

A Bicycle and Pedestrian Master Plan

For the Nyack River Villages and the Nyack School District

August 2018

 FITZGERALD & HALLIDAY, INC.
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In collaboration with

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25
SLOW
MPH

NO PARKING
ANY TIME

CURB
YOUR
DOG

NO PARKING
ANY TIME
5

CHAPTER ONE

PLAN INTRODUCTION

Safe streets are welcome streets

The Value of Bicycling and Walking

Benefits of bicycling and walking include, but are not limited to, healthy living, strong communities, equity, and more sustainable environments. Reductions to travel costs, congestion, and pollution strengthen both transportation and social networks. Though not all people ride bicycles, the river villages and the lower Hudson Valley have for decades been a destination for recreational cyclists, a trend that will continue when the planned shared use path (SUP) opens on the new Governor Mario M. Cuomo Bridge.

Active transportation infrastructure boosts property values, contributes to communities' economic development, and offers alternatives to driving and congestion. The creators and contributors to the Master Plan value the area's unique character and believe that support for active transportation will make the river villages and adjacent hamlets increasingly desirable and safe places to live, work, and enjoy the region's many recreational assets.

This *Greater Nyack Bicycle and Pedestrian Master Plan (Master Plan)* is developed with an unwavering commitment to address the safety and mobility of all road users, with emphasis placed on children, seniors, and those with mobility impairments. Infrastructure that is safe and accessible for all users, particularly the most vulnerable, promotes mobility, public health, economic vitality, and social equity.

From January 2015 to December 2017, the New York State Department of Transportation (NYSDOT) reported 52 crashes in the area involving bicyclists or pedestrians. Notably in 2018, as this plan was in preparation, two pedestrians were killed by motorists. Traffic crashes are preventable and this plan provides tools and solutions to minimize risks for all street users. Now is the time to take action.



Image credit: FHI

Strong Communities

The cost of building bicycle and pedestrian travel facilities is significantly less than building roads and parking facilities. Funds spent to build and maintain bicycle and pedestrian facilities can stretch further than those spent on other modes. Facilities such as sidewalks, crosswalks, and bike lanes, allow people the independence to choose how they want to travel. Without these facilities, people may resort to traveling by personal vehicle or engaging in unsafe walking and bicycling practices. For those who do not have the option to drive, such as younger adolescents, those unable to afford a car, and people with certain disabilities, this lack of choice in transportation creates an inconvenient and socially unjust barrier to mobility.

Reduce Travel Costs

Bicycling and walking are affordable forms of transportation. The cost of bicycling and walking are much less than driving a motor vehicle, which includes the cost of purchasing, insuring, fueling, and maintaining the vehicle. Bicycling and walking are also cheaper than the cost of regular transit use.

Improve Transportation Equity

The high cost of driving requires low-income families to spend a greater portion of their income on owning and operating a car, or to choose not to have one. If automobile travel is the only feasible mode of transportation in a community, low-income families are placed at a significant mobility. Where safe and convenient bicycle and pedestrian facilities exist, all citizens have access to transportation.

Sustainable Environments

Reduce Congestion

Bicycling and walking can help to reduce roadway congestion. Many streets and highways carry more traffic than they were designed to handle, resulting in gridlock, wasted time and energy, and driver frustration. Bicycling and walking require significantly less space per traveler than driving. Roadway improvements to accommodate pedestrians and bicyclists typically also enhance safety for motorists by lowering speeds, better organizing traffic, and reducing the potential for collisions.

Reduce Pollution

According to the U.S. Environmental Protection Agency, transportation is responsible for nearly 80 percent of carbon monoxide and 55 percent of nitrogen oxide emissions in the United States. Although cars are much cleaner today than they were in years past, if total traffic volumes continue to grow, air quality will deteriorate. In 2010, World Watch Magazine estimated that, "a bicycle commuter who rides four miles to work, five days a week, avoids 2,000 miles of driving and (in the U.S.) about 2,000 pounds of CO₂ emissions, each year. This amounts to nearly a five percent reduction in the average American's carbon footprint."

(World Watch Magazine, <http://www.worldwatch.org/node/6456>, 2010).

Healthy Living

Bicycling and walking provide people with a way to stay physically active and promote good health. Both activities increase the health of the heart and cardiovascular systems and provide resistance to obesity related health problems such as strokes, diabetes, and cancer. Research shows that keeping physically active can reduce the risk of heart and circulatory disease by as much as 35% and risk of early death by as much as 30%.

Mental well-being has also been shown to improve as a result of physical activity. Studies have shown that activities such as bicycling and walking promote mental health and can help people overcome and prevent depression and anxiety. According to the Mental Health Foundation, physical activity can be as effective as medication and counseling.

Economic Development

Bicycle and pedestrian facilities have been shown to have a positive economic impact on local communities by enhancing shopping districts, boosting spending at local businesses, generating tourism, and increasing home values. For example, a 2013 study in Sonoma County, CA found that increased bicycling and walking in the area aided the region's business vitality, employment base, and property valuation. And according to the *2012 Benchmarking Report on Bicycling and Walking in the U.S.*, bicycling and walking projects create 11-14 jobs per \$1 million spent, while highway projects only create 7 jobs per \$1 million.

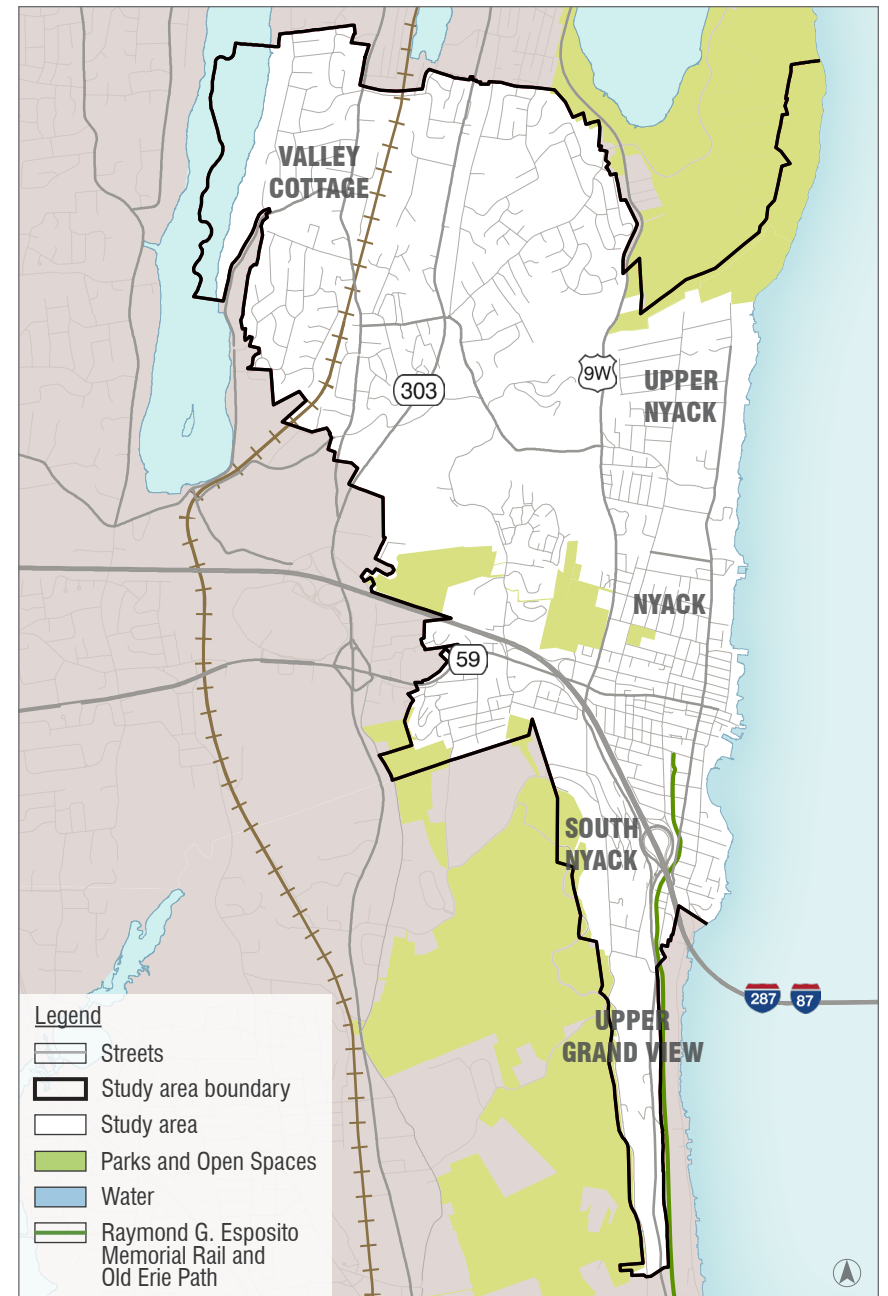
Plan Purpose

Nyack, South Nyack, Upper Nyack, and the hamlets of Valley Cottage and Upper Grand View have for many years attracted cyclists, hikers, walkers, and other outdoor and cultural enthusiasts from around the region and beyond. Much of the area is inherently walkable, notably traditional commercial core of Nyack and surrounding residential communities. This *Master Plan* is designed to further encourage and facilitate active transportation such as walking and bicycling to improve safety and access to schools, shopping, employment, and more.

This is the first plan of this kind developed for the Nyack area, though the communities have demonstrated a commitment to bicycling and walking through numerous prior initiatives, programs, and policies. This *Master Plan* serves to build upon the previous work and guide the future of active transportation. The recently released *Orangetown Bike Study* represents a similar and complementary effort.

The purpose of the *Master Plan* is to synthesize bicycle and pedestrian needs and create a comprehensive package of recommendations that will encourage the community to bicycle and walk more for transportation, recreation, exercise, and overall quality of life. It will provide a framework within which the area can strategically implement improvements that reflect the community's priorities.

The *Master Plan* is funded by a grant from the New NY Bridge Project's Community Benefits Program. The study is administered by the Village of Nyack for the entire school district, which includes Nyack, South Nyack, Upper Nyack, and the hamlets of Valley Cottage and Upper Grand View.



Project area; Image credit: FHI

Vision and Goals

The *Master Plan* is guided by a set of vision and goals, developed by the project Steering Committee. Consensus on the basic vision for the *Master Plan* and three fundamental goals to work toward that vision was an important, early action by the committee to guide the project evaluation and recommendations.

Vision

Valuing the unique character and giving attention to active transportation and community connections will make the Nyack river villages and the school district desirable and safe places for walking and bicycling. People of all ages and abilities will have safe and equal access to all travel modes, which will advance the health and well-being of residents, local businesses, and the community as a whole.

Goals

1. Improve pedestrian and bicyclist safety for all regardless of age, ability, and experience with infrastructure improvements (e.g., sidewalks, traffic calming) and non-infrastructure programs (e.g., education, enforcement).
2. Improve connections to and between key destinations for employment, education, culture, recreation, and shopping within the Nyack river villages and the school district.
3. Provide consistent signage, wayfinding, marketing, education, and enforcement programs to educate users, target undesirable behaviors, accommodate individuals with special needs, and improve perceptions of bicycling and walking in the Nyack river villages and the school district.



What would encourage you to WALK or BIKE more?

Please have a permanent bike lane in Sloansville
 More school activities like a bike ride to school or school cultural programs
 More should have bike lane
 More community walking challenge with an aspect of learning / walking challenge
 My son would be safe riding along to a bridge that is safe
 More bike lanes would be helpful especially going to school / work / store / bank / grocery store
 Bike lane is great / I really have no bike in the street
 Can't ride routes are great / they were safe in NY
 Memorial Park - More in slope - playground
 You cannot safely walk on sidewalks to learn from Memorial Park
 I would love to have a more safe route
 More lanes like Germany
 More walk/bike from here. If we had a safe space for both pedestrians and bikes.
 More bike lanes would be helpful especially going to school / work / store / bank / grocery store
 Lots of bike lanes. Always.
 if I had this lane forever - Oliver
 KE BIKING SCARY
 KNOWING WHERE THE BIKE LANES ARE
 More bike lanes would be helpful especially going to school / work / store / bank / grocery store



CHAPTER TWO

MASTER PLAN PROCESS

The Master Plan is a community-driven process, backed by an understanding of data, physical conditions, and relevant policies.

Public Involvement

From the onset of the *Master Plan* until its completion, community members played a vital role in defining the vision, recommendations, and priorities of the *Master Plan*. The project team designed a multi-pronged public involvement approach to allow ample opportunity for meaningful feedback and engage a variety of stakeholders.






Through in-person meetings, pop-up outreach events, and online engagement, members of the public shared their feedback on areas of concern and how best to improve walking and biking in the Nyack river villages and school district. The public involvement effort was defined by several core components.

Steering Committee

A Steering Committee met four times throughout the course of the study, comprised of public officials and representatives from community organizations, advocacy groups, businesses, residents, and other stakeholders in the study area. The major roles of the committee included defining the *Master Plan*'s vision, assisting with public outreach efforts, identifying needs and key destinations, reviewing project materials, and updating the draft list of recommendations. The committee also directed the project team to hold two pop-up events, the first at Nyack High School and the second at the Earth Day Festival.



Image credit: FHI

Public Involvement Efforts	2018					
	January	February	March	April	May	June
 Steering Committee						
 Stakeholder Interviews						
 Virtual Outreach						
 Pop-Up Outreach Events						
 Public Open House						

Virtual Outreach

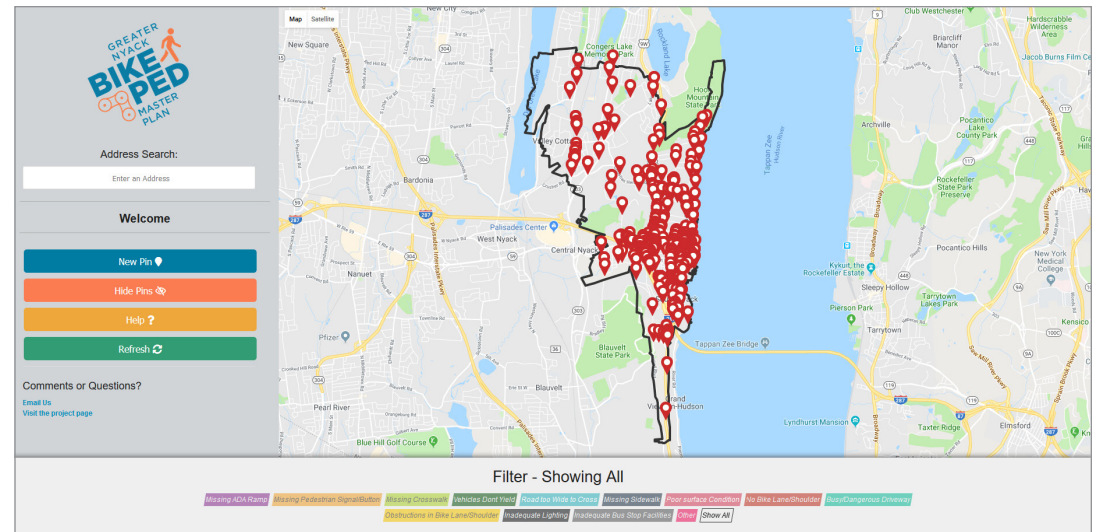
To collect feedback early and often, the *Master Plan* team engaged stakeholders through virtual outreach methods. The primary mechanism was an online mapping tool where users could share their concerns and opportunities on a map of the project area. The mapping tool received nearly 400 location-specific pin drops and comments. The project team also accepted and reviewed comments via email and through the project website.

To advertise the online mapping tool as well as meeting notifications, the project team sent frequent email blasts to the project mailing list; many of these emails were forwarded to stakeholder groups and shared through the towns' and villages' mailing lists. The school district also shared major milestones through Peachjar, the virtual outreach system used to reach parents.

The table to the right provides a summary of the most common issues survey respondents referenced. The map on the following page includes an illustrative summary of all locations that were highlighted by survey respondents as an area in need of improvements for bicyclists and/or pedestrians.

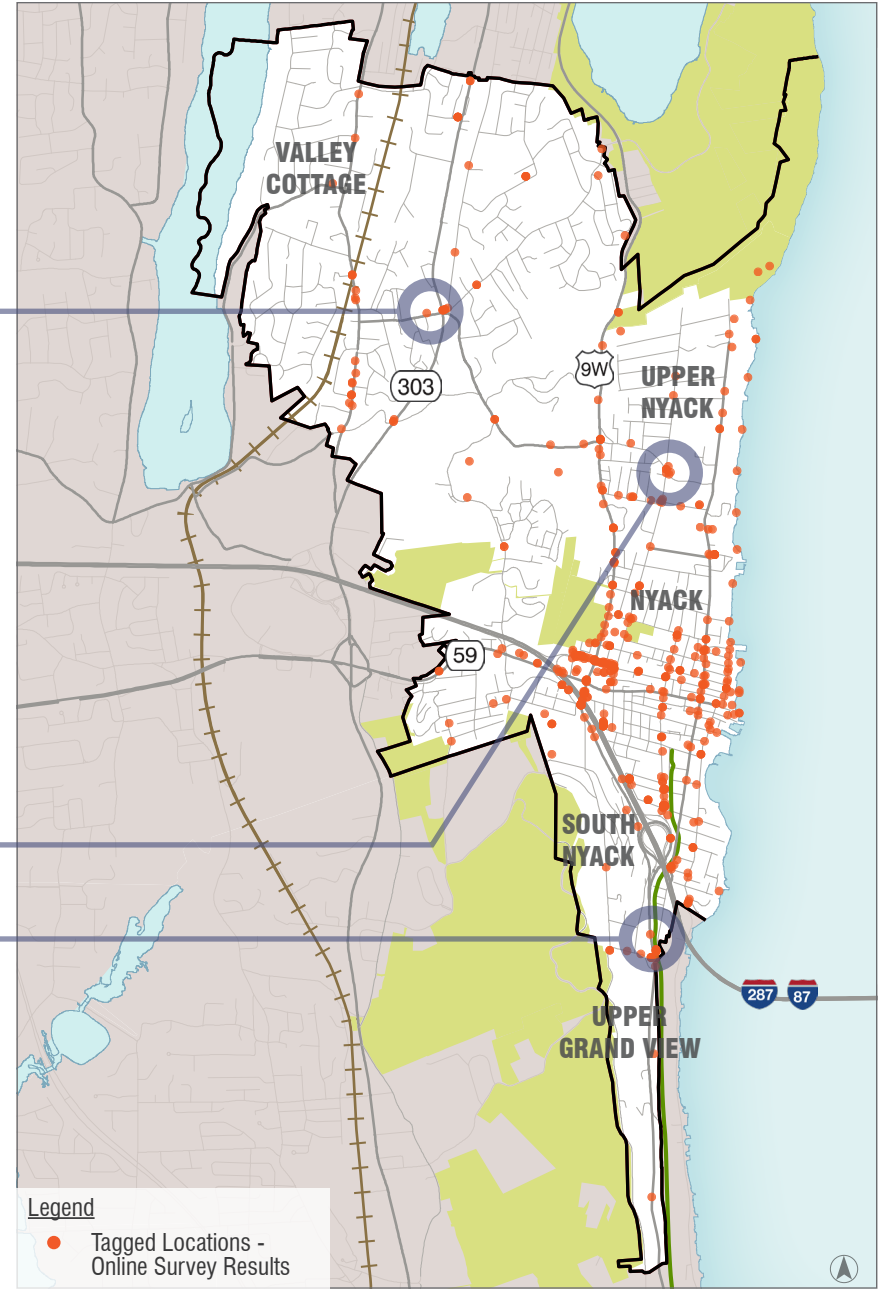
Stakeholder Interviews

The project team interviewed key stakeholder groups in the initial stages of the *Master Plan* development. These interviews included representatives from public safety, public health, the school district, the disabled community, and the *Orangetown Bike Study*. Common themes heard in these meetings included concerns about bicycle and pedestrian safety for all road users, the need for more community education on traffic laws, and a desire for extensive outreach to diverse communities.



FHI's Online Mapping Tool

Issues Referenced in Online Mapping Tool	% Survey Respondents
Problematic crossings Includes locations tagged as “missing ADA ramp”, “missing crosswalk”, “missing pedestrian signal/button”, and/or “road too wide to cross”	23%
Vehicles don't yield	18%
Missing sidewalk	16%
Maintenance needs Includes locations tagged as “poor surface condition” and those tagged with comments that referenced maintenance issues	14%
Bicycle facilities need improvement Includes locations tagged as “no bike lane/shoulder” and “obstructions in bike lane/shoulder”	14%
Inadequate lighting	12%
Traffic concerns Includes comments that referenced the amount and/or speed of traffic as a deterrent to bicycling and walking	11%



Nyack High School Pop-up Event

On Wednesday, April 11, 2018 the project team visited Nyack High School to better understand how students and faculty decide how to get to school. Project team members set up a booth outside the cafeteria where they handed out bookmarks, spoke with students about their walking or bicycling concerns, and surveyed students and faculty as they passed by on their way to lunch. As recommended by the Steering Committee, a “Lunch & Learn” session was held simultaneously to introduce students to the planning profession and solicit feedback on the walking and biking environment in their neighborhoods and around the school. The project team spoke with 160 students and faculty members and learned valuable information on the barriers to biking and walking to Nyack High School, as well as current walking and bicycling habits outside of school.

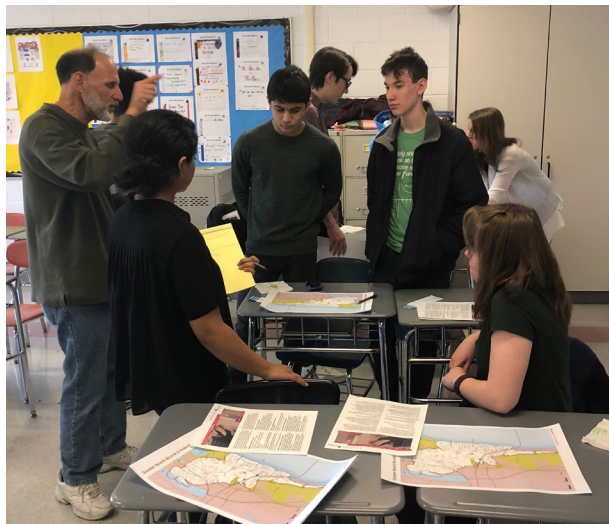


Image credit: FHI

Nyack Earth Day Pop-up Event

On Saturday, April 21, 2018, the project team attended the Nyack Earth Day Celebration and Music Fest. Team members distributed bookmarks at the information booth, spoke to Earth Day attendees about the importance of a well-connected and upgraded bicycle and pedestrian network, and encouraged passersby to share their thoughts on a feedback banner.

The team installed two demonstration projects to provide a preview of improvements that could be possible through the *Master Plan*. A temporary curb extension with tables and chairs showed community members the benefit of shorter crossing distances and safer intersections, and a protected bike lane demonstrated how the road can be readjusted to accommodate a variety of users. The bicycle lane

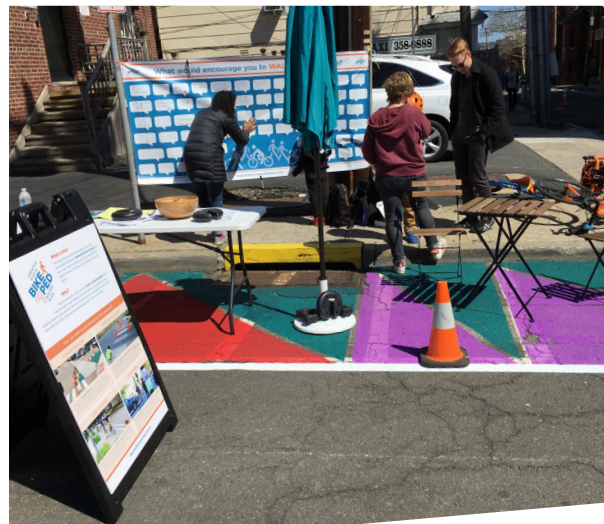


Image credit: FHI

in particular attracted parents and children who expressed excitement at the idea of more opportunity for bicycling separated from vehicular traffic.

Public Open House

The project team hosted the Public Open House on June 12, 2018 at Nyack High School's auditorium. The meeting featured a summary presentation and the public had the opportunity to comment on the draft recommendations displayed on boards. More than fifty members of the public showed up to express their support for bicycle and safety improvements and comment on specific recommendations. They suggested modifications to the draft recommendations as well as new ideas to improve bicycling and walking in the greater Nyack area. This input has been considered and incorporated into the development of the *Master Plan*.

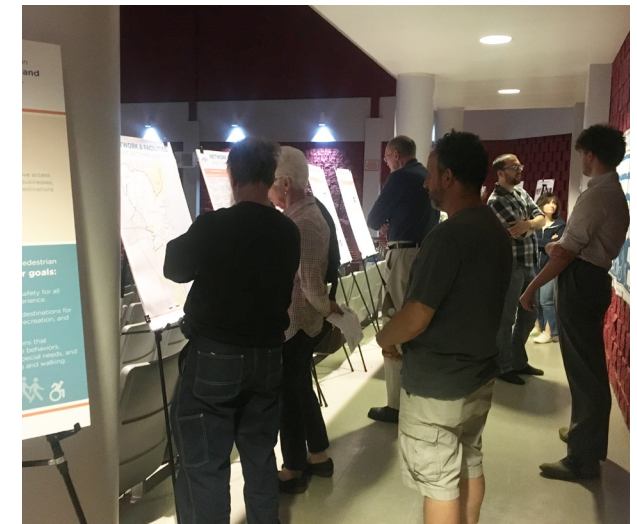


Image credit: FHI

Network Needs Assessment

A network needs assessment provides a comprehensive and prioritized list of the walking and bicycling needs in the community and is the basis of development of recommendations.

Methodology

The network needs assessment was developed with input from the Steering Committee, stakeholders, and the public. As such, the first step was a comprehensive analysis of all the input that was received throughout the development of the *Master Plan*. Each bicycle and/or pedestrian connection along a road or trail in the study area that was referenced by the public was included in the analysis.

Highlighted issues included problematic intersections, missing facilities such as crosswalks and pedestrian ramps, desired linkages between key destinations. A note was made each time additional input was received about the same connection, thereby giving more weight to that connection. While this input was organized according to corridor name, such as North Broadway, it was also analyzed to distinguish between input that specifically referenced an intersection, such as North Broadway and Main Street, and input that was specific to a certain segment of a corridor, such as the stretch of roadway along North Broadway between Main Street and 4th Avenue.

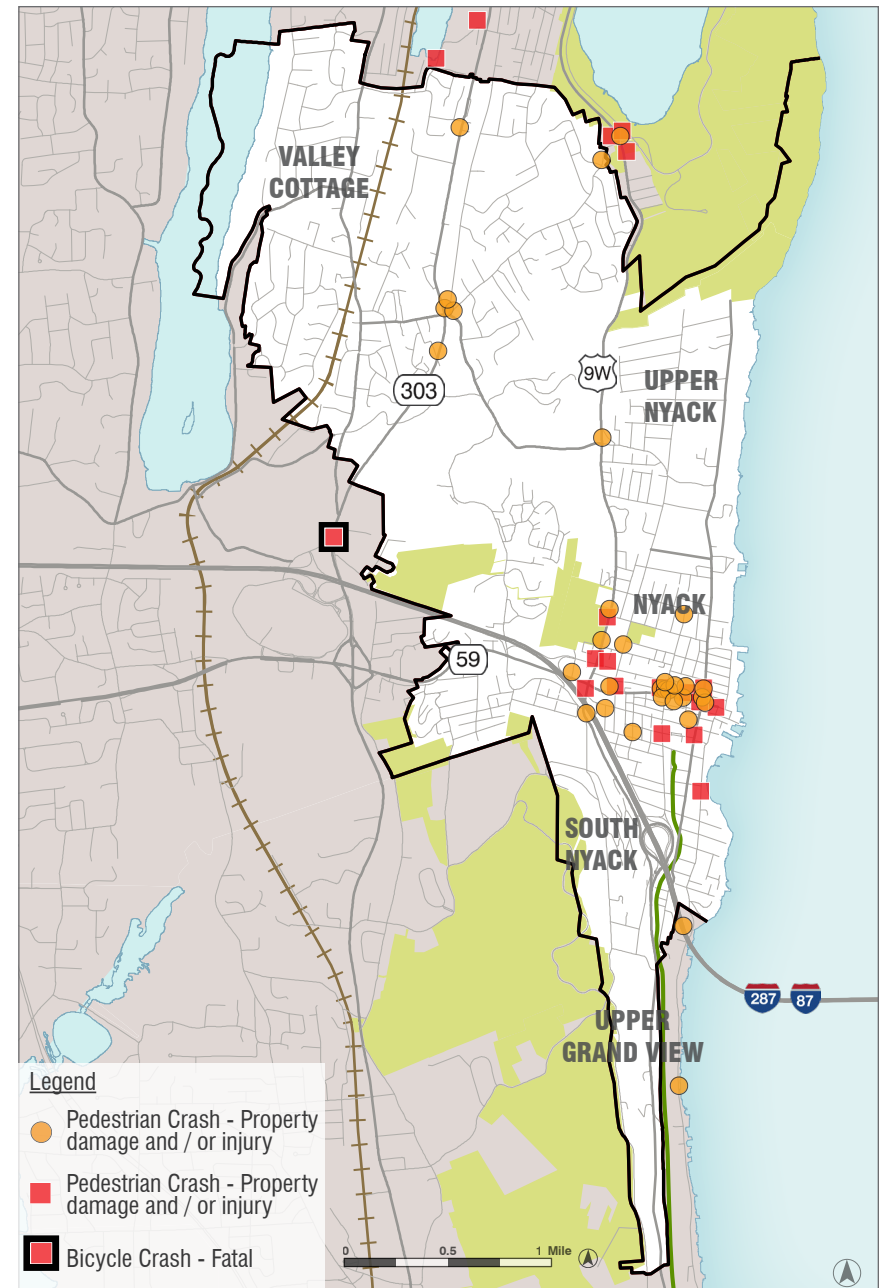
All the needs that were identified by the community were reviewed in detail and recorded as part of the needs assessment. To ensure the recommendations focused on the needs that applied to a broad community, the needs that had been identified most frequently were considered the top needs for consideration. Additional criteria included:

Crash locations: A recent crash that involved pedestrians and / or bicyclists.

School zones: Facility exists within a 0.25-mile radius of a school.

Transit-dependent populations: Census block groups that were identified by the Rockland County Planning Department.

Existing plan or study: A need already identified in another village, town, regional, or state-wide plan or study. An example would be the needs that have been identified as part of the *Village of Nyack's Pedestrian Safety Action Plan – Local Projects Grant Application for NYSDOT*.



Bicycle and Pedestrian Crash Locations, 2015 – 2017 (Source: NYSDOT)

Assessment Results

The analysis identified the following corridors considered most in need of bicycle and pedestrian improvements:

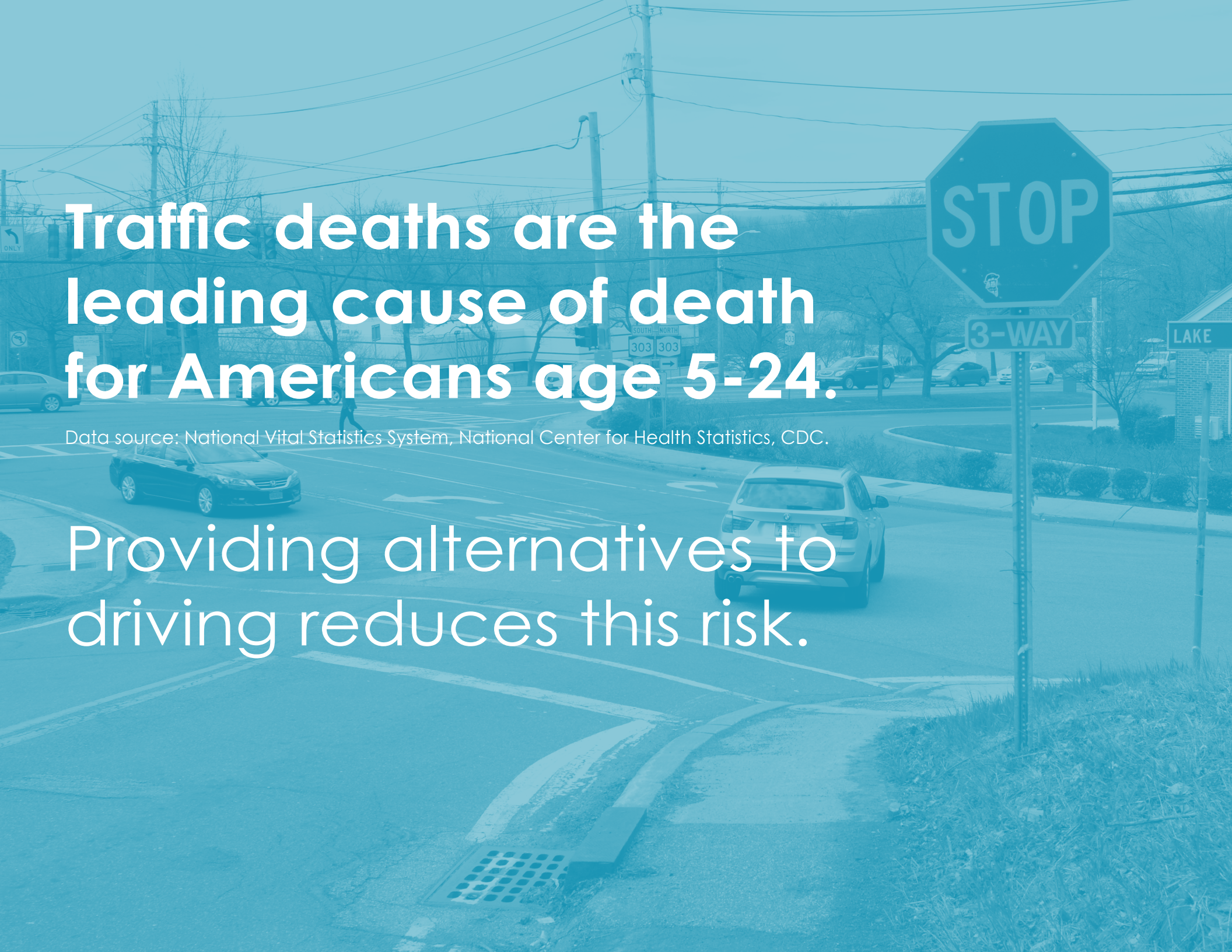
- North Broadway
- Casper Hill Road
- Depew Avenue
- Franklin Street
- Gedney Street
- Main Street
- North Midland Avenue
- Piermont Avenue
- Route 303
- Route 59
- Route 9W

In addition to this broad overview, information about specific intersections and/or corridor segments was also included in the analysis. Additionally, much of the input that identified these needs also included a suggestion for improvements, such as installation of a new sidewalk or areas warranting traffic calming. Similarly, barriers to safe and efficient non-motorized transportation were also highlighted. This information was received through comments, discussions, and tags and comments via the online mapping tool.

The network needs incorporated a variety of considerations to determine which needs should be prioritized to most effectively improve walking and bicycling safety and connectivity. Ease of implementation, cost, timeframe, and facility ownership were all considered as the network needs assessment was used to develop the recommendations in the *Master Plan*.



Image credit: FHI

A blue-tinted photograph of a street intersection. In the foreground, a white SUV is driving away from the camera. To the left, a dark sedan is driving towards the camera. In the background, there are utility poles, power lines, and a stop sign on a post. Below the stop sign is a '3-WAY' sign. Further back, there are signs for 'SOUTH-NORTH 303 303' and 'LAKE'. The overall scene is a typical urban or suburban street intersection.

Traffic deaths are the leading cause of death for Americans age 5-24.

Data source: National Vital Statistics System, National Center for Health Statistics, CDC.

Providing alternatives to driving reduces this risk.

CHAPTER THREE

RECOMMENDATIONS

Master Plan recommendations are based on the vision and goals defined by the community as well as the technical analysis performed throughout the study. The foundation of these recommendations is safety. Pedestrian and bicyclist safety must be made the highest priority. In turn, these safety improvements create a safer environment for all users, including motorists. And it is not just about safety for bicyclists and pedestrians, but about safety for all. The transportation system must be accessible and equitable to accommodate all users.

Recommendations have been organized into two categories: **Network and Facilities**, and **Policies and Programs**. Within each category, recommendations have also been organized into two tiers, with Tier I including highlighting projects suggested for earliest implementation. This list was determined by a number of factors, including which recommendations were the most compatible with the vision and goals as well as which recommendations offer the most effective and efficient strategies to enhance street safety.

More detailed information has been included for the Tier I recommendations that is intended to assist with their quick implementation. This includes a brief description, visual illustrations as appropriate, and information on quick build opportunities. The process for pursuing quick build opportunities has been highlighted in the graphic below and is discussed in further detail in Chapter 5: Implementation within this plan.

While the visualizations contained herein provide proof of concept, further engineering analysis may be necessary prior to implementation. These concept plans are intended to support decision-making and policy and are not intended as final designs. In many cases, concepts are intended not only to improve street safety but to support place-making and enhance a range of community assets.

The recommendations presented in this plan are consistent with recent local planning efforts and complementary to related efforts such as the *Orangetown Bike Study*.

Quick-Build Approach

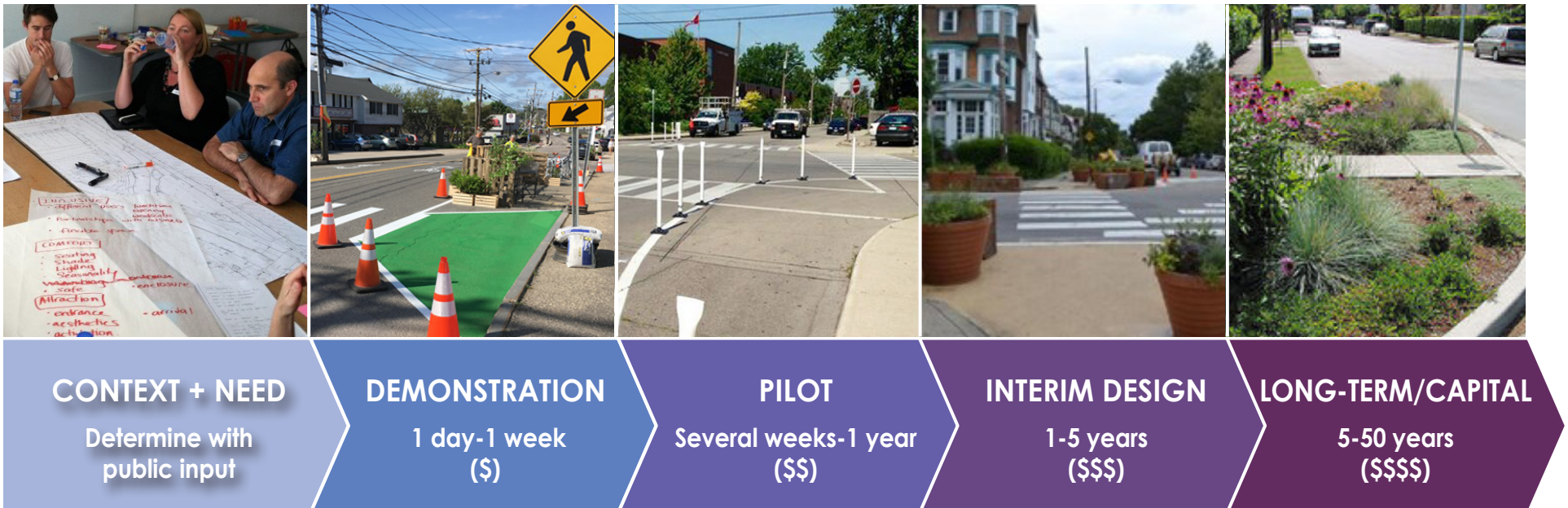


Image credit: Street Plans

Network and Facilities

Tier I

- Shoulder Repainting Program
- Designate School Slow Zones
- Crossing Improvement Program
- ADA-Compliant Facility Assessment
- Leading Pedestrian Intervals (LPI)
- Signing Program
- South Broadway at Old Erie Path/Esposito Trail
- Gedney Street Multimodal Improvements
- North Broadway to Nyack Beach State Park
- Route 303 and New Lake Road and Christian Herald Road Intersection Improvements
- North Midland Avenue and Old Mountain Road Intersection Improvements
- Birchwood Avenue and Old Mountain One-Way Road Couplet and Shared Use Paths
- Main Street and Broadway Crossing Improvements
- Route 59 to Palisades Center
- Casper Hill Road / Kings Highway Pedestrian Connection

Tier II

- Hudson Avenue and Piermont Avenue Improvements
- Greater Nyack Area Gateway Signage
- Traffic Calming Strategies for North Midland Avenue
- Route 9W Traffic Calming Strategies
- Downtown Nyack Parking Utilization Study
- Transit stop improvements
- Multimodal Link Through Planned Open Space on North Broadway
- Paved side path on Esposito (Clinton to Cedar Hill)

Shoulder Repainting Program

Excessively wide travel lanes implicitly encourage motorists to drive at higher speeds, with little regard to posted speed limits or community context. A cost effective and quick way to address this issue is to visually narrow travel lanes using painted white lines to delineate shoulders, also known as channelization.

Local, regional, and state agencies should incorporate a review process of their roadways to assess which ones have lane widths that can be reduced to the narrowest appropriate width. Determining factors for lane width include functional classification (e.g., arterial, collector, local street) and whether the roadway is a truck and/or bus route.

But what exactly is the right lane width for each type of road? →

These recommended lane widths are based on FHWA's "Mitigation Strategies For Design Exceptions."

Type of Roadway	Recommended Lane Width
Arterial	11' for rural roadways, 10' for urban roadway
Collector	10' for urban and rural roadways
Local	9' for urban and rural roadways (except truck or bus routes)

(Source: A Policy on Geometric Design of Highways and Streets, AASHTO)

This process can be incorporated into the existing maintenance programs that already require routine repaving and restriping of roads. The Villages of Upper Nyack, Nyack, and South Nyack already coordinate on striping maintenance; this recommendation encourages a consistent striping approach among participant jurisdictions consistent with *Master Plan* safety and traffic calming recommendations.

Benefits of Shoulders and Channelization

- Reducing numerous crash types
 - » Head on crashes (15%-75% reported reduction)
 - » Sideswipe crashes (15%-41%)
 - » Fixed object crashes (29%-49%)
- Improving roadway drainage
- Increasing effective turning radii at intersections
- Providing emergency stopping space for broken down vehicles
- Providing space for maintenance operations and snow storage
- Providing an increased level of comfort for bicyclists

(Source: FHWA 'Safety Benefits of Walkways, Sidewalks, and Paved Shoulders')



Image credit: Connecticut Department of Transportation

Designate School Slow Zones

A fundamental principle of the *Master Plan* is that children should have safe, accessible opportunities to walk and bicycle in their communities, including trips to school. This recommendation would designate a school slow zone for all the public schools in the greater Nyack area. Private schools could submit an application to receive a designation of a school slow zone.

Zig zag pavement markings would be installed along all corridors that provide direct access to the school. The markings would be placed along a minimum of 300 feet of roadway from the access point to the school. These zig zag pavement markings would alert drivers that they are entering a school zone and need to slow down. Such markings should be paired with signage that reinforce this message. Consideration should be given to lowering the speed limit in such zones to a maximum of 20 MPH. Such pavement markings and similar traffic calming strategies could be quickly implemented through pilot projects that would raise awareness about zig zag markings and demonstrate their effectiveness.

Within a designated school zone, consideration for additional traffic calming measures such as speed humps, RRFBs, and crossing guards should be considered. Local communities should work with the Nyack Union Free School District to develop a robust and contextually appropriate set of traffic calming strategies for each school zone.

A possible funding source for designed school slow zones is the *NYS Transportation Alternatives Program (TAP)*. Funds support bicycle and pedestrian initiatives including Safe Routes to Schools activities. More information is available on the NYSDOT website: <https://www.dot.ny.gov/divisions/operating/opdm/local-programs-bureau/tap-cmaq>.



Image credit: WSDOT Blog



Image credit: Twitter, User: Joby Jacob



Image credit: WSDOT Blog

Crossing Improvement Program

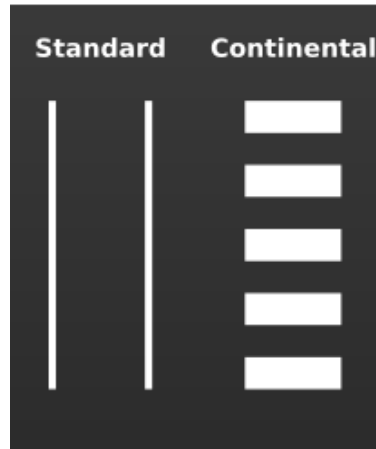
Various styles of crosswalks have been used throughout the study area yet a modern, consistent standard has not been applied throughout. This plan recommends continental crosswalks, widely considered safer since they are more effective at alerting motorists that they are approaching a pedestrian crossing. Continental crosswalks feature two-foot wide yellow or white painted stripes paired with a stop line set back from the crosswalk to reduce vehicular encroachment into the crosswalk. This design should be incorporated into existing maintenance programs that already include crosswalk repainting.

Additionally, on-street parking should be prohibited within 20 feet of a crosswalk at intersections and mid-block crossings to avoid impediments to motorist and pedestrian sightlines. Curb extensions should be considered at these locations to prevent illegal parking. A curb extension extends a portion of the sidewalk into the street at an intersection, which calms traffic, slows turning movements, shortens the crossing distance for pedestrians, improves visibility, and improves safety for all roadway users.

For example, the mid-block crossing along Depew Avenue between South Franklin Street and Liberty Street already features a daylighted area to increase visibility on the south side of the crossing. The addition curb extensions on the north and south sides would calm traffic and improve pedestrian safety at this crossing.

A combination of paint and flexible delineators can be used to quickly implement this recommendation until sufficient funds are available to move the curb. Where the installation of a curb extension impacts drainage, the curb extension can remain painted and be used primarily for on-street bicycle parking or a similar function. Alternatively, curb extensions can be designed with a one to two-foot gap between the existing curb and the extension, covered by a grate. This space would allow for a narrow drainage channel and mitigate the need to move the curb.

Paint and other special paving features along the curb extensions of a neighborhood's street also allow for an opportunity to introduce a new sense of vibrancy to that area that reinforces the community's identity and further pilots the treatment before final design. Planters or bike corrals can be placed in the space that is created by curb extensions if they are painted and additional amenities such as benches can be added once the extension has been constructed, further enhancing the streetscape. If the extension is painted, flexible delineators should be used to separate the space from traffic. Prior to winter storm forecasts, the delineators can be removed so that the extension can be used as space for snow banks by plows, with the exception of the crosswalk area which should remain clear of obstruction at all times.



Community-Led Paint the Intersection Program

Painted Intersection Programs are a way for the community to bring neighbors together through the creation of street murals. Engaging and empowering people to build public spaces reinforces a community's character through art and design.

Examples of such programs exist in Portland, Milwaukie, Los Angeles, New York, Saint Paul, and Seattle. Many programs require citizen groups to fill out a permit application that includes a sample of the artwork design that will be painted, specifies what materials will be used to create the design, and a signed approval petition of a certain percentage of all residents living within a certain amount of feet of an intersection.



Image credit: FHI

ADA-Compliant Facility Assessment

Pedestrian facilities should be accessible to all users. As an older community, the river villages have a wide range of sidewalk facilities (including notable gaps in the network) that is not uniformly accessible. The *Master Plan* recommends the development of an inventory of these facilities' compliance with ADA design guidelines.

Examples of what to include in the assessment include the existence of tactile warning strips and curb ramps at all locations where a crosswalk connects to a sidewalk. Following the completion of the assessment, an action plan should be developed to prioritize and implement necessary improvements.



Leading Pedestrian Intervals (LPI)

Pedestrian Use

Community members voiced the need for Leading Pedestrian Intervals (LPI) at intersections throughout the study area. LPIs direct pedestrians to start crossing three to seven seconds before vehicles in the same direction of travel are given a green signal. This improves visibility of pedestrians in the marked crosswalk and further emphasizes the pedestrian right-of-way.

Signal timing throughout the study area should be evaluated and reconfigured to include LPIs in areas of significant pedestrian activity. Intersections along South and North Broadway, Main Street, Route 9W, and Christian Herald Road should be prioritized.

Phase 1: Pedestrians only

Pedestrians are given a minimum 3–7 second head start entering the intersection.

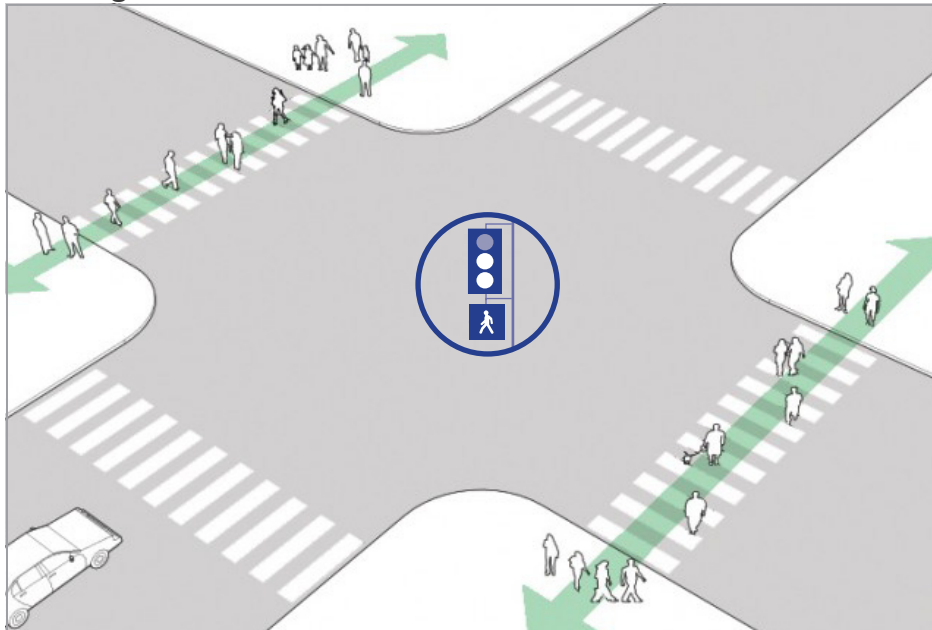


Image credit: NACTO

Bicycle Use

In addition to benefits to pedestrians, LPIs offer an opportunity for bicyclists to also take advantage of a short head start before vehicular traffic and increase their visibility. Signage indicating that cyclists may proceed on the walk signal is recommended, along with training and coordination with local law enforcement to ensure that this behavior is not treated as a traffic violation.

“Right hook” collisions are some of the most common crashes between motorists and bicycles. By allowing cyclists to ride through intersections during the LPI, they will have a head start, be more visible, and will be able to more safely traverse some of the study area’s most dangerous intersections.

Phase 2: Pedestrians and cars

Through and turning traffic are given the green light. Turning traffic yields to pedestrians already in the crosswalk.

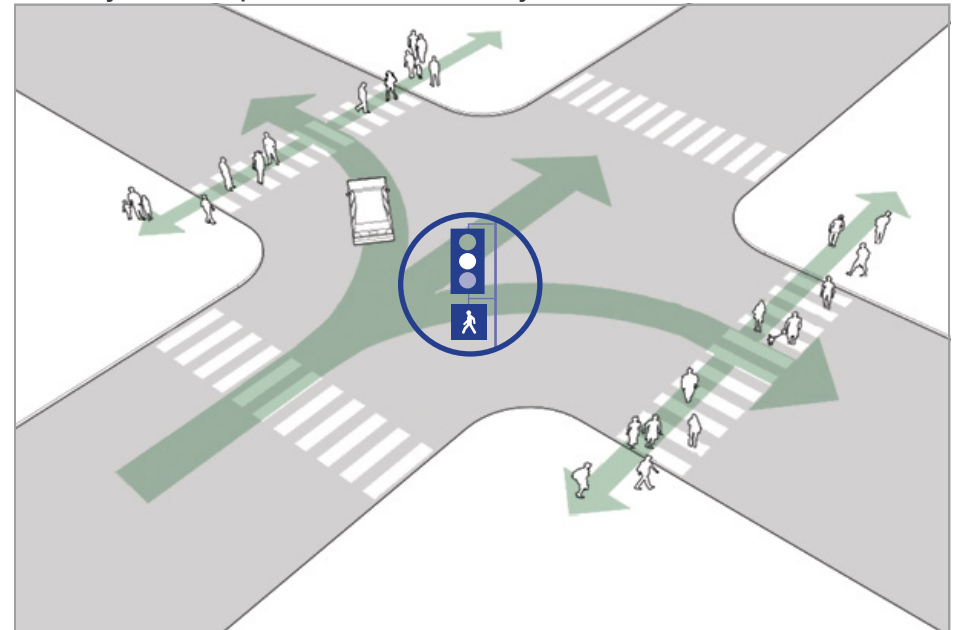


Image credit: NACTO

Signing Program

A key component of a bicycle and pedestrian network that is mostly absent is wayfinding signage to connect people to local destinations and highlight the viability of short walking and bicycling trips as an alternative to driving.

The Nyack river villages and school district should have a signage program throughout that directs pedestrians and people on bicycles to these destinations with cohesive branding and user-friendly information such as distance as measured by time, e.g., “It’s a 12-minute bike ride to Nyack Beach State Park.” Low-cost signage scaled for pedestrians and cyclists could be an interim solution before adding more durable options.



Image credit: FHI



Image credit: Street Plans



Image credit: FHI

South Broadway at Old Erie Path/Esposito Trail

The Old Erie Path/Esposito Trail is a vibrant and vital off-road option for mobility and recreation in the north/south corridor linking the river villages. It is generally free of street crossings, with a notable exception at South Broadway in Upper Grand View.

Trail users express significant concern about speeding vehicular traffic exiting Route 9W northbound to South Broadway. The trail crossing occurs on a downhill section, less than 400 feet from the split between Route 9W and South Broadway, offering little reaction time for drivers or trail users at the crossing. The posted speed limit also quickly changes from 40 MPH on Route 9W to 30 MPH on South Broadway, leaving motorists little transition time to slow down before they reach the crossing.

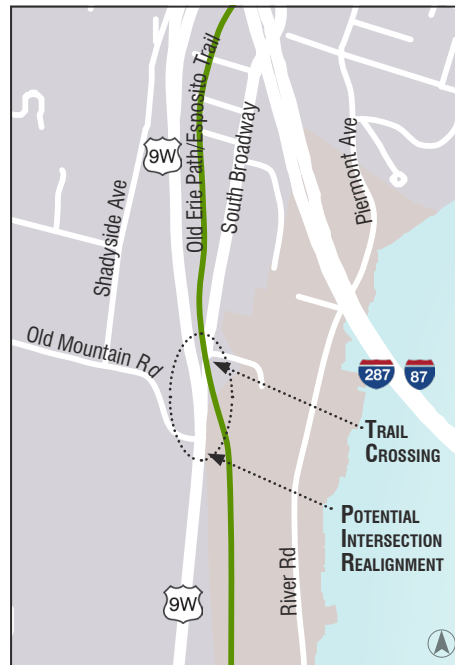
Additionally, it is recommended that the intersection of Route 9W, South Broadway, and Old Mountain Road be considered for potential realignment and/or signalization. The intersection's existing skewed alignment impedes motorists' sightlines at many of the approaches. The issue is compounded by the area's topography and surrounding wooded area. A signalized four-way intersection would afford safer turning movements for motorists and further calm northbound traffic on South Broadway at the trail crossing. This effort would require coordination between NYSDOT and local municipalities.

Quick-Build Opportunity

Recommendations to improve the safety at this crossing immediately include the following:

- Implement a consistent speed limit of 25 MPH on local streets throughout the study area
- Install advanced warning signage along South Broadway's approaches to the crossing (north and southbound)
- Paint zig zag pavement markings along the approaches

As soon as funding permits, install pedestrian-activated rectangular rapid flash beacons (RRFB) northbound and southbound in advance of the trail to further highlight this location and warn motorists to slow down and yield to pedestrians and bicyclists in the crossing.



Zig zag pavement markings

Zig zag pavement markings are currently being used by Virginia, Hawaii, and Washington's state DOTs and have been proven to slow average vehicle speeds, increase motorist awareness of pedestrians and bicyclists, and increase the likelihood that drivers will yield.

A 2015 study by the Virginia Department of Transportation (VDOT) that tested the effectiveness of zig zag pavement markings also found that the markings' effect remains strong over time.

Where else can we use zig zag pavement markings?

In designated school zones and along all on-road trail crossings.



Image credit: Virginia Department of Transportation



View of recommendations along South Broadway, looking northbound; Image credit: FHI

Gedney Street Multimodal Improvements

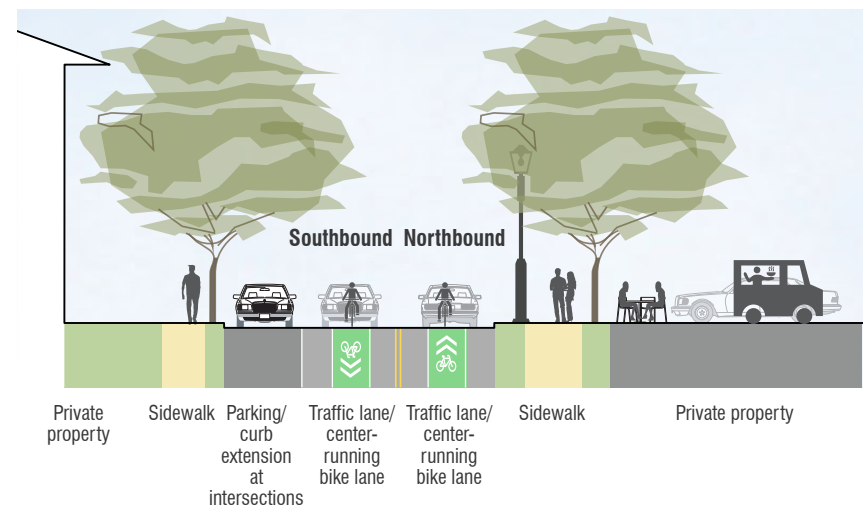
Gedney Street was identified by the community as a street in need of improvements for both bicyclists and pedestrians. Bike Route 9 follows Gedney Street from Piermont Avenue and Main Street to Fourth Avenue, providing an alternative to North Broadway for through cyclists. However, signage is limited and Gedney Street itself does not offer any protective infrastructure for bicyclists.

The sidewalk network is also incomplete and there are no crosswalks across Gedney Street from the residential side streets and developments along the river. The pavement width ranges from 28' - 32', which is an appropriate width for two traffic lanes and on-street parking. However, the straight geometry and lack of visual cues to calm traffic encourage speeding.

Calming traffic, enhancing pedestrian crossings and facilities, and improving the visibility of Bike Route 9 will enhance Gedney Street and create a more inviting, community-oriented street for all users.

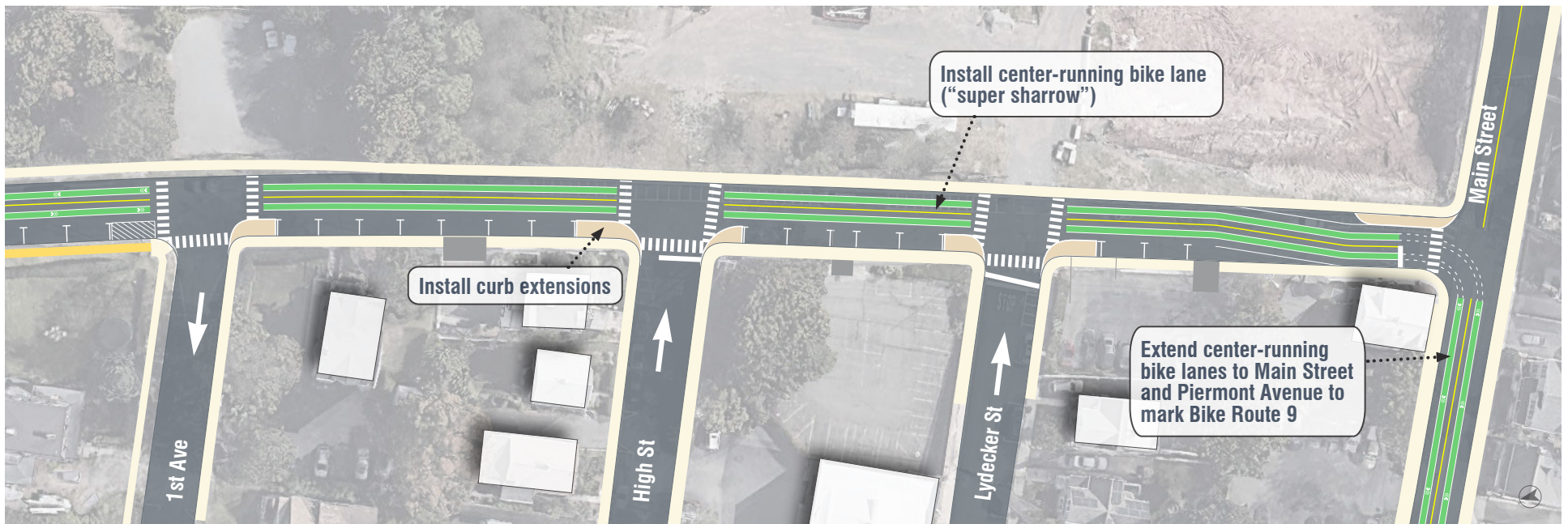
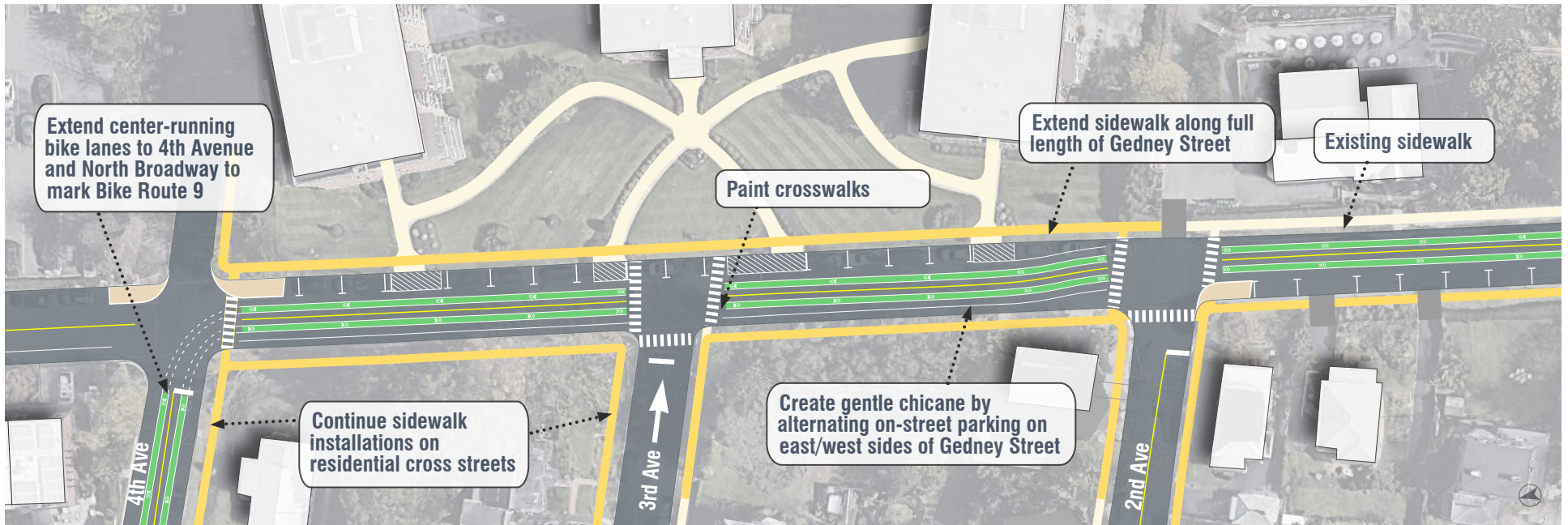
Alternating the side of the street which has on-street parking can create a chicane, introducing gentle curves to calm traffic. Curb extensions will prevent drivers from parking within crosswalks, shorten the crossing distance for pedestrians, and provide additional cues to drivers to slow down. While the road is not wide enough to add separated bike lanes and allowable signage in New York, such as “share the road”, has been found to be ineffective, this recommendation includes the installation of a center-running bicycle lane marking (sometimes referred to as a “super sharrow”). Such markings are intended to clarify that bicyclists have a right to “take the lane” and reinforce the Bike Route 9 functional designation.

Bicyclists are not required to ride in the center of the lane; however, such a practice is fully permissible. As with other recommendations, training and coordination with local law enforcement is vital to ensure that the new lane markings are understood and accepted.



Quick-Build Opportunity

Installing chicanes or a separated bikeway on Gedney as a quick-build project would present an opportunity to involve the community in the proposed enhancements. Public feedback can inform design iterations and complementary amenities to improve the pedestrian and bicycling realms.



North Broadway to Nyack Beach State Park

North Broadway serves an important function within the study area as a key connection to community resources including Upper Nyack Elementary School and Nyack Beach State Park, a popular recreational destination. The roadway currently lacks facilities for bicyclists and the existing sidewalk along the east side of the road terminates just north of Locust Drive. Its geometry and design can also encourage high vehicular speeds and there are no visual cues to encourage motorists to slow down.

While the existing paved right of way does not have the width to accommodate 9-foot vehicle travel lanes and 4 to 5-foot bicycle lanes, opportunities do exist to calm traffic and make the corridor safer and more inviting for walkers and bicyclists. Vehicle speed can be significantly moderated through the installation of chicanes at a few strategic locations along North Broadway between Old Mountain Road and the entrance to Nyack Beach State Park. Chicanes would prompt motorists to slow down and would narrow to limit passage to one car at a time. The chicanes would be set away from the roadway edge so as to have no impact on drainage and also allow bicyclists to ride through in a straight line at the roadway edge while car traffic slows to navigate the chicane.

This emphasis on speed reduction will offer the greatest improvement to safety and comfort. In conjunction with the chicanes, painting new shoulder striping to delineate 9-foot vehicular travel lanes will further offer visual cues to moderate speed while driving and offer some bicyclists a margin of comfort with a small shoulder. This recommendation is complementary to Upper Nyack's plans to complete the sidewalk to Nyack Beach State Park on the east side of North Broadway.



Image credit: FHI

Zig zag pavement markings



Image credit: WSDOT Blog

Bike friendly chicane

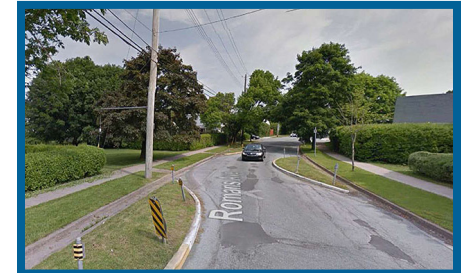
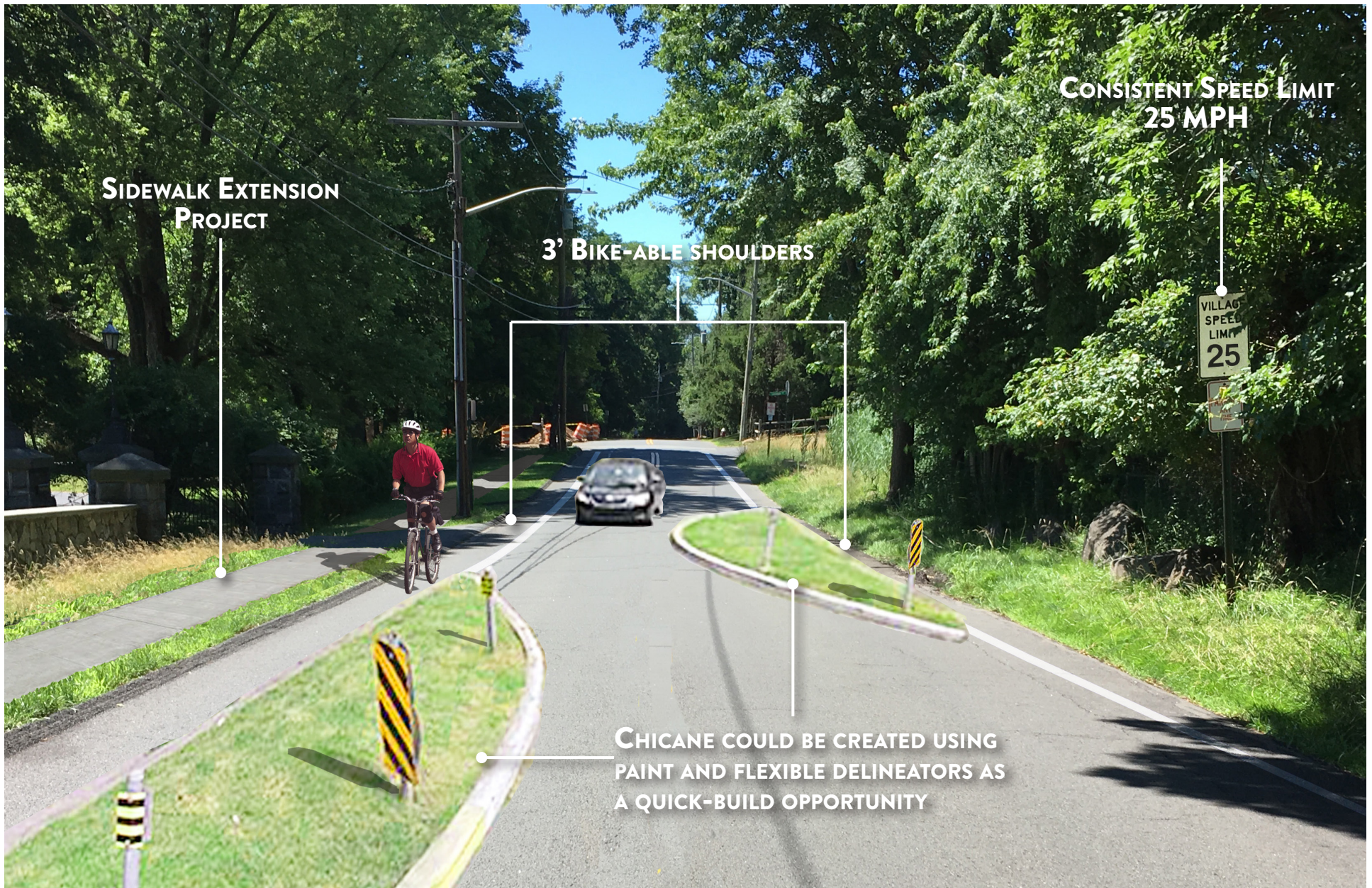


Image credit: FHWA Traffic Calming ePrimer- Module 3

Quick-Build Opportunity

Chicanes may be tested as a pilot project with tape, paint, and flexible delineators and enhanced through interim design to more attractive and context-sensitive designs with curbs and low plantings.

Additionally, attention should be paid to depressed catch basins and older drainage grates that are not bicycle-friendly. These may be signaled with paint so as not to invite incidents for bicyclists opting to ride close to the roadway edge. As funding permits, all drainage grates should be replaced with bicycle-friendly designs that do not catch bicycle tires.



View of recommended bike-friendly chicane along North Broadway, looking southbound ; Image credit: FHI

Route 303 and New Lake Road and Christian Herald Road Intersection Improvements

Community and Steering Committee members identified this complex intersection as a challenge and a persistent safety concern, particularly on foot and by bicycle. The configuration of a major signalized intersection (Route 303 and Lake Road) immediately adjacent to three stop signs at Christian Herald, Lake, and Ridge Roads creates multiple conflict points and confusing operational conditions for all road users.

Problems associated with the intersection(s) include:

- Limited delineated space for pedestrian crossings
- Lack of ADA-compliant tactile warning strips at all curb ramps
- Wide, multi-lane crossings with multiple turning movements
- Lack of clear travel ways for motorists at stop signs
- Excessively large corner radii which encourage vehicular speeding
- Steep gradient on Christian Herald Road

A more detailed study should be undertaken to focus exclusively on this intersection to determine the most effective way to address the overall traffic circulation through this intersection. Ideas that could be further explored include a potential roundabout, access management strategies or realignment of one or more of the approaches. All these potential ideas must consider what strategies will be most effective and implementable since Route 303 is owned and maintained by NYSDOT. Improvements to the traffic circulation to reduce friction and driver confusion will mitigate the greatest safety threats to pedestrians and bicyclists, such as speeding and aggressive turns. Local community members and this *Master Plan's* recommended Active Transportation Task Force should request this holistic look at the intersections to NYSDOT.

Adjustments to the signalization at Lake Road and Route 303 to incorporate an exclusive pedestrian phase (pedestrian-activated) should also be considered. An exclusive pedestrian phase is devoted only to pedestrians during a traffic signal cycle. No vehicular traffic moves during this phase and pedestrians may cross in any direction with enough time to cross diagonally. Exclusive pedestrian phases can greatly increase pedestrian safety if used in the appropriate context.

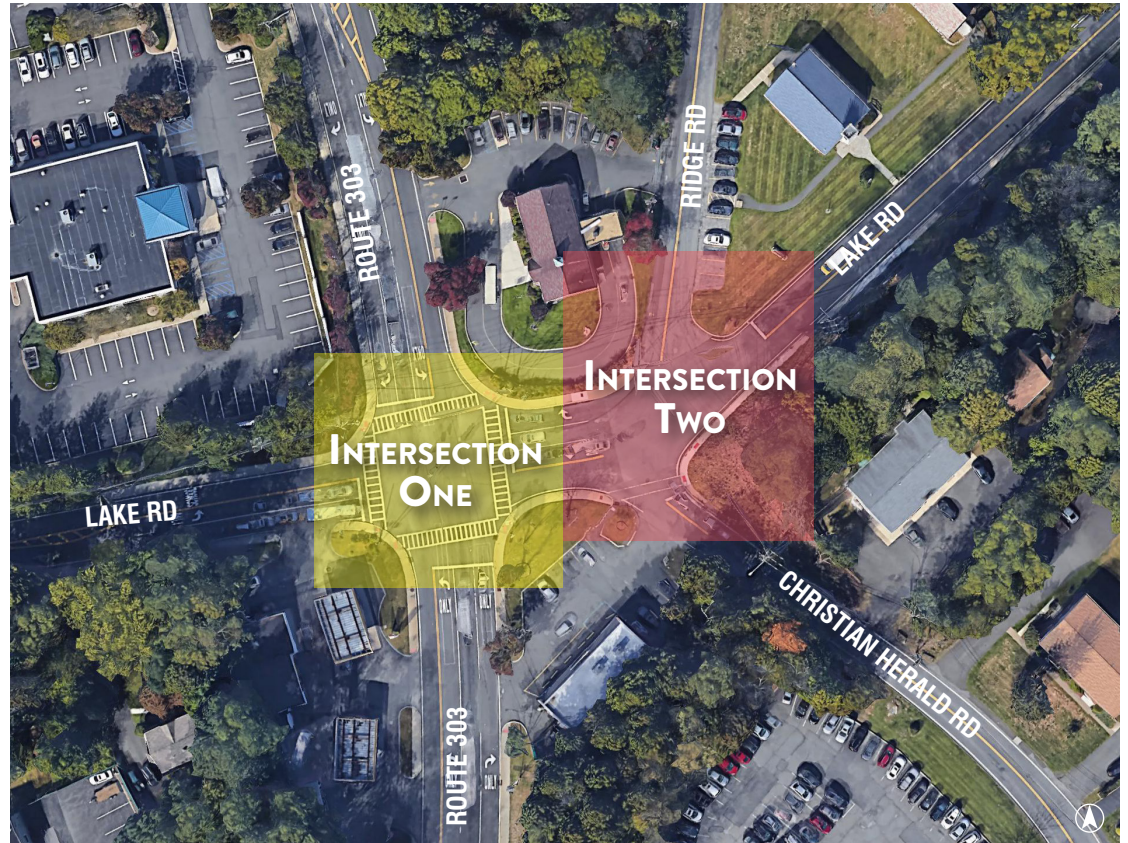


Image credit: FHI

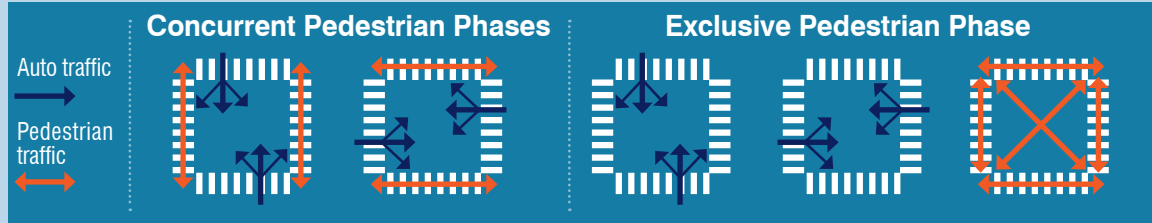
Quick-Build Opportunity

In the short-term, relatively low-cost improvements should be implemented as soon as possible to improve pedestrian safety and driver awareness at these intersections. The addition of highly visible crosswalks with unique paving (consistent with the typology seen in Valley Cottage west of Route 303) at Ridge Road, Lake Road and Christian Herald Road would clearly delineate a space for pedestrians to safely cross while also providing a visual cue to drivers to slow down.

INTERSECTION ONE

Exclusive Pedestrian Phase

An exclusive pedestrian phase is devoted only to pedestrians during a traffic signal cycle. No vehicular traffic moves during this phase and pedestrians may cross in any direction with enough time to cross diagonally. Exclusive pedestrian phases can greatly increase pedestrian safety if used in the appropriate context.



Where else can we use exclusive pedestrian phases?

It is recommended that this signal phase should be considered for intersections with atypical geometry, significant turning movements, high pedestrian volumes, and a record of high pedestrian-motorist conflicts.

INTERSECTION TWO



View of recommended crosswalks, looking northwest along Christian Herald Road; Image credit: FHI

North Midland Avenue and Old Mountain Road Intersection Improvements

The intersection between North Midland Avenue and Old Mountain Road provides an important connection between Nyack High School and Upper Nyack Elementary School to downtown Nyack and to the surrounding neighborhoods. Students frequently referenced this intersection as one they use when bicycling and walking. A sidewalk only exists along one approach, there are no crosswalks, and only controlled stops for motorists westbound on Old Mountain Road and southbound on North Midland Avenue. Visual cues are lacking to encourage traffic to slow down when approaching the intersection. The intersection can be improved for all users by:

- Realigning the southbound approach from North Midland Avenue
- Installing crosswalks and sidewalks
- Installing a pedestrian-activated Rectangular Rapid Flash Beacon (RRFB) eastbound on Old Mountain Road prior to the new crossing
- Installing advanced warning signage on eastbound Old Mountain Road and northbound North Midland Avenue

Sidewalks and crosswalks will more clearly delineate space for pedestrians and locations to more safely cross the street. Using vertical delineators and paint to tighten up the intersection will also narrow crossing distances and improve pedestrian visibility. Additionally, the realignment will provide a clearer indication to drivers that they are approaching an intersection and should slow down upon its approach.

The placement of an RRFB at the identified crossing as well as advanced warning signage along the eastbound Old Mountain Road approach to the intersection will further increase driver awareness of pedestrians crossing and encourage them to slow down. Hills and blind curves limit sight lines and inhibit drivers' ability to see pedestrians in the crossing until it might be too late.

Quick-Build Opportunity

In the short-term, the design treatments should be implemented using temporary and cost-effective installations to familiarize the public and establish the traffic calming measures. For example, painting 5-foot walking lanes, striped and protected by vertical delineators, is a cost-effective, interim measure before concrete sidewalks are installed. The next phase of the project would involve the installation of the permanent infrastructure that will require a more significant financial commitment.

Rectangular Rapid Flash Beacon (RRFB)

An RRFB is a pedestrian-activated traffic control device that uses to an irregular flash pattern similar to emergency flashers on police vehicles to increase driver awareness of potential pedestrian conflicts at unsignalized intersections or mid-block crossings.

How effective are they?

An official FHWA-sponsored experimental implementation and evaluation conducted in St. Petersburg, Florida found that RRFBs at pedestrian crosswalks are dramatically more effective at increasing driver yielding rates to pedestrians than traditional overhead beacons.

Where else can we use RRFBs?

Mid-block locations or uncontrolled intersections with high bicycle and/or pedestrian traffic where cars tend to speed and the road geometry, landscaping, or topography prevent a motorists from being able to see the crossing along the approach.

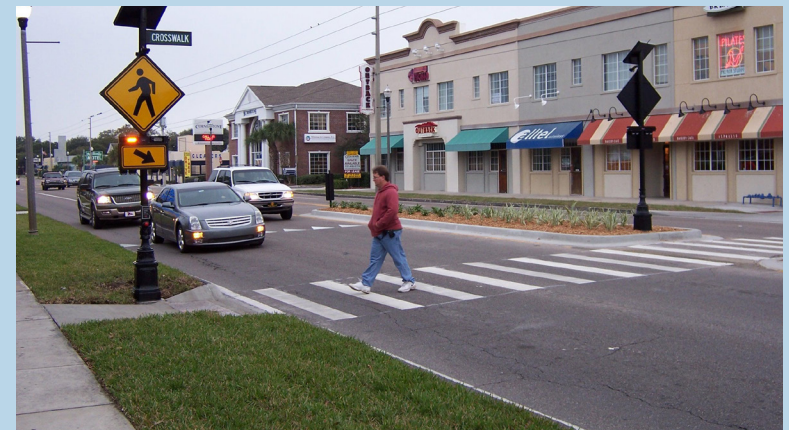


Image credit: FHWA Safety Strategies Study - Michael Frederick, City of St. Petersburg, FL



Image credit: FHI



Birchwood Avenue and Old Mountain One-Way Road Couplet and Shared Use Paths

Birchwood Avenue and Old Mountain Road provide east-west connections between Route 9W and North Broadway in Upper Nyack. Located less than ¼ mile from one another, neither of these parallel streets includes any facilities for bicyclists or pedestrians between North Midland Avenue and North Broadway, despite the designation of Old Mountain Road as Bike Route 9. This gap in the multimodal network hinders safe and convenient bicycling and walking connections to and from nearby destinations, including Nyack High School, Upper Nyack Elementary School, and Nyack Beach State Park.

The recommendation of a new one-way couplet on Old Mountain Road (westbound only) and Birchwood Avenue (eastbound only) between North Midland Avenue and North Broadway builds off a concept considered by the Village of Upper Nyack. Traffic patterns would not change too significantly since the streets are proximate and could serve as an adjacent pair. Additionally, directing eastbound and southbound traffic to Birchwood Avenue would further improve safety at the challenging intersection of Old Mountain Road and North Midland Avenue by pushing turns further south where visibility is greater.

Since only one travel lane would be needed on each street for cars, the other lane could be converted to a shared-use path, with bicyclist travel consistent with the direction of vehicular traffic flow. Two-way bicycle lanes are not recommended in this instance given the steep grade on Old Mountain Road and the potential for head-on collisions.

Shared-use paths are facilities that are physically separated from a traffic lane and designed to be used for bicycling and walking. They are typically a minimum of ten feet wide and can include a centerline to encourage bicyclists and pedestrians to use separate sides of the path and reduce potential conflicts. A landscaped buffer can provide further protection from adjacent traffic but should be placed at strategic locations where it wouldn't inhibit access to residents' driveways or negatively impact drainage.



Quick-Build Opportunity

This recommendation is ideal for quick implementation at relatively low-cost to test its effectiveness and impact. Flexible delineators and paint could be used to clarify which side of the street would remain a vehicular travel lane. The transition to a one-way street could be clearly conveyed to motorists through signage and traffic enforcement at the early stages of implementation. Besides being worked into routine local restriping efforts, as a significant bicycle network connector, a permanent installation could be eligible for funding from a state sources such as TAP funds or a NYS DEC Climate Smart Communities grant .

This recommendation would involve minor, additional changes to the intersection of Old Mountain Road and North Midland Avenue, including signage to alert drivers and bicyclists to the new one-way traffic patterns and introduction of bicycle and walking facilities.



Image credit: FHI

Case Study: Lutherville, Maryland

In July 1999, the Baltimore County (MD) traffic engineering division implemented a pilot project to convert three streets in the heart of the historic neighborhood of Lutherville to one-way operation in an effort to reduce speeding and cut-through traffic associated with a nearby transit station and the Baltimore Beltway. As part of the pilot in July 1999, space was created in the second travel lane on Francke, Front and Kurtz Avenues for walking and bicycling. The historic neighborhood lacked sidewalks on many streets.

After a period of observation, including healthy community debates over the merit of the traffic calming measures, the decision to make the change permanent was put to a neighborhood vote. In a November 2000 vote, a clear majority expressed support for the change, citing the benefits of newly created space for walking and bicycling. Subsequently, the Baltimore County Council voted unanimously in favor of the change. Baltimore County enhanced the original design, which used flexible vertical delineators and paint, to feature mountable curbs and grass medians separating the vehicle lane from the new lane for active transportation.

Main Street and Broadway Crossing Improvements

Numerous intersections were identified as safety concerns by members of the community, including nearly all intersections along Main Street in downtown Nyack. This recommendation is intended to represent an example of how such intersections can be improved for all users' safety. Traffic calming and safety strategies included in this recommendation should be considered for other similar intersections throughout the study area.

The ongoing TAP project for the Village of Nyack includes improvements along South and North Broadway, such as suggestions for additional crosswalks, curb extensions and other similar elements at many intersections. Since the intersection at Main Street already features high visibility crosswalks and a curb extension, the TAP project's recommendations are primarily focused on improvements to the streetscape.

This *Master Plan* supports the recommendations included in the TAP project and suggests that additional treatments should be considered to further enhance safety at this central intersection. Two additional curb extensions at the intersection's northeast and northwest corners are recommended. These curb extensions would reduce the turning radius for cars, forcing them to slow down, and shorten the

crossing distance for pedestrians. The extension on the northwest corner could be created with paint and flexible delineators in order to avoid impacting the drainage grate that exists at that corner. When curb extensions are built out permanently with concrete, crosswalks on Main Street should also be raised to further enhance pedestrian visibility and calm traffic. Raised crosswalks also improve accessibility since pedestrians can cross at nearly a constant grade from the sidewalk without the need for a curb ramp.

Additional paint to more clearly define the space for the bus stop will deter motorists from encroaching into this space, reduce confusion, and more effectively organize traffic on North Broadway.

Lastly, an optional strategy that should be considered is the development of a community-led program to paint the intersection. Such intersection painting projects have been facilitated by local governments and/or community groups across the US and have been successful way to encourage citizen involvement, create a sense of neighborhood, and bring people together. It transforms a car-dominated space to one that is reclaimed by the community in a cost-effective way.

Quick-Build Opportunity

In the short-term, both curb extensions should be implemented using temporary and cost-effective installations to familiarize the public and establish the traffic calming measures. Paint can be used to define the space, which would be protected by vertical delineators as a cost-effective interim measure before concrete extensions are installed at the corners. The next phase of the project would involve the installation of the permanent infrastructure that will require a more significant financial commitment.

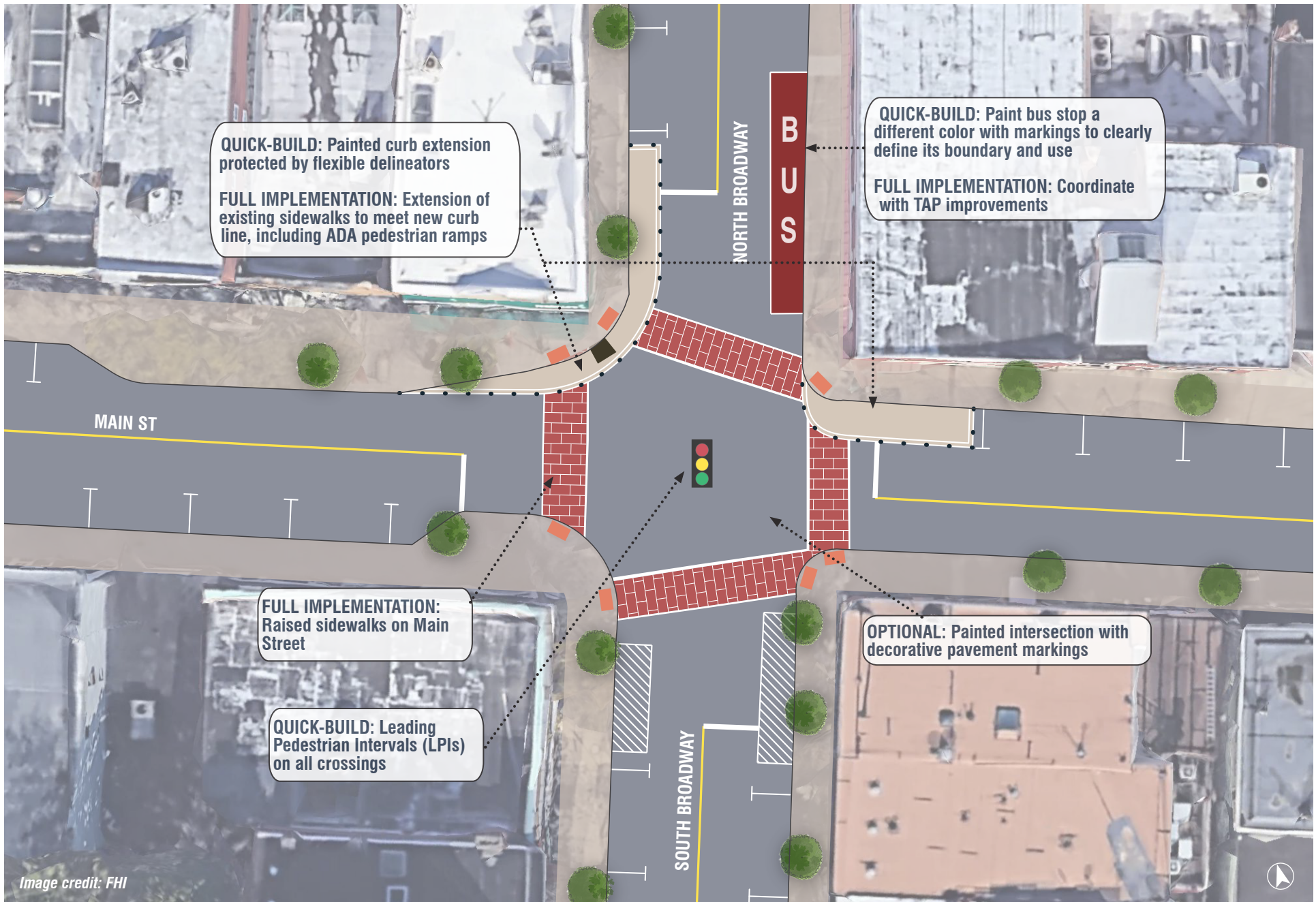
Village of Nyack's Pedestrian Safety Action Plan (PSAP)

In June 2018 the Village of Nyack was awarded \$370,000 for its Pedestrian Safety Action Plan (PSAP). The funding was awarded in response to a grant application and has been provided by NYSDOT in consultation with the Mid-Hudson South Transportation Coordinating Committee (MHSTCC).

The village is planning to use the funding to provide pedestrian safety improvements at four signalized intersections: **Main Street and North Broadway**, 5th Avenue and Midland Avenue, High Avenue and Midland Avenue, and Depew Avenue and South Broadway. Potential improvements include signalization, such as pedestrian countdown timers and LPIs, as well as overhead street name signage, and ADA-compliant crossings.



Main Street and North Broadway (Image credit: FHI)



Route 59 to Palisades Center

The Palisades Center mall is a major regional destination for shopping and an important employment center. However, without an automobile, access to the mall from Nyack and surrounding communities is difficult and dangerous. Sidewalk connectivity is limited and discontinuous and no infrastructure for safe bicycling is provided on Route 59. In early 2018, an area resident was struck and killed by a driver on Route 59.

A safe, continuous connection for pedestrians and bicyclists is vital to encouraging access to employment and other opportunities at this regional center. While it will be a long-term investment, this *Master Plan* recommends the installation of a sidewalk and/or shared-use path along Route 59 right of way to allow a safe, direct connection between Nyack and the Palisades Center.

Quick-Build Opportunity

In the short-term, it is recommended that an alternative safe route for bicyclists and pedestrians be identified with creative signage. In advance of active transportation accommodations on Route 59, a targeted signage and wayfinding campaign, working with the Town of Clarkstown and Central Nyack, can guide walkers and bicyclists through lower volume streets south of Route 59 (e.g., Upper Depew, Lawrence, Hall, Waldron, Laurel, Cresthill, Old Highway 59). While neither a direct nor complete route, this option may offer bicyclists in particular a safer and more comfortable alternative to Route 59. This route does not offer continuous sidewalks and would add significant walking time.



Image credit: FHI



Route 59, westbound; Image credit: Google Street View

Casper Hill Road / Kings Highway Pedestrian Connection

Casper Hill Road transitions to become Kings Highway north of Storms Road in Valley Cottage. Together, these streets were identified as one of the corridors most in need of improvement according to the project’s Needs Assessment. The streets provide an important connection between the surrounding neighborhoods to the local shopping center to the northeast at the corner of Kings Highway and New Lake Road.

While the sidewalks and crosswalks at New Lake Road and King’s Highway are in very good condition, pedestrian facilities along these streets to the south of that intersection are limited to the a small stretch of sidewalk.

The installation of a sidewalk along the west side of the Kings Highway and Casper Hill Road would provide a much-needed way for residents to safely walk to a key local destination. Improvements to key intersections at Casper Hill Road and Storms Road as well as painting crosswalks at all approaches at New Lake Road and King’s Highway would further strengthen the pedestrian environment. Such improvements should include pedestrian signals for signalized intersections and ADA-compliant facilities such as tactile warning strips and curb ramps.



Casper Hill Road; Image credit: Google Street View



Kings Highway; Image credit: Google Street View



Hudson Avenue and Piermont Avenue Improvements

Members of the public identified the intersection of Piermont Avenue and Hudson Avenue as a dangerous crossing location to one of Nyack's greatest community assets, Memorial Park. The stop bar for northbound vehicles on Piermont Avenue is located about 120 feet south of the crosswalk at Hudson Avenue. An excess of pavement creates too much opportunity for speeding and failure to yield to pedestrians.

This intersection should be modified in three ways:

1. The right turn segment of roadway for vehicles turning southbound should be closed.
2. The stop bar for northbound vehicles should be pulled toward the intersection at Hudson Avenue, creating a safer, more traditional three-way stop.
3. The triangle of asphalt created by the existing pavement markings and right turn segment on Hudson Avenue should be converted into open space (e.g., community garden or small park).

These intersection modifications add more visibility to people crossing into the park on foot, improve safety for drivers and bicyclists, and establish a more aesthetically pleasing and contextually appropriate gateway to the park and to the Village of Nyack.

Greater Nyack Area Gateway Signage

Gateways provide an excellent opportunity to create a strong first impression and immediately establish a community's visual identity. However, there is currently little to no indication at the key entryways to the villages and hamlets that residents and visitors are about to enter a unique area with a distinct character. This reflects a missed opportunity to design the public realm in a way that reflects the character and community that define the West Side. The lack of clear gateways also often creates confusion regarding the boundaries and causes people to fail to consciously recognize the area as an identifiable place with no clear orientation to its numerous assets.

It is recommended that gateway signage and branded design elements should be installed at key gateways into the villages and hamlets to indicate entryway into the Greater Nyack area and establish the community's identity. The design of the signage and branding elements should be determined in collaboration with the community through an open and transparent design process that encourages input. Once installed, any landscaping elements should incorporate native plantings wherever possible. Opportunities for local public art installations should also be considered.

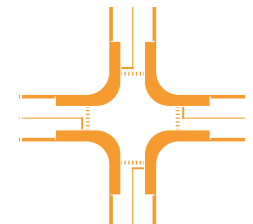
Traffic Calming Strategies for North Midland Avenue

North Midland Avenue was frequently identified as a corridor where motorists frequently travel at high speeds given the often excessively wide right of way and lane widths. This recommendation identifies potential traffic calming strategies that should be considered for this corridor. They could all be implemented for maximum effect or each measure could be implemented as a stand-alone strategy. While corridors such as North Midland Avenue are highlighted in this *Master Plan*, these strategies are applicable throughout the school district.

Speed table



Curb extensions



Chicanes



Channelization



Route 9W Traffic Calming Strategies

Route 9W is a key connection within the study area and a designated NYS bike route. The segment south of Main Street was identified by the community throughout the development of this *Master Plan* as a dangerous corridor to bike on due to the high traffic speeds. This segment of the roadway travels through mostly a mostly wooded residential area and intersects with few other main corridors. There are no visual cues or changes in the roadway’s design or geometry that would encourage motorists to slow down. Furthermore, the roadway right of way is severely constrained by topography and adjacent residential properties.

This recommendation includes removing 9W between Main Street in Nyack and Highland Avenue in Orangetown from the Bike Route 9 designation, as this corridor has been repeatedly flagged as unsafe and unwelcoming to bicyclists. This demapping should be accompanied by more robust Bike Route 9 signage and wayfinding at key turns, to prevent bicyclists from unwittingly following a higher speed and more dangerous segment of 9W.

Greater opportunity for safety improvements exists on Route 9W north of Main Street, where concerns were raised by community members and stakeholders about pedestrian crossings near Nyack Hospital and Nyack High School, among other locations. This *Master Plan* recommends the following traffic calming strategies, compliant with NYSDOT standards:

- Curb extensions at pedestrian crossings including High Avenue, Nyack Hospital, Fifth Avenue, Birchwood Avenue, Elm Street
- Speed limit pavement markings to provides an additional display of the lawful speed limit on the roadway. These markings are used to supplement speed limit signs and reinforce the transition from to the lower (current) 30 MPH speed limit through Nyack.
- Lane striping to visually narrow travel lanes using painted lines to delineate shoulders or bike lanes. The east side of North Highland Avenue (Route 9W) currently has a striped shoulder; however, the west side does not in the vicinity of Nyack Hospital, where on-street parking is more prevalent.
- Median intersections or pedestrian refuge areas can be created with small islands that replace the centerline and narrow travel lanes. These decrease pedestrian crossing distance and allows two-stage pedestrian crossing.

Traffic Calming Along New York State Roads

NYSDOT’s *Highway Design Manual* (1999) includes a chapter that defines its policy statement and design guidance on traffic calming along state roads to assist regional and local agencies throughout the process. For example, it includes examples of objectives that could be achieved by traffic calming as well as a list of test question to help organizations determine if traffic calming is viable. It also explains the applicability of traffic calming techniques, and describes the speed categories established specifically for traffic calming measures.

An excerpt from Table 25-1: Suitability of Traffic Calming Features for Speed Categories has been provided below. For more information, view the full manual at the following URL: <https://www.dot.ny.gov/divisions/engineering/design/dqab/hdm/chapter-25>

		Traffic Calming Features	
		Speed Tables	Curb Extensions at Intersections
CATEGORY I (NEIGHBORHOOD) (15 - 25 miles/hour)		Suitable	Suitable
CATEGORY II (25 -35 miles / hour)	Local streets or roads	Not recommended >30 miles / hour	Suitable
	All other streets or roads	Not recommended	Suitable only with upstream parking
CATEGORY III (35 - 50 miles / hour)		Not permitted	Suitable
CATEGORY IV (over 50 miles / hour)		Not permitted	Not permitted
SPEED REDUCTION		Yes	Slight
VOLUME REDUCTION		Possible	No

Source: NYSDOT Highway Design Manual (revision 36), Chapter 25 - Traffic Calming, Table 25-1 Excerpt

Downtown Nyack Parking Utilization Study

Downtown Nyack's streets are often characterized by their narrow width and the prevalence of on-street parking. Many community members also expressed that the sidewalks in this area are too narrow for the amount of pedestrian traffic, especially along segments that also contain sidewalks signs or other street furniture.

A parking utilization study should be performed for Downtown Nyack to assess the true need in the neighborhood. This study would include an assessment of the utilization of existing on-street parking spaces as well as the capacity of nearby parking lots to absorb additional parking needs if any on-street parking was removed. This study should also consider planned future developments in the area as it relates to parking needs.

The purpose of such a study would be to determine potential locations that might benefit if on-street parking is removed to allow for wider sidewalks along certain segments. This study could be paired with the development of a Parklet Permitting Program that would allow underutilized on-street parking spaces to be transformed into public spaces for the community. A Parklet Permitting Program is an innovative and cost-effective way to add public gathering space to public streets and reinvigorate underutilized spaces.

Parklets

Parklets are temporary installations would be placed within the parking lane to allow for an extension of the sidewalk and space for additional pedestrian amenities, such as comfortable seating areas, unique landscaping, or other creative design installations. Parklets have been found to lead to the following benefits:

- Provides the opportunity for enhancements like seating, landscaping, bike parking, and art by extending the sidewalk
- Empowers the community to participate in the beautification of the public realm
- Supports local business communities by activating community corridors
- Fosters community interaction and social engagement
- Improves walkability
- Allows for temporary installations that can easily be removed if parking demand increases

Where else should parklets be permitted?

Cities with an established Parklet Program typically stipulate that parklets are only allowed on streets that are commercial corridors and have traffic speeds of 30 MPH or less.

For guidance on the implementation of a Parklet Program, refer to San Francisco's Parklet Program (http://pavementtoparks.sfplanning.org/docs/SF_P2P_Parklet_Manual_2.2_FULL.pdf) and Minneapolis' Parklet Application Manual as two successful examples.



Image credit: Sacramento Bay Area Bicycle Advocates



Image credit: Minneapolis Parklet Program

Transit Stop Improvements

The greater Nyack area is served by multiple public transportation services that connect to the bicycle and pedestrian network, including the Tappan Zee Express (TZx), Transport of Rockland (TOR), Coach USA (formerly Red and Tan buses), TRIPS Paratransit Service, and Clarkstown Mini-Trans. Starting in November 2018, the new Lower Hudson Transit Link (LHTL) bus network will replace the TZx and connect Rockland and Westchester Counties via the Governor Mario M. Cuomo Bridge.

Transit use is highly dependent on safe and convenient pedestrian access to bus stops. Historically, the facilities that support these services can be difficult to identify and lack basic amenities such as benches, shelters, or bus route information signage. As a general rule, transit stops should be improved, giving stops that attract the highest ridership priority for improvements including bus bulbs, shelter, seating, bus route information signs, trash cans, and/or lighting. Bus bulbs and curb extensions are recommended where transit users have limited space to wait before boarding and buses lose valuable time pulling out of traffic to the curb and waiting to pull back in. At these locations, transit users are either forced to wait in close proximity to vehicle traffic or block the pedestrian right of way, compromising safety and accessibility for all.

The LHTL service design includes physical improvements, under construction as this Master Plan is written, at station locations including Artopee Way in downtown Nyack, and Route 59 at Mountainview/Waldron Avenues, and the South Franklin Street Extension in South Nyack (Exit 10 Interchange). Improvements include traffic signalization, transit signal priority, pedestrian countdown timers, leading pedestrian intervals (LPIs), high-visibility crosswalks, ADA pedestrian ramps, bike racks, and signage. LHTL buses will be equipped with bike racks to further encourage multi-modal travel.

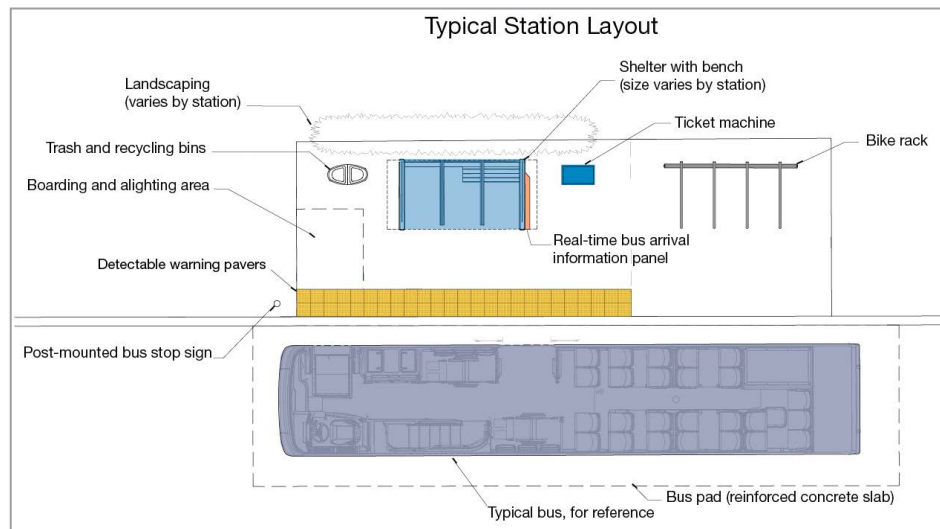


Image credit: LHTL Factsheet

Paved Side Path on Esposito (Clinton to Cedar Hill)

The forthcoming Share Use Path (SUP) on the Governor Mario M. Cuomo Bridge will enter South Nyack with a paved portion for bicycling and an unpaved section for walking, joining the existing Esposito Trail and terminating at Clinton Avenue and Franklin Street. A two-way bicycle lane, to be funded through a TAP grant, is under consideration along South Franklin Street to Artopee Way in Nyack to continue the SUP connection into downtown Nyack.

To continue the transition from the Esposito Trail and SUP north to downtown Nyack, create a paved side path at the top of the embankment along the existing Esposito Trail between Clinton and Cedar Hill Avenues. This land is owned by South Nyack and offers an opportunity for an off-street continuation of bicycling facilities from the SUP, ideal for those users not fully comfortable bicycling on-street. The original Esposito Trail would remain in its current condition, a cinder path at the bottom of the embankment, with appropriately scaled signage restricting it to walkers rather than bicyclists.

Multimodal Link Through Planned Open Space on North Broadway

This *Master Plan* endorses the concept developed by the Village of Upper Nyack for a green space at 626 North Broadway with a meandering path for recreational use. It is recommended that this project should also consider the inclusion of a bicycle and pedestrian link that could be used as an alternative to existing on-road east / west travel options.

Changing our way of thinking

Traffic deaths are **INEVITABLE** → Traffic deaths are **PREVENTABLE**

PERFECT human behavior → Integrate **HUMAN FAILING** in approach

Prevent **COLLISIONS** → Prevent **FATAL AND SEVERE CRASHES**

INDIVIDUAL responsibility → **SYSTEMS** approach

Saving lives is **EXPENSIVE** → Saving lives is **NOT EXPENSIVE**

Policies and Programs

Tier I

- Complete Streets Ordinance
- Road Safety Campaign for All Users
- Multi-Village / Town Active Transportation Task Force
- School Bicycle and Pedestrian Promotion Program
- Design and Maintenance Standards
- Sidewalk Maintenance Plan
- Neighborhood Walks Program

Tier II

- Maintenance Request & Reporting Mobile App
- Ban Right Turns on Red in Commercial Districts
- Active Transportation Community Center
- Community Service Officers (CSOs) Internship Position
- Local Law Enforcement Multimodal Training Programs
- Bike Share Program Partnership Opportunities
- Increase Bicycle Parking
- Annual Bicycle Events
- Default 25 MPH Speed Limit
- Safe Streets for Seniors Initiative
- School Bicycle Safety Class

Adopt a Complete Streets Ordinance Across the Study Area

Complete Streets ordinances direct municipal governments to develop streets for all road users, regardless of age, ability, and experience. Not all communities in the study area have passed Complete Streets policies, which presents an opportunity to pursue one consistent ordinance across all Nyack river villages and the school district. A successful Complete Streets ordinance in the study area will be consistent with the National Complete Streets Coalition's "Ten Elements of a Complete Streets Policy."

The ordinance should include language that directs communities to prioritize locations based off factors such as equity, public health, and land use. Ordinances also present opportunities to modify existing traffic laws, such as banning right turns on red in commercial zones or reducing the jurisdictions' maximum speed limit to 25 MPH. An ordinance may also earmark local funding for active transportation projects.

As a starting point, the Towns and Villages should look to other policies, including the Town of Clarkstown Complete Streets Resolution (2017), Rockland County Complete Streets Initiative (2015), New York State Complete Streets Act (2011), *Mid-Hudson Regional Sustainability Plan*, and Rockland County's Complete Streets Online Toolbox. The following step would be to convene all area jurisdictions along with the school district to see how a Complete Streets ordinance can build on these policies to include clauses related to funding, enforcement, maintenance, education, equity, design standards, and programming. Once passed, this policy will help direct all municipalities to coordinate their efforts from grant writing through implementation.



The National Complete Streets Coalition's "Ten Elements of a Complete Streets Policy"

An ideal Complete Streets policy includes the following:

- 1. Vision and intent:** Includes an equitable vision for how and why the community wants to complete its streets. Specifies need to create complete, connected, network and specifies at least four modes, two of which must be biking or walking.
- 2. Diverse users:** Benefits all users equitably, particularly vulnerable users and the most underinvested and underserved communities.
- 3. Commitment in all projects and phases:** Applies to new, retrofit/reconstruction, maintenance, and ongoing projects.
- 4. Clear, accountable expectations:** Makes any exceptions specific and sets a clear procedure that requires high-level approval and public notice prior to exceptions being granted.
- 5. Jurisdiction:** Requires interagency coordination between government departments and partner agencies on Complete Streets.
- 6. Design:** Directs the use of the latest and best design criteria and guidelines and sets a time frame for their implementation.
- 7. Land use and context sensitivity:** Considers the surrounding community's current and expected land use and transportation needs.
- 8. Performance measures:** Establishes performance standards that are specific, equitable, and available to the public.
- 9. Project selection criteria:** Provides specific criteria to encourage funding prioritization for Complete Streets implementation.
- 10. Implementation steps:** Includes specific next steps for implementation of the policy.

Case Study: Binghamton Metropolitan Transportation Study's Complete Streets Policy

Most Complete Streets policies are passed by individual municipalities, but there are some examples of multi-jurisdictional policies that the Nyack river villages and school district can reference when developing a consistent Complete Streets ordinance. Binghamton Metropolitan Transportation Study (BMTS), the regional metropolitan planning organization (MPO) centered around Binghamton, NY, adopted a resolution accepting the Complete Streets Policy in 2016.

Although the City of Binghamton had adopted municipal policies at the time, most of the municipalities in the region had not. BMTS's policy covered all cities and villages in the region under a consistent policy that envisioned an "equitable, balanced, and effective transportation system" for all road users. In addition to developing a unified vision, the policy defines how Complete Streets policies will be integrated into the funding and implementation process. Proposals are required to include a NYSDOT Complete Streets Checklist and explain how the project will be "Complete Streets Compliant." Following approval, funded projects are directed to adhere to accepted or adopted design standards.

As a New York example, BMTS's policy identifies context-sensitive resources that the Nyack river villages and school district may employ when developing their ordinance. An MPO, however, differs from local municipalities in a number of ways. Although local municipalities do not have the same level of control over the federal funding process, they have the power to pass ordinances that can advance Complete Streets initiatives. For instance, ordinances can change enforcement practices, authorize a 10% earmark for active transportation infrastructure, and ban vehicles from turning on red in commercial districts.

A single Complete Streets ordinance should be developed collaboratively and passed by all municipalities in the school district. This will reduce confusion over enforcement policies and facilitate the funding and implementation of critical safety improvements throughout the community.

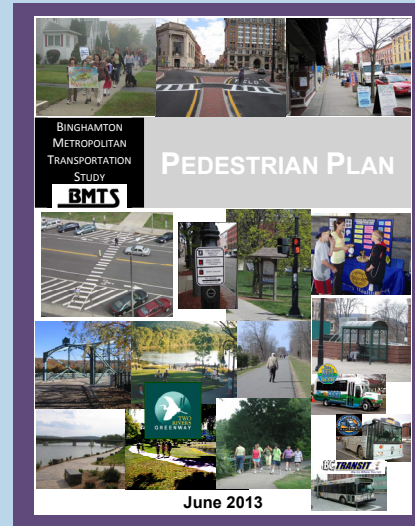


Image credit: BMTS

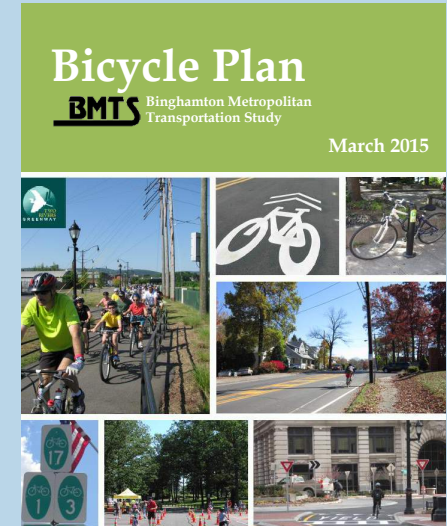


Image credit: BMTS

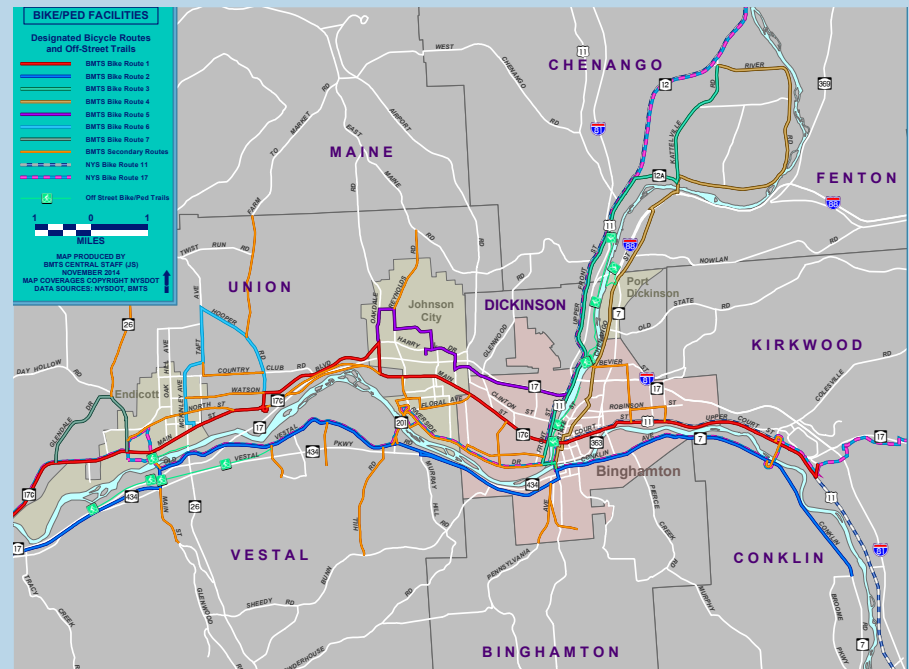


Image credit: BMTS

Implement a Road Safety Campaign for All Users

Stakeholders engaged throughout the public outreach process, including public safety officers, advocates, and members of the public, requested the development of a road safety campaign. This campaign should be designed to educate all road users (motorists, cyclists, and pedestrians) on appropriate and dangerous road behavior and the legal rights of pedestrians and cyclists. Through friendly traffic stops and thoughtful educational materials, the campaign should aim to change unsafe behaviors. In doing so, the campaign will demystify confusing roadway behaviors and ultimately reduce conflicts. The towns and villages should lead this campaign and should coordinate with NYSDOT and local law enforcement.



Image credit: National Highway Traffic Safety Administration (NHTSA) "Everyone Is a Pedestrian" safety campaign



Image credit: NYC Taxi & Limousine Commission (TLC)

The Nyack river villages and school district may reference several existing resources during the development of the campaign and throughout its launch:

Federal Highway Administration's National Safety Campaign https://safety.fhwa.dot.gov/local_rural/pedcampaign/ - Campaign guides, tools, and materials to assist local governments and organizations in implementing their own safety campaigns. Materials that may be useful to include sample press releases, newspaper articles, pamphlets, posters, and radio / video public service announcements.

U.S. Department of Transportation Traffic Safety Marketing website <https://www.trafficsafetymarketing.gov/> - Tools, ideas, and marketing materials for all types of campaigns, including bicycle and pedestrian safety campaigns.

Bikes Belong, Review of Bicycle Safety Campaigns <https://www.issuelab.org/resources/3783/3783.pdf> - Tips for success and links to example campaigns that have also had success.



Image credit: NYCDOT LOOK Safety Campaign

Organize a Multi-Village / Town Active Transportation Task Force

Other communities have fallen short on their bicycle and pedestrian plans goals because of the lack of coordination among community partners. The Nyack river villages and school district need an Active Transportation Task Force to:

- Oversee the implementation of this *Master Plan*
- Ensure continued community engagement
- Review development proposals to determine compatibility with *Master Plan* goals
- Advocate for updates to local and statewide policies

The Active Transportation Task Force would include representatives from the towns and villages, the school district, advocacy groups, Rockland County Department of Transportation, Rockland County Department of Health, and the New York State Department of Transportation (NYSDOT). It is recommended that the towns and villages hire a single coordinator who can convene the group, develop agendas, and document the progress of the Task Force and plan champions. Considering the existing momentum in the community, the towns and villages should look to start this group immediately and hire a coordinator as soon as possible.



Image credit: FHI

Develop a School Bicycle and Pedestrian Promotion Program

A central goal of the *Master Plan* is to improve access to area schools by walking and biking. In addition to a more connected network of sidewalks, crossings, and bike facilities, students at the outreach event at Nyack High School expressed an interest in programs that would foster a culture of walking and biking. Recommended initiatives, including ideas students discussed as well as programs implemented across the country, include:

Safety from the start parent workshop

This would be a workshop for new parents to share ways they can help their kids get to school by walking or bicycling. This workshop could help plan a route or connect parents to coordinate efforts.

Walk and bicycle passport program

Students get a stamp each time they walk or bike to school, and when the passport is full, it can be redeemed for selected items at participating businesses.

Walking school bus and bicycle train

Walking school buses and bicycle trains are used by parents in school districts across the country. Led by a parent, the group of pedestrians or cyclists pick up students at their homes en route to the school.

School-sponsored bicycle club

The bicycle club would be run by high school students. They could organize and facilitate various events, such as an ambassador program to pair high school students with those at the middle school or elementary school.

Bike or walk to school day

Students suggested that a Bike or Walk to School Day could be one way to encourage active transportation. This event could be associated with a food drive or fundraiser where businesses could sponsor students who walk or bike.



Image credit: Safe Routes to Schools DeKalb IL



Image credit: Virginia Department of Transportation's Safe Routes to School



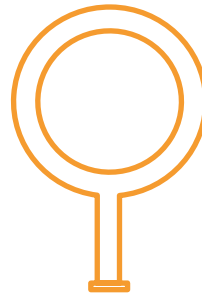
Image credit: Flickr, user: Leslie "Walking to school can be fun"

Implement Design and Maintenance Standards

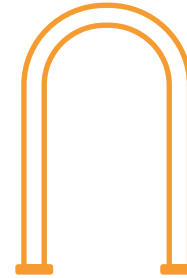
Members of the public and community advocates commented that biking and walking facilities throughout the study area lack consistency. By implementing a facility design and maintenance ordinance, the villages and towns would direct their transportation and public works officials to ensure that bicycle lanes, dedicated shoulders, signage, bike parking, and sidewalks adhere to nationally recognized guidelines.

Such guidelines include *Bicycle Parking Guidelines by the Association of Pedestrian and Bicycle Professionals (APBP)* and the *Guide for the Development of Bicycle Facilities by American Association of State Highway and Transportation Officials (AASHTO)*. Ultimately, this will create a cohesive network within the school district and provide more consistent connections with surrounding municipalities.

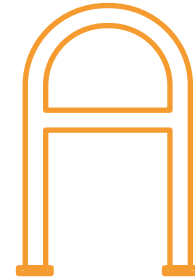
Examples of bike rack types that **ARE** APBP-recommended



Post & Loop
One rack element supports two bikes



Inverted "U"
One rack element supports two bikes



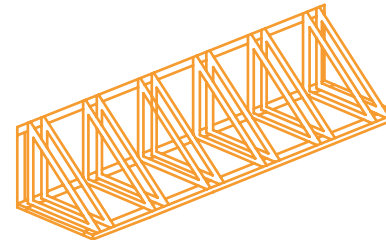
"A"
One rack element supports two bikes

Source: *Guide for the Development of Bicycle Facilities by American Association of State Highway and Transportation Officials (AASHTO)*

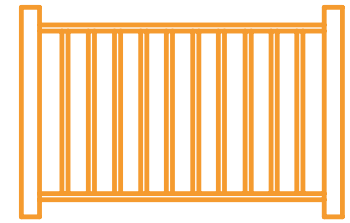
Examples of bike rack types that **ARE NOT** APBP- recommended



Wave
One rack element is a vertical segment of the rack



Toast
One rack element holds one wheel of a bike



Comb
One rack element is a vertical segment of the rack

Source: *Guide for the Development of Bicycle Facilities by American Association of State Highway and Transportation Officials (AASHTO)*

Develop Sidewalk Maintenance Plan

Poor sidewalk conditions received considerable attention throughout the *Master Plan* effort. Sidewalks that are crumbling or have a vertical or horizontal displacement of a quarter of an inch or greater can create a major burden for people with mobility or vision impairments. Moreover, the lack of snow removal or adequate drainage creates an obstacle for all pedestrians during winter months.

Developing a dedicated sidewalk replacement or extension fund can provide a small but consistent pot of money from which to spend on priority links in the pedestrian network. This money may be sourced from local impact fees, the Village and Town general funds, and local sales or property taxes.

The towns and villages should also develop a consistent, area-wide plan to maintain good condition of existing sidewalks to ensure they are accessible to all users, regardless of age, ability or skills, and throughout the year. This plan, which may place the responsibility for sidewalks on the towns and villages or on the adjacent property owners, should provide inspection criteria, design guidelines, a process for notifying adjacent property owners, and payment plan for property owners opting to hire municipal departments for repair. Enforcement is critical to ensure compliance.



Half of U.S. residents say that walkability is a top or high priority when considering where to live.

Urban Land Institute "America in 2015"

Image credit: FHI



People who live in neighborhoods with sidewalks on most streets are 47% more likely to be active at least 30 minutes a day.

Image credit: FHI

Initiate a Neighborhood Walks Program

In addition to promoting safety, active transportation plans offer ways to strengthen community ties, bolster economic development, improve public health outcomes, and engage citizens in local government. To see these benefits, advocacy groups, the Rockland County Department of Health, and local tourism offices should map various routes through different neighborhoods and encourage community-led neighborhood walking programs. They could promote the program by holding “Walk with the Mayor” events, during which members of the public can join elected officials from the towns and villages on one of the defined walking routes. The walks could also work to bring visibility to businesses in locations beyond the main commercial corridors.



Become a NorWALKer!

EXPLORE NORWALK'S CITY HALL AREA

Visit the hilly neighborhood surrounding Norwalk's City Hall, the Norwalk Health Department, and the Norwalk Historical Society Museum.

Loop 1

Start at City Hall Dr. Turn left on Eversley Ave. Turn left on Willow St. Turn right on Beacon St. Left on Chelene Rd. Left on Tierney St. Right on Winthrop Ave. Left on Lockwood Ln. Left on East Ave. Left on Sunset Hill Rd. Right on City Hall Dr.

Loop 2

Start at the corner of City Hall Dr. and Eversley Ave. Turn right on Eversley Ave. Cross East Ave. and turn left. Right on Sherry St. Left on Elton Ct. Right on Yankee Doodle Ct. Right on Hendricks Ave. Right on Selleck St. Left on Saint John St. Cross East Ave. to Raymond Terr. Left on Strawberry Hill Ave. Left on Beacon St. Left on Willow St. Right on Eversley Ave. and return to City Hall.

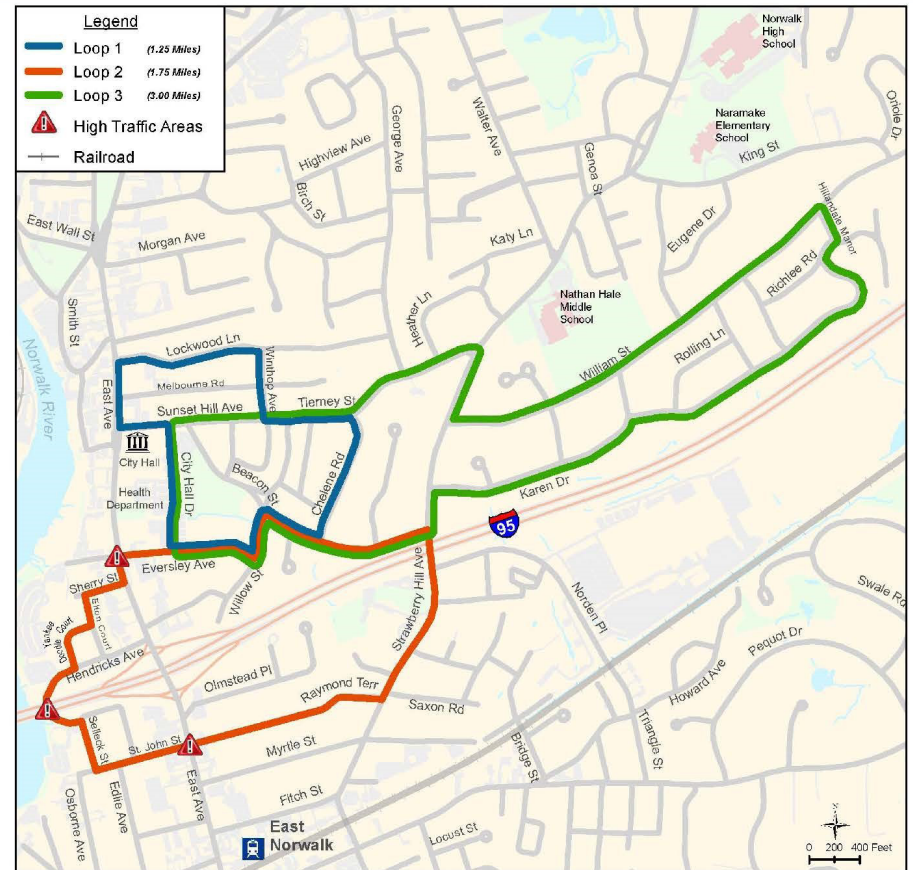
Loop 3

Exit the City Hall parking lot north to Sunset Hill Ave. Turn right on Sunset Hill and continue to Tierney St. until the end. Turn right on Strawberry Hill Ave. Turn left on William St. Continue on William St. and turn right on Hillandale Mnr. Make the first right on Richlee Rd. Make the first left on Karen Dr. Left on Dairy Farm Rd. Left on Strawberry Hill Ave. Right on Beacon St. Left on Willow St. Right on Eversley Ave. and enter the City Hall parking lot.

CITY HALL AREA

CITY HALL AREA

CITY HALL AREA



PROCEED WITH CAUTION WHEN FOLLOWING NORWALKER ROUTES!

The Healthy for Life Project is not responsible for any injuries or accidents that may occur while following NorWALKer routes. Consult your doctor before beginning an exercise program. Use pedestrian crosswalks when available, obey all traffic laws, and if no sidewalks exist, walk against traffic. Wear proper footwear and reflective gear, and bring water with you while walking. Have fun!

Image credit: Norwalk Health Department

Maintenance Request and Reporting Mobile App

The towns and villages should implement an app that allows community members to submit maintenance requests (e.g., SeeClickFix). The app should allow community members to review status updates on submissions and ideally generate reports documenting progress on pedestrian and bicycle safety initiatives.

Ban Right Turns on Red in Commercial Districts

In busy commercial areas with high pedestrian volumes, vehicles often roll through red lights when making a right turn. Traffic law requires a full stop (as at a stop sign) before turning right on red. This maneuver can block the crosswalks and create hazards for people walking or biking. The towns and villages should post "No Turn on Red" signs in areas with significant pedestrian traffic (e.g., downtown Nyack) and support these signs with enforcement.



The image features the SeeClickFix logo at the top, with 'See' in grey, 'Click' in orange, and 'Fix' in blue. Below the logo is a photograph of a hand holding a smartphone displaying the app's 'Issue Details' screen. The screen shows a photo of a trash pile, the text 'trash pile in street/parking lane is Open', '2 people want this fixed', and 'been there for weeks'. It also includes the report date and time: 'Reported by jkreat on November 12, 2010 at 1:06:19 PM EST.', the issue ID '#80216', and the location '811 Putland Rd (Brooklyn, NY 11203...'. At the bottom of the screen, there is an 'Actions' section with a 'Vote To Fix Issue' button. To the right of the phone image are three circular icons with corresponding text: an orange icon with a pencil and paper labeled 'Capture Document issues you see', a green icon with a target symbol labeled 'Report Let the neighborhood know', and a teal icon with a speech bubble labeled 'Communicate Get updates on-the-go'.

Image credit: UCSB Associated Students Bike Committee

Active Transportation Community Center

Advocacy groups and the towns and villages should support the creation of a local community center that offers free maintenance and bike safety courses. One of the ways they can do this is by providing incubator space where a potential program can start offering classes. The community center may also sponsor an “Earn-a-Bike” or “Build-a-Bike” program for students and low income residents similar to Bici Co. in Hartford, CT , Second Life Bikes in Asbury Park, NJ, and others. Oftentimes, these programs fall under an existing non-profit promoting job access, affordable housing, or training programs. This recommendation stems from the feedback shared by community members who said they were interested in riding but did not own or know how to maintain a bike.



Image credit: FHI

Community Service Officers (CSOs) Internship Position

Community members expressed concern about how the towns and villages would manage bicycle traffic with the opening of the Shared Use Path on the Governor Mario M. Cuomo Bridge. The towns and villages should create a Community Service Officers (CSOs) volunteer or internship position to help control and direct traffic upon the opening of the SUP.



Image credit: FHI

Local Law Enforcement Multimodal Training Programs

Local law enforcement should incorporate education about existing walking and bicycling rights and laws into both initial onboarding training for public safety officers as well as required annual workshops.

Through this program, they should focus on the dangerous behaviors (of all users) that lead to bicycle and pedestrian fatalities, such as signal violations, distracted walking or driving, failure to yield, and illegal turns. Priority must be given to targeting behavior most likely to cause injury to others, and protecting the most vulnerable street users, i.e., pedestrians and bicyclists.



Image credit: FHI

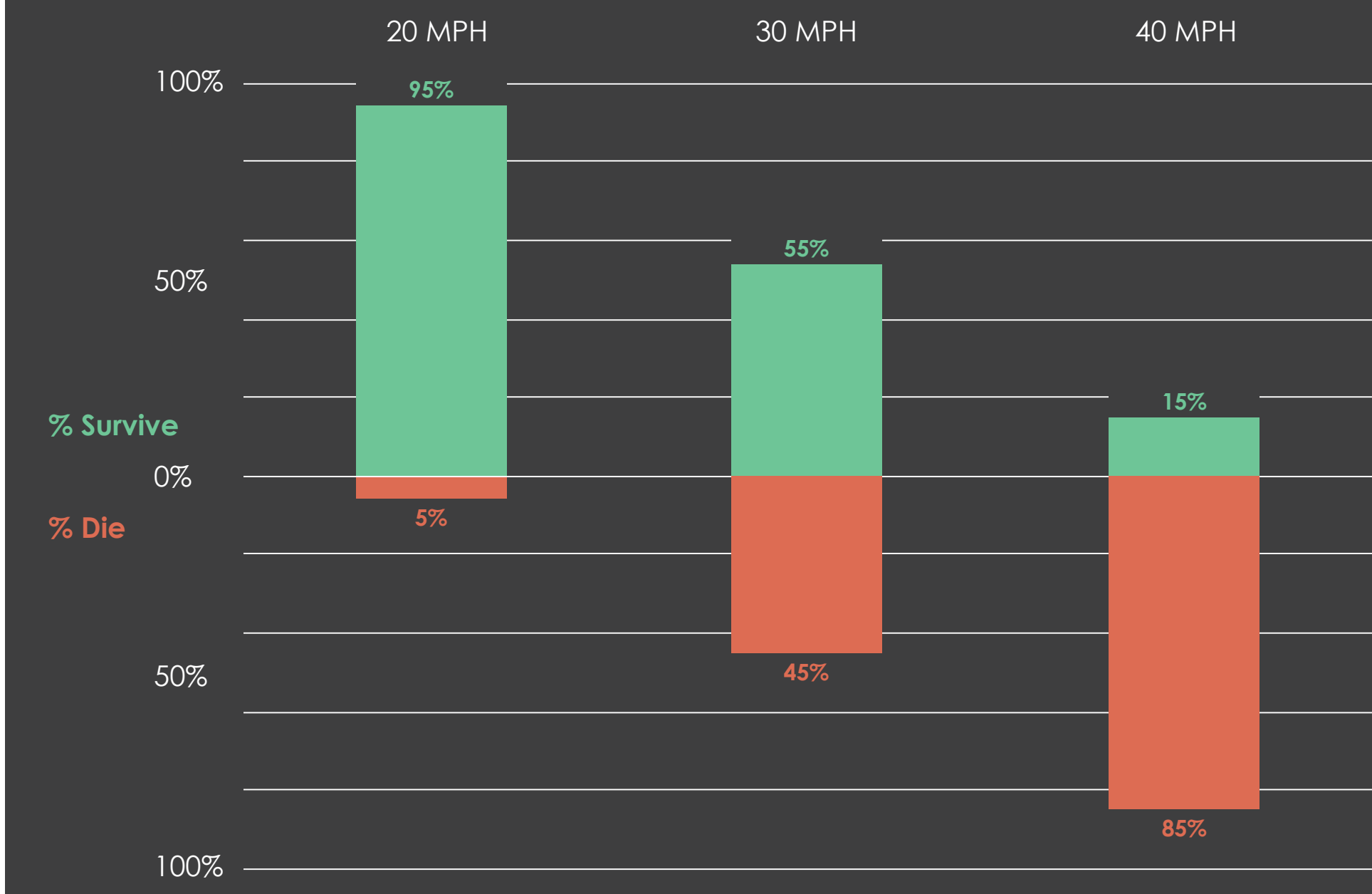
DID YOU KNOW?

Requiring bicyclists to ride single file creates a more dangerous situation for cyclists and passing motorists.

A motorist needs more time, distance, and speed to overcome a narrow line of cyclists in single file than a compact group two abreast. More time spent passing across the double yellow centerline means greater chance of crashes and injuries.

For everyone.

PEDESTRIAN CRASH SURVIVAL RATES BY SPEED



Bike Share Program Partnership Opportunities

Bike share programs allow members of the public to rent a bicycle on a short-term basis. Most programs have bicycle docks where users may check out a bike and return it to another dock. Other programs offer “dockless” systems where bicycles may be parked on any street within a specified service area.

Bike share is less common in smaller municipalities than it is in major cities, yet Nyack community members expressed an interest in seeing bike share in the Nyack river villages and school district. The Rockland County Department of Transportation should monitor the development of a regional or county-wide bike share program and consider opportunities for a private sector partner.



Image credit: WUFT News

Annual Bicycle Events

Bicycling events are a way to raise awareness of bicycling, encourage new users, promote public health initiatives, and promote local businesses. Advocacy groups, Visit Nyack, the Nyack Chamber of Commerce, and Rockland County Tourism (among others) should facilitate bicycle events on local streets.

Summer street closures are common in municipalities across the country, and off- or shoulder season events are used to bolster the local economy the rest of the year. These events should be designed to promote local businesses and reflect community character. The events are also an opportunity to test new infrastructure with demonstration projects.



Image credit: FHI

Increase Bicycle Parking

Community members expressed a concern for the lack of convenient bicycle parking. The villages and towns should consider installing bike parking on all public property where appropriate (e.g., public parking lots, in front of government buildings).

To encourage bike parking on private property, the villages and towns should develop guidelines for minimum amounts of bicycle parking for various types of uses. They may also consider providing incentives to encourage developers to accommodate bike parking on their sites, such as reducing vehicle parking minimums where bike parking is available. Requirements for off-street bicycle parking facilities developed by the City of New Rochelle can be referenced as an example of successful guidelines that include design criteria and a bicycle parking fee.



Image credit: Wikipedia, Jim.henderson

Default 25 MPH Speed Limit

Pedestrians hit by vehicles traveling at 30 MPH are twice as likely to die as pedestrians struck by vehicles traveling at 25 MPH. For seniors and children, the fatality rate is even higher.

Currently, default local speed limits are 30 MPH, while segments of state roads such as Route 9W have higher limits. Establishing a consistent, default speed limit of 25 MPH will encourage slower, safer driving throughout the school district. Individual streets or segments such as school zones and commercial districts may even be considered for slow zones with lower speed limits. A multi-jurisdictional Complete Streets ordinance is a mechanism to address area-wide speed limits.

Safe Streets for Seniors Initiative

Older adults make up a disproportionately high share of fatalities and injuries on our roads. To improve safety and promote healthy lifestyles among older community members, local governments should coordinate a Safe Streets for Seniors initiative. The program will develop outreach materials and present to senior populations about fitness, fall prevention, and pedestrian and bicycle safety. Additionally, this program should track issues related to senior pedestrian safety and consider infrastructure improvements in areas with higher concentration of older adults. This initiative should be a collaborative effort among the towns and villages, Rockland County Department of Health, and the Rockland County Department of Transportation.



Image credit: FHI

School Bicycle Safety Class

School-aged children are some of the most vulnerable road users. Each year, the Nyack Union Free School District should provide bicycle safety classes woven in to the physical education curriculum. These classes should provide safety tips and maintenance lessons that help the children navigate their communities safely on two wheels.



CHAPTER FOUR

IMPLEMENTATION

Don't wait!
The principle of the
implementation plan is action.



Image credit: FHI

Implementation Approach

This *Master Plan* provides an essential step to improving safety and accessibility. Some projects outlined in this plan will require significant coordination, capital planning, multiple funding sources, and sustained community and political leadership.

Don't wait! The principle of the implementation plan is action.

Many smaller projects can move quickly from paper to pavement, while larger efforts may be initially delivered with low-cost, interim or pilot street design projects that make use of removable materials lasting a few months to a few years. This 'tactical' approach to project delivery can be used to implement recommendations quickly, test a range of design options, and ultimately inform decision-making on which larger projects are worth the sustained effort to bring to completion in the mid- and long-term.

Engaged and involved community leaders and stakeholders are critical elements to develop a coherent and actionable consensus for achieving the shared outcomes of safer, more pedestrian- and bicycle-friendly streets. To make a strong case to potential funders of these projects, leaders must formulate a compelling narrative which expresses a roundly-supported, shared vision for a more livable, sustainable community.

The community-building work inherent in advancing this *Master Plan* and developing the early quick-build projects, such as organizing volunteers and engaging groups like artists and businesses, and seniors and schoolchildren, is the foundation for the broad support that will be necessary to shepherd the entire plan through implementation.

This undertaking is about more than just the *Master Plan*. It is about strengthening personal connections and encouraging a more united and more resilient populace that feels invested in the stewardship of their community, and regard it as a place which they enjoy living in. This requires the leadership, initiative, and cooperation of the key players who will take the first steps in pushing for these improvements.

Quick-Build Toolbox

This *Master Plan* highlights the value and importance of quick-build approaches to addressing our infrastructure needs sooner rather than later. To assist the communities in the school district with project development and implementation, either as pilot projects or permanent installations, a toolbox provides guidance on proven design considerations for commonly applicable street elements. The toolbox also points to design resources from professional organizations such as the National Association of City Transportation Officials (NACTO) and the Institute of Transportation Engineers (ITE).

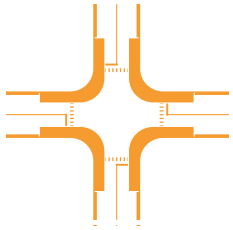


Image Credit: Street Plans



Image credit: FHI

Curb Extensions



Curb extensions shorten crossing distances, provide additional pedestrian waiting/queuing space, and calm traffic by physically narrowing the roadway. This reduces vehicular turning speeds and improves motorist sight lines at intersection and mid-block crossing locations. Curb extensions may serve as gateways for neighborhood greenways and neighborhood/downtown slow zones, offering an opportunity to create street surface murals or simple color patterns where there is a desire for aesthetic enhancements. Effectively extending the sidewalk, curb extensions are also a form of public space that may in some contexts include street furnishings, bike parking, planters, and other public realm amenities.

Components

Required

- Retroreflective double 4" stripe shall demarcate curb extension area
- Primary mountable barrier elements shall be used to separate parked and moving vehicles from the curb extension area

Recommended

- Surface material should be used to more visibly designate curb extension area
- Secondary unmountable barrier element, such as a planter, may be used when a maintenance partner is identified

Optional

- Mural art may be used to add visual interest
- Secondary truncated dome pad may be used at curb extension edge
- Crosswalk may be extended through curb extension to the curb line
- Bike corrals may be used where need exists

Design Dimensions

Required

- Ingress and egress curb return shall be angled at 45 degrees to facilitate snow clearance (unless primary and secondary barrier elements are removed for winter)
- 20' minimum curb extension ingress length; 5' minimum egress length
- Primary mountable barrier element spacing shall not exceed 10'
- Overall width shall be at least 1' less than width of adjacent parking stalls (typically 8'); minimum width shall be 2' where curbside parking is not present
- Crosswalk entrances shall be clear of vertical barrier elements

Recommended

- Primary mountable barrier element should be placed in-line with adjacent parking lane limit
- Planters should be centered between primary barrier elements, abutting inner white 4" retroreflective stripe

- Curb radius should be determined by primary design vehicle but wherever possible should not exceed 15'
- Primary barrier elements should be placed on-center, between retroreflective double 4" white stripe placed at curb extension edge

Design Notes

- Curb extensions may be used to reduce illegal parking at crosswalks and bus stops
- When applied to streets with bikeways, curb extensions must not infringe upon the designated cycling space
- Where certain bikeway types are present, curb extensions may be used to form a protected intersection configuration
- Barrier elements may be removed November 1st - April 1st so that curb extensions may be used for snow storage
- See NACTO's *Urban Street Design Guide* or ITE's *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach* for more street design guidance



Image Credit: Streetsblog NYC

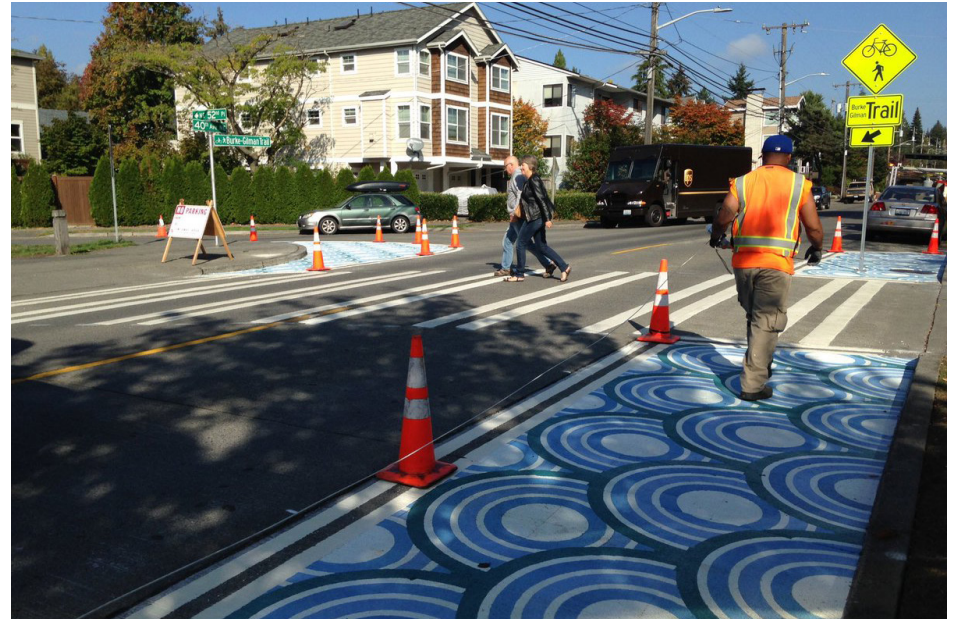


Image Credit: City of Seattle

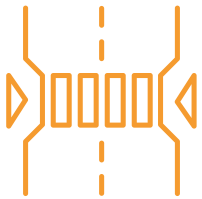


Image Credit: DNAInfo



Image Credit: Urban Residue

Mid-Block Pedestrian Crossing



Mid-block pedestrian crossings provide highly-visible and safer locations for people to cross streets along existing desire lines, especially between two common mid-block destinations not served by the existing street network. Such crossings should feature high-visibility crosswalks, curb extensions, barrier elements, and pedestrian refuge islands on (where appropriate). Mid-block pedestrian crossings may also slow vehicular traffic and offer opportunities for street beautification. In the mid to long-term, these street enhancements may become permanent, providing additional opportunities for environmental and placemaking enhancements, such as rain gardens and bicycle parking.

Components

Required

- Retroreflective double 4" stripe shall demarcate curb extension and/or pedestrian refuge area
- Primary mountable barrier elements shall be used to separate parked and moving vehicles from the curb extension and/or pedestrian refuge area

Recommended

- Secondary barrier elements, such as planters, may be used when a maintenance partner is identified

- Surface material should be used to more visibly designate curb extension and/or pedestrian refuge area

Optional

- Surface mural art may be used to add visual interest
- Yield line markings may be placed on vehicular ingress side of mid-block crossing

Design Dimensions

Required

- See Curb Extensions for basic required and recommended dimension details
- Their use is optional but where utilized, yield line markings shall be placed at a minimum of 20' back from the ingress side of crosswalk
- Refuge islands shall be a minimum of 6' in width
- Where no on-street parking is present, curb extension shall be a minimum of 2' in width
- 9' minimum clear between primary mountable barrier elements; 14' clear between secondary unmountable barriers

Optional

- Pedestrian refuge islands may feature offset crosswalks

- Yield lines
- Design Notes
- See Curb Extensions for basic design notes
- Pedestrian refuge islands are appropriate where people walking must cross two wide lanes (or more) and may be implemented within a center turn lane to provide a protected two-stage crossing for pedestrians
- Offsetting crosswalks helps orient pedestrian oncoming vehicular or cycling traffic
- See NACTO's *Urban Street Design Guide* or ITE's *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach* for more street design guidance



Image Credit: City of Seattle



Image Credit: NACTO



Image Credit: Street Plans



Image Credit: Toronto Centre for Active Transportation

Pedestrian Plazas



Pedestrian plazas provide increase street safety and foot traffic in commercial districts and residential areas, benefiting local businesses and supporting an environment in which community interaction can happen naturally.

Plazas can be designed to normalize irregular and unsafe historic street geometries, increasing legibility and reducing complex traffic patterns. Plazas can also create additional space for street furnishings, plantings, and other neighborhood amenities while providing the physical space for street murals where there is a strong community desire for aesthetic enhancements.

Components

Required

- Retroreflective double white striped line to demarcate plaza perimeter
- Vertical barrier elements, such as delineator posts and circular or rectangular planters, where curb is not present

Recommended

- Surface material treatment
- Seating, programming, bicycle parking, and other streetscape amenities
- Enhance safety and accessibility by combining pedestrian plazas with other quick-build project types

Optional

- Food truck dock or other designated mobile commercial vendor area where/when appropriate
- Shade structure(s) for summer months
- On-site equipment/street furniture storage

Design Dimensions

Pedestrian plaza dimensions will vary based on site conditions.

Required

- 4" retroreflective double white perimeter stripe
- Primary barrier element spacing not to exceed 10'

Recommended

- Primary barrier elements to be centered between double 4" white retroreflective stripe at edge of plaza
- Planters to be centered between other barrier elements, abutting inner double 4" white retroreflective stripe

Design Notes

- Pedestrian plazas are well-suited for irregular intersections where one leg of the intersection or a slip lane may be redundant or is sparsely used, or where the plaza may be used to provide a more rectilinear intersection configuration
- Plaza locations should be prioritized near local businesses or in places that generate foot traffic and where existing open space is limited
- Bicycle parking - standard or custom - must meet village or town standards
- Site conditions may dictate the need to provide bicycle access to/through the plaza in order to maintain continuity within the bikeway network. In these situations, low speed bicycle riding should be enforced through design, with physical dismounting required only in the rare instance where true space constraints exist
- Identify a maintenance/stewardship partner who will be able to water and maintain landscaping/plant matter and assist with related programming, trash removal, and space management
- Develop and maintain a clear process for community event programming



Image Credit: Archinect



Image Credit: Street Plans

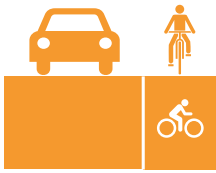


Image Credit: WNYC



Image Credit: Keep Pacoma Beautiful

Conventional Bicycle Lanes



Bicycle lanes designate portions of a thoroughfare for the preferential or exclusive use of people bicycling. Bicycle lanes come in a variety of designs and configurations, including advisory, conventional, buffered, protected, contra-flow and two-way. Each type ranges in level of user comfort, depending on traffic characteristics and the level of separation between cyclists and motor vehicles.

Components

Required

- Standard MUTCD bikeway pavement marking
- Retroreflective dashed or solid striping demarcating the inside and outside stripe of the bicycle lane where parallel parking is present

Recommended

- Crossbike markings
- Stop bar
- Striped buffer between the bike lane and moving vehicles, parked vehicles, or both wherever conditions allow
- Bike box
- Green paint

Optional

- Retroreflective dashed or solid striping demarcating the inside stripe of a curbside bicycle lane
- Directional turn arrow
- Yield line markings
- Left or right-turn pocket/queuing area
- Standard MUTCD bikeway pavement marking with ponytail

Design Dimensions

Required

- 5' minimum bike lane width for all one-way bike lanes (4' acceptable for curbside bike lanes on constrained, low-volume streets)
- 2' minimum buffer width (where appropriate)

Recommended

- 6" diagonal buffer stripes at 45° with 10' - 15' gaps
- 1' stop bar
- Crossbike markings
- Directional turn arrow

Design Notes

- Bicycle lanes are typically located on the right side of the street, between the adjacent travel lane and curb, road edge, or a parking lane. However, it is recommended that bicycle lanes be placed on the left side when installed along one-way streets to decrease 'dooring' potential.
- Wherever possible, the parking lane width should be marked at the minimum width so that the bike lane width may be maximized
- Contra-flow lanes should be marked with clear signing and a double yellow line separating the bicycle lane from the motor vehicle travel lane
- Bicycle lane symbols and/or arrow markings shall be placed outside of the motor vehicle tread path at intersections, driveways, and merging areas in order to minimize wear from the motor vehicle path; the curb radius will determine specific placement but typically 10' - 15' beyond the radius edge
- Where irregular intersections or jogs in the route exist, turn arrow markings may be used to help people navigate along a specific route or turn onto an intersecting bikeway
- See NACTO's *Bikeway Design Guide* for more design guidance



Image Credit: Miami Condo Investments



Image Credit: Denver Urbanism

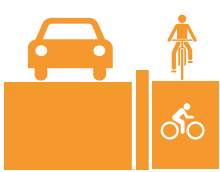


Image Credit: TreeHugger



Image Credit: Street Plans

Protected Bicycle Lanes



Protected bicycle lanes provide vertical and horizontal separation between people bicycling and people driving. As such, they provide the most comfort and therefore appeal to the widest number of people. Protected

bicycle lanes should be implemented wherever appropriate and where physical conditions allow.

Components

Required

- Standard MUTCD bikeway pavement marking
- Retroreflective dashed or solid striping demarcating the inside and outside stripe of the protected bicycle lane
- Vertical barrier element (parked car, vertical delineators, planters etc.)

Recommended

- Striped buffer between the bike lane and moving and/or parked vehicles
- Bike box
- Crossbike markings
- Stop bar
- Green paint

Optional

- Directional turn arrows
- Yield line markings (mid-block crossings)

- Left or right-turn pocket/queuing area
- Surface treatments/murals may be incorporated into some project elements, like bikeway buffers

- See NACTO's *Bikeway Design Guide* or FHWA's *Separated Bike Lane Planning and Design Guide* for more detailed design guidance

Design Dimensions

Required

- 5' minimum protected bike lane width, 6' desired where possible
- 2' minimum buffer width (If applied)
- 8' minimum width for two-way on-street protected bike lanes (not including 2' buffer minimum)

Recommended

- 6" diagonal buffer stripes at 45° with spacing of 10' - 15'
- 1' stop bar

Design Notes

- No vertical barrier elements to be placed within 15' of driveways
- Except for the select use of planters, vertical barrier elements should be mountable by emergency response vehicles
- Where street width allows for only one protected lane, it is recommended that it be installed on the uphill side
- Where possible, contra-flow lanes should include vertical barrier elements



Image Credit: Human Streets



Image Credit: Street Plans



Image Credit: Bike Delaware



Image Credit: Momentum Mag

Super Sharrows



Super sharrows, or center-running bike lanes, are a pavement marking used to indicate a shared lane for people bicycling and people driving. Like regular shared use lane markings (“sharrows”), super sharrows should not be considered a substitute for dedicated bike infrastructure, such as bicycle lanes or protected bikeways. However, the two parallel dashed line markings are intended to emphasize that “taking the lane” is permitted along designated neighborhood slow zone / neighborhood greenway streets.

Components

Required

- Standard MUTCD bikeway pavement marking
- Standard MUTCD shared use lane pavement marking
- White retroreflective solid dashed traffic paint, thermoplastic, or traffic tape striping
- Green retroreflective traffic paint, Ruby Lake Glass, or methyl methacrylate continental crossbikes (for neighborhood greenways)

Recommended

- Mid-block center line removal should be considered for all designated slow zone/ neighborhood greenway streets

Optional

- “Stop” markings may be placed in conjunction with stop bars

Design Dimensions

Required

- Super sharrows shall be placed
- The center of the super sharrow marking shall be placed at a minimum of 4’ from the curb face where on-street parking is not present, 11’ from the curb face where parallel parking is present, or in the center of the travel lane where angled on-street parking exists
- Super sharrows shall be spaced at minimum of 100’ apart except on very short blocks where closer spacing may be appropriate

Recommended

- Super sharrows should be spaced at maximum of 200’ apart
- Markings should be placed no more than 30’ from the stop bar (ingress)/15’ from the bottom of the crosswalk (egress)
- Super sharrows should be placed in the center of the travel lane when applied to all neighborhood slow zone or neighborhood greenway streets

Design Notes

- Along short blocks with bi-directional travel lanes there should be a minimum of four markings, two per travel lane
- For one-way streets, at least one marking should be placed at either end of the block
- For bi-directional streets, markings shall be placed in pairs where possible. (Short blocks, offset block links, or driveways may make exact placement impractical.)
- Where possible, super sharrow marking centerline should be placed within the center of the travel lane to prevent wheel tracking deterioration and to encourage people to bicycle outside of the door zone
- Where parking lanes are unmarked, super sharrow marking centerline should be a minimum of 12’ from the curb face
- Directional arrows may be placed in conjunction with super sharrow markings to help direct people bicycling where irregular intersections / jogs in the cycling network exist



Image Credit: Street Plans



Image Credit: 1st St. Bikes



Image Credit: Mode Shift



Image Credit: Streetfilms

Chicanes



Chicanes are offset curb lines that introduce lateral shifts to travel lanes, creating a 'slalom effect' that can reduce vehicular speeding along residential or downtown streets. Chicanes can also provide an opportunity to introduce public art or other street enhancements, like planters and on-street

bicycle parking. Low-cost chicanes may be created along narrow streets with only one parking lane by alternating the location of the parking.

Components

Required

- A 4" retroreflective double white stripe shall be used to demarcate the chicane (traffic paint, thermoplastic, or traffic tape)

Recommended

- Parking stops and other vertical barrier elements (ceramic markers delineator posts, armadillos, etc.) may be placed between the parking lane and the chicane, as well as along the hypotenuse side of the chicane triangle to discourage vehicular encroachment
- A surface material (traffic paint, Ruby Lake Glass, or methyl methacrylate) should be used to more visibly designate the chicane area

Optional

- Circular or rectangular planters may be used to beautify chicane areas
- Murals may be used to beautify the chicane area

Design Dimensions

Required

- The minimum chicane ingress length shall be 15'
- The minimum chicane egress length shall be 5'
- Chicanes shall have a maximum width of 7'
- Chicane width shall be equal to 1' less than parking lane width
- Street width two-way travel lanes and chicanes shall be a minimum of 25' in width, with 18' dedicated to the travelway

Recommended

- Chicanes should utilize a 45° angle (or shallower), as measured from the curb to allow safe lane shift, facilitate snow plowing operations, and to maximize available on-street parking
- A minimum 1' buffer should be provided between the outside edge of the chicane and the outside edge of the parking lane
- Where used, shared use lane markings shall be centered between chicane locations

Design Notes

- Chicanes may be installed on low-speed (25 mph or lower) and low-volume (3,000 ADT or lower) streets such as neighborhood greenways and within neighborhood/downtown slow zones
- Parking chicanes should be placed on alternate sides of the street approximately every 100' as driveways and intersections allow.
- Placement of chicanes should not impede access to / from existing driveways, unless part of an access management plan
- Except for intersection approaches, consider removing centerline from streets with chicanes
- Minimum chicane spacing/taper varies; to be determined by target speed and existing street geometry (see MUTCD for more guidance)
- Chicanes must maintain stormwater flow/drainage.
- Vertical barrier elements should be used to alert drivers and snow plow operators to presence of the chicane area, or removed for winter
- Ceramic markers are recommended as the vertical barrier element at chicanes adjacent to fire hydrants



Image Credit: Street Plans



Image Credit: NACTO



Image Credit: NACTO



Image Credit: Twitter; User: Dale Calkins

Speed Hump / Speed Cushion



Components

- Asphalt speed hump
- Vulcanized rubber speed cushion

should be no more than a quarter-inch high

- Where curbside bicycle lanes exist, taper the speed hump width to allow a 2.5' clear 'cycling slot' smooth bicycle passage, which may also facilitate better stormwater drainage

General Design Guidance

- Speed humps / cushions should be used almost exclusively on street designated as residential Slow Zones or Neighborhood Greenways
- The spacing for and height of speed humps / cushions should be determined based on the target speed of the roadway. Speed humps, and other traffic calming elements, should be spaced no more than a maximum of 200 ft. apart and be a height of 3" - 4" to achieve target speed of 15 - 20 mph
- Speed humps / cushions shall not be placed in front of driveways or other rights-of-way requiring a curb cut; Where frequent driveways make the application of a speed hump difficult, work with local residents to develop other traffic-calming solutions
- Where used on bus routes, major emergency access routes and / or commercial corridors, speed cushions designed to accommodate the wheelbase of such vehicles should be selected over speed humps
- Speed hump slopes should not exceed 1:10 or be less steep than 1:25. Side slopes on tapers should be no greater than 1:6. The vertical lip

Design Notes

- Speed humps may be applied on one-way or two-way streets
- Vertical speed control elements (like speed humps) shall be accompanied by a sign warning drivers of the upcoming device
- Vulcanized rubber speed hump units may be removed for road resurfacing, snow plows, or to test the product at various locations



Image Credit: NACTO



Image Credit: Eric Fischer, Flickr



Image Credit: BikeSafe



Image Credit: Richard Drdul - Traffic Calming Flickr Photoset

Wayfinding Signs



Components

Signing is an essential element of any street or shared use path network. Signs help users navigate between their origin and destination, as well as communicate valuable safety and

regulation information. Other information about amenities or local attractions at various destinations can also be highlighted in wayfinding signs. Maps can be integrated into signing schemes, thereby providing another valuable tool for wayfinding and route planning. Other indicators, such as recognizable pavement markings, can also be used for wayfinding.

All public streets in the United States use a standardized wayfinding and signing system based on the Federal Highway Administration's MUTCD. This manual defines the color, size and placement of all roadway signs.

The content of bicycle-specific signs can be broken down into four broad categories:

- **Navigation:** Serves as the prime bikeway identifier. It can also be used to offer valuable navigational information such as route destination and direction, and distances to important intersecting streets.
- **Caution:** Conveys warning messages to people driving and people bicycling. Since caution messages need to be understood quickly and from a distance, they are the largest and most basic of signs.
- **Connections:** Highlight intersections with other bikeways or public transportation hubs. Their goal is to integrate individual bikeways into a broader transportation network.

- **Points of Interest:** Highlight points on or near the route of relevance to bicyclists. By drawing attention to these locations, Point of Interest signs can help make bikeways more attractive recreational routes for cyclists.

General Guidance

On-Street Bicycle Wayfinding

Bicycle directional and confirmation wayfinding signs should consist of a "Bike Route" sign (D11-1) accompanied by an appropriate directional arrow (M7-1:7). These signs should be installed at every key-decision making point or where the bikeway intersects with another. Additionally, a wayfinding plan should be developed and include supplemental plaque signs (D1-1b or D1-1) that identify destination direction, name, distance and estimated time to arrival. The location and content of these signs should be established by the plan.

Path Entrance Markers

Shared use path entrance markers should contain the path name, and/or information highlighting the overall path distance, and all key destinations along the way. The design of the signs should be visible and easily distinguishable from other installed signs. In addition, the design should complement on-street bicycle signs, to ensure easy recognition by bicyclists.

Trail Markers

In order to fully integrate the on-street and off-street bicycle networks, it is essential that all shared use path entrances are highly visible and easily located by users. Path markers should be easily seen from adjoining roadway, particularly where there are any natural site line constraints.

Directional Signs

Estimated time to destination information is also helpful, as many cyclists prefer to know approximately how long it will take to arrive at a given destination. Distance signs or mileage markers, should also be placed soon after key decision-marking points because they serve as a confirmation to path users that they have selected the correct route.

Distance to destination(s) signs and mileage markers provide needed wayfinding elements to any network. Such signs should communicate known distances to connecting paths, general points of interest, and path exists/entrances, among other key points.

Design Notes

Signs should be placed 25 to 75 feet before any decision-making point. The design of the signs should be visible and easily distinguishable from other installed signs. In addition, the design should complement on-street bicycle signs, to ensure easy recognition by bicyclists.

In order to maximize legibility for bicyclists, directional arrows and text should be large enough so that all pertinent information is capably read from a distance of approximately 30 feet while traveling 12 miles per hour. Thus, text should be no less than 2.25 inches in height, and it is recommended that all signs be written in FHWA C Series Font, or a comparable sans serif typeface. Directional arrows should be at least three inches wide and 2.25 inches high.



Image Credit: Jager Di Paola Kemp Design



Image Credit: LA Mas



Image Credit: LA Mas



Image Credit: Studio Binocular

Funding

How Are Walking and Bicycling Improvements Funded Now?

The communities included in this *Master Plan* do not currently maintain a dedicated funding stream for walking and cycling projects. Rather, Nyack and the river villages have historically pursued the incremental implementation of walking and cycling improvements within larger roadway construction or repaving projects. Main Street in Nyack and Lake Road/Kings Highway in Valley Cottage are but two relatively recent examples of larger streetscape efforts inclusive of active travel amenities. Funding for these types of efforts are typically obtained from a variety of sources, including municipal bonding; annual local, county, and state repaving/stripping budgets, NYSDOT grant programs, and federal TAP and Community Development Block Grant (CBDG) dollars, among other sources.

At the local level, municipal budgets fluctuate year-to-year. Earmarking specific amounts of dollars within annual repaving/re-stripping budgets can be challenging, yet this is the most consistent form of local funding for building and maintaining basic pedestrian and cycling improvements, such as new crosswalks, bicycle lanes, and sidewalks. In addition, municipal bonding projects may include the reconstruction or extension of the sidewalk network.

For example, the Village of Nyack currently allocates approximately \$20,000 / year from its general fund for pavement maintenance and restriping projects. These funds can be stretched further when combined with similar Rockland County or NYSDOT efforts. In addition, Nyack undertakes a municipal bonding effort that occurs every two years, which can generate walking and cycling improvements in conjunction with larger infrastructure projects. Both methods generate modest funding that may be leveraged to incorporate small amounts of new striping/markings configurations proposed in this *Master Plan*. That said, this current funding stream is limited and alone can't deliver the additional funds required to move this *Master Plan* to fruition.



Image credit: FHI

What Will be Needed to Implement the Plan?

Many projects identified in this *Master Plan* will require changing or building new sidewalks, curbs, and other street elements. That said, key plan components (bike lanes, curb extensions, crosswalks, pedestrian refuge islands, public plazas, walking lanes and more) may be initially delivered using a range of low-cost surface materials and off-the-shelf barrier elements, including surface paint or epoxy gravel, traffic tape, vertical delineators, and planters.

While some quick-build projects may be of modest scale or visibility, they will cumulatively make a positive and systemic impact across the school district. Thus, as project development, prioritization, and funding are discussed at the municipal level, allocating funding to a series of smaller and interim quick-build projects can show greater benefits to safety and accessibility than concentrating limited resources into a limited number of large, high-cost projects requiring many years to fund, administer, and construct.

How Will We Pay For It?

The good news is that many funding sources exist to help with the implementation of this *Master Plan*. By adopting a coordinated plan, the river villages and the school district will be better positioned for success with funding and grant applications. Additionally, numerous projects included in this plan are small and relatively low-cost efforts that can be incorporated into ongoing municipal repaving and striping projects.

Regardless of individual project size, implementing this *Master Plan* requires an intentional focus so that ongoing efforts to repair and repave village streets are catalyzed as opportunities to deliver better streets.



Image credit: FHI



Strategies to Fund and Build the Plan

Concentrating on a select list of funding strategies will help the river villages implement *Master Plan* recommendations.



Dedicate 10% of Bond Funding to Implement Walking and Bicycling Projects

Municipal bonds can be issued by state and local governments to raise funds for transportation infrastructure projects. Beyond the small amount of local repaving/restriping dollars allocated by municipalities, this is one of the primary funding vehicles used for street redesign projects. As ongoing municipal bond projects are scoped, designed, and implemented, the river villages should consider a specific percentage set-aside to implement the projects identified in this *Master Plan*.

For example, every two years the Village of Nyack allocates dollars to bonded capital projects. Setting aside 10% of these funds for walking and bicycling enhancements (where appropriate) will ensure the recommendations are incorporated into all local infrastructure projects, either as standalone efforts or alongside larger projects that contain multiple funding streams.



Dedicate a Larger Share of Local Paving Funds to Walking and Cycling Projects

Every year, local, county, and state funds are allocated for repaving projects in the villages and towns. Walking and bicycling

enhancement projects are an eligible use of these funds, but do not currently receive a dedicated portion of spending in any of the municipalities involved in this *Master Plan*. Thus, it is recommended that each municipality develops a policy, ideally consistent throughout the school district, committing a specific percentage of infrastructure funds to keep ensure progress in plan implementation. This funding could be increased as existing mode share targets are achieved. For example, allocating 5% for walking and cycling could be tied to mode share gains until an overall mode share goal of 10% is achieved.



A Holistic Approach to Street Reconstruction

While many of the projects in this plan can be implemented with lower cost, quick-build techniques, some local streets will be reconstructed each year to address a multitude of needs: underground utility repair or replacement, stormwater infrastructure, structural instability, and more. With this *Master Plan* in place, it will be easier to coordinate reconstruction and resurfacing/re-striping projects so that when streets are dug up and resurfaced, they get put back together with better infrastructure for people walking and bicycling.



Bundle funds from a variety of sources

Because many of the projects in this *Master Plan* have benefits that extend beyond walking and biking (such as green infrastructure, school safety, property value increases etc.), there will be opportunities to leverage funding for projects

by bundling dollars from several sources. Examples include stormwater projects that may include a street repaving, or open space funding for park projects that include bicycling and walking connections. No matter the project or location, municipal administrators should check this plan with frequency to see where funds can be bundled so that opportunities to implement walking and cycling projects are not missed. This coordination is also a core responsibility of the plan's proposed Multi-Village/Town Active Transportation Task Force.



Use Federal Funding Judiciously

Federal funds can be obtained for larger infrastructure projects of regional importance. For example, TAP funding is obtained through a competitive application process and distributed either by NYMTC or NYSDOT and may include walking and bicycling enhancements. In addition to TAP funding, Federal Community Development Block Grants, Safe Routes to Schools, and certain other FHWA funds may be applied to local projects that include walking and bicycling enhancements. Visit https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm for a full list of opportunities.

Because of the lengthy and sometimes laborious process obtaining and administering federal funding, it is best used judiciously, and for high-cost projects.



Leverage This Master Plan for State Funding

One of the primary purposes of this *Master Plan* is to have a well-considered list of projects that will demonstrably improve safety and access for people walking and bicycling. When state or regional projects are proposed within the school district, this plan should be referenced and leveraged so that active transportation project enhancements can be made. In addition, this *Master Plan* should be highlighted within any grant applications, which may include funding from various state sources:

- **Consolidated Local Street and Highway Improvement Program (CHIPS):** A New York State funded program available to provide for bicycle, pedestrian and traffic calming measures.
- **Local Waterfront Revitalization Programs:** Available under Title XI of the Environmental Protection Fund to prepare or implement at the NYS Department of State, Division of Coastal Resources. http://www.nyswaterfronts.com/grantopps_epf.asp
- **Architecture, Planning, and Design Program:** The NYS Council on the Arts offers funding through their which includes emphasis on projects that address planning and community design, open space planning, streetscapes, transportation linkages, design of public spaces and more. <http://www.nysca.org/public/guidelines/architecture/index.htm>



Council on the Arts

- **Preservation League of New York State and the New York State Council on the Arts Grant Program:** The Preserve New York Grant Program provides support for three types of projects: cultural resource surveys, historic structure reports, and historic landscape reports. An applicant must be a not-for-profit group with tax-exempt status or a unit of local government. State agencies and religious institutions are not eligible to apply. The program generally provides only partial support on a competitive basis. Grants are likely to range between \$3,000 and \$10,000. <http://www.preservenys.org/>
- **NYS DEC Climate Smart Communities Grant:** Projects or programs that improve non-recreational, non-motorized transportation, improve transit, or reduce commuting distances through densification or smart growth strategies are eligible for funding. http://www.dec.ny.gov/docs/administration_pdf/cscfactst18.pdf
- **NYS Multimodal Program:** Discretionary fund to be spent on multimodal connectivity. <https://www.dot.ny.gov/divisions/operating/opdm/local-programs-bureau/multi-modal>



Climate Smart Communities



Incorporate Walking/ Cycling Enhancements within Tax Increment Financing Districts

Tax increment financing (TIF) is a long-term tool that uses incremental tax revenue over a set number of years to repay debt. Municipalities establish a TIF district within an area requiring public infrastructure to encourage public and private real property development or redevelopment. There is no impact on taxes.

TIF is devised to use the incremental future property tax revenue, not additional taxes, to pay for the debt incurred to finance infrastructure improvements within the district. Investment debt is repaid with the incremental tax revenue of the TIF district, not just one particular project. The river villages included in this plan may consider this approach to make select walking or sidewalk enhancements as they seek to encourage the redevelopment of certain areas.



Leverage Foundation, Development and/ or Other Alternative Funding Sources

Foundations of various types are increasingly investing in public health and the infrastructure that supports it. People for Bikes, for example, is a national foundation that supports a wide variety of community cycling projects with small, easy to administer \$10,000 grants. Another strategy is to use local zoning codes to ensure greenfield development or urban redevelopment projects enhance pedestrian or bikeway connectivity.

Other opportunities include municipalities turning to crowdfunding sites like ioby.org to close budget gaps.

For example, the Memphis, TN and Denver, CO have each closed sizeable gaps in funding for protected bike lanes through citizen philanthropy. Finally, local organizations such as the Nyack Park Conservancy, Nyack Chamber of Commerce, and Visit Nyack, might consider small scale funding partnerships to either access foundation dollars or lead fundraising efforts to improve walking and cycling infrastructure or programs.



Adopt The Quick Build Project Delivery Methodology

While raising funds for building out the walking and bicycling network is critically important, developing a new, iterative quick-build approach will make this *Master Plan* a reality. The towns and river villages should become more comfortable with the quick-build project delivery methodology. A greater reliance on this approach will make space for the creative application of a less expensive and flexible material palette that is effective, efficient, and able to provide a more adaptable transportation network over time. This will not only bring substantial transportation and public safety benefits sooner but will allow for local adaptation as travel patterns and technologies continue to shift in the coming decade.

Many of the recommendations in this *Master Plan* may be completed using lower cost approaches such as lane reassignment and establishing protected bike lanes with flex-posts or armadillos. Communities across the country are using quick-build techniques to build out their bicycle and pedestrian networks, sometimes leaving low-cost materials in place for several years until there is an opportunity to upgrade to more robust facilities. The advantage of this

approach is that municipal leaders can learn from the interim design and record public input based on user experience, refining designs as funding is acquired for more permanent infrastructure.

Quick-build also means getting started now with planning and design for small but important projects highlighted by the community through this *Master Plan* process.

Make Sure the People Power Needed is in Place

The river villages and the school district need more than just funding to implement the recommendations within this *Master Plan*. Each community also needs people who have the time and resources to coordinate the planning, assist with design, construction, and the maintenance of this network. Successful communities harness the power of dedicated municipal staff alongside the grassroots efforts of community leaders and activists in a truly public-private partnership.



Image Credit: Street Plans

WE CAN DO THIS!

This *Master Plan* is ambitious but with funding at these levels, support at all levels of local government, and staff resources available to do the work, it can get done and will be well worth the effort. The result will be a safe, modernized, and attractive street network that offers Nyack area residents and workers real choices in how they get around.



