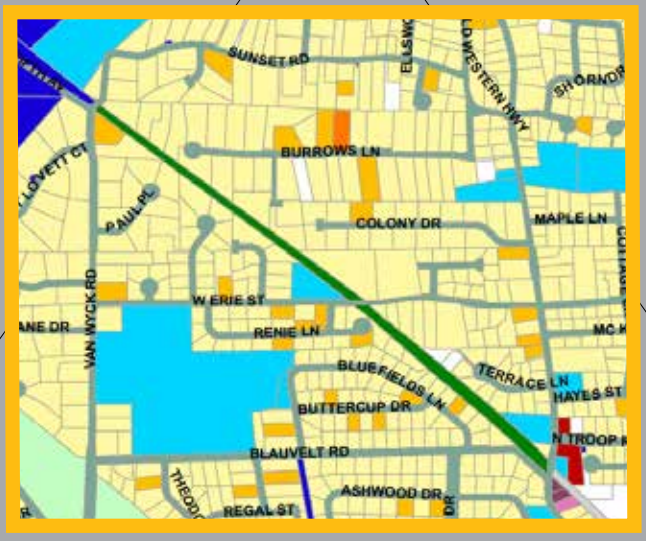
Minor street crossings typically exist where two residential streets intersect, usually warranting either a four-way or two-way stop. These intersections should prioritize bicycle movement and require stops only for traffic entering the neighborhood bikeway at the intersecting cross streets. Neighborhood traffic circles should also be considered at minor intersections where speeding is a documented issue.

Major street crossings

Major street crossings typically prioritize vehicle traffic, which is usually travelling at higher speeds than it would be on neighborhood bikeways. In many cases, they also require bicyclists to cross multiple lanes of traffic. Ensuring bicyclists can safely cross through these intersections is possible using intersection treatments such as colored conflict zones or other prominent pavement markings, advance stop lines, and integrating a bicycle-only phase into existing traffic lights or use of hybrid beacons. Wide roadway crossings can be improved through installation of median refuge islands. This treatment should be considered for bikeway crossings of Route 303, as has been recommended in previous studies.

More information on intersection treatments can be found in the Additional Resources section.

ESPOSITO RAIL TRAIL/OLD ERIE PATH BETWEEN SPARKILL AND PIERMONT



LAND USE MAP SHOWING AVAILABLE CORRIDOR FOR J. B. CLARKE RAIL TRAIL EXTENSION

Trail Enhancements

Multi-use trails are off-road facilities that allow a range of non-motorized uses, including bicycling, walking, and running. Depending on paving surfaces used and winter snow removal, other uses such as pushing strollers or walkers, inline skating, snowshoeing and cross-country skiing may also be feasible. They are generally considered to be safe and comfortable for users as they minimize interactions with vehicular traffic. Orangetown's existing multi-use trail network offers good connectivity in the eastern half of the town. The following enhancements could help further improve the trail network's reach and appeal.

Paving the Esposito Rail Trail/Old Erie Path from Sparkill to Piermont

The Study recommends that Esposito/Old Erie Path be paved in asphalt or concrete between Sparkill and Piermont, a distance of about a mile. The current surface of the rail trail in this section ranges from finely crushed stone to rougher gravel. Combined with an overall grade of 1.25%. As portions within this section may be steeper, the rough surface makes climbing to Piermont difficult. While resurfacing is especially important for cyclists travelling uphill, it can also aid cyclists descending to Sparkill. Since the rail trail is the only off-road facility connecting Sparkill to Piermont and the other river villages, this improvement could have a dramatic impact on use of the overall network.

More widespread paving of the trail, beyond just the Sparkill to Piermont section , could make the resource more accessible and comfortable for trail users. The Town should discuss the possibility of paving with villages along the trail route.

Extending the J.B. Clarke Rail Trail - Northwest

The Study recommends that the Town consider an extension of the J.B. Clarke Rail Trail. The asphalt trail currently terminates at the Blauvelt Library. However, tax maps indicate that the Town owns additional former rail corridor stretching northwest from the library to the intersection of 5th Avenue, Van Wyck Road, and Sunset Road. Extending the trail along this corridor would add nearly a mile to the trail's existing 3.8 miles. Extending the trail would allow it to serve as a safe, off-road connection for more Orangetown households, including neighborhoods off of Blauvelt, Erie and Western Highway. A trail extension would also increase the number of connections to the on-road cycling network as it develops.

Trail Enhancements

OLD ORANGEBURG ROAD FRONTAGE AT VETERAN'S MEMORIAL DRIVE

ROAD TRAIL INTERSECTION IN SPARKILL

Extending the J.B. Clarke Rail Trail – South

The Town should consider purchasing outright or obtaining a long-term easement on the rail corridor running south from Oak Tree Road to the New Jersey border in order to extend the J. B. Clarke Rail Trail. Besides offering improved access from the trail network to nearby residential neighborhoods in Orangetown, this extension would add an off-road connection to Northvale, New Jersey.

Making an Off-road Connection between Old Orangeburg Road and W Orangeburg Road

Currently, Old Orangeburd Road terminates before reaching W Orangeburg Rd. This situation may be desirable from a motorized traffic perspective; however, it limits connectivity for cyclists. The Town should consider obtaining easements or other actions necessary to construct a multi-use path connection to W Orangeburg Road.

Additional Signage & Enhanced Crossings

Both of Orangetown's existing trails could be improved by installing additional on-trail signage, including confirmation signs every 0.5 miles at a minimum and decision signs at intersections with major roads or trail junctures. This enhancement will serve to better integrate the trails into the larger cycling network, and increase the appeal of the trail system for both recreational and utilitarian cyclists.

Improving crossing elements and signage at road/trail intersections is another critical step in integrating road and trail facilities into a cohesive whole, and in taking full advantage of the convenient north south connections provided by Clarke and Esposito trails. Several road crossings on the Clarke trail have already been paved in brick, which offers both a visual and tactile distinction for cyclists and motorists. Advanced warning signage on road and trail would add additional safety here. On road signage advertising the existence of the trail, and improving look and feel of trailheads can increase use. At other locations where crossings treatments are outdated or non-existent, high visibility crossing treatments should be installed.

See PTNY's Road & Trail Intersection Safety Checklist for more information on evaluating trail crossings, at www.ptny.org/our-work/support/community-trails-assistance.

Signage

BICYCLE ROUTE SIGNAGE IS AN IMPORTANT COMPONENT OF A BICYCLE NETWORK SINCE IT NOT ONLY SERVES AS A WAYFINDING TOOL BUT IT CAN ALSO PROMOTE THE INFRASTRUCTURE INVESTMENTS MADE BY THE TOWN, ENCOURAGING BICYCLE FACILITY USAGE AND IMPROVING BICYCLIST SAFETY.

There are three main signage types that Orangetown should consider for on-road applications: confirmation signage, turn signs, and decision signs. Using a combination of the three will ensure that bicyclists can safely and conveniently navigate the Town's bicycle network.

CONFIRMATION SIGN	TURN SIGN	DECISION SIGN
		
Indicate to cyclists the route on which they are riding and give notice to drivers that they will likely encounter bicyclists on the street. They do not include arrows or directional instructions, but they may include distances to upcoming route destinations.	Notify cyclists that the bikeway is moving onto a different street or multi-use trail. Where possible, such as on neighborhood bikeways, turn signs should be used in conjunction with pavement route markings. They display important destinations and their distance from the sign location. It's important to place them far enough in advance before the intersection to ensure that cyclists do not pedal past the turn.	Located near the point of intersection between bikeways and also indicate what important destinations are accessible from the bikeways, decisions signs display not only the specific names of destinations, but also their distance – in both miles and minutes – from the route. Arrows should accompany the destination to indicate which direction the bicyclist must turn. It is important to place the signs before the intersection, or if the destination is along the route, before the turn-off. Destinations should prioritize important community destinations within 5 miles. Cycling time shown should assume 10mph cycling speed.
Placement guidelines: **For multi-use trails: Every 0.25-0.5 miles** **For on-street facilities: Every 2-3 blocks and after turns**	**Placement guidelines:** **In advance of important destination**	**Placement guidelines:** **At intersection of two bikeways or other important intersections**

ADVANCE WARNING SIGNS

An additional signage type that can enhance safety for multi-use trail users is advance warning signage. Advance warning signs are used both on roadways and on trails themselves, in advance of the road-trail intersection. Spacing between on-road advance warning signage and the road-trail intersection depends on the speed of the roadway, while on-trail versions should be placed at least 150 feet from the upcoming crossing.

Intersection Treatments

Intersections introduce higher levels of stress and increased conflicts between cyclists and motorists, so enhancing safety and providing clarity for both groups as they navigate intersections is a necessity.

Despite a town-wide speed limit of 30 MPH posted on most roads in Orangetown, speeds through intersections may vary considerably. Minor intersections between residential streets often present little added stress, while intersections with on ramps for Route 304/Pearl Street can be quite difficult to negotiate for all but the most experienced cyclists.

The following treatments should be used to reduce the risk for conflicts at the intersection and offer the same level of protection and guidance for bicyclists through an intersection as the facilities described earlier, such as bike lanes and shared lanes, offer.

A more extensive list of intersection treatments is included in the Additional Resources section.

EXISTING INTERSECTION TREATMENTS IN PIERMONT

Cycle Tracks and Sidepath Intersections

For protected facilities such as cycle tracks and sidepaths, including the proposed cycle track on Veteran's Memorial Drive and the sidepath on Orangeburg Road/Route 340, road intersections involve a significant departure from the protected environment. For these intersections, it is necessary to use colored pavement markings denoting vehicle and bicycle conflict areas and signals that are integrated with existing traffic signals.

For the cycle track, and other facilities, intersections should also be viewed as entry and exit points to the bike network. To ensure safe and comfortable conditions, additional treatments such as signage, pavement markings, and new traffic signals may be necessary on approaches on crossing streets. For example, the junction of Hunt Road, Old Orangeburg Road, and Veteran's Memorial Drive, which is currently unsignalized, should be upgraded with an additional bicycle-only signal phase or hybrid beacon to facilitate bicyclists entering and exiting the cycle track.

Transition points from cycle tracks or protected facilities to less protected shared lanes or neighborhood bikeways are also critical locations for intersection treatments. Transitions from the J. B. Clarke Rail Trail to on-road facilities near the Blauvelt Library, and the crossing from the proposed Orangeburg Road sidepath over Route 303 are examples of these points. Crossing signals and colored conflict zone paint should be used at these locations, along with signage alerting motorists to crossing cyclists. The transition from the proposed Veteran's Memorial Drive cycle track to shared lanes at South Middletown Road and Gilbert Avenue is another location in need of intersection treatments, including high vis crosswalk or colored conflict paint directing cyclists across the intersection and push button activated crossing phase integrated with the existing signals. Signage alerting motorists to the presence of cyclists is also needed.

BICYCLE SIGNALS

Similar to pedestrian crossing signals, bicycle signals give bicyclists priority as part of the traffic signal cycle. A major benefit of bicycle signals is removing the barrier of crossing a major intersection due to real or perceived safety and comfort concerns.

COLORED CONFLICT ZONES

Increase bicyclist safety by highlighting motorist and bicycle "mixing areas." Typical applications include areas where vehicles are likely to be making turns such as intersections and highway and bridge ramp entrances and exits.

Bike Lane Intersections

For roadways where protected or unprotected bike lanes are the recommended treatment, the type of intersection treatment used should be scaled to the traffic volume, speed and width of the crossing roadway. At a minimum, pavement markings and "Right turns yield to bicyclists" signage are recommended. Increasing the visibility of the intersection with colored conflict areas is also recommended for intersections with major roadways. Other markings such as elephant's feet or dotted line extensions are appropriate at intersections with lower- volume side streets and residential lanes.

Bike boxes are another treatment that should be considered at signalized intersections with bike lanes, as they increase visibility of cyclists making left turns or continuing straight through the intersection.

North Middletown Road is a good candidate for these treatments, especially signalized intersections at Crooked Hill Rd and Veterans Parkway. Colored pavement conflict zones should be used to bring the bike lane across the ramps for SR 304/Pearl Street. Another facility that is recommended on this roadway is a Two-Stage Turn Queue Box to allow cyclists to easily travel to and from Middletown to the neighborhood bikeway on Forest Avenue.

Shared Lane Intersections

Shared rely primarily on pavement markings and signage, but the need to bring the cycling facility through the intersection remains. For most intersections, extending the shared-lane marking through the intersection is sufficient. As with other shared lane markings, adding a colored background can increase visibility.

When shared lanes intersect major roads, highly visible treatments and pavement markings, such as colored paint or bollards to prevent right turn hooks should be used. The intersection of Oak Tree Road and Route 340 is a good candidate for this type of treatment. Shared lanes on Western Highway and Greenbush Road (north of Mountainview) would also benefit from pavement markings through intersections. Both are well-traveled cycling routes where motorists' awareness of cyclists should be improved.

Improved shoulders should be supported by signage at the approach to intersections, and dotted lines or colored conflict zone paint may be used to designate the path for cyclists through the intersection. On well-cycled routes such as 9W, these treatments are especially important.

The Central Avenue and North Main bike lanes in Pearl River and Dutch Hill/ Carlton/Parkway Drive facility in Orangeburg should be outfitted with colored intersection treatments that add visibility. Right turn bollards are a recommended treatment for situations where right turn lanes threaten to cross the bike lane, including Dutch Hill as it approaches Orangeburg Road, and Central Avenue as it crosses Route 304/Pearl Street. Providing bollard separation for 50 to 100 feet approachig the intersection can also protect bicyclists riding through an intersection from being hit by a turning bicyclist coming from the other direction. Cyclist on roadways with multiple turning lanes, turning into the bike lane from the right or left, should be given signal priority at signalized intersections.

BIKE BOXES

Reserve space for cyclists at the front of an intersection. Bike boxes are most effective when they are used at intersections where bicyclists and motorists are likely to turn out of the intersection or if vehicles are turning and bicyclists are continuing straight. Bike boxes increase safety by improving cyclists' visibility to motorists, give space for left-turning cyclists, and reduce the likelihood of a "right-hook" collision caused by a turning vehicle.

TWO-STAGE TURN BOX

Pavement markings that give cyclists space to make a left turn in two-stages – first, a right turn into a green bicycle box at the front of vehicles queuing at the cross street and then at the next green signal, or safe crossing opportunity at unsignalized crossings, continuing straight through the intersection.

BOLLARD PROTECTION AT INTERSECTIONS

Protect cyclists in situations where turning traffic would cross the bike lane. Also protect cyclists from turning cylists coming from the opposite direction. Typical applications include areas where vehicles are likely to be making turns such as intersections and highway and bridge ramp entrances and exits.

SHARED LANE MARKINGS

Help guide bicyclists through the intersection and highlight the presence of bicyclists to motorists.

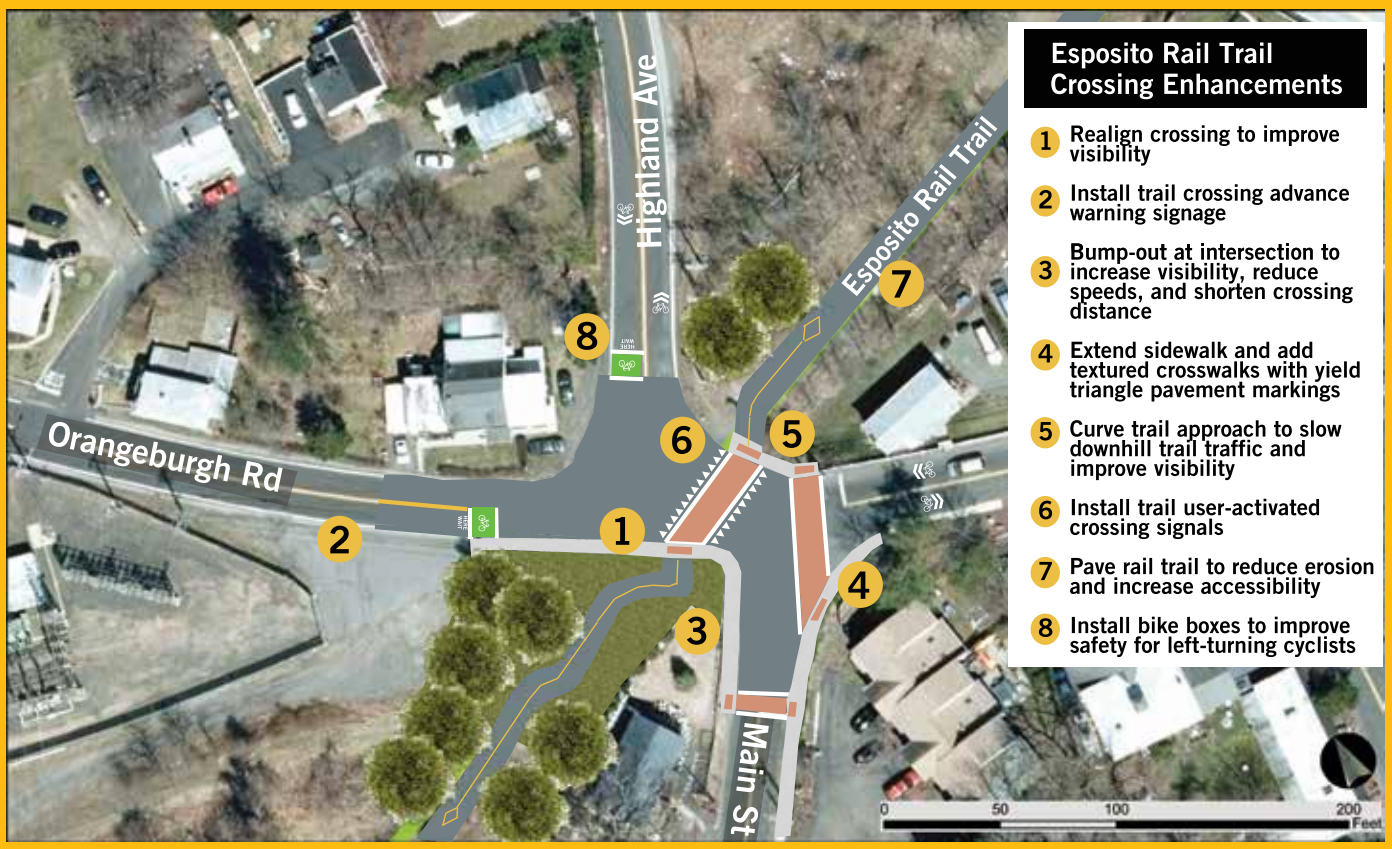
Esposito Rail Trail

SPARKILL INTERSECTION IMPROVEMENTS

This trail crossing just north of Sparkill is currently difficult for trail users to navigate, with no signal phase or crossing signal available to trail users. Moreover, existing traffic signals are not visible to trail users due to road offset. This is a dangerous situation for trail users, and a connection that is critical to the success of the overall cycling network due to the limited other opportunities to link Sparkill and Piermont.

This situation can be improved by providing trail users with a signal phase or self-actuated crossing signal. Additionally, pavement marking and striping should be used to mark the crossing path for trail users. Signage alerting motorists of a trail crossing should also be installed, as well as on-trail signage alerting trail users of the intersection ahead.

EXISTING CONDITIONS AT SPARKILL TRAIL INTERSECTION



Esposito Rail Trail Crossing Enhancements

1. Realign crossing to improve visibility
2. Install trail crossing advance warning signage
3. Bump-out at intersection to increase visibility, reduce speeds, and shorten crossing distance
4. Extend sidewalk and add textured crosswalks with yield triangle pavement markings
5. Curve trail approach to slow downhill trail traffic and improve visibility
6. Install trail user-activated crossing signals
7. Pave rail trail to reduce erosion and increase accessibility
8. Install bike boxes to improve safety for left-turning cyclists

Education, Encouragement & Enforcement

A COMPREHENSIVE APPROACH TO BUILDING A CYCLING NETWORK INCLUDES PROGRAMS AND POLICIES THAT ENGAGE RESIDENTS AND CREATE SAFER STREETS

5

"If you build it, they will come" is one philosophy for creating a cycling network, one that emphasizes infrastructure such as bike lanes and trails. However, this approach assumes a uniform level of cycling ability among all residents, which is not realistic. Instead, the Town should pursue a comprehensive approach. Education and encouragement, coupled with policies such as Complete Streets and proper enforcement of the rules of the road, both for cyclists and motorists, create an essential foundation for widespread use of cycling infrastructure.

CONTINUE OUTREACH AND ENGAGEMENT WITH CYCLISTS

The Bike Study has generated interest in and enthusiasm for cycling, and increased awareness of steps the Town is taking to improve cycling safety and accessibility. PTNY has compiled a lengthy list of contacts, including many individuals that participated in outreach efforts, volunteered to do bike counts, or made comments on the Plan. The Town should communicate periodically with this list about upcoming events, updates on the development of the bike network, and related volunteer opportunities.

Retaining the Bike Study's interactive Community Feedback Map would allow network users and residents to easily provide feedback, call out pavement conditions or other issues, and identify locations that should be considered for cycling facilities.

OPEN STREETS, POP-UP DEMONSTRATIONS & OTHER EVENTS

Open Streets events generally involve the temporary closure of a busy and/or centrally-located road or series of roads to vehicle traffic, while allowing cycling. Open streets are a great way to encourage the "interested but concerned" segment of cyclists. They are often free events, although some high-profile open streets events -- Bike the Drive in Chicago and Skyride in Buffalo -- require participants to pay a registration fee that benefits area charities or bicycling advocacy groups. To lessen traffic impacts, Open Streets programs often occur on Sunday mornings, and use 'soft closures' of major intersections, allowing vehicular traffic to pass through the route. More information on planning an open streets event can be found at www.openstreetsproject.org/

Ciclovias and bike rodeos are similar to open streets events in that they use a festival atmosphere to promote and educate around cycling.

Pop-Up Demonstrations are designed to preview or test a specific cycling facility such as a cycle track or striped bike lane. They are often created at a potential location for these facilities.

Orangetown should consider closing Veteran's Memorial Drive/West Orangeburg Road for a cycling event that could preview a future cycle track on the road, or closie local-business-heavy Central Avenue in Pearl River to create an open cycling space along with music, craft tables, and other activities.

RIDES, WALKS

The Orangetown Office of Parks and Recreation currently hosting several cycling, hiking, walking, and running programs. As improvements to the trail system are made, and elements of the on-road cycling network completed, Parks and Recreation should try to feature these improvement in its regular programming, or create new programming to showcase the expanding bike network. Town-organized or sponsored events should cater to family and beginner and intermediate riders , as the advanced recreational cyclists are already well-served by groups rides and clubs. Local bike shops and bike clubs would be good partners in setting up a weekly or monthly ride series. Orangetown is already a venue for several high-profile organized rides, including the Gran Fondo New York World Championship which occurs in May. The Town should use events such as these to promote its efforts to develop a safer and more accessible network.

BIKE FRIENDLY BUSINESSES

Bike Friendly business programs are a method of connecting the local business community to cyclists, and of enhancing the experience for Orangetown residents and visitors who choose to shop, dine, or make other trips by bike.

At the statewide level, PTNY offers the Bike Friendly New York certification to businesses that take specific steps to cater to cyclists. Actions required by businesses are modest, and generally inexpensive steps such as having a bike pump and small repair kit handy, or making cycling maps available. Participating businesses put a decal in their window, and are listed on an online map.

There are local and regional analogs that Orangetown should also look to in creating a Bike Friendly program, including Transportation Alternative's Bike Friendly Businesses program in New York City, www.transalt.org/issues/bike/business. Transportation Alternatives points to documented increases in local retail sales when cycling increases and infrastructure such as traffic calming is added.

THE MARKET ON ROUTE 9W

Additional programming recommendations are included in the Orangetown 5-Year Vision & Implementation section.

BICYCLE AMBASSADOR PROGRAMS

Bicycle Ambassadors are experienced cyclists and local residents that make themselves available at public events to provide information and enthusiasm about the bike network. The Town should consider developing an Ambassador program as it builds out the bike network. Rockland Bicycling Club may be a good partner for this initiative. The Town should furnish Ambassadors with a standard packet of materials, including safety information, maps, and contact information for issues related to the bike network. Some of these materials may be available from Rockland County, including the statewide See. Be Seen. rack cards. Up-to-date maps of the cycling network will need to be created. Promotional items that relate to cycling including bike lights or water bottles are relatively inexpensive means of promotion and branding.

New Jersey Bicycle and Pedestrian Resource Center's Ambassadors in Motion may provide a helpful example, www.njbikeped.org/nj-ambassadors-in-motion-njaim/

LAW ENFORCEMENT: OFFER TRAINING & CONDUCT TARGETED ENFORCEMENT

Local police departments should offer training for all officers engaged in traffic safety enforcement on bicycle and pedestrian safety, including rules of the road for motorists, and responsibilities of cyclists. Other issues that could be addressed include dangerous practices, common causes of cycling crashes, and methods of preventing bike theft. While Orangetown does not currently have bike patrols, this may be a policing method to consider as the network grows. New York Bicycling Coalition and Transportation Alternatives are resources to tap for officer training.

Enforcement efforts around cycling should focus on areas or times where previous issues or dangerous behaviors have been identified. Many communities have targeted reckless driving that impacts pedestrian safety through "crosswalk stings," and related techniques for cycling could be applied at trail crossings or other high-use locations. It should be noted that not all enforcement needs to involve tickets or penalties. Enforcement activities can issue warnings or hand out information to offenders. There is also precedent for rewarding good cycling behavior such as wearing a helmet, proper yielding or stopping, or proper crossing by issuing small rewards.

Rockland County Department of Public Health is a good resource for targeted enforcement.

Encouraging Cycling Among College Students

Orangetown's numerous colleges and universities should serve as activity generators for the cycling network. Connecting students, many of whom do not drive, with business districts, Town facilities, and neighboring communities can also aid economic development.

1. Create Bicycle Education Programs
- **Develop bike safety workshops and curriculum**
- **Make safe cycling materials available on campus**
- **Identify department or staff that can provide information, respond to issues**

2. Make it Easy to Obtain a Bike
- **Institute bike share programs**
- **Offer coupons for local bike shops**
- **Create bike rescue programs**

3. Construct New Bicycle Infrastructure
- **Bike lanes that provide access to school facilities**
- **Links to off-road trails**

4. Provide Bicycle Parking Facilities and other Supportive Amenities
- **Installl bike parking - both short- and long-term, and other other facilities such as bike lockers and fix it stations**
- **Equip bike stations with day-use lockers, restrooms, showers, changing rooms, self-repair stations, and bicycle parts and accessories for sale**
- **Consider sharing facilities among several nearby schools**

5. Make Streets Safer
- **Install traffic calming treatments**
- **Decrease speed limits**
- **Enforce bike safety laws**

6. Incentivize Cycling & Discourage Driving
- **Create incentives for students not to drive including discounts and vouchers**
- **Make supportive services low cost or free - lock cutting, emergency ride home**
- **Create pedestrian only zones on campus**

7. Improve Links between Cycling and Other Modes of Transportation
- **Ensure that public buses and trains have bike racks, and that bike can be brought aboard at all times**

8. Promote a Culture of Cycling with School-Wide Events and Student Organizations
- **Encourage bike clubs and co-ops**
- **Support events such as open streets and ciclovias on campus**

Adapted from www.njbikeped.org/the-top-10-ways-to-encourage-bicycling-among-college-students/

SCHOOL-BASED EDUCATION & ENCOURAGEMENT

The success of Orangetown's Bike to School Day demonstrations in bringing out students and parents to experience bike lanes, and learn more about the network in development illustrates the potential of school-based instruction and promotion to move the needle on cycling in Orangetown.

Creating a safe cycling curriculum for all students could have a profound impact on Orangetown's cycling future. The effect would not be limited to students, as parents could also be educated and encouraged, directly and indirectly. New York Bicycling Coalition and Rockland County Department of Health are resources that can be tapped to develop school-based programming.

BIKE TO WORK & BIKE TO SCHOOL

The Orangetown Bike Study organized a successful pop-up demonstration on Bike to School Day, May 9, 2018, with a significant number of elementary and middle school students riding to school using temporary bike lanes. The Town should consider using the "Bike-to" days and weeks during the month of May to demonstrate planned facilities, distribute safe cycling and driving information, and promote general network development. Both events share a common theme as they seek to work cycling into the most routine of all trips -- the commute to work or school. If properly planned and supported, and this can be done quite inexpensively, these events can help turn once-a-year cyclists into more frequent bike network users. The also significantly increase the visibility of utilitarian cycling among the wider public.

More information at http://www.walkbiketoschool.org/ and https://bikeleague.org/bikemonth

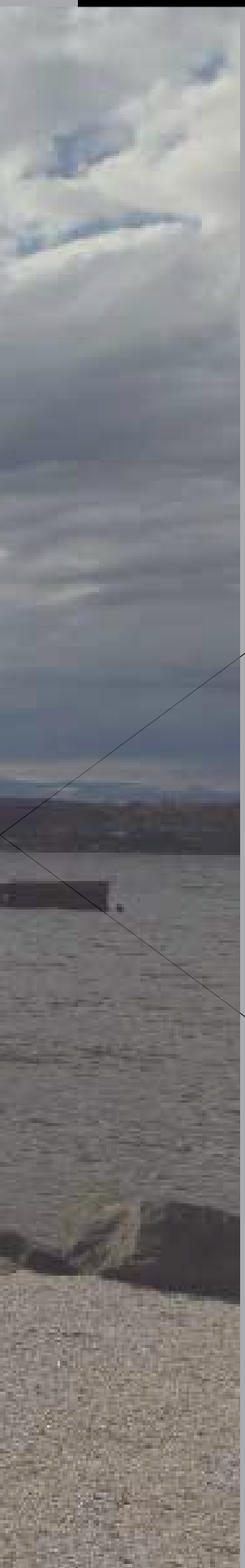
BIKE TO SCHOOL DAY IN PEARL RIVER

BIKE MONTH BANNER FROM THE LEAGUE OF AMERICAN BICYCLISTS

6

5 Year Vision & Implementation Plan

10 IMPLEMENTATION STEPS TO A SAFER AND MORE ACCESSIBLE ORANGETOWN



AS OUTLINED IN PREVIOUS SECTIONS, THE BIKE STUDY PROPOSES A NETWORK OF CYCLING FACILITIES AND ROUTES THAT PROVIDE ACCESS TO ORANGETOWN'S VARIOUS DESTINATIONS.

THE 5-YEAR VISION INCLUDES STEPS AND TASKS NECESSARY TO BUILD A WORKABLE CYCLING NETWORK THAT ADDRESSES THESE CONNECTIVITY NEEDS OVER THE NEXT HALF DECADE, AND IN A COST EFFECTIVE MANNER. RECOMMENDATIONS INCLUDE NEW INFRASTRUCTURE, ENHANCEMENTS TO EXISTING TRAIL SYSTEMS, AS WELL AS PROGRAMMING AND POLICY SUGGESTIONS THAT WILL PROMOTE AND SUPPORT THE DEVELOPING NETWORK.

WHILE THE 5-YEAR VISION & IMPLEMENTATION PLAN TAKES SIGNIFICANT STRIDES TOWARD THE BIKE STUDY'S OVERALL GOALS, IT DOES NOT REPRESENT A FINISHED PRODUCT. INSTEAD, IT PROVIDES A STEP-BY-STEP GUIDE TO ADDRESSING THE MOST PRESSING CONNECTIVITY AND SAFETY CHALLENGES IN THIS TIMEFRAME. RECOMMENDED FACILITIES AND PROGRAMMING INCLUDED IN THE BIKE STUDY OUTSIDE OF THE FIVE-YEAR PERIOD WILL BUILD ON THESE FOUNDATIONS, AND ADD ADDITIONAL COMFORT, SAFETY AND ACCESSIBILITY TO THE NETWORK.

THE PRIORITIES INCLUDED BELOW SERVE THE GOAL OF EFFICIENTLY AND QUICKLY CREATING A CONNECTED SYSTEM THROUGHOUT ORANGETOWN. HOWEVER, THEY WERE NOT CREATED WITH FULL KNOWLEDGE OF PAVING SCHEDULES, FUTURE FUNDING AVAILABILITY, OR FUTURE PLANNING OR ENGINEERING PROCESSES. THEREFORE, THE TOWN SHOULD REMAIN FLEXIBLE, PROMOTING PROJECTS AS OPPORTUNITIES ARISE.

Priorty projectS are listed according to the paving schedule for underlying roads, if available, or recommended timetable for implementation. High priority projects that are not subject to a paving schedule are listed first.

1. Strengthen Connections between Palisades and Pearl River

The sheer number of connections within the Pearl River to Palisades corridor, and constraints found on other east-west routes across Orangetown make the following facilities critical to overall success in creating a safe and accessible cycling network.

Veteran's Memorial Drive and Greenbush Road are key throroughfares that offer direct connections along this alignment. Oak Tree Road, while offering fewer opportunities for cyling infrastructure, is also a key connector. Between these streets, there several linked networks of low- stress residential streets that can be used to complete the connection.

STREET	SEGMENT	FACILITY	PAVING SCHEDULE	COST ESTIMATE*	ADDITIONAL ENHANCEMENTS
Veterans Memorial Drive	Gilbert Ave to Lester Dr	Protected Bike Lane	N/A - County road	$740,000**	Bike/Ped Detector + Signals ($8,000) High Vis Crosswalks ($6,000)
Gilbert Avenue	Middletown Rd to Veterans Mem Dr	Protected Bike Lane	N/A - County road	$86,000	Bike/Ped Detector + Signals ($2,000)
Constitution Drive	Minuteman Cir to Washington Ave	Bike Blvd	2018	$9,500	Speed tables ($12,000) Curb extensions ($41,000)
Minuteman Circle	Rutgers Dr to Constitution Dr	Bike Blvd	2018	$3,500	--
Olympic Road	Corporate Dr to Hunt Rd	Bike Blvd	2018	$4,000	Speed tables ($8,000)
Lawrence Street	Oak Tree Rd to Washington St	Bike Blvd	2021	$5,500	--
Hunt Road	W Orangeburg Rd / Vets Mem Dr to Blaisdell Rd	Improved Shoulder	2021	$11,500	--
Betsy Ross Drive	Blaisdell Rd to Rutgers Dr	Bike Blvd	2023	$3,500	--
Rutgers Drive	Betsey Ross Dr to Minuteman Cir	Bike Blvd	2025	$2,500	--
Washington Avenue	Constitution Dr to Western Hwy	Bike Blvd	2025	$11,000	Speed tables ($6,000) Curb extensions ($41,000)
Oak Tree Road	Lawrence St to Route 340	Improved Shoulder	2027	$3,500	--
Oak Tree Road	Closter Rd to Route 340	Shared Lane	2027	$13,000	--
Closter Road	Oak Tree Rd to Route 9W	Shared Lane	N/A - County road	$5,000	--
Gilbert Avenue	Main St to Middletown Rd	Shared Lane	N/A - County road	$9,500	--

* Includes intersection treatments and any necessary barriers/bollards **Does not include cost of bicycle/pedestrian bridge.

2. Connect Pearl River

Pearl River boasts a walkable business district, convenient access to transit, and community destinations including schools, parks, and the public library in close proximity. However, unlike eastern parts of Orangetown, there is no multi-use trail available for cyclist use. This makes creation of safe road connections even more essential.

STREET	SEGMENT	RECOMMENDED FACILITY	PAVING SCHEDULE	ESTIMATED COST*	ADDITIONAL ENHANCEMENTS
S Main Street	Central Ave to Franklin St	Shared Lane	2018	$4,000	--
S Main Street	Jefferson St to NJ Border	Shared Lane	2018	$6,000	Speed tables ($6,000)
S Main Street	Franklin St to Jefferson St	Striped Bike Lane	2018	$4,500	--
N Main Street	Crooked Hill Rd to Central Ave	Striped Bike Lane	2023	$21,000	Bike Boxes ($700) Curb extensions ($41,000)
N Middletown Road	Town Line Rd to Clarkstown Border	Improved Shoulder	N/A - County road	$3,500	--
N Middletown Road	Central Ave to Town Line Rd	Buffered Bike Lane	N/A - County road	$36,000	Bike boxes ($2800) Left hand turn boxes ($700)

* Includes intersection treatments and any necessary barriers/bollards

3. Strengthen East West Connections

Opportunities for on-road connections across Orangetown are somewhat limited due to roadway width issues on two primary east-west corridors: Gilbert Avenue/Convent Road and Blauvelt Road/Orangeburg Road. However, the Gilbert Avenue/Convent Road corridor offers direct connection to the proposed cycle track and multi-use trails on Veteran's Memorial Drive and Gilbert Avenue, and experiences relatively low daily traffic volume. As these are County-owned roadways, there is not a specific timetable for repaving.

STREET	SEGMENT	RECOMMENDED FACILITY	PAVING SCHEDULE	ESTIMATED COST	ADDITIONAL ENHANCEMENTS
Gilbert Ave	Pearl River Middle School to Veteran's Memorial Dr	Multi-use trail, signage & intersection treatments	N/A - County road	$171,500	Bike/Ped Detector + Signals ($2,000) High Vis Crosswalks ($1,500)
Gilbert Ave	Pearl River Middle School to Convent Rd	Shared lane, signage & intersection treatments	N/A - County road	$31,500	Speed tables ($6,000)
Convent Rd	Sickletown Rd to Western Highway	Shared lane, signage & intersection treatments	N/A - County road	$29,500	Speed tables ($6,000)

4. Create Neighborhood Bikeways

In addition to the neighborhood bikeways included in the Palisades to Pearl River priority, the Town should build other recommended neighborhood facilities as it paves the underlying roadways.

Most of these inexpensive facilities can be completed on Town-owned roads, and they add utility to bike lanes and shared lanes by reaching deep into Orangetown's neighborhoods. They provide the "last-mile" connections that have been shown to encourage greater cycling. The strength of neighborhood bikeways lies in their connected nature, therefore the Town should commit to building and linking and extensive neighborhood network This can happen over time. However, the Town should consider accelerating the paving date for roads currently scheduled beyond the 5-year window, i.e. after 2023.

STREET	SEGMENT	PAVING SCHEDULE	COST ESTIMATE	ADDITIONAL RECOMMENDED ENHANCEMENTS
Parkway Drive	Convent Rd to Blauvelt Rd	2018	$7,000	Curb Extensions ($41,000)
5th Avenue	Sunset Rd to Sickletown Rd	2019	$8,000	Speed tables ($6,000)
Forest Avenue	N Main St to N Middletown Rd	2019	$7,500	Curb extensions ($20,000) Speed tables ($6,000
Lester Drive	Washington Ave to W Orangeburg Rd	2020-2021	$25,500	--
Van Wyck Road	Blauvelt Rd to 5th Ave	2021	$9,500	HAWK Beacon ($50,000) Curb Extensions ($41,000) Bike/Ped Detector + Signal ($2,000) High Vis Crosswalk ($1,500)
Old Orangeburg Road	Full length	2021	$15,500	Speed tables ($6,000)
Marion Place	Pearce Pkwy to Evans Park ES	2021	$3,000	--
Center Street	Lincoln Ave ES to Washington Ave	2023	$4,500	Speed tables ($6,000)
Lowe Lane	Lester Dr to Western Hwy	2023	$8,000	--
Sunset Road	Western Hwy to 5th Ave	2025	$14,000	Curb extensions ($41,000)
Cottage Lane	Cottage Ln ES to Erie St	2025	$4,000	--
Franklin Avenue	S Middletown Rd to S Main St	2025	$8,000	Curb extensions ($41,000) Speed tables ($6,000)
Oriole Street	Blauvelt Rd to Orangeburg Rd	2026	$9,000	Curb extensions ($41,000) Speed tables ($6,000)
Lois Drive	Orangeburg Rd to Gilbert Ave	2026	$7,500	Curb extensions ($41,000) Speed tables ($6,000)
Lincoln Avenue	Crooked Hill Rd to Lincoln Ave ES	2027	$6,000	Speed tables ($6,000) Sidepath at Lincoln Ave ES ($80,000)
Blaisdell Road	Old Orangeburg and W Orangeburg Rd	N/A - County Rd	$4,500	--
Central Avenue, East	Oriole St to Mountainview Ave	N/A - County Rd	$6,000	Curb extensions ($20,000) Speed tables ($6,000)

5. Enhance the Rail Trail Network

The existing rail trail network is well-used and appreciated by residents. Expanding it will provide additional recreational opportunities, as well as allowing the trail system to play a greater role in meeting day-to-day transportation needs.

PROJECT	DETAIL	TIMELINE	ESTIMATED COST	NEXT STEPS
Sparkill intersection improvements	Safety improvements at critical intersection on Esposito Rail Trail	2020	$75,000	Convene meeting with NYSDOT and Village of Piermont to discuss proposed intersection changes
Improved signage and road crossings (Clarke and Esposito trails)	High visibility crossing treatments, advanced warning signage for motorists and trail users, confirmation and decision signs on trail	2020	--	Evaluate intersections using PTNY's Road & Trail Intersection Checklist; prioritize low-scoring intersections for improvements
Pave Esposito Rail Trail between Sparkill and Piermont (and possibly beyond)	Resurfacing 1.2 miles of trail with asphalt	2021	$600,000	Work with Village of Piermont to plan and construct improvements; involve Grand View-on-Hudson and South Nyack if feasible to pave additional trail sections
Improve access to J. B. Clarke Rail Trail along Orangeburg Road	Make connectcions between J. B. Clarke Rail Trail via short paths or access points to businesses and schools on Orangeburg Road	2021	--	Arrange meeting of property owners on trail side of Orangeburg Road to identify potential connection locations
Create trail connection to New Jersey	Link Orangetown's multi-use trail network to the planned Northern Valley Greenway	2023	$110,000	Confirm ownership of corridor; discuss long-term easement or corridor purchase with owner
Extend Clarke Rail Trail beyond Blauvelt Library	Extend the multi-use trail through Town-owned former rail corridor, between the library and 5th Ave	2023	$435,000	Convene group of stakeholders and Town departments to determine feasibility, and identify funding sources for extension

6. Install Bike Parking & Fix It Stations

Bicycle parking is an important consideration when making investments in Orangetown's cycling network. People are more likely to commute to work or run errands on bike if they know there are racks at their destination. Moreover, trailheads with plentiful bike parking encourage users to venture into adjacent businesses, contributing

LOCATIONS

Orangetown should prioritize community destinations such as parks, schools, libraries and publicly-oriented Town facilities for installation of bike parking. Well-used public transportation facilities, including bus stops and train stations are also key locations. Finally, efforts should be made to ensure that all of Orangetown's business districts and employment centers are outfitted with adequate bike parking.

The Town should consult the guide created by the Association of Pedestrian and Bicycle Professionals (APBP), called Essentials of Bike Parking: Selecting and installing bicycle parking that work. The guide informs municipal officials' decisions regarding the appropriate bicycle parking needs at each site.

bicycle parking prioritizes protection from weather and theft over visibility and convenience. Often, long-term bicycle parking is located inside of a building or parking garage, providing an extra level of security. However, these spaces should not be totally hidden or difficult to find, and they should also be able to handle a variety of bikes including cargo and recumbent bicycles. APBP offers guidance on bike rack designs.

Orangetown can encourage work places and apartment complexes tocreate indoor bike storage, and use the zoning code to be used to require developers to include bicycle parking into new multi-unit housing or mixed use developments. The Town could also provide incentives such as reduced parking minimums or additional units if a certain minimum bicycle parking standard are met.

See Appendix D for a model policy.

INVENTORY

The Town should consider completing a bike parking inventory to inform placement of new bike racks. The goal of the inventory should be mapping locations of existing bike rack and assessing whether an adequate number of parking spots is available at each location. Gathering information on the quality and type of existing racks, observed usage, and soliciting input on location where new racks are needed This could be undertaken by Town staff, volunteers, or a mix of the two. Using online mapping such as the Bike Study's Community Feedback Map could be an effective method of organizing this task, with the ability to post images and make comments by location.

SHORT- AND LONG-TERM BIKE PARKING

One issue raised in the guide is the difference between short- and long-term bicycle parking, and the need for both types in a community. According to APBP, short-term bicycle parking accommodates the needs of cyclists visiting an area for a maximum of two hours at a time. Therefore, locations chosen for short-term parking should depend more on visibility, convenience to destinations, and ease of use. Long-term

FIX IT STATIONS

Fix it stations are self-contained units that include all the tools necessary to perform basic bike repairs and maintenance. Tools such as tire levers and allen keys are securely attached to the stand with tamper-proof cables. Some models include rubberized arms that can be used to suspend a bike, making repairs easier.

Sschools, parks, and business districts are the best places for fix it installations. In addition to trailheads in Blauvelt, Sparkill and Piermont, the Pearl River Train Station and libraries throughout Orangetown may be good candidates for stations.

TRAIL JUNCTION AT SPARKILL DEPOT

7. Pass a Town-wide Complete Streets Policy

The Town should pass a Complete Streets policy that formalizes the responsibility of the Highway Department and others who have a role in planning, designing and constructing roads in Orangetown to consider all transportation users including pedestrians and cyclists as a standard business practice.

Rockland County Department of Health has assisted several Rockland County communities in passing similar policies, and should be used as a resource. Beyond the immediate statement of intent that such a policy provides, codifying Complete Streets as a town practice may be helpful in explaining future expenditures associated with the bike network.

8. Install Wayfinding Signage

Signage is an essential component of the overall bikeway network, and it serves multiple purposes.

Signage cost estimates are included in the overall facility costs estimates for priority projects. Signage serves several purposes. First, and most obvious, it directs cyclists to their intended destination. However, motorists also benefit from frequent and well-placed bike network signage because it reminds them to expect to encounter cyclists. Finally, bike network signage is an ever-present reminder of the Town's investment in the bike network and concern for the safety of all road users.

The Town may also want to consider a standalone wayfinding audit or study. These can be conducted by a consultant, or it may be feasible for municipal employees and/or a volunteer committee to conduct a wayfinding audit.

9. Use Education and Outreach to Improve Relationships and Perceptions among Road Users

On-going education and outreach can address tensions and build consensus among various Orangetown stakeholders regarding the need for safe transportation options.

The Orangetown Community Survey brought to light tensions between cyclists and Orangetown motorists and residents who live along frequently-used road cycling routes. Cycling respondents complained that motorists don't always pass with proper clearance among other behaviors. At the same time, many respondents expressed frustration at congestion caused by large groups of cyclists, and a lack of respect for traffic laws demonstrated by some cyclists.

It is clear that the sheer numbers of recreational cyclists that use Orangetown's roads elicit strong feelings on both sides. However, as the Town acknowledged when it initiated the Bike Study, numbers of cyclists are not likely to diminish; in fact, they will almost surely rise with the opening of the Shared Use Path allowing a loop route from Manhattan to Rockland then Westchester County (or vice versa) and back.

CYCLING LIAISON

The Town should work with bike clubs who use Orangetown roads to distribute information on the bikeway network, as well as specific regulations or directives that pertain to use of local roads. This communication channel should not be one-way, however, as bike clubs and other users should be encouraged to voice issues or questions to Town departments such as the Orangetown Police Department. Setting up an appointed liaison on both sides, i.e. an individual in Supervisor's Office or the Highway Department and a counterpart to represent the multiple bike clubs would facilitate dependable communication.

OUTREACH TO MOTORISTS

Orangetown should use its multiple means of communicating with local motorists to provide information pertaining to sharing the road with bicyclists, rules governing cyclist-motorist interactions, and the Town's desire to improve safety and accessibility for all users. Along with having a presence at any cycling-related events, the Town should take advantage of electronic or traditional signage to convey these messages.

ANNUAL BIKE SUMMIT OR OPEN HOUSE

An annual event to bring cycling groups, law enforcement and other stakeholders such as the school districts together could aid the Town's efforts in building the network and promoting safety on local roads and trails.

PYRO BOX COUNTER INSTALLED ON ESPOSITO RAIL TRAIL IN PIERMONT

10. On-going Evaluation of the Bikeway Network

Conducting regular counts of cycling activity, both on Orangetown's multi-use trails and on the local roadway network, is an important means of evaluating the cycling network.

Counts also offer a volunteer opportunity for local cyclists and others, and provide the Town with hard data that may be useful in applying for funding for infrastructure and programming.

As part of the Bike Study, counts using local volunteers were conducted in September 2017 and May 2018. These complementary fall and spring counts should continue as the bike network is built out. The Town is best positioned to organize counts, but they can continue to call on Rockland Bicycling Club and others to participate.

Manual counts should be supplemented by continuous monitoring of the Clarke and Esposito Rail Trails using automated electronic counters. Automated electronic counters using tubes can also be employed for short periods to measure road cycilng.

See Appendix B for a detailed count protocol, including suggested locations for future counts, and equipment recommendations for automated counts.

Orangetown may want to add a survey component to the fall or spring counts in order to get additional data about cyclists' feelings about the bike network and perceptions of safety. A survey that includes questions about cycling-related spending habits could provide the Town with a snapshot of the local economic impact of biking.

7 Additional Resources

A la Carte Cost Estimates

COSTS ESTIMATES TO ASSIST THE TOWN IN BUILDING OUT THE CYCLING NETWORK

FEATURE	UNIT COST / SET COST (MEDIAN COST USED IF AVAILABLE, INCLUDES INSTALLATION)
ADVANCE STOP/YIELD LINE	$380
ADVANCE WARNING/SCHOOL ZONE SIGNAGE	$500
BIKE BOX/LEFT TURN BOX	$350
BIKE LANE (STRIPED LANE + MARKINGS, TWO-WAY)	$23,000 per mile
BIKE LOCKER	$2,140
BIKE ROUTE SIGNAGE	$300 w/ post
BIKE PARKING	$540
CURB EXTENSION	$10,150/$100,000 for 4-way intersection
CYCLE TRACK	$105,600 per mile
DECISION/WAYFINDING SIGNAGE	$530
FIXIT STATION	$1100 w/ air pump
FLEXIBLE DELINEATORS (RECOMMENDED SPACING IS 20 FT)	$50
HIGH INTENSITY ACTIVATED CROSSWALK (HAWK)	$50,000
HIGH VISIBILITY CROSSWALK	$1,500
INTERSECTION TREATMENT (EXTENDS BIKEWAY THROUGH INTERSECTION)	$350
JERSEY BARRIER*	$160,000 per mile
LEFT HAND TURN LANE	$350
MULTI-USE TRAIL (SEPARATED FROM ROAD)	$500,000 per mile
NEIGHBORHOOD TRAFFIC CIRCLE	$35,000
PEDESTRIAN/BIKE SIGNAL + DETECTOR	$2,000
SHARED LANE (PAVEMENT MARKINGS)	$13,000 per mile
SIDEWALK	$65 per linear foot
SPEED TABLE (RECOMMENDED IN SETS OF 3)	$2,000/$6,000

Costs derived from Alta Planning + Design analysis of New York State Department of Transportation's Pay Item Catalog, www.dot.ny.gov/pic, as well *Costs for Pedestrian and Bicyclist Infrastructure Improvements: A Resource for Researchers, Engineers, Planners, and the General Public.* Bushnell, Poole, Zegeer, Rodriguez. October 2013. www.pedbikeinfo.org/cms/downloads/Countermeasure%20Costs_Report_Nov2013.pdf

*Jersey barrier estimates found at https://b.3cdn.net/bikes/36b7b6a4d74ea75d23_d6m6voly5.pdf

Maintenance

PROPER MAINTENANCE WILL PROMOTE SAFETY AND EXTEND THE USEFUL LIFE OF INFRASTRUCTURE INVESTMENTS MADE IN THE CYCLING NETWORK

Policy

The Town should consider adopting a separate policy that encourages regular maintenance of the bikeway network or roll it into their regular maintenance protocol. The relevant Town or village department should ensure that regular street sweeping removes debris from bicycle lanes, pavement markings are not faded or missing, and that signage is clearly visible and unobstructed by vandalism or overgrown vegetation.

Maintenance Costs

The following table displays the average bikeway maintenance unit costs for the City of Minneapolis' urban bikeway network. These costs are meant to provide a ballpark estimate; actual costs for Orangetown's network may vary significantly.

FACILITY	MAINTENANCE TYPE	ANNUAL COST PER LINEAR FOOT
MULTI-USE TRAIL	Clear snow and sweep weekly	$2
BIKE LANE WITH ENHNANCED SWEEPING (per direction)	Clear snow and sweep weekly	$1
BIKE LANE WITH YEAR-ROUND MAINTENANCE (per direction)	Remove snow and sweep weekly	$3.75
ONE-WAY PROTECTED BIKE LANE (per direction)	Remove snow and sweep weekly	$6.50
TWO-WAY PROTECTED BIKE LANE (one one side of roadway)	Remove snow and sweep weekly	$10

Winter Operation

Snow and ice should not limit the effectiveness of bikeway network treatments. Many cities with extensive bikeway networks experience harsh winters. These cities continue to maintain their bicycle network throughout the year, ensuring that bicycling remains a viable form of transportation during all four seasons.

Identify a priority network

The Town should choose which streets it will maintain first during snow and ice storms. It would make sense to start with cycle tracks and striped bike lanes (including buffered bike lanes) since these facilities will likely be on the same streets the city already prioritizes. Moreover, winter cyclists tend to be more confident riders in general, so they are more likely to use the most direct routes during their trip.

Determine a threshold at which conditions require action

The Town should define under what conditions bikeway-specific winter maintenance is necessary. Many cities use an inch of snow as a threshold.

Ensure that snow and ice build-ups do not obstruct the lane

Snow removal vehicles should pay close attention to the shoulders on roads and other roadside areas where bicyclists typically ride. Additional de-icing may be necessary in bike lanes due to the fact that bicycles are less likely to break up ice and snow compared to vehicles.

Materials Selection

The Recommendations section of this plan gives many facilities options. To help facilitate snow removal along the bikeway, Orangetown should avoid using materials and treatments that are not durable enough to withstand the wear and tear winter weather puts on local roadways. For example, flexible delineators may be used instead of concrete barriers or planters on cycle tracks; for speed and volume management, use curbs or speed humps with gradual slopes to ensure that the plow can thoroughly remove snow and ice.

Potential Funding Sources

TRANSPORTATION ALTERNATIVES PROGRAM / CONGESTION MITIGATION AND AIR QUALITY (CMAQ) IMPROVEMENT PROGRAM	TAP funding can be used for a variety of on and off-road bike and pedestrian infrastructure. Funding is administered by NYSDOT, working through the metropolitan transportation organizations, including New York Metropolitan Transportation Council (NYMTC). TAP funding was rolled into the CMAQ program in 2016.	Contact NYMTC to determine appropriate CMAQ representative. For TAP eligibility, visit www.dot.ny.gov/tap-cmaq
TRANSPORTATION IMPROVEMENT PROGRAM (TIP)	Funds infrastructure improvements related to the goals of NYMTC's regional transportation plan, including bike and pedestrian infrastructure.	Contact Gerry Bogacz at NYMTC at Gerry.gogacz@dot.ny.gov
PEOPLE FOR BIKES COMMUNITY GRANT PROGRAM	Supports bicycle infrastructure projects and targeted advocacy initiatives that make it easier and safer for people of all ages and abilities to ride.	www.peopleforbikes.org/grant-guidelines/
RECREATIONAL TRAILS GRANT	Funding to develop and maintain recreational trails for both motorized and non-motorized recreational trail use, including trailheads, linkages, and purchase an lease of equipment.	www.parks.ny.gov/grants/recreational-trails/default.aspx
LOCAL WATERFRONT REVITALIZATION PROGRAM (LWRP)	Communities that have prepared LWRP plans are eligible for funding to implement the components of that plan. Funding through the LWRP may be used to construct multi-use trails and other bicycle and pedestrian infrastructure.	www.dos.ny.gov/grants.html
BROWNFIELD OPPORTUNITY AREA PROGRAM	For areas that are perceived as environmentally-harmful, such as former industrial areas, funding through this program can be used for up to 90% of project costs for multi-use trails and other bicycle-related infrastructure.	www.dos.ny.gov/funding/rfa-16-boa-25/index.html
BETTER UTILIZING INVESTMENTS TO LEVERAGE DEVELOPMENT (BUILD) TRANSPORTATION DISCRETIONARY GRANTS (FORMERLY TIGER)	A competitive grant program with funds allocated directly by the U.S. DOT for innovative projects that deliver on five long-term outcomes: safety, economic competitiveness, state of good repair, livability, and environmental sustainability.	www.transportation.gov/BUILDgrants
HUDSON RIVER VALLEY GREENWAY GRANT PROGRAM	Funds planning for trails and other projects that align with the goals of the Hudson River Valley Greenway. Grants are available for $5,000-$10,000 but require 50% community match.	www.hudsongreenway.ny.gov/GrantFunding/HudsonRiverValleyGreenwayGrantsProgram.aspx
AARP COMMUNITY CHALLENGE GRANT	Encourage "quick action" projects that help facilitate the development of livable communities.	www.aarp.org/livable-communities/about/info-2017/aarp-community-challenge.html
SECTION 5310 PROGRAM – ENHANCED MOBILITY OF SENIORS AND INDIVIDUALS WITH DISABILITIES' PROGRAM	It provides funds for transportations projects and or programs that serve the special needs of transit dependent populations beyond traditional public transportation services.	
NATIONAL RECREATION AND PARK ASSOCIATION – 10 MINUTE WALK CAMPAIGN	Provides grants and technical assistance to support planning efforts that help communities increase access to high quality parking within a 10-minute walk	
GOVERNOR'S TRAFFIC SAFETY COMMITTEE – GENERAL HIGHWAY SAFETY GRANTS	Funding available for local, state, and non-profit agencies to address issues included in the State's Highway Safety Strategic Plan, including pedestrian and cyclist safety.	www.SafeNY.gov

Intersection Treatments & Pavement Markings

Signalized Intersection Treatments

Signalized intersections should provide time and space for cyclists, as well as making it clear when to cross.

BIKE BOXES

Reserve space for cyclists at the front of an intersection. Bike boxes are most effective when they are used at intersections where bicyclists and motorists are likely to turn out of the intersection or if vehicles are turning and bicyclists are continuing straight.
Bike boxes increase safety by improving cyclists' visibility to motorists, give space for left-turning cyclists, and reduce the likelihood of a "right-hook" collision caused by a turning vehicle. Bike boxes can also improve visibility for crossing pedestrians and reduce bus delays caused by queuing cyclists.

BICYCLE SIGNALS

Similar to pedestrian crossing signals, bicycle signals give bicyclists priority as part of the traffic signal cycle. A major benefit of bicycle signals is removing the barrier of crossing a major intersection due to real or perceived safety and comfort concerns.

Unsignalized Intersection Treatments

A major goal of treatments installed at unsignalized crossings should be to reduce the physical and mental "gap" between differing riding conditions on intersecting streets.

CURB EXTENSIONS		Reduce the gap distance by decreasing the crossing length at an intersection. Curb extensions require extending the curb at the intersection into the space typically reserved for parking. They also improve safety for pedestrians.
BICYCLE FORWARD STOP BARS		Advances the stopping line for bicyclists to the edge of the intersection, reducing crossing distance and increasing the sight lines of oncoming cross-traffic. The vehicle stop line remains at the same location (typically before the crosswalk), increasing bicyclists' visibility to waiting motorists. Can be used with curb extensions to ensure that right hand turning movements don't interfere with cyclist.
HYBRID BEACONS		Require motorists to come to a full stop when activated by a cyclist. The hybrid beacons, which are usually a signal head that sits above the traffic lanes, run through a signal phasing similar to a typical traffic signal that first gives motorists warning that they should slow down and prepare to stop
ACTIVE WARNING BEACONS		Alert motorists to the presence of cyclists (or pedestrians) at an intersection through a Rectangular Rapid Flash Beacon (RRFB) that can detect oncoming cyclists or be manually activated by a push button. Active warning beacons, specifically RRFBs, are already used throughout New York State at crosswalks or road-trail intersection crossings.
MEDIAN REFUGE		Give cyclists the opportunity to cross a busy street when breaks in traffic moving in one direction allow. Median refuge islands can also be a neighborhood bikeway volume management technique. Moreover, since they reduce the width of travel lanes, they can also calm traffic, providing safety benefits to all road users.

Pavement Markings

Pavement marking should be used at all major street crossings to designate roadway space for cyclists and alert motorists to the potential presence of cylists. Marking typically come in four types, but a combination of all or some can be used depending on local conditions.

DOTTED LINE EXTENSIONS

Demarcate space for bicyclists through the intersection.

SHARED LANE MARKINGS

Help guide bicyclists through the intersection.

ELEPHANT'S FEET

Increase bicyclist safety with wider, more visible dotted lines

COLORED CONFLICT ZONES

Increase bicyclist safety by highlighting motorist and bicycle "mixing areas." Typical applications include areas where vehicles are likely to be making turns such as intersections and highway and bridge ramp entrances and exits

Acknowledgements

Parks & Trails New York would like to thank the following individuals and organizations for their contributions to the Orangetown Bike Study:

Orangetown Supervisor's Office: Supervisor Chris Day and Executive Assistant Amanda Hyland

Orangetown Highway Department, including Superintendent James Dean and Stephen Munno

Orangetown Parks & Recreation Department, including Superintendent Aric Gorton

Orangetown Police Department

Orangetown Information Technology Department, including Matt Lenihan

Pearl River & South Orangetown School Districts

Former Supervisor Andrew Stewart and Executive Assistant Vicki Carramante

Project Intern Angela Litz

Bike Counters: Lawrence Vail, Paul Kadin, Steve Schwinn, Michael Hays, Amy Ffield

National Highway Traffic Safety Association

Rockland Bicycling Club

Rockland County Department of Health

Rockland County Highway Department

Rockland County Planning Department

Dave Zornow & Nyack News and Views

Photo Credits

8

Appendix

Contents

A Additional Context
B Count Protocol & Equipment Recommendations
C Orangetown Community Survey Summary
D Model Bike Parking Policy
E Orangetown Streets Classification Grid

Appendix A: Additional Context

To be included in final version.

Appendix B: Count Protocol & Equipment Recommendations

A full-fledged counting program, employing both automated and manual counts, is an important way for Orangetown to benchmark the effectiveness of investments it makes in bicycle infrastructure.

Observational Counts

OBSERVATIONAL COUNTS ARE AN IMPORTANT COMPONENT OF THE COUNT PROGRAM BECAUSE THEY PROVIDE DATA ON TRAVEL MODE (I.E. BICYCLISTS VERSUS PEDESTRIAN USAGE) AT A PARTICULAR LOCATION, A CAPABILITY LACKING IN MANY ELECTRONIC COUNTERS. OBSERVATIONAL COUNTS OFFER OTHER BENEFITS, INCLUDING LOW COSTS AND THE ABILITY TO RECORD CYCLING ACTIVITY THROUGH AN INTERSECTION.

Background

PTNY and the Town of Orangetown used the National Bicycle and Pedestrian Documentation Project's (NBPDP) count protocol during the inaugural bike counts in September 2017, and again in May 2018. NBPDP sets the second week in September as the official national bicycle and pedestrian count and survey week. NBPDP also recommends spring counts (May/June) at the same locations to understand seasonal changes in walking and cycling. Participants are instructed to count on at least one weekday (Tuesday, Wednesday, or Thursday) and a Saturday or Sunday following or preceding the weekday. Mondays, Fridays, and holidays are not used as count times. Additional weekday counts can be added to provide more data.

See the sample schedule for the recommended count times at each site.

Weekday PM peak periods were chosen since the afternoon peak typically has the largest volume of travelers, with commuters, school children and people running errands, and thus provide an excellent snapshot of walking and bicycling during the peak periods of the year. Road intersections are expected to experience higher commuter use, thus the recommended count time there included the after-work commute. Trail locations generally see more recreational use, which is reflected in 5-7PM recommenda**tion.**

PTNY recommends that Orangetown counts conform to the recommended times, unless local knowledge indicates high weekday, midday use at any of the proposed count sites. This is most likely to occur on trail sections adjacent to a central business district or other employment center, and generally not on roads.

Number of Count Locations

To understand walking and cycling in a local area, NBPDP recommends that participants count at least one location per 15,000 of population. This equates to three to four count locations in Orangetown. When conducting counts, it is important to try repeat locations over multiple counts to accurately track trends.

Count Location Options & Sample Schedule

LOCATION	WEEKDAY COUNT TIME	WEEKEND COUNT TIME	MANUAL AND/TYPE OF ELECTRONIC
Pearl River Train Station	4-6 PM	12-2 PM	manual/tube
Piermont Avenue and Ash Street	4-6 PM	12-2 PM	manual/tube
Western Highway and Blauvelt Road	4-6 PM	12-2 PM	manual/tube
Route 9W, S of Sparkill at Oak Tree Road	4-6 PM	12-2 PM	manual/tube
N Middletown Road	4-6 PM	12-2 PM	manual/tube
Gilbert Ave & Sickletown Road	4-6 PM	12-2 PM	manual/tube
Sparkill Depot, JB Clarke Rail Trail	5-7 PM	12-2 PM	manual/pyro
Esposito Rail Trail at 1st Street	5-7 PM	12-2 PM	manual/pyro

Volunteer Needs

Each count site requires at least one two-hour weekday and one, two-hour weekend observation period. PTNY recommends asking individual volunteers to do both the weekday and weekend count at a given location, equating to a commitment of four hours of counting.

Electronic Counts

DATA COLLECTED WITH ELECTRONIC COUNTERS TENDS TO BE MORE COMPREHENSIVE THAN DATA COLLECTED IN OBSERVATIONAL COUNTS. PTNY PROPOSES THAT ONE OR MORE METHODS OF ELECTRONIC COUNTING TECHNOLOGY BE EMPLOYED ALONG WITH MANUAL COUNTS TO CREATE A STRATEGIC NETWORK OF COUNT LOCATIONS ACROSS ORANGETOWN.

Pyro-boxes

To conduct the trail counts along the J. B. Clarke and Esposito Rail Trails, PTNY used EcoCounter's passive-infrared pyro boxes. These counters have many benefits for performing automatic trail counts. They are easy to install and remove, making it possible to rotate them to various locations along Orangetown's growing multi-use trail network. In addition to installing these counters along trails, the town could install them at park entrances (assuming they are not installed at a parking lot), near school paths, or wherever else it is desirable to measure the sum of two-way bicycle and pedestrian traffic. They are unable to differentiate between bicyclists and pedestrians, however, so having them at an intersection will not work. The town should use the protocol for observational counts to determine mode break down (bicyclists versus pedestrians) at a particular location.

More information at www.eco-compteur.com/en/products/pyro-range/pyro-box

PYRO BOX COUNTER INSTALLED AT SPARKILL DEPOT

Tubes

At the request of the Town of Orangetown Highway Department, PTNY also looked into counters using tubes. EcoCounter's tube counters are ideal for Orangetown because many areas of interest for performing counts are located on the town's roadways, where there is no dedicated space for bicyclists. Tube counters can pick out bicycle traffic volume and direction on shared roadways, or be deployed in on-road bike lanes. Moreover, they are extremely mobile, allowing the town to conduct a count with a single tube counter at 10-25 locations within a 12-month period. Tube counters used in tandem with a pyro box can be used along the JB Clarke and Esposito Rail Trails to generate both count and mode share data (i.e. cyclists vs. walkers and joggers).

More on information at www.eco-compteur.com/en/products/tubes-range

Count Data Storage & Access

All of the data that the counters record is manually or automatically (requires an annual subscription) uploaded to the website eco-visio.net. Eco-Visio's dashboard depicts hourly usage totals to get a better sense of when peak usage occurs at a particular location. The dashboard can also be used to create graphs, reports and facilitate more in depth analysis.

PYRO BOXES		**Cost Estimate:** **$3,475 per unit (bidirectional counting capability; measure up to 15')**
TUBE COUNTERS		**Cost Estimate:** **$2,955 for bidirectional counter; $110-$180 for selective tubes set (up to 30' in length)**

Appendix C: Survey Summary

IN OCTOBER 2017, AS PART OF THE ORANGETOWN BIKE STUDY, THE PROJECT TEAM DISTRIBUTED A SURVEY TO LOCAL RESIDENTS AND VISITORS REGARDING THEIR CYCLING EXPERIENCES AND GENERAL THOUGHTS ABOUT THE EXISTING BICYCLE NETWORK. RESPONDENTS HAD THE OPTION OF FILLING OUT A PAPER SURVEY AND RETURNING IT TO TOWN HALL, OR COMPLETING THE SURVEY ONLINE AT ORANGETOWN.COM/BIKESTUDY. ADDITIONAL OUTREACH WAS DONE THROUGH LOCAL SCHOOLS, AND BIKE CLUBS INCLUDING ROCKLAND BICYCLING CLUB.

Participation

The survey generated 491 total responses. Survey respondents were from Orangetown and several other neighboring municipalities with the New York- New Jersey metropolitan area. The Orangetown hamlets of Pearl River, Blauvelt, Tappan and Orangeburg recorded the highest participation levels.

Cycling Destinations

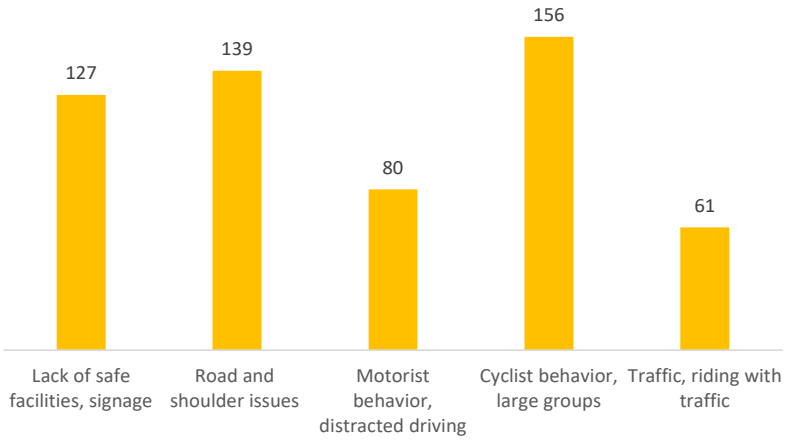
While there are destinations that attract cyclists in Orangetown, respondents singled out neighboring villages including Nyack and Piermont, nearby state parks, the Town's existing multi-use trail,
and local hamlets as the top draws.

Top Cycling Concerns

When asked what their top concerns were related to the cycling network, Orangetown respondents chose the management of group cyclists in traffic, availability of cycling facilities such as bike lanes or multi-use trails, and motorists not sharing the road.

Cycling Challenges

The survey asked respondents to list the top three challenges that affect bicycling in Orangetown. Among the choices provided, respondents chose cyclist behavior, including not signaling and riding in large groups, as the most pressing challenge. The condition of local roads and a lack of safe facilities also featured. The top five challenges are shown below.

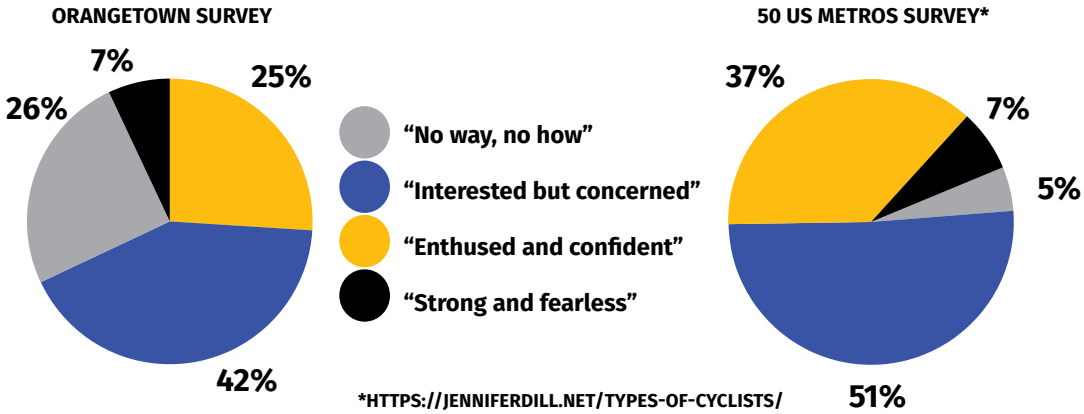


Support for Bike Safety Funding

The survey asked respondents whether they support utilizing public funding for the improvement of bicycle safety. The overwhelming majority (76%) responded that they supported such expenditures.

Biking Experience

The survey asked respondents to indicate their cycling experience level and comfort on local roads and trails. When asked "What type of cyclist are you?", Orangetown respondents mirrored national trends by favoring the "Interested but Concerned" descriptor. The number of respondents choosing "No Way, No How" and "Enthused & Confident" was roughly equal around 25%, with less than 10% considering themselves "Strong & Fearless" cyclists who will ride regardless of road conditions, traffic or availability of cycling infrastructure. This deviates somewhat from data obtained in a national survey, with more Orangetown residents indicating that they have no interest in getting on a bike.



*HTTPS://JENNIFERDILL.NET/TYPES-OF-CYCLISTS/

Appendix D: Model Bike Parking Ordinance

SUNY Institute for Healthy Infrastructure's Planning and Policy Models for Pedestrian and Bicyclie Friendly Communities in New York State, www.albany.edu/ihi/files/NY_Planning_And_Policy_Models_iHi.pdf

Model Zoning Law: Bicycle Parking

PURPOSE:

Bicyclists need a place to park at the end of a ride just like a motorist needs to park their car after driving to a destination. Municipal codes and ordinances require off-street parking for a variety of land uses. This language provides for bicycle parking as a local ordinance requirement, as part of site plan review, or as part of a special use permit.

PROPOSED POLICY:

Section XXXX: Bicycle Parking Facilities

1. Bicycle parking shall be provided in accordance with the following guidelines. All projects submitted for site plan approval shall identify bicycle racks and lockers in accordance with these guidelines.

2. Bicycle parking types:

   a. Type 1 Bicycle Parking shall be defined as bicycle racks intended for short-term parking.

   b. Type 2 Bicycle Parking shall be defined as bicycle lockers intended for long-term parking.

3. Bicycle Parking Specifications: All bicycle parking devices shall be provided in accordance with guidelines published by the Association of Pedestrian and Bicycle Professionals (APBP).

Section XXXX: Bicycle Parking Schedule

The following minimum amounts of bicycle parking shall be provided:

- **Residential (Multi – Family): 1 bicycle parking space per dwelling unit**
- **Commercial Uses: bicycle parking spaces = 10% of required auto parking**
- **Institutional (Schools): 1 bicycle parking space for every 10 students and staff Government: 1 bicycle parking space per every 10 employees**
- **Industrial Uses: 1 bicycle parking space per 1000 sq. ft.**

NOTE: For bicycle parking areas greater than 10 bicycles, 50% of the parking shall be provided in a covered area protected from the weather. Developers may reduce the amount of car parking spaces provided by the following factor: 1 car parking space may be reduced by providing parking for 10 bicycles.

NOTE: While many communities have off-street car parking requirements, few have adopted formal bicycle parking ordinances. This must be seen as a positive benefit, not a new 'unfunded mandate.' The provision allowing developers a bonus for providing bicycle parking creates a win- win situation that saves money for the developer and provides parking for the community. Madison WI, Oregon DOT, Toronto, and others have successfully adopted similar policies.

Appendix D: Orangetown Streets Classification Grid

STREET	SEGMENT	SPEED LIMIT	VPD	MIN ROAD WIDTH (FT)	REC. FACILITY	JURIS.	PAVING SCHEDULE YEAR	MILES
5th Ave	Sunset Rd to Sickletown Rd	30	<3000	<32	Bike Blvd	Town	2019	0.5
Ash St	Broadway St to Piermont Ave	30	<3000	<32	Shared Lane	Piermont		0.33
Bataan Rd	Dutch Hill Rd to Mountainview Ave	30	<3000	<32	Shared Lane	Town	2027	0.22
Betsy Ross Dr	Blaisdell Rd to Rutgers Rd	30	<3000	<32	Bike Blvd	Town	2023	0.27
Blaisdell Rd	Old Orangeburg Rd and W Orangeburg Rd	30	<3000	<32	Bike Blvd	Town		0.25
Blaisdell Rd	Orangeburg Rd to NJ Border	30	6000+	<32	Improved Shoulder	County	2019	0.74
Blauvelt Rd	Ehrhardt Rd to Oriole St	30	6000+	<32	None	Town	2024-2025	0.04
Blauvelt Rd	Sickletown Rd to JB Clark RT	30	3000 - 6000	<32	Shared Lane	Town	2023	1.9
Blue Hill Rd, North	Veterans Mem Dr to Convent Rd	30	3000 - 6000	<32	Shared Lane	County		0.77
Blue Hill Rd, South	Veterans Mem Dr to NJ Border	30	3000 - 6000	<32	Shared Lane	County		0.46
Bradley Hill Rd	Greenbush Rd to Nyack Border	30	<3000	<32	Shared Lane	County	2025	1.3
Broadway St	Route 9W to Ash St	30	<3000	<32	Shared Lane	Piermont		0.03
Carlton Rd	Parkway Dr S to Bataan Rd	30	<3000	>32	Striped Bike Lane	Town	2027	0.2
Center St	Lincoln Ave ES to Washington Ave	30	<3000	<32	Bike Blvd	Town	2023	0.25
Center St	Washington Ave to W Central Ave	30	<3000	<32	Shared Lane	Town	2023	0.1
Central Ave	Magnolia St to Mountainview Ave	30	6000+	>32	Striped Bike Lane	Town	2019	0.8
Central Ave, East	Oriole St to Mountainview Ave	30	<3000	<32	Bike Blvd	Town		0.35
Clausland Mtn Rd	Greenbush Rd to South Blvd	30	<3000	<32	Shared Lane	County		1.3
Cloister Rd	Oak Tree Rd to Route 9W	30	<3000	<32	Shared Lane	County		0.16
Constitution Dr	Minuteman Cir to Washington Ave	30	<3000	<32	Bike Blvd	Town	2018	0.62

STREET	SEGMENT	SPEED LIMIT	VPD	MIN ROAD WIDTH (FT)	RECOMMENDED FACILITY	JURIS-DICTION	PAVING SCHEDULE	MILES
Convent Rd	Sickletown Rd to Western Highway	30			Shared Lane			1.9
Cottage Ln	Erie St to Cottage Lane ES	30	<3000	<32	Bike Blvd	Town	2025	0.2
Crooked Hill Rd	Chestnut Ridge Border to N Middletown Rd	30	3000 - 6000	<32	Shared Lane	Town	2026	1.14
Dutch Hill Rd	Carlton Rd to Highview Ave	30	3000 - 6000	>32	Striped Bike Lane	Town	2021	0.51
Ehrhardt Rd	Town Line Rd to Blauvelt Rd	30	3000 - 6000	<32	Shared Lane	Town	2024	1.1
Erie St	Van Wyck Rd to Western Highway	30	<3000	<32	Shared Lane	Town	2024	0.7
Erie St	Western Hwy to Greenbush Rd	30	3000 - 6000	<32	Shared Lane	Town	2024	0.6
Ferndon Ave	Route 340 to Piermont Ave	30	3000 - 6000	<32	Shared Lane	NYSDOT	2024	1.41
Forest Ave	N Main St to N Middletown Rd	30	<3000	<32	Bike Blvd	Town	2019	0.48
Franklin Ave	S Middletown Rd to S Main St	30	<3000	>32	Bike Blvd	Town	2025	0.42
Gilbert Ave	Pearl River Middle School to Veterans Mem Dr	30	<3000	<32	Multi-use path	County		0.32
Gilbert Ave	Middletown Rd to Veterans Mem Dr	30	3000 - 6000	>32	Protected Bike Lane	County		0.31
Gilbert Ave	Pearl River Middle School to Convent Rd	30	<3000	<32	Shared Lane	County		2.2
Gilbert Ave	Main St to Middletown Rd	30	3000 - 6000	<32	Shared Lane	County		0.45
Greenbush Rd	Kings Hwy to Western Hwy	30	<3000	>32	Protected Bike Lane	Town	2019	0.51
Greenbush Rd	Clarkstown Border to Mountainview Ave	30	<3000	<32	Shared Lane	County	2019	2.6
Greenbush Rd	Route 340 to JB Clarke Rail Trail	30	3000 - 6000	<32	Shared Lane	Town	2019	0.14
Highland Ave	Route 9W to Esposito RT	30	3000 - 6000	<32	Shared Lane	NYSDOT	2025	2.1
Highview Ave	Greenbush Rd to Dutch Hill Rd	30	3000 - 6000	<32	Shared Lane	Town	2022	0.4
Hunt Rd	Orangeburg Rd / Vets Mem Dr to Blaisdell Rd	30	<3000	<32	Improved Shoulder	Town	2021	0.64
Kings Hwy	Route 340 to Greenbush Rd	30	3000 - 6000	<32	Shared Lane	Town	2022	0.42
Lawrence St	**Oak Tree Rd to Washington St**	**30**	**<3000**	**<32**	**Bike Blvd**	**Town**	**2021**	**0.35**
Lester Dr	**Washington Ave to Orangeburg Rd**	**30**	**<3000**	**>32**	**Bike Blvd**	**Town**	**2020-2021**	**1.3**
Lincoln Ave	**Crooked Hill Rd to Lincoln Ave ES**	**30**	**<3000**	**<32**	**Bike Blvd**	**Town**	**2027**	**0.4**
Lois Dr	**Orangeburg Rd to Gilbert Ave**	**30**	**<3000**	**<32**	**Bike Blvd**	**Town**	**2026**	**0.3**

Appendix D: Orangetown Streets Classification Grid

STREET	SEGMENT	SPEED LIMIT	VPD	MIN ROAD WIDTH (FT)	RECOMMENDED FACILITY	JURIS-DICTION	PAVING SCHEDULE	MILES
Lowe Ln	Lester Dr to Western Hwy	30	<3000	>32	Bike Blvd	Town	2023	0.4
Main St (Sparkill)	Piermont Ave to Union St	30	3000 - 6000	<32	Shared Lane	Town	2023	0.2
Marion Place	Pearce Pkwy to Evans Park ES	30	<3000	<32	Bike Blvd	Town	2021	0.1
Minuteman Cir	Rutgers Rd to Constitution Dr	30	<3000	<32	Bike Blvd	Town	2018	0.21
Mountainview Ave	E Central Ave to Orangeburg Rd	30	3000 - 6000	<32	Shared Lane	Town	2023-2024	0.12
Mountainview Ave	Greenbush Rd to Bataan Rd	30	3000 - 6000	<32	Shared Lane	Town	2023-2024	0.3
N Henry St	Central Ave to N Middletown Rd	30	<3000	>32	Striped Bike Lane	Town	2027	0.1
N Main St	Crooked Hill Rd to Central Ave	30	3000 - 6000	>32	Striped Bike Lane	Town	2023	0.75
N Middletown Rd	Town Line Rd to Clarkstown Border	30	6000+	<32	Improved Shoulder	County		0.14
N Middletown Rd	Central Ave to Town Line Rd	30	6000+	>32	Protected Bike Lane	County		1.23
Oak Tree Rd	Lawrence St to Route 340	30	6000+	<32	Improved Shoulder	Town	2027	0.6
Oak Tree Rd	Cloister Rd to Route 340	30	3000 - 6000	<32	Shared Lane	Town	2027	0.75
Old Orangeburg Rd	Full length	30	<3000	<32	Bike Blvd	Town	2021	1
Old Tappan Rd	Greenbush Rd to Washington St	30	6000+	<32	Improved Shoulder	County		0.02
Olympic Dr	Corporate Dr to Hunt Rd	30	<3000	>32	Bike Blvd	Town	2018	0.3
Orangeburg Rd	Mountainview Ave to Sickletown Rd	30	3000 - 6000	<32	Shared Lane	Town		0.9
Oriole St	Blauvelt Rd to Orangeburg Rd	30	<3000	<32	Bike Blvd	Town	2026	0.41
Parkway Dr N	Convent Rd to Blauvelt Rd	30	<3000	>32	Bike Blvd	Town	2018	0.36
Parkway Dr S	Convent Rd to Carlton Rd	30	<3000	>32	Striped Bike Lane	Town	2018	0.34
Pearce Pkwy	N Middletown Rd to Ehrhardt Rd	30	<3000	<32	Shared Lane	Town	2024	0.4

STREET	SEGMENT	SPEED LIMIT	VPD	MIN ROAD WIDTH (FT)	RECOMMENDED FACILITY	JURIS-DICTION	PAVING SCHEDULE	MILES
Piermont Ave	Ash St to Ferndon Ave	30	3000 - 6000	<32	Shared Lane	Piermont		0.23
Route 303	Greenbush Rd link	40	6000+	>32	Protected Bike Lane	NYSDOT		0.15
Route 340	Route 303 to Hickey St	40	6000+	<32	Multi-use path	NYSDOT		1.2
Route 340 - 9W Connector	Route 9W to Route 340	30	<3000	<32	Shared Lane	NYSDOT		0.17
Route 340/ Orangeburg Rd	Hickey St to Esposito RT	30	3000 - 6000	<32	Shared Lane	NYSDOT		3.8
Route 9W	NJ Border to Rtes 340-9W Connector	45	6000+	<32	Improved Shoulder	NYSDOT		2.35
Route 9W	S Highland Ave to Broadway St	40	6000+	<32	Improved Shoulder	NYSDOT		3.3
Rutgers Rd	Betsey Ross Dr to Minuteman Cir	30	<3000	<32	Bike Blvd	Town	2025	0.19
S Main St	Central Ave to Franklin St	30	3000 - 6000	>32	Shared Lane	Town	2018	0.1
S Main St	Jefferson Ave to NJ Border	30	3000 - 6000	<32	Shared Lane	Town	2018	0.35
S Main St	N Franklin St to Jefferson St	30	3000 - 6000	>32	Striped Bike Lane	Town	2018	0.1
S Middletown Rd	N Henry St to NJ Border	30	3000 - 6000	<32	Shared Lane	Town	2024	0.9
Sickletown Rd	Townline Rd to Blauvelt Rd	30	3000 - 6000	<32	Shared Lane	County		1.6
Sickletown Rd	Blauvelt Rd to Orangeburg Rd	30			Shared Lane	County		0.12
South Blvd	Nyack Border to Old Mtn Rd	30	<3000	<32	Shared Lane	Town	2027	0.9
Sunset Rd	Western Hwy to 5th Ave	30	<3000	<32	Bike Blvd	Town	2025	0.75
Valentine Ave	Ferndon Ave to Esposito RT	30	3000 - 6000	<32	Shared Lane	Town / Piermont	2023	3.4
Van Wyck Rd	Blauvelt Rd to 5th Ave	30	<3000	<32	Bike Blvd	Town	2021	0.53
Van Wyck Rd	Blauvelt Rd to Convent Rd	30	3000 - 6000	<32	Shared Lane	Town	2021	0.4
Veterans Memorial Dr	Gilbert Ave to Lester Dr	45	6000+	>32	Protected Bike Lane	County		2.7
W Central Ave	Center St to Magnolia St	30	3000 - 6000	<32	Shared Lane	Town	2019	0.13
Washington Ave	Constitution Dr to Western Hwy	30	<3000	<32	Bike Blvd	Town	2025	0.73
Washington Ave	NJ Border to Center St	25	6000+	<32	None	County	2025	0.66
Washington St	Union St to Kings Hwy	30	3000 - 6000	<32	Shared Lane	County		1

Appendix D: Orangetown Streets Classification Grid

STREET	SEGMENT	SPEED LIMIT	VPD	MIN ROAD WIDTH (FT)	RECOMMENDED FACILITY	JURIS-DICTION	PAVING SCHEDULE	MILES
Washington St	Union St to Kings Hwy	30	3000 - 6000	<32	Shared Lane	County		1
Western Hwy	Erie St to Sunset Rd	30	3000 - 6000	<32	Shared Lane	County		0.03
Western Hwy	Highview Ave to Greenbush Rd/Washington Ave	30	3000 - 6000	<32	Shared Lane	County		0.7

PARKS & TRAILS NEW YORK

PARKS & TRAILS NEW YORK
29 ELK STREET
ALBANY, NY 12207

(518) 434-1583
WWW.PTNY.ORG
PTNY@PTNY.ORG