

Millwood-Ossining GO Plan: North State Road Bicycle Route Planning and Design Final Report

Town of Ossining, Westchester County, New York



**Sam
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**Hudson River
Valley Greenway**



Goals and Project Impetus

Millwood-Ossining GO Plan

Millwood-Ossining GO Plan (MOGO) is a bicycle and pedestrian connectivity plan to designate corridors in the Town of Ossining (the Town), Village of Ossining (the Village), and Town of New Castle (which includes the hamlet of Millwood). Bicycling and walking are healthy and affordable means of transportation that connect people to commercial areas and parks. The Town incorporated input from community workshops into MOGO.

MOGO serves as a guide to Town-wide transportation investments. The Town began implementing key aspects of the Plan with this project, North State Road Bicycle Route Planning and Design. This document is the final plan report. MOGO's vision includes safe and comfortable bicycle routes and bicycle-friendly economic development strategies.

Safety and Comfort for All Ages and Abilities

The All Ages and Abilities (AAA) criterion is a methodology to ensure roadway design accommodates all users. National Association of City Transportation Officials (NACTO) guidelines for AAA facilities are that they be safe, comfortable and equitable. AAA-qualified bicycle facilities often improve traffic safety, reduce congestion, improve air quality, and provide equitable access to jobs. Over time, they can reduce dependence on motorized vehicles.

Better bicycle facilities can make the road safer for everyone, encouraging bicyclists to comply with roadway rules. According to NACTO, AAA bicycle facilities can cause "unsafe bicycling decisions [to] disappear, making ordinary riding safe and legal and reaching more riders." AAA requires that efforts be made to consider bicyclists who have typically been under-represented, such as children, seniors, women, people of color, people with disabilities, and lower-income riders.

The Town is using AAA as a framework for planning the future of commercial corridors such as North State Road and local roadways that provide access to open space, offices, and job sites. A goal of AAA is to make bicycling less stressful by limiting speed of adjacent motor vehicles. An objective is to make sure there is enough space for pedestrians and cyclists.

Economic Development and Tourism

Town economic development strategies can make transportation more equitable. Priorities in Ossining's current (2002) Comprehensive Plan can be a foundation. As outlined in the Trends and Projections section of this report, those commuting via bicycle to jobs along North State Road could benefit from better roadway design. This could help underserved groups in general have a safe and comfortable means of travel.

The Town identified a bicycle "circuit" loop off North County Trailway (NCT) as one priority. NCT is a scenic off-road bicycle and pedestrian path passing through Ossining, and it attracts many recreational users. It is flat and ties into

AAA criteria. The Town views the integration of NCT into the Empire State Trail (EST) as one potential economic development strategy.

The circuit from NCT to North State Road could bring more customers to a commercial corridor and its merchants. “Bicycling Means Business,” a report by the League of American Bicyclists and the Alliance for Biking and Walking, highlights the economic benefits of increased bicycling. It states that bicyclist customers are more likely to make repeat trips to local stores than motorist customers. While motorists spend the most per visit, bicyclists were found to spend the most per month.

The economic benefits of bicycle trails are well-documented. The “Bicycling Means Business” report notes that two-thirds of merchants reported an increase of gross revenue because of proximity to the Great Allegheny Passage (a 132-mile bicycle trail in Maryland and Pennsylvania), with increased visitors, customers, and real estate values. The Urban Land Institute’s “Active Transportation and Real Estate” report found similar trends along Pennsylvania trails like the Empire State Trail. The Schuylkill River Trail created \$7.3 million in direct economic impact in 2009 along its route, whereas the Delaware and Lehigh Trail generated economic impact of over \$19 million in 2012.

Town and Chamber of Commerce economic development plans can incorporate efforts to attract businesses catering to bicyclists. This includes adding amenities such as bicycle racks, as noted in the Other Recommendations section of this report. Existing businesses could add new services related to the EST’s recreational potential. For example, automotive repair shops can offer bicycle repair and restaurants can offer quick refreshments for touring cyclists. Ossining can promote weekend touring and “day tripping” from New York City and other large population centers.

Project Corridor Background

Existing Conditions

North State Road is a thoroughfare servicing the Town and nearby municipalities. It is in central Westchester County (the County), approximately 20 miles north of New York City.

Moving south-to-north, North State Road starts at Pleasantville Road in the Village of Briarcliff Manor, crosses over Briarcliff-Peekskill Parkway (NYS Route 9A) and intersects with Chappaqua Road. The next mile is the project corridor (the Corridor), which is defined as within Town jurisdiction. Northward, there is a short distance within the Town of New Castle, ending at Saw Mill River Road (NYS Route 100).

Apart from the New Castle segment, the character of North State Road is that of a “main street” for surrounding neighborhoods, and the business district it is the centerpiece of. While there are sidewalks throughout the “main street” segment, there are no on-street bicycle lanes or other bicycling facilities.

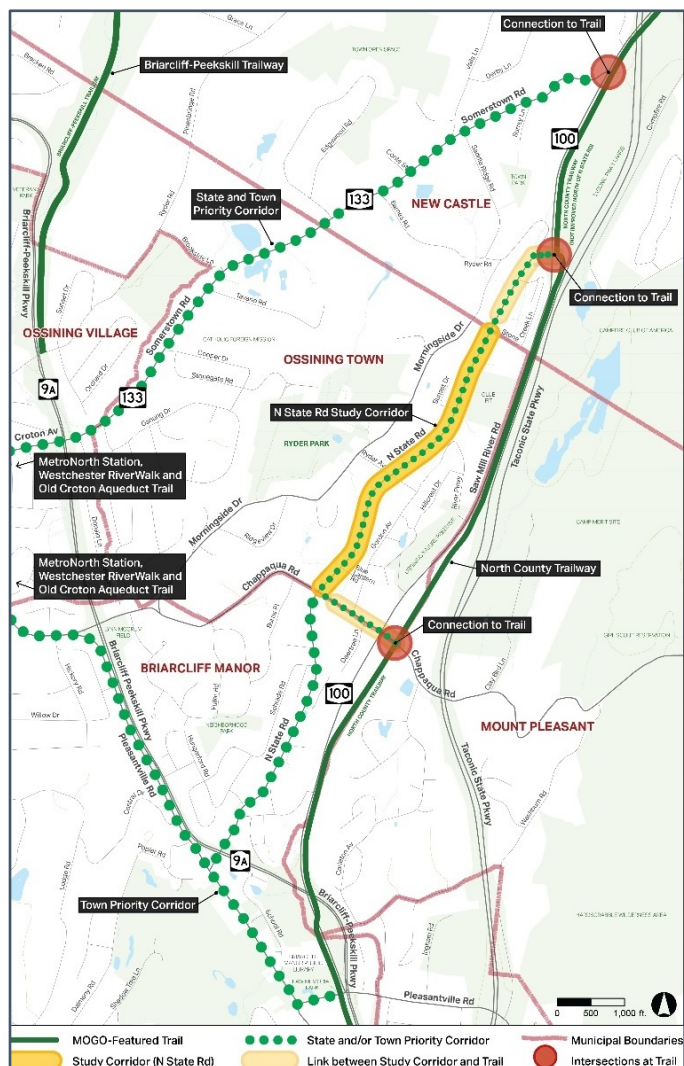


Figure 1: Project Corridor and Bicycle Routes

Existing condition motor vehicle speeds along the corridor frequently exceed the 30 miles per hour (mph) posted speed limit. This leads to potentially unsafe conditions, particularly for pedestrians, and especially at crossings.

Bicyclist Level of Traffic Stress (LTS) is a framework that can be applied to measure the stress of bicyclists on a roadway due to conditions such as traffic volumes and speeds. North State Road has been evaluated as an LTS of 3 by the project team (with 1 as the most comfortable and 4 as the most uncomfortable). This is due to no marked bicycle facilities, a 30 mph speed limit (which is generally inhospitable toward bicyclists), and moderate commercial activity (including driveways). This means only “Strong and Fearless” and “Enthusied and Confident” bicyclists will likely feel comfortable using the roadway. These are only two of four commonly recognized bicyclist typologies (developed by the City of Portland, Oregon). The vast majority of “Interested but Concerned” bicyclists, the largest percentage of potential riders, would not feel comfortable bicycling on North State Road.

North State Road in Roadway Network Taxonomy

Most of North State Road’s length is within the “General Business (GB) District” zone, while the short segment north of Club Fit (a large recreational facility) is R-20 single-family. It is functionally classified as non-National Highway System FC 17, Urban/Major Collector. Though under jurisdiction of the Town of Ossining, the Corridor is a former County road within partial Westchester County jurisdiction.

While no County road permits are required, the Town must refer certain planning and zoning actions on or within 500 feet of North State Road to the County Planning Board. For these and other collaborative reasons, Westchester County has been a stakeholder throughout the course of the Plan.

The northmost segment (in New Castle) has remained a County road. Long-term, the County could potentially divest this segment, as it periodically transfers jurisdiction of roads to local municipalities. This could be a potential catalyst for continuing a bicycle lane north of the Corridor, as roadway improvements are typically done during divestment.

General Business District in Town Comprehensive Plan

North State Road is within the Town’s General Business (GB) District, as described in the 2015 Comprehensive Plan Update. The GB District permits a wider range of commercial land uses than would otherwise be allowed in other districts. Restaurants, banks, professional offices, and other commercial uses are permissible, in line with bicycle-friendly economic development objectives.

The GB District is surrounded by residential zoning, solidifying North State Road as a commercial hub and “main street” abutting neighborhoods. At a total of 58 acres, the District is 3% of the Town’s land. Although not geographically central in the Town, it is convenient to regional thoroughfares such as Route 100, Somerstown Road (NYS Route 133), and the Taconic State Parkway.

The 2015 Comprehensive Plan Update defines the North State Road Study Area. It has four parcels of retail/shopping, four restaurant/bar parcels, five automobile-related, one private recreation (the Club Fit parcel), and 11 miscellaneous commercial parcels. Other land uses include single- and multi-family residential, office, and industrial/warehouse. There are a few vacant/undeveloped parcels. In sum, a non-unifying mix of land uses changes the visual environment from one end to the other.

An objective of the Town’s 2015 Comprehensive Plan Update is to support North State Road and other business areas. The goal for these areas is that they “remain economically vibrant and continue to provide the community with a mixture of businesses, services and pedestrian activity.”

Trends and Projections

As documented in the Comprehensive Plan, the Town’s (defined here as Westchester County Census Tract 137, the unincorporated area outside of the villages of Ossining and Briarcliff Manor) population increased at a remarkably

high rate. The Town went from 3,000 residents in 1960 to about 5,500 in 2000. During this era of nationwide suburban growth, the Town's population grew by 83%, much higher than the surrounding County growth of 16%.

Since 2000, the Town grew by a slower rate of 1%. There was a slight decrease after the Great Recession, but it bounced back to 5,555 by 2017. For comparison, from 2000 to 2017, the County grew by 5% (without losing population following the Recession) to 975,321.

The County is projected to grow by 9%, from 976,103 in 2015 to 1,064,958 in 2040, according to Cornell University's Program on Applied Demographics. Using trendlines since 2000, the Town can be expected to grow, but slower than the County. This represents a "flip" of the Town growing faster than the County before 2000, and the opposite since then.

While the nationwide median age according to the US Census in 2017 was 38, the Town's median age was 51, so the Town must plan for an older population. In 2017, Ossining was 78% white, 9% black, 4% Asian, and 9% other races or biracial. Additionally, 13% of residents were Hispanic. National population, for comparison, was 73% white, 13% black, 5% Asian, and 9% other races or biracial; 18% were Hispanic. Median household income was approximately \$125,000 in the Town, while \$57,652 nationally.

The Town has a high rate of vehicle ownership, as 1.5% of total households have no motor vehicle available. Sixteen percent of households with two or more people have only one vehicle available. Though this is a lower percent than that of the County – 34% (which also includes no vehicles available) – it nonetheless represents a significant number of households who may not have an automobile available for every adult. Additionally, the Town should also consider younger residents, as 17% of its population is younger than 18, plus anyone under 16 is essentially car-free. Therefore, many residents may be car-free at least during parts of the day and could benefit from bicycle facilities.

According to the Future of Transportation National Survey (2010), 66% of Americans want more transportation options for choosing how to get to destinations, and 73% feel they have no choice but to use a motor vehicle at current levels. The National Community and Transportation Preference Survey (2017) found that 53% nationwide would prefer living within "easy" walking distance of community amenities. These findings demonstrate a car-free preference at various times during routines.

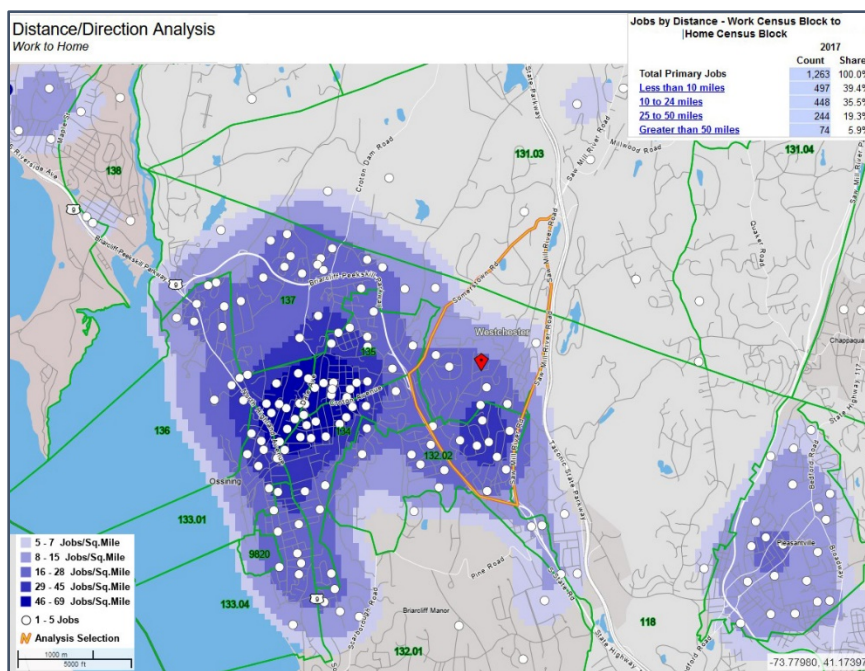


Figure 2: Employment Density and Distance Analysis in Catchment Area

Nationwide, local governments are responding by expanding space for pedestrian and bicycle facilities. Small, low-cost and quick transportation projects can have a high impact on meeting the demand of car-free preferences. As in the case of Portland, Oregon, car-free facilities such as an entire bicycle lane network cost the same budget as one mile of urban freeway.

In 2017, approximately 70% of Town commuters used private motor vehicles to commute to work, 17% used public transit, 3% walked, 0% bicycled, 1% used other modes, and 9% worked from home. Overall the County had higher percentages

of commuters who used public transit (23%), walked (5%), and bicycled (0.2%). Thus, based on the County share of commuting travel modes, there is potential for Town commuters to shift modes to meet MOGO goals and objectives.

The Corridor had about 500 jobs in 2017. It is a major route to an employment cluster at the southern end of North State Road. Though there are less jobs overall and a lower job density (jobs per square mile) than hubs such as Downtown Ossining, there nonetheless is a need to plan with these jobs' economic activity in mind. In addition, in a "North State Road catchment area" bounded by State routes 9A, 100 and 133, approximately 39% of inbound commutes were 10 miles or less (see Figure 2). Especially of note is that many of these commuters live in Downtown Ossining, meaning that infrastructure such as bicycle lanes along North State Road – and from routes connecting to and from Downtown – would potentially serve many of these workers.

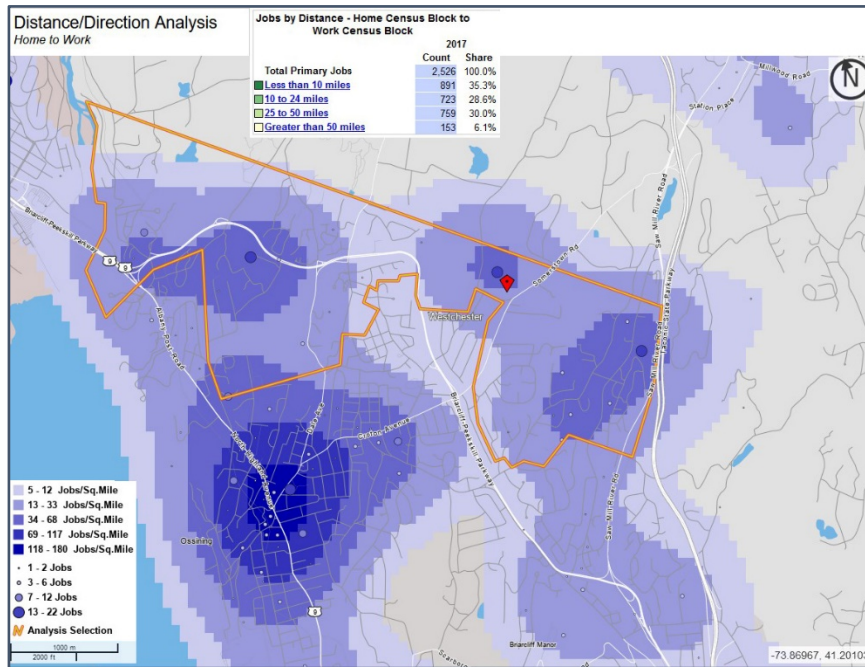


Figure 3: Town Residents by Commute Destination

Similar patterns are prevalent for where Town residents commute into. These are notably the employment hubs of Downtown Ossining, White Plains, and Midtown Manhattan, as well as North State Road itself (see Figure 3). Out of approximately 2,500 Town commuters in 2017, about 35% commuted less than 10 miles, much of which is along the Corridor. Bicycle lanes would provide a way for residents in and around the Corridor to safely and comfortably utilize the roadway, whether commuting into or passing through the Corridor. Out of the 65% of Town residents commuting over 10 miles, a significant amount work in Manhattan. Bicycling can support public transit usage, hence the need for bicycle lanes along roadways connecting to nodes such as Ossining's Metro-North train station.

The commutes under 10 miles from home present an opportunity for increasing bicycle commuting. The typical adult bicyclist speed is 8 to 15 mph on level terrain, according to the American Association of State Highway and Transportation Officials Guide for the Development of Bicycle Facilities. Commuters switching from motor vehicle to bicycle could still complete commuting within an hour. For example, a resident living near the intersection of North State Road and Ryder Avenue (in the Corridor) who works about 3 miles away in Downtown Ossining, would have an approximate 18-minute-long commute via bicycle, compared to an existing commute of 10 minutes by motorized vehicle.

Bicycle and pedestrian facilities could both encourage and absorb the demand for a shift away from car-dependency. This would also respond to regional and nationwide trends of more people working from home, choosing shorter commutes, and showing greater preference to have choices beyond the single-occupancy private automobile.

Hudson River Valley Greenway and NYSERDA

Hudson River Valley Greenway Grant

The MOGO project's process included submitting documentation for successful New York State Grant applications. **This Plan is funded in part by a grant from the Hudson River Valley Greenway** ("the Greenway"). As required, this Report serves as final Plan documentation.

In 2016, the Greenway issued the \$30,000 matching grant (titled "Greenway Conservancy Small Grant") under its Greenway Conservancy Trails Grant Program to fund MOGO. Implementation of these funds include North State Bicycle Route Planning and Design. The Greenway is a New York state public agency and conservancy founded in 1991 which utilizes regional planning to preserve Hudson River Valley resources and encourage contextual economic development. The Grant is intended to fund recreational trail projects – of which MOGO leads to, such as this Plan – in line with the Greenway's missions.

As noted in Figure 4, MOGO and the Plan fit in the Grant's "Trail Planning or Design" category, as "Planning for Open Space/Bike Lane/Commerce Connectivity Corridor." Total project cost was projected as \$90,677, including Greenway and applicant match funding. The Town is the lead applicant along with two co-applicants, the Village and Town of New Castle.

As required in the Grant application, the Town and Village boards issued resolutions of approval and endorsement of the Greenway Grant. Elected officials (who represent the Town and nearby communities) have recognized MOGO's potential to connect destinations, meet walkability and bicycling demands, and promote tourism. Amongst those who wrote to the Greenway to support the application were US Congressman Nita Lowey, State Senator David Carlucci, State Assemblymember Sandy Galef, and County Legislator Catherine Borgia. Then-County Planning Commissioner Edward Burroughs also wrote in support, as did leaders from environmental and educational organizations.

The application demonstrates how MOGO promotes Greenway criteria. It details an envisioned trail network, steering committee, and environmental objectives. Tasks were identified such as public engagement, a central Grant requirement. After awarding the Grant, Greenway Executive Director Scott Keller issued executed memorandums of agreement and understanding. This enabled MOGO and the Plan to proceed, including scope of services, deadlines, and budget.

NEW YORK STATE OF OPPORTUNITY
 KEVIN M. BURKE, Acting Chair, Greenway Conservancy
 BARNABAS MOHENRY, Chairman, Greenway Council
 MARK CASTIGLIONE, Acting Executive Director

Hudson River Valley Greenway

2016 Greenway Conservancy for the Hudson River Valley Trail Grant Program Application

PART A—PROJECT CATEGORY
 Check the one category that best fits your project:
☐ Trail Construction
☒ Trail Planning or Design
☐ Trail Rehabilitation or Improvement
☐ Trail Education or Interpretation

PART B—GENERAL PROJECT AND APPLICANT INFORMATION

1. Project Name: Planning for Open Space/Bike Lane/Commerce Connectivity Corridor

2. Lead Applicant Organization or Municipality: Town of Ossining

3. Co-Applicant(s) (if any): Village of Ossining and Town of New Castle

4. Project Location: County/Counities: Westchester
 City/Town/Village(s): Town of Ossining, Village of Ossining, Town of New Castle
 Project Site Address: Various Addresses throughout Municipalities
 City/Town/Village: Ossining & Millwood State: NY Zip Code: 10563 & 10516

5. Project Costs:

| | |
|----------------------------|-------------|
| Greenway Funds Requested: | \$40,000.00 |
| Applicant Match - Cash: | \$5,350.00 |
| Applicant Match - In-kind: | \$45,326.80 |
| Other Funding: | \$0.00 |
| Total Project Cost: | \$90,676.80 |

Figure 4: Hudson River Valley Greenway Grant Application Page

Clean Energy Communities Grant

The Plan is also funded by a \$50,000 grant awarded to the Town from New York State Energy Research and Development Authority's (NYSERDA) Clean Energy Communities (CEC) Program. The program is intended to give resources, technical assistance, and recognition to local governments in New York State which implement clean energy actions, save energy costs, create jobs, and improve the environment.

As part of a Statement of Work, objectives and components are outlined such as improving bicyclist safety, reducing greenhouse gas emissions, and promoting Corridor businesses. The stipulated plan components are (1) public outreach by the MOGO Task Force, and (2) implementation via North State Road signage, striping, and wayfinding as recommended in the Plan. The CEC Grant focuses more heavily on North State Road than the Greenway Grant.

The Grant stipulates that a staff member from NYSERDA be assigned as Project Manager, who reviews deliverables as defined in the Statement of Work. Submittals are made via email and on a Salesforce software platform account, which in turn marks design phase milestones. Then, the Manager gives direction to the Town to maintain compliance throughout the course of the Plan.

Per Grant requirements, all Plan efforts must further clean energy. A metrics report (see Appendix section of this report) is stipulated to quantify environmental, energy, and other benefits. Then, it will be used by NYSERDA as a performance review. An outreach strategy approved by the Project Manager was required by the CEC Grant. Therefore, the Public Engagement section in this report was circulated in advance. It – as well as this report itself – has been structured as specified in the Grant’s Statement of Work.

Objective: Complete Streets Level of Design

Complete Streets is a planning objective recently making inroads in New York State. In 2011, the Complete Streets Act was signed, requiring state, county and local governmental agencies to plan for all roadway users for state- and federal-funded transportation projects. New York State Department of Transportation (NYSDOT) defines Complete Streets as a “roadway planned and designed to consider the safe, convenient access and mobility of all roadway users of all ages and abilities. This includes pedestrians, bicyclists, public transportation riders, and motorists; it includes children, the elderly, and persons with disabilities.”

A Complete Street has suitable design features for all users, as opposed to a conventional roadway that may have wide motor vehicle lanes, narrow sidewalks, and no bicycle lanes. In addition to the provision of sidewalks and bicycle lanes, traffic calming measures such as bus curb pull-outs, raised crosswalks, pedestrian-control traffic signals may be incorporated.

As specified in the Greenway Grant application, Complete Streets has been identified by AARP’s Public Policy Institute as a “potential remediation to the disproportionate injuries and deaths sustained by pedestrians over 65, compared to younger counterparts.” This is noteworthy for communities such as the Town and New Castle having a growing Senior population. Complete Streets also accommodates immigrant, lower income, and other under-represented groups who may have higher rates of bicycling and walking.

Environmental Goals and Metrics

Environmental goals and metrics are specified in the applications of both the Greenway and CEC grants. Natural resource protection and maintaining public access via trails to these resources are key components. Students in nearby schools can utilize trails, studied and proposed in MOGO and the Plan, for environmental education and stewardship.

The Plan seeks to implement local and statewide environmental initiatives such as the Green Ossining Climate Action Plan and the New York State Open Space Conservation Plan. NYSERDA’s Cleaner, Greener Communities Program has established goals and targets in the Mid-Hudson Region that the Town is in. For example, environmentally-friendly commuting (such as bicycling and walking) is targeted to grow from 8% to 8.5% in future decades.

Environmental benefits such as reduced air pollution and traffic congestion are aspects of Complete Streets. Traffic calming safety measures and provision for bicyclists and pedestrians encourage greener transportation. Less motor vehicles could be on the roadway as users switch to new modes. Potentially, there is more efficient transport of vehicles, with gasoline conservation and less exhaust.

The Town must submit metrics documentation to NYSERDA as part of the CEC Grant throughout various project phases. This includes a metrics workbook during the Project Design Phase demonstrating minimum performance requirements to estimate energy and greenhouse gas savings. Another submittal focuses on vehicle miles traveled (VMT), a metric often used by transportation planners to measure motor vehicle distance traveled in an area over a given time period.

Metrics required by the CEC Grant are fully specified in the Appendix section of this report. These metrics are energy use reduction, energy efficiency, greenhouse gas reduction, sustainable development, smart growth, walkability, connectivity, green infrastructure, climate resiliency, mixed-use development, economic development, neighborhood and community revitalization, and water and waste management.

Limits and Challenges



Figure 5: North State Road Existing Conditions

As shown in Figure 6, this 30' width consists of one 11' to 11.5'-wide lane of motor vehicle traffic in each direction (separated by a double-yellow line marking), plus narrow shoulders of about 3.5' on both roadway sides. There are also 5'-wide sidewalks on both sides, adjacent to curbs. The remaining right-of-way width is typically occupied by parking lots, driveway access, or green buffers. The northernmost segment of the Corridor (from Club Fit to the New Castle boundary line) has no shoulders or a west-side sidewalk.

The overall narrow width limits what can be prescribed to address non-motorized transportation such as bicycling and walking. Challenges arising out of curb-to-curb width were addressed by comparing the concepts in the Short-Term Options section of this Report.

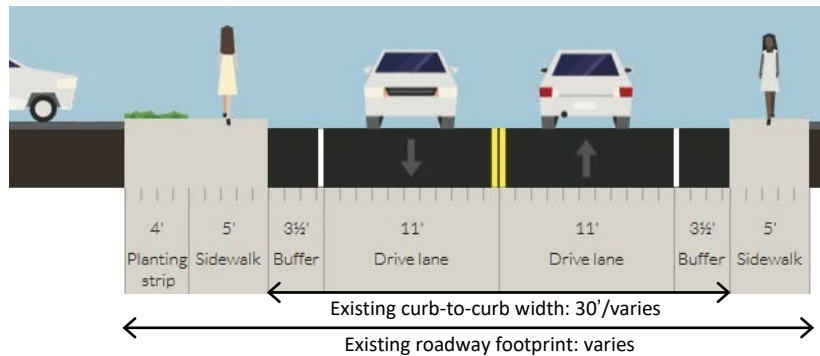


Figure 6: Short-Term Preferred Option Cross-Section

Utilities/Curb Relocations

Existing utility/curb placement and conditions are potential limits and challenges, and thus need to be studied and considered in project plans. There are a variety of utilities and supporting infrastructure along the Corridor. These include storm catch basins for drainage into and storm manholes to provide access to sub-roadway stormwater capture system pipes, fire hydrants, as well as telephone poles for overhead electrical wires. Some existing catch basins are within the roadway shoulder, while others are offset from the typical shoulder width. Those basins within typical alignment would need to be studied for safety and comfort for potential bicyclists (including for potential replacement), while offset basins impact the current path of pedestrians on sidewalks.

Long-term capital improvements along redesigned roadways can involve moving curbs to increase roadway width. Thus, existing fire hydrants, telephone poles, and alignment of overhead wires may need to be inventoried and relocated, depending on the specific roadway shift chosen. Long-term capital improvements pertaining to the Final Preferred Option are discussed in the Recommendations section of this Report.

PROJECT PROCESS AND ENGAGEMENT

Literature Review

A variety of documents were reviewed to provide context and planning inputs into the Project. The following section summarizes the four reports that were most relevant.

Millwood-Ossining GO Plan (MOGO)



Figure 7: Millwood-Ossining GO Plan

MOGO aims to establish and develop connectivity between local recreational, tourism, and business destinations. North State Road is strategically “at the center” of this. Due to the high percentage of Ossining households with no motor vehicles, MOGO urges access to local business areas and open space via bicycle and pedestrian networks, increased by connecting existing trails, commerce and other resources. The main challenge is how there is currently enough north-south pedestrian/bicycle trail connections, but not enough east-west connections.

The MOGO study area includes the Town, the Village, and Town of New Castle. Studied trails include North County Trailway (NCT), a 22-mile paved bicycle and pedestrian Rail-to-Trail on the “Old Put” rail right-of-way. NCT is slated to become part of the Empire State Trail (reviewed in a below review).

MOGO hosted community workshops, which are documented in the report. Priorities include access to existing bike trails and open space, intersection safety, and bike lanes. There was also an online community survey, which found 70% of residents commute by car, 14% by transit, and 7% by walking. Respondents ranked potential improvements that they believed would increase bicycle/pedestrian commuting. These prescriptions include bike lanes, perceived safety, less distance, “Share the Road” signs, and reduced automobile speeds. Increasing bicycle access and safety were mentioned as benefiting the environment, property values, and quality of life. Respondents articulated that they did not feel safe biking or walking, since there are currently no on-street bicycle lanes in the study area, and there are narrow roads, speeding, areas with no sidewalks, and insufficient pedestrian crossing signs, etc., which all increase the likelihood of a potential crash occurring.

MOGO aims to accommodate all levels of bicyclists, especially on a commercial corridor like North State Road. “Recreational riders” are defined in MOGO as needing the least amount of slope and speed. “Cyclists” utilize challenging marked bike routes. Generally, “cyclists” ride on roadways with less improvements.

MOGO’s goals and recommendations include implementing feasibility evaluations for proposed bicycle routes and a demonstration project and local bicycle-friendly economic development (e.g. bicycle parking for businesses). Also included are an EST gateway at the North State Road and NCT parking lot, a significant entryway to the Trail that is actively managed with user amenities, and emphasis on local culture and connection to the Statewide trail system.

Furthermore, MOGO encourages the Town to be the Hudson Valley’s recreational “starting-point” via bicycle paths starting at the Metropolitan Transportation Authority’s Ossining Metro-North train station.

Town of Ossining Comprehensive Plan

The Town’s Comprehensive Plan (referred to as the Plan in this review) was adopted by the Town Board in 2002. Key sections were updated in 2015. The Vision Statement reads: “a transportation network addresses the needs and safety of vehicular, pedestrian, and bicycle travel.” The Plan describes existing conditions of the North State Road area such as having no immediate steep slopes, wetlands, or flood plains. North State Road is at the center of the Town’s commercial, industrial, and warehouse land uses.

Other sections of the Plan include “Community Appearance.” Plantings and gateway signs are mentioned as implementation strategies to create a positive image of the community at key Town entrances. Landscaping in parking lots, street frontages, and parcel lines are specified for providing screening and shade. Design guidelines are prescribed, including lighting standards. Coordinating and refining wayfinding and signs for business districts, to NCT, and other destinations, is also recommended.

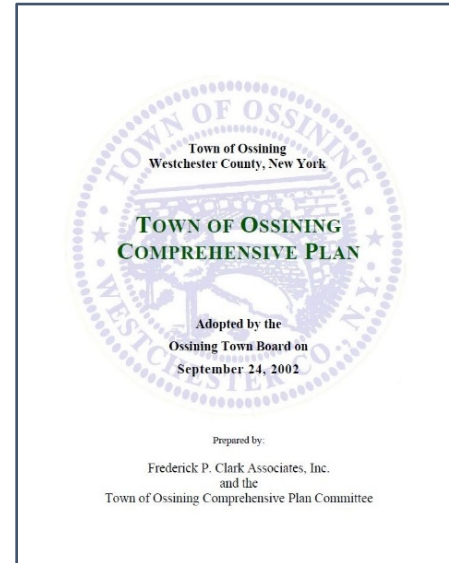


Figure 8: Ossining Comprehensive Plan

In the Plan’s Environmental section, it is prescribed to utilize preservation, buffers, permeability, pocket parks, and trail connections for projects. Road guidelines include consistent landscaping, signs, lighting, and streetscape. The section also includes integrated open space, trail network, walking/bicycling trails, and connections to North Country Trailway from nodes. The Plan prescribes promoting trail and walkway information via brochures for locals, tourists, and online resources.

The Transportation section’s goals include road network functionality, traffic circulation, parking needs, safe pedestrian and bicycle facilities, and alternative transportation. Coordination is urged for County and State on road improvements and traffic signalization for increased flow safety. North State Road access management includes pavement opening minimum distances, limit of new signals, and synchronizing signals. Other prescriptions include evaluation of sight lines and speed limits for circulation. The Plan reads, “parking lots can be landscaped and located to encourage people to park vehicles, then walk.” Finally, bicycle ridership and alternative transportation are encouraged for commuting, community services, etc.

Another section of the Comprehensive Plan is Future Development. For economic vibrancy, mixed use (having a mixture of residential and commercial land uses in one place) and pedestrian-friendly environments are urged to be supported. New land uses are prescribed to enhance the General Business District and automobile-focused land uses are urged to be considered for removal. Furthermore, potential changes to requirements for commercial buffers and setbacks are urged to be evaluated. The vision for future developments includes features such as stone walls, to keep with the Town’s historic character.

Empire State Trail Plan

The Empire State Trail is a 750-mile bicycle and pedestrian path undergoing implementation. It will start in New York City and end in the western and northern ends of New York State (via two branches splitting in Albany). In 2017, Governor Andrew Cuomo signed legislation for the EST to proceed, with planned completion in 2020.

Consisting of both new and retrofitted paths, approximately 400 miles are already in use as discrete, disconnected segments. North County Trailway, which has been studied in this Plan, is amongst the integrated segments. Roadside portions of NCT such as along Route 100 will get investment including bicycle pavement markings.



Figure 9: Empire State Trail Plan

Existing segments will keep their identity, albeit with EST co-branding. In addition to NCT, other retrofitted Hudson Valley trails include South County Trailway, Putnam Trailway, and Walkway Over the Hudson.

State agencies are coordinating 60 construction projects with various local stakeholders. Agencies overseeing each project will provide opportunities for public input. For example, New York State Department of Transportation is working with Town officials to improve NCT at Route 100 and North State Road.

A typical trail section will consist of 10'- to 12'-wide asphalt or stone surface for all levels and abilities. Wayfinding will direct to connecting trails and complement local signs, such as those to and from North State Road (see the Other Recommendations section of this report). The EST Plan states, "Gateways and trailheads will be highly visible trail entrances, often near city and village centers, that advertise and promote the Trail as well as nearby business and attractions." This is complementary to MOGO and Plan objectives. This State support

includes bicycle racks and self-service bicycle repair stations that are discussed elsewhere in this report.

When completed, the EST will be the longest multi-use trail nationwide, according to its Plan. The Town and other municipalities seek to take advantage of economic potential such as year-round tourism. The EST aims to connect natural resources and communities (similar to MOGO's objectives) and contribute to the non-motorized transportation network.

Route 133 Bicycle Lane Feasibility Evaluation

The State Route 133 Bike Route Designation Feasibility Evaluation serves as a precedent for North State Road. Written by NYSDOT in 2018, its purpose is to determine the feasibility to designate 3.3 miles of NYS Route 133 as a bicycle route. Ossining is exploring east-west on-street bicycle route connections (per findings in the MOGO Plan). These would be between major open space, NCT, transportation nodes, and Downtown Ossining.

A data analysis found that between 2014-17 there were 37 crashes, with zero involving bicycles. No crash patterns nor clusters were observed. Vehicle classification in 2015 consisted of 97% privately-operated vehicles versus 3% buses and trucks. An existing conditions inventory include the number of travel lanes, shoulder widths, on-street parking, pavement condition, curb or gravel, and utilities. Design segments were identified based on roadway section and land uses.

The Evaluation details conceptual design development and a public involvement plan. Recommendations include taking advantage of existing infrastructure such as curbs and sidewalks, widening roads when there is no curb, implementing intersection treatments for bicycle route safety and comfort, and installing signs to the municipal parking lot.

Concept 1 includes paved shoulders for bicyclists. Shared lane markings ("sharrows"), bicycle markings in a shared bicycle/motorist lane, can avoid the need to remove on-street parking and be added where additional ROW is not available.

Concept 2 includes dedicated bike lanes. There would be some on-street parking removal, and a widened roadway. 6' bicycle lanes would be next to curbs, as motorist travel lanes would be reduced to 11'.

Concept 3 includes a 10'-wide asphalt side path, 5'-wide grass buffer, and road widening. The roadway side most viable for

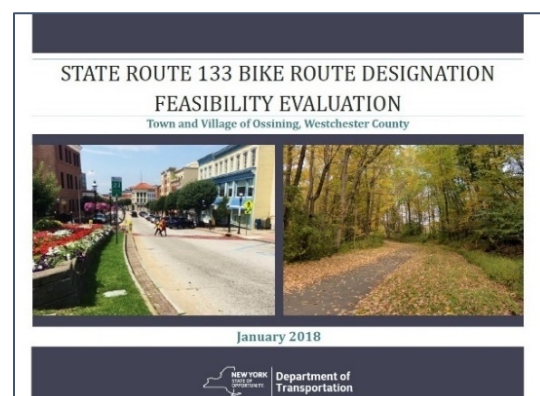


Figure 10: Rte. 133 Bicycle Lane Feasibility Evaluation

path would be chosen where there are fewer conflict points such as utility poles and driveways. Snow removal and buffer maintenance are to be considered.

All three concepts were reviewed by the MOGO Task Force. Concept 2 was preferred as a short-term option over Concept 1, while Concept 3 was preferred as a long-term option. Generally, bicycle lanes were preferred over sharrows, helping to inform a preferred concept for North State Road. The Town is currently working with NYSDOT for funding to further the Feasibility Evaluation into a scoping report.

Data Collection

Traffic Crash Data

| Corridor in Town of Ossining, Town of New Castle, and Village of Briarcliff Manor NY on North State Road (Entire Length) | | | | | | |
|---|------|------|------|------|-------|------------|
| Crash Type | 2015 | 2016 | 2017 | 2018 | TOTAL | % of Total |
| Collision with Motor Vehicle | 3 | 4 | 14 | 8 | 29 | 78% |
| Collision with Pedestrian | 0 | 0 | 0 | 0 | 0 | 0% |
| Collision with Bicyclist | 0 | 0 | 0 | 0 | 0 | 0% |
| Collision with Other | 0 | 0 | 0 | 2 | 2 | 5% |
| Collision with Light Support/Utility Pole | 0 | 0 | 1 | 2 | 3 | 8% |
| Collision with Guide Rail | 0 | 1 | 0 | 0 | 1 | 3% |
| Collision with Tree | 0 | 1 | 0 | 1 | 2 | 5% |
| Collision with Animal | 0 | 0 | 0 | 0 | 0 | 0% |
| Not Entered | 0 | 0 | 0 | 0 | 0 | 0% |
| Total | 3 | 6 | 15 | 13 | 37 | 100% |
| Pedestrian Action | | | | | | |
| Crossing Against Signal | 0 | 0 | 0 | 0 | 0 | 0% |
| Not Applicable | 3 | 6 | 15 | 13 | 37 | 100% |
| Total | 3 | 6 | 15 | 13 | 37 | 100% |
| Severity | | | | | | |
| Injury Only (Including Serious Injury) | 0 | 1 | 1 | 1 | 3 | 8% |
| Serious Injury | 0 | 0 | 1 | 0 | 1 | 3% |
| Property Damage Only | 3 | 4 | 14 | 10 | 31 | 84% |
| Property Damage and Injury | 0 | 0 | 0 | 2 | 2 | 5% |
| Non-Reportable | 0 | 1 | 0 | 0 | 1 | 3% |
| Total | 3 | 6 | 15 | 13 | 37 | 100% |
| Collision Type | | | | | | |
| Head On | 0 | 0 | 0 | 0 | 0 | 0% |
| Left Turn (Against Other Car) | 1 | 0 | 0 | 1 | 2 | 5% |
| Left Turn (with Other Car) | 1 | 0 | 0 | 0 | 1 | 3% |
| Overtaking | 0 | 0 | 0 | 0 | 0 | 0% |
| Rear End | 1 | 3 | 2 | 2 | 8 | 22% |
| Right Angle | 0 | 0 | 2 | 2 | 4 | 11% |
| Right Turn (Against Other Car) | 0 | 0 | 1 | 0 | 1 | 3% |
| Right Turn (with Other Car) | 0 | 0 | 2 | 1 | 3 | 8% |
| Sideswipe | 0 | 0 | 2 | 1 | 3 | 8% |
| Other | 0 | 2 | 1 | 6 | 9 | 24% |
| Unknown | 0 | 1 | 5 | 0 | 6 | 16% |
| Total | 3 | 6 | 15 | 13 | 37 | 100% |
| Traffic Control | | | | | | |
| No Passing Zone | 0 | 2 | 0 | 0 | 2 | 5% |
| Stop Sign | 1 | 0 | 0 | 4 | 5 | 14% |
| Traffic Signal | 0 | 3 | 1 | 2 | 6 | 16% |
| Other | 0 | 0 | 0 | 1 | 1 | 3% |
| None | 1 | 0 | 7 | 4 | 12 | 32% |
| Unknown | 1 | 1 | 7 | 2 | 11 | 30% |
| Total | 3 | 6 | 15 | 13 | 37 | 100% |

Figure 11: Traffic Crash Data Table

There were 15 crashes at the intersection of North State and Chappaqua roads (the south end of the Corridor), indicating that more could be done for safety. Crash data on nearby roadways illustrate comparative safety on the Corridor. Most crashes along nearby segments of Route 9A are at or near intersections with North State Road (39 crashes, including one with a pedestrian) and Chappaqua Road (28 crashes). There were 30 crashes on Route 100, and seven at the intersection of Route 100 and Chappaqua Road.

NYSDOT's Accident Location Information System (ALIS) was also considered for traffic crash data.

Traffic Volume Data

NYSDOT's Traffic Data Viewer was used for reference. This included spot counts (specific counts of traffic at one location measured in one-hour increments), estimated annual average daily traffic (AADT), and roadway traffic count hourly reports, all in 2016.

The project team obtained 2015-18 traffic crash datasets from NYSDOT. Data corroborates the perception of North State Road not currently supporting bicyclist safety and comfort, noted in public input. There is likely a correlation between there being no crashes involving bicyclists and so few bicyclists currently using the Corridor. As a data caveat, some crashes may not get reported if the involved parties were uninjured and little to no property damage occurred.

All 10 motor vehicle crashes on the Corridor were between motor vehicles or into utility poles. No pedestrians or bicyclists were involved. While there were no fatalities, there was property damage and a serious injury. As noted in Figure 11, North State Road in its entirety had 37 crashes, also mostly between motor vehicles, plus collisions into utility poles, guardrails, and trees. Twenty-two percent of collisions were rear-end crashes (which could indicate excessive speeds, as discussed in the Speed Limit Recommendation section of this report). These datapoints could be evidence of a high-speed environment, further hindering travel by bicycle and foot.

As shown in Figure 12, while there are no traffic counts along the Corridor itself, there are counts on North State Road in segments immediately north and south. Based on the available count data, the AADT was 4,993 motor vehicles from Route 9A to Chappaqua Road and 4,345 motor vehicles from the New Castle boundary line to Route 100. The midpoint of these AADT numbers is 4,669 motor vehicles. This provides a general framing of traffic volume, but caution should be given since it is not a direct count along the Corridor and datapoints may have been from different time periods. For comparison, the Corridor's estimated AADT is similar to Main Street in Downtown Ossining, which was approximately 5,000 motor vehicles.

To aid recommendations connecting the Corridor to and from NCT, Chappaqua Road's volumes were studied. There was a spot count of 3,677 motor vehicles west of the NCT entrance, and 746 east of it, suggesting a high traffic volume could be turning onto Route 100. The AADT for Route 100 itself (in vicinity of the Corridor) was 6,923 motor vehicles.

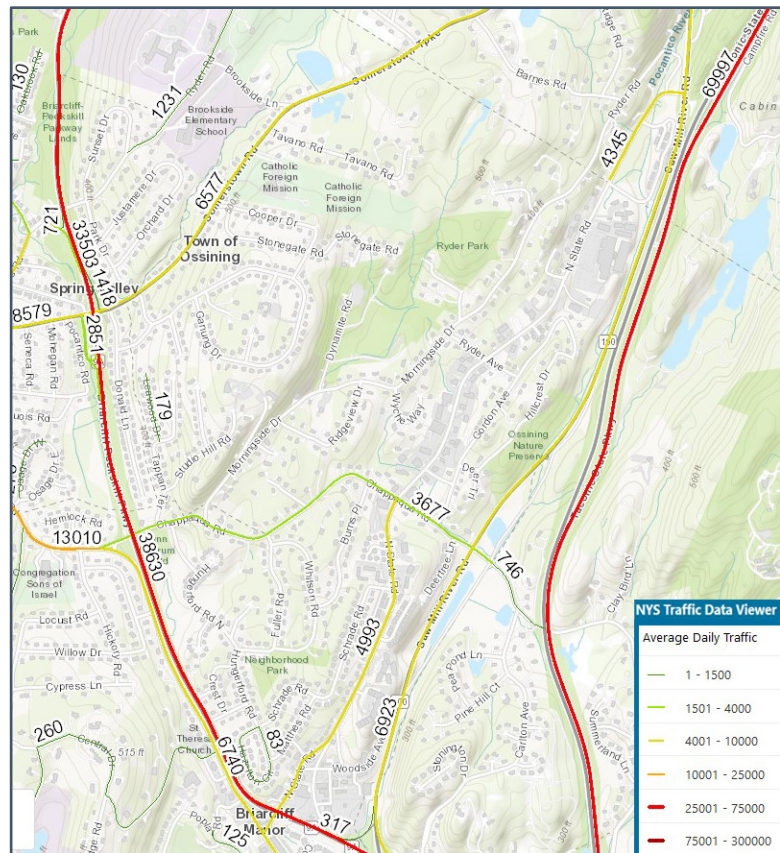


Figure 12: Traffic Volumes in Corridor Vicinity

Guidance Sources

A combination of engineering judgment and technical guidance sources have been used. Input from these guidance sources informed this Plan's recommendations with industry best practices and required standards.

The minimum allowable range of classifications (i.e. roadway types permitted within a certain area), as defined in the NYSDOT Highway Design Manual (HDM) and the 2012 American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities were adhered to when considering design options. The HDM has frequently been cited, as it defines lane-width minimums. This informed the project team when developing Plan prescriptions for roadways such as North State Road and Route 100.

The AASHTO Guide is a basis for design, first in selecting amongst cross-section options (in the Recommendations section of this report) and then specifications in the Signing and Striping Plan. The Guide was consulted when considering how to balance transportation modes within the existing curb-to-curb width of North State Road. As noted later in this report, bicycle lanes that are 4 feet wide (narrower than the recommended 5-foot width) are permitted when adjacent to curbs along roadways with speeds of less than 45 mph and when other lanes are narrowed to minimums.

The 2009 Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) was published by the US Department of Transportation's (USDOT) Federal Highway Administration (FHWA). MUTCD has provided guidance to the Plan on signage and traffic signals. MUTCD-compliant signs are specified in the Signage and Striping Plan described in a later section of in this report. Also noted later in this report, warrants determine if traffic signals are justified. For example, if pedestrian volumes, motorized vehicle speeds, and crosswalk length meet certain thresholds, then a pedestrian hybrid beacon would be considered.

Other guidebooks include the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide. It recommends best practices from around the world, expanding beyond the AASHTO Guide. As the Town has looked to a range of innovative designs, the NACTO Guide has been a resource for the project team. For instance, the Bike Box described in the Signage and Striping Plan is detailed in the NACTO Guide.

Other guidebooks have given input to cross-section options. These include FHWA's Small Town and Rural Multimodal Networks Guide as well as the Advisory Bicycle Lane Design Guide.

Public Engagement

Objective and Strategy - Outreach and Education

Public engagement was a key component of MOGO and North State Road Bicycle Route Planning and Design. Outreach, education, and opportunities to provide input have kept residents, employees, and other stakeholders informed and engaged.

North State Road's bicycle lanes would be the first of its kind in the Town, as the first instance of an on-street bicycle facility with dedicated lanes. This highly visible location will raise Town-wide awareness about bicycle lanes, especially being along the main street in the Town's General Business District. In addition to the painted line markings of bicycle lanes, improved wayfinding signage will contribute to giving residents an option to incorporate bicycling into their daily lives.

As discussed in the Literature Review section of this report, NYSDOT has done a feasibility evaluation for NYS Route 133 within Ossining becoming a bicycle route. This will further raise bicycle facility awareness. MOGO, also reviewed, is a multi-jurisdictional plan with Town leadership as key contributors. Its objective is to create and foster connectivity between recreational, historical, tourism and business destinations. Via a variety of events, public engagement has been a major component of MOGO.

Compliance with New York State Laws

The Plan follows New York State laws, including the Open Meetings Law. As required, meetings have been accessible to people with disabilities, with reasonable efforts made for barrier-free access. Meeting minutes and notes have been prepared throughout the process. The Town government's website has a MOGO webpage at www.townofossining.com/cms/millwood-ossining-go which gives information about the Plan, discusses public engagement, and provides opportunity for feedback.

In further accordance with open meetings standards, residents have been encouraged to attend meetings throughout the process. Events are advertised on the Town's and other websites. For example, the MOGO inaugural bicycle ride (see "Public Events and Project Meetings" subsection below) announcement is preserved at www.greenossining.org/this-saturday-join-us-for-our-inaugural-community-bike-ride-on-the-mogo/.

New York State Grant approval and documentation submittal were a part of the Plan funding and process. As described earlier in this report, Hudson River Valley Greenway and NYSERDA issued grants to the Town. Public engagement has been a central requirement of both grants.

Public Engagement Personnel

As part of the application process for the Greenway Grant, the Town engaged the Village and Town of New Castle as co-applicants. Upon receiving the Grant, the Town and Planner Tracey Corbitt identified key stakeholders for involvement in engagement. Further refinement of this Task Force added in representatives from the Village and New Castle.

Stakeholders have engaged with the public throughout MOGO and Plan design and implementation. Public outreach started with MOGO Committee members. These personnel include Ossining Town Supervisor Dana Levenberg and Confidential Secretary to the Supervisor Victoria Cafarelli; Mitzi Elkes (Ossining Environmental Advisory Committee); Lynn Brooks-Avni (former Planner for the Village); Mark Wilson (Village of Briarcliff Manor); Sabrina Charney Hull and Steve Coleman (Town of New Castle); Tracey Corbitt and Ilana Wagner (Westchester County); Emily Loughlin (Office of Assemblywoman Sandy Galef); Sandra Jobson (NYSDOT); and Kate Marshall and Laura Kelly (Westchester Cycle Club).



Figure 13: MOGO Public Workshop (Town of Ossining)

The MOGO Task Force has built on the outreach process. Personnel includes MOGO Committee members and other stakeholders, such as such as Joe DaRonco (Club Fit), Tracey Corbitt (now with the Village of Ossining), William Brady (Westchester County), Peter Connolly (Town Highway Superintendent), and Madeline Johl (Office of Assemblywoman Sandy Galef).

For planning and implementation of North State Road, the Town of Ossining hired Sam Schwartz Engineering, DPC (Sam Schwartz), a transportation planning and engineering consultant firm based in New York City. The interdisciplinary team at Sam Schwartz consisted of Michael Flynn, AICP, LEED AP; H. Zeke Mermell, AICP, LEED AP; Luke Martinek, PE, LEED AP; Nanette Bourne; Claudia Vilcherrez, EIT; and Jon Gerlach, PE. The team began its process with a meeting at the Ossining Municipal Building with the Town of Ossining, Town of New Castle, and Westchester County Planning Department.

Public Events and Project Meetings



Figure 14: MOGO Inaugural Bicycle Ride (Town of Ossining)

There were two community workshops (as discussed in the MOGO Plan itself), held at Ossining Public Library and Club Fit. At the workshops, residents and other attendees listed priorities for open space access, bicycle network planning, and traffic safety.

Around the same time, the Town co-hosted the MOGO inaugural bicycle ride (see Figure 14). The ride was a tour of bicycle planning and opportunities and was a comingling between residents and MOGO personnel.

In January 2019, as discussed above, Sam Schwartz was hired by the Town to further the design and implementation of the Plan (and specifically of North State Road). Then, stakeholders met for the first time at a kick-off meeting to discuss issues as the project proceeded. On March 6, 2019, the project team met with the MOGO Task Force. Cross-section design options were presented, discussed and prioritized. These options were developed as described in the “Design Options” section of this report.

On August 6, 2019, the Sam Schwartz team presented the Final Plan (including the Signage and Striping Plan of the Corridor’s preferred short-term option) to the Ossining Town Board. This was a chance for the Board and individual councilmembers to be updated and comment on Plan progress. Furthermore, the presentation was broadcasted on the Town’s website and public YouTube web channel. Also on August 6th, the Town and Sam Schwartz team presented project updates and key economic development points to the North State Road business community. To further merchant engagement, the Greater Ossining Chamber of Commerce was included.

The Town Board Meeting also had capacity to accommodate those interested in attending. Residents could see the project culmination in an open, public setting.

Green Ossining Earth Day

The ninth annual Green Ossining Earth Day Festival took place on April 27, 2019, at Louis Engel Waterfront Park, a Town-owned park located in the Village. The Festival (with the Town as an event sponsor) was a major public outreach event for the Plan. The project team spoke directly with residents, who got to weigh in on a variety of design and safety topics (see Figure 15).

A tent and booth encouraged residents to stop by to discuss the Plan. An inviting and easy-to-see message stated, *“Ossining is Making Bicycle and Pedestrian Investments; Ask Us How!”*

One main activity was a “Post-It note exercise” to gather input on long-term design options (see Figure 16).

Residents were encouraged to write on post-it notes what they liked about two long-term visioning options. By the end of the day, residents’ notes included feedback such as:

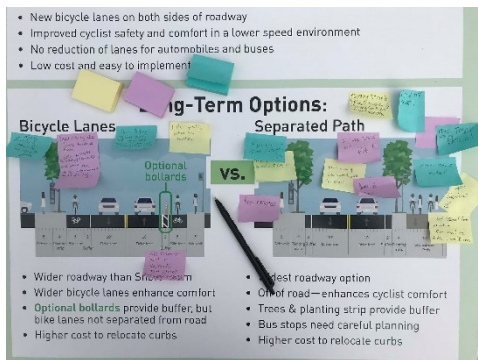


Figure 16: Post-It Note Exercise

North State Road. Residents wrote about dedicating more space for pedestrian and bicycle safety, such as:

- *“Please have a crosswalk from North State Rd across Route 100”*
- *“Traffic light at the intersection of Rte 100 and North State Rd would benefit cyclists & motorists alike.”*
- *“Increase education to promote safety & rules (laws) of the road. Include pedestrians, drivers, and cyclist[s].”*

Pedestrian and bicyclist crosswalks, traffic signals, and other topics were discussed. The Sam Schwartz team then collected the comment cards and gave them to the Town, which in turn distributed to the NYSDOT team so that public input could be conveyed to the project’s managers and designers.

Other Public Input Methods

The MOGO webpage on the Town’s website includes a feedback portal encouraging residents to give input. For example, a resident who lives near Chappaqua Road wrote about how she accesses NCT and how access could be improved. Excerpts as follows:

- *“[W]hat about the access to the bike path down Chappaqua Road from North State? We need a sidewalk badly.”*



Figure 15: Public Engagement at Green Ossining Earth Day

- *I try to stay very close to the curb, but since the cars... have limited visibility, I've almost been hit several times.*
- *I would like to be able to walk my dog... I don't usually walk to the bike trail because crossing Route 100 is also pretty dangerous."*

As indicated above, the feedback portal is a way for residents to directly engage with the Town on topics related to the Plan. Input was distributed to the consultants for further refinement into the Plan and to identify future investment priorities.

As discussed earlier, comment cards were distributed at Green Ossining Earth Day (see Figure 17). Some residents used the cards as an opportunity to weigh in on topics such as installing bicycle lanes elsewhere in the Town, or traffic safety in general. Others took the comment cards for their own submittal to NYSDOT.

Lastly, as part of the MOGO outreach process, an online survey obtained input on residents' bicycling experiences. Surveys were also distributed during community workshops. A noteworthy survey finding was published in the MOGO Plan: *"91% feel that the community would benefit from increasing access and safety for cyclists on roadways."* MOGO concluded by stating there is a *"strong desire to create a more bicycle and pedestrian friendly community."*

Public engagement to residents, merchants, and other stakeholders continues to be a strategy to ensure that it is informed by and representative of the community.

COMMENT CARD

EMPIRE STATE TRAIL
North County Trailway Safety Improvements

Please provide us with your questions or comments as they pertain to the proposed Empire State Trail project. They will each be given their due attention and considered in the design process. Thank you!

(Deadline for comments is 5/1/2019)

*Traffic (along road) 950
very dangerous intersection*

Bring them home and mail them to the address provided.
or
Submit your questions via E-mail at jason.wolfanger@dot.ny.gov

Attn: Jason Wolfanger, RLA
Project Manager
Eleanor Roosevelt State Office Building
4 Burnett Boulevard
Poughkeepsie, NY 12603

NEW YORK
STATE OF
OPPORTUNITY
Department of
Transportation

Figure 17: Example of Comment Card Public Input



Concept Development and Evaluation

Metrics for Concept Comparisons

A series of metrics were developed at the outset of the project to evaluate a range of design alternatives. There were various trade-offs between metrics, which were all factored into evaluation for Final Preferred Options.

Metrics include:

- **Enhances Bicycle Safety** – redesign creates a safer environment for bicyclists
- **Enhances Bicycle Comfort / Potential to Attract Riders** – reduces bicyclists’ Level of Traffic Stress and draws more riders, supporting the Town’s economic development objectives
- **Enhances Vehicular (Motorist) Safety** – reduces conflicts and crash risk for motorists
- **Enhances Pedestrian Safety** – reduces conflicts and improves comfort for pedestrians, who are amongst the most vulnerable roadway users
- **Minimizes Costs** – construction and maintenance costs are an important consideration
- **Technical Feasibility** – extent to which design aspects will make implementation more (or less) difficult

Cross-Section Options

A matrix is illustrated as Figure 18 on the following page. This matrix includes columns for each metric plus rows for cross-section option alternatives (six short-term and three long-term). Each metric’s standing within an option is color-coded from low to high.

Below are descriptions of these options, including how their components affect each metric. Scoring is included, based around quantifying metrics into overall numbers. The higher the number, the more effectively objectives of the Plan were met. Streetmix (www.streetmix.net), a website that allows for quick and simple visualizations, was used to develop cross-sections. These illustrations have been shown throughout the course of the project. Generally, in the Cross-Section Matrix above, options to the left were found to be potentially more feasible and less expensive, while those toward the right had the potential to induce more safety, comfort and ridership.

Short-Term Options

Option 1 “Only Add Wayfinding” involves only adding wayfinding; no striping nor markings change. In this option, the extent to which bicyclist safety would improve from existing conditions would be limited. No on-street improvements would take place, so bicyclists would be experiencing many of the same conditions that exist today. “Share the Road” wayfinding signs make bicycling slightly less stressful, encouraging motorists to be cautious (i.e. situational awareness about bicyclists), but could have marginal potential to attract bicyclists. Similarly, improvements to motorist safety would also likely be negligible, as no on-street safety improvements are included. Pedestrian safety may not be enhanced beyond wayfinding informing pedestrians of amenities. Of all options, Option 1 would be most straightforward to implement, since there are no major changes, and it would be the cheapest, as MUTCD-compliant signs are not capital improvements.

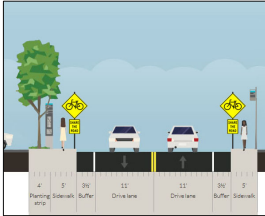
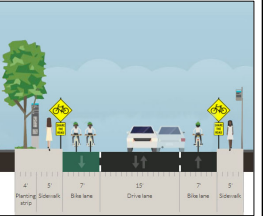
| | SHORT-TERM OPTIONS | | | | | | LONG-TERM OPTIONS | | |
|---|---|---|---|---|---|---|---|---|---|
| Existing North State Road | Opt 1: Only Add Wayfinding | Opt 2: Sharrows in Travel Lanes | Opt 3: Sharrows, No Shoulders | Opt 4: Asymmetrical Facility | Opt 5: Advisory Bicycle Lane (ABL) | Opt 6: Bicycle Lanes | Long-Term Opt: Bicycle Lanes | Long-Term Opt: Cycle Tracks | Long-Term Opt: Separated Path |
|  |  |  |  |  |  |  |  |  |  |
| Metric | Score | Score | Score | Score | Score | Score | Score | Score | Score |
| Enhances Bicycle Safety | Low | Low | Medium Low | Medium | Medium High | Medium | Medium High | Medium High | Medium High |
| Enhances Bicyclist Comfort/Potential to Attract Riders | Low | Medium Low | Medium Low | Medium Low | Medium High | Medium | Medium | Medium High | High |
| Enhances Vehicular (Motorist) Safety | Low | Low | Medium Low | Medium Low | Medium Low | Medium Low | Medium | Medium | Medium |
| Enhances Pedestrian Safety | Low | Low | Low | Low | Medium Low | Medium Low | Medium Low | Medium | Medium |
| Minimizes Costs | High | High | High | High | Medium High | High | Medium Low | Low | Low |
| Technical Feasibility | High | High | High | High | Medium | High | Medium Low | Medium Low | Medium Low |

Figure 18: Cross-Section Option Matrix

Option 1 has a metric score of 14, the lowest of all options. It was discussed at project meetings as a “baseline change,” primarily achieving wayfinding objectives of the Plan.

Option 2 “Sharrows in Travel Lanes” adds sharrow (shared motor vehicle and bicycle) markings to the roadway. Bicyclist safety could negligibly change, as the consensus amongst transportation planners is that sharrows are less safe than other facilities. Bicyclists and motorists occupy, and thus compete for, the same space. Yet, sharrows imply “there are bicyclists here, so share the road,” which may attract bicyclists. Motorist safety could negligibly change, as conflict remains possible with space being occupied by both modes. Motorist education about sharrows could make a difference. For the same reasons, this option does not change pedestrian safety. The main expense of Option 2 is painting sharrows, although maintenance will be needed, as markings fade due to tire wear. Like Option 1, it will be straightforward to implement, since there are no major changes.

Option 2 has a metric score of 15. Sharrows were discussed for when lane widths and allocations cannot change, but with a caveat that there are more robust solutions. Of note, Option 2 resembles Hawkes Avenue, a secondary Town thoroughfare that was restriped with sharrows in 2019.

Option 3 “Sharrows, No Shoulders” reallocates the cartway to make more effective use of sharrows. Bicyclist safety could be slightly enhanced, with sharrows offset 4' from curbs, giving bicyclists more travel space and away from most motorist movement (though not necessarily from wider vehicles). While this is less stressful, paths of movement could still overlap due to the shared 14.5'-wide lane (combined existing lanes and shoulders). Motorist safety could be slightly enhanced, as differing, albeit overlapping, centers of movement may reduce conflicts. Pedestrian safety could be slightly enhanced, with slower-moving bicyclists acting as “buffers” from motor vehicles. The main expenses of this option will be adding sharrows and replacing white shoulder lines, but maintenance will be necessary, as Option 3 is only as effective as the markings are visible. Due to the absence of major roadway changes, Option 3 is straightforward to implement.

Option 3 has a metric score of 17. It was viewed as marginally more robust than Option 2, but it still does not completely accomplish the objectives sought by the Plan.



Figure 19: Asymmetrical Bicycle Facility

Option 4 “Asymmetrical Facility” starts to accomplish more of the Plan objectives. A 5'-wide bicycle lane (in line with state and national guidebooks listed in the earlier Guidebook Input section of this report) is provided on one side. Due to the fixed 30' curb-to-curb roadway width, sharrows are provided on the other side, creating an “asymmetrical facility.” Bicyclist safety, comfort, and attraction is most limited to one side. Motorist safety is enhanced via separately-designated spaces (on one side). Pedestrian safety is partially enhanced, since the bicycle lane pulls motorists further away from the sidewalk on one

side, but without pedestrian safety design elements. The main expenses for this option are replacing markings and maintaining them. All existing lane markings must be shifted, making this option more costly and slightly more difficult to implement than previous options.

Option 4 has a metric score of 18. Improvements are robust, albeit limited to one roadway side. During the MOGO Task Force meeting, this option was a “finalist” with positive responses. The Sam Schwartz team additionally solicited feedback from the Association of Pedestrian and Bicycle Professionals (APBP). Utilizing message boards and other communications, APBP fosters peer knowledge-sharing, such as that with Option 4, and disseminates technical expertise. Results of the APBP feedback are mentioned in the “Selection of ‘Finalist’ Options” section below.

Attention should be paid to which side is most effective for the bicycle lane of Option 4. Sight lines, curb cuts, and general goals of the tourism “circuit” (see earlier “Economic Development and Tourism” section) should all be taken into consideration. Safety, comfort, and encouragement benefits could be focused on the “inner” or “outer” roadway-side part of the loop.

Option 5 “Advisory Bicycle Lane (ABL)” uses an innovative and less-used bicycle facility type. Generally, ABLs calm traffic and induce lower speeds. More width is given to bicyclists (7'-wide lanes), though motorists may drive in the bicycle lane (while yielding to bicyclists) when passing other vehicles. ABLs provide wide and comfortable bicycle lanes, making side-by-side riding possible. Green paint, channelization islands (small, intermittent traffic islands built to reinforce the separation of transportation modes), and paired speed bumps are design “add-ons” contributing further to enhanced bicyclist safety and comfort but add to expenses. Without proper planning, obstructions may prevent motorists from seeing oncoming traffic (ABLs have one two-way center lane). Pedestrian safety (especially at crossings) could be enhanced due to traffic calming and slower speeds. There is a learning curve of roadway users’ safety, due to unfamiliarity with ABLs. Thus, public engagement is a main expense of ABLs. Adequate budgeting and maintenance are needed. Though physical components such as markings and signs are a lower expense, Option 5 is a higher-budget short-term option relative to the preceding options.



Figure 20: Typical ABL (The Dartmouth)

Overall, Option 5 has a metric score of 19. It could place Ossining amongst other municipalities attempting the innovative concept of ABLs. Consensus during the MOGO Task Force meeting was that while it was a compelling solution, a more traditional design could be more appropriate, with there being few existing bicycle facilities in the area. Nonetheless, feedback from APBP is also mentioned in the “Selection of ‘Finalist’ Options” section below.

Overall, Option 5 has a metric score of 19. It could place Ossining amongst other municipalities attempting the innovative concept of ABLs. Consensus during the MOGO Task Force meeting was that while it was a compelling solution, a more traditional design could be more appropriate, with there being few existing bicycle facilities in the area. Nonetheless, feedback from APBP is also mentioned in the “Selection of ‘Finalist’ Options” section below.

Option 6 “Bicycle Lanes” widens space for bicyclists, enhancing safety while preserving enough width for motorists. Research shows that narrowing lanes (in this case 11’ to 10’) reduces vehicle speeds enhances all modes’ safety (note “Final Preferred Option” section below). While 4.5'-wide bicycle lanes are narrower than typical ones, there is still an enhancement to bicyclists’ comfort. The bicycle lanes are wider than existing shoulders, which may attract bicyclists. Also, bicycle lanes can reduce conflicts via dedicated spaces. Motor vehicle capacity could be reduced, as what is now a shoulder would be dedicated to bicyclists. Pedestrians safety could be enhanced, with slower-moving bicyclists as “buffers” from further-away motor vehicles. Main expenses could be low, such as shifting white, shoulder markings to align with the proposed cross-section (costs could increase depending on implementation procedures and timeframe). Technical feasibility is high, but configuration at bus stops should be noted due to conflict points. Since it is unlikely buses or trucks would pass each other next to a bicyclist, it is expected they might encroach into the bicycle lane when safe and clear.

Overall, Option 6 has a metric score of 20, the highest of all options. This speaks to the short-term balancing of safety enhancements with cost and feasibility. The option had been regarded as a “finalist.”

Long-Term Options

Long-Term Option ‘Bicycle Lanes’ widens the overall roadway. This allows for 5'-wide bicycle lanes, in line with national guidebooks. Bicyclists could still experience a lower-speed environment since motor vehicle lanes would not widen. Bicycle lanes’ widths plus 2'-wide buffers provide adequate space to enhance comfort, potentially attracting bicyclists. Optional bollards (e.g. inexpensive plastic posts) and more striping are additional buffers. Motorist safety may increase due to lower vehicle speeds, as an objective is to widen the curb-to-curb roadway width without retaining extra width for motorists (see “Final Preferred Option” section below). Pedestrian safety could be slightly enhanced, with motorists moved further away and slower-moving bicyclists acting as “buffers”. Considered a long-term solution, the main expenses and technical feasibility challenges include relocations of utilities and curbs.

Long-Term Option 'Bicycle Lanes' has a metric score of 16. The option was considered as the simpler alternative to the other two long-term options. It was presented during public outreach, as residents compared it to the 'Separated Path' option.



Figure 21: Typical Cycle Track (Bikemore)

Long-Term Option 'Cycle Tracks' utilizes 5'-wide Protected Bicycle Lanes (PBLs), also known as cycle tracks, to enhance bicyclist safety. Physical barriers such as raised curbs are used to separate transportation modes. Intersection and driveway design can reduce speeds and reinforce safety where modes mix, i.e. "mixing zones." Design "add-ons" include painting the lanes green or raising PBLs to sidewalk level. PBLs are documented to increase bicycling in municipalities that have installed them, as a wide skill-level of bicyclists are accommodated, feel comfortable, and are typically separated from higher speed motor vehicles. Increases in bicycling also happen in part because PBLs rationalize space each mode of

transportation via clearer instruction for motorists. Pedestrian safety could have significant enhancement, as physical barriers also protect sidewalks from motor vehicles. As a long-term solution, PBLs have main expenses such as curb relocation and installing concrete islands. Maintenance cost includes snowplowing the narrow space of a PBL between curbs (some municipalities purchase smaller plowing equipment). Design "add-ons" add to costs; main expenses could be extra paint or ensuring raising an area is not detrimental to adjacent or underground utilities. Feasibility may be hindered by design configuration at intersections and bus stops, and right-sizing lane widths may be a challenge. Slight encroachment onto adjacent parcels or a shifting of design within the right-of-way is possible.

Overall, Long-Term Option 'Cycle Tracks' has a metric score of 17. The option was considered throughout the project course.

Long-Term Option 'Separated Path' would have the have the least conflict points and "mixing" of bicyclists and motorists of the long-term options. A separated path pulls bicyclists away out of the roadway and brings both directions of movement next to each other. This enhances comfort and gives the bicycle facility "identity." The constrained total width means buffers and curb-to-curb distance may need to be reduced. Pedestrian safety could be enhanced with motorists confined to one side, via the shared space with bicyclists (though the existing sidewalk could remain on the other side). Separated paths carry significant costs. Main expenses include utility relocation, retaining walls, and bridging. Maintenance of added street trees and snowplowing narrow spaces adds to long-term expenses. Feasibility may additionally be hindered due to possible encroachment onto adjacent parcels or a design shift in the right-of-way. Bus stops present design constraints due to passengers crossing the path.



Figure 22: Separated Path (Vancouver Park Board)

Overall, Long-Term Option 'Separated Path' has a metric score of 18, the highest of the long-term options. It was presented during public outreach, as residents compared it to the 'Bicycle Lanes' option.

Selection of "Finalist" Options

Choosing between the various options meant balancing the needs of all roadway users. For instance, allocating buses more room (i.e. wider travel lanes) could come at the expense of space for bicyclists. The available short-term curb-to-curb width does not change; just the allocation between roadway users. For instance, along the Corridor, Westchester County's Bee-Line bus route #15 has seven northbound and eight southbound weekday

trips (and less weekend service). Design options that would provide a high level of comfort for other street users, such as bicyclists, were balanced with the relatively infrequent bus service.

Feedback was solicited from and given by the MOGO Task Force, residents at Green Ossining Earth Day Festival, and throughout the course of the project (see “Public Events and Project Meetings” section of this report). Also, the Sam Schwartz team engaged with other industry technical leaders via APBP’s online message board. Feedback was given on options including the Asymmetrical Facility and ABL. This helped to compare stakeholder feedback with best practices.

An APBP professional wrote of the Asymmetrical Facility, “My concern would be about putting in a one-side bike lane in a community with no other bike lanes. This is an outlier example of an on-street bike facility, and if part of the goal is to get residents comfortable with the idea of bike lanes, this isn't the right way to start off.” However, others expressed approval of the option, noting there were no complaints of wrong-way bicyclists utilizing the bicycle lane (instead of sharrows on the correct roadway side) over the course of a few years.

There was persuasion both for and against the ABL option. One APBP professional wrote “[ABLs] get the functionality of 2 car lanes and 2 bikes in a space that can't fit all four lanes,” whereas another wrote “[High driveway density] implies lots of turning movements onto and out of the roadway and possibly some peak hour traffic volumes... may be an issue.”

Feedback helped steer consideration to final short- and long-term preferred options. For instance, an APBP professional noted bicycle lanes specifications within AASHTO guidance (see “Guidebook Input” section of this report). Option 6 “Bicycle Lanes” was analyzed further and brought back to stakeholders for further consideration.

Final Preferred Option

Short-Term Preferred Option Cross-Section

North State Road Bicycle Route Planning and Design specifies a Short-Term Preferred Cross-Section design option to be implemented within the existing fixed 30' (with minor variance) curb-to-curb width. Option 6 (see Figure 23) was analyzed by the project team to be the most appropriate, given available space.

Option 6 improves bicyclist safety and comfort – a key metric – while also enhancing vehicular safety. It addresses the constrained curb-to-curb width (described in an earlier section of this report), balancing roadway users. Since North State Road has no existing curbside parking, and there is no encroachment onto adjacent parking lots, no parking space is lost.

Furthermore, under Option 6, there would be no reduction of motor vehicle lanes. They would be narrowed from 11' to 10' to accommodate curb-side bicycle lanes made possible by widening existing shoulder space from 3.5' to 4.5' in most places. It has been documented (including below) that narrower travel lanes induce lower speeds.

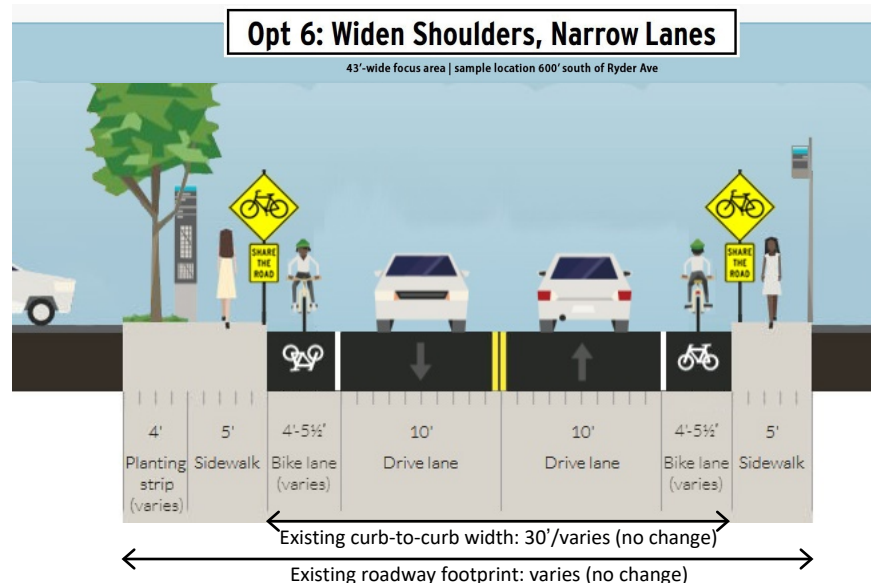


Figure 23: Short-Term Preferred Option Cross-Section

The 2007 Transportation Research Board (of the US National Academy of Sciences) study *Relationship of Lane Width to Safety for Urban and Suburban Arterials* found that there is “no indication that the use of 3.0- or 3.3-m (10- or 11-ft lanes), rather than 3.6-m (12-ft) lanes, for arterial midblock segments leads to increases in accident frequency.” The study goes on to state “There are situations in which use of narrower lanes may provide benefits in traffic operations, pedestrian safety, and/or reduced interference with surrounding development... The analysis results indicate narrow lanes can generally be used to obtain these benefits without compromising safety.”

All roadways within New York State are inventoried and classified by NYSDOT and need to follow their guidelines. As mentioned in the Project Corridor Background section of this report, the NYSDOT Highway Design Manual functionally classifies North State Road as an FC 17 non-NHS Collector. Design criteria is described in Exhibit 2-6 of the HDM. Travel lanes require a 10' minimum width (11' is preferred). The minimum bicycle lane width is listed as 5'. The total minimum width for a shared (automobile and bicycle) lane is 13'. Though the HDM considers 10'-wide travel lanes suboptimal, other guidebooks and research described in this Report state the benefits of the width.

Based on AASHTO guidance, it is still workable to have bicycle lanes as narrow as 4' at some points. Taking away additional width from bicycle lanes could undercut safety, particularly since there are narrow points throughout the corridor. Consultation took place with representatives from the Town Highway Superintendent, County Department of Public Works and Transportation, and other agencies.

Painted striping works together – toward the goal of slower vehicle speeds – with speed limit reduction. This would be in conjunction with Option 6 and is discussed in the Speed Limit Recommendations section below. Due to fixed curb locations, Option 6 – the Short-Term Preferred Option Cross-Section – is the most appropriate compromise, in line with national guidance sources and contextual to the reduced speed limit.

Long-Term Preferred Option Cross-Section

As noted in earlier sections of this report, the ‘Separated Path’ option emerged as a preferred long-term finalist. Residents compared it to the ‘Bicycle Lanes’ option via discussions and post-it notes at Green Ossining Earth Day, as described in the earlier Public Events and Project Meetings section of this report. One resident wrote that the option was “better for bikers” than having on-street bicycle lanes. Many saw value in trees and planting strips, of which the “Separated Path” option incorporates the most. The multi-use path itself was viewed as “shared use... so space is not wasted” and “for families.” One resident recognized the safety element of a “more clearly designated path for bikers,” as opposed to on-street markings.

Design components and expenses are described in the earlier section, Long-Term ‘Separated Path’ Option. The main infrastructure to be built would be the separated path aside the roadway. Other components include curb cuts and connections between the path and existing driveways to ensure seamless movement. Significant expenses of these built components include utility relocation and maintenance.

The County roadway divestment process illustrated earlier in this report can provide a specific mechanism for the ‘Separated Path’ option to happen. This feasibility further supported the ‘Separated Path’ option as the Long-Term Preferred Cross-Section.

Speed Limit Recommendations

The Plan is intended to provide a safer environment for pedestrians and bicyclists on the Corridor by lowering the speed limit from 30 mph to 25 mph. This would be 5 mph less than the existing condition-posted 30 mph speed limit, which is the Town-wide speed limit. The objective of the reduction is to provide a safer environment, including for alternative transportation modes such as walking and bicycling.

Studies cite that speeds of specifically 25 mph carry notable improvements over (the existing) 30 mph speed limit. The 2011 American Automobile Association (AAA) report *Impact Speed and a Pedestrian's Risk of Severe Injury or Death* states, “At an impact speed of 25 mph, an estimated 30% of pedestrians sustain AIS 4 or greater injury, and about 12% die. Comparatively, half of all pedestrians (47%) struck at 30 mph sustain AIS 4 or greater injury, and one in five (20%) die.” AIS refers to the Abbreviated Injury Scale, which classifies injury severity, established by the

Association for the Advancement of Automotive Medicine. AIS 4 means a “severe” trauma, whereas AIS 1 is “minor” and AIS 6 is “maximum.”

Lower-speed environments also aid demographic groups that may be focuses of safety policy. For example, the AAA report mentions that crashes effect age groups differently, as “the average risk of severe injury or death for a 70-year-old pedestrian struck by a car travelling at 25 mph is similar to the risk for a 30-year-old pedestrian struck at 35 mph.”

Additional research (as shown in Figure 24) shows speed reduction could make a critical difference in pedestrian crash survival. A review by USDOT’s National Highway Traffic Safety Administration (NHTSA) documents that “the faster a striking vehicle is traveling, the more damage is done to a struck pedestrian, has been documented in a number of studies.” It goes further on to state, “while posted speeds are not necessarily the same as travel speeds or impact speeds, the data clearly suggest a strong relationship between higher vehicle speed and the greater severity of resulting personal injury.”

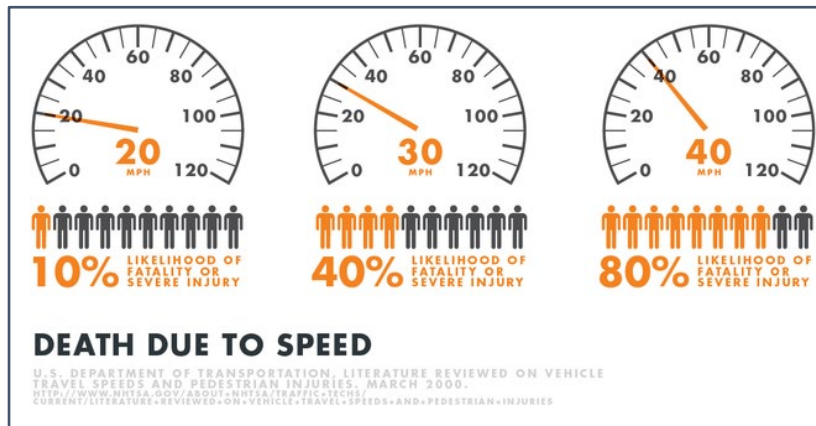


Figure 24: Speed of Automobiles Effects Pedestrian Fatality or Injury

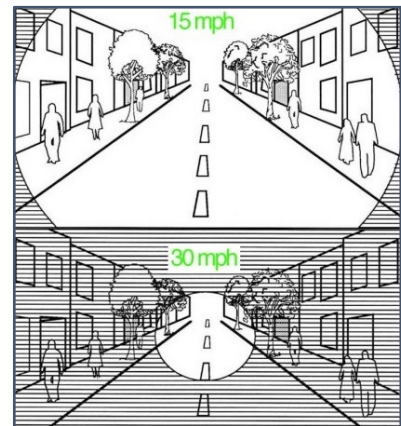


Figure 25: Cone of Vision (Streets.mn)

Decreasing speeds by a few miles per hour can increase a motorist’s field of vision (also known as cone of vision, as seen in Figure 25), and thus reaction time to stop sooner, in less distance. This reduces the potential for crashes, especially with pedestrians and bicyclists.

New York City Department of Transportation (NYCDOT) traffic safety policy materials specify, “Vehicle stopping distance improves by 45 feet (23%) when travelling at 25 mph versus 30 mph. This small 5 mph decrease in speed means that many crashes can be avoided altogether. The speed at which a vehicle is travelling directly impacts the likelihood of death for pedestrians who are struck. Pedestrians struck by vehicles traveling at 25 mph are half as likely to die as those struck at 30 mph.”

Various NYS jurisdictions have reduced their speed limits in recent years. In 2014, New York City adopted a new default speed limit law for all jurisdictional streets from 30 mph to 25 mph (unless otherwise posted). The reduction aims to meet Vision Zero, a City-wide action plan to bring traffic fatalities to zero.

The Plan follows NYS Vehicle and Traffic (VAT) Law, which defines eligibility for speed limit reduction on certain roadways. VAT Article 36 §1622 “Speed Limits on County Roads and Town Highways” states that jurisdictions can set a speed limit along Town or County roadways. NYSDOT would change a speed limit upon the request of a Town Board or County Highway Superintendent. The minimum limit set in §1622 is 25 mph, as proposed. The Plan also conforms to NYS VAT Law §1180-a “Maximum Speed Limits.”

The Plan follows the Town of Ossining’s Vehicles and Traffic Article IV Speed Regulations, including §188-7 “Speed Limits.” The Town mandates a maximum vehicle speed of 30 mph, though exempted streets are permitted. An example in the Village is a segment of Spring Street, exempted with a 25 mph limit.

The Town is handling the approval and implementation of the proposed speed limit reduction. At a Town Board work session in November of 2019, the Board decided to move forward with the speed limit change. Then, on December 23, the Board then voted on and enacted 2019 Local Law 6 which enabled the speed limit change along the Corridor from 30 to 25 mph. Local Law 6 states its intent is to “make it more conducive to alternative transportation modes, such as walking and bicycling, which the Town Board has been considering on North State Road as part of the Millwood-Ossining Go, MOGO, Bicycle and Pedestrian Connectivity Plan.” The Law was filed with the New York State Department of State on December 31, and thus is now in effect.

The Board also submitted documentation to NYSDOT in conjunction with the change of speed limit. Another supplemental option was to conduct a referendum (an elective vote), in which voting residents would have an opportunity to give input to help enable the exception to the Town-wide limit in the Vehicles and Traffic Code and give lift to the NYS VAT Law compliance process.

Now that the speed limit reduction is approved, the Town may want to engage in public outreach and enforcement. The Town can aim to persuade and educate the public on how reducing the speed limit ties into an increased safety objective. Outreach could be geared toward residents and merchants, especially those most frequently using North State Road, such as business owners along the corridor. Outreach materials/formats may include community meetings, brochures, or public announcements. An added enforcement presence could induce motorist behavior toward greater compliance, as signed speed often is less from observed travel speed.

Signage and Striping Plan

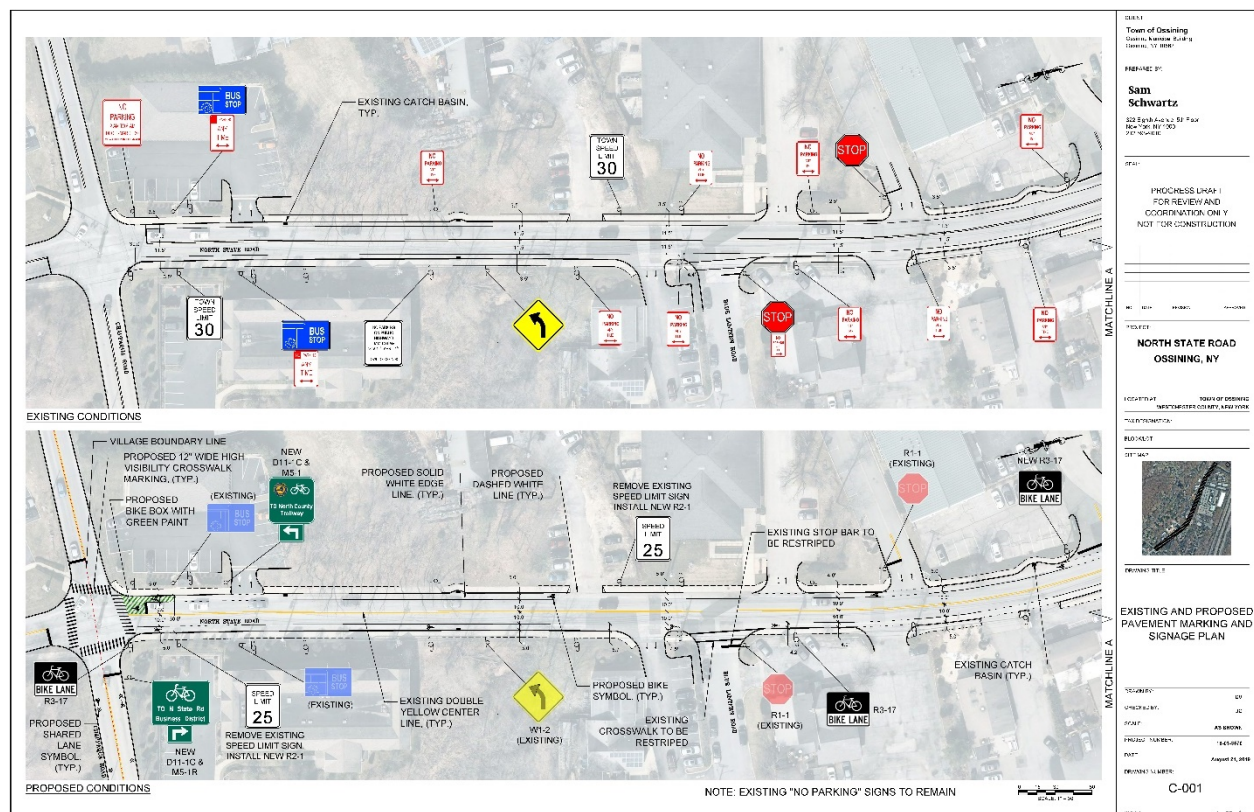


Figure 26 – Signage and Striping Plan (Excerpt, Page 1)

Bicycle lane design and improved signage recommendations – the Signage and Striping Plan (see Figure 26) – create a potentially safe and accessible environment for bicyclists and pedestrians on North State Road, as recommended by Sam Schwartz in its role as the project’s engineering design firm. These recommendations are major objectives of this Report. The MOGO Task Force and Town Board reviewed the Plan and North State Road

businesses vetted it. Afterward, the Town’s current roadway construction contractor, which had been awarded the annual bid, was given the Plan for implementation.

CAD Short-Term Schematic Plan

The Signage and Striping Plan was developed, designed and drafted by the Sam Schwartz team. AutoCAD software was used, and then a PDF distributed to the Town and MOGO Task Force. On each page, the top drawing shows existing conditions while the bottom shows proposed conditions.

The Plan aims to be pragmatic, low cost, and straightforward to implement. Double-yellow (center) lines are left in place, to reduce costs from restriping. The key changes are removing fog (white) lines to allow for enough width for bicycle lanes, compared to the narrower existing shoulders. Furthermore, the roadway surface is in good condition so there are no plans for repaving, at least until the Long-Term Plan for major changes.

High-visibility crosswalks are detailed in the Plan at the intersection of North State and Chappaqua roads. This treatment has thick painted lines, so crosswalks are unmistakable for crossing motorists. A Bike Box is also detailed at the intersection. This treatment utilizes green paint to identify a dedicated area at signalized intersections for bicyclists to navigate traffic safely and comfortably in front of motor vehicles.

North State Road narrows to substantially less than a 30’-wide cartway at its northernmost segment (between Club Fit and New Castle). Resultingly, a shift from bicycle lanes to sharrow markings is noted in page 5 of the Signage and Striping Plan. This allows for a wider shared lane within the existing curb lines.

“No Parking” regulatory signs currently exist throughout the corridor. To prevent motorists from assuming parking is allowed within bicycle lanes, the signs will remain (note the Plan shows these signs in existing conditions drawings, but not proposed drawings, for visual clarification purposes). Regulatory “Bike Lane” guide signs, outlined in MUTCD as Sign R3-17, are added into the proposed drawings to identify allowed usage of the lanes.

“Bike Route” wayfinding signs are also included in the Signage and Striping Plan. They are outlined in MUTCD as Sign D11-1c and modified to include the EST logo and text. Below the main guide sign would be arrow directional signs, either M5-1, M6-3, or M5-1R, depending on the location. These signs direct bicyclists to and from the EST, as outlined in the “Other Recommendations” section below.

As mentioned in previous sections, the signed speed limit in the Plan is 25 mph, in tandem with proposed pedestrian and bicycle improvements. Thus, for motorist notice and compliance, the current “Town Speed Limit 30 [mph]” signs along the Corridor would need to be replaced with “Speed Limit 25 [mph]” signs. Since the signed limit would differ from adjacent and intersecting streets, the Plan specifies sign locations so motorists turning onto North State Road could quickly see the posted limit and adjust speeds, if needed.

For the medium-term, an Enhanced Crossing is detailed at the intersection of North State Road and Ryder Avenue. Enhanced Crossings combine high-visibility crosswalks and pedestrian warning signs. As the primary street midway into the Corridor, Ryder Avenue serves as a main gateway into surrounding neighborhoods and the Town-owned Ryder Park. Furthermore, there is a public bus stop at the intersection, complete with benches and schedule signage. Per MUTCD code and Americans With Disabilities Act (ADA) compliance, curb cuts and ramps would align with the crosswalk. Thus, reconstructing the sidewalk could bring this solution beyond the short-term budget into the medium-term.

Long-Term Concept Illustrations

Locations of curbs would be shifted to allow for a separated path along one side of North State Road. This would seamlessly match the design of long-term connections between the Corridor and North County Trailway, as discussed in the next section of this report.

The separated path would be a multi-use bicycle and pedestrian facility. It would be curb-protected from the roadway, with trees and a planting strip. The other side of the roadway would retain a sidewalk for exclusive pedestrian usage. The roadway itself would retain one lane of motor vehicle traffic in each direction.

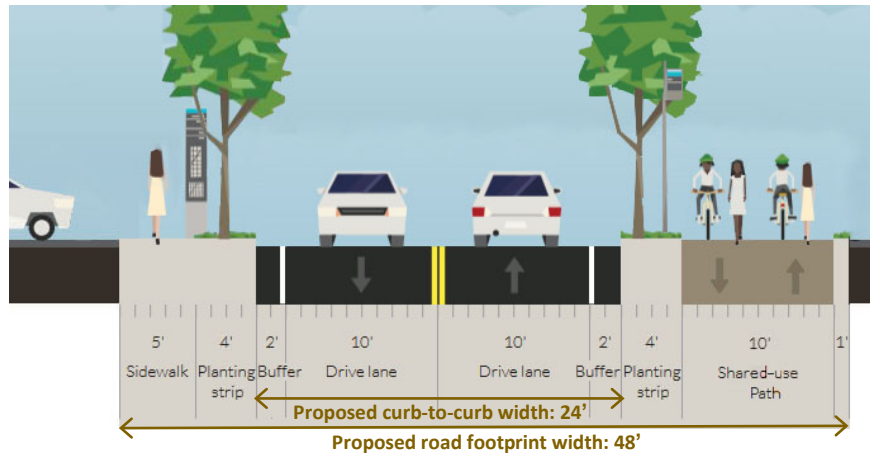


Figure 27: Long-Term Concept Illustration

Figure 27 illustrates the long-term vision. Plans such as a Signing and Striping Plan would be detailed during the transition into the long-term. There would be an analysis of impacts and recommendations to possible relocation of bus stops, stormwater infrastructure, and utility poles.

Long-Term Capital Improvements

The Town may need to address long-term capital improvement, especially once curbs are relocated. This includes resurfacing North State Road, tending to below-surface stormwater and sewer utilities, and maintaining the traffic signal at Chappaqua Road. Infrastructure added due to Plan implementation would include sidewalk curb cuts and public bus stops that are compliant with the Americans with Disabilities Act (ADA). Under long-term concepts including separated bicycle lanes, capital improvements could mean facilities suitable for snow plowing. Maintaining visibility along the Corridor means roadway signage and striping that meet specification standards.

Connections to Trail / Route 100 Intersections

Objective of Safety Needs

The Town's economic development strategy of the bicycle "circuit" is dependent on a safe and comfortable passage throughout the entire loop. To travel between the Corridor and North County Trailway (NCT), roadway users must cross over Route 100 either via Chappaqua Road or the northernmost segment of North State Road. Either option presents design challenges to meet safe crossings and other needs.

Design Recommendations

The project team studied two corridors and their respective intersections with Route 100: Chappaqua Road and North State Road. Pedestrian refuge islands, increased striping and signage, and high-visibility crosswalks are potential design prescriptions for these corridors and intersections.

Chappaqua Road between North State Road and Route 100 is a safety focus corridor. It is winding and hilly, leading to visibility issues, contributing to the potential of conflicts between motorists and other roadway users. The jurisdictional line between the Town and the Village of Briarcliff Manor run along the roadway centerline in the vicinity, so coordination is needed for comprehensive improvements.

At the intersection of North State Road and Route 100, a traffic signal warrant could determine if a signal is justified. As noted in the MUTCD, warrants analyze "factors related to the existing operation and safety at the study location and the potential to improve these conditions." One factor is collision; 2015-18 traffic crash data listed 15 crashes at the intersection.

The Sam Schwartz team reviewed warrant options to consider prescribing a typical traffic signal or pedestrian hybrid beacon (a High-Intensity Activated Crosswalk, or HAWK, with a movement phase for bicyclists). HAWKS display blinking red lights for motor vehicles when pedestrians or bicyclists have the right of way to cross.

A full traffic signal at the intersection was recommended due to the speed limit of 55 mph along Route 100. Unfamiliarity with HAWKS could pose a challenge in this instance. Rectangular Rapid Flashing Beacons (RRFBs; illuminated, irregular flash beacons that supplement warning signs at unsignalized intersections) were also considered, but MUTCD guidance was clear they would not be practical. A next step could be for the Town Highway Superintendent's office to perform a signal warrant based on applicable criteria.

FHWA states that raised refuge islands "are commonly found along wide, multi-lane streets where adequate pedestrian crossing time could not be provided without adversely affecting the traffic flow. These islands provide a resting area for pedestrians, particularly those who are wheelchair-bound, elderly, or otherwise unable to completely cross an intersection within the provided signal time. These refuge islands also provide a safety area for pedestrians caught in the street when a signal changes."

Crosswalks – with markings for bicyclists and pedestrians – at both intersections can be considered for three main reasons. First, both this Plan and NYSDOT's NCT improvement project could increase bicyclist and pedestrian volumes crossing Route 100 to get to and from NCT. Secondly, since public bus stops are just west of Route 100, crosswalks could help passengers safely cross to visit NCT. Lastly, crosswalks complete the bicycle-friendly "loop" to and from NCT outlined in earlier sections on this report. This circuit of bicycle facilities would be fully continuous across Route 100 and designed for all ages and abilities.

Short-Term and Long-Term Components

Design recommendations above are for the short-term at both intersections. Crosswalks would be realigned to connect to long-term separated paths. Also, more provision would be given to the public bus stop on North State Road at Route 100. Higher-cost improvements could happen for the long-term, such as additional paint at crosswalks to match surface components of the separated paths.

The two connecting corridors (Chappaqua Road and the northernmost segment of North State Road) would be improved in the short-term with sharrow markings, similar to Cross-Section Option 3. Consideration was given to replicate the Short-Term Preferred Cross-Section (Option 6) design, but it would not be possible due to narrow roadway widths. Chappaqua Road is approximately 25' curb to curb, while North State Road narrows to approximately 23' north of the New Castle line. Thus, sharrows are prescribed as there is not enough width for bicycle lanes alongside motor vehicle lanes. Striping proposed for the northern segment of the Corridor also consists of sharrows, providing a transition zone.

Separated bicycle/pedestrian paths along the connecting corridors are recommended for the long-term. Rather than shifting curb locations, adjacent off-roadway locations are identified. An alternate option for Chappaqua Road consists of a separated path from NCT to Route 100, and then sharrows and a north-side sidewalk from Route 100 to North State Road. This would provide greater comfort and safety than is presently along the winding, hilly corridor, but be more feasible than (or until) a separated path.

Overlap/Context - County and NYSDOT Construction Projects

There has been coordination with overlapping construction plans throughout the course of the project. As mentioned in previous sections of this report, NYSDOT is implementing safety improvements to NCT for the Empire State Trail. Their project scope includes a "road diet" (reducing the number of motorist lanes and adding a left-turn lane) to Route 100 as well as move segments of NCT from the roadway shoulder onto a shared-use path separated from motor vehicle traffic.

Upon receiving feedback on how the design effects the North State Road Plan's components, the project manager of NYSDOT's plan wrote a letter to Supervisor Levenberg. An excerpt states, "When... a project moves forward to

officially designate that route as a bike route with pavement markings and signage, please reach out to our Traffic and Safety Group at that time.” Thus, there is coordination between overlapping projects.

Westchester County has also carried out overlapping work. NCT has undergone resurfacing and drainage work, to improve safety conditions along the trail. The County is represented on the MOGO Task Force and has worked in conjunction with the team throughout the course of the project.

Public Engagement and NYSDOT Comment Cards

As described earlier in this report, the project team collected comment cards with public input (from Green Ossining Earth Day) for NYSDOT to consider for its project. The comment cards addressed safety and comfort amongst all roadway users in areas of overlapping projects, including the intersection of North State Road and Route 100.

Other Recommendations

Wayfinding

Wayfinding signage is important to help guide bicyclists to and from North County Trailway (NCT). Thus, three sets of signs are intended to be strategically planned along the Corridor. As discussed in the “Signage and Striping Plan” section, these signs are in accordance to MUTCD. As more bicyclists utilize North State Road, it is imperative to be clear how to get to and from the larger network, especially for recreational cyclists that may not be familiar with local areas.

Additionally, informational kiosks can promote pedestrian/bicycle amenities and businesses on North State Road. One possibility, as thought of by the Town, is to place a kiosk on a Town-owned parcel along Chappaqua Road close to NCT and Route 100. This would form an inviting gateway, to bring bicyclists and their economic impact to the corridor and Town. This also “works the other way,” as some bicyclists would learn of the EST, as outlined in Figure 28, an excerpt from the EST Plan.

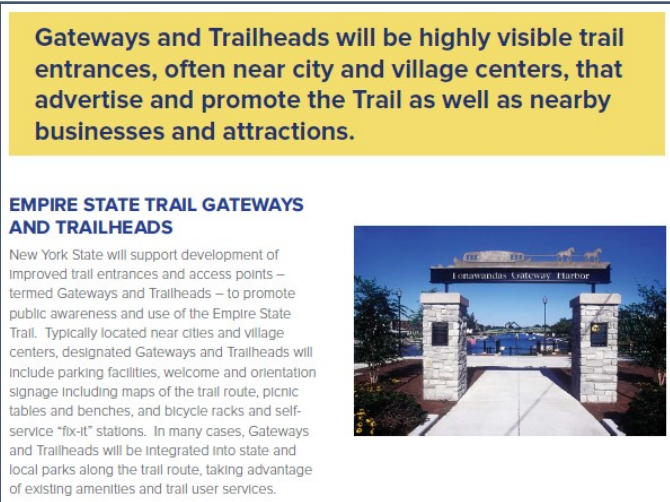


Figure 28: Excerpt from Empire State Trail Plan

Access Management

Bicycle and pedestrian facilities are potentially less safe and inclusive for all ages and abilities at intersections with motor vehicles. The average distance between driveways is referred to here as driveway density.

Commercial corridors in suburban environments such as North State Road have comparatively higher driveway density than more organized corridors. Along these corridors, driveways have been added parcel by parcel on a piecemeal basis, as development takes place organically over time. The Corridor’s density is 79 feet, consisting of 60 driveways within 0.92 miles.

Upon a driveway consolidation draft conceptual analysis by the project team, as shown in Figure 29, density could potentially be reduced to 121 feet, yielding more space (on average) in between driveways. Bicyclists and pedestrians could be safer and more comfortable being able to navigate these longer distances.



Figure 29: Access Management Conceptual Draft

and businesses, as well as the Town itself, can meet MOGO objectives by adding amenities and thus become more bicycle-friendly.

Some driveways may be straightforward and have high potential of removal, such as consolidating a separate exit and entry into one curb-cut driveway. Others could have lower potential, but still be possible upon closer study. Changing curb cut locations (such as to a side street along a corner parcel) could be a method for consolidation. Some driveways could be narrowed, potentially slowing vehicle speeds at conflict points. Other driveways may not be removable, as they may be the only conceivable parcel ingress or egress. This analysis is preliminary, nonbinding, and prior to examining any parcel site plans.

Amenities

Economic development objectives can be met by adding bicycle amenities. Bicycle racks would make it easier to park along the Corridor. Racks would especially help the Corridor's bicycle commuters and recreational riders such as tourists who follow the circuit to and from NCT. Bicycle shelters (large storage facilities with racks) and self-service repair stations can further encourage bicycling. Ossining has even had a bikeshare pilot period with the system provider Lime, which introduced bikeshare to residents and businesses. Corridor employers



Regional Impacts of Plan

Other Complete Streets Could Follow Success of North State Road

As has been discussed in this report, a Complete Streets level of design has been sought. Once implemented, the redesigned North State Road could be pilot project “template” for similar roadways in Ossining, the County and the Hudson Valley Region. The Plan can be an example as New York State’s Complete Streets Act gets applied to more transportation planning projects.

Tourism and Bicycle “Circuit” from Metro-North to North County Trailway

In addition to the loop described in this report being to and from the Corridor and NCT, there is another bicycle “circuit.” The Town often recognizes an idea a resident had to study Route 133 for a bicycle facility. This culminated in the State Route 133 Bike Route Designation Feasibility Evaluation (see Literature Review section of this report), which served as precedent for North State Road. The Town is promoting Route 133 as a major route to get to North County Trailway from Ossining’s Metro-North train station. It is about 4 miles to get in between points, and much like the economic development strategies of the Corridor circuit, would encourage bicycle-friendly commuting and tourism. Once at NCT, the circuit could either continue down the trail toward an intersecting roadway identified as a southern bicycle priority corridor (such as Chappaqua Road) or reverse back to the train station.

Environmental and Cultural Assets

Impact to Forest Along North State Road, North of Project Corridor

North State Road continues north of the Corridor into the Town of New Castle. The existing roadway width is narrower, so in order to go beyond sharrow markings, a possible long-term solution would be to build out a separated bicycle and pedestrian path, as discussed in this report. This segment of the roadway goes through undeveloped, forested terrain, a big contrast to the streetscape south in Ossining. Though flat, the roadway runs over the Pocantico River, a Hudson River tributary. Environmental impacts need to be studied before any improvement project involving bicycle facilities.

Incorporating/Highlighting Ossining’s History in Plan

Ossining has a long and noteworthy history. In addition to being of importance in of itself, highlighting history can be an economic development strategy. “Museum in the Streets” signs throughout Downtown Ossining serve as a kind of “walking trail” to inform viewers of history. Informational kiosks are amongst wayfinding and gateway strategies of the Plan and Empire State Trail. These two elements can be combined into one component.

Data *[draft text]*

- o **Energy use reduction**– how the project’s active transportation ideas help
- o **Energy efficiency**– better traffic engineering brings efficiency
- o **Greenhouse gas reduction**– same as “energy use reduction”
- o **Sustainable development**– project will induce better site planning for new and existing parcels
- o **Smart growth**– bicycle/pedestrian infrastructure to support smart growth, conservation, etc.
- o **Walkability**– improving sidewalks, curb cuts and consistency of pedestrian environment
- o **Connectivity**– project to improve going to/from parks, trails, etc.
- o **Green infrastructure**– pervious surface via driveway consolidation; bicycle-friendly grates
- o **Climate resiliency**– building out Ossining’s active transportation network
- o **Mixed-use development**– Comprehensive Plan’s goal for North State Road is to diversify land uses
- o **Economic development**– “Day-tourists” from the EST into North State Road “loop”
- o **Neighborhood/community revitalization**– raising land values and reducing “auto-blight”
- o **Water/waste management**– changes to water drainage in short/long-term options
- o **Findings summary**– data patterns
- o **Approach to Plan implementation**– short- versus long-term concepts

Public Event and Project Meeting Materials

Meeting Purposes and Strategies

The purpose of public events such as the MOGO Public Workshop was to solicit public input for Plan requirements and to make the Plan inclusive, of representation to residents, and in character with the Town Comprehensive Plan. Various strategies were undertaken to ensure that each public event achieved this purpose. For example, the “Post-it note exercise” gathered input for long-term design options at Ossining Earth Day.

Meeting Outlines and Handouts

**Sam
Schwartz**

Transportation
Consultants

**Stakeholder Kick-Off
Meeting Agenda**

Project: NORTH STATE ROAD BICYCLE PLANNING AND DESIGN

Client: Town of Ossining

Meeting Date: January 17, 2019, 10:00 AM

Location: Municipal Building, 16 Croton Ave, Ossining NY

Invitees: Town of Ossining, Village of Ossining, Town of New Castle, Westchester County, Sam Schwartz

I. Introductions

II. Project Overview (see page 2)

III. Literature Review (see page 3)

IV. Design Brainstorm

- a. Goals for bicycle access on North State Road
- b. Connections to North County Trailway
- c. Trade-offs

V. North State Road Design

- a. Near-term (with current funding)
- b. Long-term (future funding), including separated path
- c. North County Trailway connections

VI. Next Steps

North State Road Bicycle Planning and Redesign
Kick-Off Agenda: January 17, 2019

2

PROJECT OVERVIEW

1. Existing Conditions / Kickoff

- Review/request background materials, mapping & data
- Project team visit of study area
- Stakeholder kickoff (North State Rd issues/opportunities, trail connection, etc.)

2. Conceptual Design Alternatives

- Bike route design concept development (immediately-implementable, per NYSERDA)
- North State Road's limited width impacts bike route accessibility
- Longer-term capital improvements (modify sidewalks, curbs & utilities)
- Cross-sections & plan-view concepts (with benefits/drawbacks); trail connections
- Compile into presentation & final report

3. MOGO Task Force / Preferred Alternatives

- MOGO Task Force, Town & Sam Schwartz to meet
- Design-concept presentation to facilitate Task Force & Town feedback
- Identify preferred alternative (immediate & possible long-term alts.)

4. Town Board Public Open House / Final Deliverables

- Open house presentation at Town Board
- Public input on designs & summary of feedback
- Final report & deliverables
- Detailed schematic plans of recommended (immediately implementable) design
- Design Metrics workbook & report

North State Road Bicycle Planning and Redesign
Kick-Off Agenda: January 17, 2019

3

LITERATURE REVIEW

Town of Ossining Comprehensive Plan ('02) + Update ('15)

Vision Statement: 'trans. network addresses needs & safety of vehicular, ped. & bicycle travel'

Existing Conditions:

- No immediate steep slopes, wetlands or flood plains at N State Rd
- N State Rd classified as Collector in "Gen. Business (GB) District" (north tip: R-20 single-fam)
- Ossining's commercial, industrial & warehouse uses center on N State Rd

Transportation:

- Goals: road network functionality, traffic circulation, parking needs, safe ped/bike, alt. trans.
- Coordinate with County/State on road improvements & signalization for traffic flow/safety
- N State Rd access mgmt.: pavement opening min. distances, limit new signals, synch. signals
- Evaluate sight lines, and speed limits for circulation, safety & QOL
- "Parking lots can be landscaped & located to encourage people to park vehicles, then walk"
- Encourage bike ridership (racks w/ signs) & alt trans. for commuting, community services, etc.

Environment & Community Appearance:

- Trees, plantings & gateway signs to define Town entrances (N State Rd mentioned)
- Landscaping in parking lots, street frontages & parcel lines for screening, shade, etc.
- Adopt N State Rd design guidelines; consolidate signs to refine visual image
- Coordinate wayfinding/signs for business districts, to N County Trailway, etc.
- Preservation, buffers, permeability, pocket parks & trail connections: use in projects
- Road guidelines: consistent landscaping, signs, lighting, streetscape
- Integrated and promoted open space/trail network to N. County Trail

Future Dev.:

- "Support N State Rd" for econ. vibrancy; mixed use/ped. New land uses to enhance GBD; consider auto-focused uses' removal. Evaluate commercial buffer & setback rules.
- Stone walls: Ossining character; consider on future dev.

Millwood-Ossining GO: Bicycle & Ped. Connectivity Plan, "MOGO"

Purposes:

- Establish & develop connectivity between local recreational, tourism & business destinations; North State Rd is strategically "at the center" of this.
- Localities & residents can increase bike/ped (high % of Ossining households have no vehicles)
- Help get to local business areas & open space via bike/ped
- Increase bike/ped by connecting existing trails, commerce & resources

Study Area & Trails:

- Town of Ossining (North State Rd & Rt. 133 listed as "local connections")
- Village of Ossining
- Town of New Castle
- North County Trailway: 22-mi paved bike/ped path on "Old Put" freight/passenger rail ROW
- Empire State Trail (EST): 750-mi shared bike/ped multi-use path (recreation/tourism)
 - 400-mi already in discrete, disconnected segments (incl. N County Trailway)
 - Typ. section ~ 10'-12'-wide hard surface for all user levels & abilities
 - Wayfinding directing to connecting trails & compliment local signs (e.g. to/from N. State Rd)
 - EST Design Guide: tools, references & standards

MOGO community workshop priorities:

- Access to existing bike trails & open space; intersection safety; and bike lanes

North State Road Bicycle Planning and Redesign
Kick-Off Agenda: January 17, 2019

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Challenge: enough north-south ped/bike trail connections, but not east-west

Online Bike/Ped Community Survey:

- Commuting – 70% car, 14% transit, 7% walking
- Ranked changes to increase bike/ped commuting: bike lanes, perceived safety, less distance, "Share the Road" signs; reduced auto speeds
- Increasing bike access/safety benefits environ., property values, trans. options, safety & QOL
- Respondents don't feel safe: no bike lanes; narrow roads; speeding, insufficient ped crossing signs, sidewalks & ped linkages; crashes
- Major problems – narrow roads, hills & no sidewalks (but recreational biking is popular)
- Bikes/peds noted as stopping/buying at businesses

MOGO Bike Trail Plan – accommodation for all rider levels (like ski slope):

- "Commercial corridor:" Complete Streets, incl. North State Rd
- "Recreational rider:" least amount of slope & speed
- "Cyclist:" challenging bike routes, marked but less improvements

Goals & Recommendations:

- Implementation: feasibility evaluations for proposed bike routes & demo project
- Physical design (hence North State Rd)
- Local bike-friendly economic dev & tourism (e.g. bike parking for businesses)
- EST Gateway at North State Rd & North County Trail parking lot (significant entryway)
 - Actively-managed with amenities & emphasizes culture & NYS trails' connection
- Ossining: Hudson Valley starting-point via bike paths at MetroNorth station

SR 133 Bike Rte. Designation Feasibility Evaluation (2018), precedent for North State Rd

Purposes:

- Determine feasibility to designate 3.3 miles of NYS Rte. 133 as a bike route
- Conceptual design options are necessary for Designation

Ossining exploring east-west on-street bike route connections (tie-in to MOGO)

- Connections between major open space, N. County Trailway, trans. nodes & Downtown

Data collection & ex. conditions:

- 2014-17 – 37 crashes; 0 involving bikes (also, no crash patterns/clusters)
- 2015 vehicle classification – 97% POVs, 3% buses/trucks
- # of travel lanes, shoulder widths, on-street parking, pavement condition, curb or gravel, utilities
- Identifying segments based on roadway section & land use

Conceptual design development:

- Use existing curbs/sidewalks; widen road when no curb (for bicyclists); Public Involvement Plan
- Intersection treatments for bike route safety/comfort; signs to muni parking lot
- Concept 1 – paved shoulders for bicyclists (est. \$2.3m)
 - Use sharrows to keep on-street parking & where additional ROW isn't available
 - Resurfacing/restriping, wider buffer/shoulder, etc.
- Concept 2 – dedicated bike lanes (est. \$2.8m)
 - Some on-street parking removal, widened roadway, etc.
 - 6' bike lanes next to curbs; travel lanes reduced to 11'
- Concept 3 – Side path (est. \$4.5m)
 - 10' asphalt side path (5' grass buffer) & road widening
 - Side most viable for path chosen due to utility poles & less driveways (conflict points)
 - Consider snow removal & buffer maintenance

Meeting Agenda

1. Introduction
2. Project Background
3. Project Progress
4. Cross-Section Concept Options
5. Trail Connections
6. Other Recommendations
7. Next Steps

| Cross-Section Design Options: North State Road Improvements, Town of Ossining NY | | | | | | | | | |
|---|----------------------------|--------------------------------|------------------------------|------------------------------|------------------------------------|-----------------------------|-------------------------------|--------|--------|
| Existing North State Road | SHORT-TERM OPTIONS | | | | | LONG-TERM OPTIONS | | | |
| | Opt 1: Only Add Wayfinding | Opt 2: Sharrow in Travel Lanes | Opt 3: Sharrow, No Shoulders | Opt 4: Asymmetrical Facility | Opt 5: Advisory Bicycle Lane (ABL) | Long-Term Opt. Cycle Tracks | Long-Term Opt. Separated Path | | |
| Score | Score | Score | Score | Score | Score | Score | Score | Score | Score |
| Enhances Bicycle Safety | Low | Low | Low | Medium | Medium | High | High | High | High |
| Enhances Bicyclist Comfort / Potential to Attract Riders | Low | Low | Low | Medium | Medium | High | High | High | High |
| Enhances Vehicular (Motorist) Safety | Low | Low | Low | Medium | Medium | Medium | Medium | Medium | Medium |
| Enhances Pedestrian Safety | Low | Low | Low | Medium | Medium | Medium | Medium | Medium | Medium |
| Minimizes Costs | High | High | High | High | High | Low | Low | Low | Low |
| Technical Feasibility | High | High | High | High | High | Medium | Medium | Medium | Medium |
| MOGO Task Force Members-Add Your Rankings and Comments (Short-Term & Long-Term) | | | | | | | | | |

Economic Benefits of Bicycle Trails



"Two-thirds [of business owners] said that they saw some increase in gross revenue due to their proximity to the trail."

"Trails draw visitors, customers, and residents to their regions, supporting businesses and boosting real estate values."

"Local residents are benefiting from higher property values along a number of [trail] routes."

"The Schuylkill River [Bike] Trail...generated \$7.3 million in direct economic impact along its route... the Delaware & Lehigh Trail... generated an annual economic impact exceeding \$19 million."

Sam Schwartz

PowerPoints

MOGO Task Force Workshop

North State Road Improvements

Town of Ossining, NY
March 6, 2019

Meeting Agenda

1. Introduction
2. Project Background
3. Project Progress
4. Cross-Section Concept Options
5. Trail Connections
6. Other Recommendations
7. Next Steps

Bicycle and Pedestrian Context Map

Project Corridor

Project Background

Project Duration from Grant Award Date: 18 months

| Task | Description | Duration |
|---------|---|----------|
| Task 1: | Identification of Stakeholders, Interviews, & Agreements to Committee | 1 month |
| Task 2: | Initial Committee Meetings - Identification of Trail Connections & Preliminary Plan | 2 months |
| Task 3: | Trail Mapping for Board/Committee Review & Engagement of Consultant | 2 months |
| Task 4: | Final Committee Meetings - Draft Plan Finalized & Legal Review | 2 months |
| Task 5: | Presentation to Municipal Boards & Public Input Period | 2 months |
| Task 6: | Approved by Municipal Boards | 1 month |

2018 Ossining Community Plan for the Hudson River Valley
Trail Grant Program Application

PROJECT OBJECTIVES

Develop a plan for the project that includes:

- Trail Connections
- Trail Mapping or Design
- Trail Evaluation or Interpretation

PROJECT INFORMATION

1. Project Name: **2018 Ossining Community Plan for the Hudson River Valley**

2. Local Agency/Committee: **Town of Ossining**

3. Location: **Village of Ossining and Town of New Castle**

4. Project Location: **Workforce**

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Prior-Reviewed Documents

MOGO: Score Your Preferences Cross-Section Concept Options

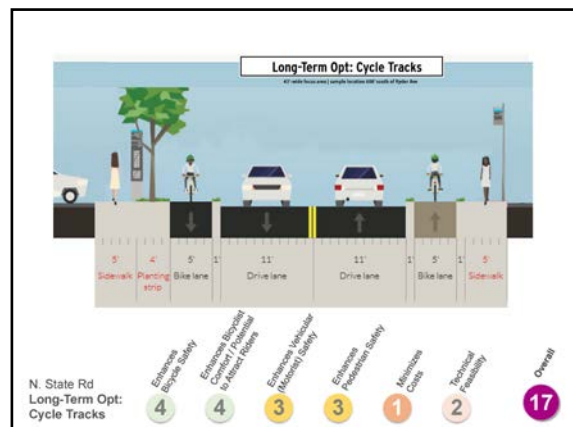
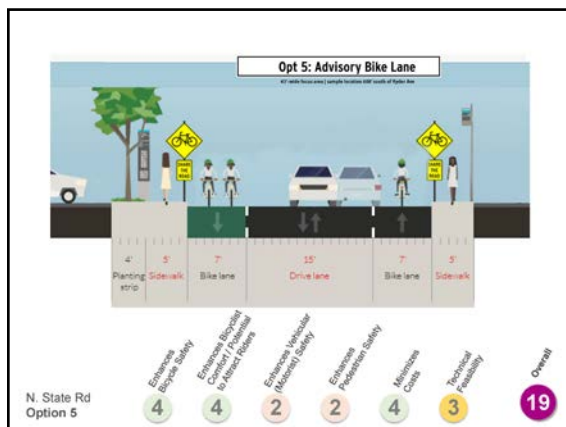
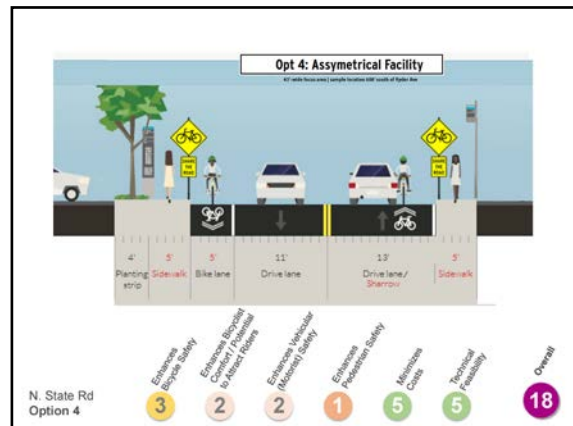
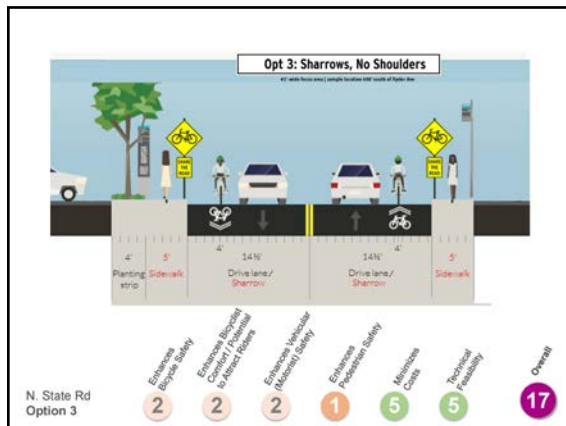
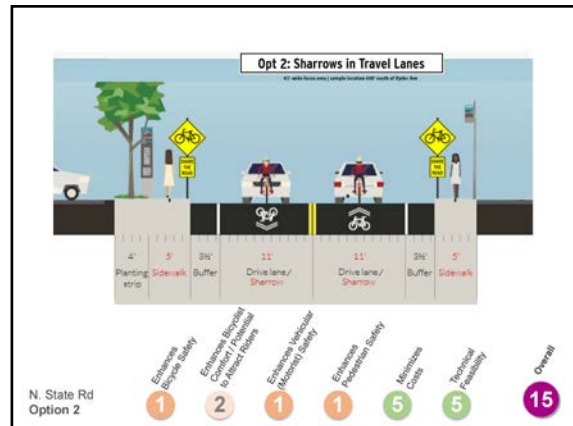
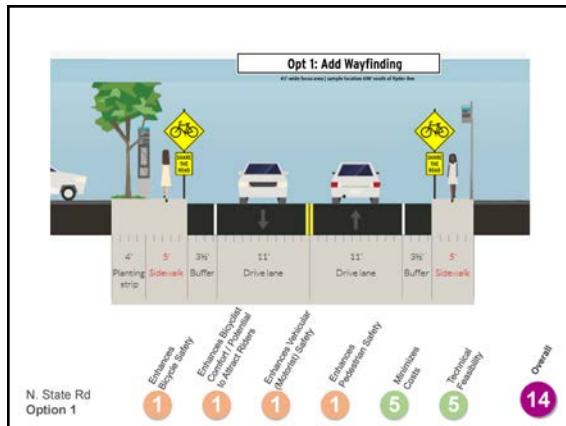
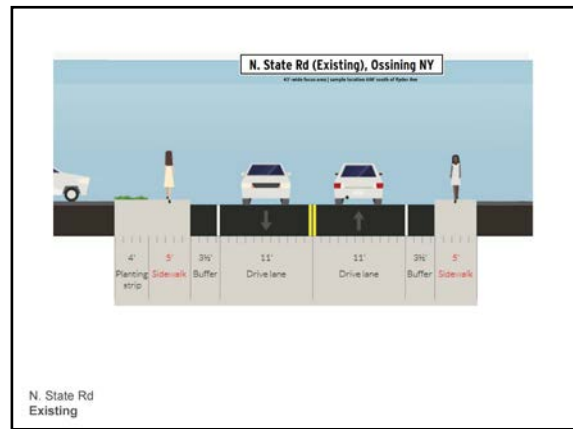
We scored the options, for comparison.

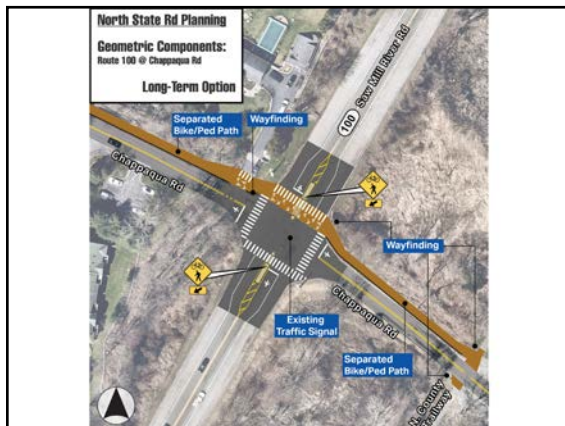
Evaluating the Options

- Enhances Bicycle Safety
- Enhances Bicycle Comfort / Potential to Attract Riders
- Enhances Vehicular (Motorist) Safety
- Enhances Pedestrian Safety
- Minimizes Costs
- Technical Feasibility

Cross-Section Concept Options

| | Option 1: Add Wayfinding | Option 2: Sharrow in Travel Lanes | Option 3: Sharrows, No Shoulders | Option 4: Asymmetrical Facility | Option 5: Advisory Bike Lane | Long-Term Opt: Cycle Tracks |
|---|--------------------------|-----------------------------------|----------------------------------|---------------------------------|------------------------------|-----------------------------|
| Existing Road Section | | | | | | |
| Enhance Bicycle Safety | 1 | 1 | 2 | 3 | 4 | 4 |
| Enhance Pedestrian Safety | 1 | 1 | 1 | 1 | 2 | 1 |
| Enhance Visual Comfort / Pleasant to Travel | 1 | 2 | 2 | 2 | 4 | 4 |
| Enhance Visual Appeal | 1 | 1 | 1 | 1 | 2 | 2 |
| Enhance Pedestrian Safety | 1 | 1 | 1 | 1 | 2 | 1 |
| Maximize Space | 1 | 1 | 1 | 1 | 2 | 1 |
| Technical Feasibility | 5 | 5 | 5 | 5 | 3 | 2 |
| Overall | 14 | 15 | 17 | 18 | 19 | 17 |





Other Recommendations

Wayfinding

Excerpt from Empire State Trail Final Plan:

Gateways and Trailheads will be highly visible trail entrances, often near city and village centers, that advertise and promote the Trail as well as nearby businesses and attractions.

EMPIRE STATE TRAIL GATEWAYS AND TRAILHEADS

New York State will support development of improved trail entrances and access points – formal Gateways and Trailheads – to promote public awareness and use of the Empire State Trail. Typically located near cities and village centers, designated Gateways and Trailheads will include parking facilities, welcome and orientation signage including maps of the trail route, picnic tables and benches, and bicycle racks and self-service “fix-a-flat” stations. In many cases, Gateways and Trailheads will be integrated into state and local parks along the trail route, taking advantage of existing amenities and trail user services.



Access Management

Slide content by Jared Rodriguez



Access Management

Slide content by Jared Rodriguez



Access Management

Slide content by Jared Rodriguez



Zoning

Slide content by Jared Rodriguez



Zoning

Slide content by Jared Rodriguez

Options:

- Define future rights of way; encourage ROW sharing; shared parking plan with reduced parking requirements
- Define a narrow-lot parcel plan with maximum lot width and depth
- Form Based Codes; maximum setbacks
- Strict Architectural/Design Requirements with increased development opportunity
- Organic/Incremental Growth: Encourage small lots, many developers/builders

North State Road Bicycle and Pedestrian Improvements

Presentation to Ossining Town Board

August 6, 2019
Town of Ossining, NY

1 Sam Schwartz

Project Background

2 Sam Schwartz

Clean Energy Communities Grant New York State Greenway Grant

3 Sam Schwartz

Prior-Reviewed Documents

4 Sam Schwartz

Study Area and Bicycle Routes

5 Sam Schwartz

North State Road

6 Sam Schwartz

Preferred Cross-Sections

Input Incorporated from MOGO Task Force and other stakeholders

7 Sam Schwartz

Evaluating the Options

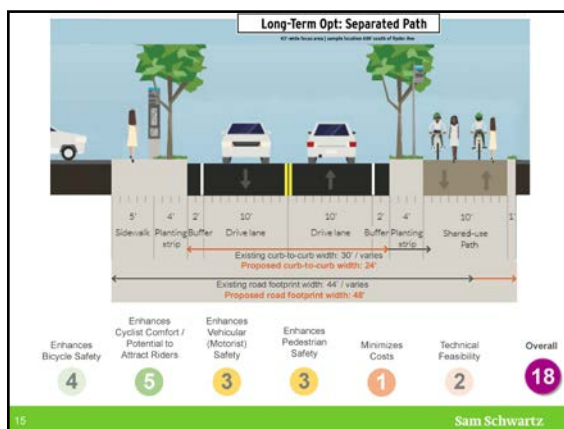
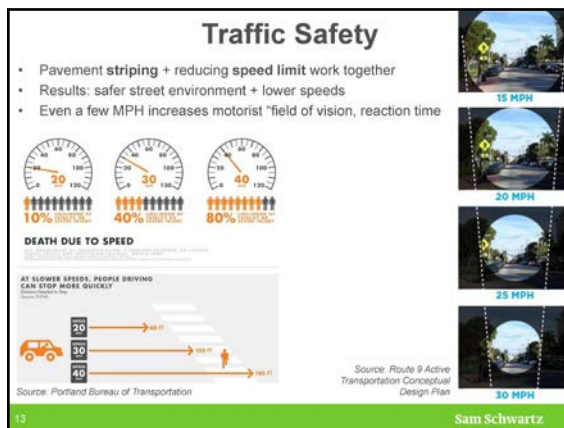
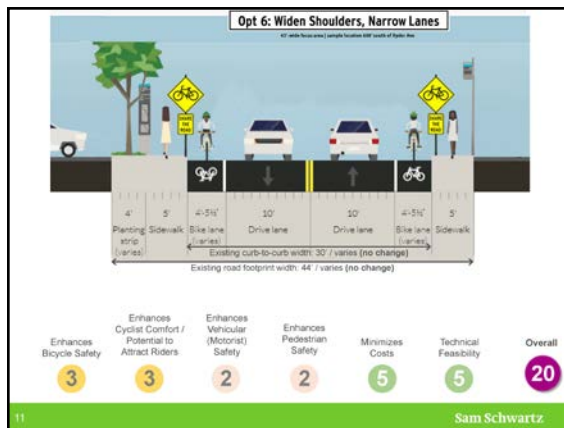
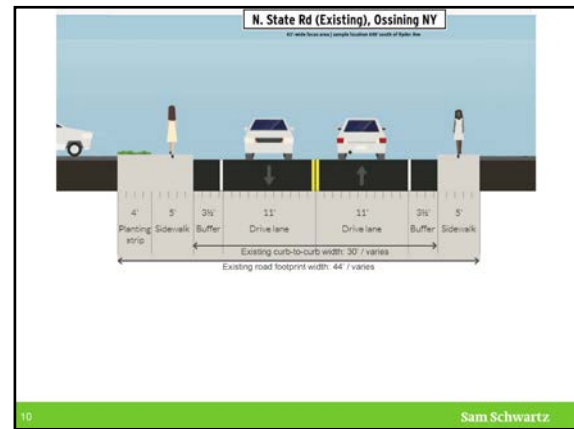
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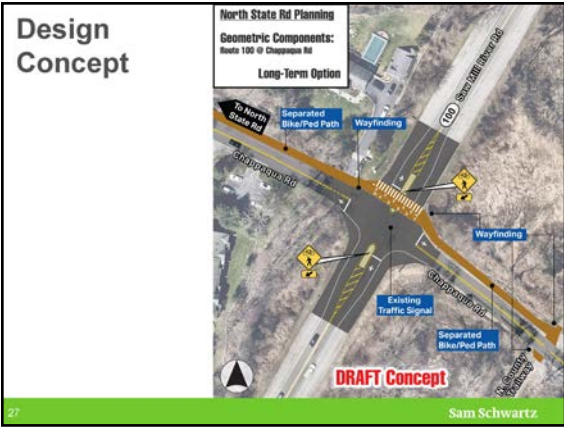
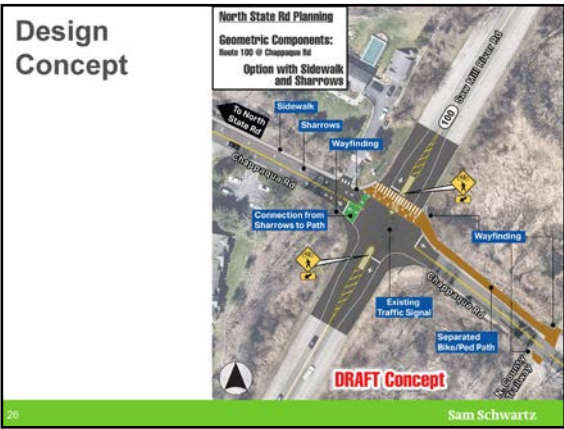
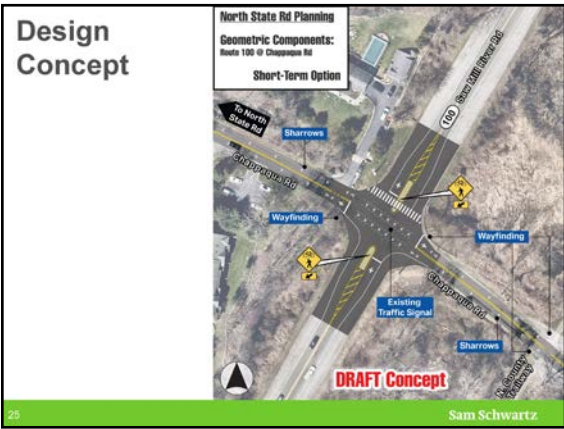
8 Sam Schwartz

Cross-Sections: Comparing Metrics

| Existing North State Road | Short-Term Options | | | | | Long-Term Opt: Bike Lanes | | | Long-Term Opt: Separated Path | |
|--------------------------------------|-------------------------|--------------------------------|-----------------------------|------------------------------|-------------------------------------|---------------------------|---------------------------|---------------------------|-------------------------------|-------------------------------|
| | Opt 1: Only Add Signage | Opt 2: Shoulder to Travel Lane | Opt 3: Shoulder to Motorist | Opt 4: Asymmetrical Facility | Opt 5: Adjacent Bicycle Lane (Left) | Long-Term Opt: Bike Lanes | Long-Term Opt: Bike Lanes | Long-Term Opt: Bike Lanes | Long-Term Opt: Separated Path | Long-Term Opt: Separated Path |
| Enhances Bicycle Safety | Low | Low | Medium-Low | Medium | Medium-High | Medium-High | Medium-High | Medium-High | Medium-High | Medium-High |
| Enhances Pedestrian Safety | Low | Low | Medium-Low | Medium | Medium-High | Medium-High | Medium-High | Medium-High | Medium-High | Medium-High |
| Enhances Vehicular (Motorist) Safety | Low | Low | Medium-Low | Medium | Medium-High | Medium-High | Medium-High | Medium-High | Medium-High | Medium-High |
| Enhances Pedestrian Safety | Low | Low | Medium-Low | Medium | Medium-High | Medium-High | Medium-High | Medium-High | Medium-High | Medium-High |
| Minimizes Costs | High | High | High | High | Medium-High | High | High | High | High | High |
| Technical Feasibility | High | High | High | High | Medium | High | High | High | High | High |

Sam Schwartz





Meeting Minutes

Sam Schwartz
Transportation Consultants

Stakeholder Kick-Off Meeting Minutes

DRAFT

Project: NORTH STATE ROAD BICYCLE PLANNING AND DESIGN

Client: Town of Ossining

Meeting Date: January 17, 2019, 10:00 AM

Location: Municipal Building, 16 Croton Ave, Ossining NY

Attendees

- Town of Ossining – Dana Levenberg, Victoria Cafarelli
- Town of New Castle – Stephen Coleman, Kellan Cantrell
- Westchester County – Bill Brady
- Sam Schwartz – Mike Flynn, Zeke Mermell, Claudia Vilcherrez

1. Project Background (& Misc.)

- a. New Castle mentioned a study about Rte. 100 (aka Saw Mill River Rd)
 - NYS is looking to improve Rte. 100 (Dave Kvinge)
- b. New Castle noted one of their top priorities is fixing the intersection of Rtes. 133/100, known as a "gateway to Rte. 133" & "the mess"
 - Enhancing North State Road (NSR) is a helpful precursor/complement
 - Discussion on a bike crossing closer to NSR being possibly safer & less expensive; existing bike crossing at intersection can be perceived to be less safe
- c. **Empire State Trail (EST) Plan** to be reviewed for relevant guidance, i.e. what is the plan in the study area & design guidance
 - NYS connected Ossining Train Station to EST, which catalyzed MOGO Plan
 - Rte. 133 is this linkage between nodes, which got NYS interested in the context
 - Existing North County Trailway (NCT) is slated to be resurfaced/improved
- d. Discussion on what Grantors are expecting for deliverables
- e. Westchester County has \$250-300k for design/construction on Rte. 133
 - Could serve as a local match to a larger state or federal grant
- f. Team to check if Police Dept has street design standards
- g. **Wayfinding**- key destinations should be called out in MOGO Plan and Grant Narrative
 - NSR could serve as a "demonstration project" for how to best serve plan

2. Literature Review

- a. A summary of Sam Schwartz's literature review was discussed; 3 documents were:
 - Town of Ossining Comprehensive Plan
 - MOGO (Millwood-Ossining Bike & Ped Connectivity Plan)
 - SR 133 Bike Route Designation Feasibility Evaluation

North State Road Bicycle Planning and Redesign
DRAFT Kick-Off Meeting Minutes: January 17, 2019

2

3. Design Goals (Brainstorming Session)

- a. Make recommendations for zoning/development; possibilities:
 - Bicycle parking (with racks)
 - Car parking behind buildings
 - Could we require developers to build out of long-term NSR plan? Is this too costly for developers?
- b. **Safety + comfort** – people would feel safer on NSR and connecting to NCT, other trails & business areas
 - Connectivity: "Emerald Necklace"
 - The Town wants NSR to feel safe for all users with places of interest to stop along the route
- c. **Access management** – recommendations to consolidate driveways
- d. **Trade-offs** due to narrow curb-to-curb & right-of-way (ROW)
- e. Routes must be clearly designated/communicated – **wayfinding**, markings, signage
 - Should promote places to stop – connections to Ryder Park, Buck Johnson Playground, Club Fit, business areas, places to visit & other attractions
 - Maps for bicyclists/peds and kiosks at Chappaqua Rd & end of NSR (precedent: Yorktown)
- f. Partnership with local businesses, e.g. Club Fit to offer incentives to cyclists
- g. Location(s) for bike station + bike parking
 - Bicycle parking (racks) & wayfinding signs for users
- h. Discuss different "ski slope" levels of cyclists → street types (i.e. from MOGO plan)
- i. Aspirational goal: placemaking – people want to be there, encourages visitors to stop and explore the town

4. Design Options

- **Consistent ROW** sought; discussion on segment concept and narrow shoulders & constraints
 - NSR is a Town road (with County advisory); discussion on changing road markings
- Methodology: guidance allowance, feasibility of options, safety prioritization, comfort
- a. **Short-term options** (with current funding):
 - **Keep as is, add wayfinding** & "share the road" signage
 - **Sharrows in travel lanes** (vehicles & bicycles share lanes)
 - **Sharrows in existing roadway shoulders**; *Sam Schwartz* to check if allowed
 - **Narrow travel lanes** to 10'; **widen shoulders** to 4.5' (with sharrows or unmarked bikeable shoulder)
 - **Advisory bicycle lanes** (dashed design); *Sam Schwartz* to check if possible/allowed
- b. **Long-term** (with future funding; capital improvements):
 - NSR long-term design options:
 - One-way **protected bike lanes** (with roadway widening)
 - **Cycle track / shared use path** on one side of roadway
 - Side path at roadway or sidewalk grade

North State Road Bicycle Planning and Redesign
DRAFT Kick-Off Meeting Minutes: January 17, 2019

3

- Identify locations that are less practical due to walls/barriers
- Bring driveways up to sidewalk grade
- Route options:
 - Connect NSR "all the way" to Rtes. 100, 103, 9A, etc.
 - Trail connections (to NCT & other important routes)
- Eco-tourism tie-in:
 - NCT for daytrips via bicycles (cars not needed)
 - Shelter & bike pump (at trailhead/NSR) could be provided by Town
- Bikeshare: NSR/trail connection recommendations support potential future bikeshare
 - This supports car-free households (e.g. connecting people to jobs on NSR)
 - Electric pedal-assist bikes could make biking more practical (i.e. hills)
- Traffic consolidation via combining curb cuts as a long-term goal
- Bus stop locations – team is welcome to recommend bus stop relocations [if needed] (work through the County, i.e. Bill Brady)
 - Bike racks are being phased in on County buses

5. Next Steps

- a. *Sam Schwartz* to analyze & possibly narrow down short-term options
- b. Team to research/coordinate questions arising from meeting

Outcome Documentation

This Report documents key phases of the project. The information is used by Grant agencies for tracking purposes. Once implemented, the Plan should also be well-documented for agency review, Town recording procedures, New York Open Meetings Law, preserving public input, and as a way of marking best practices for future plans and projects.

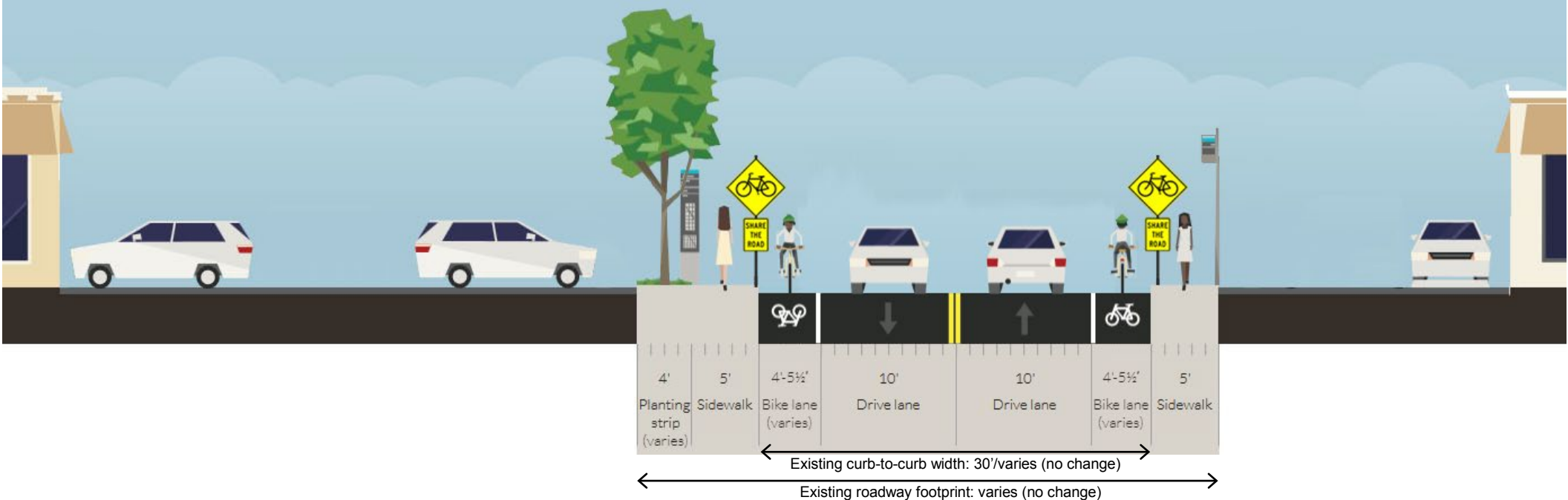
Coordination Amongst Project Team

Throughout this report, it is noted that coordination has taken place amongst the project team. Just like with coordination with overlapping projects, that within the team keeps various components working together and informed. For example, the Town Highway Superintendent's office helps to implement signage and striping proposed in the Plan in coordination with the roadway construction contractor and the Sam Schwartz team.

Project Team Resumes

Resumes with Qualifications

Documents may be added.



North State Road – Short-Term Signing and Striping Plan

Town of Ossining
Westchester County, NY

8.6.2019

**Sam
Schwartz**

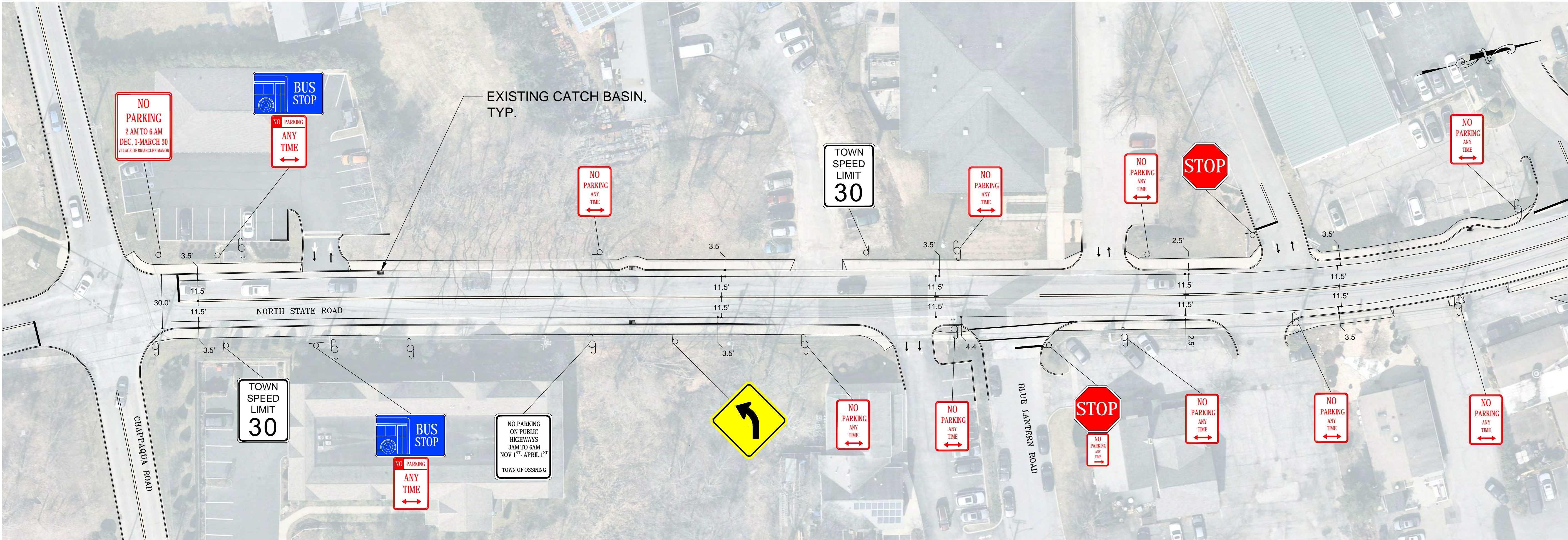
322 Eighth Avenue, 5th Floor
New York, NY 10001
(212) 598-9010
samschwartz.com

We are pleased to present the **Signing and Striping Plan for the North State Road project corridor** in the Town of Ossining. Please note the attached pages for details. On each page, the top drawing shows existing conditions while the bottom shows proposed conditions.

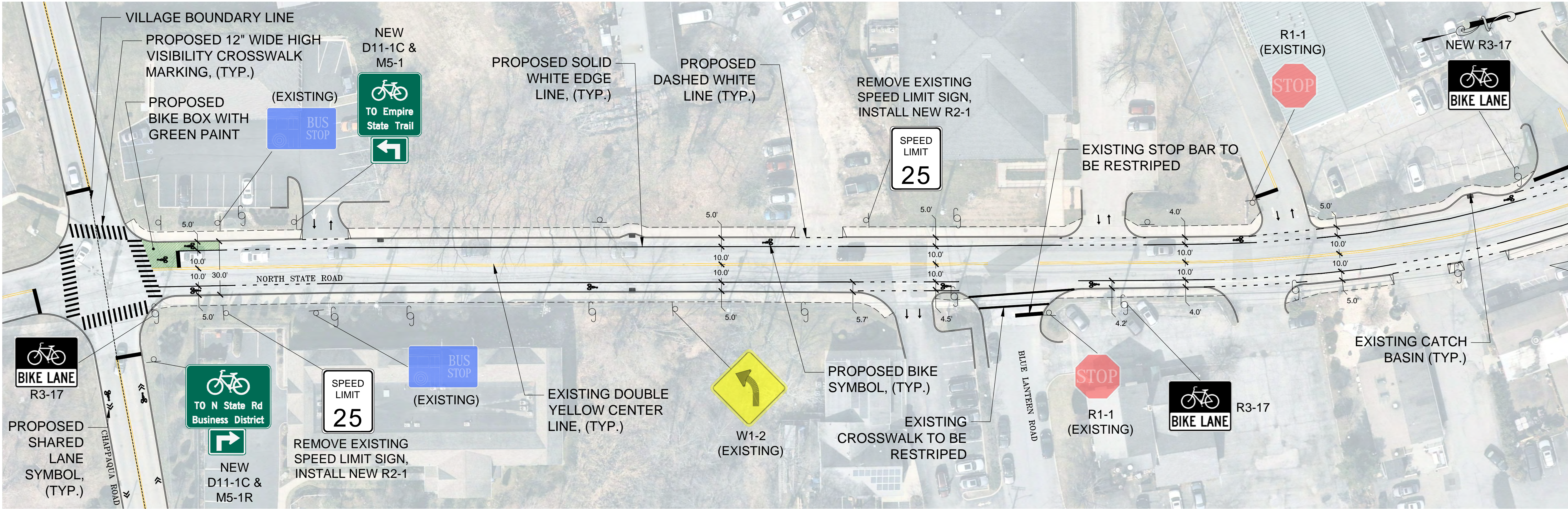
In our analysis, this preferred short-term option is the most appropriate, given available space today. Roadway width, from curb to opposite curb, does not change. Discussed long-term options can be more transformative. Highlights as follows:

- Double-yellow center lines remain in place.
- Bicycle lanes are never narrower than 4.0'. Fog (white shoulder) lines have been adjusted to allow for bicycle lane width, compared to the narrower existing shoulder.
- Wayfinding signs direct bicyclists to and from the nearby Empire State Trail (EST).
- At the intersection with Chappaqua Road, note high-visibility crosswalks and "proposed bike box with green paint." Bike boxes have been added so that bicyclists can navigate traffic safely and comfortably in a dedicated space and are at signalized intersections in front of automobiles.
- Bicycle lanes shift to sharrows on page 5 of the Plan due to roadway narrowing. Sharrows are bicycle markings in a shared bicycle-automobile lane.
- The advised speed limit is 25 mph, in the context of proposed pedestrian and bicycle improvements.
- Parking regulation signs in Existing Conditions (top drawings on pages) will remain; they are not shown in Proposed Conditions (bottom drawings on pages).

The multidisciplinary Sam Schwartz staff is available for any follow-up questions, comments, or advisory.

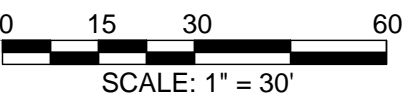


EXISTING CONDITIONS



PROPOSED CONDITIONS

NOTE: EXISTING "NO PARKING" SIGNS TO REMAIN



MATCHLINE A

MATCHLINE A

CLIENT:
Town of Ossining
Ossining Municipal Building
Ossining, NY 10562

PREPARED BY:
Sam Schwartz
322 Eighth Avenue, 5th Floor
New York, NY 10001
212 598-9010

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| NO. | DATE | REVISION | APPROVED |
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PROJECT:
**NORTH STATE ROAD
OSSINING, NY**

LOCATED AT: **TOWN OF OSSINING
WESTCHESTER COUNTY, NEW YORK**

TAX DESIGNATION:

BLOCK/LOT:

SITE MAP:

DRAWING TITLE:
**EXISTING AND PROPOSED
PAVEMENT MARKING AND
SIGNAGE PLAN**

DRAWN BY: **CV**

CHECKED BY: **JG**

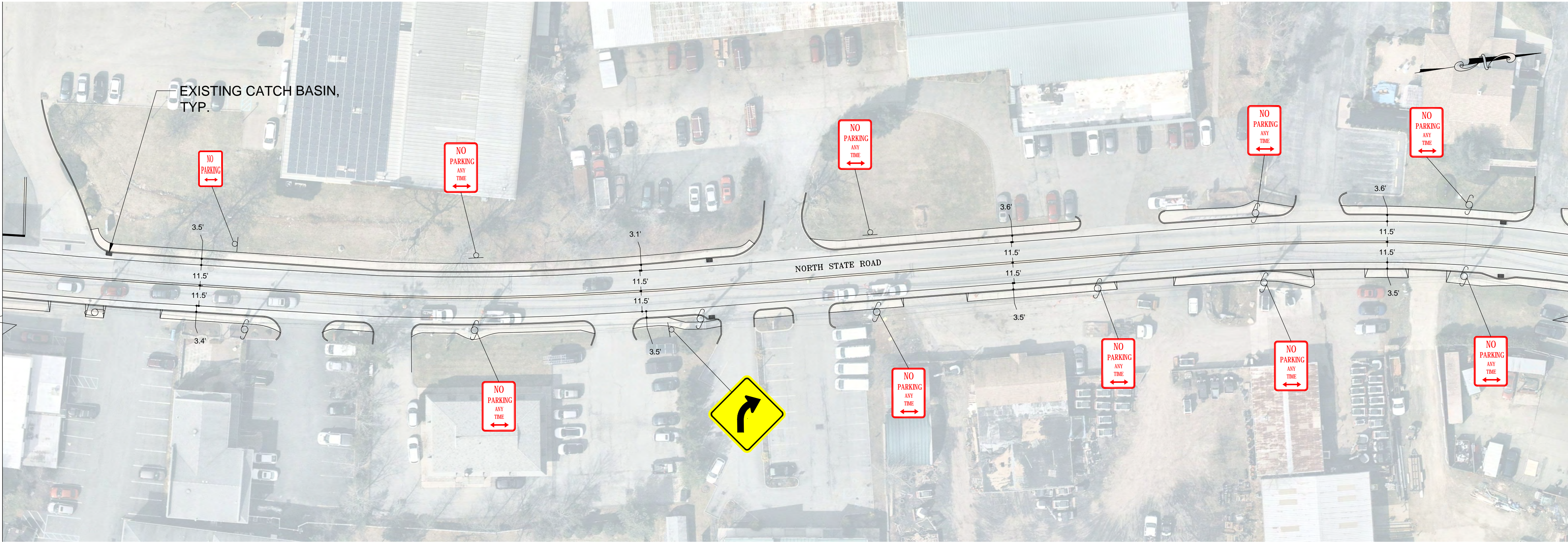
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PROJECT NUMBER: **16-01-3570**

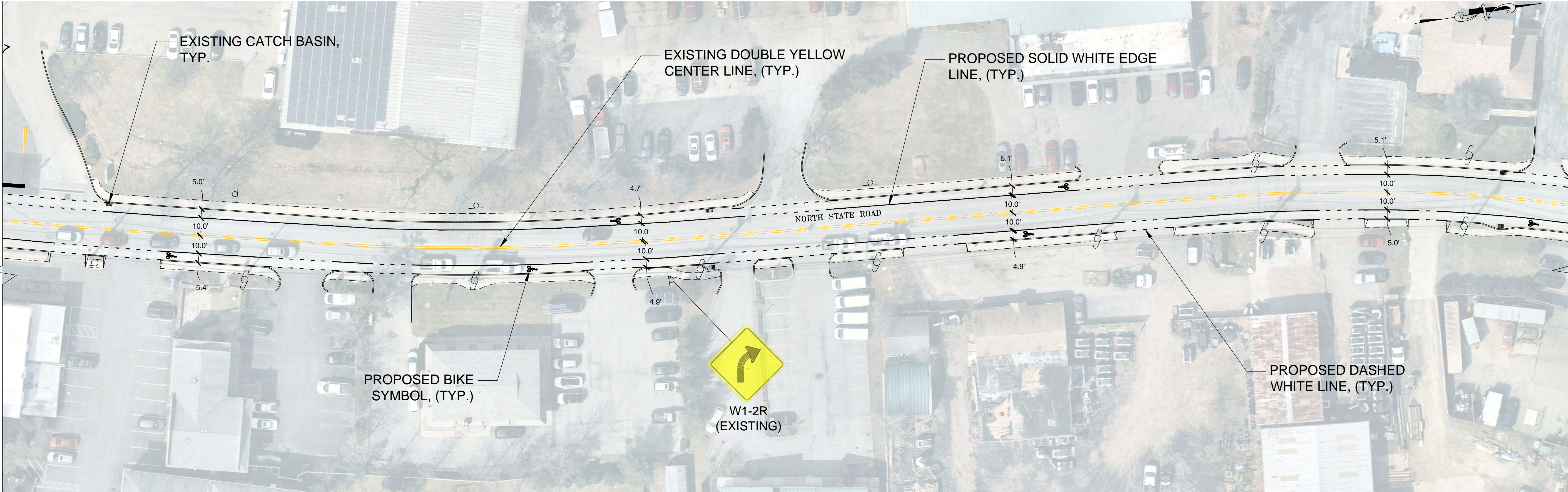
DATE: **June 17, 2019**

DRAWING NUMBER:
C-001

SHEET: **1 OF 6**



EXISTING CONDITIONS



PROPOSED CONDITIONS

NOTE: EXISTING "NO PARKING" SIGNS TO REMAIN

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Town of Ossining
Ossining Municipal Building
Ossining, NY 10562

PREPARED BY:
Sam Schwartz
322 Eighth Avenue, 5th Floor
New York, NY 10001
212 598-9010

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PROJECT:
**NORTH STATE ROAD
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LOCATED AT: **TOWN OF OSSINING
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TAX DESIGNATION:

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SITE MAP:


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**EXISTING AND PROPOSED
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DRAWN BY: **CV**

CHECKED BY: **JG**

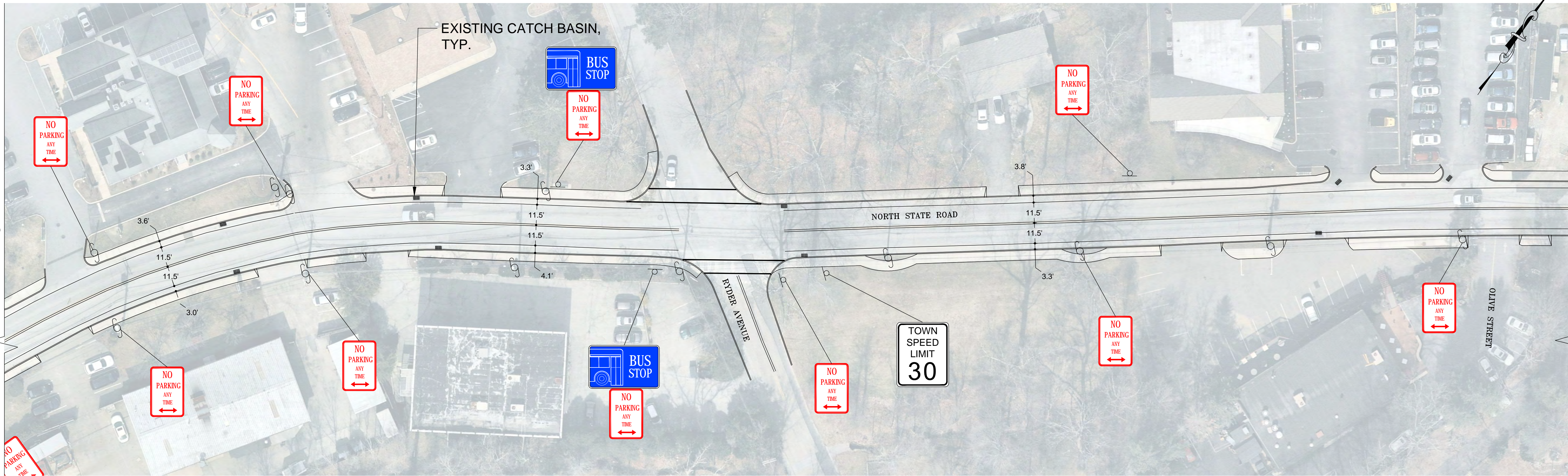
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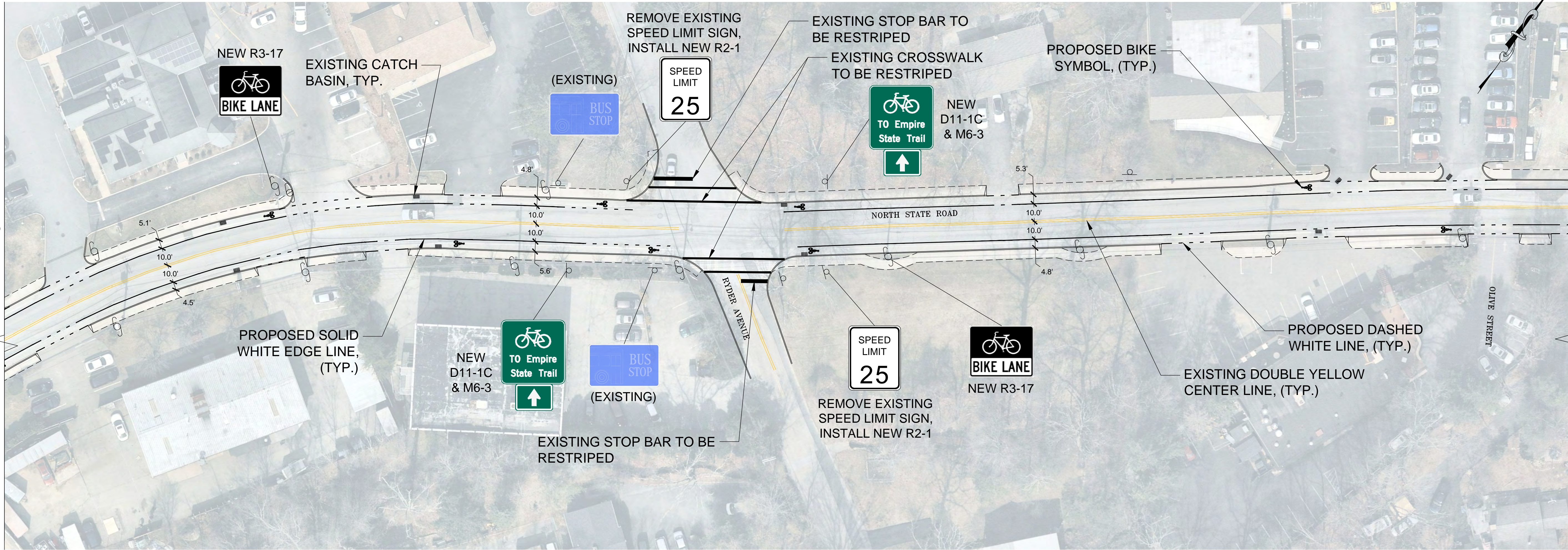
DATE: **June 17, 2019**

DRAWING NUMBER:
C-002

SHEET: **2 OF 6**



EXISTING CONDITIONS



PROPOSED CONDITIONS

NOTE: EXISTING "NO PARKING" SIGNS TO REMAIN

CLIENT:

Town of Ossining

Ossining Municipal Building
Ossining, NY 10562

PREPARED BY:

Sam Schwartz

322 Eighth Avenue, 5th Floor
New York, NY 10001
212 598-9010

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PROJECT:

NORTH STATE ROAD
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LOCATED AT:

TOWN OF OSSINING
WESTCHESTER COUNTY, NEW YORK

TAX DESIGNATION:

BLOCK/LOT:

SITE MAP:

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SIGNAGE PLAN

DRAWN BY:

CV

CHECKED BY:

JG

SCALE:

AS SHOWN

PROJECT NUMBER:

16-01-3570

DATE:

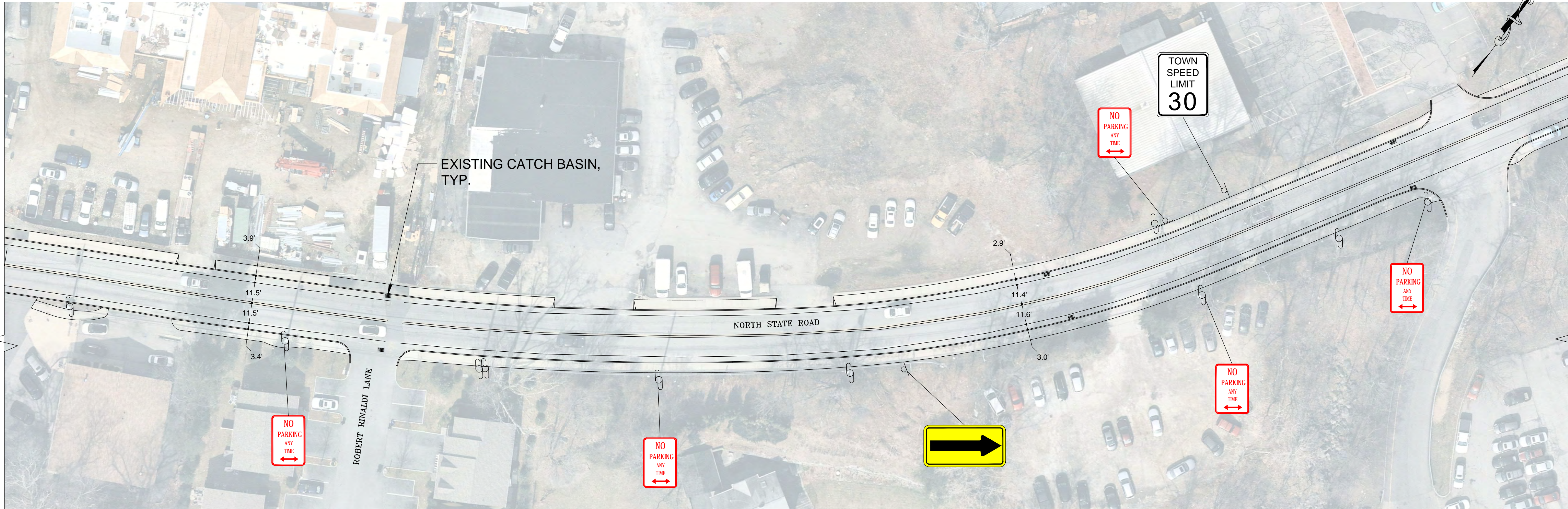
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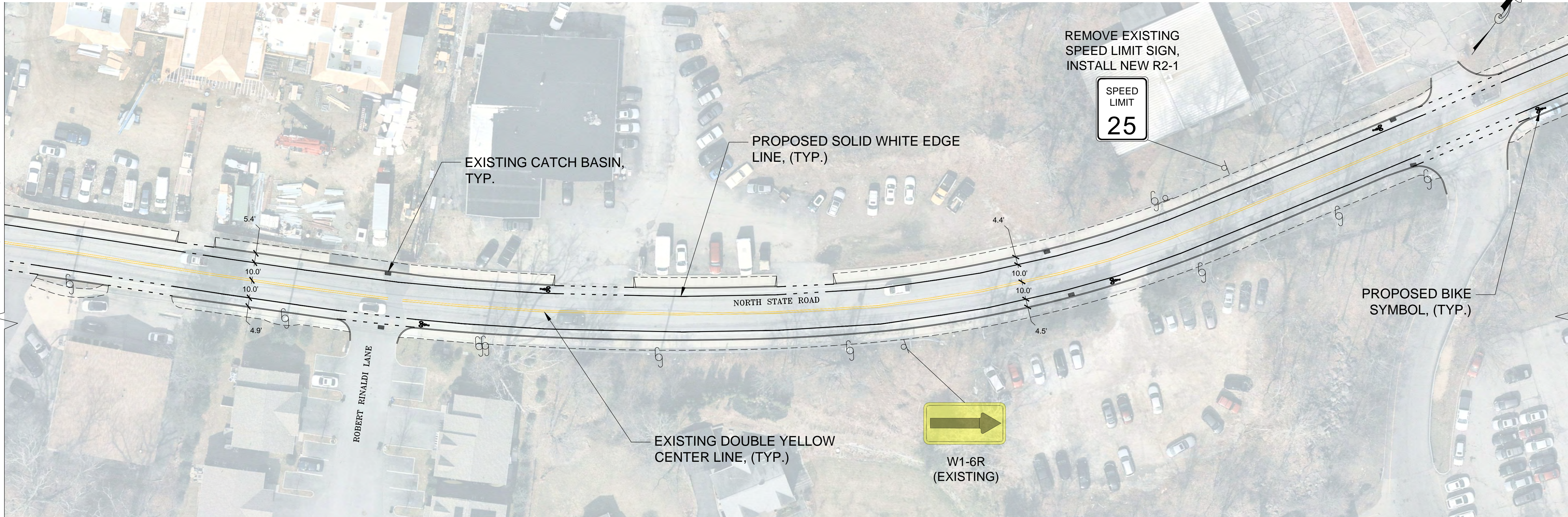
C-003

SHEET:

3 OF 6



EXISTING CONDITIONS



PROPOSED CONDITIONS

NOTE: EXISTING "NO PARKING" SIGNS TO REMAIN

CLIENT:

Town of Ossining

Ossining Municipal Building

Ossining, NY 10562

PREPARED BY:

Sam Schwartz

322 Eighth Avenue, 5th Floor

New York, NY 10001

212 598-9010

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PROJECT:

NORTH STATE ROAD

OSSINING, NY

LOCATED AT:

TOWN OF OSSINING

WESTCHESTER COUNTY, NEW YORK

TAX DESIGNATION:

BLOCK/LOT:

SITE MAP:

DRAWING TITLE:

EXISTING AND PROPOSED PAVEMENT MARKING AND SIGNAGE PLAN

DRAWN BY:

CV

CHECKED BY:

JG

SCALE:

AS SHOWN

PROJECT NUMBER:

16-01-3570

DATE:

June 17, 2019

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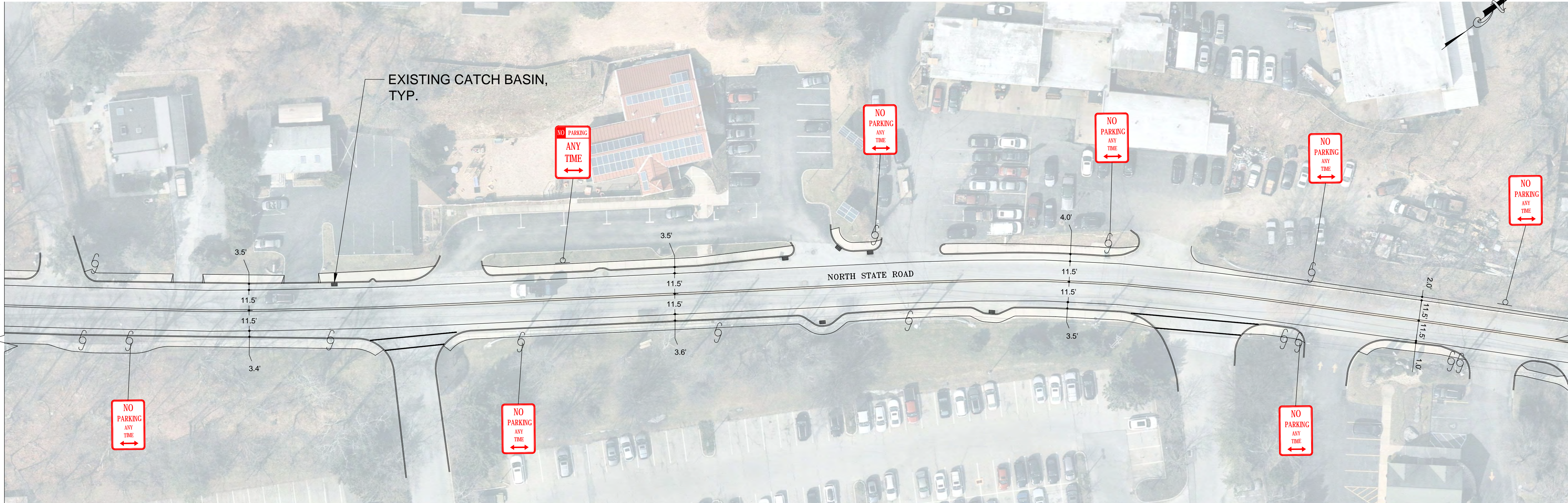
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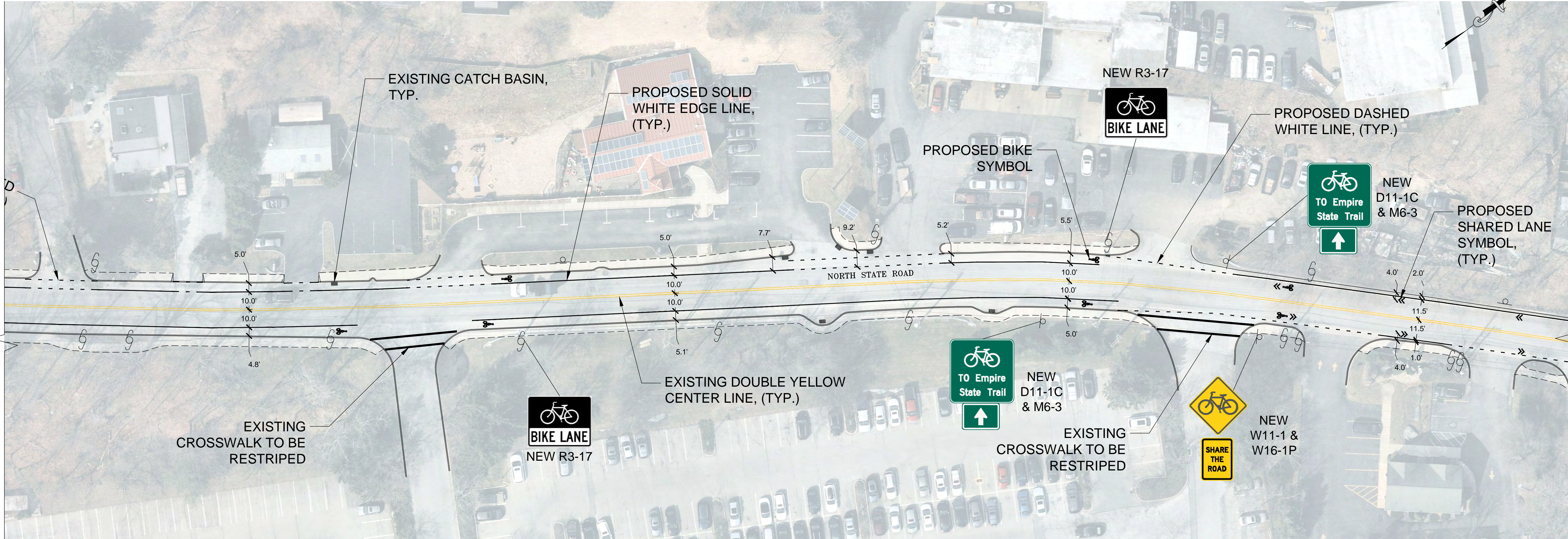
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 OF:

6



EXISTING CONDITIONS



PROPOSED CONDITIONS

NOTE: EXISTING "NO PARKING" SIGNS TO REMAIN

CLIENT:
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Ossining Municipal Building
Ossining, NY 10562

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PROJECT:
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SITE MAP:

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SIGNAGE PLAN**

DRAWN BY: **CV**

CHECKED BY: **JG**

SCALE: **AS SHOWN**

PROJECT NUMBER: **16-01-3570**

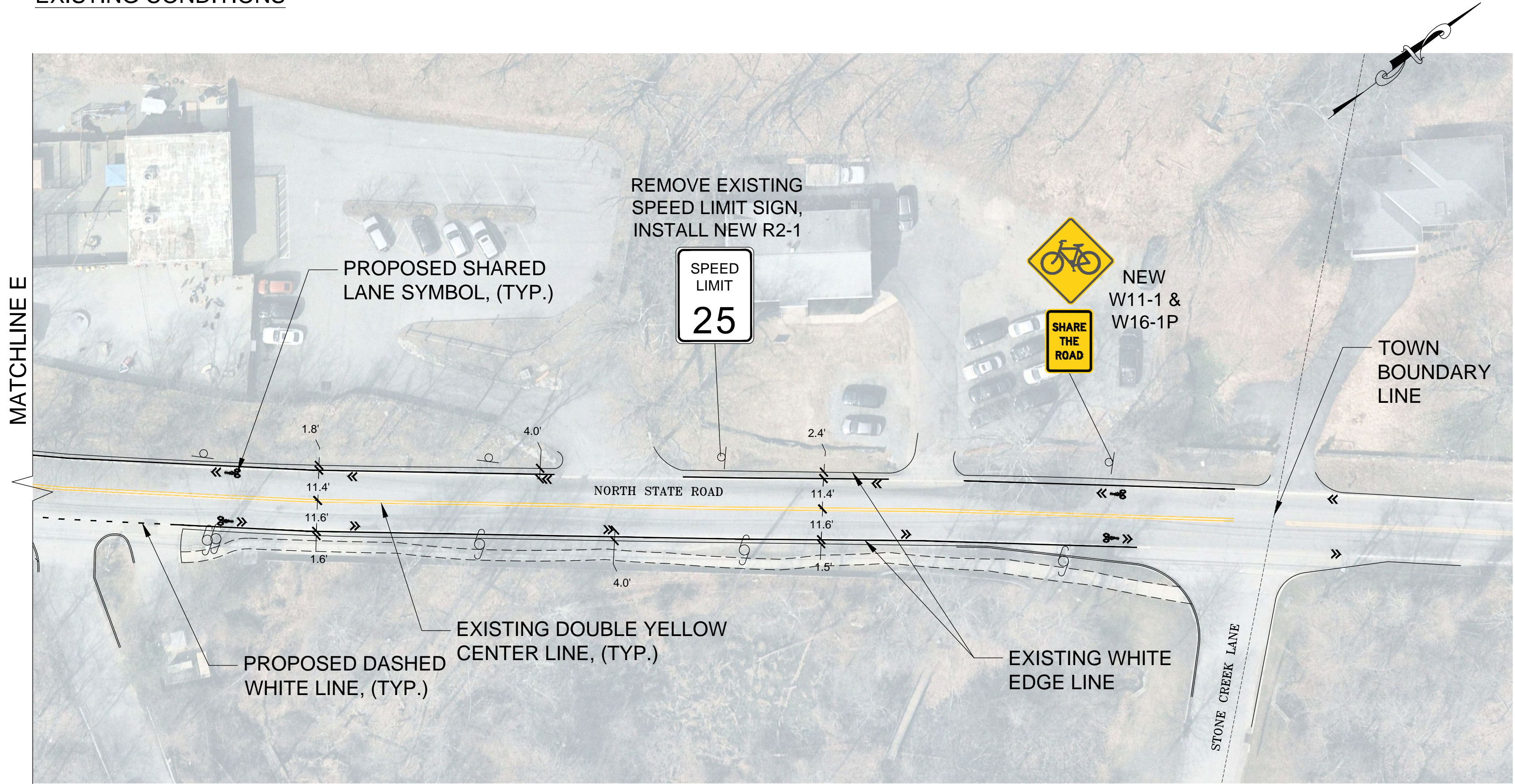
DATE: **June 17, 2019**

DRAWING NUMBER:
C-005

SHEET: **5 OF 6**



EXISTING CONDITIONS



PROPOSED CONDITIONS

NOTE: EXISTING "NO PARKING" SIGNS TO REMAIN

CLIENT:
Town of Ossining
Ossining Municipal Building
Ossining, NY 10562

PREPARED BY:
Sam Schwartz
322 Eighth Avenue, 5th Floor
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212 598-9010

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PROJECT:
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LOCATED AT: **TOWN OF OSSINING
WESTCHESTER COUNTY, NEW YORK**

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BLOCK/LOT:

SITE MAP:


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CHECKED BY: **JG**

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PROJECT NUMBER: **16-01-3570**

DATE: **June 17, 2019**

DRAWING NUMBER:
C-006

SHEET: **6** OF: **6**