

Bicycle Plan

BMTS Binghamton Metropolitan
Transportation Study

March 2015



BICYCLE PLAN

PLAN PREPARED BY:
BINGHAMTON METROPOLITAN TRANSPORTATION STUDY STAFF



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ADOPTED BY THE BMTS POLICY COMMITTEE
MARCH 5, 2015

The development of the Bicycle Plan was funded by the Federal Highway Administration and Federal Transit Administration. The contents of this report and its recommendations are solely those of the Binghamton Metropolitan Transportation Study.

BINGHAMTON METROPOLITAN TRANSPORTATION STUDY POLICY COMMITTEE

RESOLUTION 2015-06 Accepting the BMTS Bicycle Plan Update

WHEREAS the Binghamton Metropolitan Transportation Study Policy Committee has been designated by the Governor of the State of New York as the Metropolitan Planning Organization responsible, together with the State, for the comprehensive, continuing, and cooperative transportation planning process for the Binghamton Urban Area, and

WHEREAS Federal regulations (23 CFR Chapter 1, Part 450, Subpart C, and 49 CFR Chapter VI, Part 613, Subpart B) require that the urban transportation planning process shall include development of a Unified Planning Work Program which shall annually describe all urban transportation and transportation related planning activities anticipated within the next one or two year period, and will document the work to be performed with technical assistance provided under the Federal Highway Administration metropolitan planning (PL) program and the Federal Transit Administration Section 5303 program, and

WHEREAS the BMTS Policy Committee has created a Planning Committee of technical representatives to advise it on matters concerning the implementation of the urban transportation planning process, and

WHEREAS the approved 2014-2015 Unified Planning Work Program included an FHWA funded task to perform an update to the 1996 BMTS Pedestrian and Bicycle Plan, and whereas the Pedestrian Plan Update was completed in 2013, and the Bicycle Plan Update was undertaken as a separate project, and


WHEREAS BMTS staff has conducted the study, met with local municipal representatives, the BMTS Pedestrian and Bicycle Advisory Committee and solicited public input and then prepared a final report describing the findings and including recommendations for the consideration of the municipalities and,

WHEREAS the BMTS Planning Committee has reviewed and recommended Policy Committee approval,

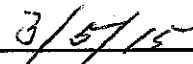
NOW THEREFORE BE IT RESOLVED that the Binghamton Metropolitan Transportation Study Policy Committee accepts the 2015 BMTS Bicycle Plan.

CERTIFICATION OF RESOLUTION 2015-06

I, the undersigned, duly elected Chair of the Binghamton Metropolitan Transportation Study Policy Committee, do hereby certify that the foregoing is a true and correct copy of BMTS Policy Committee Resolution 2015-06 adopted by consensus this 5th day of March, 2015.



Michael Marinaccio, Chair



Date

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I. INTRODUCTION

Introduction

- Previous Planning
- Development of Bicycle Plan Update

Previous Plan for the Binghamton Urban Area

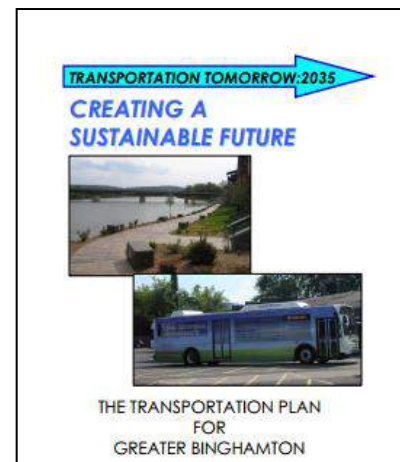
The federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) required that all Metropolitan Planning Organizations (MPOs) include pedestrian and bicycle considerations in their long range plans. In compliance, the Transportation Plan for the Binghamton Urban Area, *TRANSPORTATION TOMORROW: 2020* called for the development of a Pedestrian and Bicycle Plan. The preparation of the BMTS Pedestrian & Bicycle Plan was carried out in partnership with the Broome County Environmental Management Council, and was adopted during June of 1996 by the Policy Committee and appended to *TRANSPORTATION TOMORROW: 2020*.

The Pedestrian & Bicycle Plan was a safety-focused plan with the goal of increased safety for those travelling on foot or by bicycle within the Binghamton Urban Area, as measured by reduction in the number of accidents, while increasing the number of trips made by these modes. Action items were recommended and prioritized into high priority/short range, medium priority/mid-range, and lower priority/long range actions.

Development of Bicycle Plan Update

Given the length of time since the adoption of the initial Pedestrian & Bicycle Plan, the need for an update to the plan exists to respond to changes that have taken place including: transportation related legislation and policy at federal, state, and local levels; numerous improvements for pedestrians and bicyclists have been made to the urban area's transportation system; and changes in the demand for improved pedestrian and bicycle facilities, as well as the desire for a better quality of life for those in and nearby the Binghamton Urban Area.

Adopted in September 2010, the BMTS Transportation Plan, *TRANSPORTATION TOMORROW: 2035 – Creating a Sustainable Future*, called for the BMTS Pedestrian & Bicycle Plan to be updated. It was also recognized that there are unique needs for both of these modes of transportation, as well as distinct methods used to address their needs. Therefore, it was determined that the update should be in the form of separate plans for pedestrians and bicyclists. The Pedestrian Plan was completed first and was adopted by the BMTS Policy Committee during June 2013.



Transportation Tomorrow: 2035

Preparing a new Bicycle Plan also provides an opportunity to address the interrelations of transportation with multiple disciplines and quality of life issues. Transportation decisions have a significant impact on issues such as improving public health, preserving and improving the environment, making land use decisions, enabling economic development, meeting the needs of the entire population, through recognizing the significant needs of an aging population, and instilling sustainable practices across the population and across multiple disciplines. It is important to understand the need to develop and maintain partnerships, working together with agencies, organizations, and individuals of multiple disciplines to enable the accomplishment of each other's complementary goals and objectives.

Furthermore, there is a need for a **culture change** in which bicycling is recognized as a viable mode of transportation, the rights and responsibilities of bicyclists are recognized, and where providing bicycle facilities is seen as equally important as the provisions for automobiles, public transportation, and pedestrians. Engineering improvements to the transportation system to safely accommodate bicyclists by including elements such as bike lanes, shoulders, shared lane markings (also known as sharrows), and multi-use trails, must also be combined with education, encouragement, enforcement, and evaluation efforts to accomplish the culture change.



Bicycle Racks at 20 Hawley Street,
Binghamton, NY

During 2014, BMTS began the Bicycle Plan update. With assistance from the BMTS Pedestrian & Bicycle Advisory Committee (PBAC), through survey results and findings of the Community Health Assessments of Broome and Tioga Counties, and through the public outreach efforts of the 2030 and 2035 Transportation Plans, Blueprint Binghamton, and the Broome County Comprehensive Plan, bicycle needs and issues were identified. BMTS used this information to develop actions to address those issues. The actions consist of existing and modified ones from the 1996 Pedestrian and Bicycle Plan, as well as the addition of some new actions. The draft Bicycle Plan was reviewed by the BMTS PBAC and other key stakeholders before completing the final draft.

II. OPPORTUNITY STATEMENT

Opportunity Statement

- Vision of Transportation Tomorrow: 2035

A decision was made by the BMTS Policy Committee that *TRANSPORTATION TOMORROW: 2035* must address the concept of sustainability, and how transportation can contribute or potentially detract from achieving a sustainable region. The *2035 Plan* also builds on achieving the scenario determined by extensive public outreach for *TRANSPORTATION*

TOMORROW: 2030 – that the BMTS Plan be based on the ‘moving inward’ (i.e. encouraging in-fill redevelopment rather than outward sprawling new development) scenario combined with the modest population growth forecast of 10,000. The scenario also forms the basis for understanding the context in which transportation investment and improvement sits. This is important, since the Plan can define not only projects, but also transportation policies and strategies.

The following is the VISION for *TRANSPORTATION TOMORROW: 2035*

In 2035, Greater Binghamton will be a successful, livable, and vibrant region, and its regional transportation system will have the following characteristics:

- **Sustainability.** Community sustainability will be supported in terms of reduced energy consumption and greenhouse gas emissions; and improved public health and social equity.
- **Accessibility:** All users will have convenient, mode-neutral access to employment, education, services, and other destinations.
- **Mobility.** Personal travel and goods movement will be efficient, with many modes of travel and excellent connections among them.
- **Safety:** All users will be able to travel safely and with a sense of security, regardless of which mode they choose to use.
- **System Preservation:** Transportation infrastructure will be maintained in a state of good repair, as the foundation for providing safe, efficient mobility

Incorporating this vision [*identified in italicized brackets below*] along with the following policy statements from the 1996 Pedestrian and Bicycle Plan, form the foundation for this Bicycle Plan update:

(1) *Fully accommodate bicyclists in the metropolitan transportation system.*
[*Accessibility, Mobility, and System Preservation*]



Bicycle lane on Court Street Bridge, Binghamton, NY

The Binghamton Metropolitan Transportation Study (BMTS) seeks to direct investments in the metropolitan transportation system to enhance and support all modes of travel in the Binghamton metropolitan area. Encouraging walking is beneficial from a planning, engineering, healthy living, and financial perspective. Further, improvements to the bicycle infrastructure are a cost effective and equitable way to serve people of all ages, abilities, and incomes. BMTS recognizes that non-motorized modes, walking and bicycling, have been for the most part overlooked in the past. Though more attention has been given to improving the infrastructure for non-motorized modes since the 1996 Pedestrian and Bicycle Plan, elements

for those modes are still often among the first targeted for elimination from projects in efforts to reduce costs.

There also is considerable potential demand for bicycle facilities in the BMTS region, as the 2013 American Community Survey 5-Year Estimates show that 10,878, or 19% of households in the municipalities that comprise the BMTS Planning Area have zero car ownership. Residents of these households stand to benefit significantly from improved bicycle facilities. Also, sizable and increasing student populations at Broome Community College and Binghamton University, and even the significant senior population make bicycling necessary and a viable transportation mode.

(2) Improve safety for all users of the metropolitan transportation system.

[Safety]

Significant actions and improvements have been made since the 1996 Pedestrian and Bicycle Plan to address the needs of bicyclists; however, there are still locations where the regional transportation infrastructure does not always safely accommodate them. Safety is a critically important consideration in the development and design of the transportation system. Educational, encouragement, and enforcement efforts are also necessary to establish safe behavior and interaction between all users of the transportation system. According to the New York State Accident Location Information System, there were a total of 45 accidents involving bicyclists in 2012 and 50 in 2013 for the Binghamton Metropolitan Area. Data is not yet available for 2015. These figures will be used as a benchmark to measure progress in bicycle safety in future years.

(3) Recognize the importance of the natural and human environments, and minimize negative impacts.

[Sustainability]

While the Binghamton metropolitan area is in attainment of national air quality standards, it is the policy of BMTS that its transportation plans should result in reduced emissions. Encouraging people to shift some of their travel from a single occupant vehicle to a non-motorized mode will have a positive impact on that goal, and help enhance the quality of life in the region.

This policy statement also includes the need to recognize the significant health benefits of biking. Biking to work, school, or running errands, incorporates physical activity into one's daily routine. This helps all to get the physical activity needed for good health for little additional time and very little cost. Since 1996, BMTS is continuing to develop strong multidisciplinary partnerships, particularly with the health sector. Through coordination efforts and with funding from the health sector, improvements to the built environment, as well as bicycle friendly policies have been made to increase bicycle safety, thus encouraging more to bike.

Regarding biking and social equity, perhaps the most important factor is choice. When providing bike facilities such as bike lanes and multi-use trails, communities allow people to choose how they want to travel. One consequence of not installing these facilities is to force people to travel by personal vehicle or to engage in unsafe biking practices. For those who do not have the option to drive, such as adolescents, those unable to afford a car, and people with certain disabilities, this lack of choice in transportation creates an inconvenient and socially unjust barrier to mobility.

(Source: http://www.pedbikeinfo.org/data/factsheet_social.cfm)

The high cost of car ownership means that low-income families will have to spend a greater portion their income on owning and operating a car or choose not have one. If automobile travel is the only feasible mode of transportation in a community, low-income families are placed at a large disadvantage with very limited mobility. By providing safe and convenient bicycle facilities, the community can ensure that all citizens have access to a viable mode of transportation.

(Source: http://www.pedbikeinfo.org/data/factsheet_social.cfm)

Finally, BMTS' policy goals are supported by the federal Moving Ahead for Progress in the 21st Century (MAP-21), which was signed into law on July 6, 2012, became effective on October 1, 2012, and as a result of the Highway and Transportation Funding Act (August 2014) is effective until May 31, 2015. They are further supported by federal and state transportation policy which promotes bicycling as an important and environmentally sound mode of travel.

III. GOALS, OBJECTIVES, AND EVALUATION

Goals, Objectives, and Evaluation

- Accessibility, mobility, system preservation, safety, and sustainability
- System development, system maintenance, and education, encouragement, and enforcement
- Performance measures

This plan update continues to be driven by the following goal of the 1996 Pedestrian and Bicycle Plan, adopted from the policy statements of *TRANSPORTATION TOMORROW: 2020* as detailed above, and mirroring the goal of the National Bicycling and Walking Study of the U.S. Department of Transportation.

Goal: To increase the safety of all persons traveling on foot or by bicycle, as measured by reduction in the number of accidents, while increasing the number of trips made by these modes.

Additionally, this plan update incorporates goals derived from the *TRANSPORTATION TOMORROW: 2035* vision statement.

Sustainability Goals:

- (1) To reduce the per capita amount of carbon-based energy consumed and greenhouse gases produced by the transportation sector by 50% by 2035.
[CAVEAT: Climate science generally recognizes that the primary means to accomplish this goal lies in changes in vehicle and fuel technology, which cannot be controlled or influenced by BMTS.]
- (2) To enhance the livability of the Region with appropriate transportation investment.

Accessibility Goal:

To ensure that the regional transportation system provides convenient mode-neutral access to destinations including employment, education, and services.

Mobility Goal:

To create a regional transportation system that provides travel choices so personal travel and goods movement can maximize efficiency.

Safety Goal:

To create a regional transportation system that provides safe and secure travel for all users and all modes.

System Preservation Goal:

To maintain the regional transportation system in a state of good repair.

Objectives: In order to accomplish these goals, a number of objectives have been developed which will guide the recommended action plan. These objectives are divided into the following categories: (1) System Development, (2) System Maintenance, and (3) Education, Encouragement, and Enforcement. Applicable objectives from the *TRANSPORTATION TOMORROW: 2035* (TT: 2035) vision are also incorporated into these categories.

1. System Development

Objective #1: To create a network of *bicycle facilities* that is safe and convenient, and links residential, commercial, and business districts; educational institutions, major employment sites, recreation areas, and river corridors.

Objective #2: To make bicycle travel part of an intermodal transportation system.

[TT:2035 – Sustainability Objectives 1.3, 1.4; Accessibility Objectives 3.0; Mobility Objectives 1.5]

Sustainability Objectives:

(1) Invest in strategies to reduce per capita vehicle miles traveled (VMT)

1. Complete the Greater Binghamton Greenway multiuse trail system by year 2020.
2. Overcome barriers to bicycle use as identified in a cycling suitability analysis.

Accessibility Objectives:

(3) The same as Sustainability Objective 2.

Mobility Objectives:

(1) Invest in strategies to provide travel choices and alternatives to single-occupant vehicle personal travel

1. The same as Sustainability Objectives 1 and 2.

2. System Maintenance

Objective #3: To maintain the existing road infrastructure in addition to unique features of the bicycle infrastructure to ensure its safety and usefulness, and to protect the community's investment.

[TT: 2035 – Safety Objectives 1.1, 1.2, 4.1; System Preservation Objective 5]

Safety Objectives:

(1) Improve roadway safety by reducing number and severity of crashes

1. Continuously analyze traffic crash data to identify high crash locations.
2. Study and propose countermeasures for high crash locations within two years of identification.

(4) Improve safety for bicyclists

1. Complete during 2015 a new Regional Bicycle Plan that addresses the need for improvements to on- and off-road bicycling facilities.

System Preservation Objective:

Adopt a “Rebuild Smarter” policy for all infrastructure projects that includes:

- ♦ Road Safety Assessment to identify and include necessary safety elements;
- ♦ Complete Streets Assessment to identify and include appropriate complete streets elements;
- ♦ Green Construction Assessment to identify best practices for reducing the environmental impact of construction.

2. Education, Encouragement, and Enforcement

Objective #4: To ensure that bicyclists and motorists understand and abide by the requirements for safe facility-sharing.



Cyclists using the Chenango Riverwalk in Binghamton, NY

Objective #5: To foster increased interest in bicycling in Broome and Tioga Counties. To encourage people to view bicycling as a viable mode of transportation.

Evaluation: As noted in TT: 2035, measuring the outcome of the transportation investments that will be made to achieve the Plan’s objectives is very important. This helps make the Plan meaningful to the public by showing that transportation funds are being used to accomplish objectives, and improve conditions of the transportation system. The Bicycle Plan will use performance metrics from TT: 2035 that are applicable for bicycle transportation. Additionally, metrics were added to track progress on education, encouragement, and enforcement objectives. See Table 1 for the list of performance measures. It is acknowledged that collecting and analyzing all of the data to determine the measures is a large task, as not all of the data is now collected by system owners and operators. Nonetheless, it is the intent of BMTS to work with those agencies over time to make robust performance measurement possible and routine.

Table 1: Performance Measures for Plan Objectives

Performance Measures for Plan Objectives	
Plan Objective	Performance Measure
1. System Development: Objectives #1 & #2	
Sustainability	
<ul style="list-style-type: none"> Complete Greater Binghamton Greenway Plan (i.e. Two Rivers Greenway) 	% of total miles in Plan completed or funded
<ul style="list-style-type: none"> Overcome barriers to bicycling 	Complete bicycling suitability analysis. Performance measures to be extracted from analysis.
Accessibility	
Accessibility Objective 3 is the same as Sustainability Objective 2.	
Mobility	
Mobility Objective 1 is the same as Sustainability Objectives 1 & 2.	
2. System Maintenance: Objective #3	
Safety	
1.1 Identify high crash locations	System in place to collect and analyze crash data records
1.2 Study HCLs	# and % of high crash locations studied within 2 years of identification
4.1 Regional Bicycle Plan	Plan completion and adoption
System Preservation	
“Rebuild Smarter” approach to system preservation projects	# and % of pavement and bridge improvement/rehabilitation/ replacement projects that include Road Safety Assessment, Complete Streets Assessment, and Green Construction Assessment (as project applicable)
3. Education, Encouragement, and Enforcement – Objectives 4 & 5	
Objective #4: To ensure that bicyclists and motorists understand and abide by the requirements for safe facility-sharing.	# of public outreach opportunities and special events providing instruction and informational materials # of people reached by outreach opportunities and special events
Objective #5: To foster increased interest in bicycling in Broome and Tioga Counties. To encourage people to view bicycling as a viable mode of transportation.	# of encouragement related activities and promotions. # of people reached by encouragement related activities and promotions

The League of American Bicyclists' Bicycle Friendly America (BFA) Program is a tool that is available to gauge progress in bicycle transportation improvements in and around the BMTS region. Each year, the League assesses all 50 states. Communities, businesses, and universities are assessed through a voluntary application process. All applicants get customized feedback on their application and access to technical assistance. If applicants do not attain Bicycle Friendly certification, the League provides assistance in how to get there. Once an applicant makes the ranks of a Bicycle Friendly CommunitySM, Bicycle Friendly BusinessSM or Bicycle Friendly UniversitySM (i.e. Honorable Mention, Bronze, Silver, Gold, or Platinum) the BFA program helps you get to the next level. Bicycle Friendly certification is also a great way to market your state, municipality, business, or university. For more details, see bikeleague.org/bfa.

IV. LOCAL SITUATION

In order to plan for the future development of the bicycle infrastructure, it is necessary to have a thorough understanding of the current local situation. This section will discuss the following topics:

- A. Policy and Regulatory Environment
- B. Local Participants in Transportation Planning
- C. Description of the BMTS Region
- D. Past Bicycle Planning Activities
- E. Profile of Bicyclists
- F. Local Transportation Systems
- G. Safety and Accident Data
- H. Relationship to Public Transit
- I. Relationship to Public Health
- J. Relationship to Economics
- K. Relationship to Multiple Disciplines

A. Policy and Regulatory Environment

New York State Vehicle and Traffic Law

New York State Vehicle and Traffic Law (V&T) assigns various rights and responsibilities to bicyclists and to drivers who encounter them.

While it may seem to be common sense, § 1146 of the V&T states:

Drivers to Exercise Due Care. "Notwithstanding the provisions of any other law to the contrary, every driver of a vehicle shall exercise due care to avoid colliding with any bicyclist [or] pedestrian upon the roadway and shall give warning by sounding the horn when necessary."

Also, bicyclists must follow all traffic laws that apply to them, as noted in § 1231 of the V&T:

Traffic laws apply to persons riding bicycles or skating or gliding on in-line skates. "Traffic laws apply to persons riding bicycles or skating or gliding on in-line skates. Every person riding a bicycle or skating or gliding on in-line skates upon a roadway shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle by this title, except as to special regulations in this article and except as to those provisions of this title which by their nature can have no application."

Bicyclists under the age of 14 must wear a helmet, according to the V&T § 1238:

"Passengers on bicycles under one year of age prohibited; passengers and operators under fourteen years of age to wear protective headgear."

Policy and Regulatory Environment

- New York State Vehicle and Traffic Law
- Federal Law and Policy
- New York State Law and Policy
- Local Law and Policy

There are also recent laws that relate to bicycling. One of these laws is the V&T § 1122a, Overtaking a Bicycle, which was signed into law August 13th, 2010:

Overtaking a Bicycle. The operator of a vehicle overtaking, from behind, a bicycle proceeding on the same side of a roadway shall pass to the left of such bicycle at a safe distance until safely clear thereof.

Finally, there are sections of the law which spell out the rights of governmental entities to prohibit the use of limited access facilities by pedestrians and cyclists; establish bicycle lanes or paths; establish crosswalks; and mark these with signs. See Appendix 3, Exhibit 1 for these sections of the New York Vehicle & Traffic Law.

For more details and a complete list of New York State Vehicular and Traffic Law pertaining to bicycling, visit: www.safeny.ny.gov/bike-vt.htm or www.dot.ny.gov/display/programs/bicycle/safety_laws/laws

Federal Law and Policy

The following is a description of Federal Law and Policy relating to transportation, summarized from these websites: www.csrardc.org/bike/bikeped/legislate_policy.html and www.fhwa.dot.gov/environment/bicycle_pedestrian/overview/policy_accom.cfm.

The United States Department of Transportation (USDOT) is responsible for transportation policies and spending programs at the federal level. Policies and programs of the USDOT and the Federal Highway Administration (FHWA), such as the Interstate Highway System, often have tremendous influence on the national transportation system. FHWA works with Departments of Transportation (DOTs) in each state to implement policies and programs.

Federal transportation funds often are the largest non-local source of funding for infrastructure projects. For urban areas, federal funds are channeled through the state DOT and then through metropolitan planning organizations (MPOs). MPOs are federally-mandated transportation planning agencies in charge of creating long- and short-range transportation plans for their regions. Citizens and advocates interested in policies and projects that support bicycling should become familiar with their MPO, its functioning, and with elected officials that represent local jurisdiction in MPO activities.

In 1991, Congress passed landmark transportation legislation that set a new direction for transportation policy. **The Intermodal Surface Transportation Efficiency Act (ISTEA)** recognized the importance of bicycling and walking in creating a balanced transportation system. Key provisions in ISTEA regarding bicycling and walking included funding programs through the 10% of funds set aside as part of the Transportation Enhancement program as well as increased flexibility in use of federal transportation funds. ISTEA also included provisions requiring long-range transportation plans to consider bicycle and walking.

Following the adoption of ISTEA, the U.S. Department of Transportation published the National Bicycling and Walking Study (NBWS) in 1994. The NBWS translated the recognition of non-motorized travel embodied in ISTEA into two specific goals: to double the percentage of trips made by foot and bicycle while simultaneously reducing the number of crashes involving bicyclists and pedestrians by 10 percent.

The **Transportation Equity Act for the 21st Century (TEA-21)**, signed into law on June 9, 1998, carried forward the same programs for bicycling and walking established in ISTEA, and also included several new and stronger directives. Important policies and statements in TEA-21 included requiring long range plans to strategize for improved safety for motorized and non-motorized transportation users, as well as requiring “due consideration” for bicyclists and pedestrians in state and Metropolitan Planning Organization plans, as well as in newly constructed or reconstructed transportation facilities.

TEA-21 also required the Secretary of Transportation assure that bicycle and pedestrian linkages are maintained and improved. In February 1999, FHWA issued a **Guidance Memorandum** regarding the bicycle and pedestrian provisions of TEA-21. The memorandum is extremely supportive of bicycling and walking and clearly establishes that these modes are an important component of the transportation system. For more information about this memorandum, visit www.fhwa.dot.gov/environment/transportation_enhancements/guidance/.

The **Safe, Accountable, Flexible, Efficient Transportation Equity Act — A Legacy for Users (SAFETEA-LU)** was passed into law in August 2005. It continued the programs for bicycling and walking established in ISTEA and TEA-21, included several new directives such as the Safe Routes to School Program and Highway Safety Improvement Program (HSIP). It also increased funding for some programs, such as the Recreational Trails Program and Congestion Mitigation and Air Quality Program (CMAQ) while giving other programs more flexibility. In addition to this, SAFETEA-LU required that, prior to approval of a Transportation Improvement Program (TIP), a listing of "investments in pedestrian walkways" and "bicycle transportation facilities" obligated from federal funds during the preceding year to be made public. This increases accountability of bicycle-related projects and regional priorities and can be used to inform future TIP decisions.

The United States Department of Transportation issued a **Policy Statement** on bicycle and pedestrian accommodation regulations and recommendations, signed on March 11, 2010 and announced March 15, 2010. Below are the details of this Policy Statement.

Purpose: To reflect the Department’s support for the development of fully integrated active transportation networks. The establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. Legislation and regulations exist that require inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Accordingly, transportation agencies should plan, fund, and implement improvements to their walking and bicycling networks, including linkages to transit. In addition, DOT encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient,

safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate. Transportation programs and facilities should accommodate people of all ages and abilities, including people too young to drive, people who cannot drive, and people who choose not to drive.

Policy Statement: The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

Authority: This policy is based on various sections in the United States Code (U.S.C.) and the Code of Federal Regulations (CFR) in Title 23—Highways, Title 49—Transportation, and Title 42—The Public Health and Welfare. These sections, provided in the Appendix, describe how bicyclists and pedestrians of all abilities should be involved throughout the planning process, should not be adversely affected by other transportation projects, and should be able to track annual obligations and expenditures on non-motorized transportation facilities.

Recommended Actions: The DOT encourages States, local governments, professional associations, community organizations, public transportation agencies, and other government agencies, to adopt similar policy statements on bicycle and pedestrian accommodation as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. In support of this commitment, transportation agencies and local communities should go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks. Such actions should include:

- Considering walking and bicycling as equals with other transportation modes.
- Ensuring that there are transportation choices for people of all ages and abilities, especially children.
- Going beyond minimum design standards.
- Integrating bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges.
- Collecting data on walking and biking trips.
- Setting mode share targets for walking and bicycling and tracking them over time.
- Removing snow from sidewalks and shared-use paths.
- Improving non-motorized facilities during maintenance projects.

Conclusion: Increased commitment to and investment in bicycle facilities and walking networks can help communities. Walking and bicycling provide low-cost mobility options that place fewer demands on local roads and highways. Regardless of regional, climate, and population density differences, it is important that pedestrian and bicycle facilities be integrated into transportation systems. While DOT leads the effort to provide safe and convenient accommodations for pedestrians and bicyclists, success will ultimately depend on transportation agencies across the country embracing and implementing this policy.

MAP-21, the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141), was signed into law on July 6, 2012. Funding surface transportation programs at over \$105 billion for fiscal years (FY) 2013 and 2014, MAP-21 is the first long-term highway authorization enacted since 2005. MAP-21 creates a streamlined, performance-based, and multimodal program to address the many challenges facing the U.S. transportation system. These challenges include improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery.

MAP-21 builds on and refines many of the highway, transit, bike, and pedestrian programs and policies established in 1991. The Department will continue to make progress on transportation options, working closely with stakeholders to ensure that local communities are able to build multimodal, sustainable projects ranging from passenger rail and transit to bicycle and pedestrian paths. For more information about MAP-21, visit <http://www.fhwa.dot.gov/map21>.

MAP-21 restructures core highway formula programs. Activities carried out under some existing formula programs – the National Highway System Program, the Interstate Maintenance Program, the Highway Bridge Program, and the Appalachian Development Highway System Program – are incorporated into the following new core formula program structure:

- National Highway Performance Program (NHPP)
- Surface Transportation Program (STP)
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- Highway Safety Improvement Program (HSIP)
- Railway-Highway Crossings (set-aside from HSIP)
- Metropolitan Planning

It also creates the Transportation Alternatives (TA) formula program with funding derived from the NHPP, STP, HSIP, CMAQ and Metropolitan Planning programs, encompassing most activities funded under the Transportation Enhancements, Recreational Trails, and Safe Routes to School programs under SAFETEA-LU.

Map-21 was set to expire on October 1, 2014. However, the Highway and Transportation Funding Act was signed into law on August 8, 2014, which extends Map-21 until May 31, 2015.

Another Federal level policy is **Context Sensitive Solutions**. Its objective is to improve the environmental quality of transportation decision making by incorporating context sensitive solution principles in all aspects of planning and the project development process. To learn more about Context Sensitive Solutions, visit the FHWA website on CSS at www.fhwa.dot.gov/context/index.cfm.

The **National Environmental Policy Act (NEPA)** provides protection for the human environment by requiring federal agencies, including transportation planning agencies, to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet NEPA requirements, federal agencies must prepare a detailed statement known as an Environmental Impact Statement (EIS) for many projects. For more

information on NEPA and EIS statements, visit the EPA National Environmental Policy Act web site at www.epa.gov/compliance/nepa/index.html.

The **Clean Air Act Amendments (CAAA)** of 1990 is another piece of Federal law that affects transportation planning, specifically for non-motorized transport. The CAAA sets standards for air quality around the nation. Although the Binghamton metropolitan area is in compliance with National Ambient Air Quality Standards (NAAQS), BMTS still strives to minimize the impacts of transportation projects on the environment. Encouraging walking and bicycling to replace some automobile trips has a positive environmental impact on air quality. For more information, visit the EPA's Clean Air Act website at www.epa.gov/air/caa/.

One other Federal law that has affected both bicycle and pedestrian travel is the **Americans with Disabilities Act (ADA)** of 1990. The ADA has resulted in significant improvements to pedestrian infrastructure. Although the majority of the current ADA Accessibility Guidelines (ADAAG) do not apply directly to bicycle facilities, the guidelines do contain provisions that are applicable to trails that also are used by bicyclists.

New York State Law and Policy

New York State policy and legislation has in many ways mirrored that of the Federal government. The New York State Department of Transportation has appointed a pedestrian/bicycle coordinator in its main office and each of its regional offices. The main office also created a Pedestrian Specialist position.

NYSDOT produced the [New York State Pedestrian and Bicycle Plan](#) during 1997, as a component of **The Next Generation...Transportation Choices for the 21st Century**, the 1996 New York State transportation plan. This plan recognizes the importance of bicycle, pedestrian, and intermodal transportation safety and mobility, and the benefits they bring for the State's economy, environment, and quality of life. The **three goals** of the plan are: 1) INCREASE MOBILITY by increasing New York State bike/pedestrian commuter trips by 15% (from 7.2% to 8.5% of all work trips) by the end of year 2015, and by meeting or exceeding the national goal of 16% of all trips being walking or bicycling; 2) IMPROVE SAFETY of bicyclists and pedestrians of all ages and abilities, and meet or exceed the USDOT National Bicycling and Walking Study goal of 10% reduction in the rate of bicycle/pedestrian injuries and fatalities; and 3) PROVIDE ACCESSIBILITY of bicycle and pedestrian transportation to all destinations by integrating bicycling and walking into local, regional and statewide transportation infrastructure. Priority actions to accomplish the goals are: share the road campaign, walk and bike to work promotion, statewide 'Bike & Hike' system, urban bicycle and pedestrian plans, high visibility crosswalks, suburban sidewalks, bicycle and pedestrian design guidelines, intermodal connections, greenway and rail trail development, and State Bicycle and Pedestrian Advisory Council.

The latest version of the [NYSDOT Pedestrian and Bicycle Policy](#) was adopted during April 2010, and updates the October 2006 version that was listed in the Appendix of the 1997 NYS Pedestrian and Bicycle Plan. The policy statement reads, "the New York State Department of Transportation will promote pedestrian and bicycle travel for all persons on the state transportation system." This policy will be addressed in all planning, programming, scoping, design, construction, maintenance, operations,

permits, and education and outreach programs by incorporating the purpose and intent of this policy into their 16 operating guidance and procedures. The policy objectives are to: reduce pedestrian and bicycle fatalities and serious injuries, increase the number of pedestrian and bicycle trips, integrate walking and bicycling as viable modes for connectivity, smart growth, and transit oriented development, and promote development of pedestrian and bicycle networks that support sustainable transportation, minimize impacts on natural resources, reduce greenhouse gas emissions, and improve quality of life.

New York State implemented the [Smart Growth Public Infrastructure Policy Act](#) into law in September 2010. The law requires most state agencies and all state authorities, prior to approving or funding any public infrastructure project, to prepare and file a Smart Growth Impact Statement finding that the project is consistent with ten Smart Growth Criteria (see below) or justifying why it is not practicable to do so. The new law also requires each covered state agency and authority to appoint from staff a “Smart Growth Advisory Committee” to investigate and prepare Smart Growth Impact Statements and to advise its agency/authority on how to promote smart growth goals. The Act was intended to minimize the “unnecessary cost of sprawl development” and requires State infrastructure agencies, including NYSDOT, to ensure public infrastructure projects undergo a consistency evaluation and verification using 10 Smart Growth criteria set out in the Act (see below). NYSDOT supported the Smart Growth Public Infrastructure Policy Act Legislation and since the Act became Law in 2010, NYSDOT has undertaken a comprehensive, agency-wide, phased implementation effort to integrate the requirements of Law into the existing, federally-required transportation project development process.

To the extent practicable, projects must align with the following:

- To advance projects for the use, maintenance, or improvement of existing infrastructure
- To advance projects located in municipal centers
- To advance projects in developed areas or areas designated for concentrated infill development in a municipally approved comprehensive land use plan, local waterfront revitalization plan and/or brownfield opportunity area plan
- To protect, preserve and enhance the state’s resources, including agricultural land, forests, surface and groundwater, air quality, recreation and open space, scenic areas, and significant historic and archaeological resources
- To foster mixed land uses and compact development, downtown revitalization, brownfield redevelopment, the enhancement of beauty in public spaces, diversity and affordability of housing in proximity to places of employment recreation and commercial development and the integration of all income and age groups
- To provide mobility through transportation choices including improved public transportation and reduced automobile dependency
- To coordinate between state and local government and intermunicipal and regional planning
- To participate in community based planning and collaboration
- To ensure predictability in building and land use codes
- To promote sustainability by strengthening existing and creating new communities which reduce greenhouse gas emissions and do not compromise the needs of future generations, by among other means encouraging broad based public involvement in developing and implementing a community plan and ensuring the governance structure is adequate to sustain its implementation.

On August 15, 2011 New York State Governor Andrew Cuomo signed [Complete Streets Legislation](#) that took effect on February 11, 2012. The purpose of the law is to enable safe access to public roads for all users by utilizing complete street design principles. New York Highway Law-Article 11 was amended with Section 331 titled, Consideration of Complete Street Design.

The following is a summary of this Complete Streets legislation from the Cornell Local Roads Program publication titled “Complete Streets-Planning Safer Communities for Pedestrians and Bicyclists” (Updated February 2012):

§ 331. Highway Law states that “Complete Street Designs [must 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 road projects that receive federal funding also receive state funding. The law therefore will not apply to many projects on roads owned by villages, towns and counties. For this reason, local complete streets policies are still necessary because such policies help to knit together a robust network of complete streets. The law does not apply retroactively to previously approved designs for projects that have not yet been constructed.

The law applies to road planning, design, construction, reconstruction and rehabilitation projects, but not resurfacing, maintenance, or pavement recycling projects on otherwise eligible roads. The law provides for exceptions to its provisions. Specific exemptions are provided to the application of the Complete Streets Law. It does not apply to 1) roads where bicyclists and pedestrians are prohibited (e.g. most interstate highways). 2) When the “cost would be disproportionate to the need or [there is] a demonstrated lack of need” and, 3) where installing complete street design features would create a hazard.

NYSDOT’s New York State Complete Streets Report that details how it will comply with this Complete Streets Legislation is available to view at www.dot.ny.gov/programs/completestreets/nysdot.

Local Law and Policy

During July of 2011, the City of Binghamton adopted a Complete and Sustainable Streets Policy. The policy states that all projects, including design, planning, reconstruction, rehabilitation, maintenance or operations by the City of Binghamton shall be designed and executed in a balanced, responsible and equitable way to accommodate and encourage travel by public transportation vehicles and their passengers, bicyclists and other wheeled modes of transportation, and pedestrians of all ages and abilities. To view the entire policy, see Appendix 3, Exhibit 2.

Grants through the Broome County Health Department’s STEPS to a Healthier New York program and Strategic Alliance for Health programs respectively, were the impetus for municipal policies. Both programs were funded by the Centers for Disease Control and Prevention. Each grant required changes to the built environment, such as curb ramps, crosswalks, and bike lanes, to improve pedestrian and bicycle safety, and encourage more walking and/or bicycling. The other requirement was to make a policy change to sustain efforts to continue improving the built environment for walking and bicycling.

Several other municipalities in the Binghamton urban area have added bicycle transportation elements to Comprehensive Plans and other similar plans. During December 2013, the Broome County Legislature has unanimously adopted a new Comprehensive Plan, titled Building Our Future. In developing the plan, there are certain self-evident principles that will guide the County's efforts. One principle is **natural and cultural resources should be preserved and enhanced**. It is noted that Broome County's four rivers (Susquehanna, Chenango, Tioughnioga, and Delaware) support **walking trails** (also used for bicycling), fishing, recreation, and destination tourism, and that these resources can be threatened by poor development, or they can attract investment to the County. Another principle is **public health and healthy communities should be promoted through planning tools and strategic public investments**. Planners have tools such as land use reviews that can be used to **make communities more walkable**, and therefore healthier. In addition, public investments made in infrastructure and the proper location of facilities can contribute significantly to community sustainability. To view all the principles of the *Building Our Future* Plan, go to www.gobroomecounty.com/comprehensiveplan.

Blueprint Binghamton, the comprehensive plan for the City of Binghamton, was adopted during July 2014. The section titled, "Transportation: a plan for a city that walks, bikes, rides transit... and drives too", provides the following goals related to improving bicycle transportation: **3.1** - Improve transportation connections between Binghamton University and Downtown by finishing the Route 434 Greenway trail (NYSDOT Project #903808), adding bike parking in Downtown, and promoting the Binghamton University Bike Share to all students; **3.5** - Develop complete streets hierarchy for street design; **3.7**- Amend the City Code to require consideration of complete streets infrastructure for all City ROW projects including mill and pave projects; **3.8** - Mark all New York State bike routes in the City with either dedicated lanes or sharrows by 2016; **3.9** - Develop a citywide bike network; **3.10** - Consider a small bike share program; **3.11** - Add more bike parking; **3.12** - Build a bicycling community; and **3.13** - Hold regular Bike the Drive events. Details about these goals and the entire Blueprint Binghamton Plan can be found at www.blueprintbinghamton.com.

In light of the City of Binghamton's Complete Streets Policy and the New York State Complete Streets legislation, BMTS established a **Complete Streets Policy & Design Guidelines Project** that is part of its 2014-2015 Unified Planning Work Program. The goal of these initiatives is to provide a seamless transportation system for all users regardless of age, mobility or mode of transportation. In order to provide a consistent traveling experience, it would be helpful for municipalities to adopt similar guidelines when they undertake a reconstruction, paving or pavement striping project, i.e. bike lanes, sharrows, sidewalks. This project will develop a regional complete street policy and a set of engineering instructions. It is the intent of this task to form a subcommittee of the Planning Committee to provide input to this project, working with BMTS staff, NYSDOT's Region 9 Regional Planning & Program Management staff and its Traffic & Safety staff. An ongoing effort of this project will be for BMTS to work with municipalities to adopt their own Complete Streets Policies, based on the regional policy and design guidelines. The BMTS Complete Streets Project was initiated on June 25 – 26 with an educational outreach to municipal leaders, decision makers, and key stakeholder groups. Nationally renowned Complete Streets expert, Mark Fenton, led a municipal Planning Commission and Zoning Board of Appeals member training session, spoke to a combined BMTS Planning Committee and Policy

Committee meeting where each municipality received a copy of the NACTO Urban Street Design Guide, and led a walking audit of the State St./W. State St./Chenango St. corridor in Binghamton.

B. Local Participants in Transportation Planning

1. Binghamton Metropolitan Transportation Study

BMTS, also known as a Metropolitan Planning Organization (MPO), is responsible for transportation planning and engineering, as well as programming of federal transportation funds. MPOs are mandated by federal law and designated by the governor of each state in urban areas with at least 50,000 residents. The Binghamton urban area includes portions or the entirety of municipalities within Broome and Tioga Counties. BMTS, like most MPOs, is structured so that decisions are made collectively by all municipalities within the urban area in cooperation with New York State. Composed of state and federal transportation officials, as well as elected municipal officials, and representatives from public transit providers and regional planning boards, the BMTS Policy Committee allocates federal transportation funds within the BMTS region, and adopts transportation plans. To do this, the Committee must reach consensus. A second committee, the Planning Committee, assists the Policy Committee by providing planning and engineering expertise, as well as recommendations for action items. Members of the Planning Committee also represent each of the municipalities in the BMTS region. BMTS Central Staff provides research and administrative support to both committees.

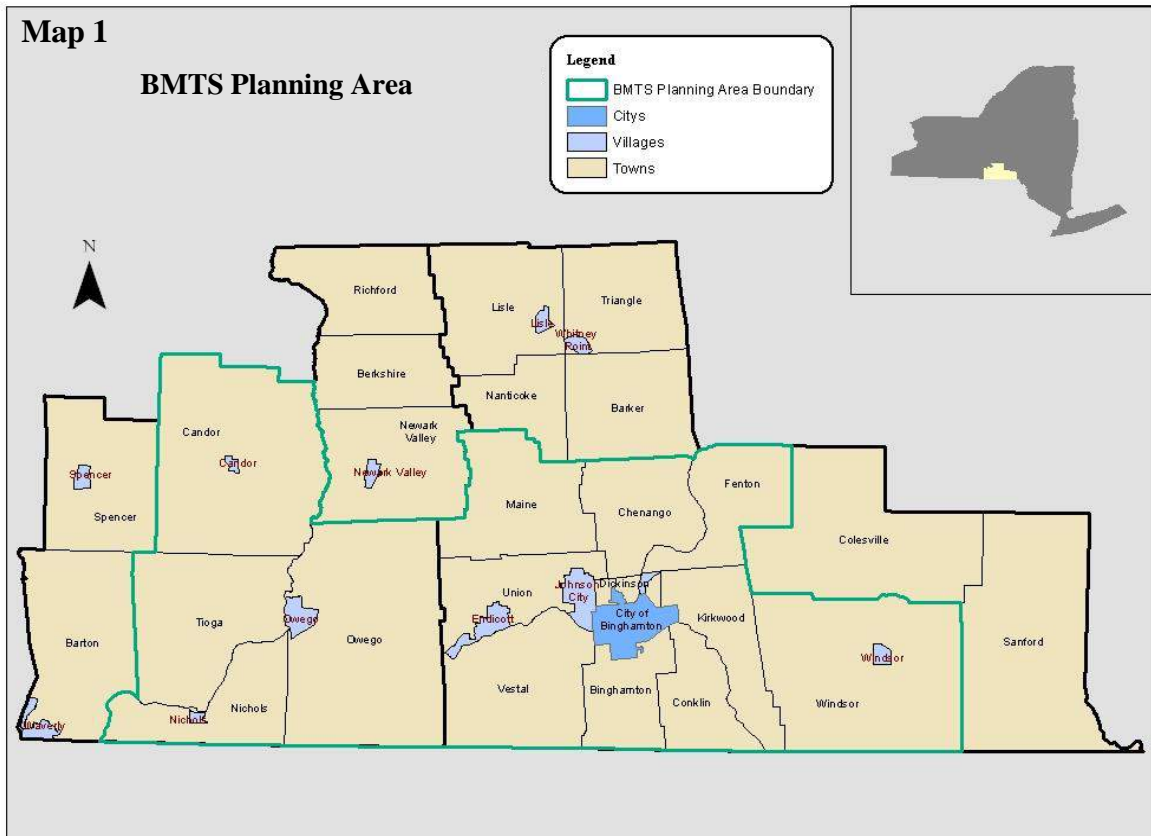
Local Participants in Transportation Planning

- BMTS
- Municipalities in BMTS region
- BMTS Pedestrian and Bicycle Plan Advisory Committee
- Broome County EMC
- NYSDOT
- Health Sector
- Southern Tier Bicycle Club (STBC)
- Community Groups and Organizations

2. Municipalities in BMTS region

BMTS's region includes parts or all of the Towns of Binghamton, Candor, Chenango, Conklin, Dickinson, Fenton, Kirkwood, Maine, Nichols, Owego, Tioga, Union, Vestal, and Windsor; the Villages of Endicott, Johnson City, Nichols, Owego, and Windsor; and the City of Binghamton (See Map 1). These municipal governments are responsible for constructing, improving, and maintaining local roads within their boundaries. These responsibilities include all pedestrian and bicycle facilities on those roads. Broome and Tioga Counties also have jurisdiction over their respective county highway systems.

The Binghamton Urbanized Area also extends into Pennsylvania as a result of 2000 U.S. Census. The area includes the Interstate 81 and US 11 corridor through Great Bend, Hallstead, and New Milford. Based upon an agreement reached with the Pennsylvania Department of Transportation and the Northern Tier Regional Planning & Development Commission (designated as a Rural Planning Organization by PennDOT), they will administrate the Federal aid process for projects in the Pennsylvania portion of the BMTS area. Those projects are to be included in the BMTS Transportation Improvement Program for information only; and in the Pennsylvania Statewide TIP (STIP) for programming purposes. Accordingly, this Bicycle Plan will not include the Pennsylvania portion of the Binghamton Urban Area.

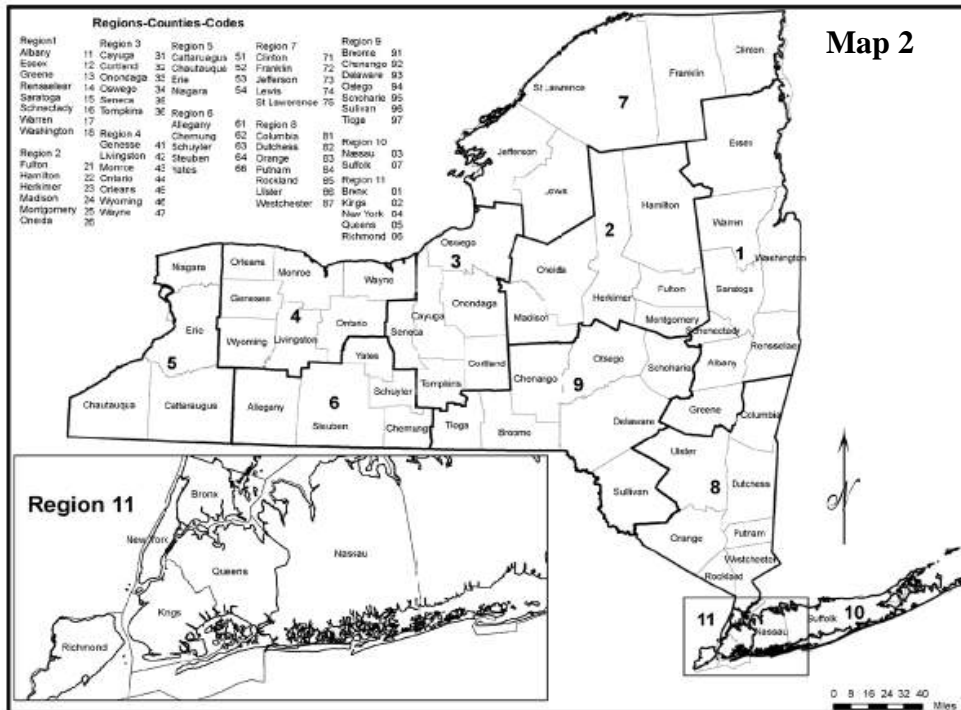


3. BMTS Pedestrian and Bicycle Plan Advisory Committee

The Advisory Committee to the Pedestrian and Bicycle Plan was established by BMTS in 1994 to provide public input on plans from early scoping stages to the review of final drafts. As noted below, the EMC's Ad Hoc Committee on Alternative Transportation was merged with this Committee. Additionally, toward the end of 1999, the EMC handed over the administration of the Pedestrian and Bicycle Advisory Committee to BMTS. The BMTS Pedestrian & Bicycle Advisory Committee is comprised of officials from NYSDOT Region 9, and the Broome County Health Department, as well as representatives from the Association for Vision Rehabilitation and Employment (AVRE), the Southern Tier Bicycle Club (STBC), and the general public. All with an interest in improving safe walking and bicycling in the Binghamton Urban Area are welcome to be a part of the BMTS Pedestrian & Bicycle Advisory Committee. The Committee reviews and provides input on transportation project designs and transportation plans, addresses safety issues brought to the Committee, and organizes or assists in educational and encouragement outreach activities. A particularly successful encouragement created by the Committee is the annual Binghamton Bridge Pedal. This event features a family friendly 9 to 10 mile police-escorted bike tour around downtown Binghamton and the river corridor areas, exploring parks, historic sites, and bridges. There are several stops at local parks and significant sites along the way with representatives from several community organizations that speak and provide information about these special landmark places. The 2014 Bridge Pedal is done in cooperation with the Center for Technology and Innovation and was combined with their Coolest Dessert In Town event featuring local ice cream establishments. See www.bmtsonline.com/bmts/binghamton-bridge-pedal for photos and materials from previous Binghamton Bridge Pedal events.

4. Broome County Environmental Management Council (EMC)

The EMC is the citizens' advisory board to Broome County government on a broad range of local environmental issues. Its work includes but is not limited to land use and natural resource planning, solid and hazardous waste management, water resource protection, and alternative transportation planning. In April of 1994, the EMC's Executive Committee created the Ad Hoc Committee on Alternative Transportation whose mission statement is, "To plan and promote alternative transportation projects that are environmentally sound and improve the quality of life in Broome County." This committee and BMTS's Pedestrian and Bicycle Advisory Committee merged, and it continues to participate in and advise on the



implementation of this plan. Toward the end of 1999, the EMC handed over the administration of the Pedestrian and Bicycle Advisory Committee to BMTS. Loss of a full-time staff person during 2010 further limited the amount of direct participation the EMC could contribute toward implementing the Pedestrian & Bicycle Plan. Despite these two changes, the EMC continues to support BMTS in its efforts to implement the 1996 Pedestrian & Bicycle Plan, as well as the updated Pedestrian Plan and the subsequent Bicycle Plan update.

5. New York State Department of Transportation (NYSDOT) - Region 9

At the time of the 1996 Plan, the BMTS region included parts of both NYSDOT Regions 6 and 9, with Tioga County being in Region 6. During 2006, Tioga County was moved to Region 9 (See Map 2).

Region 9 is responsible for the construction and maintenance of state roads within its jurisdiction as well as management of the Federal-aid transportation program. Region 9, as well as the NYSDOT Main Office, have designated bicycle and pedestrian coordinators. They are responsible for developing regional and statewide bicycle and pedestrian plans, programs, and policies. Region 9 created a Pedestrian and Bicycle Advisory Committee comprised of representatives of each division within NYSDOT Region 9, as well as BMTS, the Association for Vision Rehabilitation and Employment (AVRE), the Southern Tier Bicycle Club, and other organizations. NYSDOT projects with pedestrian and/or bicycle issues are reviewed by this committee, and recommendations on actions to take are provided. This Committee is also working with

BMTS on facilitating the implementation of the BMTS regional greenway trail system (i.e. the Two Rivers Greenway) as an ongoing task.

6. Health Sector

BMTS has partnered with the Broome County Health Department even prior to the completion of the 1996 Pedestrian & Bicycle Plan. The primary connection has been with the County's Traffic Safety Committee, working together on educational outreach such as bike rodeos (i.e. cycling skills clinics), Walk to School Day, and the pedestrian & bicycle interactive information display at venues such as the B-Mets baseball & education game, and the SUNY Broome Children's Fair.

Through the Broome County Health Department, BMTS has been included as a part of several coalitions and consortiums (e.g. Steps to a Healthier NY, Strategic Alliance for Health, and Chronic Disease Leadership Team) that proved to be exceedingly effective in accomplishing the complementary goals of the member organizations, and efficiently having a significant positive impact in Broome County. Regarding bicyclist safety, through networking with key stakeholders, and through provision of funds, several projects were completed that improved the built environment, providing increased safety for bicyclists, and thus encouraging more biking. Policy changes to encourage ongoing built environment improvements were also accomplished. Ultimately, the County's health will improve as we provide the availability for active transportation such as bicycling.

Notable partnerships have also been established with the Tioga County Health Department, with BMTS currently participating on the Tioga County Health Communities Partnership (TCHCP), and with United Health Services (UHS), with BMTS participating in its Stay Healthy Kids Club Committee. BMTS will continue to develop relationships and partnerships with the many public, private, and non-profit agencies in the health sector.

7. Southern Tier Bicycle Club (STBC)

The STBC is a non-profit recreational bicycling club in Binghamton, New York with over 300 members ranging in age from 13 to over 80 years old. The club was founded in 1969, and it promotes and encourages safe, enjoyable bicycling activities by offering rides of varying distance, speed, and terrain most days of the week. STBC publishes three newsletter ride schedules per year, and is open to anyone interested in cycling from a beginning cyclist up to an expert. STBC membership is required to participate in all club rides and events. For more information about the STBC, go to www.southerntierbicycleclub.org. STBC members also provide input on transportation projects via participation in the BMTS Pedestrian & Bicycle Advisory Committee or attending public information meetings. They also volunteer for bicycle education and encouragement activities.



Southern Tier Bicycle Club Shirt
Image courtesy of www.southerntierbicycleclub.org

8. Various Community Groups and Organizations

Community involvement is important toward promoting bicycle facilities, bike safety, and increasing the number of bicyclists. BMTS looks to continue partnering with diverse groups and organizations that are interested in advancing bicycling. Examples include:

- George F. Johnson Dream Center – *Annual Johnson City Bike Day* (<http://gfjdreamcenter.wix.com/gfj-dream-center#!bike/c2do>)
- Center for Technology and Innovation – *Binghamton Bridge Pedal* (<http://ctandi.org/events.html>)

C. Description of Binghamton Metropolitan Region

The BMTS region encompasses 175.97 square miles that is home to 209,170 people (U.S. Census 2010). It is comprised of both urban and suburban elements. Although the region is centered around the relatively flat Susquehanna and Chenango River Valleys (820 feet above sea level), elevations quickly reach up to 1,600 feet above sea level within a five mile radius of the river valleys. The rolling hills that characterize the area can make for challenging walking and cycling in some areas of the BMTS region.

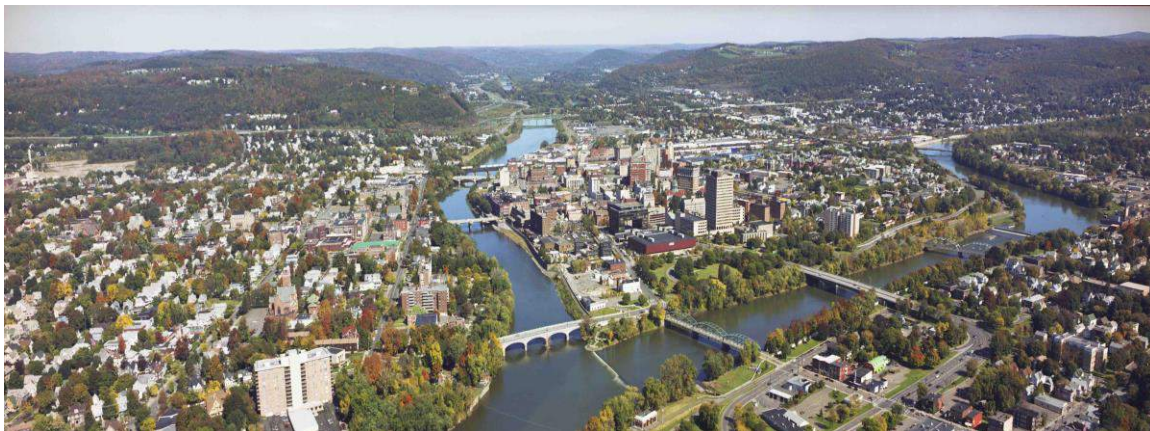
Description of Binghamton Metropolitan Region

- 175.97 square miles
- 209,170 people
- CAAA compliant air quality
- Northeast Ozone Transport Region

A more extensive discussion of BMTS's transportation infrastructure can be found in *TRANSPORTATION TOMORROW: 2035* at <http://bmtsonline.com/bmts/long-range-plan-2035>.

The Binghamton region is in attainment with air quality standards established by the CAAA and the United States Environmental Protection Agency (USEPA). This means that on virtually every day of the year, air quality in Broome and Tioga counties is rated as good. More specifically, it is assumed that levels of sulfur dioxide, carbon monoxide, ground-level ozone, nitrogen dioxide, lead, and inhalable and total suspended particulates fall within acceptable levels.

Currently, however, all of New York State falls within the Northeast Ozone Transport Region, an area created by Congress in the CAAA that includes all east coast states from Maine to Virginia. The USEPA requires that these states enforce more stringent standards for volatile organic compounds (VOCs). Because almost 50% of VOCs emissions come from mobile sources (motor vehicles), it is to the advantage of all communities located in the region to encourage bicycle travel to the maximum extent practicable. By increasing the number of trips made by bicycle, air quality will be positively impacted.



Binghamton, NY
Image courtesy of www.jmas.info

D. Past Planning Activities

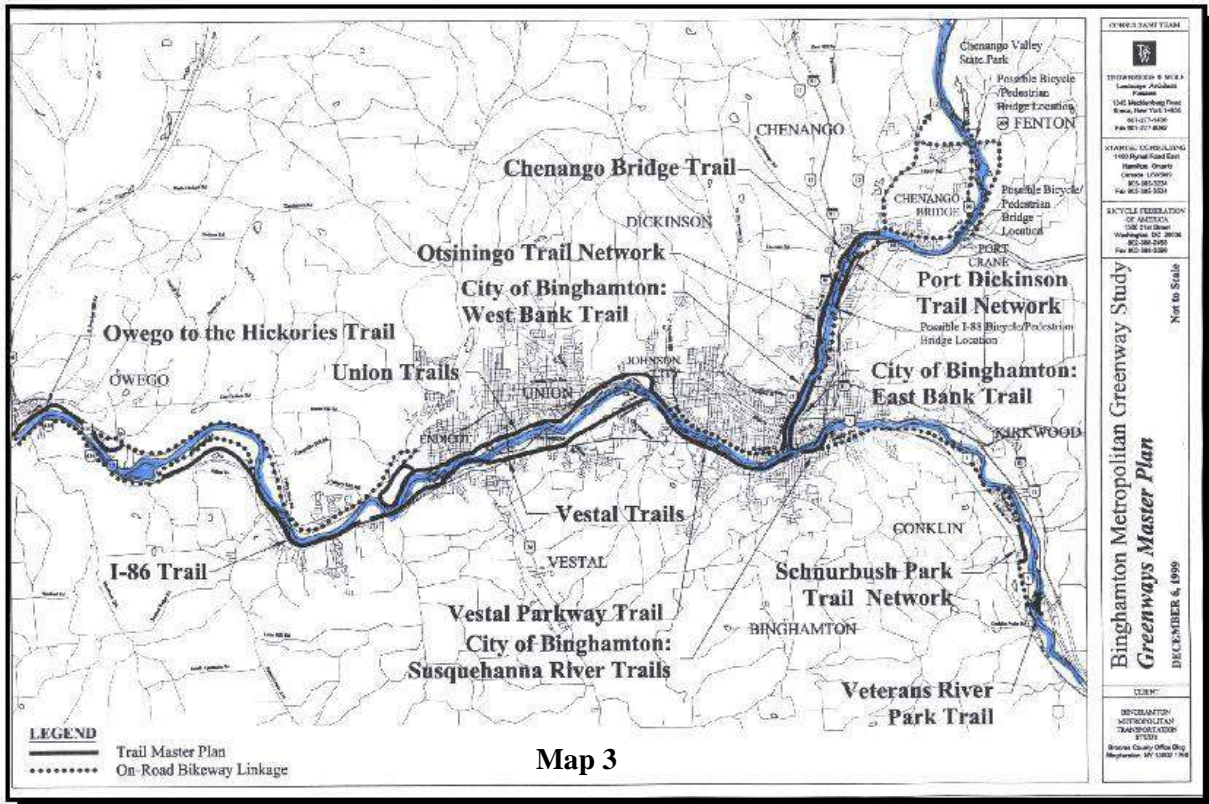
Planning for cyclists in the Binghamton region is not new. In 1976, BMTS contracted with Konski Engineers, P.C. to complete a long-term bicycle plan for the region entitled the *Binghamton Metropolitan Bikeway System: A Plan and Program*. In 1979, BMTS Central Staff revised the study and wrote *Bikeways System Report*. Since then and the 1996 BMTS Pedestrian and Bicycle Plan, only piecemeal improvements to pedestrian and bicycle facilities have been made. This is due to decisions by BMTS policy makers to assign a lower priority to such projects in comparison to highway, bridge, and transit improvements.

During December 1999, the *Binghamton Metropolitan Greenway Study* was completed. The Study document is available at

<http://www.bmtsonline.com/bmts/bicycle-amp-pedestrian>. This greenway feasibility study was an action item in the 1996 Pedestrian and Bicycle Plan, and was carried out under a consultant contract. The consultant team that performed this study, led by Trowbridge & Wolf Landscape Architects (Ithaca, NY), determined where riverbank trails are feasible throughout the urban area based on access, land use, engineering, and cost criteria. They have also indicated how a continuous system can be developed by using on-road links, and noted the safety improvements that would be required on those links (See Map

Past Planning Activities

- Binghamton Metropolitan Bikeway System: A Plan and Program
- Binghamton Metropolitan Greenway Study
- Local Waterfront Revitalization Program
- Walkable Community Workshops Project
- Roadway Safety Audits
- Two Rivers Greenway Design Guidelines and Sign Plan



3). Finally, they provided recommendations for phased implementation that recognizes how the cost of constructing the system can be spread over a number of years.

During March 2000, the *Binghamton Metropolitan Greenway System Implementation Plan* was completed to facilitate the development of the proposed greenway system. This *Implementation Plan* outlines how BMTS will proceed, based on the consultant's recommendations, public input, and opportunities for trail implementation. As noted above, during 2005 the NYSDOT Region 9 Pedestrian & Bicycle Advisory Committee has taken on working with BMTS on facilitating the implementation of the BMTS regional greenway trail system as an ongoing task. To date, about 38% of the proposed greenway trail system has been either built or has been funded.

During September 2002, The National Center for Bicycling and Walking chose BMTS as one of eight MPOs nationally to participate in the first round of its *Walkable Community Workshops Project*. This was a shared-cost workshop project, pledging staff and financial resources in exchange for technical assistance and training. The project provided technical assistance to MPOs on how to help communities become more walkable. It included training an MPO staff specialist to serve as the local workshop coordinator and providing instructors to present a series of eight workshops in each region. These workshop sessions were designed for professionals in the fields of planning, engineering, law enforcement, public health, and education, as well as for elected officials and citizens. The workshop program presented information on how to turn communities into pedestrian-friendly places and encourage active living. The series of eight workshops and two community presentations in the BMTS and nearby areas took place from May 12-16, 2003 in the City of Ithaca, the City of Binghamton, Towns of Conklin, Owego, Union, Vestal, and the Villages of Candor and Johnson City. The workshops were extremely successful and were a significant impetus for municipalities to see pedestrian and bicycle modes as an important part of the entire transportation system, and realize the necessity to make changes in policy and the built environment to ensure their safety as well as encourage more to walk & bike. Such changes have been realized in many municipal roadway projects and planning documents.

During 2005, the City of Binghamton completed preparation of a *Local Waterfront Revitalization Program (LWRP)*, which is a locally prepared, comprehensive land and water use plan for its natural, public, and developed waterfront resources. The Binghamton LWRP (<http://www.cityofbinghamton.com/departments.asp?zone=dept-planning&pid=113&pm=page#LWRP>) provides a comprehensive framework within which critical waterfront issues can be addressed and planned waterfront improvement projects can be pursued and implemented. Funding for implementation is also available through LWRP program that is a part of the New York State Department of State.

The City of Binghamton prepared its LWRP with assistance from the New York State Department of State and in accordance with the New York State Waterfront Revitalization of Coastal Areas and Inland Waterways Act and the New York State Coastal Management Program. Trails for walking and bicycling are eligible for this funding.

During 2008 and 2009, BMTS worked with Johnson City and Binghamton officials respectively to perform **Roadway Safety Audits (RSA's)**. The Johnson City audit analyzed transportation performance and safety issues Floral Ave. from St. Charles St./Ackley Ave. to Baldwin Street. The Binghamton audit analyzed Vestal Ave. from South Washington St. to Pennsylvania Avenue. During October 2014, an audit was conducted of the State St./W. State St./Chenango St. corridor in Binghamton in anticipation of the planned repaving project in 2015. The audit was also done as a part of the BMTS Complete Streets Project, seeking to take advantage of opportunities in upcoming road projects to best design for all modes. RSA's are a generally accepted proactive, low cost tool to identify safety issues of transportation facilities. The

Federal Highway Administration (FHWA) is encouraging states and local municipalities to use RSA's (See <http://safety.fhwa.dot.gov/rsa/>). A RSA is the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. An assessment team considers the safety of all users, qualitatively estimates and reports on safety issues, and suggests opportunities for safety improvements. BMTS continues to allocate time and funds to perform two to three roadway safety audits annually.

The City of Binghamton's Energy and Climate Action Plan was created by City staff and a citizen Climate Action Plan Advisory Committee during 2010 and 2011. On December 7, 2011, City Council adopted a resolution in support of the Energy and Climate Action Plan, which sets a target of reducing greenhouse gas emissions 25% by the year 2025 (accomplishing Milestone 2 & 3). The final steps of the CCP will be to implement the action plan (Milestone 4) and monitor and evaluate the impacts of the action plan (Milestone 5). An Energy and Climate Action Plan plots our course for an important journey into our future. Such a plan is a description of the actions – policies, programs, and projects – a government will take to reduce a community's dependence on fossil fuels and to meet its greenhouse gas (GHG) reduction target. Created by City staff, interns, and a citizen Climate Action Plan Advisory Committee, the City of Binghamton's Energy & Climate Action Plan outlines strategies for cutting energy costs, promoting energy independence and reducing greenhouse gas emissions within Binghamton. The Climate Action Plan calls for promoting and facilitating commuting by walking, biking, carpooling, and public transit instead of private cars in-part by implementing the City's Complete Streets policy, expanding and enhancing bike and pedestrian infrastructure, as well as improving the public transit system. Continuing greenway trail development is also recommended. To view the Climate Action Plan, go to www.binghamton-ny.gov/sites/default/files/files/ECAP%20FINAL%202011_12_01.pdf

Toward the end of 2011, a Broome County-wide effort with Vestal as the lead municipality, produced the LWRP titled, *Four Rivers – An Intermunicipal Waterfront Public Access Plan for Broome County* (http://www.vestalny.com/Resources/Parks/file/BroomeCountyFINAL_web.pdf). This document will serve as a resource to guide future development activity along Broome County's riverfronts: the Susquehanna, Tioughnioga, Chenango, Otselic and Delaware. The Broome County riverfront includes more than 89 miles of waterway that defines the region's diversity. Water traverses the densely populated areas of Vestal, Johnson City, Endicott and Binghamton and the quiet enclaves of communities like Windsor, Kirkwood and Whitney Point. The riverfronts have historically provided power for industry, transportation, agriculture, fishing and recreation and represent the once and future economic powerhouses for Broome County. Ultimately, the Plan is intended to serve as a tool for each riverfront community in Broome County to create a comprehensive riverfront experience. The experience will attract new visitors to stimulate the local economy and improve existing quality of life for residents by



Two Rivers Greenway Logo

enabling them to interact with their riverfront. As with Binghamton's LWRP, funding for implementation, such as construction walking and biking trails, is also available through the New York State Department of State's LWRP program.

BMTS contracted with a consultant team to develop the *Two Rivers Greenway Design Guidelines and Sign Plan* was completed during December 2012. The project renamed the regional trail system proposed from the Binghamton Metropolitan Greenway Study (1999) to the Two Rivers Greenway, created a logo, and designed a series of signs including orientation, directional, trail blazer,

interpretive, and regulatory signs to have the trail system recognized as a regional, contiguous system, as well as facilitate user access to and circulation throughout. A project is now in progress to sign the existing Two Rivers Greenway trail segments as the *Sign Plan* prescribes, and should be complete during 2015. Further signing will be incorporated into the design and construction of new trail segments.

Finally, BMTS has been involved continuously in reviewing New York State and municipal transportation project designs to provide recommendations for the accommodation of bicyclists and pedestrians.

E. Profile of Bicyclists

1. Bicycling data

Documentation of pedestrian and bicyclist behavior in Broome and Tioga Counties can be found in the in the 2013 American Community Survey 5-year estimates from the U.S. Census. It indicates that in the two counties, 262 people cycled and 4,049 people walked to work in 2013. In comparison, 88,273 drove alone, 10,382 carpooled, and 2,798 took public transportation. For more transportation to work statistics, see Table 2 (shown on the next page). These numbers do not account for trips made to stores, to school, to recreational activities, or for personal business.

A comparison of these numbers to the 2000 U.S. Census shows that there has been a .10% increase in the number of people bicycling and a .19% decrease in the number of people walking to work from 2000 to 2013. There has been a statewide increase of .24% in the amount of people bicycling to work, as well as a .2% increase in the amount of people walking to work during this time period. Nationally, there has been a .17% increase in the amount of people bicycling to work and a .09% decrease in the number of people walking to work from 2000 to 2013.

Profile of Bicyclists

- Bicycling Data
- Travel Statistics
- Public Input

Table 2: Transportation Method to Work

Transportation Method to Work									
U.S. Census 2013 ACS, 2010 ACS, and 2010 Census Estimates									
Geography	Census	Car, Truck, or Van				Walk		Bicycle	
		Drive Alone		Carpool					
Broome County	2013 ACS	68,340	78.32%	8,072	9.25%	3,590	4.11%	259	0.30%
	2010 ACS	70,282	79.20%	7,868	8.90%	3,307	3.70%	275	0.30%
	2000 Census	71,226	79.50%	9,145	10.20%	3,852	4.30%	193	0.20%
Tioga County	2013 ACS	19,933	83.44%	2,310	9.67%	459	1.92%	3	0.01%
	2010 ACS	19,620	82.30%	2,319	9.70%	572	2.40%	45	0.20%
	2000 Census	19,507	80.20%	3,106	12.80%	546	2.20%	62	0.30%
NY State	2013 ACS	4,773,429	53.81%	619,527	6.98%	567,408	6.40%	48,268	0.54%
	2010 ACS	4,784,387	54.00%	667,841	7.50%	556,692	6.30%	38,253	0.40%
	2000 Census	4,620,178	56.30%	756,918	9.20%	511,721	6.20%	25,036	0.30%
United States	2013 ACS	106,725,474	76.35%	13,631,263	9.75%	3,922,801	2.81%	802,450	0.57%
	2010 ACS	105,185,519	75.90%	14,577,524	10.50%	3,964,813	2.90%	687,199	0.50%
	2000 Census	97,102,050	75.70%	15,634,051	12.20%	3,758,982	2.90%	488,497	0.40%

Table 2 (continued): Transportation Method to Work

Transportation Method to Work (Continued)									
U.S. Census 2013 ACS, 2010 ACS, and 2010 Census Estimates									
Geography	Census	Public Transit (no taxi)		Taxi		Other		Work at Home	
Broome County	2013 ACS	2,656	3.04%	123	0.14%	685	0.79%	3,529	4.05%
	2010 ACS	2,005	2.30%	181	0.20%	764	0.90%	3,894	4.40%
	2000 Census	2,345	2.60%	145	0.20%	344	0.40%	2,237	2.50%
Tioga County	2013 ACS	142	59.44%	43	0.18%	208	0.87%	791	3.31%
	2010 ACS	156	0.70%	43	0.20%	98	0.40%	918	3.90%
	2000 Census	128	0.50%	47	0.20%	130	0.50%	782	3.20%
NY State	2013 ACS	2,398,671	27.04%	52,817	0.60%	64,122	0.72%	346,471	3.91%
	2010 ACS	2,350,208	26.50%	60,810	0.70%	53,370	0.60%	335,092	3.80%
	2000 Census	1,938,297	23.60%	67,897	0.80%	40,375	0.50%	247,869	3.00%
United States	2013 ACS	7,000,722	5.01%	158,124	0.11%	1,499,420	1.07%	6,046,385	4.33%
	2010 ACS	6,859,705	5.00%	170,686	0.10%	1,219,225	0.90%	5,575,316	4.00%
	2000 Census	5,867,599	4.60%	200,144	0.20%	901,298	0.70%	4,184,223	3.30%

During 2008-2009, a Regional Household Travel Survey was performed by the ETC Institute for the BMTS area, which provides information on transportation mode use for all trips in the BMTS region. The actual number of completed household travel surveys was 1,034. Findings are shown in the table on the following page.

Table 3: 2008 – 2009 BMTS Regional Household Travel Survey

2008 – 2009 BMTS Regional Household Travel Survey		
Bicycle	0.1%	Only 0.1% of all trips generated by household travel survey participants were completed by persons who rode a bicycle to their destination.
Walk	1.8%	Low income residents (earning less than \$20,000) were three times more likely to complete trips by walking than upper income residents (earning \$80,000 or more).
Drive	92%	92% of all trips generated by participants in the household survey were completed by persons who either drove or were passengers in private vehicles, such as cars, SUVs, and pickups. 97% of home-to-work trips completed by household survey participants were completed in private vehicles.
Carpool	→	Over half (58%) of all trips completed by household travel survey participants were completed by persons driving alone. Six percent (6%) of all trips completed by household travel survey participants were completed by persons driving with 3 passengers or more.
Public Transportation	0.8%	Less than one percent (0.8%) of all trips generated by household travel survey participants was completed by persons who used public transit to get to their destination.

Another source of information to consider is the nationwide statistics for all trips, not just transportation method to work. The *Bicycling and Walking in the United States 2014 Benchmarking Report*, published by The Alliance for Bicycle and Walking, states that for all trips, 10.4% are made by foot and 1% are made by bicycle. On the state and local levels, the 1995 Nationwide Personal Transportation Survey indicated that 15.37% of person-trips were walk/bicycle trips in New York State, while 5.47% of person-trips were walk/bicycle trips in Binghamton urban area.

Regarding car ownership, the 2013 American Community Survey 1-Year Estimates data reveal that 10,878 households, or 19% of all households in the Binghamton metropolitan area, do not own a car. Similarly, the 2013 ACS shows that 11,141 households (11.5%) do not own a car. The 2008 – 2009 BMTS Regional Household Travel Survey (seen in Table 3) indicates that 29 (2.8%) of the 1,034 surveyed do not own a car. While residents of these households and those who were surveyed may sometimes have access to a car, they most likely rely extensively on public transit, walking, and bicycling for their travel needs.

2. Public Input from Transportation Tomorrow (TT) 2030 and 2035 Long Range Plans

As noted in the Introduction, this Plan will rely in part on the extensive public outreach that was done for BMTS' TT 2030 and TT 2035 Long Range Plans. In each case, the public clearly supported making investments in the transportation system to better accommodate and improve safety for pedestrians and bicyclists. Refer to the TT 2030 and TT 2035 documents for detailed information and excerpts regarding public outreach. The TT 2030 document is available by request to BMTS, while TT 3035 is available at www.BMTSONline.com.

F. Local Systems Inventory

1. Inventory

Designated Bike Routes and Roadway System

The 1996 Pedestrian and Bicycle Plan recommended the creation of a network of bicycle facilities that is safe and convenient, and links residential, commercial, and business districts, educational institutions, major employment sites, recreation areas, and river corridors. Per this recommendation, BMTS worked with its Pedestrian & Bicycle Advisory Committee to designate seven local bike routes in the Urban Area, numbered 1 through 7, and then bike route signs were installed during 1997.

NYSDOT has established several statewide bike routes. New York State Bike Route 17 is an east-west route, primarily using roads parallel to or near the NYS Route 17 corridor, which takes it through the BMTS region. Bike route signs were installed in the Binghamton Urban Area during 1997. New York State Bike Route 11, a north-south route primarily using roads parallel to or near the NYS Route 11 corridor, was established and signed during 2006, and also goes through the BMTS region. An online interactive map of the state bike routes is available at <https://www.dot.ny.gov/display/programs/bicycle>.

It is important to note that designating roadways as bike routes does not increase that liability of the municipality with jurisdiction. On February 15, 1994, the NYSDOT Office of Legal Affairs issued a memorandum regarding bicycle TORT liability. In general, the memorandum concludes that since municipalities are responsible and held liable to maintain their roadways to be safely used by all legal users, including bicyclists, there is no increased liability if the roadway is designated as a bike route. See the full memorandum in Appendix 3, Exhibit 3.

To inform cyclists about the area bike routes, to access to points of interest & common destinations, to encourage more people to bicycle, and to educate cyclists about their rights and responsibilities as roadway users, BMTS created the Binghamton Metropolitan Bicycle Route Map, first published during November 2000. A second version of the bike route map was printed during July 2005 titled Bicycle Route Map - Greater Binghamton Area. In addition to the local and state signed routes, the updated map included BC Transit bike rack information, local bike route descriptions, walking and biking trails, a calendar of annual events, and photos of area bicycle facilities. The latest version of the bike route map was printed during 2011 using the same name with the same, but updated information. The Bicycle Route Map - Greater Binghamton Area is available in hard copy upon request or online at <http://www.bmtsonline.com/bmts/map>.

Common roadway treatments for bicyclists in the central urban and developed areas are bike lanes, sharrows/shared lane markings, and bike sensitive signal detectors. However, many roadways in the urbanized areas have no pavement markings specifically for cyclists and are considered to have shared lanes by motorists and cyclists. It is desired that bike lane and sharrow facilities be as contiguous as possible along entire roadway lengths and corridors for cyclist safety and comfort. Unmarked, shared lanes are usually safe and sufficient for cyclists in residential neighborhoods as well as other locations where automobile traffic volumes are low and travel speeds are 30 mph or less. In the suburban and rural areas, shoulders are the primary facility for cyclists.

Sidewalks are not considered part of the bicycle infrastructure. Except for young children, bicyclists should not ride on the sidewalk. Bicycles are vehicles and should be operated within the roadway in accordance to the state and local Vehicle and Traffic Laws.

Local Systems Inventory

- Inventory of facilities and infrastructures
- Maintenance of inventory

An overview of the Binghamton Urban Area’s designated bike route network, and inventory of bicycle facilities is provided in Section VII of this Bicycle Plan.

Regional Greenway Trail System - Two Rivers Greenway

Multi-use trails are an important resource to supplement roadway bicycle facilities. They provide additional connections to destinations, and in some cases, provide cyclists access where roadway facilities are not able to be constructed. Both sidewalks and multi-use trails are important parts of the transportation system, and the constructing of one should not preclude the constructing of the other.



Two Rivers Greenway Logo

As noted earlier, the *Binghamton Metropolitan Greenway Study* was completed during December 1999, with a subsequent *Implementation Plan* during March 2000. Implementation efforts for the regional trail system have been ongoing since then. Currently about 38% of the proposed greenway trail system has been either built or has been funded.

Also noted earlier, BMTS contracted with a consultant to produce a *Sign Plan and Design Guide* for the regional greenway trail system. A project is now underway for the fabrication and installation of the signs on the *Two Rivers Greenway* existing trails that should be completed during 2015.

Table 4 is a list of trails that are a part of the regional trail system, and Table 5 is a list of trails that are funded and in development.

Table 4: Existing Two Rivers Greenway Trails		
Trail Name	Jurisdiction	Length (miles)
Owego Riverwalk	Village of Owego	0.25
Chugnut Trail – River Terrace to Riverview Dr	Village of Endicott	0.70
Vestal Rail Trail - Main St to African Rd	Town of Vestal	2.09
Vestal Rail Trail – Phase 2 Castle Gardens to Main St	Town of Vestal	1.62
South Washington Street Pedestrian & Bicycle Bridge	City of Binghamton	0.10
Confluence Park	City of Binghamton	0.10
Chenango Riverwalk - Confluence Park to Court St	City of Binghamton	0.39
Chenango Riverwalk - Court St to East Clinton St	City of Binghamton	0.28
Chenango Riverwalk - Water St to Eldredge St	City of Binghamton	0.40
Chenango Riverwalk - Eldredge St to Cheri Lindsey Park	City of Binghamton	0.50
Otsiningo Park/Otsiningo Park Ext.	Broome County	3.50
Port Dickinson Community Park	Village of Port Dickinson	0.75
Conklin Multi-use Trail	Broome County/Town of Conklin	1.40
Total Existing Miles:		12.08

Table 5: Funded Two Rivers Greenway Trails

Trail Name	Jurisdiction	Status of Completion	Funding Source	Cost Estimate (millions)	Length (miles)
Vestal Rail Trail – Phase 3 Broome Co line to Castle Gardens	Town of Vestal	TBD	TBD – Used for Phase 2	\$0.660	1.50
Vestal Rail Trail – Phase 4 African Rd to Sycamore Dr.	Town of Vestal	TBD	TBD – Used for Phase 2	\$0.736	0.46
University Trail - Bing U. East to South Washington St. Bridge	NYSDOT	In Design	NHS (<i>Design only</i>)	\$2.522 (<i>Design only</i>)	1.91
Susquehanna North Trail – Confluence Park to Exchange St.	City of Binghamton	Construction in 2015	TEP	\$0.668	0.40
Chenango Riverwalk – Cheri Lindsey Park to Bevier St	City of Binghamton	Construction in 2015	TEP	\$0.971	0.41
Prospect St to Bevier St	NYSDOT	Phase 2 Prospect Mt.	NHS	Unknown	0.68
South Otsiningo Riverfront Trail – <i>Note: Project replaces & widens existing trail.</i>	Broome County	Construction in 2015	TEP	\$0.508	1.30
Total Funded Miles:					6.66

TEP = Transportation Enhancements Program (Federal Funds)
 NHS = National Highway System Program (Federal Funds)
 TBD = To Be Determined

As previously noted, the Bicycle Route Map - Greater Binghamton Area shows the existing and funded walking and biking trails that comprise the Two Rivers Greenway. Printed maps are available for free from BMTS, and the map can be downloaded at <http://www.bmtsonline.com/bmts/map>.

The Village of Endicott used Local Waterfront Revitalization Program (LWRP) funding from the New York State Department of State for a study to plan trails on the north banks of the Susquehanna River, extending the Chugnut Trail westward and providing connections to several parks including Mersereau Park, Roundtop Park, Grippen Park, the Tri-Cities Airport, Route 17C Sports Facility, and Glendale Park. Conceptual locations for trail projects have been made for several locations. This proposed trail is identified as high priority trail in the Four Rivers LWRP for Broome County. The Chugnut Trail Extension Project Feasibility Study was completed during March 2012.



Cyclists using Chenango Riverwalk in Binghamton, NY

Additionally, due to catastrophic flooding events during 2006 and 2011, many property owners in the flood

plain are applying to be “bought-out” by the Federal Emergency Management Agency (FEMA). Once bought-out the property becomes publicly owned, which is potentially an opportunity for further trail development along the corridors of the Susquehanna and Chenango Rivers.

BMTS will continue to promote and seek opportunities for funding trail projects in the effort to complete, as well as expand the Two Rivers Greenway.

Parks or recreational areas are other places where people can cycle for recreation and exercise. In Broome County parks located within the metropolitan area, Otsiningo Park is a popular park for biking. People also cycle in Tioga County's Hickories Park. Chenango Valley State Park, immediately adjacent to the BMTS region, has on-road and off-road biking trails. There are also opportunities to cycle in municipal parks. To enable maximum access to park facilities for the all sectors of the population, connections with bicycle facilities (e.g. bike lanes, trails, and wide shoulders in rural areas) are needed.

Bike Parking

Bike Parking facilities are also a critical component of an area’s cycling infrastructure. Bicycle racks in various designs are the most prevalent form of bike parking facilities in the Binghamton Urban Area. Bike racks are typically at public facilities like parks, libraries and government offices, or in the municipal right-of-way along a street. Private establishments may also provide bike parking racks on-site. Bike parking facilities, however, are sporadic and not uniform since municipal codes of municipalities in the Binghamton Urban Area do not currently have bike parking requirements and design standards. The Broome County Health Department funded the installation of bike parking bollards in downtown Binghamton, and the Owego Rotary Club installed bike parking racks in the Village of Owego. However, poor location of the bike racks results in lack of use, as cyclists choose to lock their bikes to sign posts, trees, or other fixed objects.

Bike Share Programs

Binghamton University – Bearcat Bikeshare is a free student service available to anyone with a Binghamton University (BU) ID. The bike share policies are listed below:

- **Hours:** The Bike Share hours are from 12 PM – 8 PM every day. All bikes must be back by 8 PM so the maintenance team can check them for damage and make repairs.
- **Time Limit:** After signing a bike out at the Old Union Information Desk, the bike is yours for up to 4 hours! If you would still like to ride the bike, you may sign it out again at the Information Desk. All bikes must be back by 8 PM when the program closes for the night.
- **Lock it up:** never leave an unlocked bike unattended. If you walk away from the bike, please lock it to a bicycle rack. The lock should go through the bike frame to prevent theft. When you return the bike, please lock it to our rack.
- **Damage:** If you notice any damage to the bike, please contact the Bike Share as soon as possible so it can be repaired.



For more information about the Binghamton University – Bearcat Bikeshare program see <http://binghamtonbikeshare.com/> or <https://www.facebook.com/BinghamtonUniversityBikeShare>.

2. Maintenance

As noted in the previous section of this Plan, municipalities and NYSDOT are responsible and held liable to maintain their roadways to be safe for all legal users, including bicyclists. The following are several bike specific maintenance matters:

Pavement Markings: NYSDOT and all municipalities in the Binghamton Urban Area stripe or refresh striping and pavement markings, including bike lanes, sharrows, and shoulders, on roads using a cyclical schedule. It is important for municipalities to plan ahead for each restriping project as they are an opportunity to add new pavement markings or even change the striping design to better support bicycle traffic, as well as automobile, public transit, and pedestrian modes.

Street Sweeping: The 1996 Pedestrian & Bicycle Plan states that several municipalities in the BMTS region sweep their streets 2-3 times per year, typically beginning in early to mid-spring to remove winter debris. Frequent removal of debris along the sides of roadways where bicyclists typically ride is particularly important.

Signal Activation: Bike sensitive traffic signal actuation equipment is essential for cycling safety. Induction loops in the pavement should be designed with their sensitivity adjusted to detect bike. See Appendix 5, Exhibit 7 for the NYSDOT specifications for bike sensitive induction loops and bike placement marking. Video and microwave (radar) detection technology has also been demonstrated to effectively recognize the presence of bicycles.

Sewer Grates: The 1996 Pedestrian & Bicycle Plan states that the Town of Union, and the Villages of Johnson City and Endicott report that virtually all "tire-catching" sewer grates, a significant hazard to cyclists, have been replaced. The City of Binghamton and the Town of Owego have replaced most tire-catching grates and continue to install safer grates as funding permits. Since then, with increased opportunities to review roadway projects for bike safety elements, NYSDOT and the other municipalities have been sensitive to the need to install bike safe sewer grates.

To aid in maintaining the roadway system for bicyclists, the public can notify the appropriate municipality with roadway jurisdiction when a safety hazard is identified (e.g. unsafe drainage grate, broken glass alongside of road), when signal activation not working properly, when pavement markings are worn away, or when other maintenance is needed.

Mutli-use Trails:

Maintenance of each trail segment of the Two Rivers Greenway is the responsibility of the municipality with respective jurisdiction of the segment(s). Maintenance includes keeping the trail in good



Chenango River Promenade, Binghamton, NY



Chenango Riverwalk, Binghamton, NY

condition, vegetation control, managing safe and proper trail use, signing, snow removal if desired, adding enhancements such as benches, and general upkeep. Opportunity exists for private sector and community involvement in maintenance and enhancement of the trails. Examples of such involvement are on the Binghamton Chenango River Trail with plantings of trees, flowers and shrubs; the “Tuesday Walkers” group that maintains the plantings; trail cleanup on the Day of Caring; artistic enhancements including murals & mosaics; and organizing activities on the trails.

G. Safety and Accident Data

- Safety and Accident Data
- Local data
 - Maps of accident occurrences
 - Existing safety programs

1. Local data

At the time of the 1996 Plan, there were two data bases of accident reports maintained by the NYSDMV. The State Accident Surveillance System (SASS) and the Consolidated Local Accident Surveillance System (CLASS) summarized accident data for the State highway system and local roads, respectively. Accidents included collisions between motor vehicles and either pedestrians or cyclists. Only reported accidents were included, using standard accident reports filed either by police agencies, or by motorists through their insurance companies.

SASS/CLASS data was extracted for Broome and Tioga Counties from 1990-1993. In all, 207 pedestrians and cyclists were injured in accidents with motor vehicles. Ten people died as a result of their injuries. The average age of Tioga County residents involved in these accidents is 15.5 while the average age for Broome County residents is 20.4. These statistics must be viewed with the understanding that except for those resulting in injury, many bicycle and pedestrian accidents go unreported.

Many of the accidents documented by SASS/CLASS occurred when pedestrians and cyclists shared the road with motorists. Other contributing factors include driver inattention, darting out of a pedestrian or cyclist, absence of adequate crosswalks, crossing against signals, cycling against the flow of traffic, view obstructions, road debris, pedestrian error, glare, or playing in the roadway. This points to a need to stress road sharing in any future safety education program.

The current source for accident information is the New York State Accident Location Information System (ALIS). ALIS is a multi-agency collaboration to develop a Geographic Information System (GIS)-based Accident Location Information System (ALIS), combining several state organizations’ information systems to improve the location accuracy and streamline the processing of traffic accidents. (Kevin Hunt, NYSDOT & Jackie Magnant, ESRI) For detailed ALIS information, see www.gis-t.org/files/EAPPb.pdf.

Table 6 below shows ALIS data for the Binghamton Metropolitan Area for pedestrian- and bicycle-vehicle accidents from 2012 – February 2014. This data will be used as a baseline for performance measurement.

Table 6

Bicycle- and Pedestrian-Vehicle Crashes 2012-2014 Binghamton Metropolitan Planning Area						
	Year			Location		
	2012	2013	Feb. 2014	Intersection	Not at Intersection	Unknown
Bicycle-Vehicle	45	50	0	60	30	5
Total: 96						
Pedestrian-Vehicle	78	66	7	79	64	8
Total: 153						

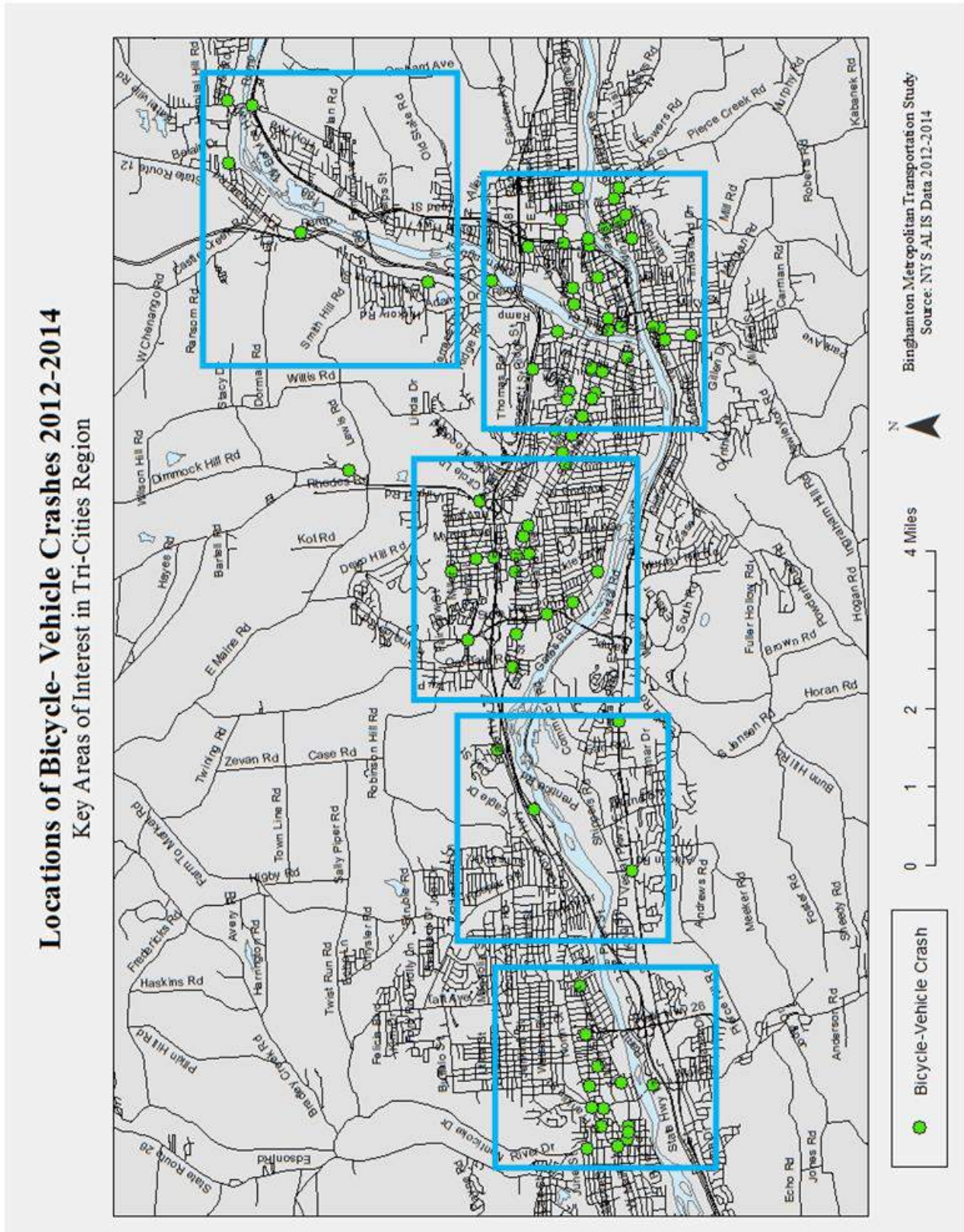
Table 7 shows the breakdown of bicycle- and pedestrian-vehicle accidents for the Binghamton Metropolitan planning area by municipality for 2012- February 2014.

Table 7: Bicycle- and Pedestrian-Vehicle Crashes 2012-2014

Bicycle- and Pedestrian-Vehicle Crashes 2012-2014 Binghamton Metropolitan Planning Area		
Municipality	Pedestrian-Vehicle	Bicycle-Vehicle
Binghamton	71	40
Candor	1	0
Chenango	5	4
Conklin	2	3
Dickinson	6	3
Endicott	17	12
Fenton	2	1
Johnson City	11	12
Kirkwood	4	2
Maine	1	0
Owego	7	5
Port Dickinson	1	0
Tioga	2	0
Union	14	6
Vestal	5	3
Windsor	1	3
Unknown	1	1

The following maps (Maps 4 – 9) show the locations of bicycle-vehicle crashes from 2012- February 2014.

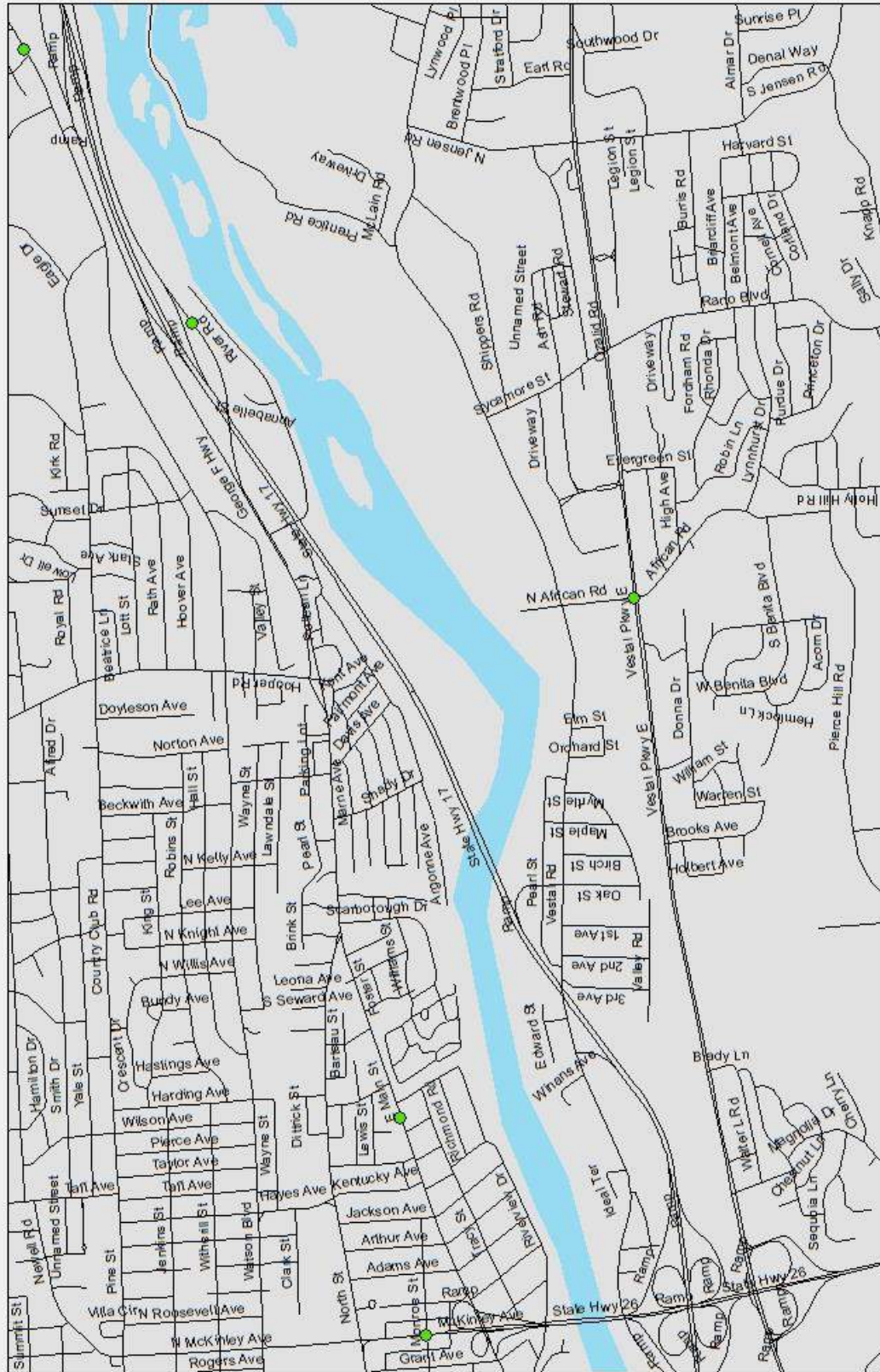
Map 4



Map 5

Locations of Pedestrian-Vehicle Crashes 2012-2014

Vestal and Endwell



Binghamton Metropolitan Transportation Study
Source: NY S AL IS Data 2012-2014



Bicycle-Vehicle Crash

Map 6

Locations of Bicycle-Vehicle Crashes 2012-2014 Johnson City



0 0.375 0.75 1.5 Miles

N

Binghamton Metropolitan Transportation Study
Source: NYS ALIS Data 2012-2014

Map 7

Locations of Bicycle-Vehicle Crashes 2012-2014

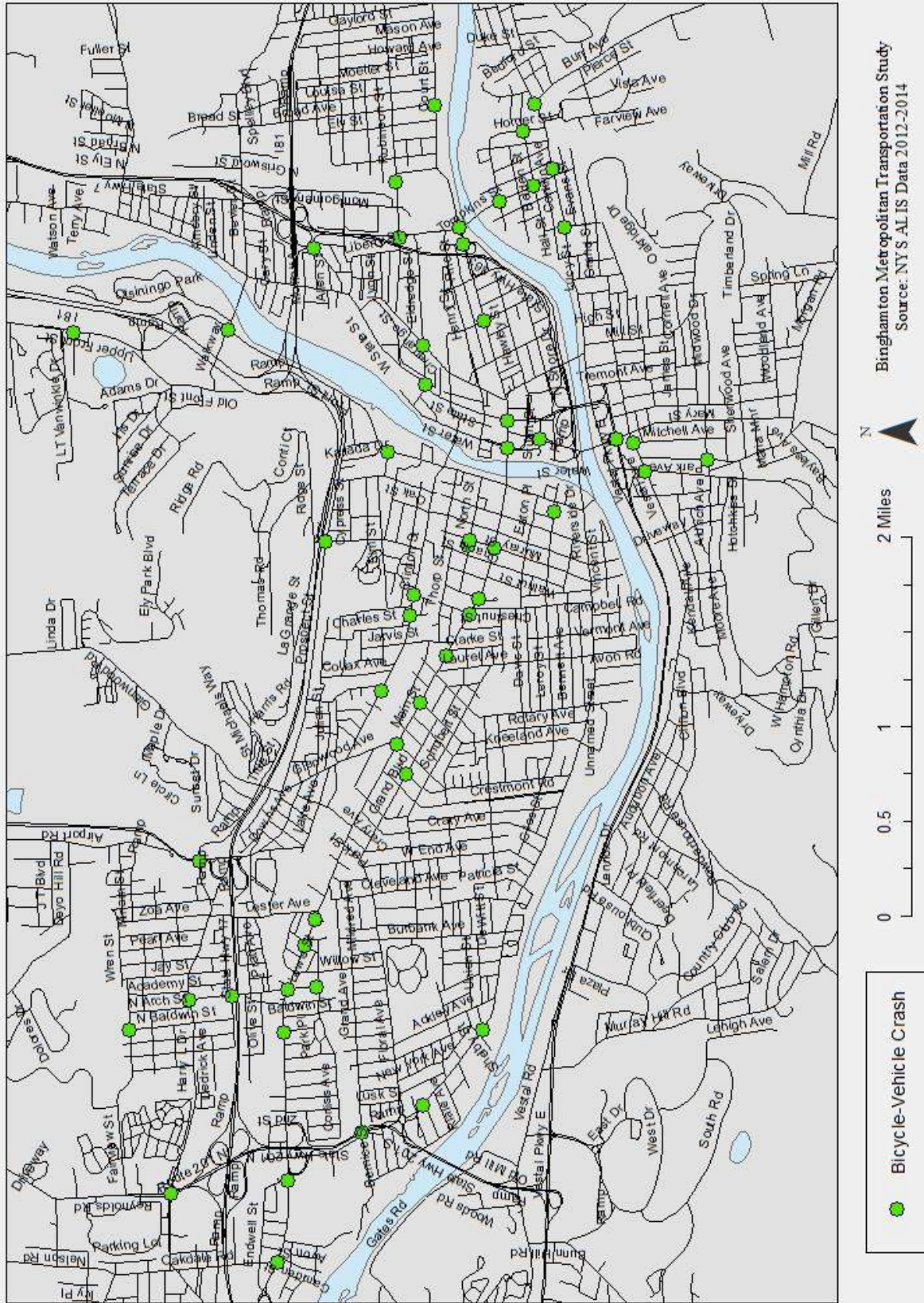
Binghamton's Westside



Map 8

Locations of Bicycle-Vehicle Crashes 2012-2014

Binghamton

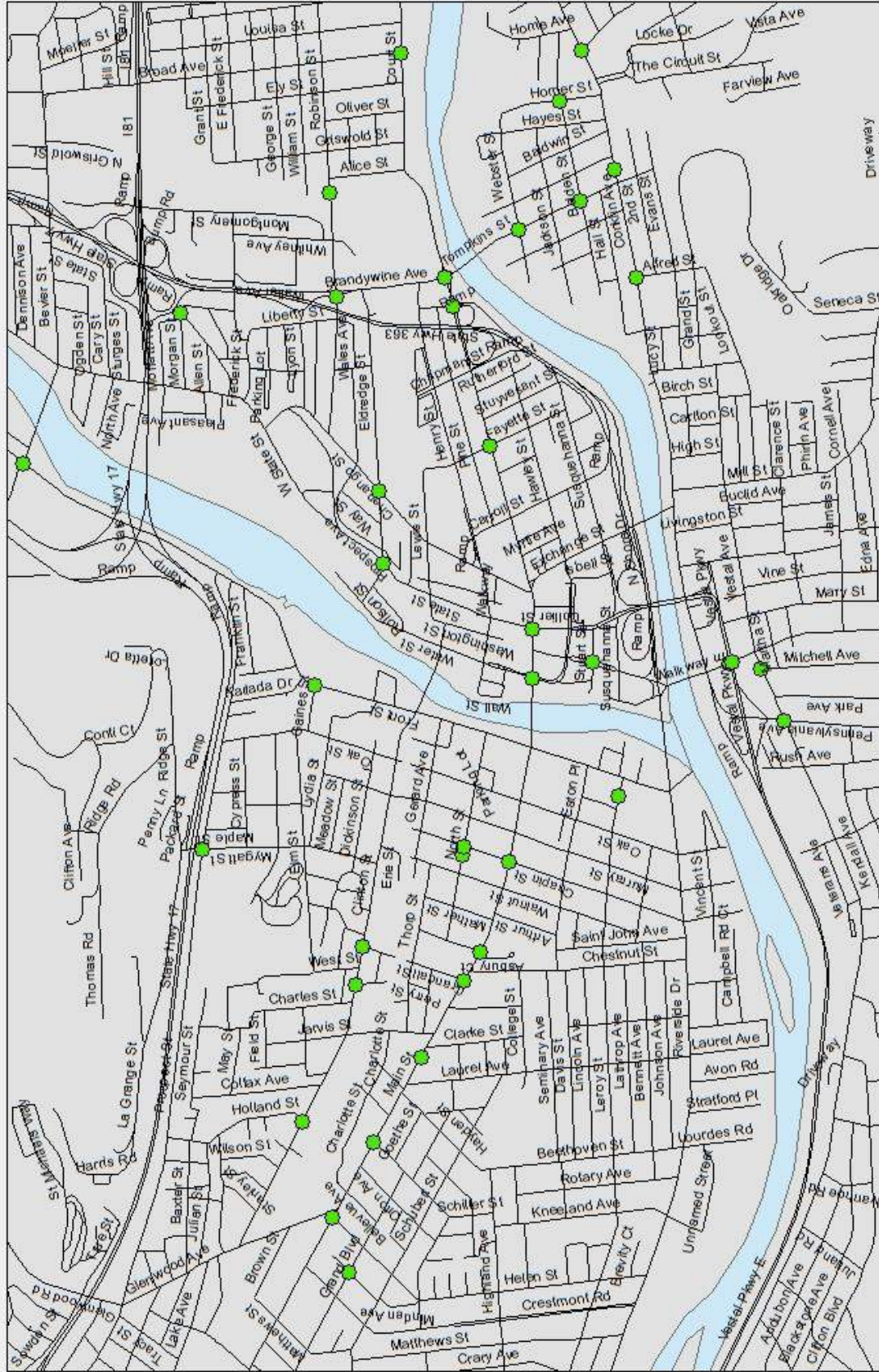


Binghamton Metropolitan Transportation Study
Source: NY S AL IS Data 2012-2014

Map 9

Locations of Bicycle-Vehicle Crashes 2012-2014

Downtown Binghamton



Bicycle-Vehicle Crash

●

0 0.275 0.55 1.1 Miles

North Arrow

Binghamton Metropolitan Transportation Study
Source: NYS ALIS Data 2012-2014

2. Existing safety programs

Currently, the Broome County Division of Health, as part of its injury prevention mission, houses a Traffic Safety Program which includes safety education programs for bicyclists and pedestrians. The program is funded through an annual grant from the Governor's Traffic Safety Committee.

NYS DOT also addresses bicycle and pedestrian safety in the course of performing safety investigations of high crash locations (HCL), and through scoping and design of its highway and bridge projects.

H. Relationship to Public Transit

BC Transit, operated by the Broome County Department of Public Transportation, is the sole public fixed route transit provider for the Binghamton Urban Area. For more details about BC Transit, as well as Broome County's paratransit services, BC Lift (for persons with disabilities) and BC Country (for rural Broome County residents), go to www.ridebctransit.com.

Tioga County's public transit service, Ride Tioga, ceased operation as of November 30, 2014. The possibility of BC Transit providing service between the Village of Owego and Broome County is being investigated.

One other important component of public transit in the area is the Off Campus College Transport (OCCT) service, a completely student operated and managed enterprise. OCCT serves Binghamton University students and staff. More information about OCCT can be obtained at www.occtransport.org.

Both BC Transit and OCCT have installed bike racks on the front of their bus fleets, with each rack carrying two bicycles. There is no added fee to use the bike rack. See www.ridebctransit.com/transit/bikerack for instructions on using the bike racks. Enabling transit to be accessed by and carry bikes expands the area where transit service can be accessed. Therefore, a contiguous network of roadway bike facilities and multi-use trails are critical to maximize cyclist access to bus stops and desired destinations.

Additionally, the Greater Binghamton Transportation Center is home to several intercity bus services of Coach USA (www.coachusa.com), Greyhound (www.greyhound.com), Megabus.com (us.megabus.com/), and Trailways (www.trailwaysny.com). Each company has specific regulations available on their website about how a customer needs to pack a bicycle that they are bringing with them. Bike parking is available Transportation Center in the form of a bike parking rack. Bike parking lockers are not available at this time. Other information about the Greater Binghamton Transportation Center is available at www.ridebctransit.com/transit/greater-binghamton-transportation-center.

Relationship to Public Transit

- BC Transit and BC Lift
- Ride Tioga
- OCCT
- Greater Binghamton Transportation Center



Bicyclist using BC Transit bus bike rack at Binghamton University. Image courtesy of www.ridebctransit.com

I. Relationship to Public Health

This plan identifies bicycling’s relationship with public health in that it creates physical, mental, and environmental benefits. An established, safe, and connected network of bicycle facilities is essential to engaging the public of Broome and Tioga Counties and surrounding areas in healthy lifestyles.

Bicycling and its physical relationship to public health is simple: using a bicycle is exercise, which is an essential part of being physically healthy.

Building and improving bicycle infrastructure around Broome and Tioga Counties will allow citizens, as well as those from surrounding areas, to exercise by using bicycles for both recreational and utilitarian purposes, such as to get to work, the grocery store, or school. Thus, with the proper infrastructure, residents and visitors alike will be able to get more exercise by incorporating more physical activity into one’s daily life.

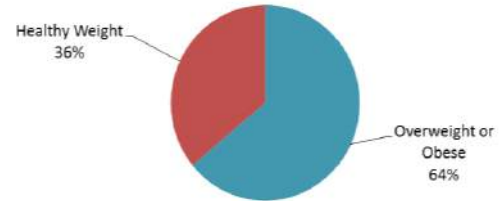
This potential for more physically active lifestyles is crucial to citizens’ health, as Figure 1 shows that almost 65% adults in Broome County (“Broome County Community Health Assessment 2013 - 2017”) are either overweight or obese. Similarly, Figure 2 shows that 63% of the Tioga County population have identified themselves as being overweight or obese (“Tioga County Community Health Assessment 2010 - 2013.”). According to The Center for Disease Control and Prevention, adults should achieve at least 150 (about 20 a day) minutes of physical activity a day, while children should get 420 (about 60 minutes a day) to be physically healthy. Having the ability to bicycle gives citizens the opportunity to get the exercise that is needed to reach and maintain a healthy weight.

Not only do citizens need the opportunity to bicycle for their health, studies have shown that they want this opportunity. Figure 3 (shown on next page) shows that when asked what would encourage Broome County residents to exercise more, three of the most popular responses were more recreational space, maintained sidewalks, and improved pedestrian and bicycle access. Each of these responses is supported in this bicycle plan.

Relationship to Public Health

- Physical Benefits
- Mental Benefits
- Environmental Benefits

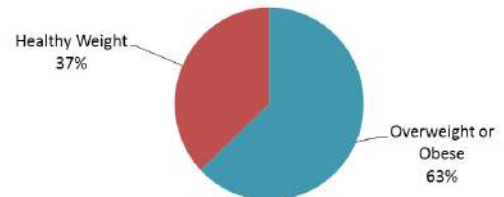
Broome County Weight Distribution



Broome County Community Health Assessment 2013 – 2017
Distribution shown for adults only.

Figure 1

Tioga County Weight Distribution



Tioga County Community Health Assessment 2010 – 2013
Distribution shown for adults only.

Figure 2

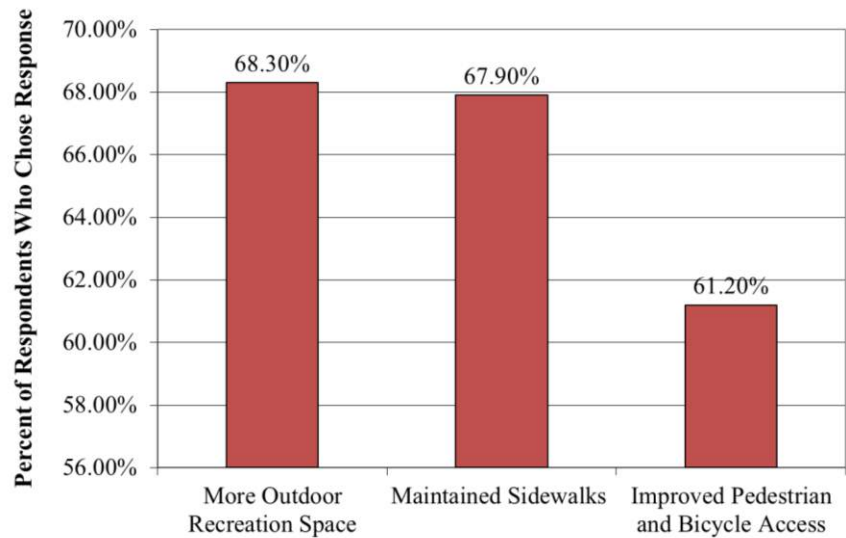


Cyclist using bike lane on Court Street, Binghamton, NY

In addition to bicycling as a means to control weight, bicycling has many other physical health benefits, such as lowering the risk of heart disease, stroke, type II diabetes, and certain cancers (Center for Disease Control, 2012).

Another aspect of physical health that relates to the bicycle plan is physical safety. Many people believe that more can be done to mitigate stressful and unsafe conditions in roads and intersections in Broome and Tioga County. Similarly, some off-road trails could be improved with pavement or signage. This bicycle plan recognizes these deficiencies and provides recommendations to improve the bicycling experience in the area, encouraging increased bicycling.

What Will Encourage Broome County to Exercise



Data from Broome County Health Assessment 2013-2017

Figure 3

Beyond the physical health relationship that this bicycle plan identifies, there are also several mental health benefits related to public health and bicycling. For example, bicycling is shown to improve one’s confidence and sense of well-being, while lowering stress levels (Cavill and Davis). Additionally, bicycling at a mild to moderate level is known to release natural endorphins that make a person happy (bikeradar.com). Finally, bicycling facilitates interaction with others (an important part of mental health), since many bicyclists travel with a partner or group.

A bicycling initiative that provides both mental and physical health benefits is the Safe Routes to School program. These programs seek to provide routes and trails that are safe for children to use for walking or bicycling to school. Provision of Safe Routes to School initiatives not only supports physical health by helping children achieve their recommended daily physical activity, but improves mental health, as studies have shown that students who get more exercise perform better in the classroom (British Journal of Sports Medicine, 2013). Because of this, it is important for Broome and Tioga Counties to facilitate Safe Routes to School initiatives in order to support public health. For more information about Safe Routes to School, visit www.saferoutespartnership.org/ or www.saferoutesinfo.org/ or www.fhwa.dot.gov/environment/safe_routes_to_school/.

The last aspect of the relationship between bicycles and public health is environmental. Since bicycles do not emit any type of pollution, they are a sustainable method of transport that does not have a harmful effect on the environment. In contrast, other methods of transportation such as car and transit produce both air and sound pollution. For example, automobiles emit carbon dioxide, a toxic gas that harms depletes air quality. While the Binghamton area is already in compliance with air quality standards, municipalities should always strive to retain and improve healthy air qualities. Facilitation of bicycles will decrease the need for car trips, thus improving the atmosphere through improved air quality and noise reduction.

Combined, these health benefits of bicycling depict the overwhelming need for bicycle facilitation in our communities and justify the increased support Broome and Tioga County must have for alternative methods of transport such as the bicycle.

For more health benefits of bicycling, visit www.peopleforbikes.org/statistics.

J. Relationship to Economics

The relationship between bicycles and the economy is recognized on many different levels. Bicycles, along with their infrastructure, offer many economic benefits that will be discussed.

On an individual level, bicycling is an inexpensive alternative to the automobile. The average annual cost of operating a car is \$8,220 while the cost of operating a bicycle is only \$308 (U.S. Bureau of Transportation Statistics, 2012). If even a portion of car trips are converted into bicycle trips, a large amount of money can be saved on transportation and spent elsewhere in the area, helping to improve the local economy.

Relationship to Economics

- Transportation Costs
- Accessibility
- Local Shopping Trips
- Land Value
- Business Growth
- Tax Revenue
- Tourism
- Municipality Cost
- Health Care Costs
- Job Creation and Retention

In addition to cheaper travel costs, improved bicycle facilities will also provide many residents who don't own cars with access to jobs, schools and colleges, stores, and restaurants that would otherwise be too difficult or too far to reach. Thus, investment in bicycle facilities results in improved quality of life for area residents.

Another way that bicycles and bicycle facilities relate to the economy is through the value of land that is close to bicycle infrastructure. According to the pamphlet published by The Business Council and the New York Parks and Conservation Association, "Greenways and Trails," the value of a home or business is increased if it is located near a bicycle route, trail, or even a facility such as a bicycle rack. In fact, homes located with half a mile of Indianapolis' popular multi-use trail, the Monon Trail, had a value 11% higher than identical houses further away (Darren Flusche, 2012). Furthermore, a study in Minneapolis and St. Paul, Minnesota found that for every 400 meters closer a median-priced home was to an off-street bicycle facility, the home's value increases by \$510 (peopleforbikes.org).

In the same sense, retail businesses and restaurants have been shown to have improved business when they support pedestrian and bicycle transit rather than only the automobile (Darren Flusche, 2012). Broome and Tioga Counties' retail and restaurant industry has the potential to see these improvements upon provision of bicycle facilities as described in this plan. Likewise, if businesses in the area are receiving more customers and more sales, other businesses will decide to locate in that area in order to reap the benefits that bicycle infrastructure creates. Not only does this decrease the amount of vacant buildings in the area, it increases the associated municipality's tax revenue due to an increase in the tax base.

A municipality will also benefit from bicycling due to the fact that bicycle lanes, routes, and associated facilities are cheaper to build and maintain than those of the automobile. For example, the amount of money it takes to build parking for four cars could build parking for 75 bikes (The Daily Vanguard Online). Therefore, if a city or town facilitates bicycle travel instead of solely vehicular, there is potential financial savings that can be invested elsewhere to improve the area. Furthermore, by improving the area with these funds, more people will be attracted to visit and spend money.

Provision of multi-use trails along a river or through other unique areas especially relate to the economy because they not only attract local bicyclists, but tourists as well. Whether spent on hotels, restaurants, or local souvenirs, tourist commerce supports the local economy immensely and serves as a huge potential asset to the area's future growth.

For example, the Erie Canalway Trail in Upstate New York has brought approximately \$253 million in sales and \$28.5 million in taxes to the Upstate economy each year (The Economic Impact of the Erie Canalway Trail, 2014). As an area with its own scenic and historic value, Broome and Tioga Counties have the potential to also benefit economically in this fashion.

Apart from the trails themselves, local bicycle events such as Bike Tioga and the Binghamton Bridge Pedal also attract bicyclists, both locals and tourists. Many people are interested in local bicycle events such as these and are excited to be involved with them. In fact, the Binghamton Bridge Pedal has attracted over 100 participants each year. The importance of events such as these that stimulate the economy by bringing people to the area while increasing bicycle interest should not go unnoticed. To continue holding these events, municipalities must take into consideration their level of bicycle accommodation and seek to improve areas that do not support bicycling. By doing this, more bicycling events can be held to further promote bicycling as well as the area's economy.

Perhaps one of the most overlooked economic benefits of bicycling is the fact that the increased exercise works to improve people's health, resulting in less sickness and doctor visits. Thus, medical costs for area residents have the potential to be lower. Currently, the annual medical costs in the United States related to physical inactivity are estimated to be 75 billion dollars, or close to 10% of all medical costs (Center for Disease Control, 2012). Significant savings can be realized by area residents when an active lifestyle is enabled and their health improves. What's more, not only can area residents save money, they can spend it in the local economy.

Lastly, bicycling relates to the economy due to the fact that improving bicycle infrastructure and bicycling opportunities will help to create and retain jobs. These jobs would arise from all aspects of bicycle facilitation, from building and maintaining infrastructure, to providing bicyclists with bicycle repair and supply shops. An increase in area residents earning income in turn increases the amount of money spent and invested in the local economy. The Erie Canalway Trail again exemplifies these benefits in that it creates 3,440 jobs and \$78 million in labor income (The Economic Impact of the Erie Canalway Trail, 2014) every year. Just as the Erie Canalway has created jobs, the Broome and Tioga County area has the opportunity to do the same.

Case Study: The Erie Canalway Trail



The Economic Impact of the Erie Canalway Trail, 2014

For all of these reasons and more, it is imperative that area municipalities work to promote and facilitate bicycles in the manner described in this plan during current and future projects in order to improve their local economy. For more economic benefits of bicycling, visit www.peopleforbikes.org/statistics.

K. Relationship to Multidisciplinary Partnerships

As is evident from the previous sections B, I, and J, transportation decisions directly and indirectly affect various aspects of the population's quality of life, as well as the goals and objectives of agencies from multiple disciplines. In times past, it has been the practice to compartmentalize decision making by a specific discipline or subject area without regard to or at least unaware of the impact those decisions have in other sectors.

Especially with less resources and funding available in general, it is important for agencies and representatives from multiple disciplines to work together to accomplish complementary goals & objectives. This encourages efficient spending that maximizes the return on the investments. As noted earlier, BMTS is participating in several committees and coalitions comprised of representatives from various disciplines. Projects have come to fruition and policies have been adopted that improve the Binghamton Urban Area's bicycle friendliness as a result of BMTS partnering with agencies of different expertise.

To ensure continued improvement in providing for bicyclists' needs, it is important to maintain, strengthen and expand these collaborative efforts, particularly in the transportation planning process at the federal, state, MPO, and local levels. Ample opportunity needs to be provided for other stakeholders to join in the process when transportation decisions are affecting them, or when their practices impact the transportation system.

Relationship to Multidisciplinary Partnerships

- Transportation decisions affect various aspects of the population's quality of life
- With less resources and funding available, it is important for multiple disciplines to work together

V. SYSTEM DESIGN

System Design

- Description of bicycle facilities
- Maintenance of facilities

This section presents recommended design guidelines for bicycle facilities. These standards may need to be modified to accommodate unique local circumstances. However, using uniform standards improves the public's familiarity with and understanding of bicycle facilities.

Since the 1996 Pedestrian & Bicycle Plan, numerous guidelines for bicycle facility design have been and continue to be published. The primary

resources highway designers should refer to for bicycle facility design are:

- Chapter 17 of the *NYS DOT Highway Design Manual (updated March 2006)*
- *AASHTO's Guide for the Development of Bicycle Facilities 2012 – 4th Edition*
- The *Manual of Uniform Traffic Control Devices (MUTCD)* establishes warrants for signs, pavement markings, and signals. After the update of the *Federal MUTCD* during 2009, the *New York MUTCD* adopted the *Federal MUTCD* with a few exceptions.
- *NACTO Urban Bikeway Design Guide, Second Edition*
- *NACTO Urban Street Design Guide*
- *Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guidelines – 2nd Edition*

Below are bicycle facility types along with general design guidelines using the primary reference resources listed above, as well as the Access Board's ADA Accessibility Guidelines (ADAAG).

Much more detail for design options are found throughout the entire text of each of the primary and many other design guide publications (See list of Design Guide Publications in Appendix 5, Exhibit 1).

Additionally, design considerations for the bicycle facility types are found in Appendix 5, Exhibit 2.

A. Bicycle Facilities

1. Shared Lanes

Bicycles may be operated on all roadways except where prohibited by statute or regulation. The vast majority of roadways locally, in New York State, and beyond consist of lanes shared by bicyclists and vehicles. Shared lanes exist for most roadway contexts including: local neighborhood streets, city streets, as well as urban, suburban, and rural streets. Though no specific design guidelines exist for shared lanes or roadways, various design features can make shared lanes more compatible with bicycling: good pavement quality; adequate sight distances; roadway designs that slow motorist speeds; and bike compatible drainage grates, bridge expansion joints, and railroad crossings (Section 4.3 of the *AASHTO Guide to Bicycle Facilities, 4th Edition*).

Below are common design options for shared lanes:

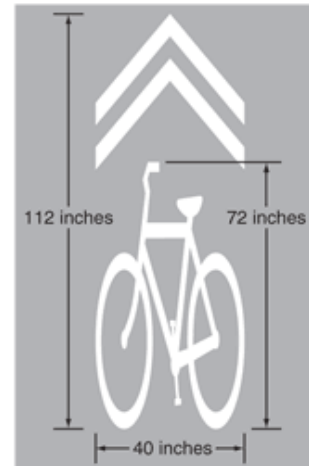
Wide Curb/Outside Lanes for Shared Lanes on Major Roadways:

- Usable lane widths of 14 feet or greater are desired, and allow motorists to pass bicyclists without encroaching into the adjacent lane.
- Usable pavement width is from curb face to the center of the lane stripe, or from edge line to the center of the lane stripe, but adjustments need to be made for drainage grates, parking, and longitudinal joints between pavement and gutter sections. See Appendix 5, Exhibit 3.

- Wider outside lane widths (15 feet) may be necessary to allow the bicyclist more maneuvering space on sections with steep grades or on sections where drainage grates, raised delineators, or on-street parking effectively reduces the usable width.
- The provision of wide outside lanes shall also be weighed against the likelihood that motorists will travel faster in them and heavy vehicles will prefer them over inside lanes, resulting in reduced level of service for bicyclists.
- When sufficient width is available to provide bike lanes or paved shoulders, they are the preferred facilities on major roadways.

Shared Lane Marking/Sharrows

- Shared lane markings (SLM) are useful in locations where there is insufficient width to provide bike lanes, or for a motor vehicle and bicycle to travel side by side in the same lane.
- The SLM also alerts road users to the lateral position bicyclists are likely to occupy within the travel way; encourage safe passing of bicyclists by motorists; and may be used to reduce the incidence of wrong-way bicycling.
- The MUTCD outlines guidance for shared lane markings in [Section 9C.07](#).
- NYSDOT has adopted a Shared Lane Marking (SLM) Policy during December 2013 which has stricter guidance for the use and installation of SLMs than the MUTCD. The SLM Policy (TSMI 13-07) is available at <https://www.dot.ny.gov/programs/completestreets/repository/TSMI13-07final.pdf>.
- The NYSDOT SLM Policy also eliminated the SHARE THE ROAD sign assembly for shared roadways and replaces it with the new Narrow Lane sign assembly shown to the right.
- See Appendix 5, Exhibit 4 for the SLM application diagrams and the NYSDOT SLM Policy.



2. Paved Shoulders

Adding or improving paved shoulders can greatly improve bicycling conditions on roadways with higher speeds or traffic volumes, as well as benefit motorists. Paved shoulders are most likely to be used on rural roadways, as well as on some suburban roads.

For any given roadway, the determination of the appropriate shoulder width shall be based on the roadway's context and conditions on adjacent lanes. The following are design guidelines for paved shoulders:

- On uncurbed roadway cross sections, paved shoulders shall be at least 4 feet wide to accommodate bicycle travel.
- Shoulder width of at least 5 feet is recommended from the face of a guardrail, curb, or other roadside barrier to provide additional operating width, as bicyclists typically shy away from them.
- It is desirable to increase the shoulder width where higher bicycle usage is expected.
- Additional shoulder width is also desirable if motor vehicle speeds exceed 50 mph; if use by trucks and large vehicles is considerable; or if static obstructions exist on the right side of the roadway.
- Coarse pavement materials shall not be used on shoulders, since it creates a rough and uncomfortable bicycling condition.

- If rumble strips are installed, their design shall comply with Section 4.5.2 of the AASHTO Guide to Bicycle Facilities, 4th Edition. In particular, a minimum clear path of 4 feet from the rumble strip to the outer edge of the shoulder, or 5 feet to the adjacent curb is needed; and provision of gaps in the rumble strips spaced at intervals of 40 to 60 feet are necessary to allow bicyclists to move across the rumble strip as needed.

3. Bicycle lanes

Bicycle lanes are a portion of the roadway that has been designated by striping, pavement markings, and signing for preferential use by bicyclists. They are one-way facilities that typically carry bicycle traffic in the same direction as adjacent motor vehicle traffic. Bicycle lanes are the appropriate and preferred bicycle facility for thoroughfares in both urban and suburban areas. Properly designed bicycle lanes encourage bicyclists to operate in a manner consistent with the legal and effective operation of all vehicles.

Bicycle lanes shall have a smooth riding surface. Utility covers shall be adjusted flush with the surface of the lane. Bicycle lanes shall be provided with adequate drainage, using bicycle compatible drainage grates, to prevent ponding of water, washouts, debris accumulation, and other potential concerns for bicyclists.

Use the following criteria when designing lanes:

Conventional Bicycle Lanes:

- Install bicycle lanes with a width of 5 feet when possible, or a minimum width of 4 feet.
- Install lanes with a minimum width of 5' when placed next to curbs.
- Add an additional 1-2 feet where there are high traffic volumes (greater than 15,000 ADT), 5% or more truck traffic, or traffic speeds greater than 35 mph.
- Where parking lanes exist, place bicycle lanes between parking lane and the motor vehicle lane (see Appendix 5, Exhibit 5).



Buffered Bicycle Lanes:

The *NACTO Urban Bikeway Design Guide* describes buffered bicycle lanes as conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. A buffered bicycle lane is allowed as per the MUTCD Section 3D-01 guidelines for buffered preferential lanes.



Typical applications are: Anywhere a standard bicycle lane is being considered; On streets with high travel speeds, high travel volumes, and/or high amounts of truck traffic; and On streets with extra lanes or extra lane width.

- The buffer shall be marked with 2 solid white lines. White lines on both edges of the buffer space indicate lanes where crossing is discouraged, though not prohibited. For clarity, consider dashing the buffer boundary where cars are expected to cross at driveways.
- The buffer area shall have interior diagonal cross hatching or chevron markings if 3 feet in width or wider.

Additional Types of Bicycle Lane Options:

See the NACTO Urban Bikeway Design Guide and the AASHTO Guide to Bicycle Facilities, 4th Edition for other types of bicycle lanes, such as contra-flow bicycle lanes and left-side bicycle lanes that are used in specific roadway contexts.

Bicycle Lane Markings, Signs, and Intersections:

Proper design of bicycle lanes, with supplemental signs when needed, and pavement markings at intersections are critical to creating a safe bicycling environment by clearly indicating correct operation of motorists on non-motorists, as well as reducing conflict among them as well.

- Design guidance for bicycle lane markings, supplemental bicycle lane signs, and bicycle lanes at intersections is found in Section 4.7 and 4.8 of the AASHTO Guide to Bicycle Facilities, 4th Edition, as well as in Chapter 9C of the MUTCD, Chapter 17 of the NYSDOT Highway Design Manual, and the NACTO Urban Bikeway Design Guide. Refer to Appendix 5, Exhibit 6 for suggested designs.

4. Cycle Tracks

The NACTO Urban Bikeway Design Guide defines a cycle track as an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—they provide space that is intended to be exclusively or primarily used for bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks. In situations where on-street parking is allowed cycle tracks are located to the curb-side of the parking (in contrast to bike lanes).

Cycle tracks may be one-way or two-way, and may be at street level, at sidewalk level, or at an intermediate level. If at sidewalk level, a curb or median separates them from motor traffic, while different pavement color/texture separates the cycle track from the sidewalk. If at street level, they can be separated from motor traffic by raised medians, on-street parking, or bollards. By separating cyclists from motor traffic, cycle tracks can offer a higher level of security than bike lanes and are attractive to a wider spectrum of the public.



Cycle Track on the Connective Corridor in Syracuse, NY

The NACTO Urban Bikeway Design Guide provides installation and design guidance for One-Way Protected Cycle Tracks, Raised Cycle Tracks, and Two-Way Cycle Tracks. See <http://nacto.org/cities-for-cycling/design-guide/cycle-tracks/>.

5. Bicycle Boulevards

A bicycle boulevard is a local street or series of contiguous street segments designated and designed to give bicycle travel priority through modification to function as a through street for bicyclists, while discouraging through automobile travel. Local access is maintained. The streets have low motorized traffic volumes and speeds. Bicycle Boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.

Bicyclists riding on bicycle boulevards typically share the roadway with other traffic. Some segments on busier roads with bike lanes. Bicycle boulevards should be long enough to provide continuity over a distance typical of an average urban bike trip (2-5 miles), but can be shorter when needed to connect path segments, or as a short segment on a route between a neighborhood and a school.

Several design elements can be used to accommodate bicyclists including, but not limited to: Traffic Diverters at key intersections to reduce through motor vehicle traffic, while permitting passage for through bicyclists; Neighborhood/Mini-Roundabouts at minor intersections that slow motor vehicle traffic but allow bicyclists to maintain momentum; Other traffic calming features to lower motor vehicle speeds; Wayfinding signs; Shared lane markings where appropriate to alert drivers to the approximate path bicyclists will need to take on a shared roadway, and intersection crossing improvements such as a traffic signal, median refuges, and/or curb extensions.

Not all bicycle boulevards need all the treatments noted above. A local street may already have desired characteristics, while others will need varying amounts of treatments. See the NACTO Urban Bikeway Design Guide and Section 4.10 of the AASHTO Guide to Bicycle Facilities, 4th Edition for more details on the planning and design of bicycle boulevards.

6. Bicycle Routes

Bicycle routes are designated and signed as preferred routes through high demand corridors by the jurisdiction having authority. Use the following guidelines and the information listed in Appendix 5, Exhibit 2 when developing bicycle routes:

- Install signs along route including: narrow lane sign assemblies (See Section V.A.1 of this Bicycle Plan above), bike route signs, and information about destination distances and route direction changes.
- Appropriate bicycle facility widths, drainage grates, railroad crossings, pavement condition, signal responsiveness to bicycles shall be evaluated and improved as needed on roads designated as bicycle routes (Chapter 17 of the NYSDOT Highway Design Manual).

7. Traffic Signals

Section 4.12.4 of the AASHTO Guide to Bicycle Facilities, 4th Edition provides guidance details for adjusting traffic signal operations for bicyclists based on their operating characteristics, which vary among the different types of bicyclists, and are significantly different from motorists. Of particular importance is to make signal adjustments to enable clearance time for bicyclists in intersections assuming the following: (1) a bicyclist initial start-up time of 6 seconds and, (2) a final crossing speed of 10 mph.

- Install bicycle sensitive detectors in all lanes including left turn lanes. See Appendix 5, Exhibit 7 for loop detector designs.

It is noted in Section 4.12.5 of the AASHTO Guide to Bicycle Facilities, 4th Edition that actuated traffic signals should detect bicycles: otherwise, a bicyclist may be unable to call a green signal and may be forced to break the law by violating a red signal.

Various technologies are available for detecting bicycles, including:

- **Inductive Loops** – Induction loop embedded in the pavement. The metal rims of a bicycle intercept the horizontal magnetic field above an induction loop.
- **Video** – Video detection aimed at bicyclist approaches and calibrated to detect bicycles.
- **Microwave** – Miniature microwave radar that picks up non-background targets.
- **Push-button** – User-activated button mounted on a pole facing the street.
- Place a bicycle detector symbol (MUTCD Section 9C.05) on the pavement indicating the optimum position for a bicyclist to actuate the signal. An R-10 sign (MUTCD Section 9B.13) may be installed to supplement the pavement marking.

Maintenance: Inductive loop detector sensitivity settings need to be monitored and adjusted over time.

For more details and information, see Section 4.12.5 of the AASHTO Guide to Bicycle Facilities, 4th Edition, as well as the [Signal Detection and Actuation section of the NACTO Urban Bikeway Design Guide](#).

8. Roundabouts

Roundabouts are increasingly popular design solution for intersections intersections. The primary purpose of roundabouts is to provide motor vehicles with free-flowing mobility at reduced speeds through an intersection. The slower speeds work to provide significant crash reduction benefits for bicyclists when roundabouts are designed with their needs in minds (Section 14.12.11 of the AASHTO Guide to Bicycle Facilities, 4th Edition).

Single lane roundabouts are much simpler for bicyclists than multilane roundabouts, since bicyclists do not need to change lanes, and motorists are less likely to cut off bicyclists when they exit the roundabout. Therefore, authorities should avoid implementing multilane roundabouts before their capacity is needed.



Cyclist using single lane roundabout in downtown Binghamton, NY

In general, bicyclists who have the skills to ride in urban traffic can manage single lane roundabouts with little difficulty, comfortably merging into the lane of traffic. Even at multilane roundabouts, many bicyclists will be able to travel through the roundabout in the same manner as other vehicles, particularly during low traffic volume periods.

- Bike lanes should be terminated in advance of roundabouts; normally 100 feet before the edge of the circulatory roadway.
- Shared lane markings can be used after the termination of the bike lane, and within the roundabout.

Some on-road bicyclists, including children, may not feel comfortable navigating roundabouts on the roadway. Bicycle ramps can be provided to allow access to the sidewalk or shared-use path at the roundabout. See Appendix 5, Exhibit 8 for bicycle ramp design details. Also see the picture to the right that shows the separated shared-use path outside the JC roundabout.



Two lane roundabout with surrounding shared-use path in Johnson City, NY

More information about roundabouts, as well as detailed design guidelines can also be found on the NYSDOT website at www.dot.ny.gov/main/roundabouts, and in FHWA Publication (FHWA-RD-00-067) *Roundabouts, An Informational Guide, 2000*.

9. Other Roadway Considerations

Refer to Section 4.12 AASHTO for other roadway designs considerations for bicycles including: railroad at-grade crossings; bridges, viaducts, and tunnels; traffic calming; traffic management; drainage grates and utility covers; and bicycle travel through interchange areas.

10. Bicycle Parking

The following guidance for bicycle parking is taken primarily from the *Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guidelines – 2nd Edition* and the *AASHTO's Guide for the Development of Bicycle Facilities 2012 – 4th Edition*. Refer to these guides for detailed information in addition to that provided below.

Importance: Bicycle parking is an essential element in a multi-modal transportation system. Secure and convenient bicycle parking not only encourages more bicycling, but it also has some benefits even for non-cyclists:

- *Bicycling is good for business.* Bicycle racks provide additional parking spaces which customers can use to patronize local businesses. Bicycle racks not only invite cyclists in, but they announce to potential cyclist and non-cyclist customers alike that the business supports sustainable values; an increasingly important factor for many customers.
- *Designated, well-designed parking promotes a more orderly streetscape and preserves pedestrian right of way:*
 - It preserves a more orderly appearance for buildings.
 - It prevents damage to trees and street furniture.
 - It keeps bicycles from falling over or blocking the sidewalk.
- *Bicycle parking helps legitimize bicycling as a transportation mode by providing parking opportunities equal to motorized modes.*

Planning: Bike parking facilities can be planned for and installed in a number of ways. Bicycle parking should be provided at all public facilities, should be incorporated into roadway and streetscape projects, and should be an integral aspect of land development and redevelopment process.

All bicycle parking facilities fall into two categories: short-term and long-term. The following table describes the differences between the two types.

Table 8: Criteria for short-term and long-term bicycle parking

Criteria	Short-term	Long-term
Parking duration	Less than two hours	More than two hours
Fixture types	Simple bicycle racks	Lockers, racks in secured area
Weather protection	Unsheltered	Sheltered or enclosed
Security	Unsecured, passive surveillance (eyes on the street)	Secured, active surveillance
		Unsupervised:
		“Individual-secure” such as bicycle lockers
		“Shared-secure” such as bicycle room or cage
		Supervised:
		Valet bicycle parking
Typical land uses	Commercial or retail, medical/healthcare, parks and recreation areas, community centers	Residential, workplace, transit

Source: APBP Bicycle Parking

The majority of bicycle parking is short-term parking. In some cases, short term parking can function as long-term, through strategies such as shelters and locating parking in areas with high pedestrian volumes, which provides eyes on the street or passive surveillance.

- **Short-Term Parking:**

- Bike racks should be constructed of sturdy material, difficult to dismantle, and resists cutting, rusting, or deformation.
- Bike racks allow locking of the frame and one or two wheels with a U-lock. A simple and effective bike rack design is the “inverted-U” as shown in the photo to the right. “Lollipop” style bike racks are also a popular design. See left photo of this style in Binghamton. Artistic designs for bike rack can also



Inverted-U style bicycle parking



Lollipop style bike parking bollard in Binghamton, NY

be effective while promoting public art, as seen in the photo to the following page.

- Bike racks should support the bicycle in at least two places, preventing it from falling over.
- Older "dish-rack" style bicycle parking racks are no longer preferred since they support bicycles only by the front wheel, which can bend the rim. “Wave or ribbon” type racks are not recommended because they are often used incorrectly, and when used as intended do not provide adequate support or spacing.

- Artistically-inspired bike parking racks can add a desirable element to a streetscape. They are also an opportunity to partner with the arts community as well as other community organizations. Care must be taken that such bike racks be designed in accordance with all of the design and location guidelines described above and as follows.



“Artistic” bicycle parking at Museum of Science & Technology in Syracuse, NY.

- Bike parking rack location guidelines:
- Easily accessible from the street and protected from motor vehicles.
- Visible to passers-by to promote usage and enhance security.
- Does not impede or interfere with pedestrian traffic or routine maintenance activities.
- Does not block access to buildings, bus boarding, or freight loading.
- Allows reasonable clearance from opening of passenger-side doors of parked cars.
- Are covered, if practical, where users will leave their bikes for a longer time.

- ◆ Multiple bike racks should be placed with adequate space between the racks to allow for proper use and for racks to utilize full bike parking capacity (See Appendix 5, Exhibit 9).

Long-Term Parking:

Long-term bicycle parking facilities should provide a high degree of security and protection from the weather. They are intended for situations where the bicycle is left unattended for long periods of time, such as apartments, schools, places of employment, and transit stops. Long-term bicycle parking facilities can include lockers, monitored bike parking areas, or a dedicated space or room within a building or a parking garage. The facilities should be well lit and accessible to provide a high degree of personal security. Signs may be needed to direct bicyclists to long-term parking.

Bike Lockers are typically used for long-term bicycle parking because of their security features and protection from the weather

- Bike lockers must:
 - Fully enclose the bicycle.
 - Provide weather protection.
 - Anchor securely to the ground.
 - Resist tampering and vandalism.



Location: Whether it is short-term or long-term parking, bicyclists seek to park as close as possible to their final destination. Bicycle parking should be conveniently placed in a location that is highly visible and as close to the building entrance as practical. In the event that directional signage is needed to indicate the location of bicycle parking, Section 9B.19 of the MUTCD provides a sign that can be used for this purpose. See graphic to the right.

11. Shared-use Paths / Multi-Use Trails

Shared use paths, also referred to as multi-use trails, are a complementary system of off-road transportation routes for bicyclists and other non-motorized users that serve as a necessary extension to the roadway network. Shared use paths shall not be used to preclude on-road bicycle facilities, but rather to supplement a network of on-road bicycle facilities (Section 5.1 of the AASHTO Guide to Bicycle Facilities, 4th Edition).

Install shared-use paths where there is continuous right-of-way that is generally uninterrupted by

intersections. Use the following guidelines when designing shared-use paths:

- NYSDOT's minimum recommended width for shared-use paths is 13 feet (4 meters).
- NYSDOT Highway Design Guide – Ch. 17.5, 2006.
- AASHTO guidelines set a minimum 10 foot wide path. It is preferred to install a 12 foot or wider path, especially where significant pedestrian as well as bicycle traffic are anticipated. Use pavement markings to designate separate bicycle and pedestrian areas.
- Minimize grade to 5%.
- Provide a minimum 2 foot wide graded area on either side of path.
- Sign intersections with streets, both on the path and the street as guided by the MUTCD.

See Section 5 of the AASHTO Guide to Bicycle Facilities, 4th Edition for complete share-use path design guidelines, as well as Appendix 5, Exhibit 10 for typical cross sections of two-way shared-use paths.

It is critical that bicyclist needs be identified and addressed as early as possible in the project development process. It is preferable that this occurs at the Initial Project Proposal stage so an accurate cost estimate can be made, which is essential to create a fiscally constrained list of projects for the Transportation Improvement Program. Too often, bicyclist needs are addressed during scoping or even as late as the draft design review for a project. At these later stages of a project, adding bicycle facilities can significantly increase the project cost, creating a fiscal hardship. Addressing bicyclist needs too late often is labeled as “scope creep”, and not being a part of the original purpose of the project. Thus, addressing bicyclist issues late in the project development process frequently results in compromised bicycle accommodations or none at all being included in the project, despite the importance and need.

Chapter 17 of the *NYSDOT Highway Design Manual* details its design policy and procedural requirements to account for bicyclist needs in the project development process shown below.

17.4 DESIGN OF FACILITIES FOR BICYCLING

Bicyclists have the same rights and responsibilities as the operators of motor vehicles, except as provided in Article 34 of the *State of New York Vehicle and Traffic Law*.

When designing highway projects, it is essential to consider physical improvements for bicycles just as for other vehicles in the traffic mix. Therefore, all state highways should be designed and constructed to safely accommodate known and anticipated bicycle traffic consistent with the needs identified during project scoping or during preliminary design. If the scoping and Design Approval Documents indicate that bicycle facilities are needed, but cannot be provided, an explanation should be provided in the Design Approval Documents.

Special consideration should be given to routes that have been mapped by MPOs, or have been identified in other local or state bicycle transportation plans. Also, special consideration should be given in areas near schools and residences. Significant numbers of children may require special signage that will alert others to their presence.

17.4.1 BICYCLE FACILITIES DESIGN POLICY

Highways and streets where bicyclists are permitted should provide for safe and convenient bicycling. However, not every highway or street requires the provision of specific bicycle facilities in order to improve bicycling conditions. The project scoping and design approval documents should clearly identify where facilities for bicyclists are needed and should be provided. These needs can usually be met through the use of wide curb lanes, bike lanes and/or paved shoulders of adequate width.

Furthermore, NYSDOT's *New York State Complete Streets Report* details how it will comply with Complete Streets Legislation and institutionalize Complete Streets into planning, project scoping and design phases of road projects. This will occur primarily through the use of the Complete Streets Planning Checklist in these project phases. The Checklist is currently under development, but a draft version is available at www.dot.ny.gov/programs/completestreets/nysdot, as will the final version once it is completed.

B. Maintenance

Chapter 7 of the *AASHTO Guide to Bicycle Facilities* provides a comprehensive overview of maintenance and operations needs for bicycle facilities. As the introduction states, bikeways are subject to surface deterioration and debris accumulation, and need maintenance to function well. Poorly maintained facilities may become unusable for bicyclists. Additionally, what may be an adequate roadway surface for automobiles can cause difficulty for bicyclists who ride on narrow, high pressure tires. Uneven longitudinal cracks and joints, gravel, small rocks, branches, and other debris can deflect a wheel. Pot holes can cause wheel rims to bend, broken glass can puncture tires, and along with items mentioned above, can cause falls. A good maintenance program protects public funds invested in bikeways, so they can continue to be used effectively.

A bikeway maintenance program is needed so that facilities are adequately maintained. Sufficient funds should be budgeted to accomplish needed tasks. Neighboring jurisdictions can consider joint programs for greater efficiency and to reduce cost.

Below are some integral maintenance items important for bikeways: (See Chapter 7 of the *AASHTO Guide to Bicycle Facilities* for the full list of maintenance items and details for each.)

- **A Spot Improvement Program** that enables bicyclists and other roadway users to report roadway and bike facility condition needs and concerns to the proper municipal official in important. Municipalities and states should publicize contact information (phone number, email, website, etc.) for the proper office to be contacted to report such needs and concerns. Apps for mobile devices can also be developed to conveniently enable reporting as well. The City of Binghamton announced the availability of such an app available as a free service. The app is accessible in the Apple App Store and Google Play Store. Search "City of Binghamton" or go to these URLs to access: Download iOS- publicstuff.com/iphone/binghamton or Download Android- publicstuff.com/android/binghamton.
- **Signs and Markings**: Signs and markings should be kept in a readable condition, including those directed at motorists. Signs and markings should be inspected regularly. Defective or damaged signs should be replaced as soon as possible, and pavement markings should be replaced as need. Many of the municipalities in the Binghamton Urban Area and the State have a cyclical pavement marking maintenance program, which needs to include cyclical and pedestrian pavement marking maintenance as well.

Repaving projects, along with more significant roadwork projects, are opportunities to make low cost changes to signing and pavement markings that can improve pedestrian and bicyclists safety. A mechanism to review road projects of all types as early as possible in their planning stages is needed so such opportunities are not missed.

- **Sweeping**: Bicyclists often avoid shoulders and bike lanes filled with gravel, broken glass, and other debris. Regularly scheduled maintenance should involve regular sweeping of litter on the traveled way.

Shared use paths should also be swept to remove debris when present, especially after an overflow of water that leaves sediment deposits, which is relatively common on trails along the local rivers.

- Snow clearance: Many bicyclists ride year-round, especially for utilitarian or commute trips. Snow stored in bike lanes impedes bicycling in winter.

On streets with bike lanes or with paved shoulders that are used by bicyclists, remove snow from all travel lanes (including bike lanes) and the shoulder, where practical.

Snow should also be removed on shared use paths that are regularly used by commuters, unless there is a desire to use the facility for cross-country skiing.

- Traffic Signal Detectors: See above Section 5.A.7. of this Bicycle Plan.
- Other important maintenance items detailed in Chapter 7 of the *AASHTO Guide to Bicycle Facilities* include: Surface Repairs, Pavement Overlays, Vegetation, Drainage Improvements, Chip Sealing, Patching Activities, and Utility Cuts.
- Work Zones: Proper planning for bicyclists through and along work zones is as important as planning for motor vehicle traffic. Section 6A.01 of the MUTCD states that “the needs and control of all road users (motorists, bicyclists, and pedestrians...) through a temporary traffic control zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.” On roads where bicycling is not prohibited, work zone treatments such as temporary lane restrictions, detours, and other traffic control measures should be designed to accommodate bicyclists. See Chapter 7 of the *AASHTO Guide to Bicycle Facilities* for more details.

VI. RECOMMENDED ACTIONS

Recommended Actions

- Overview of objectives and actions for implementation

The recommended actions each relate to the previously stated objectives of the plan. Most of the recommended actions from the 1996 Pedestrian & Bicycle Plan remain, some with minor changes. Some of the TT 2035 objectives are more specific and incorporated into the recommended actions as bulleted items. New recommendations are noted by an asterisk (*). Status of their

implementation is indicated in *italics*. In the following section, these actions will be assigned a priority for implementation.

1. System Development

Objective #1: To create a network of *bicycle facilities* that is safe and convenient, and links residential, commercial, and business districts; educational institutions, major employment sites, recreation areas, and river corridors.

Recommended Actions:

1. Collect and compile data necessary to determine the number of trips made by bicycle. Manual and automated bicyclist, as well as pedestrian counting methods shall be considered. Use the National Bicycle and Pedestrian Documentation Project (www.bikepeddocumentation.org) methodology as a guide for bicyclist and pedestrian counts, which incorporates a survey when manually counting. U.S. Census American Community Survey data, as well as data from other bicycle related studies may also provide some useful data for the BMTS area.

Status: Need to establish a bicyclist and pedestrian counting program. Bicyclists and pedestrians are also counted, though not separately, as a part of the turning movement counts that BMTS summer traffic counter employees perform at intersections. The traffic counters took a pedestrian & bicycle count on the South Washington St. Pedestrian & Bicycle Bridge during the summer of 2012. The NYSAMPO Bicycle & Pedestrian Working Group is investigating bicycle and pedestrian counting practices and automated technology to aid MPOs in developing their respective counting programs, and possibly initiate a cooperative effort, that may also include NYSDOT, to accomplish that objective.

2. Prioritize and phase-in bicycle infrastructure system development over several years. The development of this system, and pilot projects, should begin at the earliest possible time.
 - Construct bicycle facilities appropriate for the roadway context (see Section V – System Design) to ensure connectivity in the urban core communities and contiguous residential areas.
 - Complete the Two Rivers Greenway by the year 2020.

Status: Ongoing and accomplished mainly through the current review process of transportation projects and development site plans, road safety assessments, as well as when bicyclist needs and safety issues are made known to BMTS, NYSDOT, or municipalities.

See Appendix 6, Exhibit 1 for excerpt from Transportation Tomorrow: 2035 (TT 2035) providing status of Transportation Tomorrow long range plans. Pedestrian system development and improvements are highlighted. See Section IV.F.1. of this Bicycle Plan for information on the development of the Two Rivers Greenway.

3. Provide adequate resources for planning, implementing, and maintaining the existing road infrastructure for cycling at all levels of government in the BMTS region.

Status: Addressed in the development of the BMTS Unified Planning Work Program and Central Staffing Plan; in the project selection process for the Transportation Improvement Program; and in the development of the Long Range Transportation Plan.

4. Comply with and exceed requirements of the New York State Complete Streets Act by incorporating bicycle design elements as appropriate in all local road, highway, and bridge construction, reconstruction, and improvement projects on the BMTS Transportation Improvement Program, in accordance with AASHTO standards and the other design guides referred to in this Bicycle Plan. BMTS will work with NYSDOT and municipalities to maintain, enhance, or create a process for review of all transportation projects to ensure bicycle accommodations are included.

Status: See status for Recommended Action 2. See Appendix 4, Exhibit 3 for before & after photos of completed projects.

Additionally, the BMTS Complete Streets project was initiated at the end of June 2014, which involves working with a subcommittee of the BMTS Planning Committee to develop a Complete Streets Policy and uniform Roadway Design Guide. The project will also develop a more robust project review process and make use of a Complete Streets Checklist being developed by NYSDOT.

5. Evaluate and improve intersections where necessary to safely accommodate bicyclists.

Status: See status for Recommended Action 2.

6. Provide for safe bicycle travel in construction zones or provide alternative routes.

Status: See status for Recommended Action 2.

7. Install secure bicycle parking facilities at municipal garages and parking lots. Work with businesses and public institutions to establish secure bicycle parking as appropriate.

Status: See the Bike Parking portion of Section IV.F.1 of this plan. More bike parking is needed, however.

8. Continue to inventory the road network in the urbanized area and assess its ability to accommodate bicycle facilities. Additional data items include: road widths, average annual daily traffic and peak period traffic flow, volume/capacity ratio, bicycle treatment at semi-actuated signalized intersections.

- *The recommendation above enables implementing the action called for from TT 2035 objectives: Overcome barriers to bicycle use as identified in a cycling suitability analysis.

Status: See Section IV.G. and VII of this Plan. The data in the aforementioned sections must be updated annually, and analyzed to identify locations that are a high priority for bicycle improvements. Need to work with NYSDOT and local municipalities to establish an inventory of the entire roadway network in the urbanized area.

9. Create the following two maps on BMTS's Geographical Information System (GIS). The first, included in this plan, shows bike route system once completed. The second, to be updated on an ongoing basis, will display recommended routes based on actual infrastructure improvements.

Status: An initial Bicycle Route Map for the Binghamton Urban Area was printed, with 10,000 copies made available to the public for free at various locations during November 2000. This map displayed the local signed bike routes 1 through 7 as well as NYS Bike Route 17. A second edition of the Bicycle Route Map was completed during May 2005. Added to the map were NYS Bike Route 11, as well as existing and planned Greater Binghamton Greenway (now called the Two Rivers Greenway) and park loop trails that also provide opportunities for bicycling. In addition to 10,000 printed copies, an online version of the map was put on the BMTS website (www.BMTSONline.com). The current and third edition of the Bicycle Route Map was completed and printed during May 2011, which displays updated information from the previous map. 10,000 copies were printed, and it is also available on the BMTS website.

10. Review site development proposals during all review processes related to the State Environmental Quality Review Act (SEQRA) and Section 239(1&m) of NYS Municipal Law. Encourage developers to incorporate bicycle design elements in construction plans in accordance with this plan.

Status: BMTS is represented on the NYSDOT Site Plan Review Committee, and participates in Section 239 reviews for transportation issues and impacts.

11. Consider traffic calming techniques (e.g., construction of refuge islands, landscaped medians, sidewalk curb extensions, roundabouts, speed limit reductions, and street trees) in areas where use by cyclists is being encouraged and there is evidence of safety hazard and conflict.

Status: See status for Recommended Action 2.

12. NYSDOT Region 9 notify BMTS regarding the availability of abandoned railroad properties. Evaluate any such corridors based on their usefulness as multi-use trails and acquire as appropriate and as resources are available.

Status: Not initiated.

*13. BMTS work with municipalities to evaluate feasibility of developing multi-use trails on land near the river corridors that have become publicly owned due to buyouts resulting from the extensive flooding during 2006 and 2011. Such trails would expand and/or increase the contiguity of the originally proposed Two Rivers Greenway trail system.

Status: Not initiated.

14. Involve State and local parks departments and tourism professionals to help establish connections between parks and other greenways in the area.

Status: Not initiated.

15. Post signs along major roads entering the BMTS region welcoming bicyclists and providing guidepost and service information.

Status: Not initiated.

*16. Actions from TT 2035 objectives:

- Invest in strategies to provide travel choices and alternatives to single-occupant vehicle personal travel.
 - See #2 & #8 above.

Objective #2: To make bicycle travel part of an intermodal transportation system.

Recommended Actions:



Bike rack at BC Transit bus stop, Upper Front St. (Town of Chenango)

1. Install bicycle racks and/or lockers at major bus stops and terminals.

Status: Ongoing. Bike racks have been installed at bus stops along Upper Front St/NYS Rt. 11 in the Towns of Chenango and Dickinson. Bike racks have also been installed at the Greater Binghamton Transportation Center at 81 Chenango St. in Binghamton.

2. Install bicycle lockers and/or racks at park and ride lots/commuter parking lots.

Status: Not initiated.

3. Initiate a pilot project of installing bicycle racks on Broome County Transit (BC Transit), Tioga County Transit (Ride Tioga), and/or Binghamton University's Off Campus College Transit (OCCT) buses.

Status: COMPLETED - BC Transit and OCCT busses are all equipped with a bike rack on the front of the bus. Each bike rack carries two bicycles. Ride Tioga busses were also equipped with bike racks, however, the transit service ceased to operate after November 30, 2014.



Bike rack in use on BC Transit bus.

2. System Maintenance

Objective #3: To maintain the existing road infrastructure in addition to unique features of the bicycle infrastructure to ensure its safety and usefulness, and to protect the community's investment.

Recommended Actions:

1. All bike facilities must be well maintained in order to ensure their safety and continued use. System

maintenance activities include, but are not limited to sweeping, filling of cracks and potholes, replacing tire-catching or below-grade grates, and repainting pavement markings.

Status: See Section IV.F.2. of this Bicycle Plan.

2. Responsible jurisdictions may not be aware of bicycle level hazards on roadways. Because of this, bicyclists should assist municipalities by notifying them, in writing, of hazards whenever possible.

Status: BMTS aids in notifying jurisdictions of bicyclist hazards when made aware of them through the BMTS Pedestrian & Bicycle Advisory Committee, or from the public. The City of Binghamton has also developed a mobile app that serves this function as well.



Cyclist using sharrow-marked road on Riverside Dr. in Johnson City.

3. Governmental entities responsible should clean roadways and shoulders of debris after accidents and after construction activity.

4. Include snow removal on bicycle facilities as a regular part of winter maintenance. This is particularly critical in the area of bus stops.

Status: BMTS and its Pedestrian & Bicycle Advisory Committee address snow removal needs as they are made known.

*5. Actions from TT 2035 objectives:

- Improve roadway safety by reducing the number and severity of crashes
 - Continually analyze traffic crash data to identify high crash locations (HCLs).
 - Study and propose countermeasures for HCLs within two years of identification.

Status: BMTS has crash location information available through the New York State ALIS. Coordination with NYSDOT Region 9 needs to take place to receive lists of HCLs.

- Adopt a “Rebuild Smarter” policy for all infrastructure project including:
 - Road Safety Assessments to identify and include necessary safety elements
 - Complete Streets Assessment to identify and include appropriate complete streets elements
 - Green Construction Assessment to identify best practices for reducing the environmental impact of construction

Status: Road Safety Assessments have been performed for Vestal Ave. (Mary St. – Pennsylvania Ave.) in Binghamton; State St./W. State St./Chenango St. corridor in Binghamton; and Floral Ave. (Ackley Ave. – Baldwin St.) in Johnson City. New York State has passed Complete Streets and Smart Growth Legislation. Additionally, the City of Binghamton adopted a Complete Streets policy. (See Section IV.A. of this Plan for details). BMTS is also working on a regional complete streets policy and design guide. See Section V.A. of this Plan.

3. Education, Encouragement, and Enforcement

Objective #4: To ensure that bicyclists, pedestrians and motorists understand and abide by the requirements for safe facility-sharing.

Recommended Actions:

1. Support the continued development and implementation of safety education programs for bicyclists. Take steps to encourage public schools to implement bicycle safety and law programs.

Status: Special events, such as: Cycling Skills Clinics; the Pedestrian & Bicycle Safety Display at the Binghamton Mets annual Education and Baseball Day game, and at the Broome Community College Children's Fair are being used to provide bicycle safety education.

2. Develop a public awareness program focusing on "Share the Road" safety consciousness.



Status: See Objective #4 Action #1 above. This needs to be an ongoing effort.

3. Assess the educational needs of other target groups including motorists, law enforcement officials, and local government officials.

Status: This has been addressed in several manners including: the 2003 series of walkable communities workshops, performing road safety assessments, involvement with the Broome County Traffic Safety Committee, and through participation on the NYSAMPO Bicycle & Pedestrian Working Group. Continuing education efforts are needed.

4. Encourage local police agencies to enforce traffic violations involving bicyclists.

Status: This has been brought up at the Broome County Traffic Safety Committee and the NYSAMPO Bicycle & Pedestrian Working Group, but no organized enforcement efforts have resulted yet.

5. In conjunction with other MPOs, advocate the incorporation of bicycle safety laws into the NYS drivers' manual and drivers' test.

Status: This is currently a task of the NYSMPO Bicycle & Pedestrian Working Group.



Objective #5: To foster increased interest in bicycling in Broome and Tioga Counties. To encourage people to view bicycling (and walking) as viable modes of transportation.

Recommended Actions:

1. Increase general public's awareness about health and environmental benefits of cycling and walking.

Status: This has been accomplished through BMTS' participation in multidisciplinary partnerships, particularly with the health sector.

2. Make public aware of local opportunities to bike through the distribution of maps, and organizing special events.

Status: An initial Bicycle Route Map for the Binghamton Urban Area was printed, with 10,000 copies made available to the public for free at various locations during November 2000. This map displayed the local signed bike routes 1 through 7 as well as NYS Bike Route 17. A second edition of the Bicycle Route Map was completed during May 2005. Added to the map was NYS Bike Route 11, as well as existing and planned Greater Binghamton Greenway and park loop trails that also provide opportunities for walking. In addition to 10,000 printed copies, an online version of the map was put on the BMTS website (www.BMTSONline.com). The current, and third edition of the Bicycle Route Map was completed and printed during May 2011, which displays updated information from the previous map. 10,000 copies were printed, and it is also available on the BMTS website. The annual Binghamton Bridge Pedal event encourages the public of all ages to begin, continue, or get back into bicycling. See Section IV.B.3. of this Plan for more information.

3. Merge EMC Ad Hoc Committee on Alternative Transportation with existing BMTS Pedestrian and Bicycle Plan Advisory Committee, and establish it as the ongoing forum for public review of the plan's implementation.

Status: The Committees merged during 1997, and BMTS was given administration of the Committee during 1999. See Section IV.B.4 of this Plan for details.

4. Design and implement a pilot project for state, county, and city government offices in Binghamton Government Plaza to encourage employees to bike to work. Encourage major employers in the metropolitan area to establish bike to work programs.

Status: Several Bike to Work Day events have been held since the original Pedestrian & Bicycle Plan (1995), but an annual program has not been established.

5. Investigate other sources of funding for plan implementation i.e., special grants, bicycle registration, etc.

Status: This is an ongoing task that is facilitated through both the BMTS and NYSDOT Pedestrian and Bicycle Advisory Committees, participation in multidisciplinary partnerships, and bicyclist subject related email listserves.

*6. Bikeable communities have impacts and benefits in other areas of discipline (i.e. public health, environment/sustainability, economic development, tourism, historic preservation, etc.). Multidisciplinary partnerships must be maintained, strengthened and expanded.

Status: BMTS will continue to actively participate in multidisciplinary partnerships and foster their

growth. Projects have resulted including bike parking, sharrows pavement markings, crosswalk improvements, added curb ramp improvements; complete street policies have been adopted; and educational / encouragement programs (e.g. cycling skills clinic, and interactive bike & pedestrian safety displays) have been created with successful results.

4. Evaluation

Recommended Actions:

- *1. Establish a data collection process for performance metrics in Table #1.

Status: Two Rivers Greenway implementation is tracked by BMTS and NYSDOT Region 9. Bicycle facilities for the non-state federal aid eligible roadways was completed during the 2014 annual pavement condition survey, and will be updated annually. BMTS has access to bicycle crash data is available via ALIS, which enables identification of High Crash Locations.

- *2. Perform an annual evaluation by using available data to fill the fields of the Performance Measurements Table

Status: Need to develop annual report process.

VII. BICYCLE FACILITIES INVENTORY

Bicycle Facility Inventory of Binghamton Urban Area

The following is a compilation of charts and tables portraying the inventory of bicycle facilities of the Binghamton Urban Area on ONLY non-state federal aid eligible roads, organized into five sections: Bike Lane, Sharrow, Shoulder, Shared Lane, and All. Data collected July 2014.

Bicycle Facilities Inventory

- Tables listing the bicycle facility inventory across the region
- Graphs and charts of the inventory
- Maps displaying the inventory

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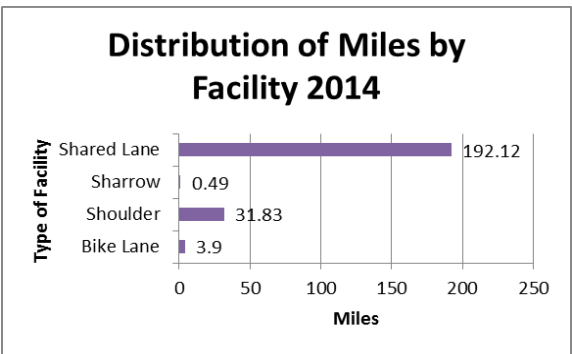
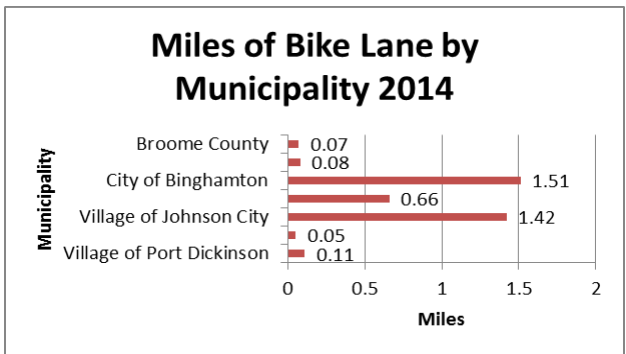
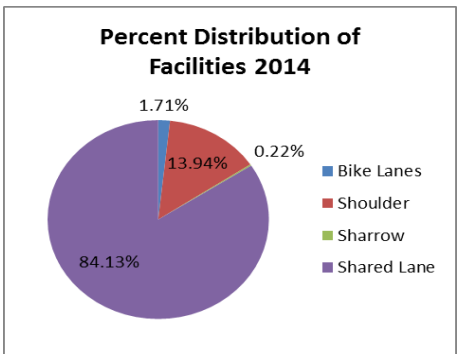
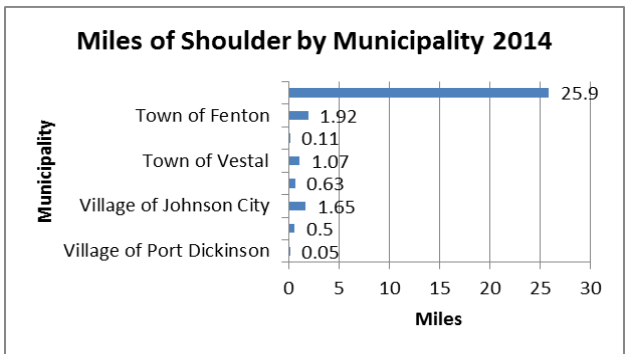
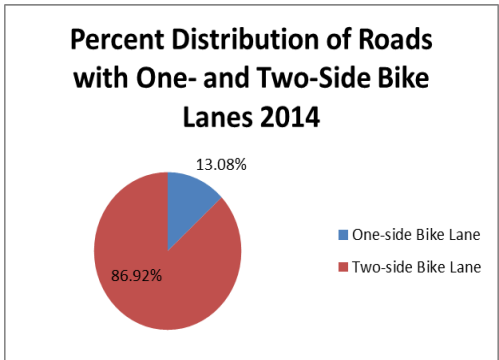
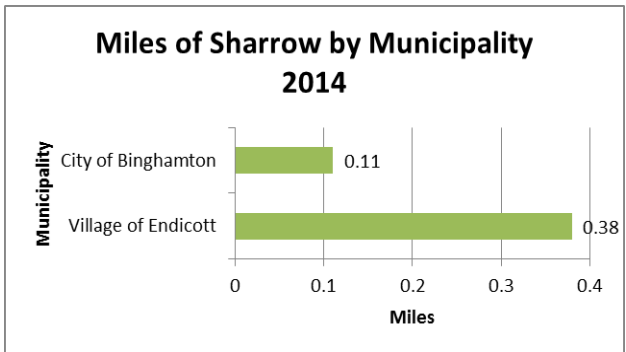
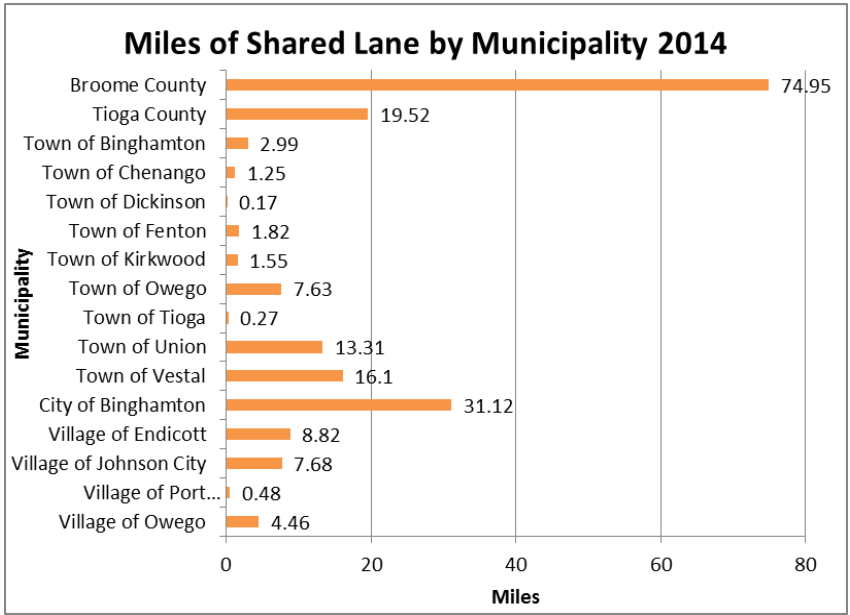
Miles of Bike Lane 2014	
Municipality	Miles
City of Binghamton	1.51
Village of Johnson City	1.42
Village of Endicott	0.66
Village of Port Dickinson	0.11
Town of Union	0.08
Broome County	0.07
Village of Owego	0.05

Miles of Shoulder 2014	
Municipality	Miles
Broome County	25.9
Town of Fenton	1.92
Village of Johnson City	1.65
Town of Vestal	1.07
City of Binghamton	0.63
Town of Kirkwood	0.11
Village of Owego	0.5
Village of Port Dickinson	0.05

Miles of Sharrow 2014	
Municipality	Miles
Village of Endicott	0.38
City of Binghamton	0.11

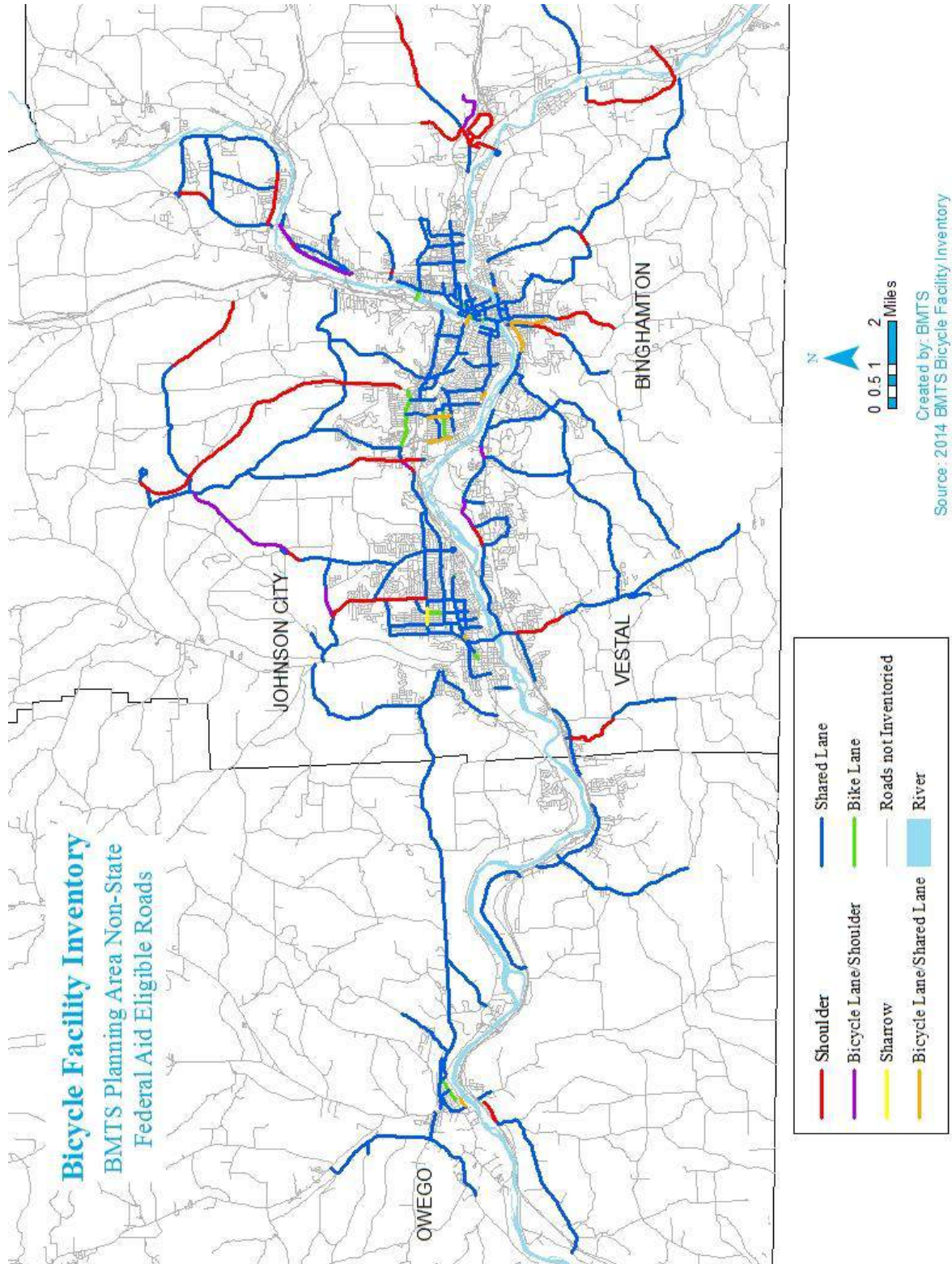
Miles of Shared Lanes	
Municipality	Miles
Broome County	74.95
City of Binghamton	31.12
Tioga County	19.52
Town of Vestal	16.1
Town of Union	13.31
Village of Endicott	8.82
Village of Johnson City	7.68
Town of Owego	7.63
Village of Owego	4.46
Town of Binghamton	2.99
Town of Fenton	1.82
Town of Kirkwood	1.55
Town of Chenango	1.25
Village of Port Dickinson	0.48
Town of Tioga	0.27
Town of Dickinson	0.17

Overall Mile Distribution of Facilities 2014	
Facility	Miles
Shared Lane	192.12
Shoulder	31.83
Bike Lane	3.9
Sharrow	0.49

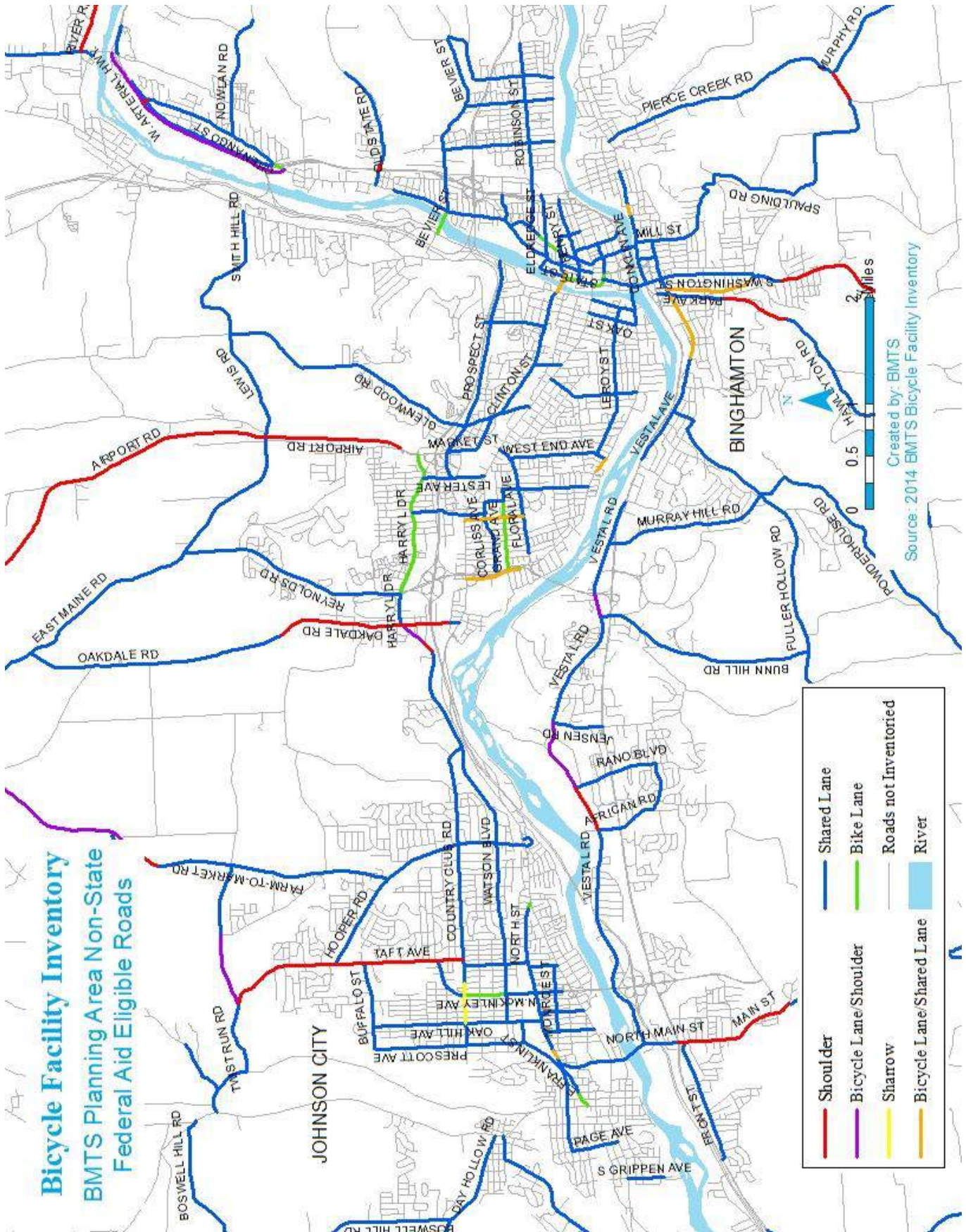


The following maps show the current bicycle facility inventory for the BMTS Metropolitan Area Non-State Federal Aid Eligible Roads. The colored roads demonstrate whether that segment facilitates bicycles via a bicycle lane, shoulder, shared lane, sharrow, or a combination of two types.

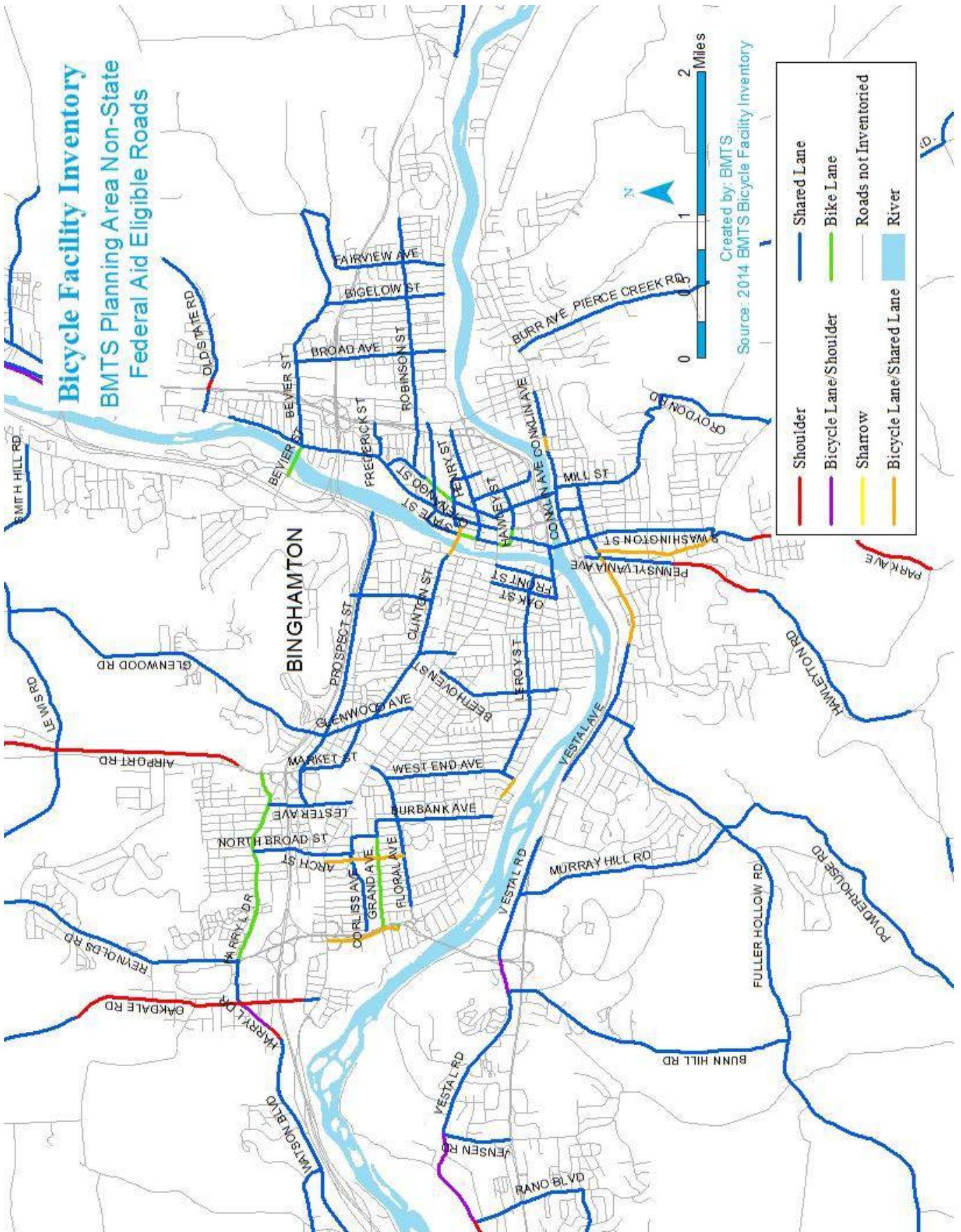
Map 11



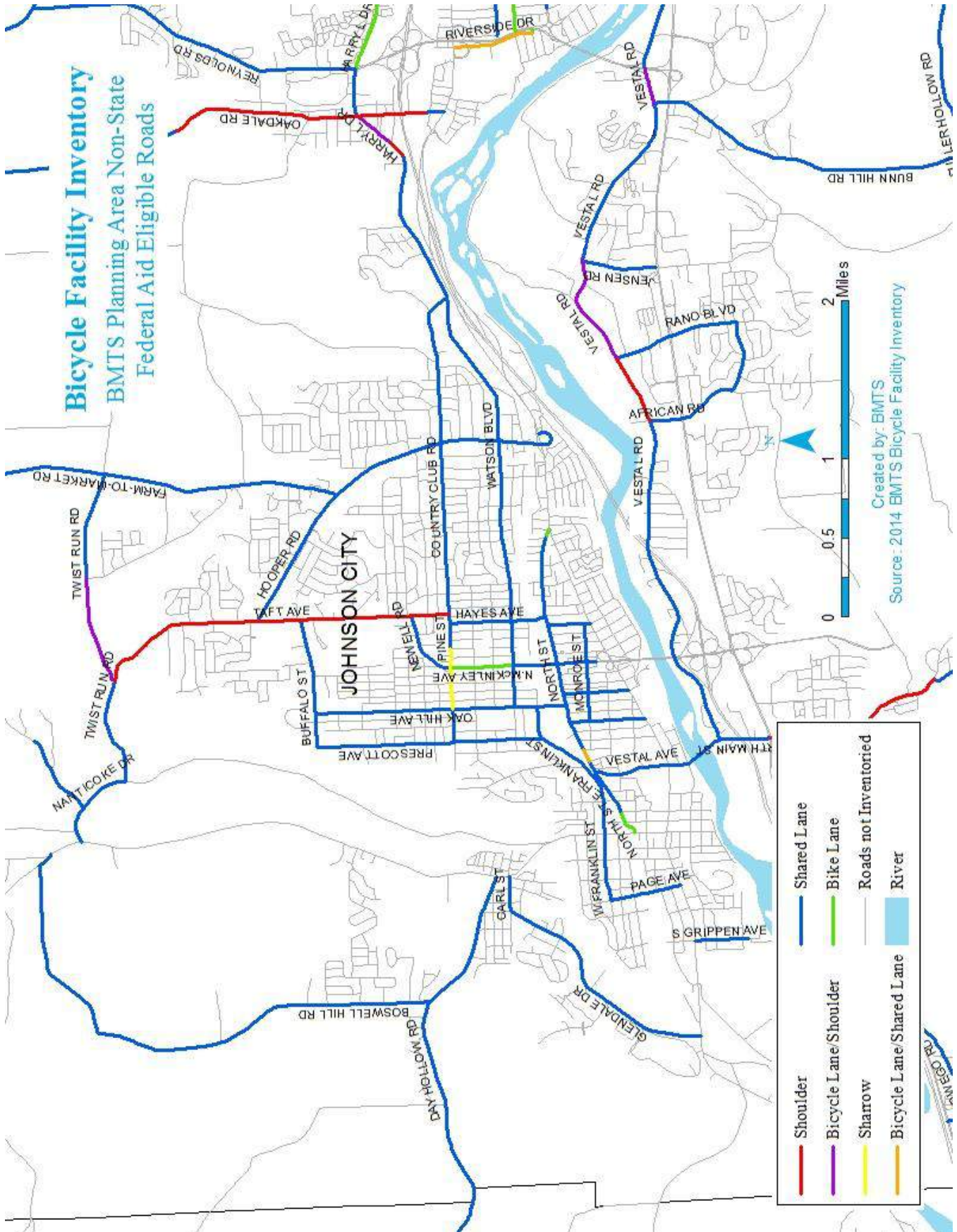
Map 12

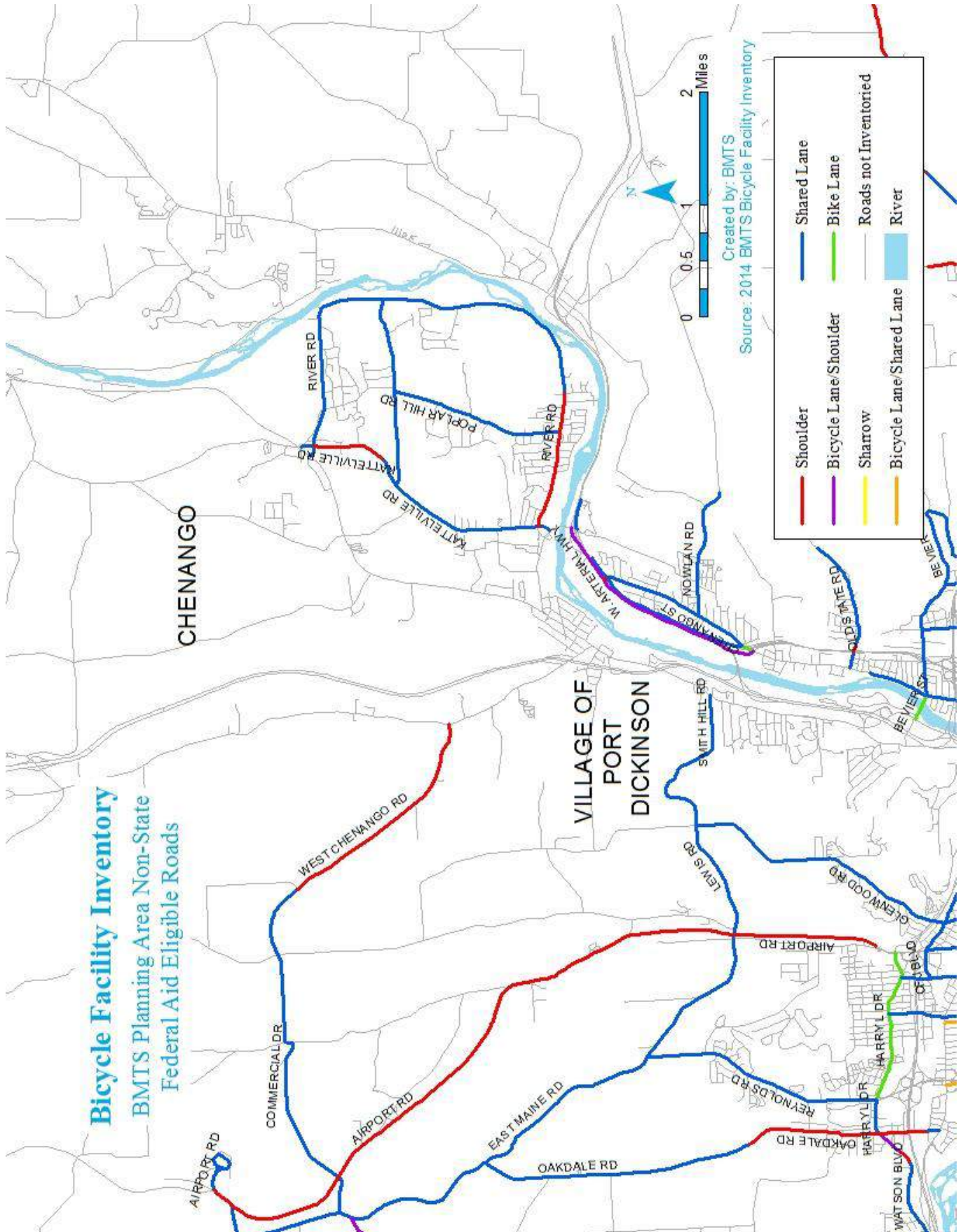


Map 13

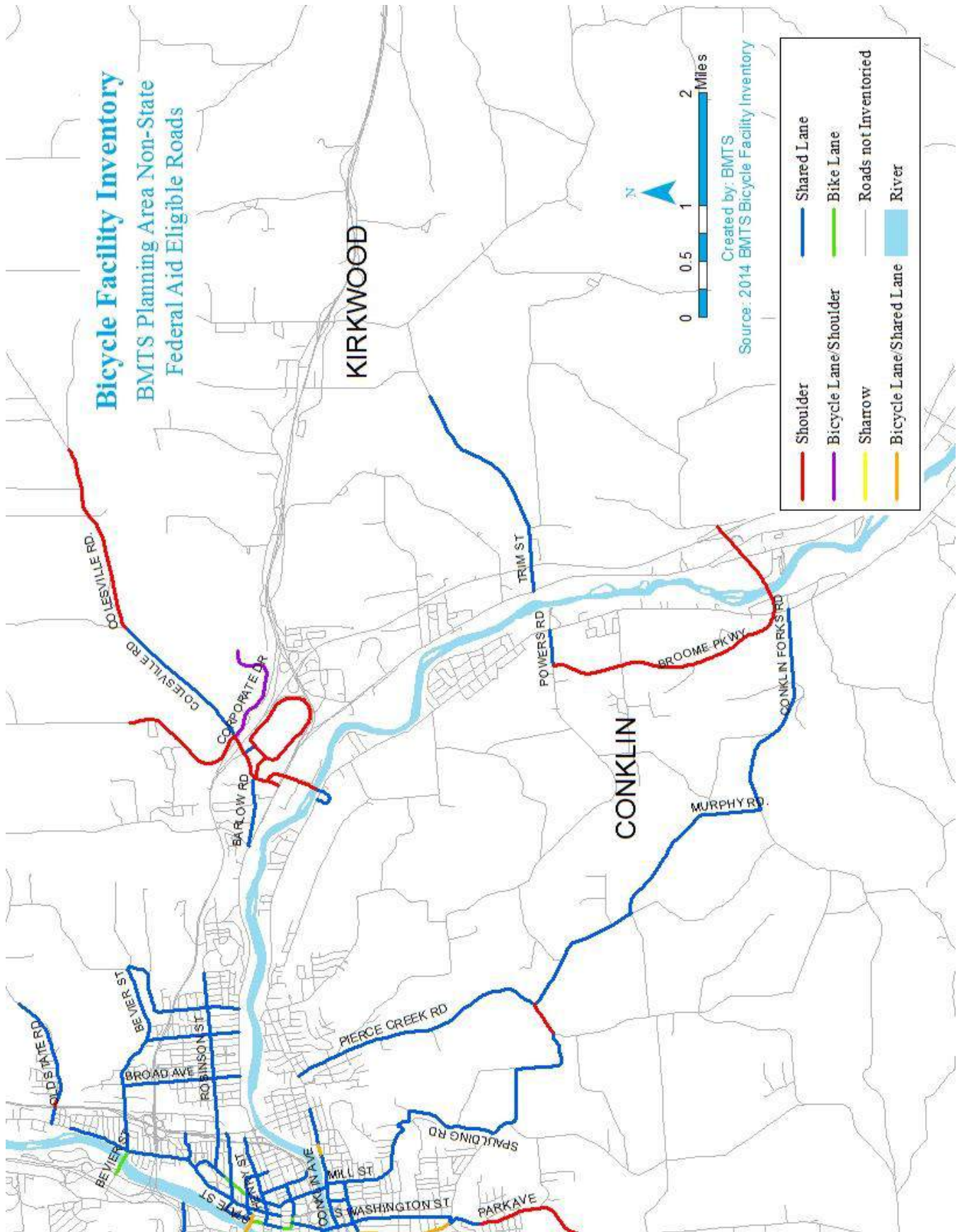


Map 14

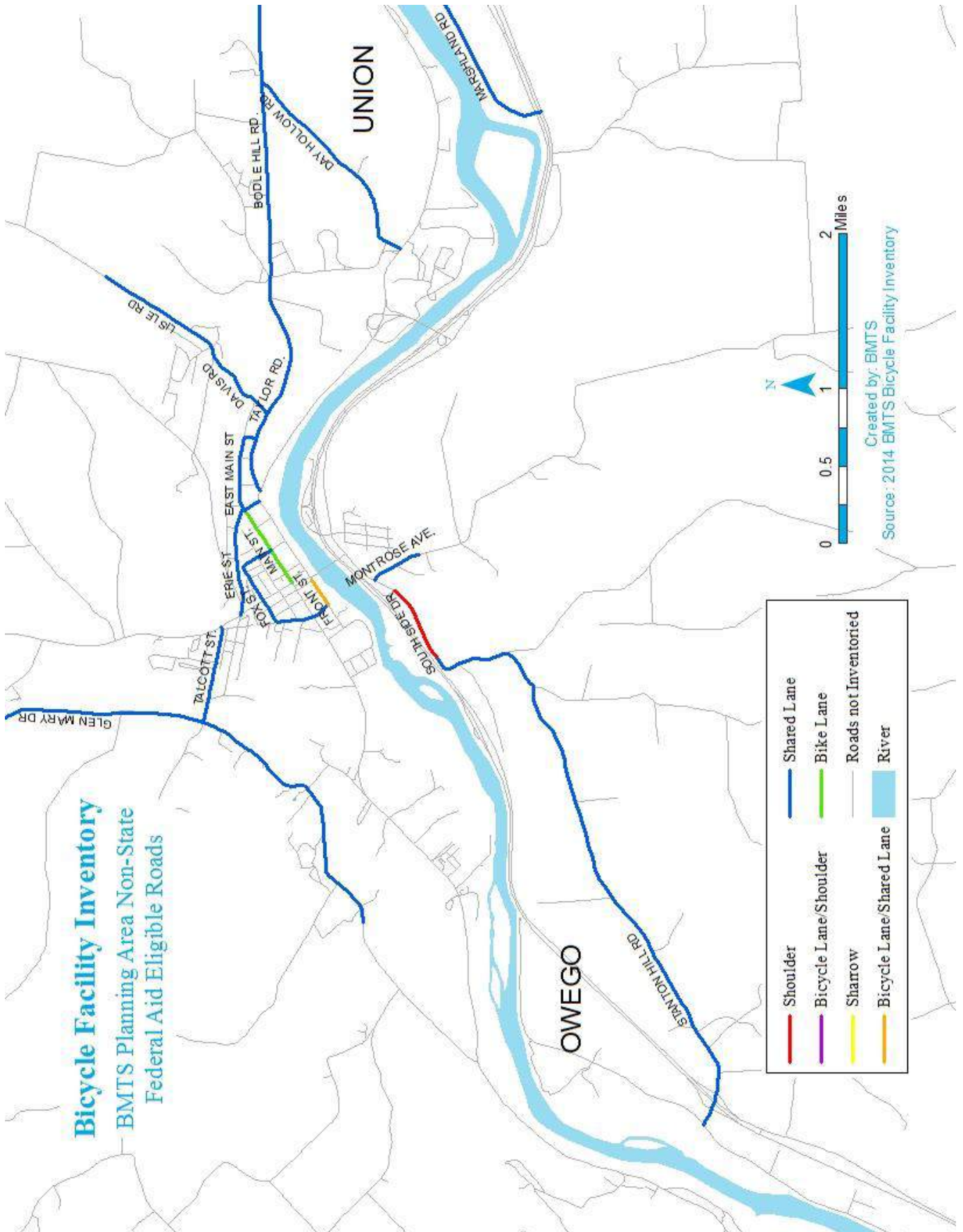




Map 16



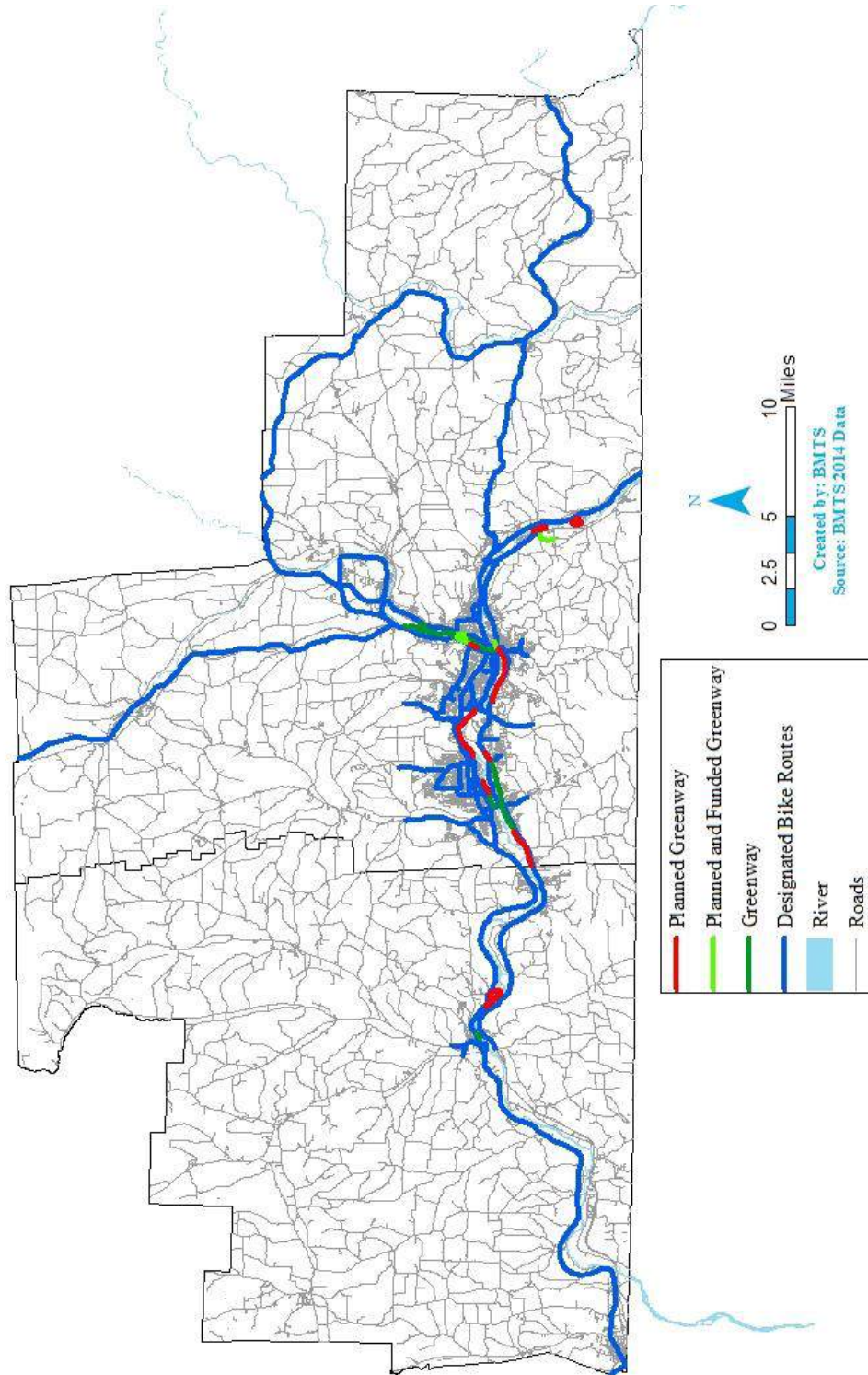
Map 18



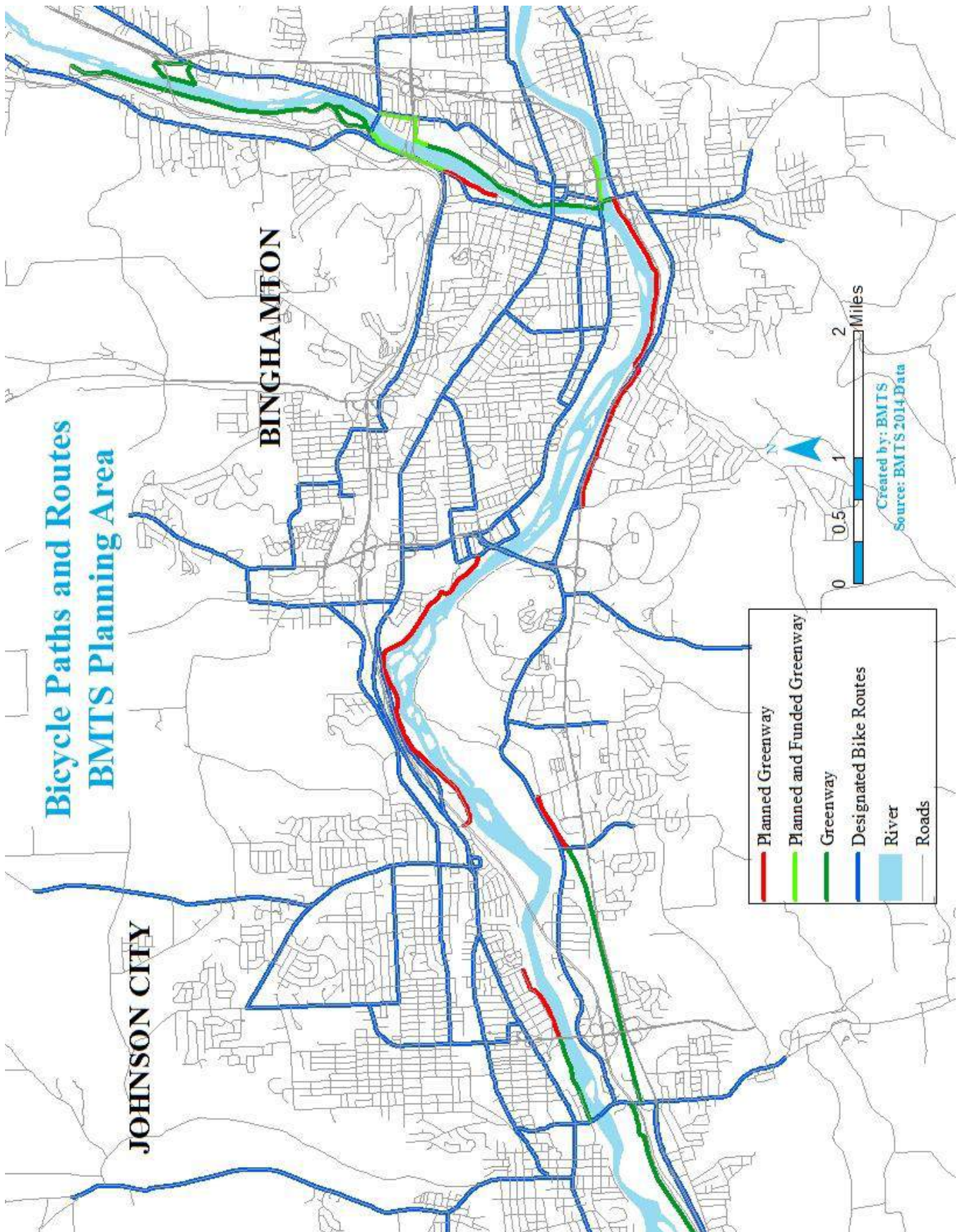
The following maps show the current local and New York State designated and signed bicycle routes, as well as multi-use trails in the Binghamton Metropolitan Area that comprise a portion of the Two Rivers Greenway (TRG) trail system. The different colors represent designated bike routes, greenways, planned and funded greenways, and planned greenways. See Table 4 in Section IV.F.1 TRG implementation status and construction plans.

Map 19

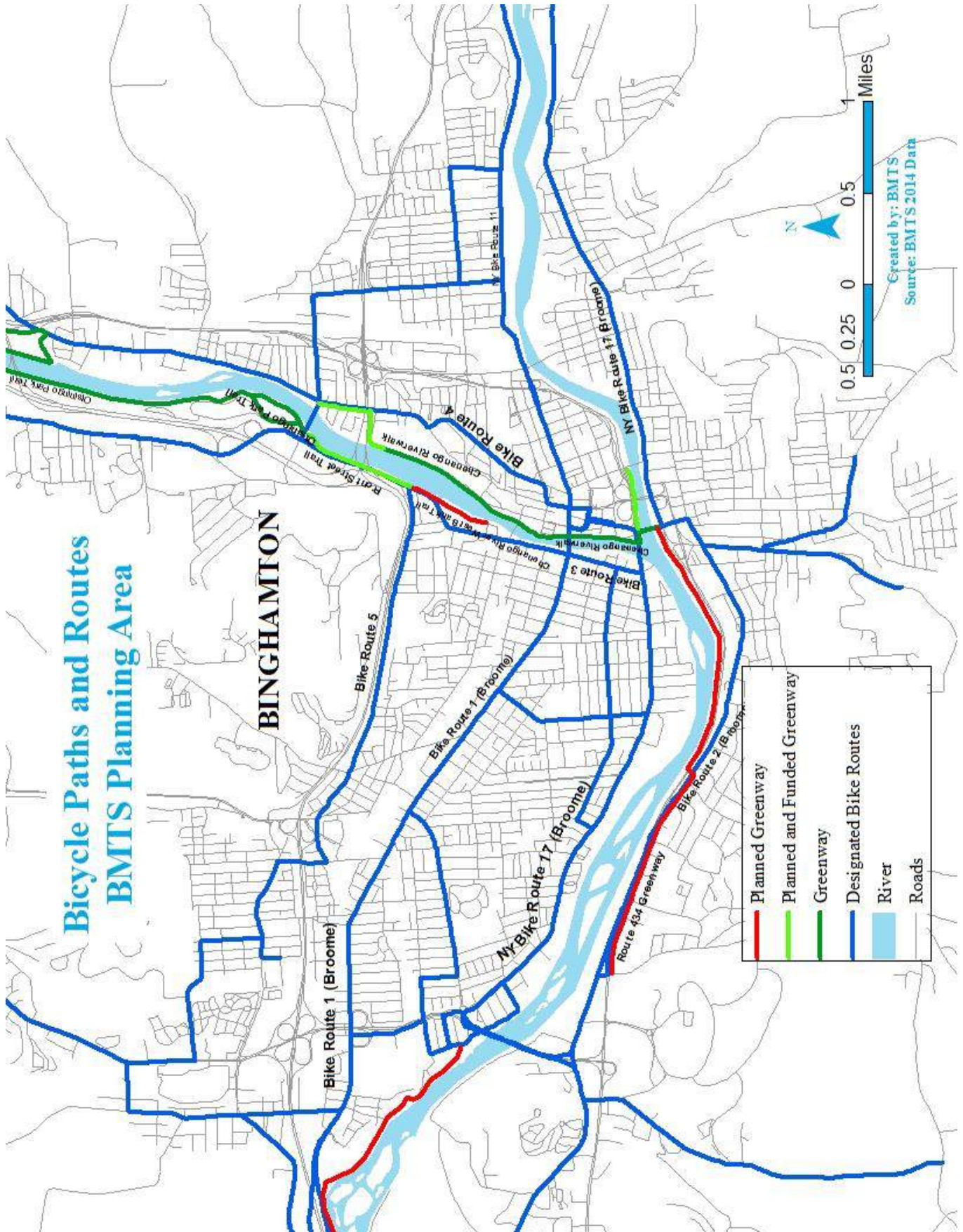
Bicycle Paths and Routes BMTS Planning Area

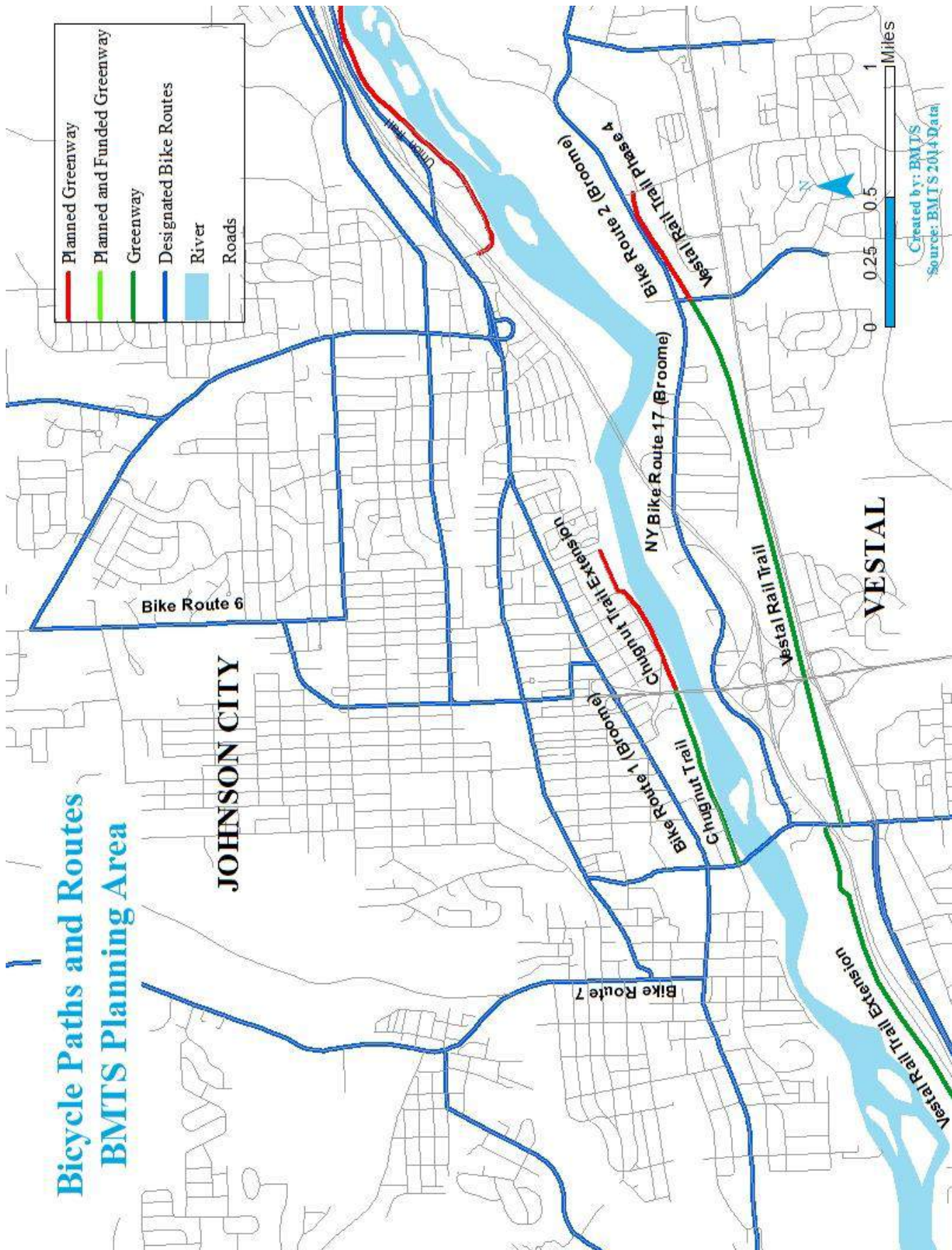


Map 20

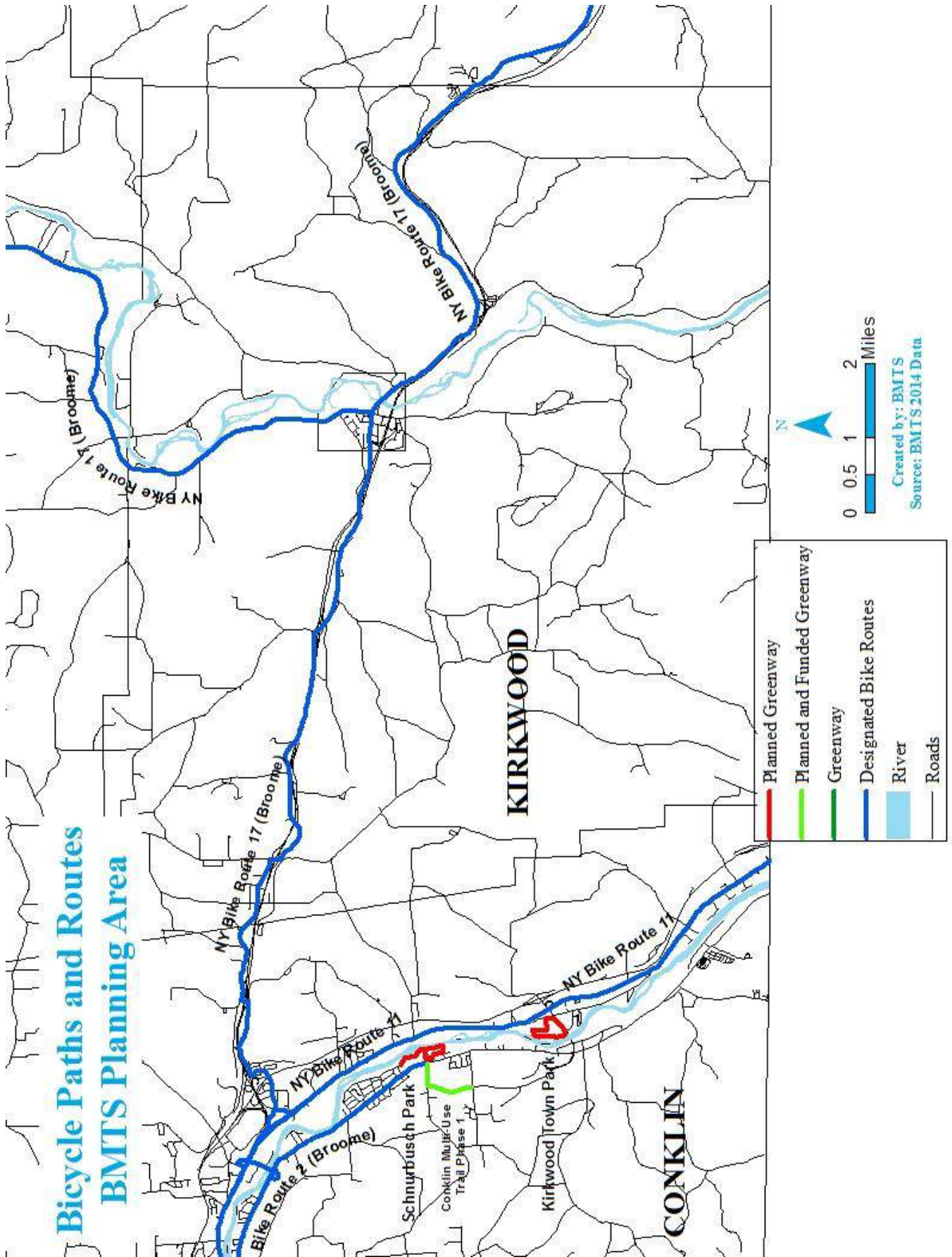


Map 21

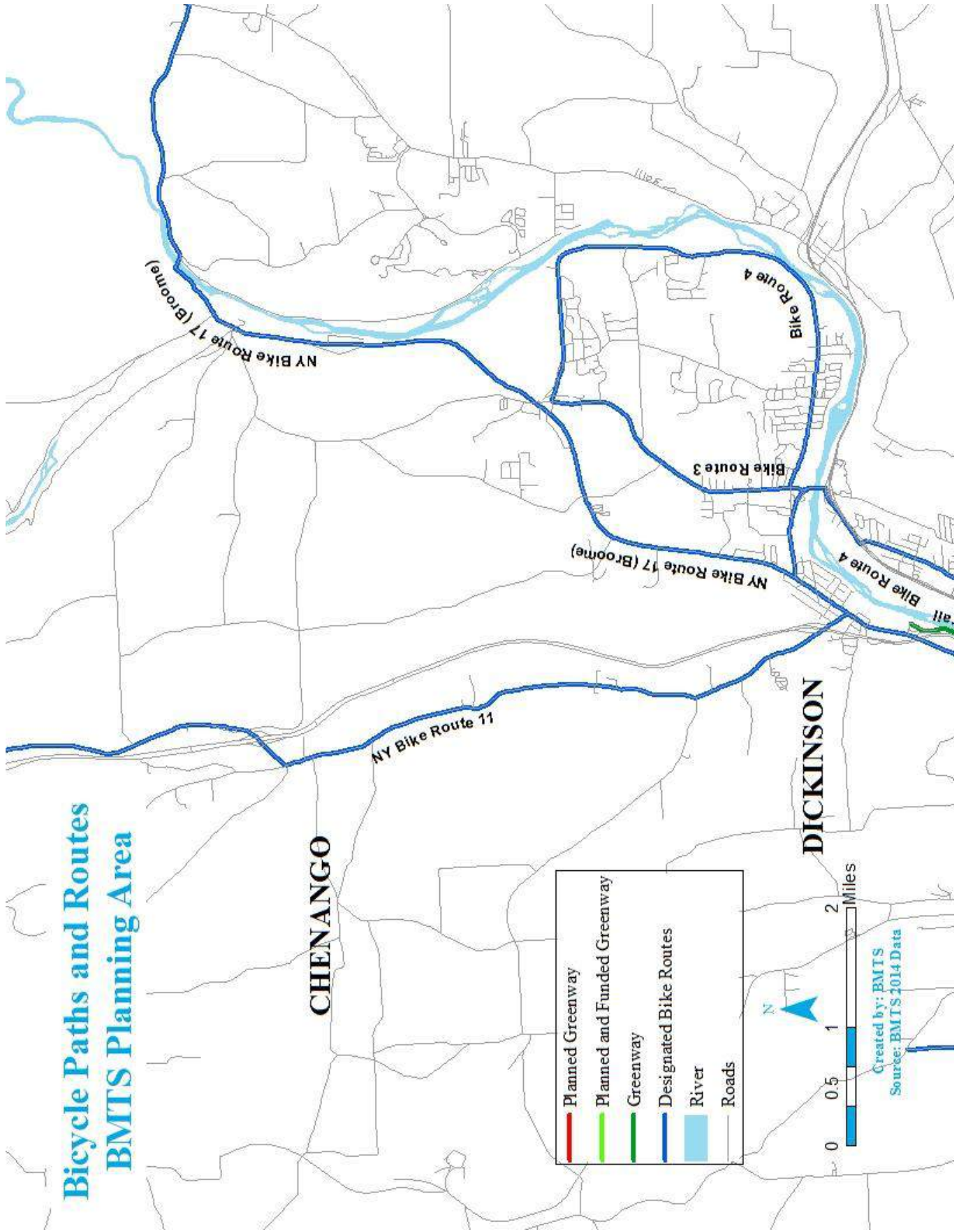


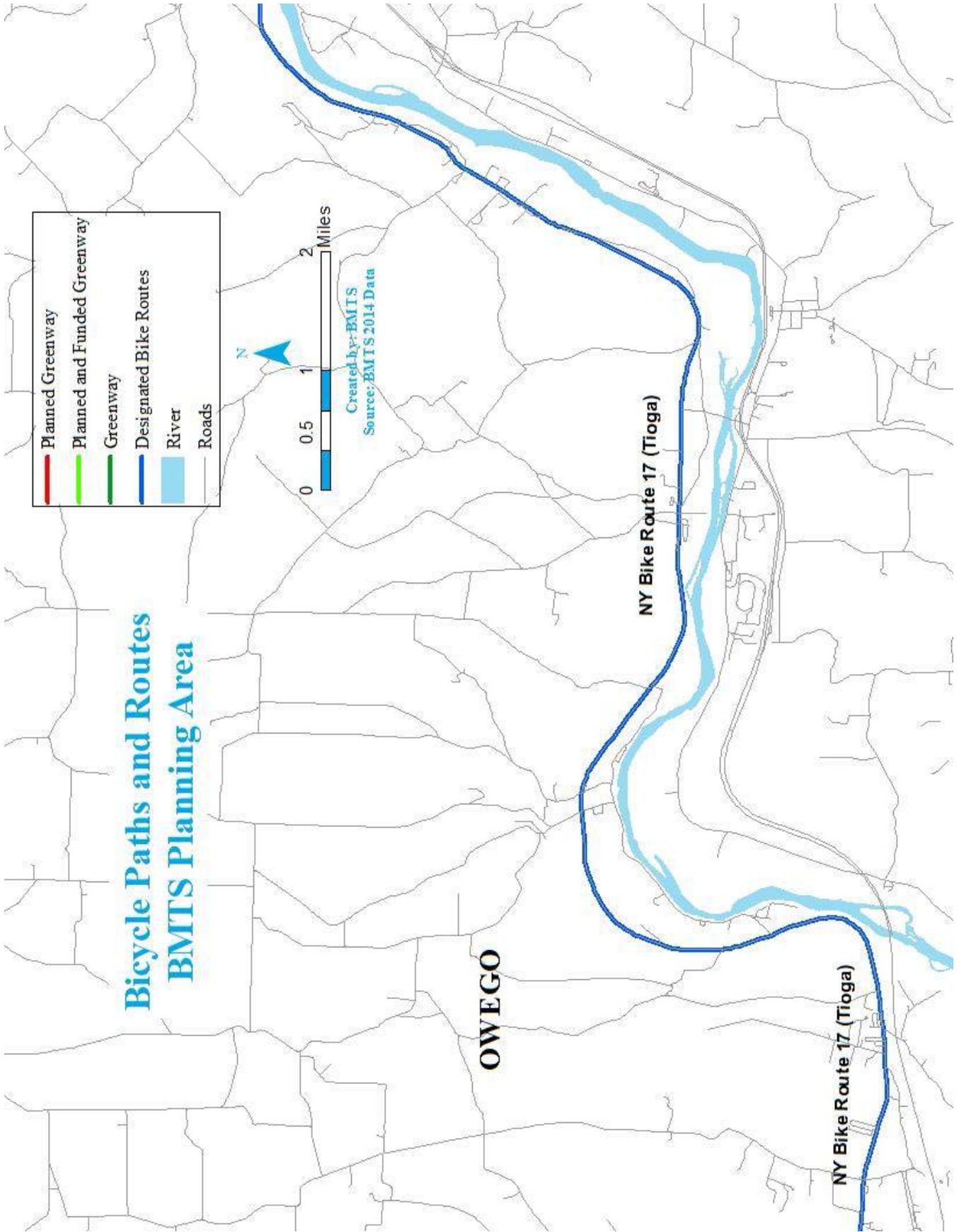


Map 23

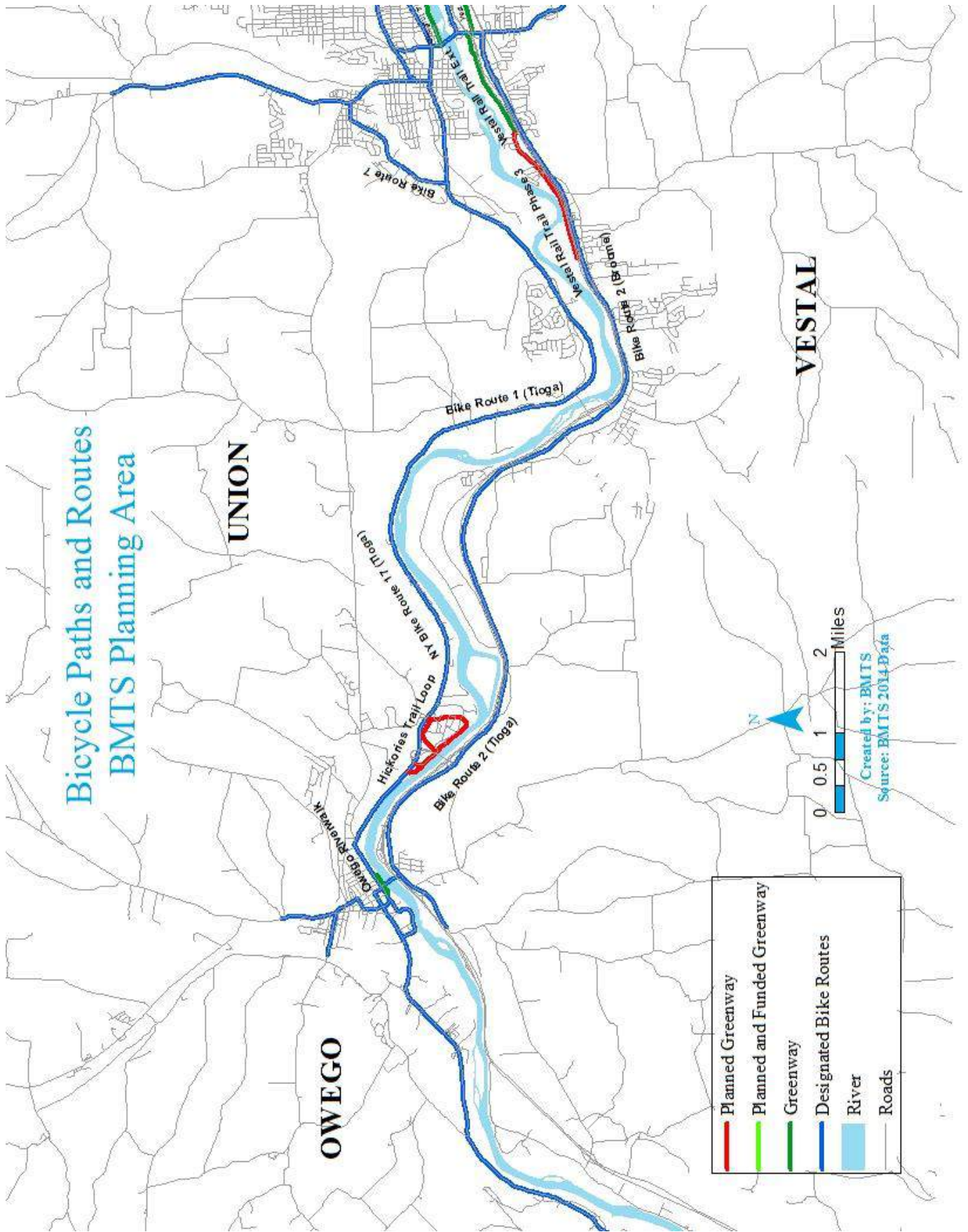


Bicycle Paths and Routes BMTS Planning Area





Map 26



VIII. ACTION PLAN AND IMPLEMENTATION ACTIVITIES

Action Plan and Implementation Activities

- Guidelines for phased implementation
- Delineation of responsibilities
- Summary of cost estimates
 - Funding sources

A. Guidelines for Phased Implementation

This action plan will guide BMTS and its member municipalities in the implementation of recommended actions. The result will be a phased program for improving bicycle facilities in the Binghamton metropolitan area. What follows are examples of high, medium, and lower priority projects which will help involved agencies select implementation projects.

Implementation of projects does not have to follow the order of prioritization, should an opportunity arise to implement a lower priority action.

1. High Priority/Short Range Actions

Engineering:

- ✓ Develop the core bicycle route system. - **COMPLETED**
- ✓ Improve bicycle infrastructure on the core bicycle route system as appropriate, with creation of striped bicycle lanes and intersection improvements as warranted by usage experience and system inventory.
- ✓ Include appropriate bicycle design elements in all currently programmed projects to construct, reconstruct, rehabilitate, improve, or preserve State and local highways, streets, and bridges.
- ✓ Complete the Two Rivers Greenway multi-use trail system.
- ✓ Evaluate all hazardous intersections, based on accident report analysis. Based on accepted traffic engineering principles, develop and implement appropriate countermeasures.
- ✓ Provide safe bicycle access to all schools, including institutions of higher education, not currently served.
- ✓ Install secure bicycle parking/storage facilities at municipal parking garages, Government Plaza, high volume outlying bus stops.
- ✓ Develop projects as candidates for Federal Transportation funding.
- ✓ Coordinate with the New York State Department of Transportation's regional and statewide pedestrian and bicycle plans.

Education / Encouragement / Enforcement:

- ✓ Strengthen and expand multidisciplinary partnerships.
- ✓ Develop and implement a public education program emphasizing safe road sharing for all users.
- ✓ Continue research into best practices which demonstrate enhanced safety for bicyclists.
- ✓ Distribute, and periodically update the Greater Binghamton Area Bike Route Map for consumers.
- ✓ Promote pilot projects and special events to increase interest in bicycling.

Evaluation:

- ✓ Evaluate and prioritize performance metrics in Table #1 to determine which information exists, or what data can be collected with reasonable effort and benefit. Ensure that the performance metrics comply with those scheduled to be established no later than September 30, 2015 by the Federal Highway Administration (FHWA) for MAP-21 legislation.
- ✓ Establish a data collection process for performance metrics in Table #1. As much as is feasible, BMTS to work with the appropriate agencies over time to make robust performance measurement possible and routine.
- ✓ Collect information necessary and establish annual Bicycle Plan evaluation report.
- ✓ Continue to collect information about the local use of the transportation system by bicyclists.

2. Medium Priority/Mid Range Actions

Engineering:

- ✓ Provide a safe means of access to Chenango Valley State Park.
- ✓ Expand the core bicycle route system as appropriate to provide access to additional major employment centers, shopping malls and other commercial districts, parks and recreational facilities.
 - Develop plan for Bike Corridors/Bike Boulevards in the Binghamton Urban Area.
- ✓ Address hazards on streets/roads connecting to core system, including sewer grates, deteriorated pavement, narrow or deteriorated shoulders.
- ✓ Install bicycle racks on OCC-T buses as a pilot project. – **COMPLETED** as well as on BC Transit and the Ride Tioga buses, though Ride Tioga has ceased operations.
- ✓ Encourage installation of secure bicycle parking/storage facilities at significant privately owned traffic generators.
- ✓ Create a plan for a network of riverbank/greenway paths. – **COMPLETED**

Education / Encouragement / Enforcement:

- ✓ Work with Broome County Traffic Safety Committee to provide bicycle & pedestrian law training for law enforcement officials.

3. Lower Priority/Long Range Actions

Engineering:

- ✓ Identify a system of dedicated bicycle/pedestrian paths, including linkage of existing park and river bank facilities and rail-to-trail conversions. – **COMPLETED**
- ✓ Expand the Two Rivers Greenway trail system beyond the recommended system of trails from the Binghamton Metropolitan Greenway Study.
- ✓ Continue to expand bicycle system as appropriate to serve high to medium density residential areas.
 - Implement plan for Bike Corridors/Bike Boulevards in the Binghamton Urban Area.
- ✓ Expand of the core system of bicycle and pedestrian facilities.
- ✓ Develop pilot projects into ongoing programs; expansion to other sites.

Evaluation:

- ✓ Work with municipalities and area colleges to apply for Bicycle Friendly Community and Bicycle Friendly College certification through the League of American Bicyclists

B. Delineation of Responsibilities

A number of agencies and organizations will be involved in plan implementation. The following delineation of responsibilities will assist in the coordination of their efforts.

1. BMTS Central Staff

Designate a current BMTS Central Staff member to coordinate and lead implementation of the Bicycle Plan. Responsibilities include:

- Collect and analyze bicycle trip making data in the metropolitan area.
- In cooperation with NYSDOT & local municipalities, collect local system inventory data for input into the BMTS Geographic Information System.
- Create and periodically update the bicycle system map.
- Monitor system maintenance.

- Provide technical assistance to municipalities in improving infrastructure to accommodate all travel modes.
- Review scoping and preliminary design documents for all State and local highway, street, and bridge construction, reconstruction, and improvement projects to ensure inclusion of appropriate bicycle design elements.
- Review scoping and preliminary design documents for all multi-use trail projects to ensure inclusion of appropriate bicycle design elements.
- Review site development documents as provided under SEQRA, Section 239, and participation on the NYSDOT Region 9 Site Plan Committee to ensure inclusion of appropriate-bicycle design elements.
- Provide technical assistance to employers regarding bicycling commute programs.
- Coordinate periodic complete streets workshops for municipal engineers, planners, highway officials, and elected officials to discuss and monitor the Bike Plan, as well as Pedestrian Plan, and upcoming Complete Streets Policy implementation.
- Coordinate the efforts of the BMTS Pedestrian and Bicycle Advisory Committee.
- Work with other agencies to develop a public education and marketing plan to promote a "Share the Road" safety consciousness for bicyclists and motorists, and encourage more bicycling.

The BMTS traffic engineer and transportation analyst will assist by:

- Review scoping and preliminary design documents for all State and local highway, street, and bridge construction, reconstruction, and improvement projects to ensure appropriate inclusion of bicycle design elements.
- Review site development documents as provided under SEQRA, Section 239, and participation on the NYSDOT Region 9 Site Plan Committee to ensure appropriate inclusion of bicycle design elements.
- Review local accident records to identify hazardous locations.
- Check signal timings for adequate pedestrian green times as part of the BMTS traffic count program.
- Provide technical assistance to member jurisdictions regarding the redesign of hazardous intersections and traffic calming strategies.
- Provide GIS and mapping assistance.

2. New York State Department of Transportation

The NYSDOT Main Office and Region 9 have designated Bicycle and Pedestrian Coordinators. Their responsibilities with respect to the BMTS plan include:

- Coordination with NYSDOT regional and statewide bicycle planning and implementation activities. (e.g. participation in the NYSAMPO Bicycle & Pedestrian Working Group)
- Provision of technical and mapping assistance to BMTS Central Staff.
- Attendance at BMTS Pedestrian & Bicycle Advisory Committee meetings.
- Participation in scoping and preliminary design of Federal aid and State funded highway and bridge projects to ensure inclusion of appropriate bicycle related design elements.
- Communication regarding availability of abandoned railroad properties and/or DOT right of way for multi-use trail development.
- Region 9 – Partner with BMTS to promote implementation of the Two Rivers Greenway trail system.

3. BMTS Pedestrian & Bicycle Advisory Committee

Role of the BMTS Pedestrian and Bicycle Advisory Committee:

- Serve as a focal point for public participation in implementation of the BMTS Bicycle Plan.
- Assist BMTS Central Staff in developing a public education and marketing plan to promote a "Share the Road" pedestrian and motorist safety consciousness, and encourage more bicycling.
- Review, comment on, and assist in implementing bicycle safety education programs.
- Review and comment on transportation project design plans.
- Assist BMTS in informing public of new bicycle facilities.
- Comment on project priorities in conjunction with BMTS staff and committees; recommend system improvements.
- Provide volunteer staff for promotional and community outreach events.
- Assist BMTS Central Staff in developing bicycle system maps; assist in distribution.
- Advocate needs of bicyclists.

4. BMTS Member Municipalities

Because of their jurisdiction over local streets and sidewalks, local municipalities will have primary responsibility for implementation and maintenance of facilities. Responsibilities include:

- Participate in development of high priority improvement projects in conjunction with BMTS Central Staff.
- Inventory bicycle facilities that are part of their respective local roadways. Maintain and update the inventory information at least annually.
- Include appropriate bicycle design elements in road, street, and bridge construction or reconstruction projects in their jurisdiction.
- Install additional facilities such as bike racks/lockers in areas recommended by this plan.
- Continue appropriate maintenance of streets, roads, sidewalks, and any other bicycle facilities in their jurisdiction.
- Respond to recommendations from the BMTS traffic engineer regarding correction of hazardous locations.

5. Broome County Traffic Safety Board Program

This ongoing program, funded by a grant from the Governor's Traffic Safety Committee, and housed by the Broome County Department of Health, has various responsibilities in the areas of traffic safety. The primary emphasis is education, both through broad public awareness campaigns and focused efforts.

Responsibilities of the Traffic Safety Program Coordinator include:

- Develop and coordinate bicycle and pedestrian safety plans and programs.
- Provide information to other plan participants of best practices regarding pedestrian and bicycle safety issues.
- Advise on and participate in the development of the "Share the Road" public awareness safety campaign.

6. The Health Sector

Additional partnerships between the transportation and health sectors, which typically are in the form of coalitions comprised of representation from many other disciplines, have also proven valuable in accomplishing members' complementary goals. Health sector agencies primarily serve as the lead agency for the coalitions. Examples of recent and current coalitions include: Broome County Chronic Disease Leadership Team (Broome County Health Dept.), Tioga County Healthy Communities Partnership (Tioga County Health Dept. & Rural Health Network of South Central NY), and Stay Healthy Kids Committee (United Health Services). Responsibilities of the Health Sector include:

- Continue to coordinate as well as administrate multidisciplinary coalitions and partnerships.
- Use coalitions to organize partners to use their strengths and expertise to develop and implement programs and projects to accomplish members' complementary goals resulting in improved public health. Of particular importance to this Bicycle Plan is promoting improved health through active living, by enabling and encouraging more bicycling as a transportation option.

C. Summary of Cost Estimates

Table 9 is a summary of a variety of pedestrian and bicycle-related cost estimates summarized from katana.hsrc.unc.edu/cms/downloads/Countermeasure_Costs_Summary_Oct2013.pdf. This link also contains more helpful information on costs for pedestrian and bicycle infrastructure. For an interactive cost estimation of bicycle-related projects, see NYSDOT's Quick Estimator at www.dot.ny.gov/programs/completestreets/repository/Quick_Estimator_web_062514.xls. Cost estimates for items not listed can be acquired by contacting NYSDOT Region 9 or the Public Works Department or Engineering Departments of counties and local municipalities. Costs of items may vary depending on location and suppliers. Use these figures for planning purposes.

Table 9: Pedestrian and Bicycle Infrastructure Costs in the U.S.

Pedestrian and Bicycle Infrastructure Costs in the U.S.						
Facility	Median	Average	Minimum	Maximum	Cost Unit	Number of Sources
Bicycle Locker	\$2,140	\$2,090	\$1,280	\$2,680	Each	4 (5)
Bicycle Lane	\$89,470	\$133,170	\$5,360	\$536,680	Mile	6 (6)
Bicycle Rack	\$540	\$660	\$64	\$3,610	Each	19 (21)
Concrete Sidewalk	\$27	\$32	\$2.09	\$410	Linear Foot	46 (164)
Curb and Gutter	\$20	\$21	\$1.05	\$120	Linear Foot	16 (108)
Curb Extension/Choker/ Bulb-Out	\$10,150	\$13,000	\$1,070	\$41,170	Each	19(28)
Flashing Beacon	\$5,170	\$10,010	\$360	\$59,100	Each	16 (25)
High Visibility Crosswalk	\$3,070	\$2,540	\$600	\$5,710	Each	4(4)
Multi-Use Trail -Paved	\$261,000	\$481,140	\$64,710	\$4,288,520	Mile	11 (42)
Multi-Use Trail -Unpaved	\$83,870	\$121,390	\$29,520	\$412,720	Mile	3 (7)
Pedestrian Crossing	\$310	\$360	\$240	\$1,240	Each	4 (6)
Pedestrian Hybrid Beacon	\$51,460	\$57,680	\$21,440	\$128,660	Each	9 (9)
Pedestrian Rail	\$95	\$100	\$7.20	\$690	Linear Foot	29 (83)
Pedestrian Signal	\$980	\$1,480	\$130	\$10,000	Each	22 (33)
Raised Crosswalk	\$7,110	\$8,170	\$1,290	\$30,880	Each	14 (14)
Rapid Rectangular Flashing Beacon	\$14,160	\$22,250	\$4,520	\$52,310	Each	3 (4)
Shared Lane/Bicycle Marking	\$160	\$180	\$22	\$600	Each	15 (39)

Pedestrian and Bicycle Infrastructure Costs in the U.S. (continued)

Facility	Median	Average	Minimum	Maximum	Cost Unit	Number of Sources
Signed Bicycle Route	\$27,240	\$25,070	\$5,360	\$64,330	Mile	3 (6)
Speed Bump	\$1,670	\$1,550	\$540	\$2,300	Each	4 (4)
Speed Hump	\$2,130	\$2,640	\$690	\$6,860	Each	14 (14)
Speed Table	\$2,090	\$2,400	\$2,000	\$4,180	Each	5 (5)
Speed Trailer	\$9,480	\$9,510	\$7,000	\$12,410	Each	6 (6)
Stop/Yield Signs	\$220	\$300	\$210	\$560	Each	4 (4)
Streetlight	\$3,600	\$4,880	\$310	\$13,900	Each	12 (17)
Striped Crosswalk	\$340	\$770	\$110	\$2,090	Each	8 (8)
Wheelchair Ramp	\$740	\$810	\$89	\$3,600	Each	16 (31)

D. Funding Sources

This section lists funding sources commonly used to construct bicycle facilities on the roadway network, construct separated multi-use trails/greenways, and conduct education and enforcement programs. Though the list is extensive, it is not comprehensive.

- Funding Sources
- Federal
 - New York State
 - Private
 - Other

Federal Funding Sources

Under MAP-21, federal transportation funding is organized within several core programs, as noted in Section INSERT of this Bicycle Plan. Bicycle transportation is largely eligible for funding under the **Surface Transportation Program (STP)**. It is the responsibility of the BMTS Policy Committee to choose projects to be funded through this program. The federal share is 80%, with the State and municipal project sponsor paying the remainder.

STP funds are limited and many projects in the BMTS area compete for funds. Every two years, BMTS updates its Transportation Improvement Program (TIP). This process involves selecting and ranking projects, and scheduling ranked projects for design and construction over the next five year period. The TIP is financially constrained and can only program projects within the funding levels that are available. Although the Highway and Transportation Funding Act of 2014 extended Map-21 until May 31st, 2015, there is some uncertainty about future funding availability, but funding will continue unchanged for the foreseeable future.

Under Map-21, many programs that support transportation methods other than the automobile have been consolidated into a new program called **Transportation Alternatives (TA)**. The state DOT distributes 50% of the TA funding based on population. This means that for 50% of the funds, areas with populations below 200,000, such as the BMTS area, petition the state directly for funds in a competitive grant process

for projects. Metropolitan Planning Organizations (MPOs) with a population greater than 200,000 have their own competitive grant process.

The other 50% of TA funds may also be available directly from New York State via a competitive grant process. Those that are eligible to apply include:

1. Local governments
2. Regional transportation authorities
3. Transit agencies
4. Natural resource or public land agencies
5. School districts, local education agencies, or schools
6. Tribal governments
7. Any other local or regional governmental entity with responsibility for or oversight of transportation or recreational trails (other than a metropolitan planning organization or a state agency) that the state determines to be eligible.

To be eligible for TA funding, projects must fit into one of these criteria:

- 1) Construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other nonmotorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related infrastructure, and transportation projects to achieve compliance with the Americans with Disabilities Act of 1990.
- 2) Construction, planning, and design of infrastructure-related projects and systems that will provide safe routes for non-drivers, including children, older adults, and individuals with disabilities to access daily needs.
- 3) Conversion and use of abandoned railroad corridors for trails for pedestrians, bicyclists, or other nonmotorized transportation users.
- 4) Construction of turnouts, overlooks, and viewing areas.
- 5) Community improvement activities, including:
 - a) Inventory, control, or removal of outdoor advertising;
 - b) Historic preservation and rehabilitation of historic transportation facilities;
 - c) Vegetation management practices in transportation rights-of-way to improve roadway safety, prevent against invasive species, and provide erosion control; and
 - d) Archaeological activities relating to impacts from implementation of a transportation project eligible under title 23.
 - e) Any environmental mitigation activity, including pollution prevention and pollution abatement activities and mitigation to:
 - i) Address stormwater management, control, and water pollution prevention or abatement related to highway construction or due to highway runoff, including activities described in sections 133(b)(11), 328(a), and 329 of title 23; or
 - ii) Reduce vehicle-caused wildlife mortality or to restore and maintain connectivity among terrestrial or aquatic habitats.

The federal share is 80%, with the project sponsor paying the remainder. For more information, visit www.fhwa.dot.gov/map21/tap.cfm

Through funding such as this, **Safe Routes to School Programs** have been established. This national partnership seeks to create routes and paths that are safe for children to use to get to and from school. This not only supports bicycle facilitation but also supports the physical and mental health of the nation's children. For more information about Safe Routes to School, visit www.saferoutesinfo.org/, www.fhwa.dot.gov/environment/safe_routes_to_school/, or www.saferoutespartnership.org/

Recreational Trails Funds: Under MAP-21, the Recreational Trails Program is no longer guaranteed but rather must be opted-in each year. Governor Cuomo has decided to opt-in to the Recreational Trails program for this year, which means that the program will continue to be funded at 2009 levels. The program funds trails for recreational modes such as walking, hiking, bicycling, in-line skating, equestrian use, cross-country skiing, snowmobiling, off-road motorcycling, all-terrain vehicle riding and four-wheel driving. The program is administered by New York State's Recreational Trails Program. For more information, visit www.nysparks.com/grants/recreational-trails/default.aspx.

Congestion Mitigation and Air Quality Improvement Program (CMAQ): CMAQ funding is available for Urban Areas to improve congestion and air quality. BMTS is not eligible for CMAQ funding since the Binghamton Urban Area currently meets air quality standards. However, should air quality compliance or CMAQ eligibility criteria change, the Binghamton Urban Area could again be eligible. Since bicycling and walking are cleaner forms of transportation, bicycling and walking improvements are eligible for CMAQ funding. For more information regarding CMAQ funding, visit www.fhwa.dot.gov/map21/cmaq.cfm.

Funding for pedestrian and bicycle projects can be also provided through the **Highway Safety Improvement Program (HSIP)**, which aims to improve roadway safety for all modes of travel. A highway safety improvement project is any strategy, activity or project on a public road that is consistent with the data-driven State Strategic Highway Safety Plan (SHSP) and corrects or improves a hazardous road location or feature or addresses a highway safety problem. Workforce development, training, and education activities are also an eligible use of HSIP funds. The program is largely underutilized and can provide funds for bicycle improvements in our communities. For more information, go to www.fhwa.dot.gov/map21/hsip.cfm.

Section 402: The State and Community Highway Safety Grant Program, commonly referred to as Section 402, was initially authorized by the Highway Safety Act of 1966 and has been reauthorized and amended a number of times since then, most recently under MAP-21, with relatively few changes from SAFETEA-LU. The program is jointly administered by the National Highway Traffic Safety Administration (NHTSA) and the Federal Highway Administration (FHWA) at the federal level and by the New York State Governor's Traffic Safety Committee (GTSC) at the state level. The Section 402 program provides grants to states to improve driver behavior and reduce deaths and injuries from motor vehicle-related crashes. Funds can be spent in accordance with national guidelines for programs to improve pedestrian and bicycle safety through safety and education trainings, as well as traffic law enforcement programs. Broome and Tioga County Health Departments have received Section 402 grants.

BMTS has partnered with the Broome County Health Department on several pedestrian and bicycle safety education outreaches including Walk to School Days, and interactive Pedestrian & Bike Safety Displays at Binghamton Mets baseball games. For more information about this funding, go to www.ghsa.org/html/stateinfo/programs/index.html or www.safeny.ny.gov/overview.htm#grant.

Community Development Block Grant Program (CDBG) provides annual grants on a formula basis to local governments and states for a wide range of community planning initiatives. CDBG funds are intended for activities that benefit low- and moderate-income persons, prevent or eliminate slums or blight, and address urgent community development needs. Examples of the types of bicycle-related projects this program funds are: commercial district streetscape improvements, sidewalk improvements, safe routes to school, and neighborhood-based bicycling or walking facilities (including trails) that improve local transportation options or help revitalize neighborhoods. For more information about CDBG visit www.hud.gov/cdbg.

New York State Funding Sources

Consolidated Local Street and Highway Improvement Program (CHIPS): A New York State-funded program administered through the NYSDOT to assist localities in financing the construction, reconstruction or improvement of local highways, bridges, highway-railroad crossings and other local facilities, including provisions for bicycle, pedestrian and traffic calming measures. Visit www.dot.ny.gov/programs/chips for more information.

Local Waterfront Revitalization Programs (LWRP): This is a locally prepared, comprehensive land and water use program for a community's natural, public, working waterfront, and developed costal area. It provides a comprehensive structure within which critical coastal issues can be addressed. This program is administered by the Department of State and provides 50/50 matching grants to local communities from the New York State Environmental Protection Funds. To find more information, go to www.dos.ny.gov/communitieswaterfronts/.

The New York State Office of Parks, Recreation, and Historic Preservation (OPRHP)

Environmental Protection Fund Programs: Money is available for projects such as municipal parks, historic preservation, and the acquisition and development of parklands. See www.nysparks.com/grants/ for more information.

Architecture, Planning and Design Program: The New York State Council on the Arts makes over 2,500 grants each year to arts organizations in every arts discipline throughout the state. These grants are used to bring high quality artistic programs to the citizens of the state through supporting the activities of nonprofit arts and cultural organizations. More information can be found at www.nysca.org/public/guidelines/architecture/index.htm.

A Grant Program of the Preservation League of New York State and the New York State Council on the Arts: The Preserve New York Grant Program provides support for three types of projects: cultural resource surveys, historic structure reports, and historic landscape reports. An applicant must be a not-for-profit group with tax-exempt status or a unit of local government. State agencies and religious

institutions are not eligible to apply. The program generally provides only partial support on a competitive basis. Grants are likely to range between \$3,000 and \$10,000. For more information, go to www.preservenys.org/.

New York Main Street Program: The Office of Community Renewal administers this program which provides financial resources and technical assistance to communities to strengthen the economic vitality of the state's traditional main streets and neighborhoods. This program provides funds to local governments, business improvement districts and other not-for-profit organizations that are committed to revitalizing historic downtowns, mixed-use neighborhood commercial districts and village centers. Find more information at www.nyshcr.org/Programs/NYMainStreet.

Private Funding Sources

Advocacy Advance Rapid Response Grants: Rapid Response Grants help state and local advocacy organizations take advantage of unexpected opportunities to win, increase, or preserve funding for biking and walking. These grants, accepted on a rolling basis, are for short campaigns that will increase or preserve the investment in biking and walking in states, MPOs, and cities where program choices are being made on how to spend safety, air quality, bridge, and local highway funding. Rapid Response Grants information can be found at www.advocacyadvance.org/grants.

A wide range of private foundations have provided funding for bicycling and walking. A few national and large regional foundations have supported the national organizations involved in pedestrian and bicycle policy advocacy. However it is usually regional and local foundations that get involved in funding particular bicycle, pedestrian or trail projects. These same foundations may also fund statewide and local advocacy efforts as well. The best way to find such foundations is through the research and information services provided by the national Foundation Center (www.foundationcenter.org). They maintain a huge store of information including the guidelines and application procedures for most foundations, and their past funding records.

Robert Wood Johnson Foundation (RWJF) awards grants for bicycle and pedestrian projects if they can be tied into research or promotion of health and physical activity. Find more information at www.rwjf.org/.

Other Funding Sources

AmeriCorps: Offers "people power" for programs that protect and preserve neighborhood environments. See more information at www.americorps.gov or www.rhnsncy.org

Supplemental resources may be available from many private and public grant sources, as well as public/private partnerships. These partnerships have proven to be successful in funding pedestrian and bicycle improvements, as well as in increasing the awareness of the value of these travel modes to the private sector. For example, retail and commercial developers can be encouraged to provide appropriate facilities within the context of their development. Advertising space can be rented to pay for bus shelters or benches. Central business district merchants, who understand that increases in human -scale traffic are good for business, may be willing to fund projects for sidewalk improvements, bus stop amenities, or

bicycle racks. Service organizations may wish to participate in an "adopt a bus stop" maintenance program. Finally, in many communities, citizens groups have been formed to finance these sorts of improvements.

Many municipalities that have benefitted from the programs listed above have found that matching dollars, which are necessary to receive funding, can be contributed through in-kind services.

Other Sources for Funding and Bicycle Project Information:

American Trails - www.americantrails.org/resources/funding/index.html

Association of Pedestrian & Bicycle Professionals - www.apbp.org

National Center for Bicycling and Walking - www.bikewalk.org

National Transportation Enhancements Clearinghouse - www.enhancements.org

Parks & Trails New York - www.ptny.org

Pedestrian and Bicycle Information Center - www.pedbikeinfo.org

Rails to Trails Conservancy - www.railstotrails.org

APPENDIX 1
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EXHIBIT 1

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APPENDIX 2
Glossary of Terms

EXHIBIT 1

Glossary of Terms

American Association of State Highway Transportation Officials (AASHTO): An organization of state departments of transportation which promulgates transportation design and operational policies.

Americans with Disabilities Act: 1990 federal legislation that resulted in significant improvements to make infrastructure accessible to all persons regardless of disability.

Barriers: In some areas, there are physical barriers to walking caused by topographical features, such as rivers, railroads, freeways or other impediments. In such cases, providing a facility to overcome a barrier can create new opportunities for walking.

Bicycle: A two or three wheeled vehicle ridden and propelled by a person or persons in combination with belts, chains or gears, and wheels (in tandem or tricycle) except devices intended for sole use on a sidewalk or by pre-teenage children (NYS Vehicle and Traffic Law).

Bicycle facilities - A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling. These include bicycle parking facilities and shared roadways.

Bicycle and Pedestrian Facilities: Infrastructure designed specifically to accommodate pedestrians and cyclists. Facilities can include sidewalks, parking, mapping, areas set aside specifically for pedestrian or bicycle use, and/or shared roadways not specifically designated for bicycle use.

Binghamton Metropolitan Transportation Study: The MPO for the Binghamton metropolitan region.

Broome County Environmental Management Council (EMC): Broome County citizens' advisory board to Broome County government on local environmental matters.

The Federal Highway Administration (FHWA): provides stewardship over the construction, maintenance and preservation of the Nation's highways, bridges and tunnels. FHWA also conducts research and provides technical assistance to state and local agencies in an effort to improve safety, mobility, and livability, and to encourage innovation.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA): Legislation passed by the US Congress that authorizes all federal surface transportation funding programs for a six year period. Among many other factors, it required the consideration of bicycle and pedestrian needs, environmental concerns such as air quality and energy usage, and public participation in transportation planning.

Multi-use trail: Also known as a "Rail-Trail," greenway, or shared use path, it is a facility shared by pedestrians and bicyclists that is separated from motor vehicles and has minimal cross flow by motor vehicles.

Moving Ahead for Progress in the 21st Century Act (MAP-21). Legislation passed by Congress in 2012 that funds surface transportation programs at over \$105 billion for fiscal years (FY) 2013 and 2014. MAP-21 creates a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991.

Metropolitan Planning Organization (MPO): Regional transportation planning organizations established by federal law for urban areas with more than 50,000 people.

Manual on Uniform Traffic Control Devices (MUTCD): defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic

National Association of City Transportation Officials (NACTO): NACTO is a 501.c.3 non-profit association that represents large cities on transportation issues of local, regional, and national significance. NACTO views the transportation departments of major cities as effective and necessary partners in regional and national transportation efforts, promoting their interests in federal decision-making. We facilitate the exchange of transportation ideas, insights and best practices among large cities, while fostering a cooperative approach to key issues facing cities and metropolitan areas.

New York State Department of Transportation (NYSDOT): The New York State agency responsible for building and maintaining state roads. BMTS falls into NYSDOT Region 9.

NYSDOT Highway Design Manual: (1) to provide requirements and guidance on highway design methods and policies which are as current as practicable, and (2) to assure uniformity of design practice throughout the New York State Department of Transportation consistent with the collective experience of the Department of Transportation, the American Association of State Highway and Transportation Officials, and the Federal Highway Administration.

Pedestrian: A person on foot or in a wheelchair (NYS Vehicle and Traffic Law).

Pedestrian Facilities: Any features or elements used by disabled or able-bodied pedestrians to move from one point to another including sidewalks, crossings, refuge islands, pedestrian signs and signals, curb ramps, stairs, and general pedestrian areas such as plazas, public transit loading zones, and grade-separation structures. Pedestrian facilities also include call boxes, street furniture, etc.

Roadway Safety Assessment (RSA): A RSA is the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. An assessment team considers the safety of all users, qualitatively estimates and reports on safety issues, and suggests opportunities for safety improvements.

Shared lane marking: also called a *sharrow*. A pavement marking symbol for a shared lane that assists bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of a bicyclist's impacting the open door of a parked vehicle; assists bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane; alerts road users of the lateral location bicyclists are likely to occupy within the traveled way; encourages safe passing of bicyclists by motorists; and reduces the incidence of wrong-way bicycling.

Sidewalk: A smooth, paved, stable and slip-resistant, exterior pathway intended for pedestrian use along a vehicular way separated with a curb offset.

State Environmental Quality Review Act (SEQRA): The State Environmental Quality Review Act (6NYCRR Part 617) established a process that considers environmental factors early in the planning stages of actions that are directly undertaken, funded, or approved by local, state, or regional agencies (Jensen et al, 1992).

Traffic Calming: A technique of making streets safer for pedestrians and cyclists by slowing the flow of traffic. Methods to accomplish traffic calming include building pedestrian islands, slowing traffic through speed limits, narrowing and curving streets, installation of stop signs, and the planting of trees.

Transportation Improvement Plan (TIP): A five year schedule of federally aided highway, bridge, transit, and other improvements developed by MPOs for their regions.

APPENDIX 3
State and Local Law Pertaining to Bicyclists

EXHIBIT 1

New York Vehicular and Traffic Law Pertaining to Bicyclists

ARTICLE 1: WORDS AND PHRASES DEFINED

§ 102. **Bicycle.** Every two or three wheeled device upon which a person or persons may ride, propelled by human power through a belt, a chain or gears, with such wheels in a tandem or tricycle, except that it shall not include such a device having solid tires and intended for use only on a sidewalk by pre-teenage children.

ARTICLE 9

§ 375 24-a. **Use of earphones while driving or riding a bicycle.** It shall be unlawful to operate upon any public highway in this state a motor vehicle, limited use automobile, limited use motorcycle or bicycle while the operator is wearing more than one earphone attached to a radio, tape player or other audio device.

ARTICLE 25: DRIVING ON RIGHT SIDE OF ROADWAY, OVERTAKING AND PASSING, ETC.

§ 1122-a. **Overtaking a bicycle.** The operator of a vehicle overtaking, from behind, a bicycle proceeding on the same side of a roadway shall pass to the left of such bicycle at a safe distance until safely clear thereof.

ARTICLE 26: RIGHT OF WAY

§ 1146 **Drivers to Exercise Due Care.** Notwithstanding the provisions of any other law to the contrary, every driver of a vehicle shall exercise due care to avoid colliding with any bicyclist [or] pedestrian...upon the roadway and shall give warning by sounding the horn when necessary.

ARTICLE 34: OPERATION OF BICYCLES AND PLAY DEVICES

§ 1230. **Effect of regulations.** (a) The parent of any child and the guardian of any ward shall not authorize or knowingly permit any such child or ward to violate any of the provisions of this article. (b) These regulations applicable to bicycles or to in-line skates shall apply whenever a bicycle is, or in-line skates are, operated upon any highway, upon private roads open to public motor vehicle traffic and upon any path set aside for the exclusive use of bicycles, or in-line skates, or both.

§ 1231. **Traffic laws apply to persons riding bicycles or skating or gliding on in-line skates.** Every person riding a bicycle or skating or gliding on in-line skates upon a roadway shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle by this title, except as to special regulations in this article and except as to those provisions of this title which by their nature can have no application.

§ 1232. **Riding on bicycles.** (a) A person propelling a bicycle shall not ride other than upon or astride a permanent and regular seat attached thereto, nor shall he ride with his feet removed from the

pedals. (b) No bicycle shall be used to carry more persons at one time than the number for which it is designed and equipped.

§ 1234. Riding on roadways, shoulders, bicycle or in-line skate lanes and bicycle or in-line skate paths. (a) Upon all roadways, any bicycle or in-line skate shall be driven either on a usable bicycle or in-line skate lane or, if a usable bicycle or in-line skate lane has not been provided, near the right-hand curb or edge of the roadway or upon a usable right-hand shoulder in such a manner as to prevent undue interference with the flow of traffic except when preparing for a left turn or when reasonably necessary to avoid conditions that would make it unsafe to continue along near the right-hand curb or edge. Conditions to be taken into consideration include, but are not limited to, fixed or moving objects, vehicles, bicycles, in-line skates, pedestrians, animals, surface hazards or traffic lanes too narrow for a bicycle or person on in-line skates and a vehicle to travel safely side-by-side within the lane. (b) Persons riding bicycles or skating or gliding on in-line skates upon a roadway shall not ride more than two abreast. Persons riding bicycles or skating or gliding on in-line skates upon a shoulder, bicycle or in-line skate lane, or bicycle or in-line skates path, intended for the use of bicycles or in-line skates may ride two or more abreast if sufficient space is available, except that when passing a vehicle, bicycle or person on in-line skates, or pedestrian, standing or proceeding along such shoulder, lane or path, persons riding bicycles or skating or gliding on in-line skates shall ride, skate, or glide single file. Persons riding bicycles or skating or gliding on in-line skates upon a roadway shall ride, skate, or glide single file when being overtaken by a vehicle. (c) Any person operating a bicycle or skating or gliding on in-line skates who is entering the roadway from a private road, driveway, alley or over a curb shall come to a full stop before entering the roadway

§ 1237. Method of giving hand and arm signals by bicyclists. All signals herein required to be given by bicyclists by hand and arm shall be given in the following manner and such signals shall indicate as follows:

1. Left turn. Left hand and arm extended horizontally.
2. Right turn. Left hand and arm extended upward or right hand and arm extended horizontally.
3. Stop or decrease speed. Left hand and arm extended downward.


N.Y. HAY. LAW § 316: NY Code - Section 316: Entitled to free use of highways

The authorities having charge or control of any highway, public street, park, parkway, driveway, or place, shall have no power or authority to pass, enforce or maintain any ordinance, rule or regulation by which any person using a bicycle or tricycle shall be excluded or prohibited from the free use of any highway, public street, avenue, roadway, driveway, parkway, park, or place, at any time when the same is open to the free use of persons having and using other pleasure carriages, except upon such driveway, speedway or road as has been or may be expressly set apart by law for the exclusive use of horses and light carriages. But nothing herein shall prevent the passage, enforcement or maintenance of any regulation, ordinance or rule, regulating the use of bicycles or tricycles in highways, public streets, driveways, parks, parkways, and places, or the regulation of the speed of carriages, vehicles or engines, in public parks and upon parkways and driveways in the city of New York, under the exclusive jurisdiction and control of the

department of parks and recreation of said city, nor prevent any such authorities in any other city from regulating the speed of any vehicles herein described in such manner as to limit and determine the proper rate of speed with which such vehicle may be propelled nor in such manner as to require, direct or prohibit the use of bells, lamps and other appurtenances nor to prohibit the use of any vehicle upon that part of the highway, street, park, or parkway, commonly known as the footpath or sidewalk.

EXHIBIT 2

City of Binghamton Sustainable Complete Streets Resolution

Legal Counsel Approval 

RL11-109

Introductory No. R11-69

Permanent No. R11-66



THE COUNCIL OF THE CITY OF BINGHAMTON STATE OF NEW YORK

Date: July 20, 2011

Sponsored by Council Members: Weslar, Webb, Collins, Massey, Rennia, Kramer

Introduced by Committee: Municipal and Public Affairs

RESOLUTION

entitled

A RESOLUTION ESTABLISHING A SUSTAINABLE COMPLETE STREETS POLICY FOR STREET AND TRANSPORTATION PROJECTS

WHEREAS, "Complete Streets" are defined as roadways that enable safe and convenient access for all users, including bicyclists, children, persons with disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation and seniors; and

WHEREAS, "Sustainable Complete Streets" are defined as Complete Streets with elements of design, construction and operation that also incorporate environmental sustainability; and

WHEREAS, streets that support and invite multiple uses, including safe, active and ample space for pedestrians, bicycles and public transportation, are more conducive to the public life and efficient movement of people than streets designed primarily to move automobiles and trucks; and

WHEREAS, promoting pedestrian, bicycle and public transportation travel as an alternative to the automobile reduces negative environmental impacts, promotes healthy living, and is less costly to the commuter; and

WHEREAS, the full integration of all modes of travel in the design of streets and highways will increase the capacity and efficiency of the road network, reduce traffic congestion by improving mobility options, limit greenhouse gas emissions and improve the general quality of life; and

WHEREAS, many studies show that when roads are better designed for bicycling, walking and transit use, more people utilize them for alternative modes of transit; and

WHEREAS, the design and construction of new roads and facilities should anticipate and provide for future demand for biking, walking and other alternative transportation facilities and not preclude the provision of future improvements; and

WHEREAS, Complete Streets are supported by the Institute of Traffic Engineers, the American Planning Association and many other transportation, planning and public health professionals.

**THE COUNCIL OF THE CITY OF BINGHAMTON
STATE OF NEW YORK**

Date: July 20, 2011

NOW, THEREFORE, the Council of the City of Binghamton, duly convened in regular session, does hereby:

RESOLVE, that the City hereby establishes and adopts a Sustainable Complete Streets policy whereby all street projects, including design, planning, reconstruction, rehabilitation, maintenance or operations by the City of Binghamton shall be designed and executed in a balanced, responsible and equitable way to accommodate and encourage travel by public transportation vehicles and their passengers, bicyclists and other wheeled modes of transportation, and pedestrians of all ages and abilities, in accordance with established Best Practice Design Guidelines for Complete Streets and Sustainable Complete Streets and in consultation with the AASTHO Guide for Development of Bicycle Facilities and the AASTHO Guide for Pedestrian Facilities; and be it further

RESOLVED, the City of Binghamton shall strongly consider the needs of drivers, public transportation vehicles and patrons, bicyclists, wheelers, and pedestrians of all ages and abilities in all planning, programming, design, construction, reconstruction, retrofit, operations and maintenance activities and products; and be it further

RESOLVED, the City shall view all transportation improvements as opportunities to improve safety, access and mobility for all travelers in the City and shall recognize bicycle, pedestrian and transit modes as integral elements of the transportation system.

I hereby certify the above to be a true copy
of the legislation adopted by the Council
of the City of Binghamton at a meeting
held on 7/20/11. Approved by the
Mayor on 7/20/11.

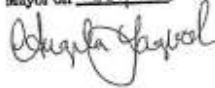


EXHIBIT 3

Department of Transportation Memorandum of Bicycle Tort Liability

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

TO: J. Olson, Bike/Ped Program, 206-4
FROM: E. M. Kerness, Asst. Counsel, Office of Legal Affairs, 509-5 *ELK*
SUBJECT: BICYCLE TORT LIABILITY
DATE: February 15, 1994

Section 1231 of the Vehicle and Traffic Law provides:

"Every person riding a bicycle upon a roadway shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle by this title, except as to special regulations in this article and except as to those provisions of this title which by their nature can have no application."

Section 1231 of the Vehicle and Traffic Law provides that every person who rides a bicycle on a roadway has the same rights as a driver of a motor vehicle. In other words, a bicyclist has the same rights to utilize the State roadways as the driver of a motor vehicle.

In addition, Section 1231 and other sections of the Vehicle and Traffic Law also impose on bicyclists additional requirements, i.e. driving on right, etc.

My review of the law indicates that the same legal liability principles for motor vehicles apply to bicycles. The State or municipality (hereinafter referred to as State) is obligated to maintain its roadways in a reasonably safe condition. The duty to maintain the roadway in a reasonably safe condition extends to all users of the highway and bicyclists are entitled to the same protection as drivers of other vehicles so long as it is perceivable that they are users of the highway. If the State or municipality knows that bicycles use the roadway, they have an obligation to maintain it in a safe condition for cyclists. This obligation exists regardless of whether the roadway is marked "bicycle route".

The State is required to consider the safety of bicyclists in determining whether a road is reasonably safe for a bicyclist. Certain defects which may be trivial to a car,

may well create a hazard to a cyclist. Therefore, the State has an ongoing duty to inspect such roads for such conditions.

As a general rule, if a dangerous condition is the proximate cause of the bicycle accident, the State, with notice of its existence, will be liable if it failed to remedy the condition. In addition, absent actual notice, the courts at times find the State liable if the State had constructive notice of the condition (if the condition existed for such a period of time that the State should have had knowledge of it). Thus, in all such cases, liability is created irrespective if the road is signed a bicycle route or not.

I hope this memo is of assistance to you and your staff. If further information is desired, please advise.

EMK:cb
EMK0564

EXHIBIT 4

NACTO Urban Street Design Guide Review

3/26/14 *Dayful*



STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
ALBANY, N.Y. 12232

WWW.DOT.NY.GOV

JOAN McDONALD
COMMISSIONER

ANDREW M. CUOMO
GOVERNOR

March 26, 2014

David Vega-Barachowitz
Director, Designing Cities Initiative
National Association of City Transportation Officials (NACTO)
55 Water Street, 9th Floor
New York, NY 10041

Dear Mr. Vega-Barachowitz:

Thank you for the invitation to review the NACTO *Urban Street Design Guide* (Guide). The New York State Department of Transportation (NYSDOT) has had the opportunity to assess the Guide, and it presents many good ideas and innovative design solutions for accommodating diverse user needs for urban roadways. We are pleased to support the Guide for our internal use and will provide it to our staff as a reference for the design of urban and residential streets, where implementation would be in conjunction with the appropriate traffic and engineering studies.

As noted in the introduction of the Guide, urban situations are complex, and good engineering judgment must always be employed. NYSDOT found that the requirements or recommendations of the Guide occasionally conflict with those of the American Association of State Highway and Transportation Officials (AASHTO) and NYSDOT's own guidelines for collectors and arterials. We understand that the Guide is intended to apply primarily to urban streets, however many of New York State's collectors and arterials are located in urban areas. Due to our concern for the potential safety and mobility impacts on these roadways, we will not be recommending its use for collectors and arterials.

I anticipate that the Guide will prove to be a useful resource for NYSDOT in our continued effort to meet the needs of all roadway users, and to strengthen Complete Streets in New York State. If you have any questions or concerns, please don't hesitate to contact me at (518) 457-1030.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard W. Lee".

Richard W. Lee, P.E.
Deputy Chief Engineer
Director, Office of Design

APPENDIX 4
Progress Before and After Photos

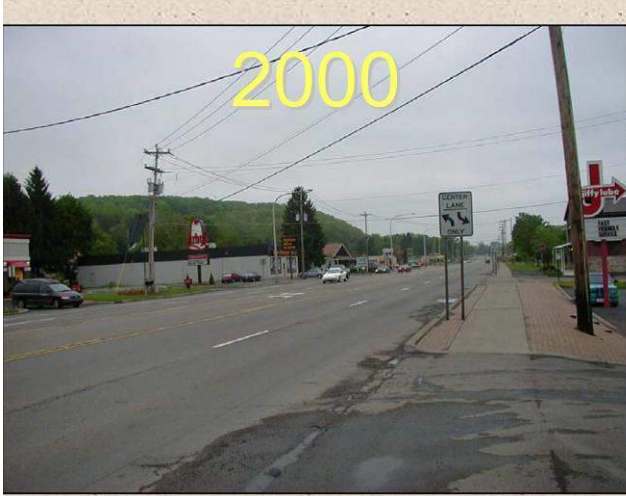
EXHIBIT 1

FRONT ST. (BCC to Exit 6) – NYSDOT Reconstruction Project



FRONT ST. (Exit 6 to NYS 12A) – NYSDOT Project
(Repave and re-stripe to narrow travel lanes and add bike lanes.)





NYS 12A – NYSDOT Reconstruction Project

Before

After



Hawley Street – City of Binghamton

(Mill & Fill project with new pavement marking design.)

BEFORE



AFTER



River Road – Town of Chenango (Broome County Project)

This project resulted from a request from the Town of Chenango, wanting slower motorist speeds along River Road. This request was precipitated by a crash of a motorist into a house along River Rd., and the desire for increased safety for pedestrians and bicyclists using the roadway to access transit bus stops, an elementary school, a park, and residences, as well as for those using the roadway for recreational biking and walking.

By installing an edge line, a space for pedestrians and bicyclists is defined, while the motorist travel lane is narrowed to constrain space, encouraging traffic calming & speed limit compliance.

The Broome County Dept. of Public Works funded and constructed the project.



Before

After



Eastbound

Westbound



APPENDIX 5
Bicycle Facility Guidelines and Diagrams

EXHIBIT 1

Design Guide Publications for Bicycle Facilities

Proper design of bicycle facilities is essential to encourage proper use, and to operate safely and effectively.

Below is the list of the primary design guides with approved design standards including the AASHTO Guide for the Development of Bicycle Facilities, NYSDOT Highway Design Manual, Chapter 17 Design of Bicycle Facilities and the Federal Manual of Uniform Traffic Control Devices (MUTCD). These and additional resources providing guidance for proper design and operation of bicycle facilities are listed below.

Federal, state and national design guidance:

- **AASHTO Guide for the Development of Bicycle Facilities.** This AASHTO Guide can be ordered from the AASHTO bookstore.
 - https://bookstore.transportation.org/category_item.aspx?id=DS
- **NYSDOT Bicycle Facility Design Guide (Chapter 17)**
 - <https://www.dot.ny.gov/divisions/engineering/design/dqab/hdm>
- **Federal Manual of Uniform Traffic Control Devices**
 - <https://www.dot.ny.gov/divisions/operating/oom/transportation-systems/traffic-operations-section/mutcd>
 - Chapter 9 - Traffic Controls for Bicycle Facilities
 - Chapter 6 - Accessibility in Temporary Traffic Control Zones
- **BIKESAFE: Bicycle Countermeasure Selection System (FHWA Report – FHWA-SA-05-006)**
 - <http://www.bicyclinginfo.org/bikesafe/>
- **NYSDOT Work Zone Traffic Control Guidance**
 - <https://www.dot.ny.gov/divisions/operating/oom/transportation-systems/safety-program-technical-operations/work-zone-control>
- **Design Guidance; Accommodating Bicycle and Pedestrian Travel: A Recommended Approach (FHWA)**
 - <http://www.fhwa.dot.gov/environment/bikeped/design.htm>
- **NCHRP Report 672 Roundabouts: An Informational Guide**
 - http://www.trb.org/Main/Blurbs/Roundabouts_An_Informational_Guide_Second_Edition_164470.aspx
- **NYS Bridge Manual (Metric Version) Chapter 6 Bridge Railing: Details on the accommodation of bicycle and pedestrian traffic and bridge railings.**
 - https://www.dot.ny.gov/divisions/engineering/structures/manuals/bridge_manual_4th_ed
- **NACTO Urban Bikeway Design Guide** - <http://nacto.org/cities-for-cycling/design-guide/>
- **NACTO Urban Street Design Guide** - <http://nacto.org/usdg/>

EXHIBIT 2
General Considerations for Different Bikeway Types
 AASHTO Guide for the Development of Bicycle Facilities – Chapter 2

General Considerations for Different Bikeway Types

Type of Bikeway	Best Use	Motor Vehicle Design Speed	Traffic Volume	Classification or Intended Use	Other Considerations
Shared lanes (no special provisions)	Minor roads with low volumes, where bicyclists can share the road with no special provisions.	Speeds vary based on location (rural or urban).	Generally less than 1,000 vehicles per day.	Rural roads, or neighborhood or local streets.	Can provide an alternative to busier highways or streets. May be circuitous, inconvenient, or discontinuous.
Shared lanes (wide outside lanes)	Major roads where bike lanes are not selected due to space constraints or other limitations.	Variable. Use as the speed differential between bicyclist and motorists increases. Generally any road where the design speed is more than 25 mph.	Generally more than 3,000 vehicles per day.	Arterials and collectors intended for major motor vehicle traffic movements.	Explore opportunities to provide marked shared lanes, paved shoulder, or bike lanes for less confident bicyclists.
Marked shared lanes	Space-constrained roads with narrow travel lanes, or road segments upon which bike lanes are not selected due to space constraints or other limitations.	Variable. Use where the speed limit is 35 mph or less.	Variable. Useful where there is high turnover in on-street parking to prevent crashes with open car doors.	Collectors or minor arterials.	May be used in conjunction with wide outside lanes. Explore opportunities to provide parallel facilities for less confident bicyclists. Where motor vehicles allowed to park along shared lanes, place markings to reduce potential conflicts with opening car doors.

General Considerations for Different Bikeway Types (continued)

Type of Bikeway	Best Use	Motor Vehicle Design Speed	Traffic Volume	Classification or Intended Use	Other Considerations
Paved shoulders	Rural highways that connect town centers and other major attractors.	Variable. Typical posted rural highway speeds (generally 40–55 mph).	Variable.	Rural roadways; inter-city highways.	Provides more shoulder width for roadway stability. Shoulder width should be dependent on characteristics of the adjacent motor vehicle traffic, i.e. wider shoulders on higher-speed and/or higher-volume roads.
Bike lanes	Major roads that provide direct, convenient, quick access to major land uses. Also can be used on collector roads and busy urban streets with slower speeds.	Generally, any road where the design speed is more than 25 mph.	Variable. Speed differential is generally a more important factor in the decision to provide bike lanes than traffic volumes.	Arterials and collectors intended for major motor vehicle traffic movements.	Where motor vehicles are allowed to park adjacent to bike lane, provide a bike lane of sufficient width to reduce probability of conflicts due to opening vehicle doors and objects in the road. Analyze intersections to reduce bicyclist/motor vehicle conflicts.

General Considerations for Different Bikeway Types (continued)

Type of Bikeway	Best Use	Motor Vehicle Design Speed	Traffic Volume	Classification or Intended Use	Other Considerations
Bicycle boulevards	Local roads with low volumes and speeds, offering an alternative to, but running parallel to, major roads. Still should offer convenient access to land use destinations.	Use where the speed differential between motorists and bicyclists is typically 15 mph or less. Generally, posted limits of 25 mph or less.	Generally less than 3,000 vehicles per day.	Residential roadways.	Typically only an option for gridded street networks. Avoid making bicyclists stop frequently. Use signs, diverters, and other treatments so that motor vehicle traffic is not attracted from arterials to bicycle boulevards.
Shared use path: independent right-of-way	Linear corridors in greenways, or along waterways, freeways, active or abandoned rail lines, utility rights-of-way, unused rights-of-way. May be a short connection, such as a connector between two cul-de-sacs, or a longer connection between cities.	N/A	N/A	Provides a separated path for non-motorized users. Intended to supplement a network of on-road bike lanes, shared lanes, bicycle boulevards, and paved shoulders.	Analyze intersections to anticipate and mitigate conflicts between path and roadway users. Design path with all users in mind, wide enough to accommodate expected usage. On-road alternatives may be desired for advanced riders who desire a more direct facility that accommodates higher speeds and minimizes conflicts with intersection and driveway traffic, pedestrians, and young bicyclists.

General Considerations for Different Bikeway Types (continued)

Type of Bikeway	Best Use	Motor Vehicle Design Speed	Traffic Volume	Classification or Intended Use	Other Considerations
Shared use path: adjacent to roadways (i.e., sidepath)	Adjacent to roadways with no or very few intersections or driveways. The path is used for a short distance to provide continuity between sections of path on independent rights-of-way.	The adjacent roadway has high-speed motor vehicle traffic such that bicyclists might be discouraged from riding on the roadway.	The adjacent roadway has very high motor vehicle traffic volumes such that bicyclists might be discouraged from riding on the roadway.	Provides a separated path for nonmotorized users. Intended to supplement a network of on-road bike lanes, shared lanes, bicycle boulevards, and paved shoulders. Not intended to substitute or replace on-road accommodations for bicyclists, unless bicycle use is prohibited.	Several serious operational issues are associated with this facility type. See Sections 5.2.2 and 5.3.4 for additional details.

EXHIBIT 3
Wide Curb Bicycle Lanes
NYSDOT Highway Design Manual – Chapter 17

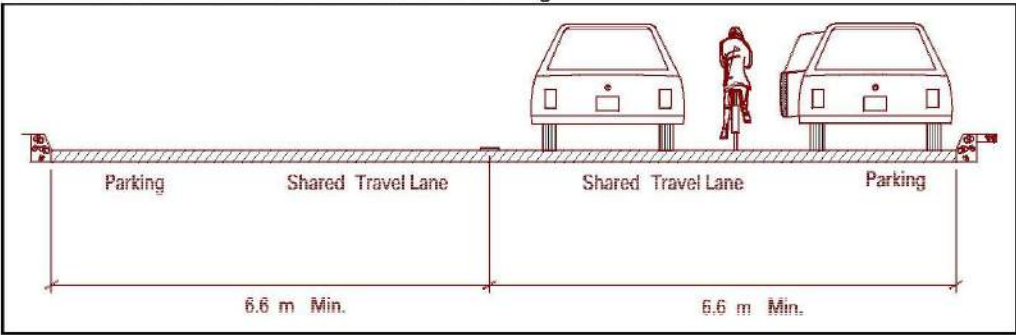
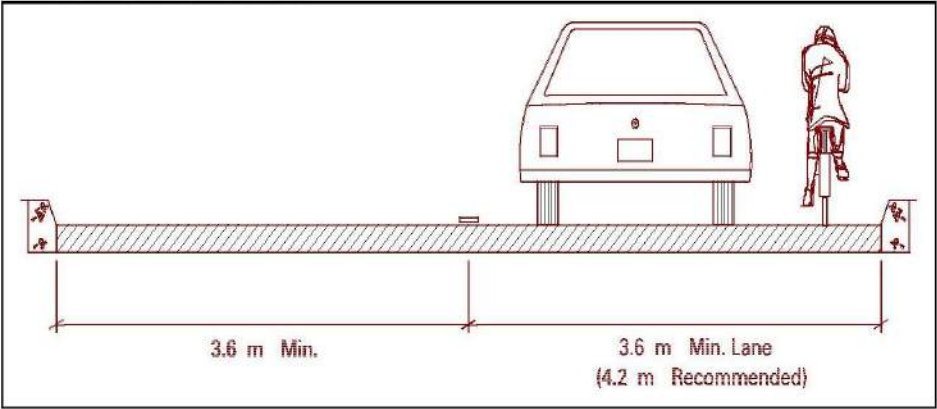
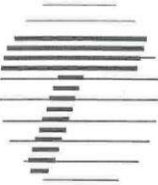



EXHIBIT 4
Shared Lane Markings
 NYSDOT Traffic Safety & Mobility Instruction 13-07

When to use Shared Lane Markings	
A. SLMs SHALL NOT be used where:	Notes
The usable width of the right lane is equal to or greater than 14' where parking is not allowed.	14' is the minimum acceptable width to allow for side-by-side travel. When determining the usual width of the lane, the presence of deteriorated pavement, drainage structures, and other obstacles to bicycle operation should be considered. A wide lane containing such obstacles may actually function as a narrow lane in terms of usable width, and may be considered for SLMs.
The usable width of the right lane + a marked parking lane is equal to or greater than 26'.	26' allows for side-by-side travel with a bicyclist out of the door zone. When determining the usual width of the lane, the presence of deteriorated pavement, drainage structures, and other obstacles to bicycle operation should be considered. A wide lane containing such obstacles may actually function as a narrow lane in terms of usable width, and may be considered for SLMs.
B. SLMs SHOULD NOT be used where:	Notes
The speed limit is 40 mph or greater.	This is an explicit MUTCD provision.
A shoulder exists.	The key here is whether or not a motorist would have to leave the lane in order to pass the bicyclist. While a bicyclist is not legally obligated to use the shoulder, it is often most practical to use a shoulder. NYSDOT does not want to disadvantage bicyclists who choose either option. Generally, the presence of a shoulder should disqualify a location for an SLM. If both a narrow lane and narrow shoulder exist, however, or an existing shoulder is not usable, an SLM could be considered subject to the other restrictions of this policy.
The condition upon which the SLM need is based does not exist during most of the daylight hours.	An example is on-street parking that only occurs during limited hours.
A reasonable level of bicycle usage (actual & potential) does not exist.	A lack of bicycle usage reduces the conflict potential and the need for countermeasures. Some reasons for potential increases in bicycle usage include planned local development, and a public perception of the highway being safer for bicyclists with SLMs.
A reasonable level of motor vehicle usage (actual & potential) does not exist.	A lack of motor vehicle volume reduces the conflict potential and the need for countermeasures. One reason for a potential increase in vehicular usage is a change in land use.
C. SLMs MAY be used where:	Notes
There's a wrong-way biking problem.	SHALL and SHOULD restrictions in A & B of this table still apply.
There's a sidewalk biking problem.	SHALL and SHOULD restrictions in A & B of this table still apply.
An actual or potential conflict exists between bikes and motor vehicles.	Examples include parked cars, driveways, and intersections; SHALL and SHOULD restrictions in A & B of this table still apply.
It's unclear (either to motorists or bicyclists) what lane a bicyclist should be using.	Examples are dedicated turning lanes; SHALL and SHOULD restrictions in A & B of this table still apply.

<p align="center">New York State Department of Transportation</p> <p>OFFICE of TRAFFIC SAFETY & MOBILITY</p>		<p align="center">TRAFFIC SAFETY & MOBILITY</p> <p align="center">INSTRUCTION</p>	<p align="center">TSMI</p> <p align="center">13-07</p> <p align="center">Code: TO</p>								
<p>Title: SHARED LANE MARKING (SLM) POLICY</p>											
<p>Target Audience:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Regional Traffic Engineer</td> <td><input type="checkbox"/> Construction</td> </tr> <tr> <td><input type="checkbox"/> Operations & Asset Mgt. Div.</td> <td><input checked="" type="checkbox"/> Design</td> </tr> <tr> <td><input checked="" type="checkbox"/> Regional Dir. of Operations</td> <td><input checked="" type="checkbox"/> Maintenance</td> </tr> <tr> <td><input checked="" type="checkbox"/> Regional Director</td> <td><input checked="" type="checkbox"/> Policy & Planning Div.</td> </tr> </table>		<input checked="" type="checkbox"/> Regional Traffic Engineer	<input type="checkbox"/> Construction	<input type="checkbox"/> Operations & Asset Mgt. Div.	<input checked="" type="checkbox"/> Design	<input checked="" type="checkbox"/> Regional Dir. of Operations	<input checked="" type="checkbox"/> Maintenance	<input checked="" type="checkbox"/> Regional Director	<input checked="" type="checkbox"/> Policy & Planning Div.	<p>Approved:</p>  <p>Todd B. Westhuis, P.E., Acting Director Office of Traffic Safety & Mobility</p> <p align="right"><u>12/09/2013</u> Date</p>	
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ADMINISTRATIVE INFORMATION:

- This Office of Traffic Safety & Mobility Instruction (TSMI) is effective immediately.

PURPOSE: The purpose of this TSMI is to transmit NYSDOT's Shared Lane Marking (SLM) policy.

TECHNICAL INFORMATION:

- This policy discontinues the use of the SHARE THE ROAD (W16-1P) plaque, and creates a new IN LANE (NYW5-32P) plaque.
- This policy will be incorporated into the next NYS Supplement revision.

TRANSMITTED MATERIALS: *NYSDOT Shared Lane Marking (SLM) Policy.*

BACKGROUND: The 2009 MUTCD added a new pavement marking called a *shared lane marking* (sometimes informally called a *sharrow*) as an optional traffic control device to be used as deemed appropriate. Anticipating requests from the public to use this device, the Office of Traffic Safety & Mobility held a meeting in February 2012 with public stakeholders and key Department personnel to craft a draft policy. The policy was finalized in December 2012 after incorporating comments submitted by citizens, public agencies, and Department personnel.

CONTACT: Direct questions regarding this issuance to Barbara S. Abrahamer, PE, PTOE of the Office of Traffic Safety and Mobility at (518) 457-1795 or via e-mail at barbara.abrahamer@dot.ny.gov.

NYS DOT Shared Lane Marking (SLM) Policy



Purpose

The purpose of this policy is to explain how Shared Lane Markings (SLMs, sometimes referred to as “sharrows”) will be used on highways under the jurisdiction of the New York State Department of Transportation. Information about this traffic control device can be found in Section 9C.07 of the *Manual on Uniform Traffic Control Devices* (MUTCD). It is expected that this guidance will ultimately be incorporated into the NYS Supplement, thereby making the policy applicable to all highways in New York State open to public travel.

Background

In determining when SLMs should be used, general MUTCD guidance regarding traffic control devices should be kept in mind:

The purpose of traffic control devices, as well as the principles for their use, is to promote highway safety and efficiency by providing for the orderly movement of all road users on streets, highways, bikeways, and private roads open to public travel throughout the Nation.

Traffic control devices notify road users of regulations and provide warning and guidance needed for the uniform and efficient operation of all elements of the traffic stream in a manner intended to minimize the occurrences of crashes.

To be effective, a traffic control device should meet five basic requirements:

- A. Fulfill a need;*
- B. Command attention;*
- C. Convey a clear, simple meaning;*
- D. Command respect from road users; and*
- E. Give adequate time for proper response.*

SLM use should also correctly reflect the legal rights/obligations of bicyclists and motorists, and promote safe and effective bicycling techniques. See Figure 1 for an illustration that summarizes these principles.

Policy

SLMs should only be used to indicate the presence of a *narrow lane*; a narrow lane is a lane that is less than 14' wide and does not allow motorists and bicyclists to safely travel side-by-side within the lane. In a narrow lane, motorists and bicyclists must travel one after the other, rather than side-by-side, and a motorist must leave the lane to safely pass the bicyclist. SLMs should not be used to indicate the desired position for a bicyclist, as the optimal position can change depending on a number of varying factors.

In conjunction with the SLM policy, the SHARE THE ROAD plaque will be eliminated from use due to misconceptions about its meaning to both motorists and bicyclists. Instead, the following signing policy shall be used:

- On any facility (both low-speed and high-speed), the Bicycle (W11-1) warning sign may be used alone to warn motorists of the presence of bicyclists, either on the shoulder or in a wide ($\geq 14'$) outside lane.
- A new Narrow Lane assembly, consisting of the Bicycle sign + a new IN LANE plaque (NYW5-32P), should be used with SLMs in the manner described in the Implementation section. (See Figure 2 for layout of the IN LANE plaque.)
- The Narrow Lane assembly may be used on any facility (both low-speed and high-speed), where side-by-side travel within the outside lane is not possible. SLMs do not need to be present to use this assembly.



Implementation

Table 1 shall be used to determine the need for SLMs.

Table 2 shall be used to determine the placement of SLMs. On a facility with on-street parking, SLMs shall be placed in the center of the *effective lane*, which is the lane width between the left edge shy zone and the door zone. (See Figure 1 for a graphic explanation of the term *effective lane*.) On a facility without on-street parking, SLMs shall be placed in the center of the actual lane.

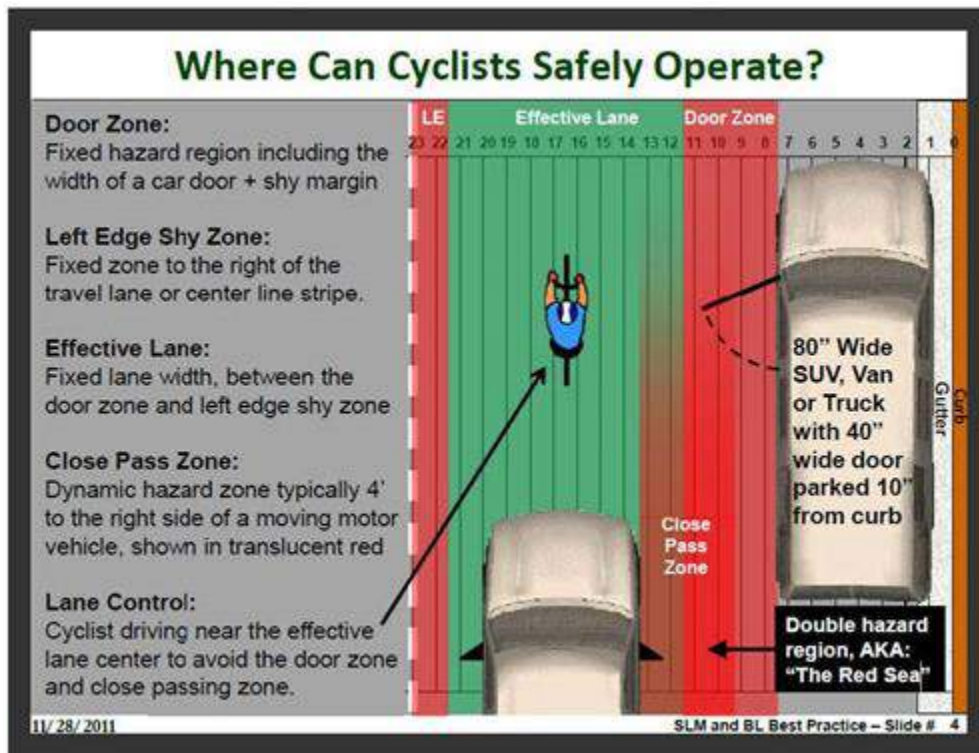
Where used, SLMs should be placed approximately 250' apart. In addition to regular interval spacing, SLMs should be placed immediately before and immediately after intersections, and at other strategic locations dependent upon specific needs (e.g., conflict points).

Where SLMs are used, the Bicycle sign + IN LANE plaque assembly should be placed at the location of the first SLM, and may be repeated as deemed appropriate within the section. It is neither necessary nor desirable to supplement every SLM with the sign assembly.

Where the Bicycle sign, or the Bicycle sign + IN LANE plaque assembly, is used without accompanying SLMs, its need and placement should be in accordance with Section 2C.49 of the MUTCD. The advance posting distance for the first sign should be determined using Condition C in Table NY2C-4 of the NYS Supplement. Additional signs should be placed at suitable locations, and at appropriate intervals, within the section of highway where the bicycle activity occurs.

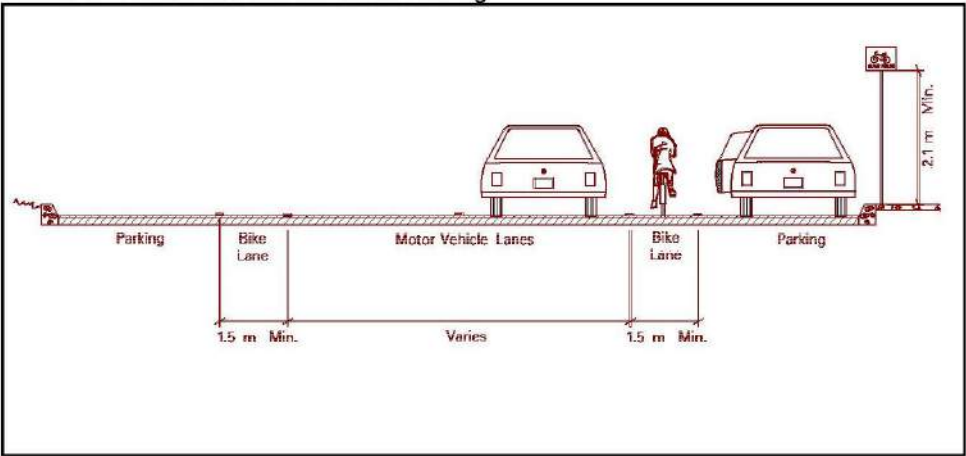
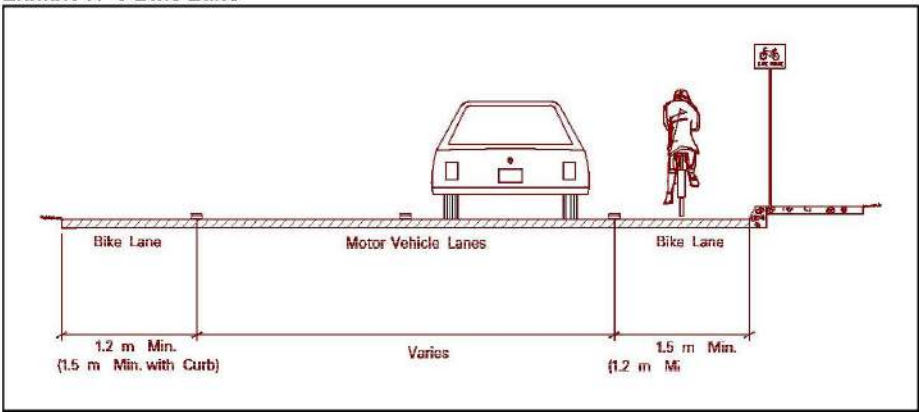
SLM Placement

A. With On-Street Parking	
Width of Outside Lane + Parking	Distance from Curb/Edge of Pavement
17'	13.5'
18'	14'
19'	14.5'
20'	15'
21'	15.5'
22'	16'
23'	16.5'
24'	17'
25'	17.5'
B. Without On-Street Parking	
All widths < 14'	Center of Lane



Narrow and Bike Lane Best Practices for Streets with Parallel Parking – Dan Gutierrez & Brian DeSousa

EXHIBIT 5
Conventional Bicycle Lane Guidelines
NYSDOT Highway Design Manual – Chapter 17



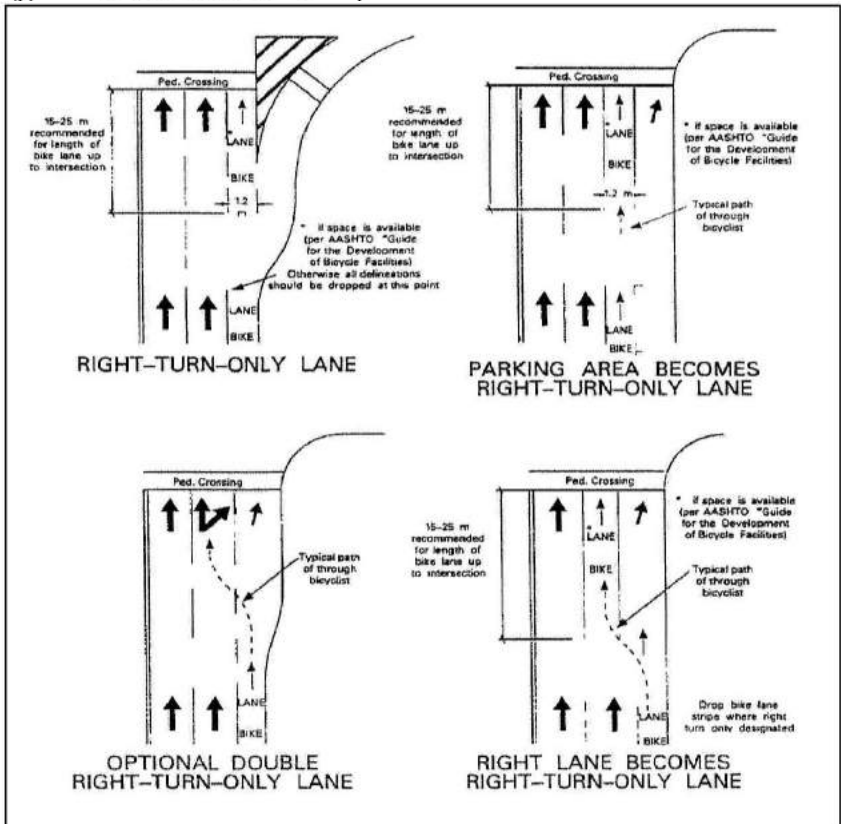
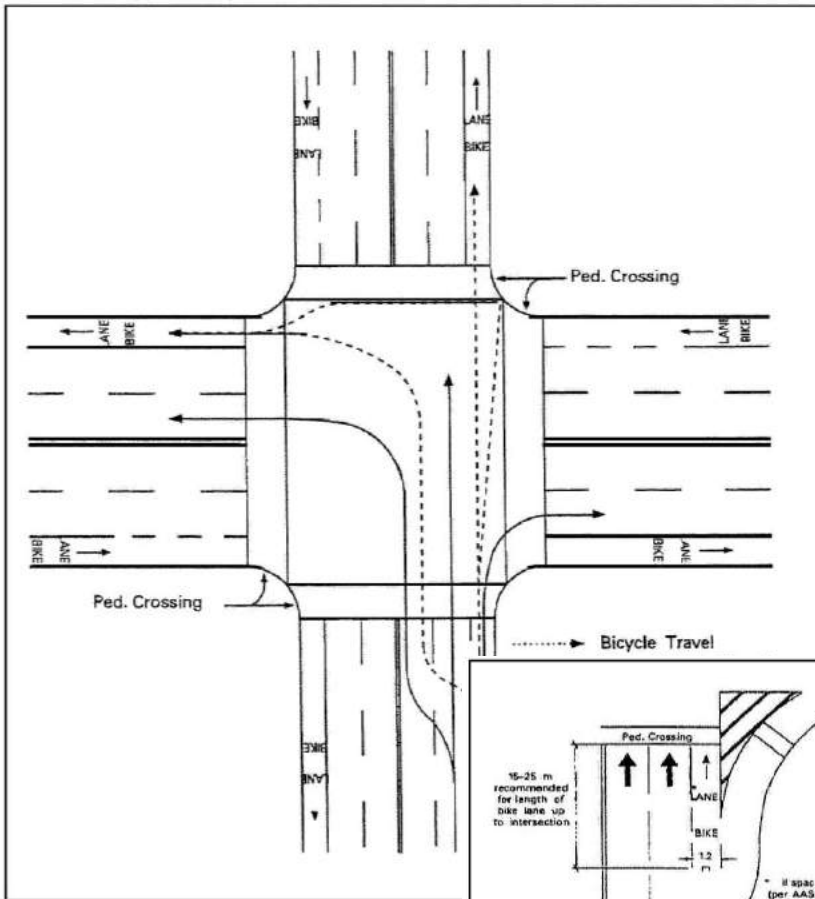
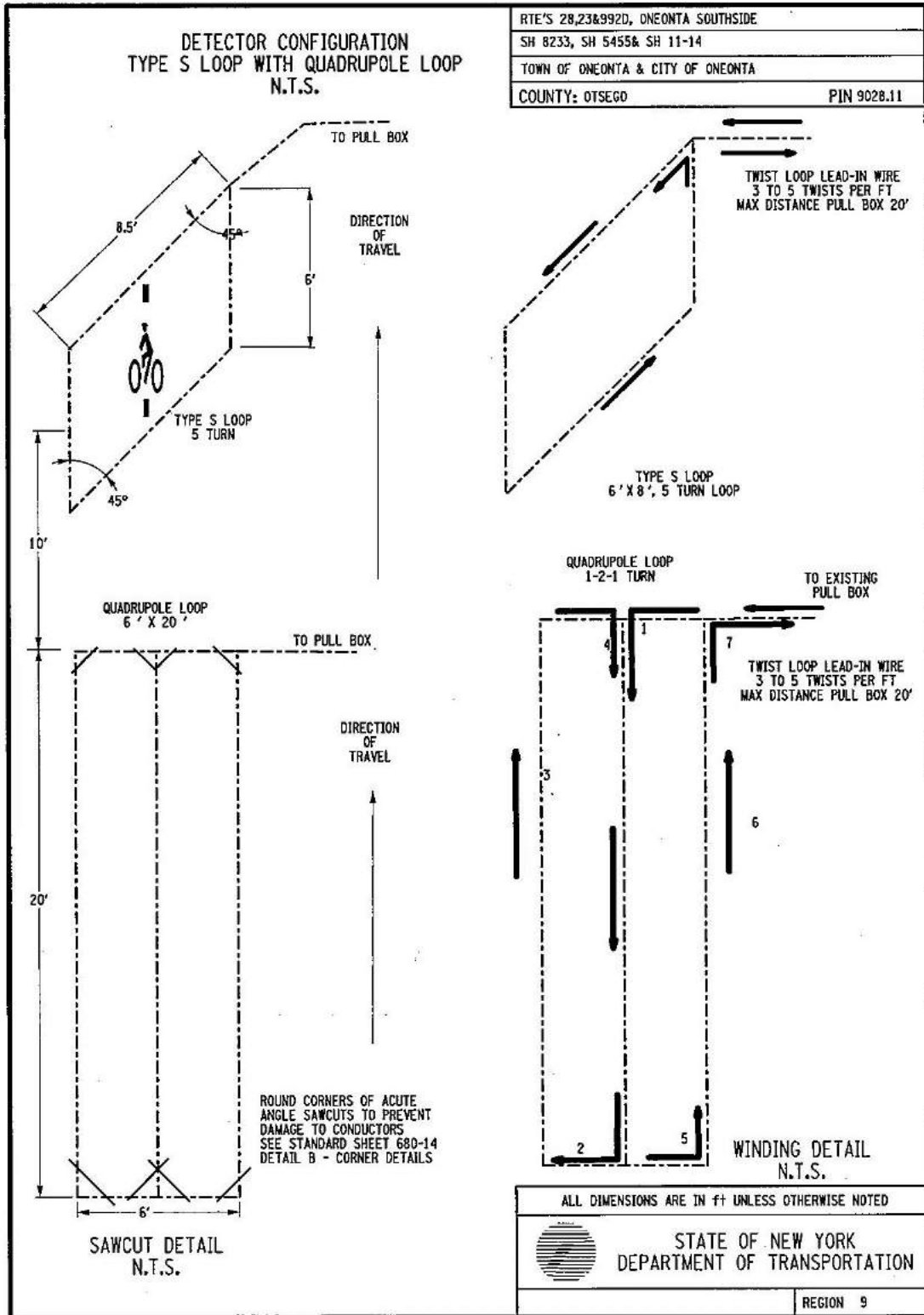


EXHIBIT 6
Signage



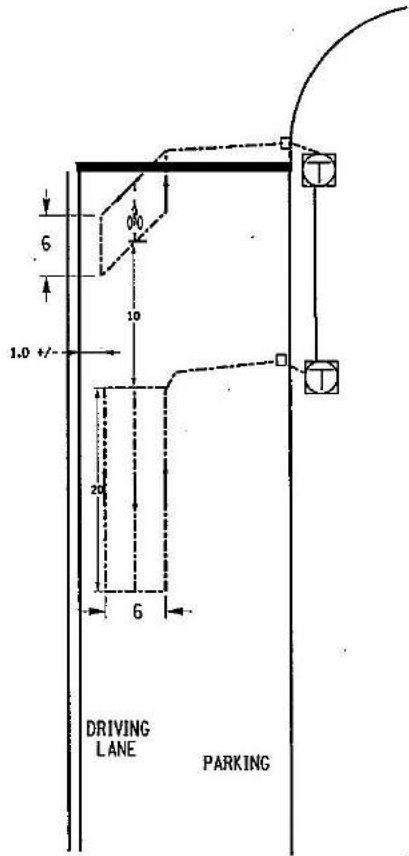
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TH=0.63"
IN=0.38"

EXHIBIT 7
Loop Detection
 NYSDOT Design Specification

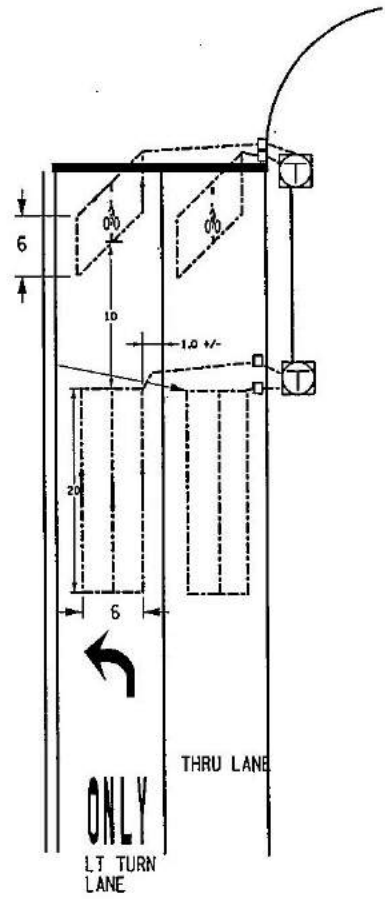


RTE'S 28,23&992D, ONEONTA SOUTHSIDE	
SH 8233, SH 5455& SH 11-14	
TOWN OF ONEONTA & CITY OF ONEONTA	
COUNTY: OTSEGO	PIN 9028.11

TYPICAL LOOP LAYOUT
SIDE STREET WITH PARKING
N.T.S.



TYPICAL LOOP LAYOUT
SIDE STREET WITH TWO LANES
N.T.S.

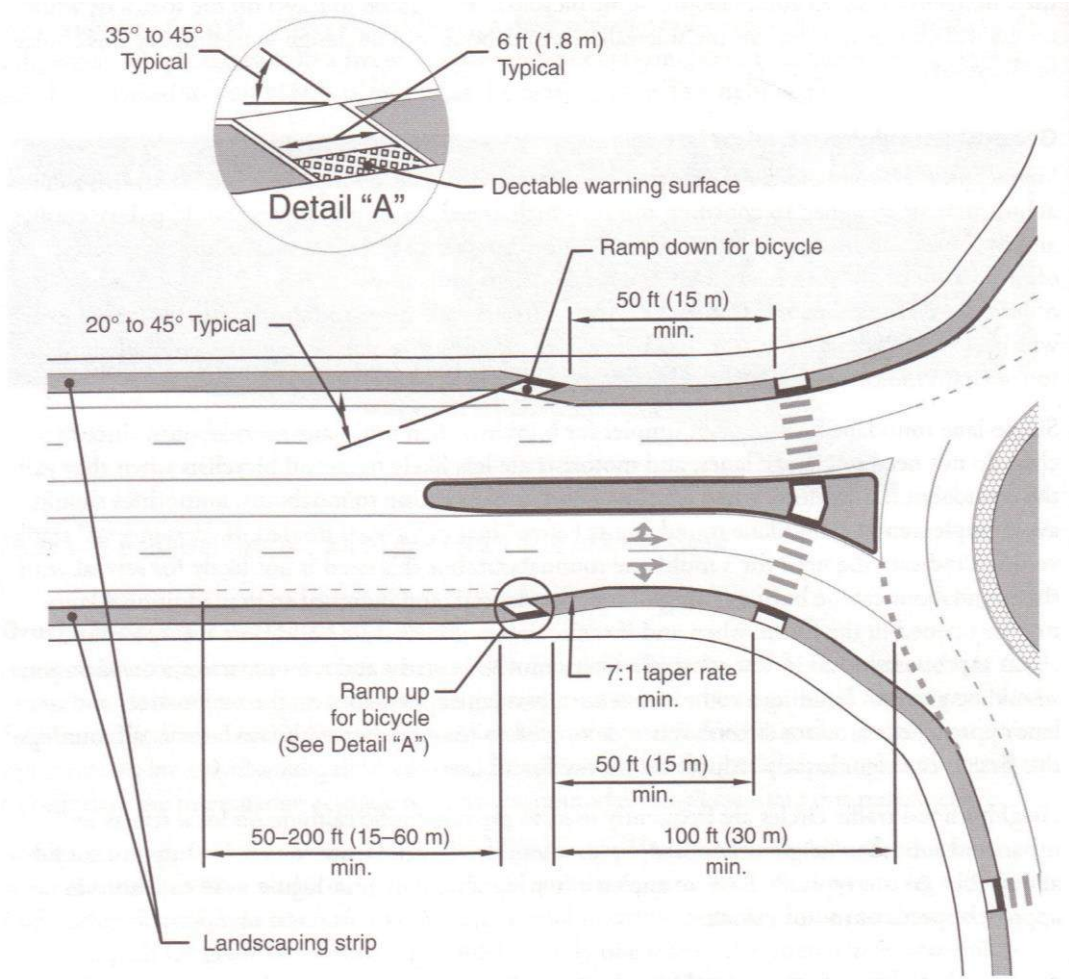


ALL DIMENSIONS ARE IN FT UNLESS OTHERWISE NOTED

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

REGION 9

EXHIBIT 8
AASHTO - Bicycle Ramp Design
 AASHTO Guide for the Development of Bicycle Facilities – Chapter 4



Typical Layout of Roundabout with Bike Lanes (4)

EXHIBIT 9 Bicycle Parking

Typical rack spacing

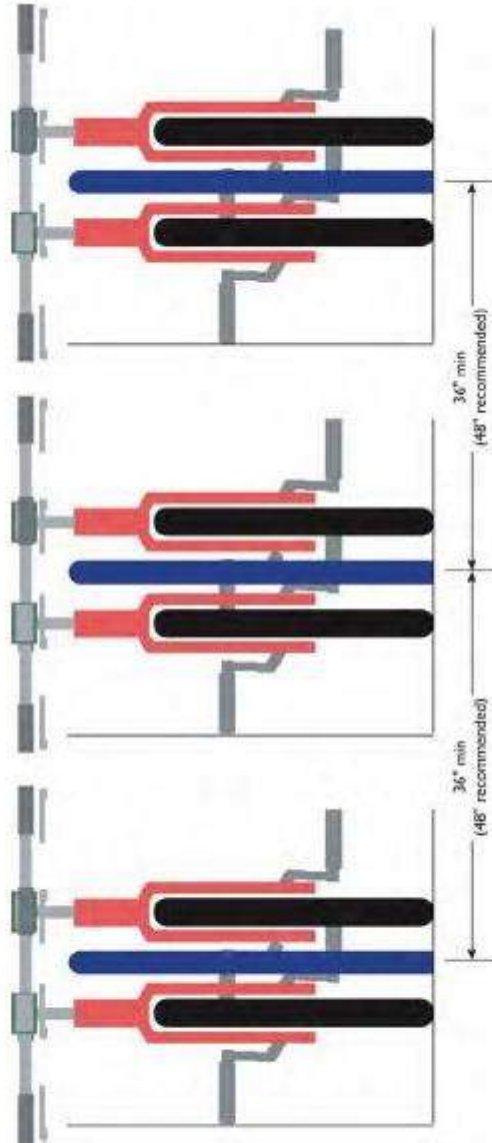
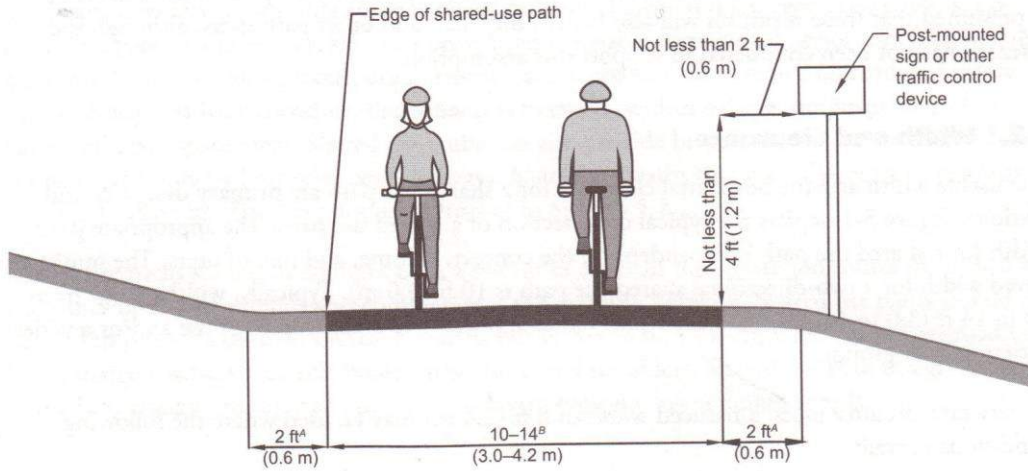


EXHIBIT 10
Shared Use Paths
 AASHTO Guide for the Development of Bicycle Facilities – Chapter 5

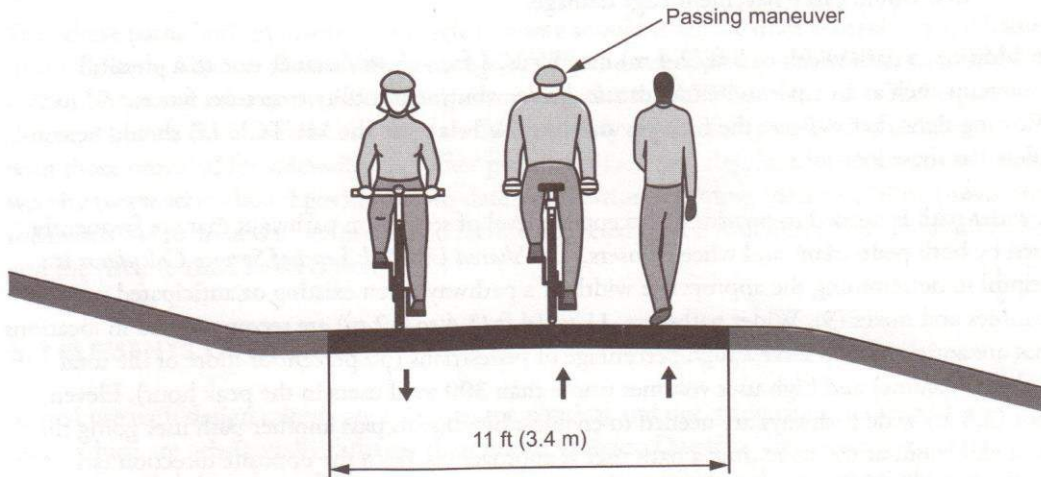


Notes:

^A (1V:6H) Maximum slope (typ.)

^B More if necessary to meet anticipated volumes and mix of users, per the *Shared Use Path Level of Service Calculator (9)*

Typical Cross Section of Two-Way, Shared Use Path on Independent Right-of-Way



Minimum Width Needed to Facilitate Passing on a Shared Use Path

APPENDIX 6

Status of Transportation Tomorrow: 2035

EXHIBIT 1
Status of *Transportation Tomorrow: 2035*

- ♦ Construct northbound flyover, NY 201 and Roundabout, Village of Johnson City
 ☒ **Completed.**
- ♦ Projects associated with Vestal Corridor Study:
 - ♦ Operational and safety improvements, Murray Hill Rd to Campus Plaza; in conjunction with NY 201 over Vestal Rd and over NY 434 bridge replacement project
 ☒ **Completed but reduced in scope, limiting project limits along Vestal Road and NY 434 to Glenn Bartle Dr to Bunn Hill Rd**
 - ♦ Operational and safety improvements, NY 434 - Jensen Rd to African Rd including intersection reconstruction, NY 434/Rano Blvd/Sycamore Rd
 ☒ **Programmed but reduced in scope to minimal intersection improvements and one sidewalk segment**
- ♦ Widen Front Street, I-81 Exit 5 to Broome Community College
 ☒ **Completed** *Included sidewalks, bike lanes, bus stop benches & bike parking racks.*
- ♦ Construct new Susquehanna River Crossing, Apalachin to Campville, Town of Owego
 ☒ **Completed.**
- ♦ Support the designation of Route 17 as Interstate 86: reconstruct I-81/NY 17 overlap
 ☒ **Programmed**
- ♦ Projects associated with City of Binghamton Access Study:
 - ♦ Court Street Gateway
 ☒ **Completed**
 - ♦ Washington Street Gateway
 ☒ **Programmed, then deleted from program to consider private development on that street segment**
 - ♦ Front Street Gateway
 ☒ **Programmed but potentially reduced in scope (currently in design with a reduced cost cap)**
 - ♦ Improved truck access into City of Binghamton First Ward: project to reconstruct intersection of Front St/Clinton Streets
 ☒ **Programmed, ready for letting, now deferred**
- ♦ Continue multimodal enhancement of Main Street (NY Route 17C):
 - ♦ West Endicott
 ☒ **Completed**
 - ♦ Hooper Road to Harrison Avenue
 ☒ **Programmed previously, now deferred**
 - ♦ Arch Street to Lester Avenue, Village of Johnson City
 ☒ **Programmed previously, now deferred. Project limited in scope to improve signals and street lighting was completed for a portion of this segment.**
- ♦ Improve multimodal mobility on Front Street, BCC to I-81 Exit 6
 ☒ **Completed.** *Included sidewalks, bike lanes, bus stop benches & bike parking racks.*
- ♦ Provide additional transit service in Binghamton: utilizing FTA Job Access-Reverse Commute funds, expanded fixed route bus service (and complementary ADA paratransit service) on weekday nights and Saturdays, and initiated service on Sundays

- ⊗ **Completed/ongoing.**
- ♦ Construct Intermodal Transit Terminal
 - ⊗ **Completed.**
- ♦ Provide additional bicycle and pedestrian infrastructure
 - ⊗ **Ongoing, as Transportation Enhancement projects are awarded; additional infrastructure has been constructed with street improvement projects**

Status of *TRANSPORTATION TOMORROW: 2030~PLACEMAKING FOR PROSPERITY*:

- High priority actions:
 - Rebuild Main Street using the principles of placemaking and context sensitive solutions
 - ⊗ **No projects yet initiated**
 - Rebuild Front Street in the City of Binghamton using the principles of placemaking and context sensitive solutions
 - ⊗ **Programmed, in preliminary design; scope to be reduced to meet imposed funding cap**
 - Focus on the rivers and complete the Greenway Plan
 - ⊗ **Route 434 Greenway segment programmed, construction deferred; no other new greenway projects programmed.**
 - Support core area economic development strategies with appropriate transportation improvements
 - ⊗ **BMTS has participated in Broome County Brownfield Opportunity Area plans for 3 locations in the urban core; no development proposals have yet come forward.**
- System preservation and asset management:
 - Maintain all modal facilities in an acceptable state of good repair and maintenance life cycle
 - ⊗ **Little progress made toward this objective because of hyperinflation of construction costs and little growth in revenue over the period. Also true of the Broome Country transit fleet, where a sizable number of buses exceed the federal 12 year standard**
 - Focus pavement investment on urban core area arterial streets.
 - ⊗ **Some progress on this objective, primarily as a result of spending ARRA funds on arterial street projects**
 - Expend at least 75% of investments on system preservation over the life of the Plan
 - ⊗ **The current TIP shows over 90% of investment directed toward system preservation.**
- Safety:
 - Roadway safety: ensure that high accident locations are addressed, and that safety is accommodated in project design
 - ⊗ **High accident locations that are within capital project limits are routinely addressed; stand alone locations as funding becomes available**
 - Pedestrian safety: complete the implementation of the Pedestrian and Bicycle Plan
 - ⊗ **Little progress on this objective; 2010-2011 includes development of new Pedestrian Plan, to be followed by new Bicycle Plan**

- Proactively address the special safety needs of an aging population
 - ⊗ **Little progress; staff educational efforts directed at older driver programs and participation in AARP intersection audits.**
- Personal mobility:
 - Transit: enhance service frequency and consolidate into a single transit operation
 - ⊗ **Study of consolidation of BC Transit and OCC-Transit completed; no implementation activities to date. No service enhancements to BC Transit; in 2010, service reductions in response to budget cuts**
 - Roadway: use transportation system management and operations, and intelligent transportation system technology to improve reliability
 - ⊗ **NYSDOT Region 9 Traffic Operations Center is operational, and continues to add ITS functionality**
- Freight: focus on multimodal trade corridors; specific strategies pending the outcome of the Binghamton Regional Freight Study
 - ⊗ **Binghamton Regional Freight Study completed; no project recommendations were of high priority for the first 5 years of the Plan**
- Environmental protection and quality of life:
 - Enhance the physical and social environment
 - ⊗ **Modest progress in terms of construction of Greater Binghamton Transportation Center, and some greenway/trail projects**
 - Reduce greenhouse gas emissions and energy consumption
 - ⊗ **Implementation of Broome-Tioga Greenride rideshare matching website**