

# Warren County Bicycle Plan

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Project Partner:



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## 1. Introduction

### *a. Purpose*

#### ***Bicycle Plan Goal:***

Provide a framework for future improvements which will result in a more expansive and comprehensive network of bicycle facilities in Warren County.

In association with the Warren County Safe & Quality Bicycling Organization (WCS&QBO), the Adirondack/Glens Falls Transportation Council (A/GFTC) has prepared this Warren County Bicycle Plan. This plan is intended to identify existing conditions, create a methodology to select needed improvements, set priorities for short- and long-term goals, and facilitate implementation in the future. The goal of this plan is to provide a framework for future improvements which will result in a more expansive and comprehensive network of bicycle facilities in Warren County.

This plan has been created in conjunction with a public outreach process which takes into account the priorities of the local municipalities in Warren County. All existing community master plans have been reviewed, stakeholder interviews have been conducted, and a public meeting has been held to review the draft version of the plan. This process is intended to strengthen ties between the local municipalities, County DPW, A/GFTC, and the WCS&QBO, so that partnerships can continue in the future implementation of the priority projects.

### *b. Previous Studies/Process*

This plan is in many respects an update to the Bicycle and Pedestrian Plan prepared by A/GFTC in 2000. As this plan was prepared with help from WCS&QBO, the focus of the update is solely on bicycle improvements within Warren County. Pedestrian systems will be addressed in a separate planning effort; however, in many cases, improvements to bicycle facilities will also benefit pedestrians.

To create the plan, the project team developed a work plan which included:

- An inventory of existing conditions
- A review of all available community plans and priorities for each municipality in the County
- Identification of priority network connections
- A methodology to select appropriate design features, and
- A plan for implementation

This process enabled the project team to identify feasible, real-world actions that can be taken to improve biking within the county in general. By coordinating implementation across local, county, and state levels, it is hoped that the plan will increase the efficiency and efficacy of improvements to the bicycle network.

### *c. Benefits of Bicycle Facilities*

Biking, whether conducted as a mode of transportation or as a recreational activity, offers a wide variety of personal, social, and environmental benefits. On a personal level, biking is not only a method to become or stay physically active, but is also an affordable, fun transportation method available to all ages. Socially,

biking reduces health care costs and vehicular traffic, can provide a healthy activity for families and children, and can provide an important component to the local economy in terms of tourism. In terms of the environment, biking can be an effective way to reduce dependence on the automobile, and subsequently reduce carbon emissions. Increasing opportunities for cycling can potentially increase the associated benefits, which include:



Figure 1 - Bicycle tourists (photo courtesy of Dauset Trails Nature Center)

**Economic Development:** Investing in bicycle infrastructure can attract tourists to an area, where they might otherwise spend their vacation dollars elsewhere. One example is North Carolina's Outer Banks, which generates \$60 million annually in economic activity through bicycle tourism, after spending \$6.7 million on bicycle infrastructure. This one-time investment has resulted in an annual nine-to-one return. An analysis of the demographics of visitors drawn to bike on the Outer Banks shows that the bicycle tourists tend to be affluent (50% earning more than \$100,000 a year and 87% earning more than \$50,000) and educated (40% with a masters or doctoral degree). Finally, expenditures by the 680,000 annual visiting bicyclists support 1,400 jobs in the area.<sup>1</sup>

On a local level, it is estimated long-distance, multi-day bicycling vacationers in New York spend between \$100 and \$300 per day on food, lodging, and other items. A group of six cyclists, therefore, each spending \$250 per day on seven-day trip would add up to \$10,500.<sup>2</sup> This type of economic benefit could add up to significant revenue for the region.

Separate from tourism, economic benefits from increased bicycle infrastructure also abound. Portland, Oregon, well known for being a bike-friendly city, saw \$90 million in bicycle-related activity in 2008. Almost 60 percent of that activity was comprised of retail, rental, and repair, with manufacturing and distribution, bicycle events, and professional services.<sup>3</sup>

Bike trails can also raise the value of nearby homes. According to a study completed for the Delaware Department of Transportation, proximity to an off-road bike trail can raise the value of a home by 4% or more.<sup>4</sup> This supports the idea that more and more people are seeking to live in bikeable communities.

**Quality of Life:** An increase in cycling is often associated with an increased quality of life. Numerous intangible benefits are associated with bicycling and walking. Having safe, accessible bicycle facilities can provide children and families with another option for recreation or

<sup>1</sup> Lawrie, et al, "Pathways to Prosperity: the economic impact of investments in bicycling facilities," N.C. Department of Transportation Division of Bicycle and Pedestrian Transportation, Technical Report, July 2004. [http://www.ncdot.org/transit/bicycle/safety/safety\\_economicimpact.html](http://www.ncdot.org/transit/bicycle/safety/safety_economicimpact.html)

<sup>2</sup> "Bicyclists Bring Business – A Guide for Attracting Bicyclists to New York's Canal Communities," Erie Canalway National Heritage Corridor, Parks & Trails New York, and New York State Canal Corporation, 2010. [http://www.ptny.org/pdfs/canalway\\_trail/b3/Bicyclists\\_bring\\_business.pdf](http://www.ptny.org/pdfs/canalway_trail/b3/Bicyclists_bring_business.pdf)

<sup>3</sup> Alta Planning + Design, "Bicycle-related Industry Growth in Portland," September 2008 (updated from June 2006.) [http://www.altaplanning.com/App\\_Content/files/fp\\_docs/2008%20Portland%20Bicycle-Related%20Economy%20Report.pdf](http://www.altaplanning.com/App_Content/files/fp_docs/2008%20Portland%20Bicycle-Related%20Economy%20Report.pdf)

<sup>4</sup> Racca, David P. and Dhanju, Amardeep, "Property Value/Desirability Effects of Bike Paths Adjacent to Residential Areas," Center for Applied Demography & Survey Research, November 2006. <http://128.175.63.72/projects/DOCUMENTS/bikepathfinal.pdf>

transportation. According to the Pedestrian and Bicycle Information Center, “Providing more travel options can increase a sense of independence in seniors, young people, and others who cannot or choose not to drive. Increased levels of bicycling and walking can have a great impact on an area’s sense of livability by creating safe and friendly places for people to live and work.” A specific example comes again from Portland, where policies to encourage bicycling have reduced auto-dependency, saving the residents on transportation costs. In comparison with the median American city, Portland residents save \$2.6 billion a year in terms of miles traveled and hours spent in vehicles.<sup>3</sup>

**Transportation:** With the exception of recreational riders, every cyclist represents one less car on the road. Although many vehicle trips are less than three miles in length, which could easily be accomplished by most cyclists, 72 percent of these short trips are made in cars. Bicyclists in some areas may arrive at their destinations faster than if they had driven a car, since they can often bypass congestion and gridlock traffic.<sup>5</sup>

**Public Health:** Cycling is a great form of exercise, reducing the risks for many cardiovascular diseases. Enabling and encouraging residents to bicycle also results in public health benefits. For example, according to the American Heart Association, with each dollar a community invests in multi-use trails, \$3 in medical cost savings is realized.<sup>6</sup>

With all these benefits, many communities are demonstrating a strong interest in strengthening and improving bicycle infrastructure, on both a local and regional level. Warren County, and the communities within, has been active in pursuing ways to directly and indirectly improve the biking experience in the region. This has included innovative partnerships to promote bike education and events as well as physical projects such as the Warren County Bikeway. With this plan, Warren County is underscoring its ongoing commitment to encouraging bicycle activity for the benefit of residents, business owners, and visitors alike.

#### *d. Terminology*

Throughout this plan, a variety of specific terms are used. To reduce confusion, a short glossary has been provided:

#### **Important Terms:**

**Bike ROUTE:** The on- or off-road alignment designated specifically as accommodating to bicycles.

**Bike FACILITY:** The physical surface or feature used by cyclists.

**Bike Routes:** The alignments (on- or off-road) along which bicycles are specifically accommodated, as designated by the authority of the roadway owner. Bike routes typically feature directional and/or informational route markings. Note: Roadway not specifically designated as a “bike route” does not imply that it cannot or should not be used by cyclists. However, some cyclists may find that non-designated roadways are not as accommodating to cyclists.

<sup>3</sup> Pedestrian and Bicycle Information Center, “National Bicycling and Walking Study: 15-Year Status Report”, May 2010 [http://katana.hsrrc.unc.edu/cms/downloads/15-year\\_report.pdf](http://katana.hsrrc.unc.edu/cms/downloads/15-year_report.pdf)

<sup>6</sup> Weintraub, William S. et al, “Value of Primordial and Primary Prevention for Cardiovascular Disease : A Policy Statement From the American Heart Association,” *Circulation*, online publication July 25, 2011 <http://http://circ.ahajournals.org/content/early/2011/07/25/CIR.0b013e3182285a81>

Bike Facilities: The physical surface on which the cyclists ride. These may include, but are not limited to, multi-use trails, bike lanes, road shoulders, or vehicle travel lanes. A description of the different types of bicycle facilities is included in Section 4 of this plan. Bike facilities can also include other features designed to accommodate/encourage cycling, such as bike parking facilities.

Design Standards: The geometric specifications regarding pavement width and other elements which are recommended to be met in order to be considered a bicycle facility.

## **2. Existing Conditions**

This plan is intended to guide the improvement of bicycle facilities and the future designation of bicycle routes throughout the County. However, this effort is not “starting from scratch”, but is rather the continuation of many years of work by several agencies. Warren County, along with A/GFTC, local bike groups, and individual municipalities, has been active in encouraging accommodations for cyclists. It is therefore important to take stock of the conditions for cyclists as they stand today.

### *a. Existing Bike Routes*

Bicycle facilities in Warren County consist of on-road designated routes and multi-use trail systems. (See map 1) The centerpiece of this system is the Warren County Bikeway, a mainly off-road bike facility which extends from the City of Glens Falls to the Village of Lake George. This paved trail provides access to many important destinations and also links with the Feeder Canal Trail via on-road connections. In addition to the facilities shown in Map 1, other on-road facilities feature “Share the Road” or other bicycle-related signage.

The Town of Queensbury recently designated several roadways in the southwest part of the Town as on-street Bicycle Routes. The identification of these roadways as potential bike routes was facilitated by WCS&QBO prior to the commencement of this plan; the designation process described in Section 6 of this plan can serve as a model for other towns as well.

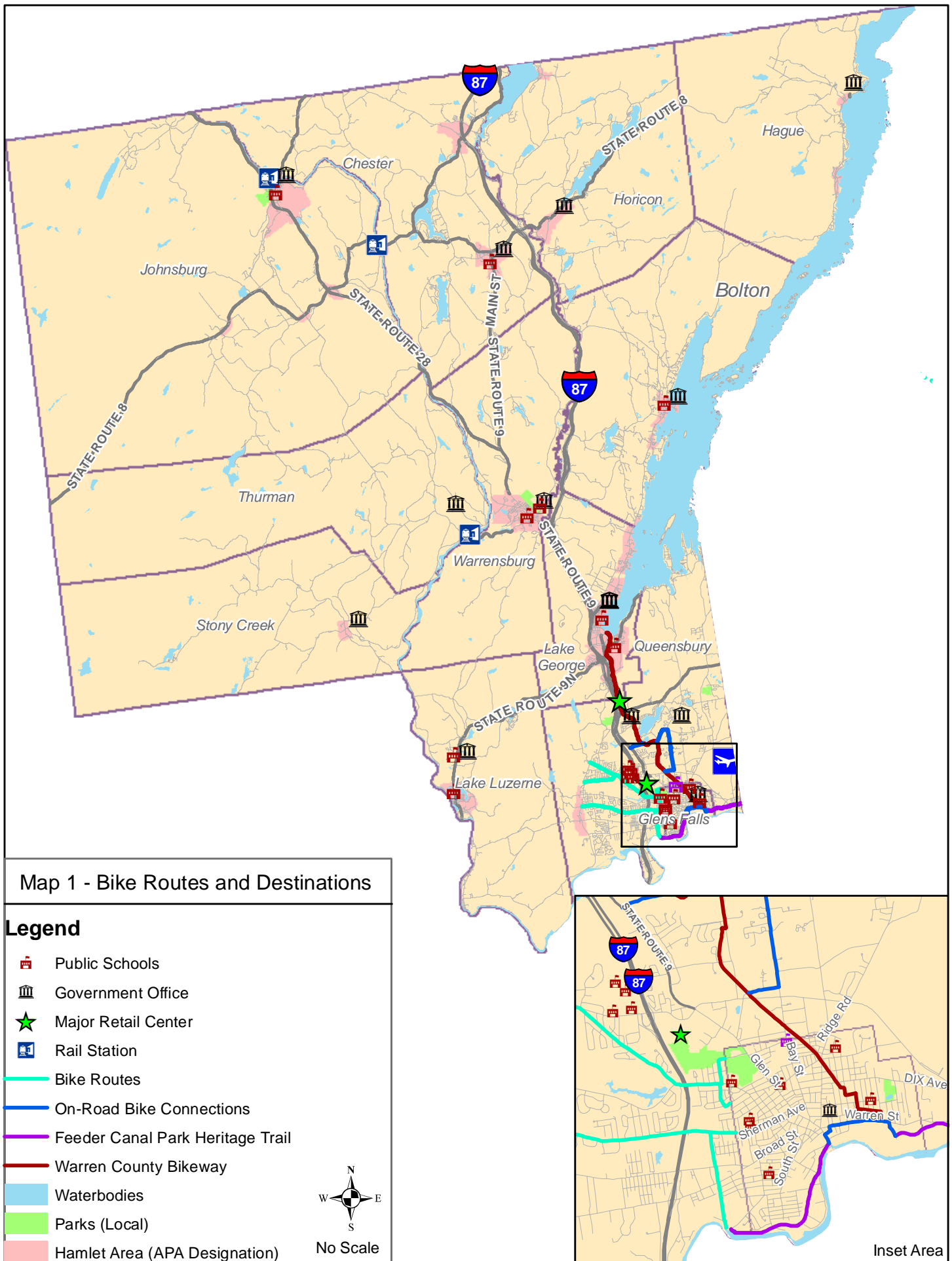
There are also other bicycle route networks and facilities surrounding Warren County, especially in Saratoga, Washington, and Hamilton Counties. These include networks such as the Saratoga County Heritage Trail, New York State Bike Route #9, the Champlain Canal Trail, and the “Bike the Byways” network. Creating and maintaining strong connections to these neighboring opportunities is a key aspect of this plan.

### *b. Existing Destinations*

Warren County has a variety of potential destinations for bike trips. (See Map 1) Many of the hamlet areas, shown in pink on Map 1, serve as centers of activity for residents and visitors. Stand-alone employment centers are located throughout the County, including industrial parks and the Warren County Municipal Center. Schools also constitute important bicycle destinations. Finally, many of the

recreational amenities and parks in the County are also biking destinations, both for tourists and for employees. These include active recreation amenities, such as amusement parks, shopping, and cultural features located in and around the city, village, and hamlets, as well as passive parks and natural areas spread throughout the County.





### 3. Priority Connections

The goal of this plan is to provide a framework for future improvements which will result in a more expansive and comprehensive network of bicycle facilities in Warren County. Most of these facilities are likely to be located along existing roadways. However, it is not realistic to assume that every roadway will be the focus of bicycle improvement projects, especially given current funding limitations. Conversely, even if a roadway meets the minimum requirements for the appropriate design standard, there may be reasons to refrain from pursuing designation as a bicycle route, at least in the short-term. Possible reasons to delay designating a roadway as a bicycle route include: location (does the roadway provide connections to other bike routes?); maintenance (will the bicycle facility require a level of maintenance which is currently not feasible?); and/or public input (are there local objections to formal designation as a bike route?).

As such, an important component of this plan involved setting priorities to identify which roadways are recommended to be designated as bike routes. To set realistic and feasible actions for this plan, several factors were considered, described in greater detail below.

#### *a. Local Priority Routes*

**Local Priorities:** Many municipalities have specifically addressed bicycle facilities in their planning documents, including:

- Bolton
- Chester
- Horicon
- Johnsbury
- Town and Village of Lake George
- Lake Luzerne
- Queensbury
- Warrensburg

Many of the local municipalities have addressed the need for bicycle facilities in planning documents; these ideas should be taken into account. As part of this plan, all local planning documents were reviewed to determine the stated bicycle transportation priorities in each municipality. On Maps 2 and 3, the roadways shown in red were specifically mentioned within the individual municipal plan as being suitable for current bike use, or desired for bike use in the future.

This analysis highlights the fact that not every community in Warren County has stated priorities concerning cycling. Some communities have identified specific on- and off-road alignments, while others include a general statement of support for bicycling issues. Still others make no mention of cycling at all; however, this should not infer that the community does not desire accommodation of bicycles on the roadways. Nothing in this plan is intended to prevent local municipalities from supporting the establishment of additional bicycle facilities, nor to obligate communities to engage in projects in the future.

#### *b. WCS&QBO Priority Routes*

Maintaining and promoting safe, functional bicycle facilities along the roads most used by cyclists is a key goal of this plan. To facilitate this, members of the WCS&QBO generated a list of cycling routes. These roadways represent the alignments of existing bike events, important connections to recreation destinations, and roadways which are enjoyable to ride. Although recreational riding is not the focus of this plan, it is important to recognize those routes which are favored by the biking community. These routes are shown in gold on Maps 2 and 3.

*c. A/GFTC Staff Priority Routes*

In addition to the priorities stated above, it will be important to include regional transportation needs into this bicycle plan. A/GFTC staff therefore identified several roadway alignments which fulfill a regional transportation role. These include connections to destinations within Warren County, as well as bike routes in adjacent counties. These routes, shown in green on Maps 2 and 3, were selected to allow for transportation connectivity, rather than just recreational enjoyment.

*d. Priority Bicycle Network*

As part of this plan, a methodology to prioritize the importance of roadway improvements was developed. Using this methodology, the Priority Network was developed. See Maps 2 & 3, as well as the more detailed maps for each municipality located in Appendix 1. This includes on- and off-road connections which are proposed to be the focus of bicycle improvements in the future. Showing the needs and desires of all three groups simultaneously allows for a rudimentary hierarchy to be assigned.

1. **On-Road Connections:** Roadways which have been selected by all three groups are considered high priority. Whenever feasible, upgraded bicycle facilities such as bike shoulders or shared use lanes should be included in improvement projects on these high priority routes. Those routes selected by two of the three groups are considered still important, but of a lower priority for implementation. If feasible, bicycle facilities should be included in any upcoming capital improvement projects. If bicycle facilities cannot be accommodated, “Share the Road” signage may be recommended to raise awareness of cyclists on the part of motorists. Roadways which are important to only one group are included in this plan as well, with the understanding that improvements along these roadways may take place in the long-term.
2. **Multi-use trails:** In terms of off-road connections, only those previously proposed in local planning documents have been added to the priority connections map. However, many other multi-use trails may be feasible. If pursuing an off-road connection is the preferred alternative, the need to acquire easements or rights-of-way should be the initial consideration. Trail alignments through recreation/open space areas may be a feasible option which minimizes property acquisition burdens. In addition, National Grid has a standard process and dedicated staff to evaluate whether they will grant access rights for multi-use trails, making them another potential partner.

This hierarchy is intended to provide one tool in the decision-making process. It may be useful in situations in which there is some leeway in selecting among several potential projects. However, the selection of capital projects involves other equally important factors. The remainder of this plan is intended to address the design, feasibility, and implementation of bicycle improvement projects.

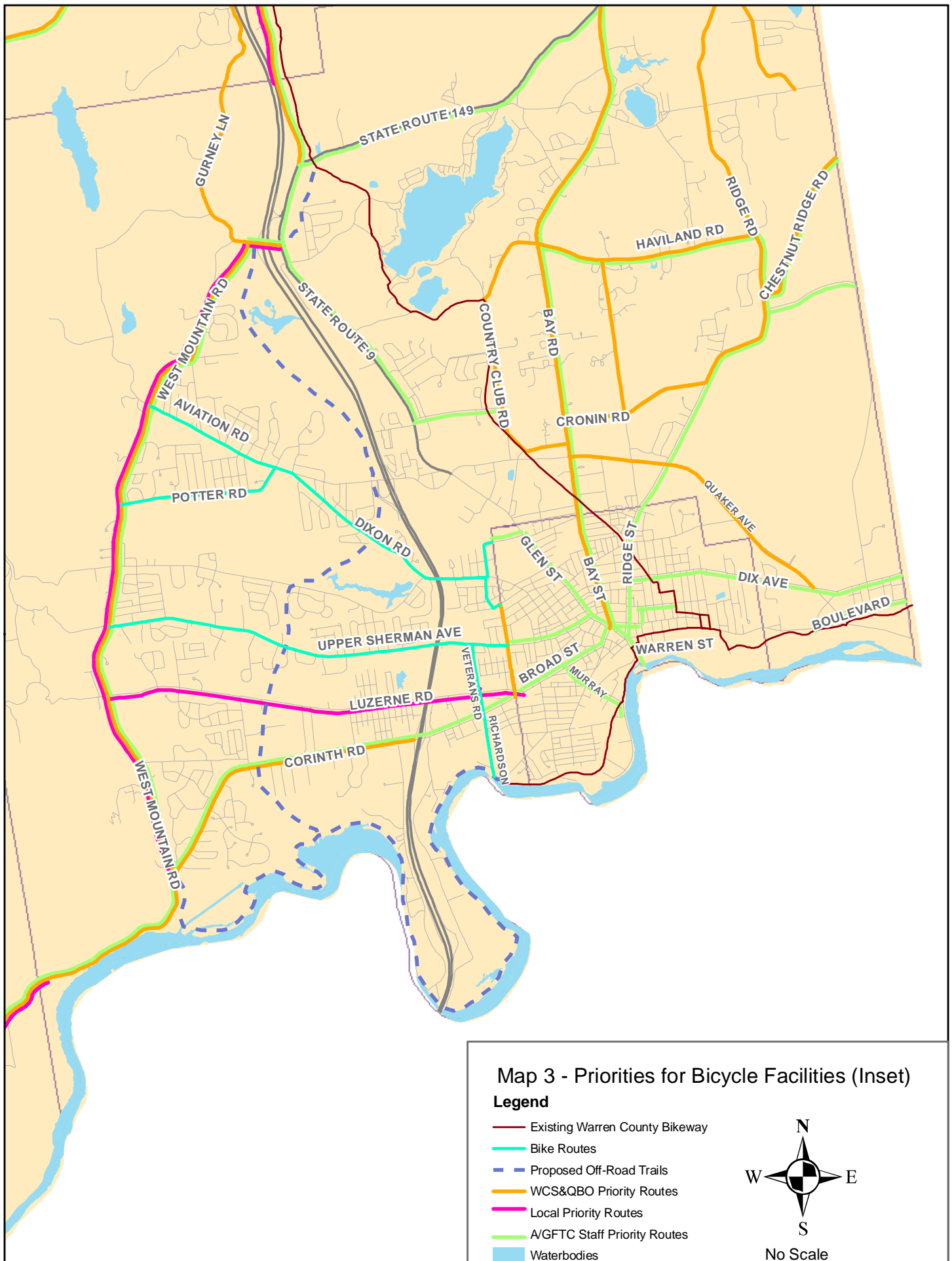


Map 2 - Priorities for Bicycle Facilities

### Legend

- Existing Warren County Bikeway
- Bike Routes
- - Proposed Off-Road Trails
- WCS&QBO Priority Routes
- Local Priority Routes
- A/GFTC Staff Priority Routes
- Waterbodies





**Guidance Documents  
for Bicycle Facility  
Design Standards:**

American Association of  
State Highway and  
Transportation Officials  
(AASHTO): *Guide for the  
Development of Bicycle  
Facilities*, 1999

Federal Highway  
Administration (FHWA):  
*Bikesafe: Bicycle  
Countermeasure Selection  
System*, May 2006;  
*Selecting Roadway Design  
Treatments to  
Accommodate Bicycles*,  
1992

New York State  
Department of  
Transportation: *Highway  
Design Manual, Chapter 17  
Bicycle Facility Design*,  
2006

## 4. Design Standards

### a. Overview

Design standards for bicycle facilities can apply to the location, width, pavement, and other features such as drainage grates and protective railings. These standards may be applied to part of an on-road facility or an multi-use trail.

The selection of a bicycle facility depends on many variables: the type of cyclist likely to use the facility; traffic mix, volume, speed, parking, and sight distances (for on-road facilities); bicycle speed, grade, multi-use capacity, and roadway/rail crossings (for off-road facilities). Several agencies, including NYSDOT, FHWA, and AASHTO, have compiled manuals and guidance documents which can help to select the most appropriate design standards for each facility.

For the purposes of this document, the most commonly applicable design standards have been summarized below. This summary is intended to aid in the prioritization of improvement projects, by outlining minimum standards for the types of facilities most likely to be proposed in Warren County. The design standards are based on those in the NYSDOT *Highway Design Manual Chapter 17 (Bicycle Facility Design)*, and on AASHTO's *Guide for the Development of Bicycle Facilities*. Standards for features such as bridges or railings have not been included; refer to the appropriate guidance document for detail concerning these facilities.

This summary is not intended to limit the range of potential bicycle facilities in Warren County. As new standards are adopted, and different types of bicycle facilities tested and deployed, it is recommended that these new techniques be reviewed to determine if they may be appropriate to conditions in Warren County.



*b. Types of Bicycle Facilities*

1. Bike Shoulders (aka Wide Shoulders)

Most appropriate for: Rural/suburban roadways with limited sections of curbing and without on-street parking

Design standards: 4'-wide (min.) shoulder for non-curbed roadways with speeds under 40 MPH. Width increased to 6' for higher-speed/higher-volume roadways, roads which exceed 5% grade for 6 miles or longer, or roads with curbs or other obstacles at the edge of pavement. (See Figure 2&3)

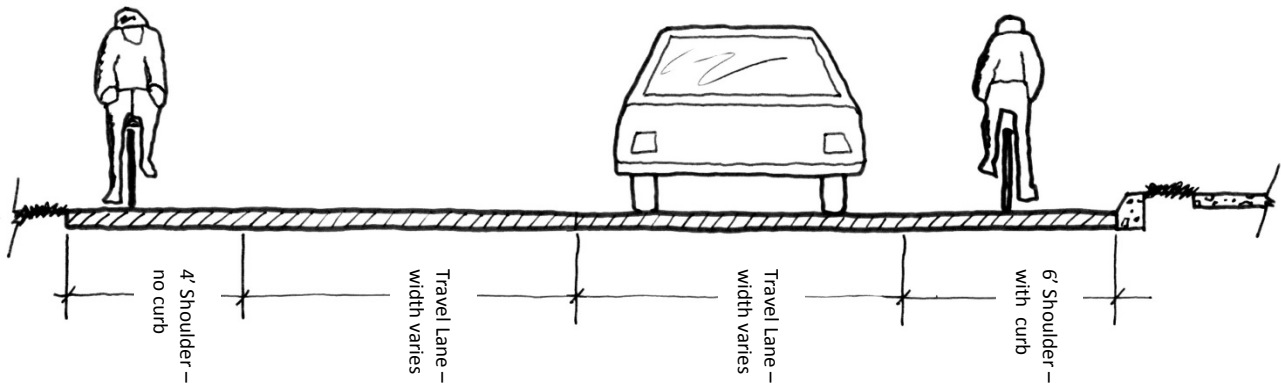


Figure 2 - Design Standard for bike shoulders



Figure 3 - Bike shoulders (photo courtesy of ANCA)

Advantages:

- Many bike shoulders already exist in the County
- No additional maintenance required beyond that which is required for the roadway
- Can sometimes be accommodated via re-striping
- Appropriate for rural and suburban areas
- No additional striping at intersections

Disadvantages:

- Less comfortable for beginning/average cyclists than bike lanes (see page 10)
- May require widening of the roadway in certain areas
- Can pose conflict with on-street parking

## 2. Shared-Use Lanes (a.k.a. Wide Curb Lanes)

Most appropriate for: Roadways with width constraints

Design standards: 14'-wide desired/12'-wide minimum travel lane (See Figure 4&5). Some shared-use lanes deploy a "sharrow" roadway striping, which reinforces the need to share the road with cyclists.

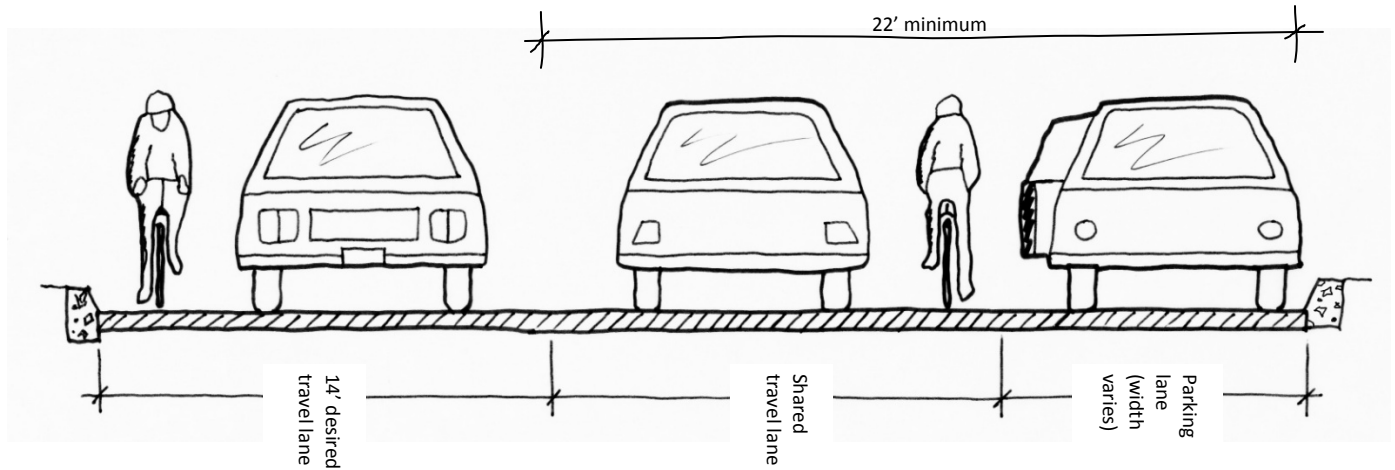


Figure 4 - Design Standard for shared lanes



Figure 5 - Example of cyclist in shared lane (photo courtesy of pedbikeinfo.org)

### Advantages:

- Minimal striping or maintenance required
- Benefits to non-bicycle traffic: accommodates buses and truck turning movements/emergency maneuvers
- Greater lateral mobility for advanced cyclists (can use the whole lane if needed to avoid obstacles)

### Disadvantages:

- Least comfortable for beginning/average cyclists
- Wider travel lanes can increase traffic speeds
- Can pose conflict with on-street parking



Figure 6 - Striped bike lane (photo courtesy of pedbikeinfo.org)



Figure 7 - Example of bike lane signage



Figure 8 – Multi-Use trail

### 3. Bike Lanes

Most appropriate for: Urban roadways with curbing and on-street parking

Design standards: 4'-wide (with no on-street parking/curb) or 5'-wide (with on-street parking/curb) striped lane located between travel lane and parking lane/curb. (Figure 6)

Advantages:

- Channelizes bike traffic
- More comfortable for beginning/average cyclists to ride
- Minimizes cars swerving into other lane to avoid cyclists
- Higher profile/visibility for cyclists

Disadvantages:

- Intersections can become complicated with extra bike lane striping and signage (Figure 7)
- May require additional ROW width
- Mainly an urban roadway feature
- Can be blocked by parked cars
- Can pose conflict with on-street parking

### 4. Multi-Use Trail/Path (aka Off-Road Trail)

Most appropriate for: Areas with existing linear ROW (rail/utility corridors, for example) which link destinations

Design standards: 10'-wide recommended for a two-way path (12' preferred)

Advantages:

- Least potential for vehicle/bike conflict
- Most comfortable for beginning/average cyclists
- Potential to create direct links
- Recreation amenity

Disadvantages:

- Highest cost to implement – requires ROW acquisition, design, and construction
- Requires separate maintenance; many municipalities may be unable to provide maintenance



Figure 9 - Diagram of Share the Road signage

## 5. “Share the Road” Signage

Most appropriate for: Roadways which do not have sufficient shoulder width to support designated use for bicycles. Note that the signs themselves do not constitute a bicycle facility, but can be deployed along on-road connectors.

Design standards: Set by the Manual of Uniform Traffic Control Devices (MUTCD)

### Advantages:

- Inexpensive to deploy
- No physical changes needed to roadway
- Roadway need not be a designated Bike Route to have Share the Road signs

### Disadvantages:

- Does not provide dedicated space for cyclists
- Over-deployment dilutes the efficacy of the signs



## 5. Physical Feasibility Analysis

In addition to identifying the location of important bicycle connections (the Priority Network), and summarizing the applicable design standards for conditions in Warren County, this plan also analyzed whether roadways may currently have the requisite pavement width meet the Design Standard appropriate to the context. A GIS map was prepared which compares the existing shoulder width to the width required by the bike shoulders Design Standards outlined in Section 4.<sup>7</sup> This assumption creates a conservative analysis, as the width necessary for the wide shoulder Design Standard is greater than or equal to the dimensions needed for any other type of bicycle facility. As such, it can be broadly assumed that a roadway which is wide enough to support the Design Standard for bike shoulders will likely also be wide enough for shared lanes, bike lanes, and so forth.

The existing shoulder width was based on GIS information, then verified via inspection by A/GFTC staff. For the purposes of this plan, the average paved shoulder width was measured for each section of roadway. Gravel shoulders were not included in this analysis. This analysis does not take into account the condition of the pavement. The shoulder width was then compared to the posted speed limit for the roadway. It should be noted that the posted speed limit is not the only factor which can be taken into account when determining the required width of a bike shoulder. Topography, functional classification of the roadway, traffic volume and mix, and sight distance are all other factors which can be taken into account to determine an appropriate bike shoulder width. Posted speed was chosen as the analysis method for this plan to facilitate the GIS analysis.

The results of this analysis are shown in Map 4, which indicates that the majority of roadways do not have current sufficient width to meet the wide shoulder Design Standard. It is crucial to note that lack of shoulder width does not imply that a roadway is inherently unsafe or unsuitable for use by cyclists. The intent of this mapping exercise was to determine which, if any, roadways could *currently* meet (or come close to meeting) the appropriate design standard. This information can be useful in helping roadway owners determine the scope of work required to create or enhance bicycle facilities in the future.

It must also be noted that many roadways in Warren County are “user highways”. These are roadways in which the right-of-way width is the same as the pavement width. As such, widening these types of roads usually involves acquisition of property from adjacent landowners, which can significantly increase the cost and time frame of construction projects.

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<sup>7</sup> Not all roadways on the priority network were analyzed during the course of this mapping analysis.



Map 4 - Physical Conditions Map  
(Shoulder width vs. posted speed limit)

### Legend

#### Shoulder Width Meets Applicable Bike Design Standard

- No
- - - No - Roadside Obstacles
- Yes
- Other Roads
- Waterbodies



Shoulder and posted speed conditions based on field observation by A/GFTC staff and may be subject to revision. Information as presented is not to be used for construction or engineering and is intended for planning purposes only.

## 6. Implementation

The priority network identified in Section 3 is intended to serve as a guide for the location of bicycle facility improvements. However, several other factors will play an important role in the timing and selection of projects which further this plan. These are listed below.

### ***Complete Streets:***

Complete streets provide transportation options for everyone by creating safer places to walk and ride bicycles. They also provide better access to public transportation, improve transit efficiency, and calm traffic. Complete streets create complete communities.

In the summer of 2011, the NYS legislature unanimously passed a statewide Complete Streets bill, which was signed by the governor and will go into effect February 2012.

This law calls for Complete Street Designs to be considered for all state, county, and local transportation projects that are undertaken by the Department of Transportation or receive both federal and state funding and are subject to Department of Transportation oversight.

Most projects that receive federal funding also receive state funding. However, the law is not applicable on many roads owned by villages, towns and counties.

- Funding availability. As of the date of this report, funding for stand-alone on-street bicycle features is so limited as to be essentially unavailable. However, other funding streams may become available which can further the implementation of this project. For example, there may be funding for off-road connections which would allow for extensions of the Warren County Bikeway, or for similar facilities to be constructed in the County.
- Complete Streets/Integration with other transportation projects. Given the current funding restrictions facing all aspects of transportation, combining vehicle and bicycle improvements in the same project may be the most efficient and effective course of action. Since New York State recently enacted Complete Streets legislation, it is likely that bicycle facilities will become a more prominent element in the design and construction of roadways at the State and County level. In addition, there may be opportunities to create or improve a bicycle facility during a local roadway or bridge project in the future, regardless of the priority level assigned as a part of this plan. Local agencies should take advantage of these opportunities as they arise.
- Phasing of Improvements. For high-priority roadways, it may be beneficial to adopt a phased approach to bicycle facility improvements. For instance, if there is insufficient pavement/right-of-way width to support creation of bike shoulders, or if the roadway was very recently improved (and therefore not likely to be the focus of a capital project in the near future), “Share the Road” signage can be added as a short-term solution. This would allow the roadway owner to designate the road as a Bike Route in the near future, while still allowing for future physical improvements to take place in the long term. In addition, phasing should take into account the location of the facility. Connections to existing bike facilities, and continuous routing between logical termini, are both important considerations.
- Target Cyclist. Cyclists can span a wide range of experience levels and skill. Experienced cyclists may feel more comfortable using certain types of bicycle facilities than do children or less-experienced adults. This plan does not differentiate between types of cyclists, as the goal is to encourage cycling for everyone. However, the desire to accommodate a wide range of cyclists should be balanced with the benefits of providing a facility where none currently exists, even if the facility may not be the most comfortable for every cyclist. This balance should be informed by factors such as proximate land uses,

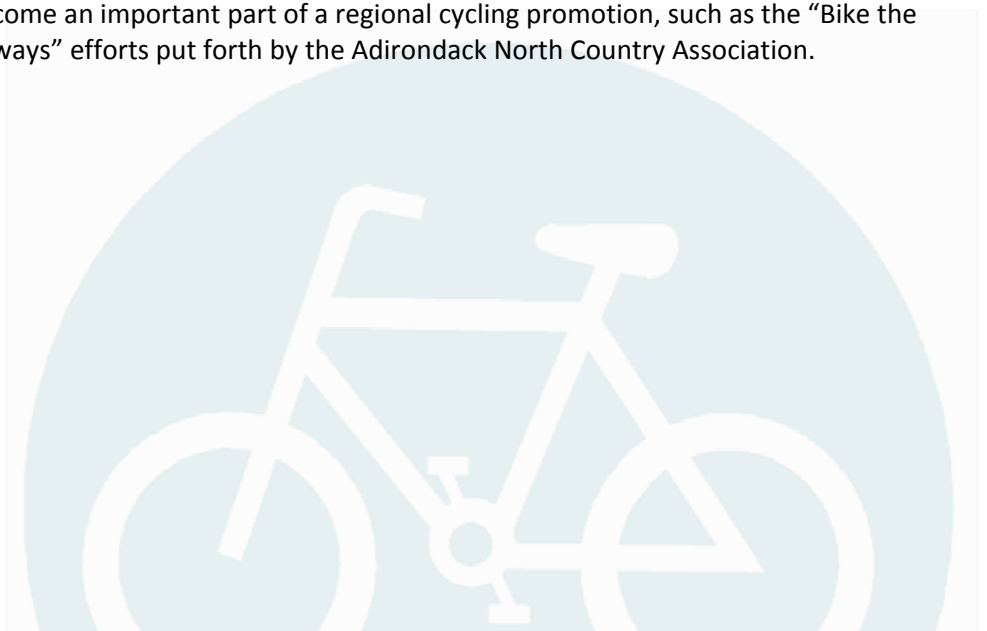
location of the proposed facility, and physical constraints of the roadway/trail area.

To further facilitate the decision-making process, a Bicycle Facility Improvement Process has been developed. In general, the end goal is to have all of the roadways in the priority network include a functional bicycle facility. Theoretically, the roadway owners could designate these roadways as bicycle routes at any time. However, most agencies would prefer that the roadways that they designate as formal bike routes meet (or come close to meeting) the criteria for accepted design standards, such as those listed in this plan, prior to making the designation.

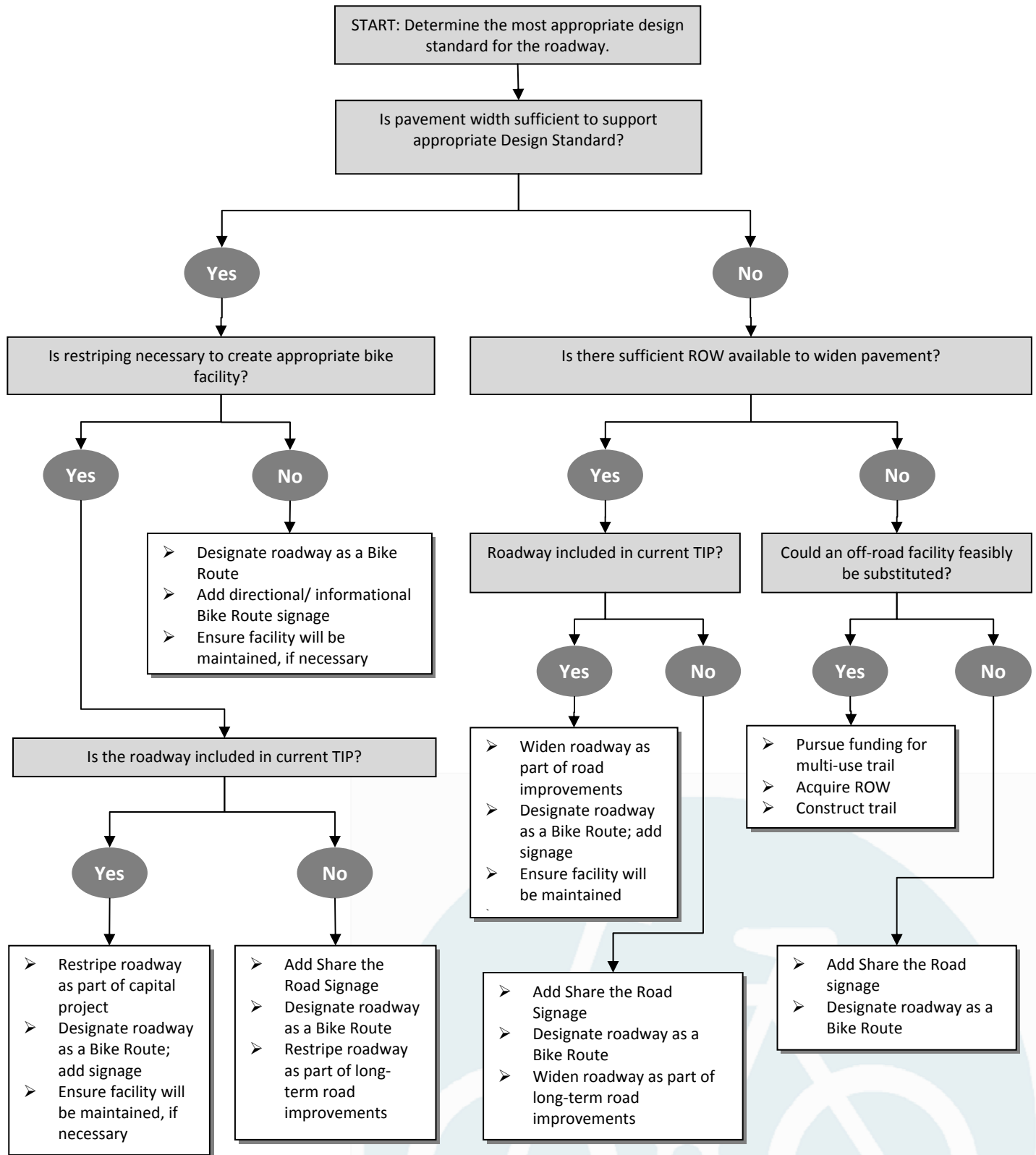
The first step in that process is to select the appropriate Design Standards for the roadway in question. The next step is to determine whether the roadway will require additional improvements in order to be in compliance with the Design Standards. The flow chart on the following page is intended to help guide this process. Factors such as existing pavement width, available ROW, the feasibility of off-road connections, and whether the roadway is slated for improvements in the 5-year Transportation Improvement Program, are all considered.

This process anticipates that most roadway owners would require that bicycle facilities are largely consistent with the design standards prior to designation as a bike route; however, this is not prerequisite. The designation itself may be an internal process, or may be at the behest of a separate group. For example, the WCS&QBO recently petitioned the Town of Queensbury to designate several roadways as bike routes; the Town Board passed a resolution designating the roadways as this plan was being drafted. This process could be replicated for any town in Warren County. Similarly, this group, or any local municipality, may choose to petition Warren County to designate their roadways as bike routes.

New York State maintains a separate system of bike routes, designed to encourage long-distance connections statewide. However, they may be petitioned to add bike route signage along State roadways. These can then become an important part of a regional cycling promotion, such as the “Bike the Byways” efforts put forth by the Adirondack North Country Association.



### **Bicycle Facility Improvement Selection Process**



*a. Other Improvements*



Figure 10 - Above, poor drainage grate choice; Below, bicycle-friendly grate (photos courtesy of Syrcast)

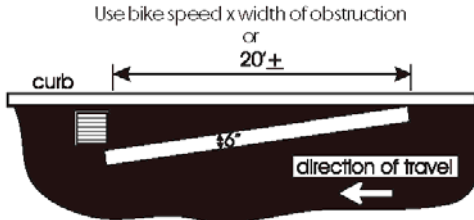


Figure 11 - Example of bike hazard striping

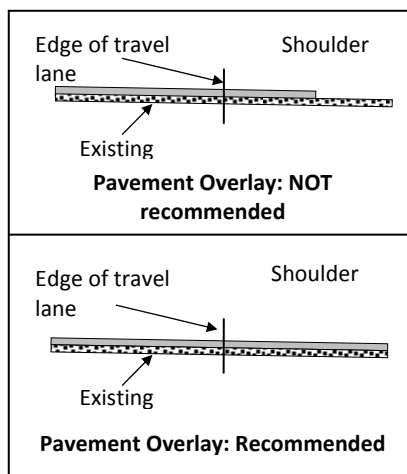


Figure 12 - Pavement Overlays

The implementation process outlined above is intended to apply to large-scale improvement projects, which would apply to significant portions of a roadway. However, there are also opportunities to pursue small-scale improvements, which could also improve the biking experience in Warren County. These “spot” improvements are focused on addressing those small-scale issues which may not require significant funding to complete. Several examples are included below.

1. **Drainage grates.** The direction of the grating pattern on storm drains is an often-overlooked detail. (See figure 10). Grate openings which run parallel to the travel direction can cause havoc for thin bicycle tires. Ideally, grates should be selected which feature a “bike-friendly” pattern. If this is not feasible, the grate should be situated so that the pattern runs perpendicular to the travel direction.
2. **Individual hazards.** Over time, potholes and cracks can form in pavement, causing hazardous conditions for cyclists. Sudden changes in grade, whether because of pavement failure or manholes set at an improper elevation, can be difficult for cyclists to maneuver, especially at night. In the short term, pavement markings as specified in Chapter 3C of the Manual for Uniform Traffic Control Devices (figure 11) can help alert cyclists that a potentially hazardous condition exists. These hazards can then be eliminated or minimized as the appropriate roadway or utility project is undertaken in the future.
3. **Pavement overlays.** Even if no re-striping or widening is called for in a paving project, there may still be good opportunities to improve conditions for cyclists. Ensuring that the seam of the pavement does not occur in the middle of the shoulder, or is properly feathered, will provide a smooth, regular surface for cyclists. (See figure 12)
4. **Roadway sweeping.** Patches of gravel, especially on corners, can pose a threat to cyclists. With the help of the cycling community, it may be possible to identify areas where significant gravel accumulation is hampering safe cycling. Targeted road sweeping, even just a few times a year, can help to reduce the potential hazards.
5. **Bicycle Racks.** Lack of adequate bike racks is a frequent issue for cyclists. Although some communities are beginning to require provision of bicycle racks during project development approval, it can still be difficult for cyclists to find a safe place to lock their bike. As a starting point, bike racks should be provided in locations near public buildings such as schools, municipal centers, and post offices, as well as in public parking areas. Commercial businesses and employment centers should also be encouraged to provide bike racks as a service to their customers and employees.

*b. Partnerships*

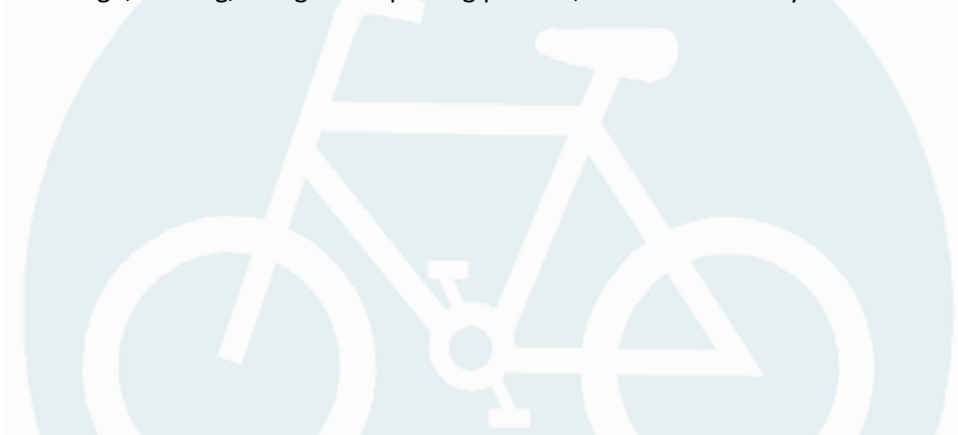
The improvements outlined in this plan are extensive, and will take a significant and focused effort to bring about. In addition, implementation will be at the hands of many different agencies. For on-road facilities, the implementation lead is likely to be the roadway owner. For off-road facilities, a wider variety of lead agencies is possible: local municipalities, recreation and open space groups, or the WCS&QBO itself. Any projects which involve acquisition of easements or rights-of-way will also involve the landowners as a key stakeholder. WCS&QBO, along with A/GFTC, will play important roles in maintaining open communication with these groups as implementation of bicycle improvement projects is undertaken.

In terms of maintenance, it can be assumed that on-road bike facilities will be the responsibility of whichever agency currently maintains the roadway itself, unless other specific provisions are made. For multi-use trails, there may be partnership opportunities to provide some or all maintenance services. This can take the forms of occasional volunteer events, such as trail-cleaning days, or a more formal maintenance agreement between agencies and groups to perform maintenance.

In addition, WCS&QBO, as a 501(c)3 non-profit organization, may be able to assist in identifying and implementing some of the spot improvements listed in this plan. For example, this group may be able to create and maintain an inventory of individual hazards, and may also be able to seek funding for the roadway owners to address these concerns. It may also be possible to partner to perform targeted road sweepings or trail maintenance, with help from the local and county DPWs. Sponsored community events such as these would also raise the profile of the organization and provide an important community education benefit.

*c. Funding Sources*

The following funding sources have historically been available for projects which involve bicycle facilities. Not all of these programs are currently active; conversely, new programs may arise which could be applied towards bicycle facilities. In selecting funding sources, it is important to keep in mind the stipulations and requirements of the funding agency. For instance, projects funded under NYSDOT's Transportation Enhancements Program must follow the State's design, bidding, and grant reporting process, which can be very involved.



Program	Granting Agency	On- or Off-Road	Eligible Activities	Local Match
Transportation Enhancements Program	NYS Department of Transportation (NYSDOT)	Both	Provision of Facilities for Bicycles and Pedestrians (on- or off-road)	Yes
Make the Connection	A/GFTC	Both	Small-scale projects that improve the region's bicycle and pedestrian travel network	Yes
Transportation, Community, System Preservation Program (TCSP)	FHWA/NYSDOT	On-Road	Planning, development, and implementation of strategies to integrate transportation, community, and system preservation plans and practices	Yes
Highway Safety Improvement Projects (HSIP)	FHWA/NYSDOT	Both	Safety improvement projects on any public road or publically owned bicycle or pedestrian pathway or trail.	Yes
National Scenic Byways Discretionary Grants	Federal Highway Administration (FHWA)	On-Road	Construction along a scenic byway of a facility for pedestrians and bicyclists; safety improvements for deficiencies resulting from designation as a Byway	Yes
Consolidated Local Street and Highway Improvement Program (CHIPS)	NYSDOT	On-Road	Local highway projects which can include elements such as: Bike lanes and wide curb lanes; shared use paths, and bike paths within the highway ROW	No
Recreational Trails Program	NYS Office of Parks, Recreation, and Historic Preservation (NYS OPRHP)	Off-Road	Acquisition, development, rehabilitation and maintenance of multi-use trails	Yes
Local Waterfront Revitalization Program	NYS Department of State (NYSDOS)	Both	Implementation of projects listed in a locally adopted Waterfront Revitalization Plan; communities without this type of plan are not eligible to apply	Yes
Adirondack Smart Growth Grants	NYS Department of Environmental Conservation (NYSDEC)	Both	Focused on planning and design projects including: Efficient transportation systems; Main streets, including bicycle and pedestrian access; Public access improvements, including trails	No
Creating Healthy Places to Live, Work, and Play	NYS Department of Health	Both	Small grants available to municipalities to pursue Complete Streets projects or purchase bicycle racks, if community has passed Complete Streets policy	No

## **Appendix 1: Detailed Maps**

To facilitate implementation among individual municipalities, a series of more detailed priority maps has been prepared. These maps depict the same content as Maps 2 and 3 of this plan, on a larger scale. The map contents include:

Map A: Glens Falls/Southern Queensbury

Map B: Lake Luzerne

Map C: Lake George/Northern Queensbury

Map D: Warrensburg

Map E: Stony Creek

Map F: Bolton

Map G: Thurman

Map H: Hague

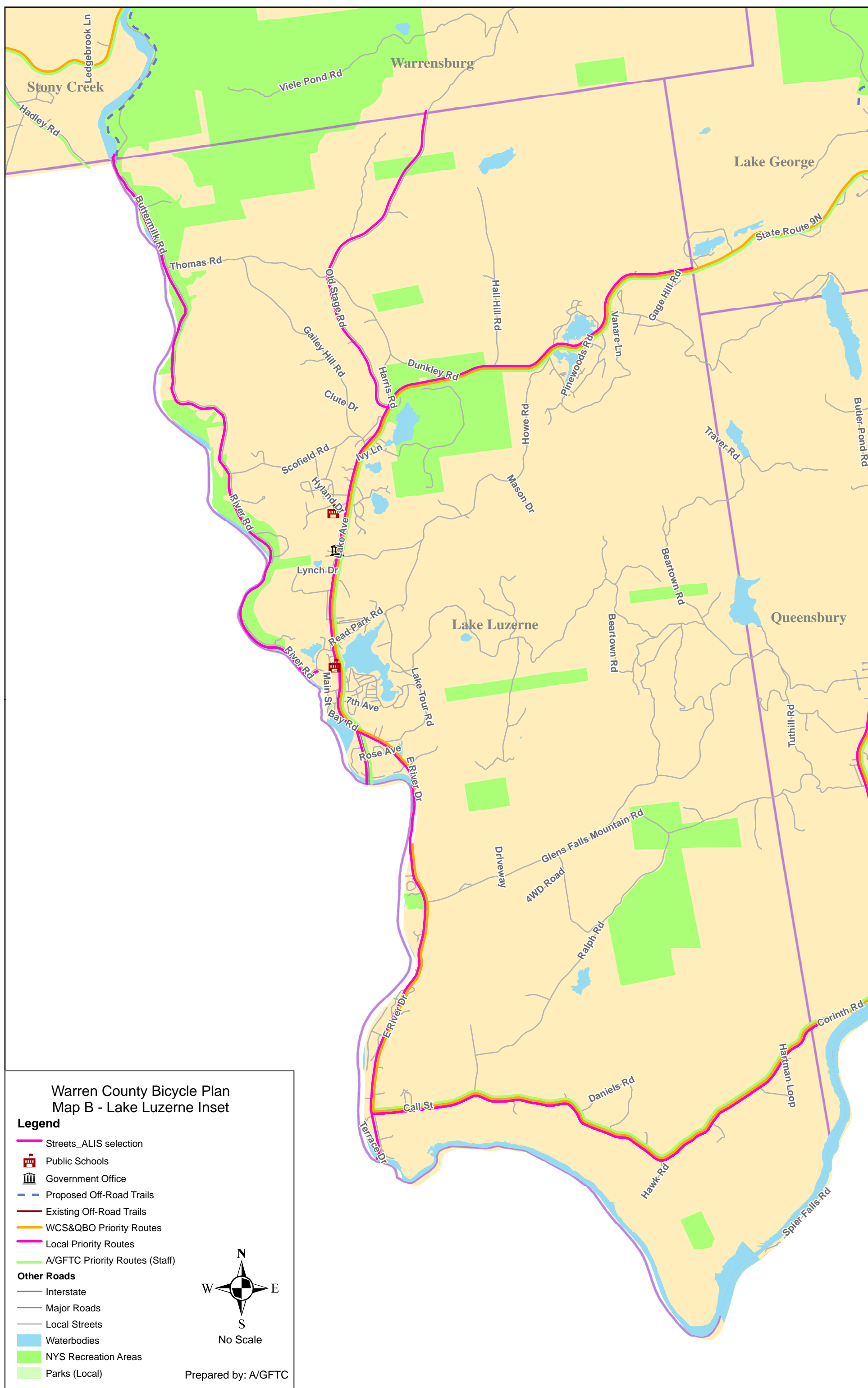
Map I: Horicon

Map J: Chester

Map K: Johnsburg







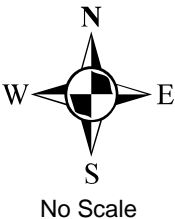


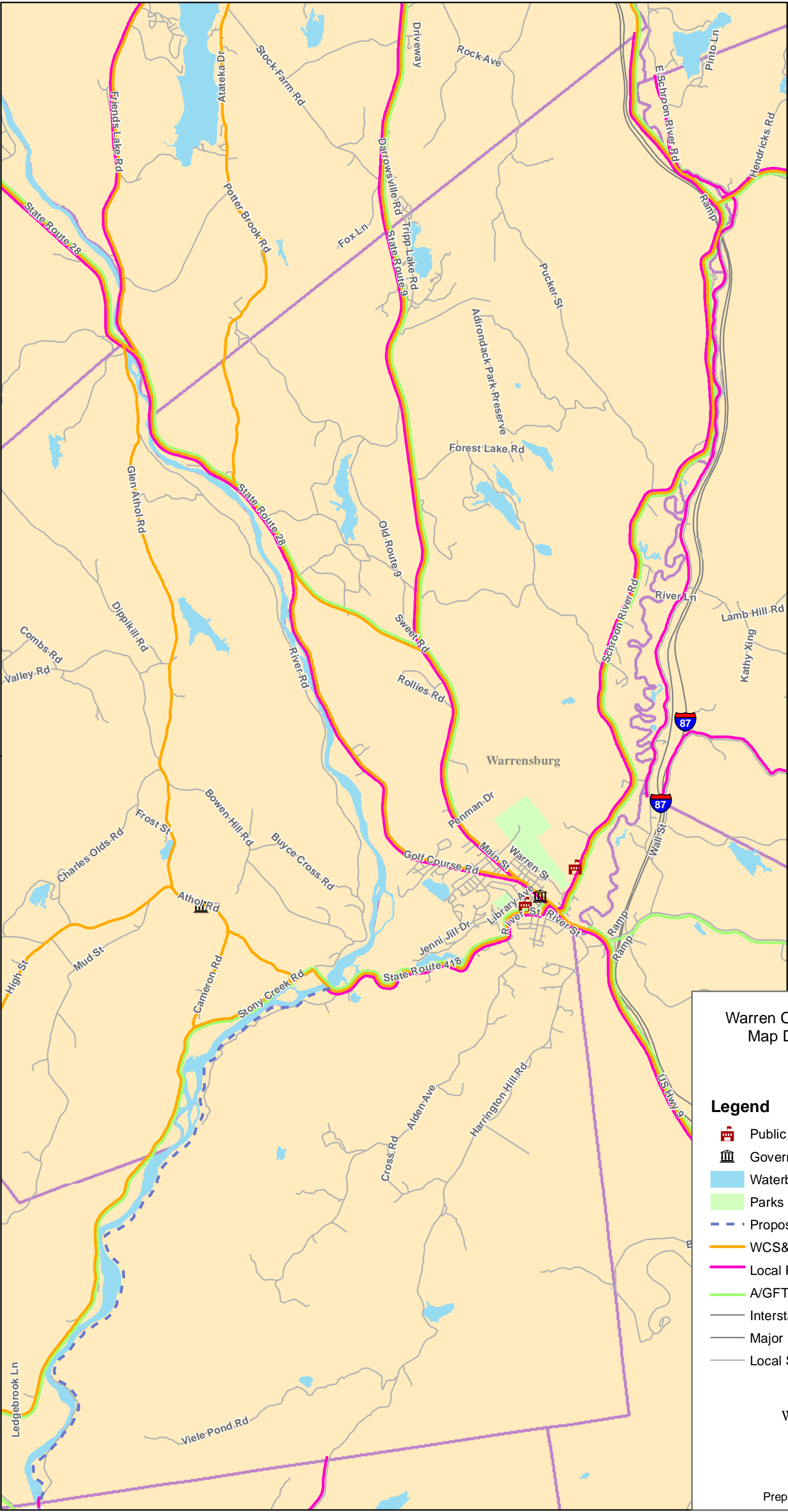
**Legend**

- Public Schools
- Government Office
- Waterbodies
- Proposed Off-Road Trails
- Existing Off-Road Trails
- WCS&QBO Priority Routes
- Local Priority Routes
- A/GFTC Staff Priority Routes

- Other Roads**
- Interstate
  - Major Roads
  - Local Streets












Warren County Bicycle Plan  
Map C - Lake George/North Queensbury Inset

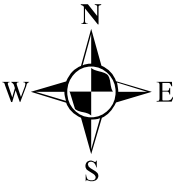




Warren County Bicycle Plan  
Map D - Warrensburg

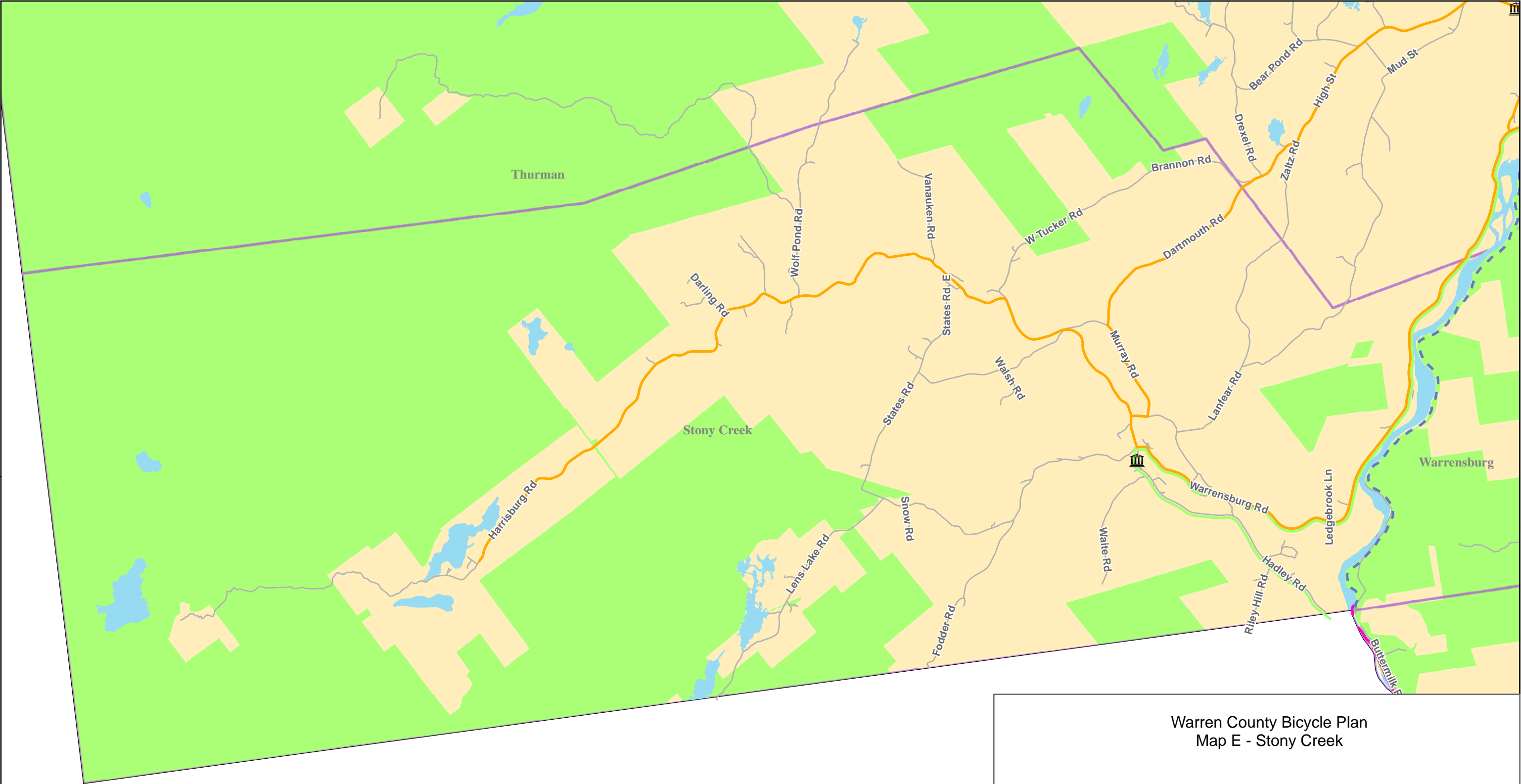
Legend

-  Public Schools
-  Government Office
-  Waterbodies
-  Parks (Local)
-  Proposed Off-Road Trails
-  WCS&QBO Priority Routes
-  Local Priority Routes
-  A/GFTC Staff Priority Routes
-  Interstate
-  Major Roads
-  Local Streets



No Scale

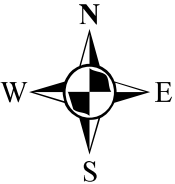
Prepared by: A/GFTC



Warren County Bicycle Plan  
Map E - Stony Creek

Legend

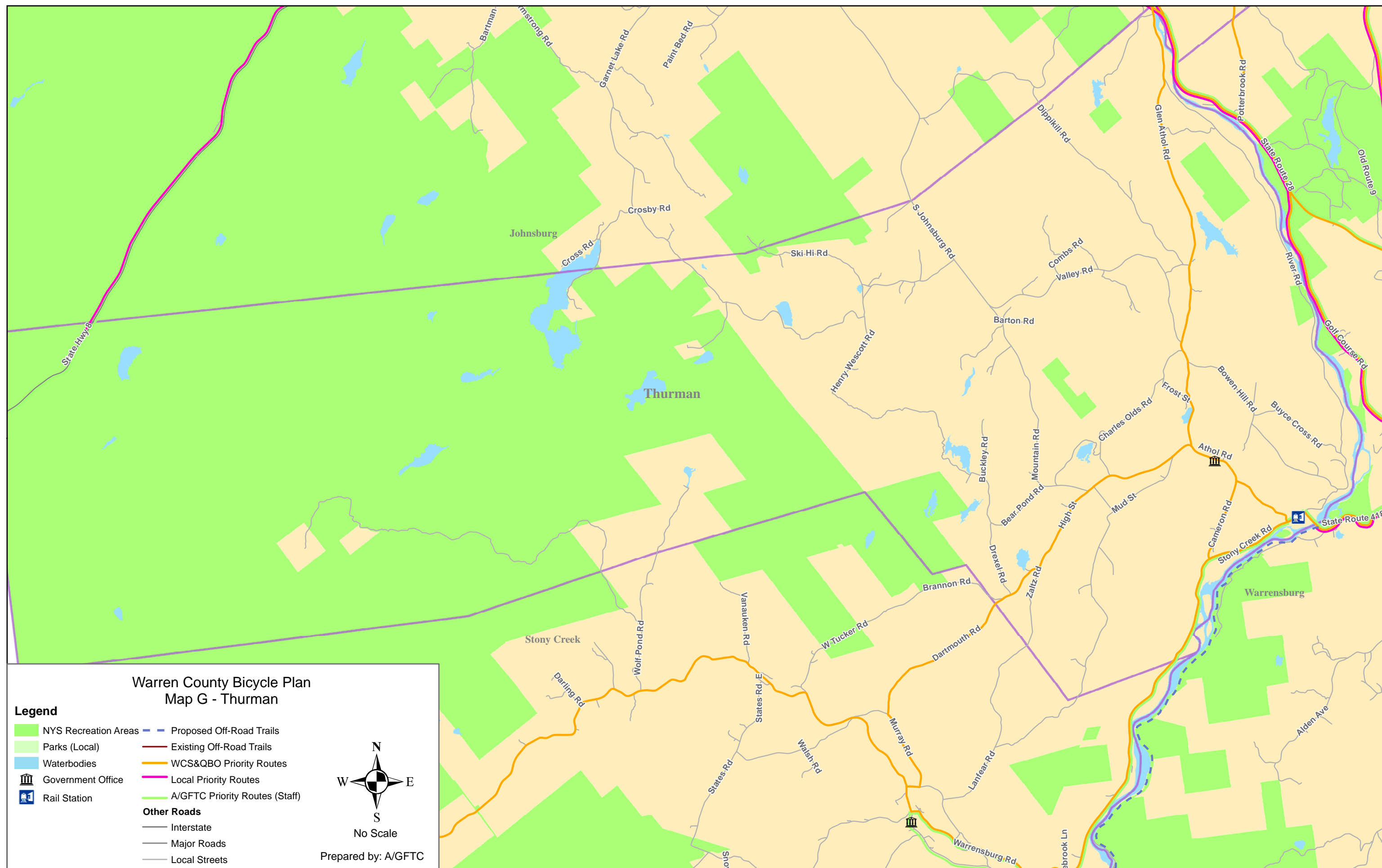
- |                          |                                |
|--------------------------|--------------------------------|
| Government Office        | WCS&QBO Priority Routes        |
| Waterbodies              | Local Priority Routes          |
| Parks (Local)            | A/GFTC Priority Routes (Staff) |
| NYS Recreation Areas     | <b>Other Roads</b>             |
| Proposed Off-Road Trails | Interstate                     |
| Existing Off-Road Trails | Major Roads                    |
|                          | Local Streets                  |

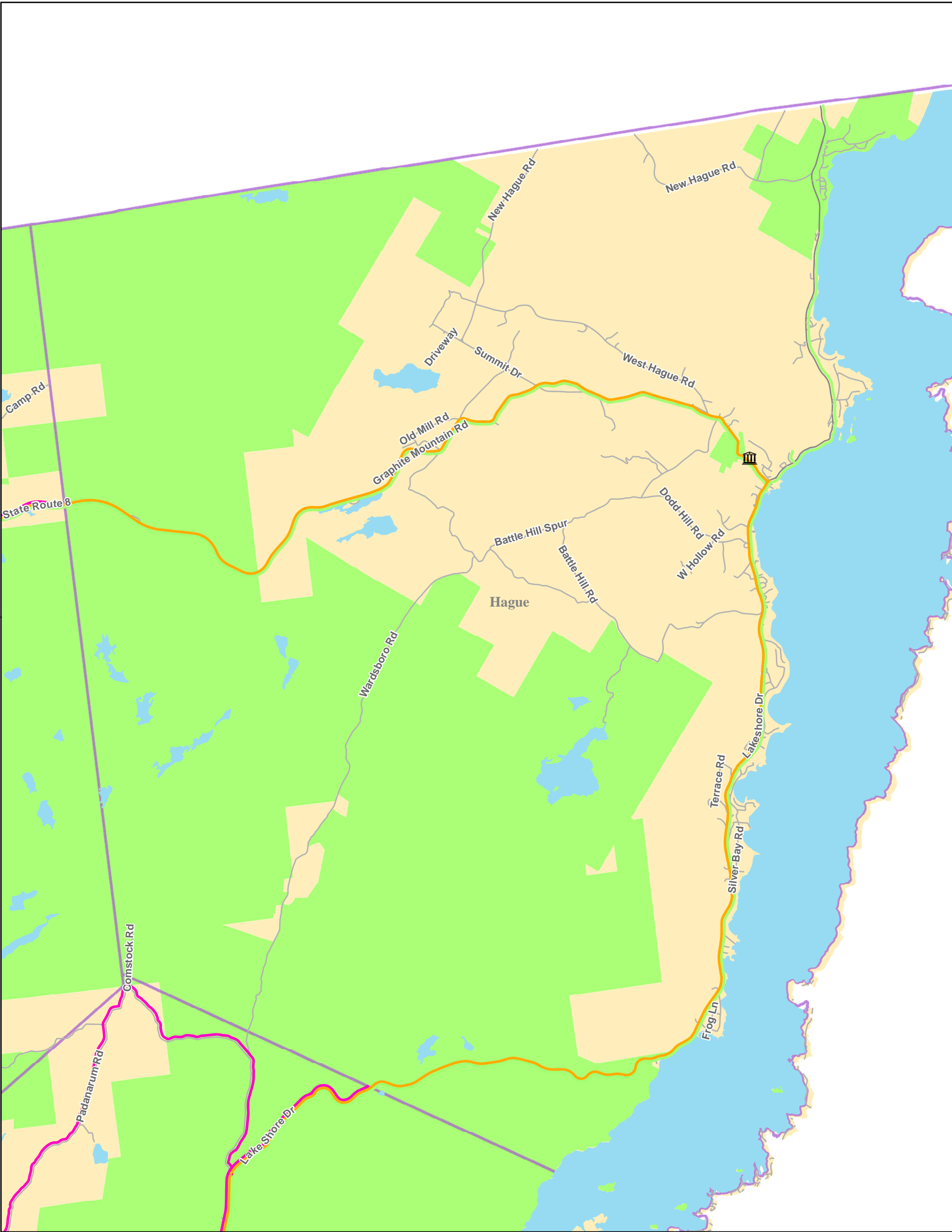


No Scale

Prepared by: A/GFTC







**Legend**

- Public Schools
- Government Office
- Waterbodies
- Parks (Local)
- NYS Recreation Areas
- Proposed Off-Road Trails
- Existing Off-Road Trails
- WCS&QBO Priority Routes
- Local Priority Routes
- A/GFTC Priority Routes (Staff)

**Other Roads**

- Interstate
- Major Roads
- Local Streets

Warren County Bicycle Plan  
Map H - Hague Inset

No Scale

Prepared by: A/GFTC



**Legend**

 Public Schools

 Government Office

 Waterbodies

 Parks (Local)

 NYS Recreation Areas

 Proposed Off-Road Trails

 Existing Off-Road Trails

 WCS&QBO Priority Routes

 Local Priority Routes

 A/GFTC Priority Routes (Staff)

**Other Roads**

 Interstate

 Major Roads

 Local Streets

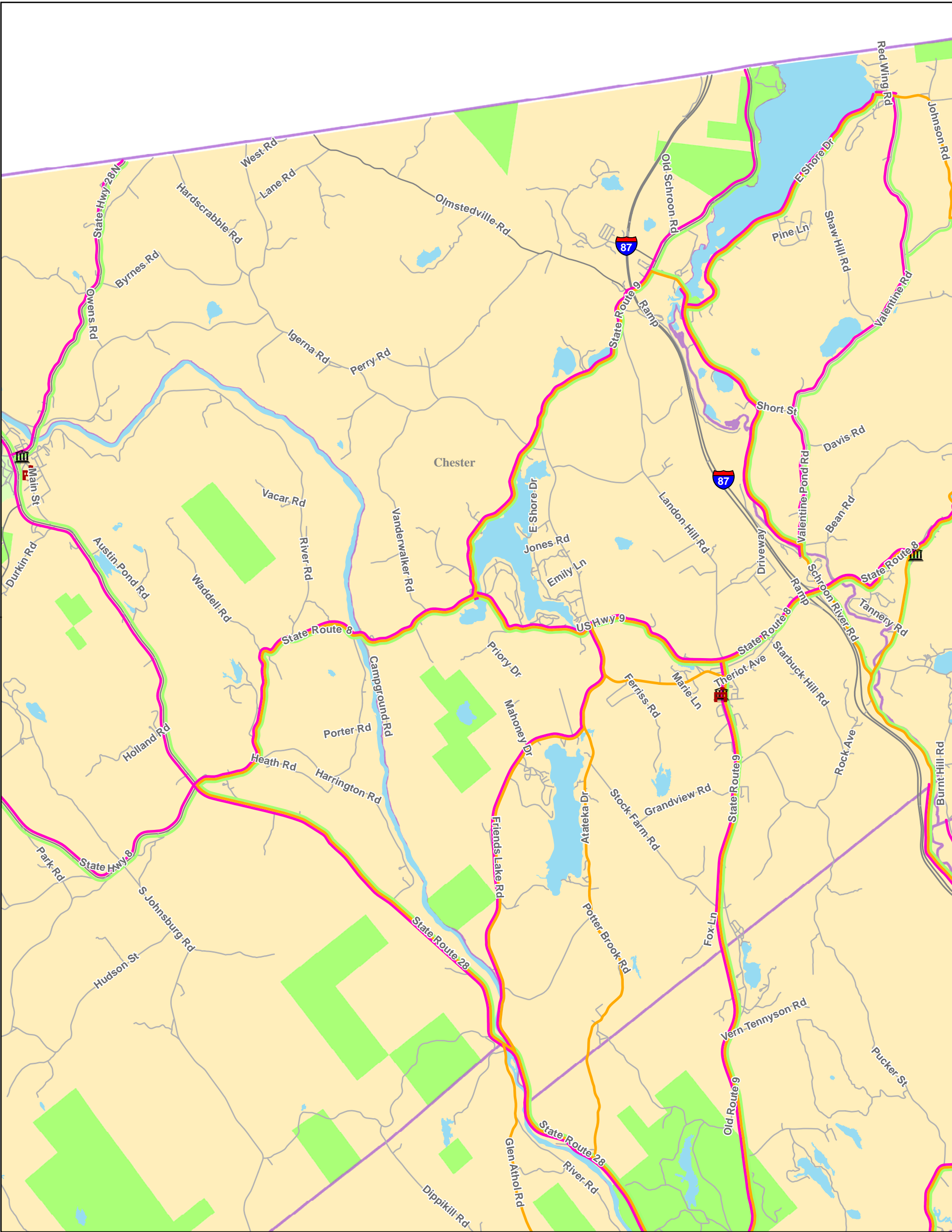
Warren County Bicycle Plan

Map I - Horicon Inset



No Scale

Prepared by: A/GFTC



**Legend**

- Public Schools
- Government Office
- Waterbodies
- Parks (Local)
- NYS Recreation Areas
- Proposed Off-Road Trails
- Existing Off-Road Trails
- WCS&QBO Priority Routes
- Local Priority Routes
- A/GFTC Priority Routes (Staff)

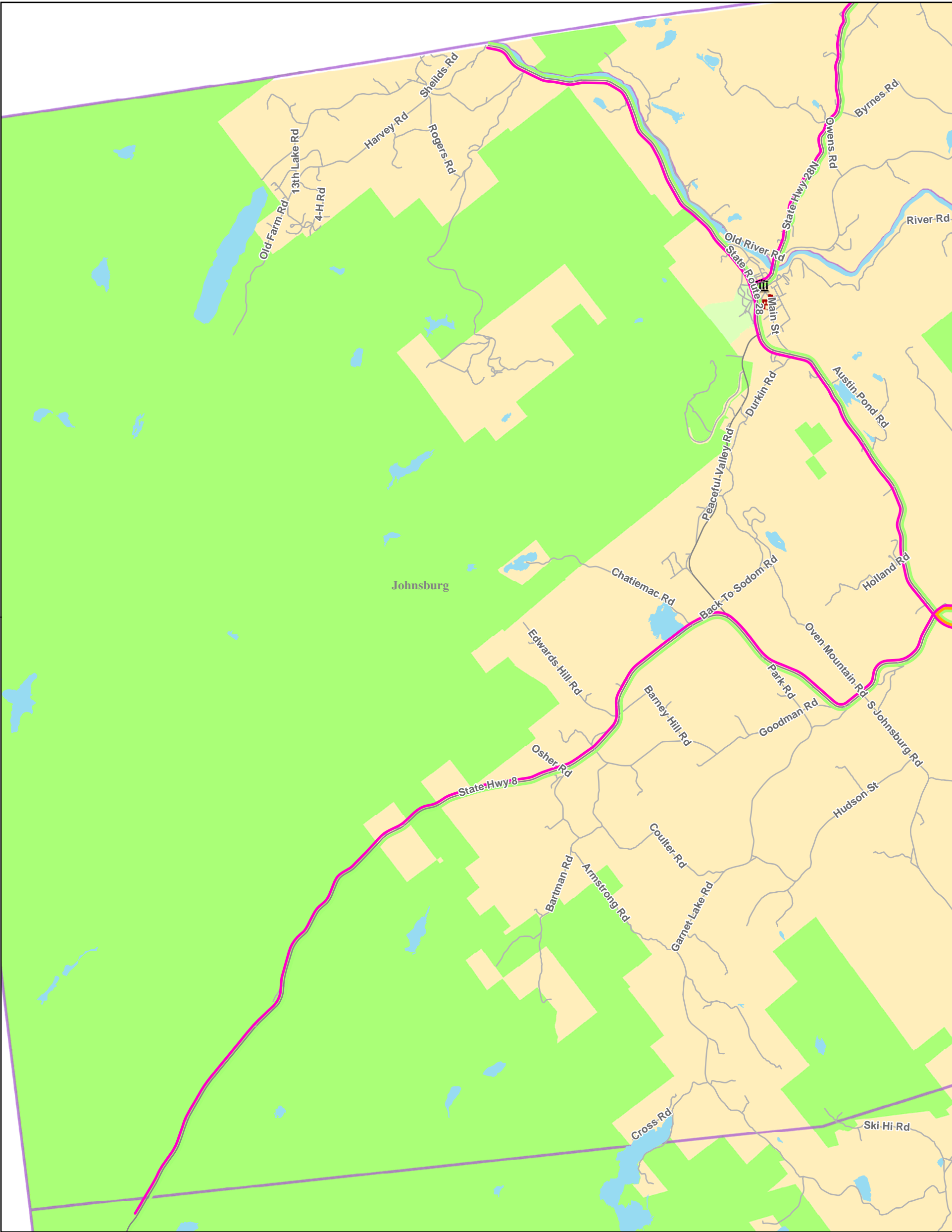
**Other Roads**

- Interstate
- Major Roads
- Local Streets

Warren County Bicycle Plan  
Map J - Chester Inset

N  
W E  
S  
No Scale

Prepared by: A/GFTC



Legend

Public Schools

Government Office

Waterbodies

Parks (Local)

NYS Recreation Areas

Proposed Off-Road Trails

Existing Off-Road Trails

WCS&QBO Priority Routes

Local Priority Routes

A/GFTC Priority Routes (Staff)

Other Roads

Interstate

Major Roads

Local Streets

Warren County Bicycle Plan  
Map K - Johnsburg Inset

No Scale

Prepared by: A/GFTC