Ulster County Non-Motorized Transportation Plan

December, 2008

Ulster County Non-Motorized Transportation Plan

Table of Contents

Appendices

This document was prepared for the Ulster County Transportation Council by the consulting team of Alta Planning + Design and sub consultants Parks & Trails NY and Hudson Valley Engineering. Special thanks are due to the advisory committee members, stakeholders, organizations and citizens who participated in the planning process.

Ulster County Transportation Council
244 Fair Street
PO Box 1800
Kingston, NY 12402-1800
www.co.ulster.ny.us/planning

EXECUTIVE SUMMARY

New York's Hudson Valley is a region rich in history, scenic resources and a dedicated and active resident population. The Ulster County Non-Motorized Transportation Plan builds on these existing resources and expands opportunities for healthy, sustainable transportation infrastructure and recreational tourism development. The plan connects schools, work and recreation destinations to help create a sustainable future for Ulster County.

By improving the connection between the human and natural environments, Ulster County can create a 'green infrastructure' that reduces fossil fuel consumption, enables freedom of mobility, encourages more physical activity, allows children to walk or bike to school, reduces traffic congestion, and makes it possible to create economic growth at the same time.

The objective of this plan is to develop a county-wide non-motorized transportation plan that includes strategies for promoting and implementing non-motorized transportation solutions. The plan provides policy guidelines and project recommendations to promote and implement a county-wide non-motorized transportation system. It identifies existing and potential commuter and recreational corridors, provides concept plans for priority projects, and recommends potential programs for encouragement, education and enforcement. It is important to note that while the Plan's focus is Ulster County, it recognizes a regional system that also must be connected. Overcoming barriers to connections, such as the bridges across the Hudson and jurisdictional issues across both county and town lines and transportation systems, is a key component of the advocacy role associated with the Plan's implementation.

The implementation of this plan will improve the quality of life for local residents through improved walkability and bikeability, and will serve as a tourism resource which can be used to effectively market Ulster County as a prime destination in the Hudson Valley. The proposed non-motorized transportation includes more than 30 miles of shared use paths, along with on-road bikeways, pedestrian improvements and supporting programs. Implementation will be phased as resources become available and through integration in ongoing infrastructure projects. With a vision of non-motorized transportation, communities can work together to make this plan a reality.

Residents and visitors of all ages and abilities will enjoy the non-motorized transportation system in Ulster County.

KEY RECOMMENDATIONS:

The next steps of implementing the Non-Motorized Transportation Plan (NMTP) and the probable lead organization are summarized as follows:

1. Next Phase Projects
The projects identified through the NMTP process can be advanced through the UCTC process with the support of local communities. This will involve ongoing communication and coordination to ensure that projects remain visible to local leaders and participants in the project development process.
Lead: NTAC

2. Project Funding
Funding opportunities are available and more may be included in the reauthorization of the federal SAFETEA transportation legislation. Other sources include the NYS Environmental Bond Act funds and recreational funds available at the county and local level. It is critical to connect these resources to potential projects in the NMTP.
Lead: UCTC, NYSDOT

3. Friends of Ulster Trails
Successful communities need well-organized advocacy groups to support local government efforts. With the range of interested organizations, a county-wide 'friends of trails' organization would play a key role in advancing the NMTP.
Lead: New non-profit (or partnership with an existing 501(c) organization)

4. Continue the Non-Motorized Transportation Advisory Committee (NTAC)
The NTAC was a vital part of the public process for the NMTP. This Committee should continue to meet as part of UCTC's ongoing coordination, public input, and implementation process.
Lead: UCTC

5. Maintenance Agreements
In the long term, cost-sharing opportunities will exist for maintenance and operations of the trail system in Ulster County. Local communities can share resources to maintain user safety, security and quality of experience as the system continues to grow.
Lead: Public Works Department staff

6. Ulster Trails Map & Clearinghouse
With the extensive existing system in place, a new County-wide trails map will help connect people with local trails in their communities, and provide an important way to promote the system and educate users about NMT safety.
Lead: County Agencies – UCTC, Open Space Partnership, and Tourism coordinated by UCTC staff

7. Annual Event
An annual promotional event can create new partnerships and demonstrate the value of NMT facilities. Several successful events are already held in the County, a coordinated events calendar and 'signature' annual event are great opportunities for the region.
Lead: Friends of Ulster Trails

8. Coordination with the 2009 Hudson-Champlain Quadricentennial Celebration
The 400th celebration of the accomplishments of Hudson, Champlain and Fulton will take place along the Hudson and Champlain Valleys in 2009. The Explore NY program is an opportunity to connect the NMT plan to the State's celebration of these historic events. The Quadricentennial also presents an opportunity to link to the current efforts to develop the Walkway Over the Hudson which would connect Ulster and Dutchess Counties.
Lead: Grand Walk About Committee

9. Policy Adoption: Complete Streets
It is important to have policies adopted at the county and local levels to ensure that appropriate infrastructure improvements for bicyclists and pedestrians become the standard operating procedure for future projects. The "Complete Streets" policy concept outlined in the NMT plan is a key to integrating facilities for pedestrians, bicyclists and trails into local projects.
Lead: County Agencies / Local Communities

10. Education, Enforcement and Encouragement Programs
While the physical facilities are a major focus of this plan, it is essential to remember that the 'other E's of education, enforcement and encouragement programs are equally important. The Share the Road program and other proposals in the NMT plan will provide important health, safety, environmental and quality of life benefits for Ulster County.
Lead: County Agencies / Local Communities

These actions will provide Ulster County with the foundation of a greenway and trail system that will provide lasting benefits to residents, businesses, and visitors. Moving this plan forward will take cooperation, innovation, and leadership. Over time, short-term priorities will get completed, and future phases will build upon early successes. With the vision developed in this plan, non-motorized transportation will be an important part of the future for Ulster County.

TECHNICAL MEMOS AND TASK REPORTS:

As part of the process to complete the Ulster County Non-Motorized Transportation Plan (NMTP), a series of Technical Memos and Task Reports were produced. These documents provide supplemental information for the chapters of this plan, and are summarized below.

1. Technical Memo 1: Public Participation

The document outlines the public involvement process for the NMTP. The public participation plan is based on the principles outlined in the UCTC Operating Procedures, Approved June 4, 2003, which states that, *"Public participation efforts will be used to educate the*

public about major transportation issues, solicit information, assist in achieving consensus, and provide a way for citizens to share their perspectives with the policy makers in the region."

2. Technical Memo 2: Data Collection and Analysis

The report provides a summary of data collected and analyzed for the NMTP. The project team utilized data and information provided by the UCTC, combined with an interactive public involvement process to develop a network of proposed non-motorized transportation facilities. This task included an inventory of existing facilities (with a focus on projects that connect two or more municipalities or projects of county-level significance), trailheads, and associated rest areas/parks, and other related infrastructure.

3. Technical Memo 3: ITS Applications for NMT

Intelligent Transportation Systems or "ITS" is a broad term describing the application of innovative technologies to improve mobility and safety. While the majority of ITS investments in the U.S. have generally been applied to high-tech information systems to improve conditions for motorists, ITS can have important applications for non-motorized travel. The task includes a section on the use of bicycle and pedestrian Intelligent Transportation Systems (ITS) technology and identifies locations where the implementation of ITS and advanced technology for bicycle and pedestrian safety and mobility could be deployed. Potential applications include the use of audible signals, microwave detectors, countdown signals, automated data counting, surveillance cameras, and other devices to enhance non-motorized transportation safety and mobility.

4. Technical Memo 4: Next Phase Projects

The report provides a summary of the selection and prioritization criteria for projects included in the NMTP. Criteria were established by the project advisors and given a range of values. Each project was scored according to the criteria with a maximum score of 100 points. The top capital improvement projects were listed in descending order and an additional ranking was developed for non-capital (education, encouragement and enforcement) projects.

5. Task Report: Policy and Programs - Best Practices Summary Report

This report provides a summary of policies and programs for the NMTP. This task identifies general policy issues associated with non-motorized transportation, and develops policy models that can be adopted by Ulster County, UCTC, and local municipalities. These policies and programs will enable communities, agencies, and governmental entities to implement elements of the non-motorized transportation infrastructure. The model policies will address the planning, construction, and/or maintenance of non-motorized transportation facilities, including sidewalks, bikeways, and trails.

The Policy and Program report includes sections on maintenance agreements among two or more municipalities, insurance requirements, liability and law enforcement issues, safety and operating issues. The report identifies model programs for promoting bicycle and pedestrian use, "Complete Streets", and provide a best practices guide for Encouragement, Enforcement, and Education programs such as the League of American Bicyclists' "Bicycle Friendly Communities" award program, the Initiative for Healthy Infrastructure (iHi) at UAlbany, the New York State Governor's Traffic Safety Committee / AAA "Share the Road" initiative, and other similar policy and program related initiatives.

1. INTRODUCTION

The purpose of this study is to develop a Non-Motorized Transportation Plan for Ulster County. The plan will serve as a guide to the County for selecting appropriate areas for non-motorized transportation, prioritizing projects, and funding, constructing, and maintaining the non-motorized transportation system. The plan recommends a number of policies and defines a network of non-motorized transportation projects within Ulster County that will enhance multi-modal transportation, connect urban and rural areas, and increase recreation and conservation opportunities in the County.

The Ulster County Transportation Council (UCTC) recognizes the importance of providing non-motorized transportation connections between every day destinations, urban and rural areas, as well as providing linkages between urban areas and state parks, historic sites, rivers, wetland systems, and other natural areas. This can be accomplished by providing sidewalks as well as a network of trails and greenways that can serve as alternatives to on-road motorized travel. For the purposes of this plan, non-motorized transportation modes include walking, bicycling, running, horseback riding, rollerblading, cross-country skiing and other uses.

The following are important benefits of non-motorized transportation and trails:

- Increased economic activity through local spending by recreational users
- Reduced costs to government through lower infrastructure spending in areas where non-motorized transportation and trails take place of development
- Increased revenues to government by sales taxes associated with local spending
- Increased property values near non-motorized transportation and trails
- Increased environmental benefits, including protection of ecological corridors to help support wildlife and protection of watersheds
- Enhanced quality of life through increased alternative transportation opportunities
- Increased public health benefits through recreational use and physical activity
- Increased access to cultural and historical resources
- Reduced automobile use as short trips can be made by non-motorized travel
- Improvements to local air quality through reduction of automobile use

Non-motorized transportation facilities can play an important role for economic development and tourism in Ulster County. According to a 2006 survey by the National Association of Homebuilders, the most desired amenity of prospective buyers is walking, bicycling and jogging trails – over swimming pools, golf courses and exercise rooms. Similar case studies have shown the value of non-motorized transportation and trails for attracting and maintaining businesses, especially technology companies which can choose to locate in communities that provide the quality of life amenities they prefer.

The development of Ulster County's non-motorized transportation system coupled with its unique connection to the culture and history of the Hudson Valley should be seen as an integral part of the region's efforts to attract businesses, residents and visitors. New Paltz was recently named as one of the best places to live for outdoor recreation and as the reputation of Ulster County grows with regards to its opportunity for outdoor activity, the region stands to benefit from increased eco-tourism and heritage tourism, both of which are significant markets.

When implemented, the non-motorized transportation projects identified in the NMTP will enhance multi-modal transportation and increase, tourism, education, recreation, economic development, health, physical fitness, and environmental conservation throughout the county. The envisioned non-motorized transportation system will provide opportunities for seniors to be more physically active, for children to walk or bike to school, for people to commute to work without their cars, and to connect local communities together. All of these benefits will enhance the quality of life for the residents and visitors of Ulster County.

Improved infrastructure for walking, bicycling and trails will have a wide range of benefits including improved health, mobility and quality of life for Ulster County's residents, businesses and visitors.

2. PUBLIC INVOLVEMENT

The public participation element of the plan was based on the principles outlined in the UCTC Operating Procedures, Approved June 4, 2003, which states that, "*Public participation efforts will be used to educate the public about major transportation issues, solicit information, assist in achieving consensus, and provide a way for citizens to share their perspectives with the policy makers in the region.*"

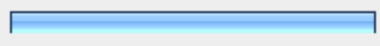
With input and guidance from the UCTC staff, a Non-Motorized Transportation Advisory Committee (NTAC) was established, including members of county and local governments, non-profit groups, and the public. The NTAC participated in the planning process throughout the development of the Non-motorized Transportation Plan and met several times during the project. A representative group of the NTAC acted as a project review committee to coordinate management of the planning process. A list of the NTAC representatives is provided in the appendix of this document.

During the course of the study, public meetings were held in Woodstock, Highland, Kingston, Ellenville and New Paltz. These meetings were essential to provide progress updates to the public, a discussion of data findings, and receiving input in the planning process. The consulting team was responsible for preparing agendas, minutes, and supporting visual aids such as maps, media releases, flyers, and other items to and handouts to assist the discussions at all meetings. Outreach efforts included direct mailings by the consultant team to special needs populations for feedback on the proposed projects.

A project website was established and was linked to the UCTC website. The site included all project documents and presentation materials. An electronic project newsletter was produced and distributed to coincide with the scheduling of the public meetings. An on-line survey was conducted via the project website. The survey was intended to provide general information about non-motorized travel in Ulster County, as well as to identify specific issues and potential projects for implementation. The response was strong and showed support for a diverse range of trail uses, indicating the need to address a balanced approach to trails, bicycle and pedestrian projects. The survey provided a list of hundreds of project ideas.

The responses to some of the key questions in the survey are provided below. Question 2 asked about the types of non-motorized travel and question 3 indicated the where and why people use non-motorized travel in Ulster County. Question 10 addressed the factors preventing respondents from using non-motorized travel.

2. What types of non-motorized uses do you participate in? (Check all that apply)



	Response Percent	Response Count
Cycling, On-road	67.5%	306
Cycling, Shared Use Paths	59.4%	269
Cycling, Mountain Bike	43.9%	199
Walking	**87.2%**	395
Jogging / Running	35.1%	159
In-line skating	13.7%	62
Child Strollers	12.4%	56
Equestrian	17.7%	80
Canoeing	39.5%	179
Tubing	8.8%	40
Rowing	9.3%	42
Sailing	6.6%	30
Skateboarding	4.0%	18
Wheelchair	0.9%	4
Cross Country Skiing/Snowshoeing	45.5%	206
Other (please specify)	15.9%	72
answered question		453
skipped question		2

3. Why and where do you use non-motorized travel? (Check all that apply)

	Response Percent	Response Count
To get to work	21.0%	95
For exercise	93.1%	421
For recreation	93.1%	421
For shopping/ errands	35.6%	161
To get to school	3.1%	14
To get to a bus stop or train station	5.8%	26
I don't like bicycling	0.4%	2
Other (please specify)	10.4%	47
answered question		452
skipped question		3

10. What prevents you from using non-motorized travel more often? (Check all that apply)

	Response Percent	Response Count
Too many cars / motorists drive too fast	68.6%	301
No trails near my residence	39.9%	175
No bike lanes or on-street bike routes near my residence	62.2%	273
Existing paths are in poor condition	20.3%	89
Destinations are too far away	27.3%	120
Not enough lighting	9.3%	41
I have to carry things	11.8%	52
I travel with small children	6.8%	30
I don't own a bicycle	3.2%	14
I don't have enough time	15.7%	69
Other (please specify)	23.7%	104
answered question		439
skipped question		16

3. EXISTING CONDITIONS / DATA COLLECTION

The planning process consisted of gathering the pertinent planning, environmental, land use, and engineering information necessary to develop the non-motorized transportation plan. Data were collected in digital format, from existing plans and documents, and through field observations. This information provided data necessary to identify the environmental, transportation, and recreation aspects of potential non-motorized transportation projects.

Bicyclist and pedestrian crashes in Ulster County were reviewed using data provided by the Ulster County Traffic Safety Board, the Fatal Accident Reporting System (FARS), and the New York State Governor's Traffic Safety Committee. In reviewing this information, it is important to note that crash rates are difficult to determine without data for the number of people walking and bicycling. It is also important to note that fatality and injury trends are difficult to determine without location-specific geo-coded data that can link crash types with infrastructure and behavioral countermeasures. That information is not currently available in Ulster County. The available data has been consolidated and presented in the following tables and maps to illustrate the number of pedestrian and bicyclist crashes, and the location of these incidents by municipality.

Table 1 - Crash Data

ULSTER COUNTY

CRASH DATA

	1999	%	2000	%	2001	%	2002	%
TOTAL CRASHES* (events)	**4,164**		**4,583**		**3,766 ***		**2,638 ***	
Fatal	20	0.5	21	0.5	27	0.7	20	0.8
Personal Injury	1,722	41.4	1,800	39.3	1,611	42.8	1766	66.9
Property Damage*	2,422	58.2	2,762	60.3	2,128 *	56.5	852 *	32.3
SELECTED CRASH TYPES (events)								
Pedestrian crashes	50	1.2	72	1.6	67	1.8	54	2.0
Bicycle crashes	46	1.1	47	1.0	37	1.0	31	1.2
Motorcycle crashes	74	1.8	66	1.4	85	2.3	68	2.6
TOTAL FATALITIES (persons)	**25**		**24**		**33**		**23**	
Drivers	17	68.0	15	62.5	19	57.6	14	60.9
Passengers	6	24.0	7	29.2	10	30.3	6	26.1
Pedestrians	2	8.0	1	4.2	2	6.1	3	13.0
Bicyclists	0	0.0	1	4.2	1	3.0	0	0.0
TOTAL INJURIES (persons)**	**2,522**		**2,631**		**2,359**		**2,413**	
Drivers	1,640	65.0	1,674	63.6	1,503	63.7	1605	66.5
Passengers	780	30.9	835	31.7	757	32.1	724	30.0
Pedestrians	53	2.1	74	2.8	64	2.7	50	2.1
Bicyclists	44	1.7	46	1.7	34	1.4	30	1.2

* Starting in October 1997, the DMV recorded property damage only crashes that were reported by police but had no motorist report submitted. This policy was rescinded in mid 2001; the most direct impact of this change was a large decrease in the number of property damage only crashes; the effect is also reflected in the total number of crashes and the total number of occupants involved in crashes.

** Police-reported crashes only.

Note: Totals may not equal the sum of the parts due to missing data.

Source: 1999-2000 NYSDMV county MV-144A, Table 1, and special county MV-144A on motorcycle crashes, Table 1.
2001-2002 NYSDMV AIS Data Base.

Source: Ulster County Traffic Safety Data, February 2005, Institute for Traffic Safety Management and Research, http://www.nysgtsc.state.ny.us/02Data/ULSTER-02-Data.pdf

In addition to traffic safety, development of the appropriate infrastructure for a non-motorized transportation system improves public health. America is experiencing a national physical inactivity epidemic which is caused in part on dependence on motorized transportation. Integrating physical activity such as walking and biking helps increase physical fitness and reduce cardiovascular disease, diabetes and other health risks. According to data from New York State Department of Health County Health Indicator Profiles, cardiovascular disease accounts for more than 30% of all fatalities in Ulster County. In 2003, more people died from heart disease in Ulster County than from lung cancer, AIDS, homicides and motor vehicle crashes combined.

(Source: http://www.health.state.ny.us/statistics/chip/ulster.htm).

A demand model was used to quantify usage of existing and potential non-motorized transportation facilities. The purpose of the model is to provide an overview of the demand and benefits for bicycling, walking and trails in Ulster County. As with all models, the results show a range of accuracy that can vary based on a number of assumptions and available data. The model used for this study incorporated information from existing publications as well as data from the U.S. Census. All data assumptions and sources are noted in the tables following each section of the analysis.

Based on U.S. Census journey to work data, walking and bicycling in Ulster County have declined by more than 23% in the decade between 1990 -2000.

Table 2: Census Transportation Planning Package

CENSUS TRANSPORTATION PLANNING PACKAGE (CTPP 2000)

Geographic Area: Working in Ulster County, New York

TABLE 1. SELECTED CHARACTERISTICS BY PLACE OF WORK, 1990 and 2000

Selected Characteristics (Universe: All Workers)	1990		2000		Change 1990 to 2000	
	Number	Percent	Number	Percent	Number	Percent
Workers 16 years or over	**66,863**	**100**	**64,730**	**100**	**-2,133**	**-3.2**
Sex						
Male	36,303	54.3	32,645	50.4	-3,658	-10.1
Female	30,560	45.7	32,085	49.6	1,525	5.0
Mode to work						
Drove alone	50,106	74.9	49,345	76.2	-761	-1.5
2-person carpool	7,163	10.7	5,480	8.5	-1,683	-23.5
3-or-more-person carpool	1,213	1.8	1,435	2.2	222	18.3
Bus or trolley bus	558	0.8	570	0.9	12	2.2
All other transit[1]	66	0.1	139	0.2	73	110.6
Bicycle or walked	4,066	6.1	3,120	4.8	-946	-23.3
Taxicab, motorcycle, or other mode	764	1.1	685	1.1	-79	-10.3
Worked at home	2,927	4.4	3,950	6.1	1,023	35.0

Source: http://ctpp.transportation.org/part2/36111.htm

2005 Census Data also show the percentage of people walking and bicycling to work in selected Ulster County Communities. Walking (4.8%) and bicycling (.8%) account for a

combined 5.6% of commuter travel in Kingston, for example. Although more detailed data are not available, it important to note that walking and bicycling trips are often for social, school, errands, recreation and other types of trips that are not included in the Census journey-to-work data.

The Ulster County bicycle demand model consists of several variables including commuting patterns of working adults, and predicted travel behaviors of area college students and school children. For modeling purposes, the study area included all residents within Ulster County in 2000. The information was ultimately aggregated to estimate the total existing demand for bicycle facilities in the County. Table 1 identifies the variables used in the model. Data regarding the existing labor force (including number of workers and percentage of bicycle commuters) was obtained from the 2000 Census. In addition to people commuting to the workplace via bicycle, the model also incorporates a portion of the labor force working from home. Specifically, it was assumed that about half of those working from home would make at least one walking or bicycling trip during the workday. The 2000 Census was also used to estimate the number of children in Ulster County. This figure was combined with data from National Safe Routes to School surveys to estimate the proportion of children riding bicycles to and from school. College students constitute a third variable in the model due to the presence of SUNY-New Paltz and Ulster County Community College. Data from the Federal Highway Administration regarding bicycle mode share in university communities was used to estimate the number of students bicycling to and from these campuses. Finally, data regarding non-commute trips was obtained from the 2001 National Household Transportation Survey to estimate bicycle trips not associated with traveling to and from school or work.

The table below summarizes estimated existing daily bicycle trips in Ulster County. The table indicates that over 22,500 trips are made on a daily basis. Most bicycle commuting trips are made by college students as well as persons making trips while working from home. The fewest trips are made by commuters traveling to and from a workplace away from home. The model also shows that non-commuting trips comprise the vast majority of existing bicycle demand.

Table 3 – Aggregate Estimate of Existing Daily Bicycling Activity in Ulster County

Variable	Figure	Calculations
Employed Adults, 16 Years and Older		
a. Study Area Population [1]	177,749	
b. Employed Persons [2]	81,726	
c. Bicycle Commute Mode Share [2]	0.2%	
d. Bicycle Commuters	163	(b*c)
e. Work-at-Home Percentage [2]	4.8%	
f. Work-at-Home Bicycle Commuters [3]	1,961	[(b*e)/2]
School Children		
g. Population, ages 6-14 [4]	22,513	
h. Estimated School Bicycle Commute Mode Share [5]	2%	
i. School Bicycle Commuters	450	(g*h)
College Students		
j. Full-Time College Students [6]	8,861	
k. Bicycle Commute Mode Share [7]	5%	
l. College Bicycle Commuters	443	(j*k)
Work and School Commute Trips Sub-Total		
m. Daily Bicycle Commuters Sub-Total	3,018	(d+f+i+l)

Variable	Figure	Calculations
n. Daily Bicycle Commute Trips Sub-Total	6,036	(m*2)
Other Utilitarian and Discretionary Trips		
o. Ratio of "Other" Trips in Relation to Commute Trips [8]	2.73	ratio
p. Estimated Non-Commute Trips	16,479	(n*o)
Total Estimated Daily Bicycle Trips	**22,516**	**(n+p)**

Notes: Census data collected from 2000 U.S. Census for Ulster County. 2000 U.S. Census, STF3, P1. 2000 U.S. Census, STF3, P30. Assumes 50% of population working at home makes at least 1 daily bicycle trip. 2000 U.S. Census, STF3, P8. Estimated share of school children who commute by bicycle, as of 2000 (source: National Safe Routes to School Surveys, 2003).

Fall 2004 full-time enrollment (Westchester Comm. College); and Fall 2004 "credit" enrollment (SUNY-Ulster/Ulster Comm. College).

Review of bicycle commute mode share in 7 university communities (source: National Bicycling & Walking Study, FHWA, Case Study #1, 1995).

27% of all trips are commute trips (source: National Household Transportation Survey, 2001).

Existing Pedestrian Demand

Existing demand for pedestrian facilities was estimated using a model similar to the bicycle demand model. The study area boundaries, variables and methodology for estimating pedestrian demand also generally reflect those used in the bicycle demand model. However this model included an additional variable to address transit access. Specifically, the model included pedestrian trips to and from public transit stops. Transit currently accounts for about 2 percent of commute trips in Ulster County, and the analysis assumed that about 75 percent of transit users would walk to and from transit stops. Estimating the pedestrian mode share of college students incorporated walking mode share data from other universities.

The table below summarizes estimated existing daily walking trips in Ulster County. The table indicates that nearly 70,000 trips are made on a daily basis. Most commute trips on foot are made by people walking to and from a workplace away from home, while college students make the fewest walking trips. The model also shows that non-commuting trips comprise the vast majority of existing pedestrian demand.

Table 4 - Aggregate Estimate of Existing Daily Pedestrian Activity in Ulster County

Variable	Figure	Calculations
Employed Adults, 16 Years and Older		
a. Study Area Population [1]	177,749	
b. Employed Persons [2]	81,726	
c. Pedestrian Commute Mode Share [2]	3.8%	
d. Pedestrian Commuters	3,106	(b*c)
e. Work-at-Home Percentage [2]	4.8%	
f. Work-at-Home Pedestrian Commuters [3]	1,961	[(b*e)/2]
g. Transit Commute Mode Share [2]	2.2%	
h. Transit Pedestrian Commuters [4]	1,348	[(b*g)*0.75]
School Children		
i. Population, ages 6-14 [5]	22,513	
j. Estimated School Pedestrian Commute Share [6]	11%	
k. School Pedestrian Commuters	2,476	(i*j)
College Students		

Variable	Figure	Calculations
l. Full-Time College Students [7]	8,861	
m. Pedestrian Commute Mode Share [8]	5%	
n. College Pedestrian Commuters	443	(l*m)
Work and School Commute Trips Sub-Total		
o. Daily Pedestrian Commuters Sub-Total	9,335	(d+f+h+k+n)
p. Daily Pedestrian Commute Trips Sub-Total	18,670	(o*2)
Other Utilitarian and Discretionary Trips		
q. Ratio of "Other" Trips in Relation to Commute Trips [9]	2.73	ratio
r. Estimated Non-Commute Trips	50,969	(p*q)
Total Estimated Daily Pedestrian Trips	**69,639**	**(p+r)**

Notes: Census data collected from 2000 U.S. Census for Ulster County. 2000 U.S. Census, STF3, P1., 2000 U.S. Census, STF3, P30. Assumes 50% of population working at home makes at least 1 daily walking trip. Assumes 75% of transit riders access transit by foot. 2000 U.S. Census, STF3, P8. Estimated share of school children who commute on foot, as of 2000 (source: National Safe Routes to School Surveys, 2003). Fall 2004 full-time enrollment (Westchester Comm. College); and Fall 2004 "credit" enrollment (SUNY-Ulster/Ulster Comm. College). Based on walking mode share from other universities. 27% of all trips are commute trips (source: National Household Transportation Survey, 2001).

In addition to the existing demand, GIS data for Ulster County was used to identify areas with potential latent demand. Bicycling and walking distances were illustrated on maps to show areas where the potential exists for improved non-motorized travel. Schools, worksites and grocery stores were identified as symbolic trip generators. The maps showed land use densities within half mile walking distance and two mile walking distance areas around these generators. This data was combined with safety, connectivity and mode share information do identify potential project locations. Bicycle Level of Service maps were also developed for primary roadways in the county, to identify general conditions for on-road bicycling. Two alternatives for bicycle level of service were used (LOG BLOS and BLOS + Speed methods). Utilizing data and digitized information from existing plans and projects, a series of maps were developed to illustrate the existing non-motorized transportation infrastructure in Ulster County. This includes a wide variety of facility types, including on and off road bikeways, single track trails, water trails, shared use paths and pedestrian facilities in community centers. A copy of the latent demand map and existing conditions base map of bicycle, pedestrian and trail facilities in Ulster County are shown on the following pages.

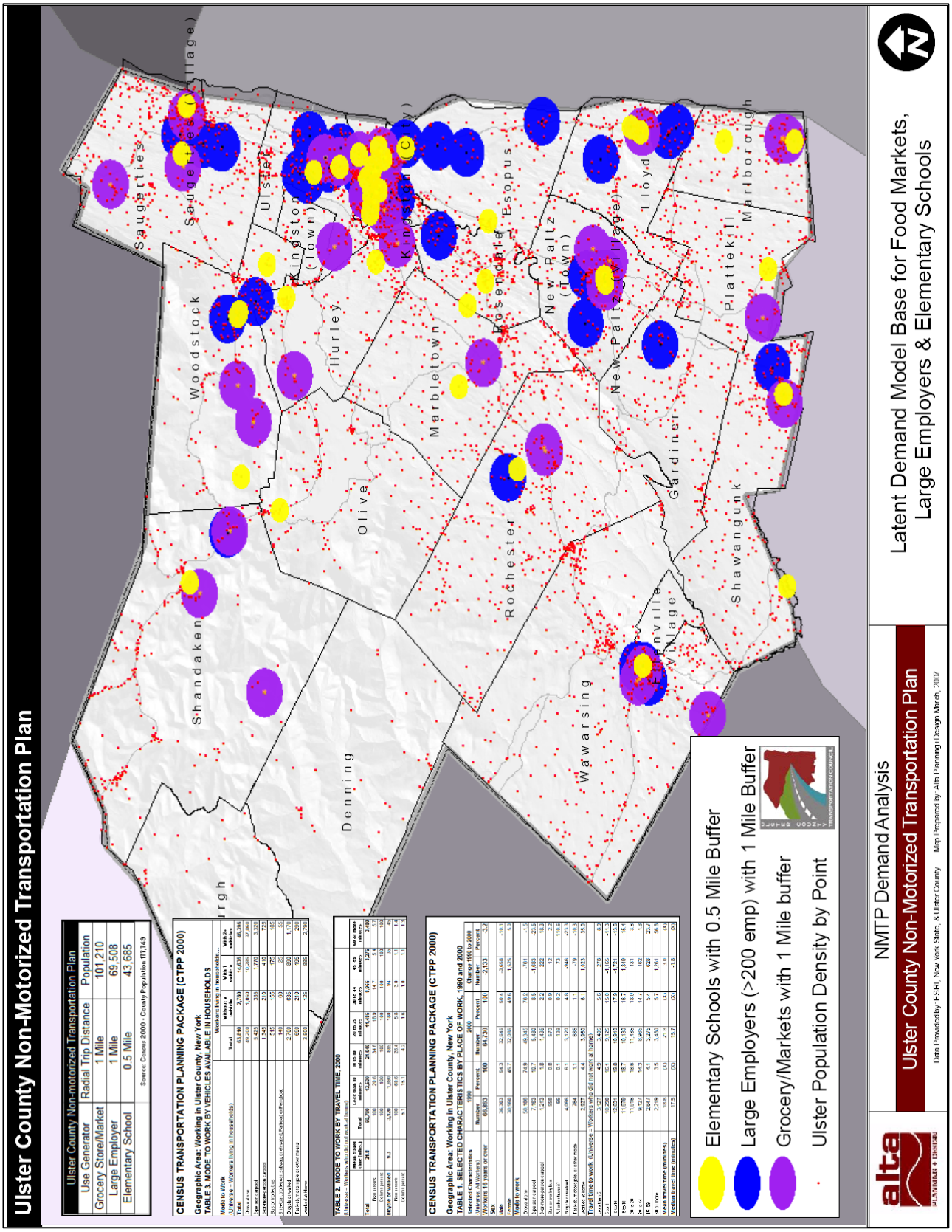

Ulster County Non-motorized Transportation Plan
Use Generator | Radial Trip Distance | Population
Grocery Store/Market | 1 Mile | 101,210
Large Employer | 1 Mile | 69,508
Elementary School | 0.5 Mile | 43,685
Source: Census 2000 - County Population 177,749
CENSUS TRANSPORTATION PLANNING PACKAGE (CTPP 2000)
Geographic Area: Working in Ulster County, New York
TABLE 3. MODE TO WORK BY VEHICLES AVAILABLE IN HOUSEHOLDS
TABLE 2. MODE TO WORK BY TRAVEL TIME: 2000
CENSUS TRANSPORTATION PLANNING PACKAGE (CTPP 2000)
Geographic Area: Working in Ulster County, New York
TABLE 1. SELECTED CHARACTERISTICS BY PLACE OF WORK, 1990 and 2000
Elementary Schools with 0.5 Mile Buffer
Large Employers (>200 emp) with 1 Mile Buffer
Grocery/Markets with 1 Mile buffer
Ulster Population Density by Point
NMTP Demand Analysis
Ulster County Non-Motorized Transportation Plan
Data Provided by: ESRI, New York State, & Ulster County
Map Prepared by: Alta Planning+Design March, 2007
Latent Demand Model Base for Food Markets, Large Employers & Elementary Schools

Figure 1

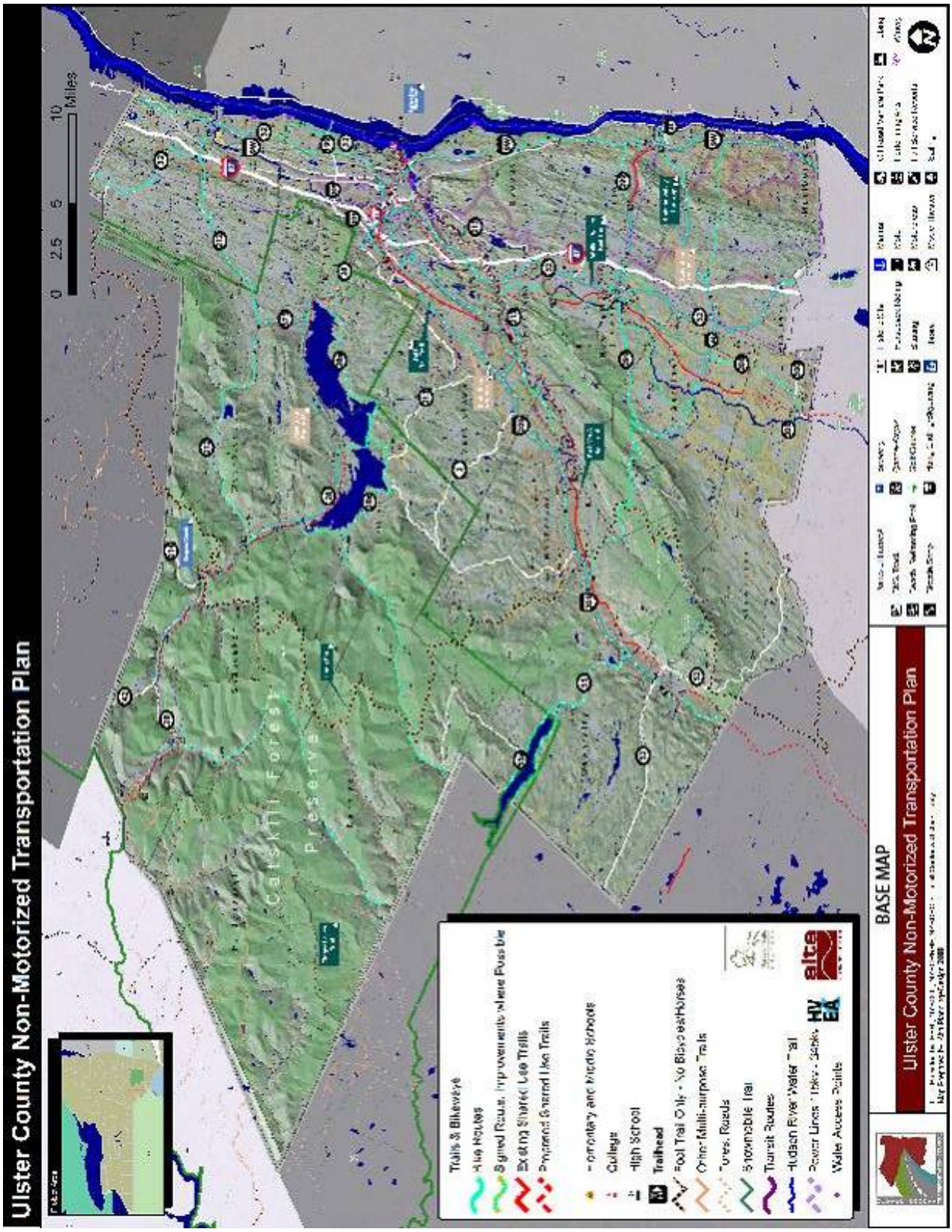

Ulster County Non-Motorized Transportation Plan
0 2.5 5 10 Miles
Catskill Forest Preserve
Trails & Bikeways
Hike Routes
Signed Route, Improvements Where Possible
Existing Shared Use Trails
Proposed Shared Use Trails
Elementary and Middle Schools
College
High School
Trailhead
Rail Trail Only - No Bikes/Horses
Other Multi-purpose Trails
Lakes, Ponds
Snowmobile Trail
Transit Routes
Hudson River Water Trail
Power Lines / Utility Corridor
Water Access Points
BASE MAP
Ulster County Non-Motorized Transportation Plan

Figure 2

In addition to quantifying existing and future demand for non-motorized facilities, a variety of models can also quantify the benefits of such facilities. Models were used in this analysis to estimate the positive air quality, public health, transportation, and recreation benefits associated with existing and future bicycle/pedestrian travel in Ulster County.

Air Quality Benefits

Non-motorized travel directly and indirectly translates into fewer vehicle trips, and an associated reduction in vehicle miles traveled and auto emissions. The variables used as model inputs generally resemble the variables used in the demand models discussed earlier. Data including population, employed persons and commute mode shares were used for this analysis. In terms of daily bicycle trips, assumptions regarding the proportion of persons working at home reflect those used in the demand models. Other inputs included data regarding college student and school children commuting patterns.

Additional assumptions were used to estimate the number of reduced vehicle trips and vehicle miles traveled, as well as vehicle emissions reductions. In terms of reducing vehicle trips, it was assumed that 73 percent of bicycle trips would directly replace vehicle trips for adults and college students. For school children, the reduction was assumed to be 53 percent. To estimate the reduction of existing and future vehicle miles traveled, a bicycle roundtrip distance of eight miles was used for adults and college students; and one mile for school children. For pedestrian trips, a roundtrip distance of 1.2 miles was used for adults and college students, and a 0.5 mile distance was used for children. These distance assumptions are used in various non-motorized benefits models. The vehicle emissions reduction estimates also incorporated calculations commonly used in other models, and are identified in the footnotes of Table 5.

Estimating future benefits required additional assumptions regarding Ulster County's population and anticipated commuting patterns. According to the U.S. Census, approximately 81,700 people are currently employed in the County. A future workforce population of 90,000 was used to reflect current overall population growth trends. In terms of commuting patterns, the walking and bicycling mode shares were increased to address higher use potentially generated by the addition of new non-motorized facilities and enhancements to the existing system. The estimated proportion of residents working from home was also grown slightly.

Table 5 summarizes existing and potential future air quality improvements associated with bicycling and walking in Ulster County. Combined, bicycling and walking currently remove over 8,400 weekday vehicle trips, eliminating nearly 22,000 vehicle miles traveled. Bicycling and walking also prevent nearly 13,000 tons of vehicle emissions from entering the ambient air each weekday. Bikeway and pedestrian network enhancements are expected to generate more bicycling and walking trips in the future. This growth is expected to improve air quality by further reducing the number of vehicle trips, vehicle miles traveled and associated vehicle emissions.

It should be noted that this model only addresses commute-related trips. Unlike the demand models, this model does not account for air quality improvements associated with recreational non-motorized travel. Quantifying the benefits of recreational travel could further improve the air quality benefits of bicycling and walking.

Table 5 - Existing and Potential Future Air Quality Benefits

Vehicle Travel Reductions	Bicycle		Pedestrian	
	Existing	Future	Existing	Future
Reduced Vehicle Trips per Weekday [1]	2,113	3,537	6,319	9,233
Reduced Vehicle Trips per Year [2]	551,551	923,027	1,649,322	2,409,748
Reduced VMT per Weekday [3]	15,235	28,292	6,664	11,676
Reduced VMT per Year [2]	3,976,420	7,384,212	1,739,392	3,047,319

Vehicle Emissions Reductions	Bicycle		Pedestrian	
	Existing	Future	Existing	Future
Reduced PM_{10} (tons per weekday) [4]	280	521	123	215
Reduced NO_X (tons per weekday) [5]	7,599	14,112	3,324	5,824
Reduced ROG (tons per weekday) [6]	1,106	2,054	484	848
Reduced PM_{10} (tons per year) [7]	73,166	135,870	32,005	56,071
Reduced NO_X (tons per year) [7]	1,983,438	3,683,245	867,609	1,520,002
Reduced ROG (tons per year) [7]	288,688	536,094	126,280	221,235

Note: VMT means Vehicle Miles Traveled, NOx means Nitrogen Oxide, PM10 means particulate matter of 10 micrometers or less and ROG means Reactive Organic Gases. Assumes 73% of bicycle trips replace vehicle trips for adults/college students; 53% reduction for school children. Weekday trip reduction multiplied by 261 weekdays per year. Bicycle trips: assumes average roundtrip of 8 miles for adults/college students; 1 mile for school children. Pedestrian trips: assumes average roundtrip of 1.2 miles for adults/college students; 0.5 mile for school children. PM10 reduction of 0.0184 tons per mile. NOX reduction of 0.4988 tons per mile. ROG reduction of 0.0726 tons per mile. Weekday emission reduction multiplied by 261 weekdays per year.

Other Benefits

Bicycling and walking generate benefits beyond air quality improvements. Non-motorized transportation can also serve recreational purposes, improve mobility and improve health. The "*BikeCost*" model, made available by the National Pedestrian and Bicycle Information Center, quantifies these benefits. Though focused primarily on bicycling, the model provides a starting point for identifying the potential cost savings of improving Ulster County's non-motorized transportation network.

Several modeling assumptions should be discussed. First, the *BikeCost* model is project-specific, requiring specific information regarding project type, facility length and year of construction. Because this study focuses on a larger study area, several variables were used. The model was based on a new 100-mile off-street trail system with an expected 2016 "mid year" of construction. The model also required other inputs obtainable from the 2000 U.S. Census, including bicycle commute mode share, average population density and average household size.

Based on the variables described above, the *BikeCost* model estimated annual recreational, mobility and health benefits. The benefits were quantified based on a combination of research from previous studies as well as other factors (identified in the footnotes of Table 6).

Table 6 summarizes the estimated benefits of an enhanced non-motorized system in Ulster County. Except for mobility benefits, the model outputs are represented on an aggregate basis. Potential annual recreational benefits range from a low estimate of about $80,000 to a high estimate of $876,000. Annual health benefits range from about $5,600 to over $33,000. Mobility benefits were estimated on a per-trip, daily and annual basis. The roughly $5 per-trip benefit of off-street trails could translate to an annual benefit of over $101,000.

Decreased auto usage could also generate monetary benefits. As Ulster County contains urban, suburban and rural areas, the enhanced network could generate up to $3,500 in annual savings from reduced vehicle trips.

Table 6 - Estimated Aggregate Annual Benefits of an Enhanced Bikeway Network

Recreational Benefits [1]	Low Estimate	Mid Estimate	High Estimate
	$79,576	$429,712	$875,339
Mobility Benefits [2]	**Per-Trip**	**Daily**	**Annually**
	$4.96	$407	$101,789
Health Benefits [3]	**Low Estimate**	**Mid Estimate**	**High Estimate**
	$5,581	$17,860	$33,487
Decreased Auto Use	**Urban**	**Suburban**	**Rural**
	$3,543	$2,180	$273

Source: Benefit-Cost Analysis of Bicycle Facilities ("BikeCost") Model, Pedestrian and Bicycle Information Center.

Recreational benefit estimated at $10 per hour (based on previous studies). Assumes one hour of recreation per adult. $10 value multiplied by the number of new cyclists minus the number of new commuters. This value multiplied by 365 days to estimate annual benefit.

Assumes an hourly time value of $12. This value multiplied by 20.38 minutes (the amount of extra time bicycle commuters are willing to travel on an off-street path). Per-trip benefit then multiplied by the daily number of existing and induced commuters. This value then doubled to account for roundtrips, to reach daily mobility benefit. Daily benefit then multiplied by 50 weeks per year and 5 days per week.

Annual per-capita cost savings from physical activity of $128 based on previous studies. This value then multiplied by total number of new cyclists.

4. PROJECT SELECTION AND EVALUATION

SYSTEM DEVELOPMENT

Based on the existing conditions, current and proposed trails, and the analysis of potential demand, a core bike/pedestrian trail system was identified and evaluated. With input from the public meetings and the NTAC, hundreds of project ideas were identified, and the project team developed a proposed county-wide non-motorized transportation system. Through an iterative process, the draft maps were made available for comment, and comments were consolidated and incorporated into map and project rankings on the following pages.

Project Prioritization

As part of the planning processs, potential projects were identified based on information obtained from site visits, field work, public involvement, and the Non-Motorized Transportation Advisory Committee (NTAC). Potential projects were prioritized using a scoring matrix. This allowed the Project Review - Working Committee (PRJ) to have input into the process of recommending projects for implementation, and provided the consultant team with input for the implementation section of the plan.

The criteria were intended to be quantitative, understandable to the public, and sensitive to the potential differences between various proejct elements (bicycling, equestrian, hiking, and multi-use). These tools helped the Advisory Committee and the consulting team to understand the relative value of potential projects so that a system could be developed which is appropriate to local issues.

Based on the identified projects and using the information presented in the project descriptions, projects were prioritized based on the following criteria:

- Transportation
- System Connectivity
- Quality of Life Benefits
- Multiple Use
- Agency Support
- Cost
- Constructability

A copy of the identification and prioritization criteria matrixes are provided in the appendix of this document. Using these criteria, projects were ranked in priority order. These rankings were then used to group the proposed projects into phase 2 recommendations. The listing of the top capital improvement projects is provided below and the listing of the top education and encouragement programs is included in the appendix.

The first 29 projects that are labeled "TIP" in the "Current Funding" column are currently scheduled projects in UCTC's Transportation Improvement Plan (TIP). Since these projects are already defined and have been placed on the TIP, they were elevated to the top of the prioritization list.

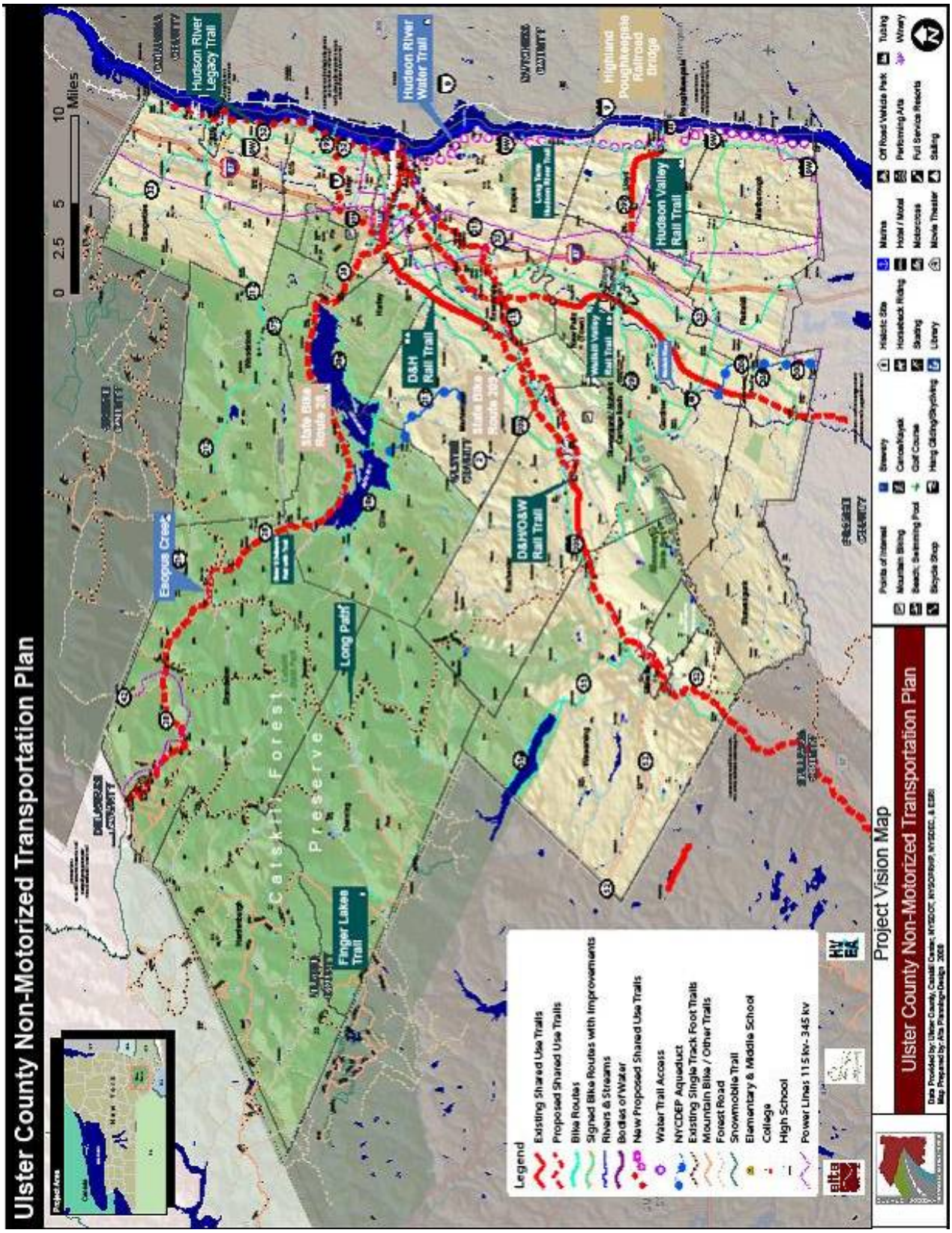

Ulster County Non-Motorized Transportation Plan
Project Vision Map
Ulster County Non-Motorized Transportation Plan
Hudson River Legacy Trail
Hudson River Water Trail
Highland Poughkeepsie Railroad Bridge
Hudson Valley Rail Trail
D&H Rail Trail
D&H/O&W Rail Trail
Esopus Creek
Long Path
Finger Lakes Trail
Catskill Forest Preserve
0 2.5 5 10 Miles
Legend
Existing Shared Use Trails
Proposed Shared Use Trails
Bike Routes
Signed Bike Routes with Improvements
Rivers & Streams
Bodies of Water
New Proposed Shared Use Trails
Water Trail Access
NYCDEP Aqueduct
Existing Single Track Foot Trails
Mountain Bike / Other Trails
Forest Road
Snowmobile Trail
Elementary & Middle School
College
High School
Power Lines 115 kv - 345 kv

Figure 3

Table 7

Ulster County Non-Motorized Transportation Plan: Project List

Project Number	Description	Locality	Type	Current Funding
1	Glasco Turnpike/Esopus Creek	UCDPW	Bridge	TIP
2	Ulster Ave(Rt 212) / CSX	Saugerties	Study	TIP
3	CSX RR Crossings Consolidation	Saugerties	Pave	TIP
4	South Putt Corners	UCDPW	Pave	TIP
5	Sawkill Road	UCDPW	Pave	TIP
6	Rt 299: Wallkill River - Rt 44/55	UCDPW	Pave	TIP
7	Western Ave	UCDPW	Pave	TIP
8	Leggs Mill Rd @ Seremma Ct	Ulster	Signal	TIP
9	Main St @ Partition St	Saugerties	Signal	TIP
10	Lucas Ave @ Cottekill Rd	Rosendale	Signal	TIP
11	Kings Hwy @ Saw Kill Rd	UCDPW	Signal	TIP
12	Hamlet Sidewalks Wallkill	Shawangunk	Bike/Ped	TIP
13	D&H/O&W Trail: Napanoch - Kerhonkson	Wawarsing	Bike/Ped	TIP
14	High Fall Hamlet Sidewalks	Marbletown	Bike/Ped	TIP
15	Multi-Modal Center	Ellenville	Transit	TIP
16	3 Cutaway Buses	UCAT	Transit	TIP
17	Kingston/Ulster River Line Crossing Safety	Safety	Other	TIP
18	Ulster & Delaware RR Trail, Stage 1	County	Bike/Ped	TIP
19	Ulster & Delaware RR Trail, Stage 2	County	Bike/Ped	TIP
20	Ulster County Park & Ride	County	Transit	TIP
21	Route 9W Marlborough	NYSDOT	Bike/Ped	TIP
22	Route 299 New Paltz	NYSDOT	Bike/Ped	TIP
23	Route 209: Ellenville - Kingston	NYSDOT	Study	TIP

Project Number	Description	Locality	Type	Current Funding
24	Washington Ave: Saw Kill Rd - Schwenk	County	Bike/Ped	TIP
25	Kingston Intermodal Center	NYSDOT	Multi-Modal	TIP
26	I-587 @ Albany Ave	NYSDOT	Bike/Ped	TIP
27	Trailways Service Improvements	Multiple	Transit	TIP
28	Connection from WVRT to Ulster County CC	Stone Ridge	Connections	TIP
29	Complete D&H Trail from Kingston to Hurley	D&H	Complete Existing Trail	TIP
30	Hudson River "Legacy Trail" Kingston North to Saugerties	Multiple	Trail development	Next Phase #1
31	Wallkill Valley Rail Trail	County	Trail development	Next Phase # 2
32	Kingston Point Trolley Trail	Kingston	Trail development	Next Phase #3
33	RT 299 Bike Lanes / Trail: New Paltz to Carriage Roads (RT 299 Bike Demonstration Corridor)	299	On-street	Next Phase #4
34	RT 299 Pathway adjacent to Hudson Valley Rail Trail (HVRT) to New Paltz (RT 299 Bike Demonstration Corridor)	299	Trail development	Next Phase #4
35	Shoulders Route 299 West of HVRT to Route 44/55 (RT 299 Bike Demonstration Corridor)	299	On-street	Next Phase #4
36	Route 9W Bikeway	County/State	On-street	Next Phase #5
37	Woodstock - Art Walk	Woodstock	Trail development	Next Phase #6
38	Phoenicia Bicycle and Pedestrian Improvements	Phoenicia	On-street	Next Phase #7
39	Kingston Broadway Non-Motorized Access	Kingston	Safety	Next Phase #8
40	County Wide Bike Parking Program (Municipal Facilities)	County	Bike Parking	Next Phase #10
41	SR2S - Plattekill Elementary School	Plattekill	SR2S	Next Phase #11
42	Hurley Walkable Community / Safe Routes to School	Hurley	SR2S	Next Phase #12
43	Ulster Mountain Bike Park	County	Trail development	Next Phase #13
44	Crash Locations - Town of Ulster - Ulster Avenue	Ulster	On-street	Next Phase #14
45	Ellenville D&H Trail	County	Complete existing trail	Next Phase #15
46	Bike / Ped Access across Hudson River Bridges	County	Bridges	
47	Canoe/kayak launch in Gardiner near the 44/55 bridge	Gardiner	Water access	
48	Bike Lanes in Uptown Kingston	Kingston	On-street	

Project Number	Description	Locality	Type	Current Funding
49	New bike paths in Woodstock area	Woodstock	Trail development	
50	Cottekill Rd Sidewalk in Stone Ridge; access to school.	Stone Ridge	Safety	
51	Sidewalk/bike lane to Lenape Elementary School	New Paltz	SR2S	
52	Safe route to bike on Glasco turnpike to Mount Marion school	Saugerties	SR2S	
53	Walking path to Duzine Elementary School to Willie Road through the side woods	New Paltz	SR2S	
54	Sidewalks to Lloyd Middle school, elementary school along New Paltz Road with access to Rail Trail.	Lloyd	SR2S	
55	Sidewalks in Kerhonkson.	Kerhonkson	Pedestrian	
56	SR 32 Washington Avenue to Gateway - UC Transit Stop	Ulster	On-street	
57	Ulster & Delaware Rail with Trail (Kingston to Delaware County Line)	U&D	Complete Existing Trail	
58	Signage/Wayfinding Plan update – bike/ped/crosswalks	County	Signage	
59	Establish sidewalks from housing development to the trails (Ellenville, Hurley - Rte. 209)	Hamlets	Pedestrian	
60	Increase Number of Water Access Points - HR, Esopus, Wallkill, Rondout	Local	Water Access	
61	Water access coordination with Hudson River Valley Greenway Water Trail	State	Water Access	
62	Improve Bike/Ped. access to Bristol Beach in the Town of Saugerties	Saugerties	On-street	
63	Hiking Trails/Connection to Catskill Mountain system	County/DEC	Diverse Trail Uses	
64	Bike Lanes/Shoulder along State Route 209	State	On-street	
65	Bike Lanes/Shoulder on State Route 32	State	On-street	
66	Improvements to Bike Lanes/Shoulders on State Route 28 from Delaware County Line to Phoenicia	State	On-street	
67	Old Post Road (Rifton to Esopus Bike Lanes)	Esopus	On-street	
68	Paved shoulders - integrated into County Roadways	County	Policy	
69	Bikeway along Kyserike RD and Lucas Ave and improvements to the rail trail between Lucas and Rt 209.	Ulster	Trail development	

Project Number	Description	Locality	Type	Current Funding
70	Equestrian Accessible Parking Areas (Trailers)	County	Equestrian	
71	Provide signed and striped bike lanes on NYSDOT designated bike routes	State	Policy	
72	Link the two major rail trails (Kingston to High Falls, and Rosendale to Wallkill)	County	Connections	
73	Shawangunk rail trail connect Gardiner / New Paltz trail past the Shawangunk prison	Shawangunk	Connections	
74	Dual surface trail (asphalt and stone) on Wallkill Valley Trail	County	Equestrian	
75	Kerhonkson to Kingston bike route (between Accord and the southern end of the new bike path to the west of 209; from the Esopus Creek to Kingston).	County	Trail development	
76	Ulster County Bike Stations	Kingston/New Paltz	Transit	
77	Loop Trail around Ashokan Reservoir	Ashokan/NYCDEP	Trail development	
78	Trail along NYC DEP aqueduct system (Rondout Reservoir & Ashokan Reservoir)	NYCDEP	Utility corridor	
79	Springtown Road in Rosendale for Bikeway/traffic calming	Rosendale	On-street	
80	Connections to the Long Path	Catskill Park	Diverse trail uses	
81	Canoe and kayak access to Ashokan Reservoir	Ashokan/NYCDEP	Water access	
82	Walkway Over the Hudson / Highland Rail Trail to New Paltz.	Highland	Connections	
83	Traffic Signal Loop Detectors for Bicycles	New Paltz	Safety	
84	Equestrian Park in the Ellenville, Wawarsing & Saugerties areas	Wawarsing & Saugerties	Equestrian	
85	Bike lanes on Rte 299 and Libertyville Road to Fair Grounds	New Paltz	On-street	
86	Walking/Parking Improvements in Stone Ridge business district	Stone Ridge	Pedestrian	
87	Bikeway Improvements at lower end of the Cherry Hill -- Joalyn Road	County	On-street	
88	Improve intersection at Broadway/Chandler Drive & Route 209 in Stone Ridge	Stone Ridge	Safety	
89	Increase use of in-street crosswalk signage	County	Safety	

Project Number	Description	Locality	Type	Current Funding
90	Establish New Paltz Shuttle bike racks to take cyclists to 'Gunks	New Paltz	Transit	
91	East End Sidewalks	Ellenville	Bike/Ped	
92	Circle Ave	Ellenville	Pave	
93	Pedestrian Crosswalk Signage and Striping	County	Safety	

5. PROPOSED "NEXT PHASE" PROJECTS

The following list was developed from public involvement and project team suggestions during the Ulster NMT Plan process. Projects were identified using a ranked scoring matrix. Maps, aerial photos, and field observations were analyzed, and each project was summarized in a set of project description sheets.

Fifteen "Next Phase" projects were selected and include a range of bike/ped/trail facilities located in communities throughout Ulster County. These projects represent the next phase implementation of NMTP for Ulster County. These projects are not listed in priority order, and they include both short term and long term efforts. The recommended project concepts are intended to be flexible, so that solutions can be combined and developed in phases over time, as funding becomes available, and as support for potential projects becomes available.

Based on the outcome of the planning process, the results of the previous tasks, and input received from the public and affected jurisdictions, the following projects are recommended for phased development of the Ulster County Non-Motorized Transportation System:

1. Hudson River "Legacy Trail" Kingston North to Saugerties

The "Legacy Trail" is an important component of the west side of the Hudson River Greenway stretching from Kingston north to Saugerties. The corridor does not have an existing public right-of-way but could utilize a combination of local and county roads, utility right-of-way and the land along the CSX rail line.

2. Wallkill Valley Rail Trail

The Wallkill Valley Rail Trail is a critical link in the Ulster County non-motorized network connecting Kingston south to the town of Rosendale. The section from Rosendale to Kingston, including the "historic" trestle is privately owned. Ensuring future access and continued maintenance for this section is the primary objective of this project.

3. Kingston Point Trolley Trail

The Kingston Point Trolley Trail would connect the Trolley Museum and existing sidewalks parallel to the Rondout Creek to Kingston Point. This project was identified in the Ulster County RWT study, and is a first phase towards the proposed RWT corridor trail.

4. RT 299 Bike Demonstration Corridor

This project combines multiple proposed improvements into a single demonstration project corridor: the completion of the rail-trail along Route 299, a bikeway through New Paltz and the connections to the Minnewaska carriage roads. The Route 299 Corridor is a major east-west connection between the Hudson Valley Rail Trail and access to the Minnewaska/Mohonk Carriage Trail network. The concept includes a combination of path, bike lane and other innovative on-street / intersection improvements.

5. Route 9W Bikeway

The Route 9W Bikeway is an on-road bikeway from the Mid-Hudson Bridge to Kingston, including potential improvements to signage, shoulders and intersections. This should be considered with the potential for off-road links similar to the Legacy Trail above.

6. Woodstock Art Walk

The Woodstock Art Walk showcases the connection west of the town center to the Post Office, including integrated public art elements to enhance the streetscape.

7. Phoenicia Bicycle and Pedestrian Improvements

The Phoenicia bicycle and pedestrian design will focus on Main Street improvements in the hamlet center. The Catskill Mountain tracks run through the center of town entering at the intersection of Bridge St., High St. and Station St. The streets are lacking in sidewalks and the major intersections in town are devoid of crosswalks and other safety measures to protect people walking.

8. Kingston Broadway Non-Motorized Access

The Kingston Broadway Non-Motorized study will redevelop the urban neighborhood's bicycle, pedestrian and transit access with additional traffic calming improvements. This neighborhood is home to the Kingston High School and other significant destinations will benefit from improved non-motorized access.

9. County Share the Road/Drive Less Live More Program

The countywide Share the Road/Drive Less Live More program is a marketing and education campaign to increase awareness of non-motorized travelers and encourage trips by walking and biking.

10. County Wide Bike Parking Program (Municipal Facilities)

The County Wide Bike Parking Program would put a funding and installation mechanism in place county-wide which would provide bicycle parking facilities at potential destinations such as schools, libraries, municipal buildings, cafes and other appropriate destinations.

11. SR2S - Plattekill Elementary School

The Plattekill Safe Routes to School demonstration project will develop bicycle and pedestrian improvements in the school zone to encourage improved safety and access.

12. Hurley Walkable Community / Safe Routes to School

The Hurley Safe Routes to School demonstration project will develop bicycle and pedestrian improvements in the school zone to encourage improved safety and access.

13. Ulster Mountain Bike Park

The Jockey Hill area just north of Route 28 and east of Ashokan Reservoir is currently being used as a mountain bike destination for many off-road riders in the county. Onteora Lake and the surrounding area are currently managed by the New York State Department of Environmental Conservation. The Mountain Bike Park project would upgrade the access to the park and improve the trail facilities though the IMBA design guidelines to make the Park a major bicycling destination.

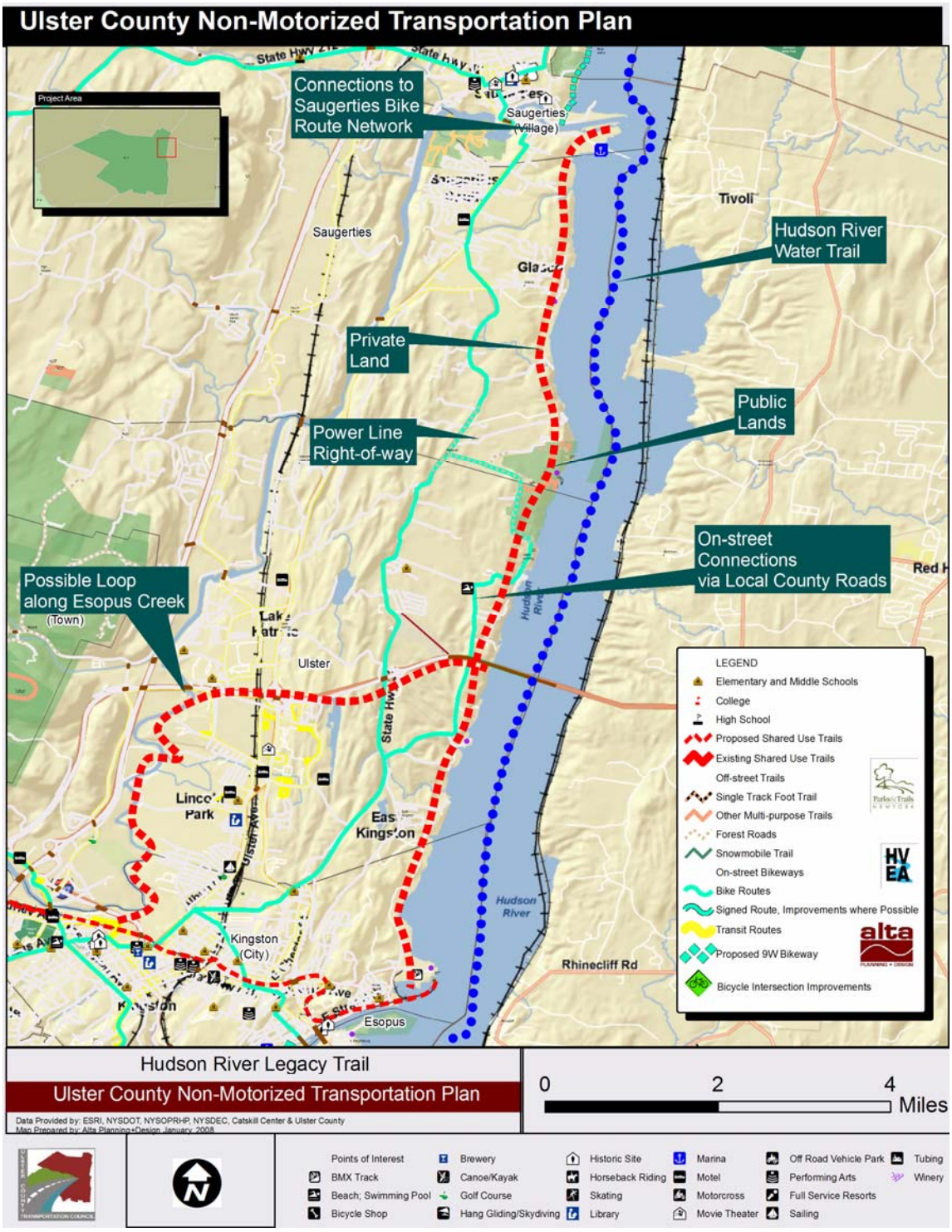
14. Crash Locations - Town of Ulster - Ulster Avenue

Ulster Avenue is a major commercial strip just north of Kingston. The Ulster crash location project identifies high collision areas and provides improvements to increase safety.

15. Ellenville D&H Trail

The D&H / O&W Trail project will connect the existing D&H/O&W Trail from the Rochester Town Line to Wurtsboro (in Sullivan County) and will include a connector route to the Lundy property conservation area. The project has been nicknamed the "Sockanissing Trail" by local advocates to capture the region's historic quality.

Project 1: Hudson River "Legacy Trail"



Project 1: Hudson River "Legacy Trail"

Description

The "Legacy Trail" is an important component of the Hudson River Greenway stretching from Kingston north to Saugerties. The corridor does not have a continuous existing public right-of-way but could utilize a combination of local and county roads, utility right-of-ways, existing parks and trails incorporated into development proposals.

Option 1 proposes a signed route and additional accommodations on the existing local and county roads. Option 2 proposes a shared use trail on the utility corridor and/or rail with trail component parallel to the Hudson River.

Type/Width	Length
1) signed bike route on Rte 32 2) long-term shared use trail	12 miles

Context

1) Existing topography may not be able to accommodate roadway widening for bike lanes in all locations. Portions of Rt 32 are signed for the Rt 9W Bikeway.

2) Potential coastal impacts zone, wetlands, public/private ROW. Environmental awareness is needed when constructing trails along the shoreline.

Ownership

Mixed public and private ownership, including several parks and public access sites along the River.

Key Land Uses / Destinations

The Legacy Trail would be a key connection bringing travelers from the North into Kingston to connect with the Trolley Trail and other projects proposed in the NMTP. The trail offers extensive waterfront open space possibilities and would be a major link in the Hudson River Greenway from NYC to Albany once the Walkway Over the Hudson bridge is restored.

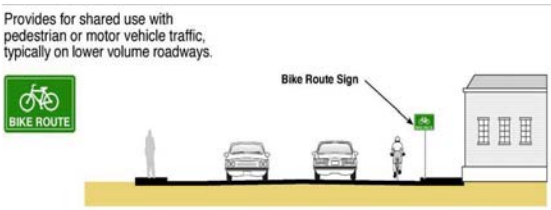
Issues

- Numerous land owners
- Rail with trail sections (Trolley)
- Coastal impacts
- Integration with development proposals

Planning-Level Cost Estimate

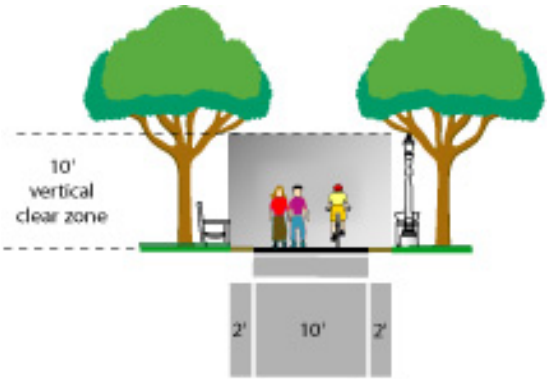
Option 1: $2.5M

Option 2: $17.1M (including Right-of-way acquisition)



Option 1: Signed route with bicycle lanes and/or sharrows where needed.

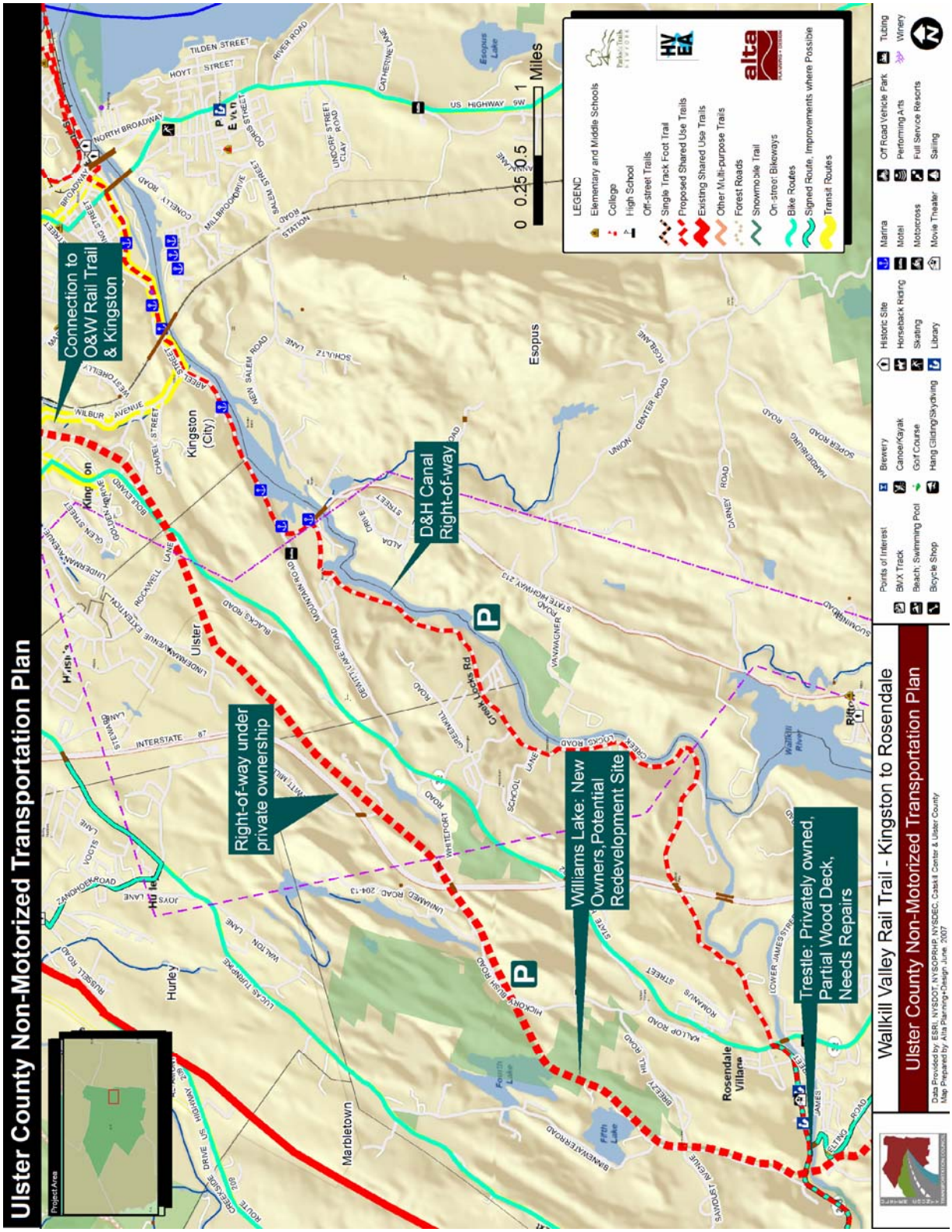
This option is the most cost effective and would provide bicycle access through signed routes and additional facilities along the route.



Option 2: SHARED USE PATH ALONG RIVER

This option is the more costly of the two options, and would create a long-term alternative parallel to the Hudson River. The feasibility of a RWT facility at this location would need to be further explored in cooperation with the railroad and local landowners.

Project 2: Wallkill Valley Rail Trail



Project 2: Wallkill Valley Rail Trail

Description

The Wallkill Valley Rail Trail is a critical link in the Ulster County non-motorized network connecting Kingston south to the town of Rosendale. The Rosendale to Kingston section is privately owned and future public access needs to be secured. The Williams Lake property has new owners and offers potential for redevelopment.

Option 1 proposes a formal agreement between the current private owner(s) and public rights to improve conditions on the railway trestle.

Option 2 proposes improvements to railway trestle and a development agreement which would allow access through the Williams Lake area.

Type/Width	Length
8 – 10 ft. asphalt shared use path.	7.4 miles – trestle is approximately 940'

Context

1) Bridge inspection must be completed on trestle to determine extent of rehabilitation.

Topography and existing field conditions will need to be examined.

Ownership

Mix of public and private ownership.

Key Land Uses / Destinations

The Wallkill Valley Rail Trail is a key connection bringing travelers from the South into Kingston to connect with the Trolley Trail and other projects proposed in the NMTP. The existing trail is well used and supported by the "Friends of the Wallkill Valley Rail Trail."

Issues

- Private ownership and high acquisition costs
- Deteriorating conditions of the existing railway trestle and liability issues of public use.
- Integration with development proposal

Planning-Level Cost Estimate

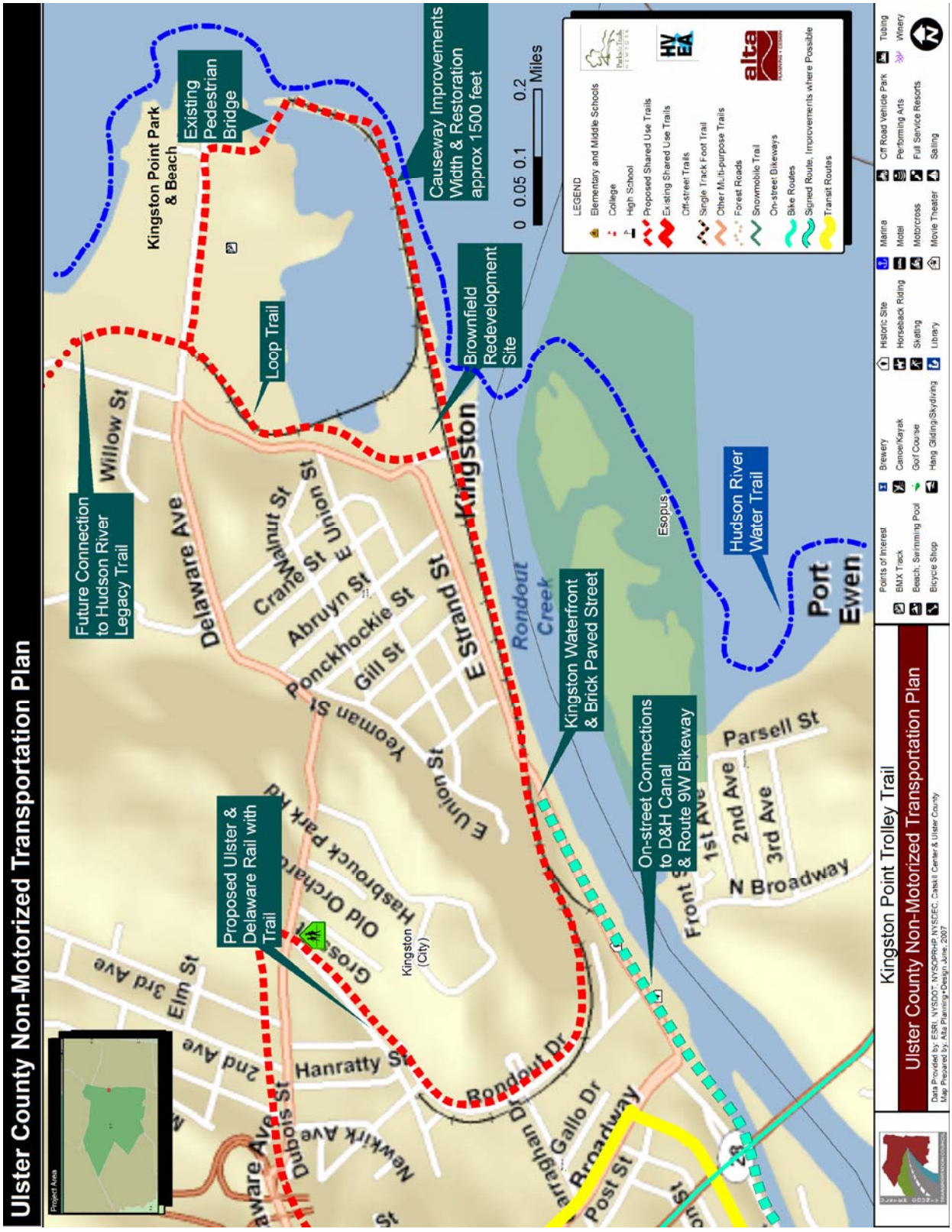
Option 1: $2.3M

Option 2: $5.5M

Option 1: Improve the abandoned railroad trestle to carry pedestrians and bicyclists.
This option will provide bicycle/pedestrian access on the abandoned trestle.

Option 2: Improve the abandoned railroad trestle to carry pedestrians, and provide shared use trail allowing access through the Williams Lake area.
This option extends the bridge to create connections to existing trails.

Project 3: Kingston Point Trolley Trail



Project 3: Kingston Point Trolley Trail

Description

The Kingston Point Trolley Trail would connect the Trolley Museum and existing sidewalks parallel to the Rondout Creek to Kingston Point. This project was identified in the Ulster County RWT study, and is a first phase towards the proposed RWT corridor trail.

Option 1 proposes use of the trolley line right of way to include a rail-with-trail facility extension to the existing pedestrian bridge connection to Kingston Point Park.

Option 2 Proposes a continuous loop trail and bikeway west from Kingston Point Park back to the Rondout waterfront (in addition to option 1).

Type/Width	Length
8 ft asphalt shared use path on shared rail facility.	1 - 2 miles

Context

1) Topography and existing right-of-way will need to examined and mapped. Causeway improvements may require permits and additional costs for driving sheet piling into Rondout Creek. The existing pedestrian bridge will need to be evaluated for trail continuity.
2) Brownfield redevelopment site will need to be studied and considered during the design process.

Ownership

City of Kingston / Trolley Museum

Key Land Uses / Destinations

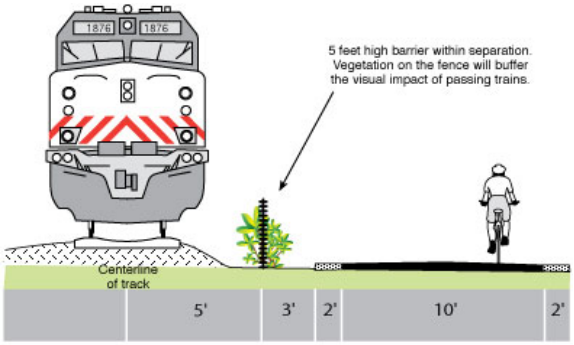
Kingston Point Park
Rondout Waterfront
BMX Park

Issues

- Narrow right of way.
- Causeway improvements could be expensive
- Electrification of the trolley

Planning-Level Cost Estimate

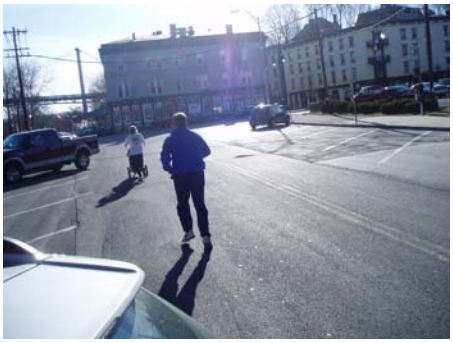
Option 1: $1.3M
Option 2: $1.6M



Rail With Trail
Trail in Active Railroad Corridor

Option 1: Rail-with-trail facility to Kingston Point Park

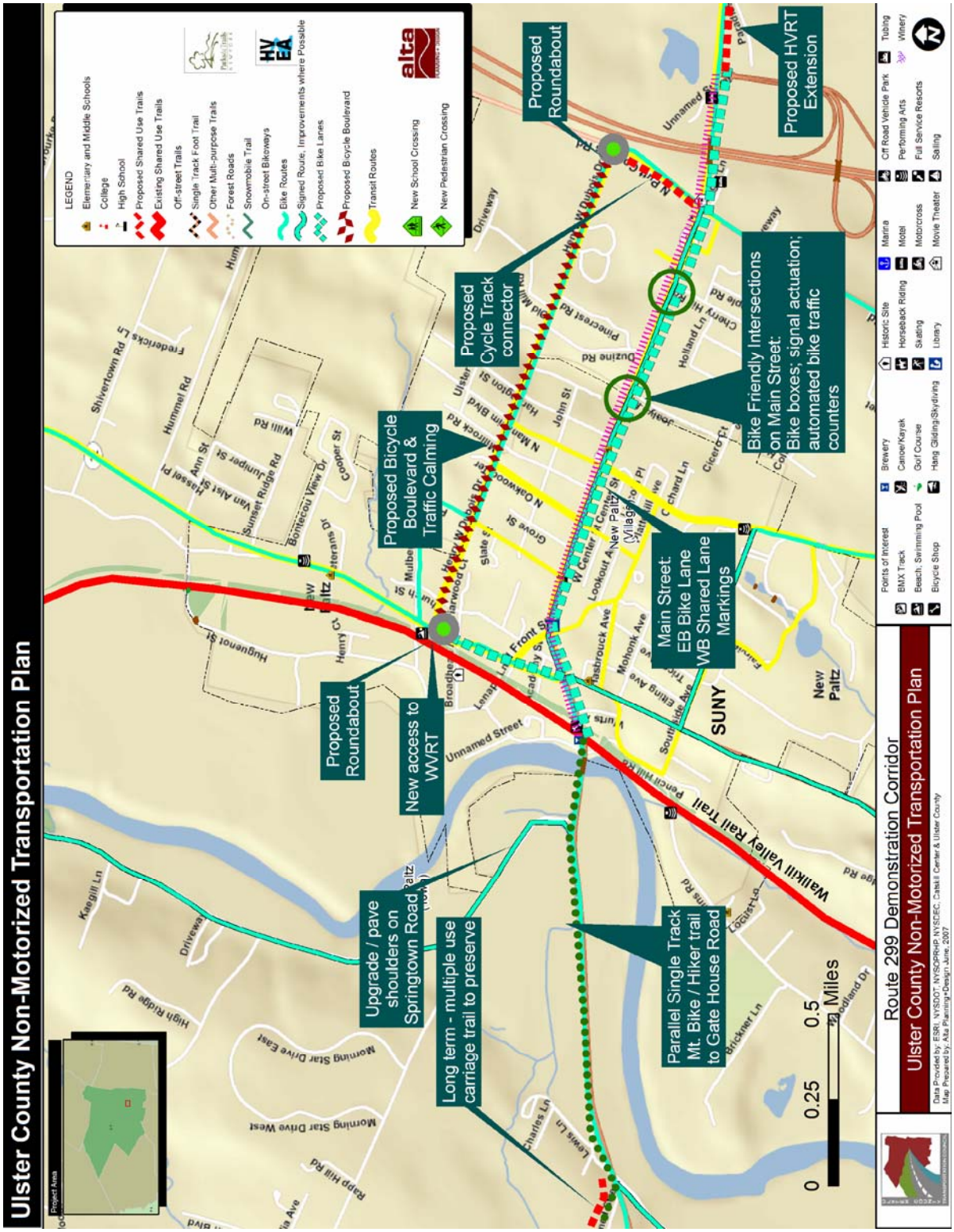
This option is the most cost effective and would provide a scenic bicycle/pedestrian route along Rondout Creek.



Option 2: Rail-with-trail facility to Kingston Point Park back to Rondout waterfront

This option is the more costly of the two options, but would have a more logical terminus.

Project 4: Route 299 Bike Demonstration Corridor



Project 4: Route 299 Bike Demonstration Corridor

Description

The Route 299 Corridor is a major east-west connection between the Hudson Valley Rail Trail and access to the Minnewaska/Mohonk carriage trail network. The proposed concept is to create a Bikeway Demonstration Corridor that will include a unique combination of path, bike lane, traffic calming, bicycle boulevard and other innovative on-street / intersection improvements. The project will demonstrate the potential for combining these new treatments to improve mobility and safety across one of the most heavily traveled corridors in the County, and create a key link in the regional bikeway network.

Option 1 proposes a combination of traffic calming and on-street facilities to improve access to Main St. (Rte. 299) and Henry Dubois Dr. Option 2 proposes extension of the facilities in town westward to an improved gateway for access to the carriage trail network.

Type/Width	Length
1) Bicycle Boulevard – existing lane width 2) Cycle Track – 1.525m 3) Bike lane – 1.2m 4) Single track – 12-18”	1) 1.5miles 2) 0.25miles 3) 2.375miles 4) 1.375miles

Context

Traffic and pedestrian/bicycle counts and capacity analysis will need to be completed at the proposed project location, as well as right-of-way investigation.

Ownership

NYSDOT, New Paltz & Mohonk Preserve

Key Land Uses / Destinations

New Paltz experiences traffic congestion from travelers passing through town as well as short trips from the local and SUNY student population.

New Paltz is a central access point for people traveling to the Mohonk Mountain House and other outdoor activities around the Shawangunk Mountains.

Issues

- High traffic streets with limited opportunities to expand the roadway.
- Limited bicycle access to carriage trail network.
- Multiple driveway conflicts
- Uphill grade from west to east

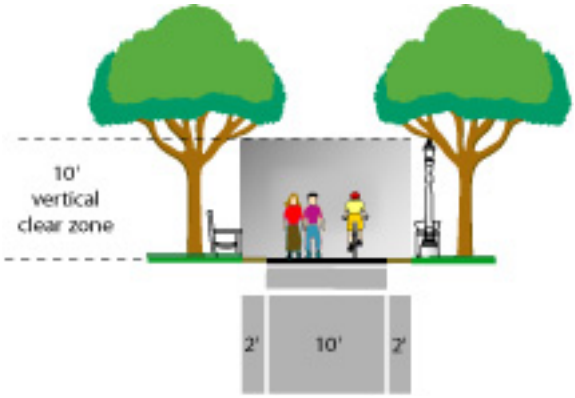
Planning-Level Cost Estimate

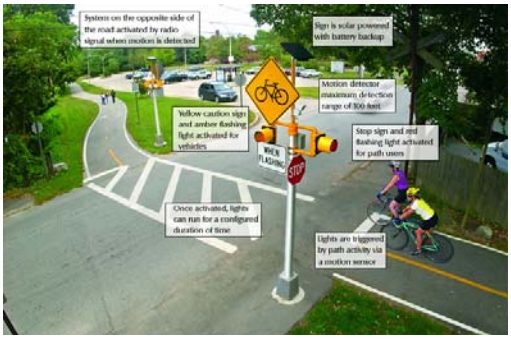
Option 1: $0.91M

Option 2: $1.5M

Option 1: Bicycle boulevard on Henry W Dubois Drive, cycle track connector on N Putt Corners Rd, and improvements to Main St: EB bike lane, WB sharrows

This option proposes the use of traffic calming and ITS techniques as well as new on-street facilities provide pedestrian/bicycle access to the surrounding areas.

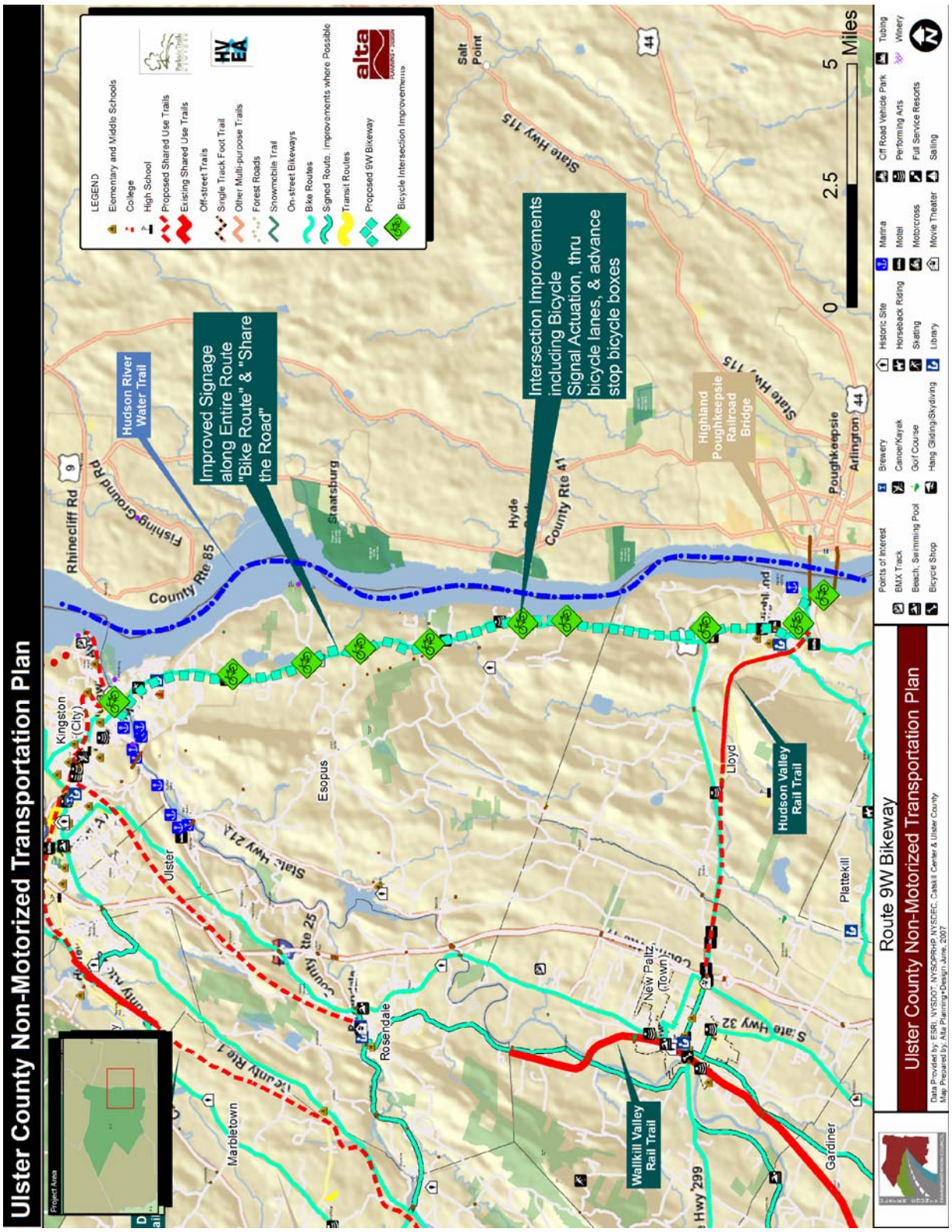




Option 2: Shared-Use Path to Gate House Road

This option would extend connect New Paltz with the historic carriage roads, including a new section of shared use path with advanced safety features.

Project 5: Route 9W Bikeway



Project 5: Route 9W Bikeway

Description

On-road bikeway from the Mid-Hudson Bridge to Kingston, including signage, shoulders and intersections.
Option 1 proposes improved route markings and the addition of Share the Road signs to the existing 9W bikeway. Improvement of the intersections along the route including the addition of bike lanes and bike boxes to allow traffic signal actuation by bicycles. Option 2 considered a long-term shared use path parallel to the Hudson River. This corridor includes the active CSX freight rail lines and is not feasible in the short term.

Type/Width	Length
1) 4 – 6 ft shoulder/striped bike lane. 2) 10 ft shared use trail with 2 ft shoulders	15 miles

Context

1) Existing 9W Bikeway will be improved with signage and striping for delineation of roadway and wayfinding. There are ten locations for bicycle intersection improvements. These intersections will need to be evaluated for traffic signal actuation warrants. If signals are provided, appropriate phase design will depend of traffic, pedestrian, and bicycle counts.
2) Due to heavy freight traffic and limited right-of-way, the CSX railroad right-of-way is not currently a viable alternative option to provide trail access along the Hudson River. The corridor along the river is not wide enough to accommodate a path, and would require sheet piling or floating sections along the river.

Ownership

Ulster County, NYDOT, Multiple Jurisdictions

Key Land Uses / Destinations

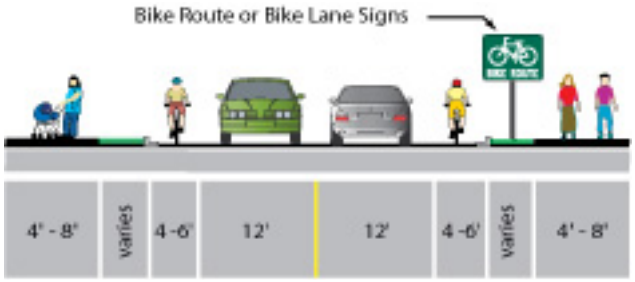
The Mid-Hudson Bridge is a critical crossing point of the Hudson River which provides bicycle and pedestrian access on the sidewalk on the North side of the bridge. The 9W corridor connects travelers from destinations on the east side of the river to the bridge.

Issues

- Busy thoroughfare with a high number of intersections
- High-speed traffic
- Good paved shoulders
- Presents opportunity to utilize wayfinding signs approved in 2008 MUTCD updates

Planning-Level Cost Estimate

Option 1: $1.3M
Option 2: $22.4M



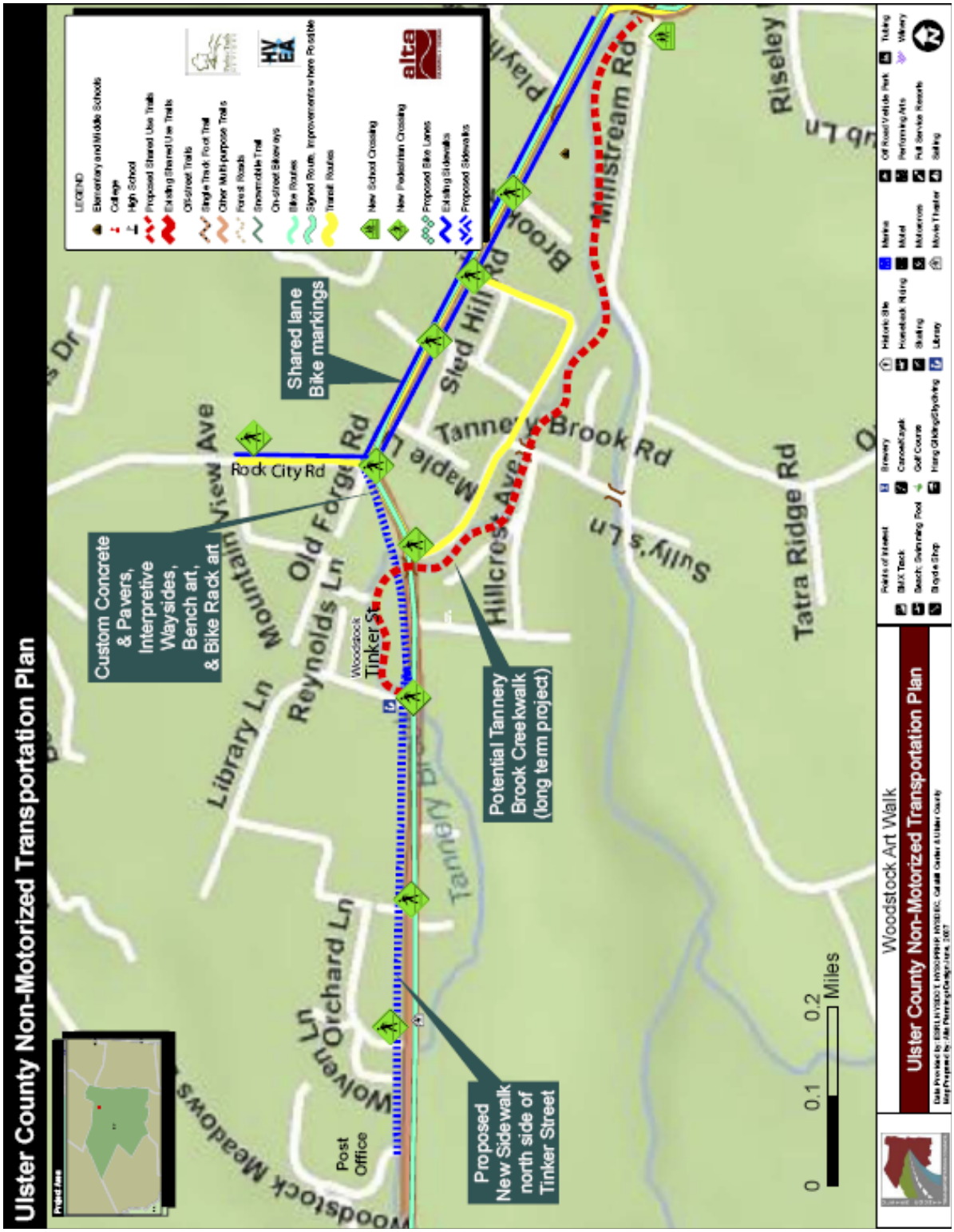
Option 1: Improved route markings on the existing 9W bikeway, improve intersections, and addition of bike lanes.

This option is cost effective and will enhance the existing Route 9W Bikeway, with an emphasis on safety and operational improvements for pedestrians and cyclists who use the corridor.

Option 2: Long – Term alternative trail parallel to the existing CSX rail line, connecting to the proposed Hudson River Legacy Trail.

This option is much more costly and has significant constraints and would only possible as a long-term future alternative if railroad operations changed significantly.

Project 6: Woodstock Art Walk



Project 6: Woodstock Art Walk

Description

The Woodstock Art Walk showcases the connection west of the town center to the Post Office, including integrated public art elements to enhance the streetscape.

Option 1 proposes the improvement of the sidewalks on the south side of the street and the addition of high visibility pedestrian crossings.

Option 2 proposes the inclusion of street furniture and other aesthetic improvements such as custom concrete pavers, benches, bike racks and other elements. The feasibility of a 3/4 mile "Creek Walk" along Tannery Brook should also be explored as a long term option.

Type/Width	Length
1) Concrete sidewalk / 6 ft 2) Shared-use trail	0.8 - 1.7 miles

Context

1) Existing sections and conditions will need to be examined to determine if rehab or reconstruction of areas of sidewalk is necessary. Right-of-way will need to be investigated.
2) Tannery Brook will need to be studied for right-of-way, land restrictions, and feasibility.

Ownership

State, County and Town of Woodstock

Key Land Uses / Destinations

The post office lies on the north side of Tinker St. and is the final significant destination before leaving town. Along the way, the route is lined with many commercial destinations and access to residential neighborhoods.

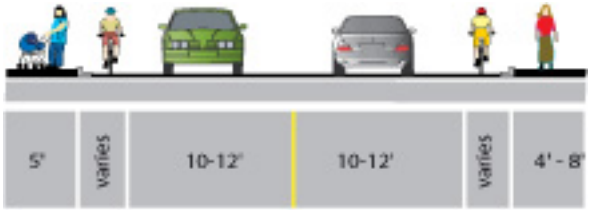
Issues

- The north sidewalk is largely intact although it is narrow with limited buffer from the road
- The south sidewalk is incomplete with varying surfaces and poor LOS.
- There is an opportunity for community involvement in the design process similar to the City of Rochester Art Walk project.

Planning-Level Cost Estimate

Option 1: $0.57M

Option 2: $1.015M



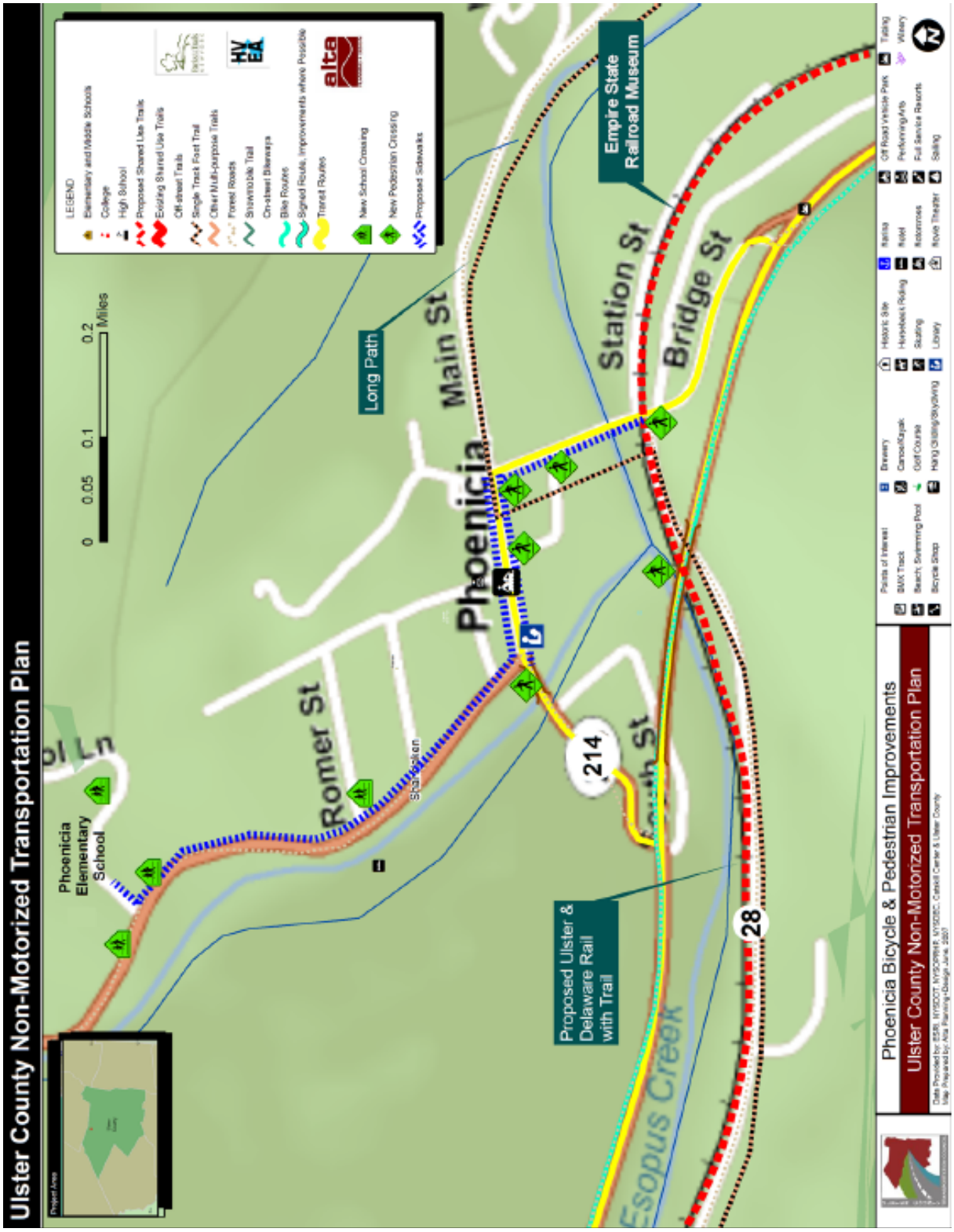
Option 1: Sidewalk and crosswalk improvements

This option is a basic streetscape improvement that will upgrade existing facilities, and add new sidewalk sections where necessary

Option 2: Includes public furniture and other aesthetic improvements to give the walk a sense of the local community.

This option adds custom designed benches and other functional works of art to improve the character of the sidewalk space and connect the design to Woodstock's culture and heritage.

Project 7: Phoenicia Bicycle and Pedestrian Improvements



Project 7: Phoenicia Bicycle and Pedestrian Improvements

Description

The Phoenicia bicycle and pedestrian design will focus on Main Street improvements in the hamlet center. The Catskill Mountain Railroad tracks run adjacent to Main Street entering at the intersection of Bridge St., High St. and Station St. Streets in the hamlet lack sidewalks and the major intersections are devoid of crosswalks and other safety measures to protect people walking.

Option 1 proposes the introduction of pedestrian infrastructure in the form of sidewalks and high visibility crosswalks.

Option 2 proposes the addition of a rail-with-trail facility as part of the previously studied Ulster & Delaware Rail with Trail Study along the tracks of the Catskill Mountain Railway.

Type/Width	Length
1) 6 ft. concrete sidewalk 2) RWT shared-use trail	1.05 Miles 1.3 Miles

Context

1) Right-of-way and existing sections would need to be examined.

2) Railroad ROW, ownership, and restrictions would need to be examined.

Ownership

Town of Shandaken

Key Land Uses / Destinations

Main Street in Phoenicia is the primary destination for many commercial activities in the town including the marketplace and a number of restaurants.

The rail-with-trail facility would be an important tourism resource especially when coupled with other outdoor activities such as rafting on the Esopus Creek.

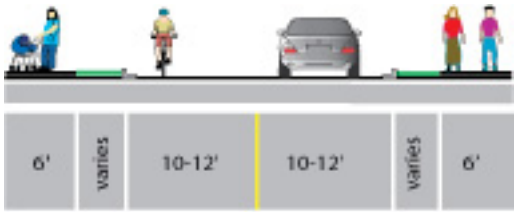
Issues

- Need for improved pedestrian crossings at all major intersections
- Potential option of paved shoulders in lieu of sidewalks

Planning-Level Cost Estimate

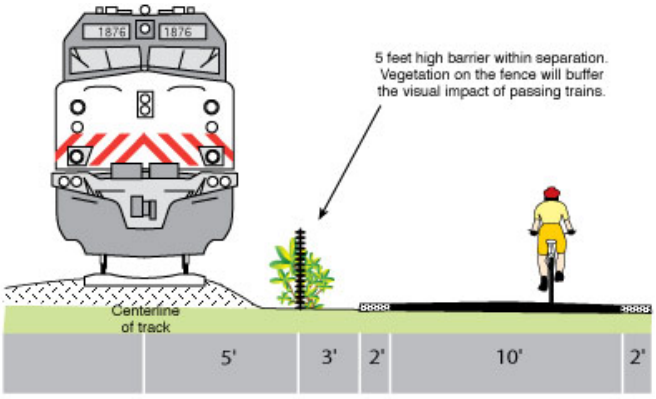
Option 1: $0.17M

Option 2: $0.73M



Option 1: Addition of sidewalks and crosswalks.

This option will add pedestrian facilities along existing roadways in the hamlet area.

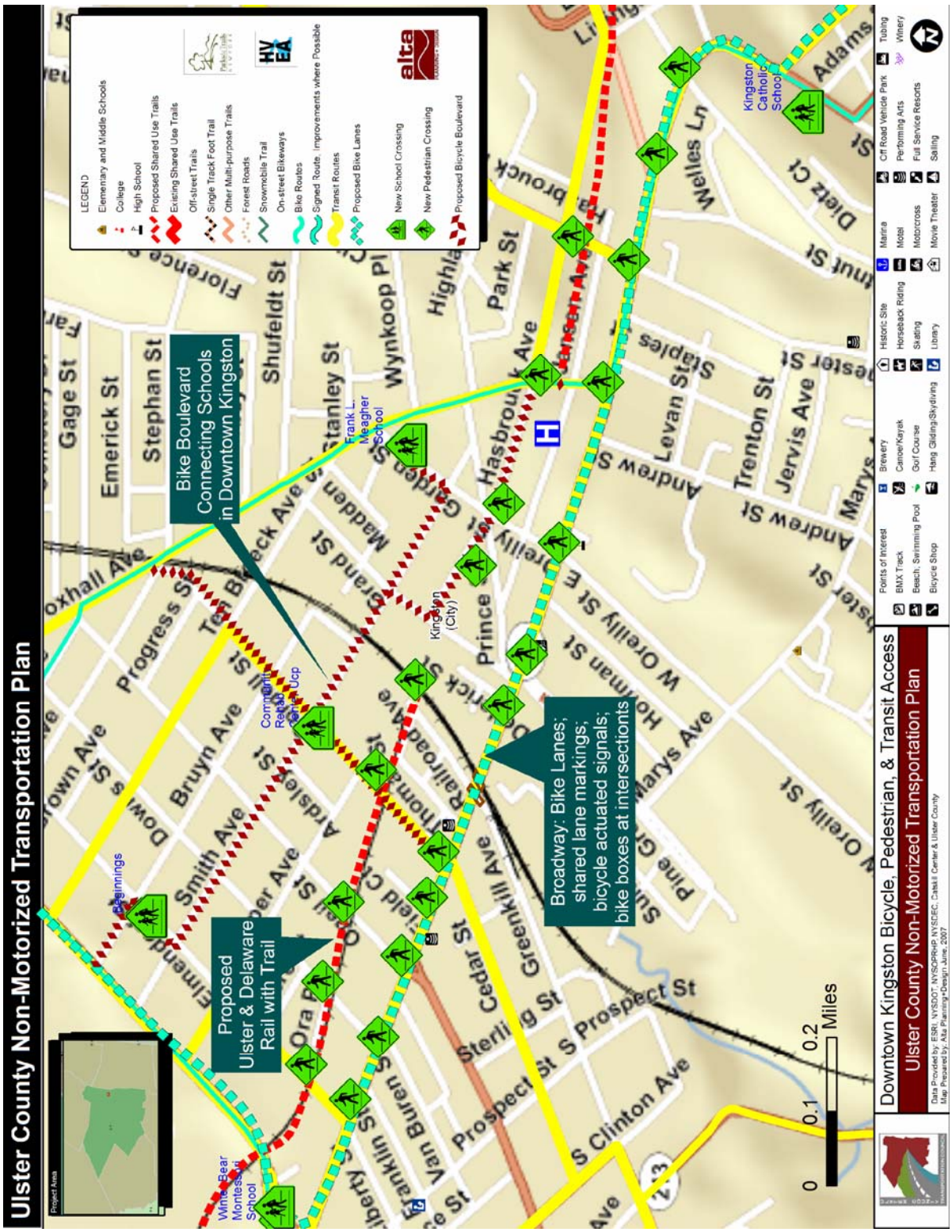


Rail With Trail
Trail in Active Railroad Corridor

Option 2: Shared Use Trail adjacent to Rail Right of Way

This option is identified in the county's previous RWT study; the Ulster & Delaware RWT facility will be an integral tourism resource in the area.

Project 8: Kingston Broadway Non-Motorized Access



Project 8: Kingston Broadway Non-Motorized Access

Description

The Kingston Broadway Corridor Non-Motorized Access project will redevelop the urban neighborhood's bicycle, pedestrian and transit access and provide traffic calming improvements. This neighborhood is home to the Kingston High School and other significant destinations will benefit from improved non-motorized access.

Option 1 proposes the improvement of pedestrian crossing movements across the street and the addition of bicycle lanes and other bicycle facilities to improve bike access to the neighborhood.

Option 2 proposes further traffic calming improvements and consideration of road diet for segments of Broadway in Kingston

Type/Width	Length
4 – 5 ft bike lanes	1 mile

Context

1) Existing sections of all roadways will need to be investigated as well as right-of-way. Vehicular, pedestrian, and bicycle counts will need to be taken at the bike boulevard locations to verify feasibility.
2) Existing sections of Broadway will need to be determined for the design of bike lanes and sharrows. Feasibility of modifying the parking lanes will need to be examined.

Ownership

City of Kingston

Key Land Uses / Destinations

The Kingston High School is a major destination of the Broadway Corridor in addition to other public offices, City Hall and the Kingston Hospital.

Issues

- High traffic volumes
- Limited room for expansion for other modes without the removal of on-street parking.
- Multiple driveway conflicts
- Pedestrian and bicyclist safety
- Safe Routes to School and Transit

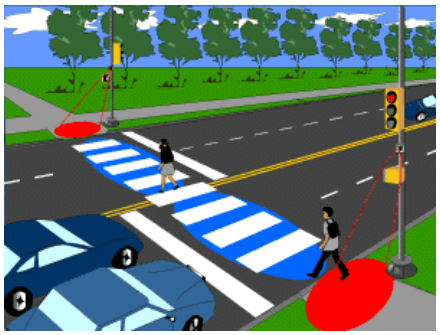
Planning-Level Cost Estimate

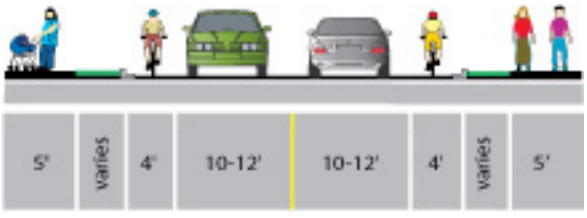
Option 1: $0.95M

Option 2: $1.3M

Option 1: Improved pedestrian crossings and the addition of countdown timers

This option is the cost effective. It will not require reconstruction of the roadway and will provide signing, striping, visibility and intersection improvements for pedestrians.





Option 2: Addition of bike lanes and/or 'sharrows.'

This option includes proposed on-street bikeway improvements that create safe, clearly delineated routes for bicyclists, and will connect to other facilities.

Project 9: County Share the Road / Drive Less - Live More Program

Description

The countywide Share the Road/Drive Less Live More program is a social marketing and education campaign to increase awareness of non-motorized travelers and encourage travelers to walk and bike.

Option 1 promotes the use of Share the Road signs on selected roadways coupled with a driver's education curriculum to increase awareness of vulnerable roadway users.

Option 2 institutes a "Smart Trips" marketing program to actively encourage residents to walk and bike and provides them with the needed resources and support. Smart Trips marketing includes one-on-one sessions with personal trainers to encourage individuals to make appropriate travel choices. This program has achieved significant mode share reductions in Portland, OR and other communities.

Type/Width	Length
County-wide	Ongoing

Context

Education and Encouragement Programs

Partners

AAA, Driver Education Schools, Elementary Schools

Key Land Uses / Destinations

Any signed bicycle route or other roadways which have significant bicycle or trail access can be signed with Share the Road signs.

Issues

- Curriculum development
- Volunteer participation with driver's education instructors

Planning-Level Cost Estimate

Option 1: $50,000 / year for County-Wide Program, including signage and 'train the trainers' program

Option 2: $100,000 for pilot marketing program

Option 1: Share the Road signage and education programming

Increase the usage and exposure of Share the Road signs and include Share the Road training in driver's education and insurance point reduction classes.

Project 10: County Wide Bike Parking Program (Municipal Facilities)

Description

The County Bike Parking Program would put a funding and installation mechanism in place county-wide to provide bicycle parking facilities at public destinations such as schools, libraries, municipal buildings, and other destinations.

Option 1 would utilize existing off-the-shelf bicycle racks. Local artists could develop location specific themed racks to enhance town identity.

Option 2 would provide long-term secure bicycle parking facilities such as bike lockers at multimodal facilities, large office complexes and other locations where warranted.

Type/Width	Length
Multiple Locations	N.A.

Partners

UCTC, Municipalities, Parks and Recreation Departments

Ownership

Various: pilot program can be centrally funded

Key Land Uses / Destinations

Schools, libraries, municipal buildings, cafes and other appropriate destinations

Issues

- Administration by county or town
- Provides a visible 'win' at a variety of locations
- Installation costs and responsibilities
- Opportunity to work with local artists and fabricators

Planning-Level Cost Estimate

Option 1: $ 250 / per location

Option 2: cost will vary with customized artwork

Option 1: Branded Bicycle Parking

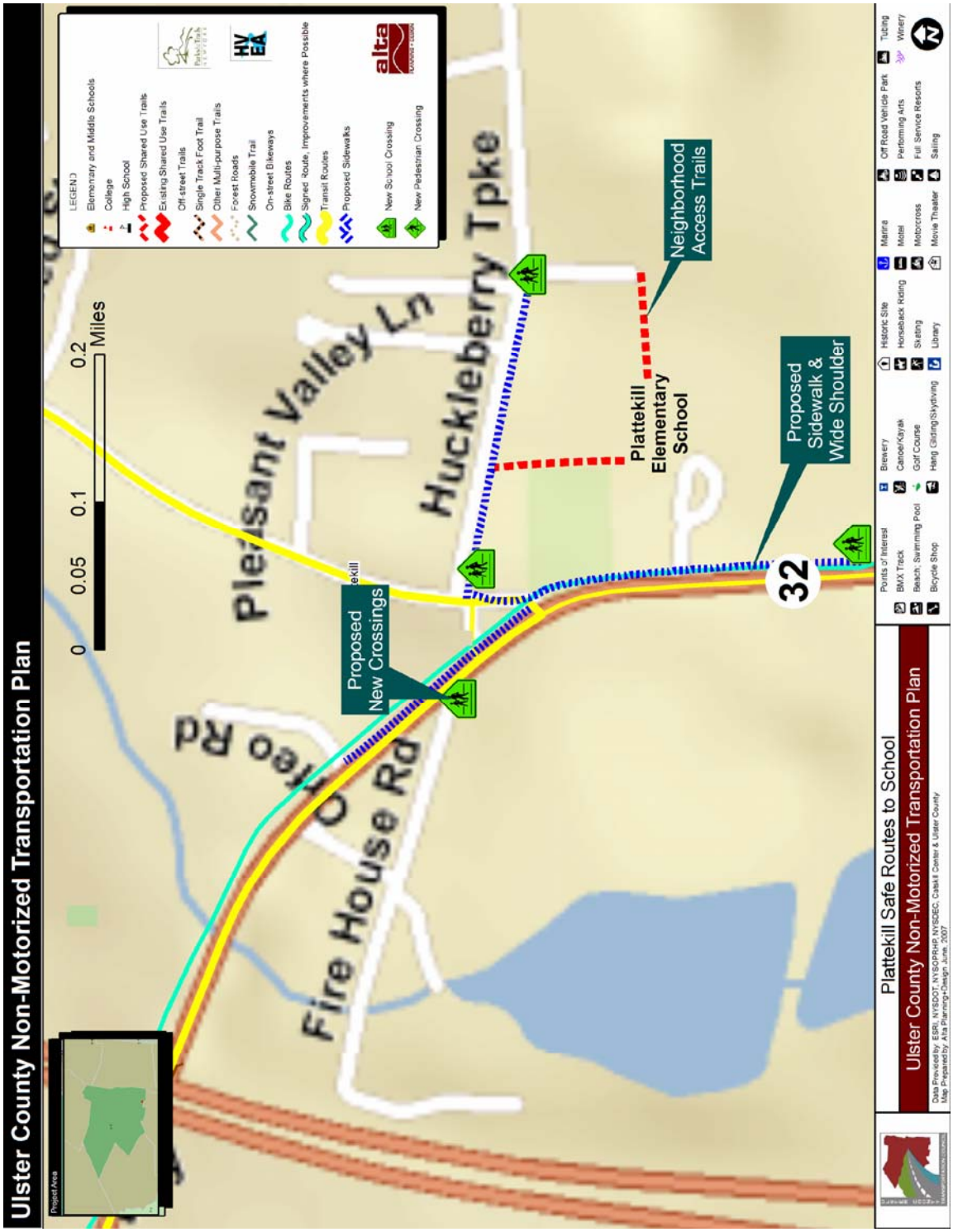
The standard ribbon rack can be customized to include the town or county seal, advertising of local businesses or other information which may be beneficial to the bicycling public.

Option 2: Artist Designed Bicycle Rack

The town or county can partner with local artists to create identity pieces and sculptures which double as bike parking.

Project 10: County Wide Bike Parking Program (Municipal Facilities)

Project 11: SR2S – Plattekill Elementary School



Project 11: SR2S – Plattekill Elementary School

Description

The Plattekill Safe Routes to School demonstration project will develop bicycle and pedestrian improvements in the school zone to encourage improved safety and access.

Option 1 proposes traffic calming measures and the addition of high visibility pedestrian crossings for students and faculty to improve the safety of the crossing of Route 32.

Option 2 proposes the construction of a sidewalk/path on Route 32 and additional access from Huckleberry Turnpike.

Type/Width	Length
2) Concrete sidewalk / 6 ft or Shared-use trail 10 ft wide, paved shoulders	0.875 miles

Context

Route 32 is a major thoroughfare through southern Ulster County and has a posted speed limit of 45 mph outside the school. Different types of traffic calming measures should be considered per NYSDOT guidelines. (i.e.: speed trailers, high visibility crossings, signage, etc). ROW and sections need to be fully investigated.

Ownership

Town of Plattekill / NYSDOT

Key Land Uses / Destinations

The Plattekill Elementary School is the primary destination along the Route 32 corridor.

Issues

- High posted and operating speeds outside the school.
- Limited access to the school from other approaches.
- Right-of-way for sidewalk along school property

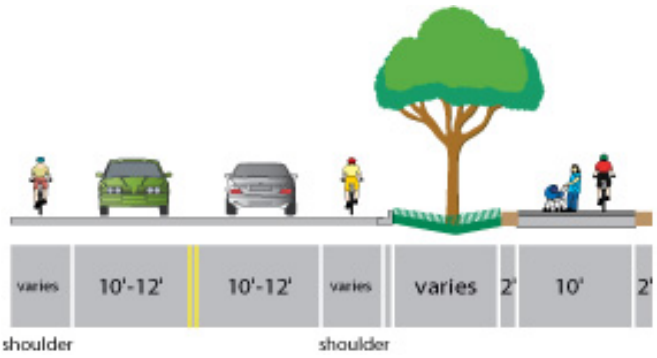
Planning-Level Cost Estimate

Option 1: $0.065M

Option 2: $0.65M

Option 1: Traffic calming & high visibility crosswalks.

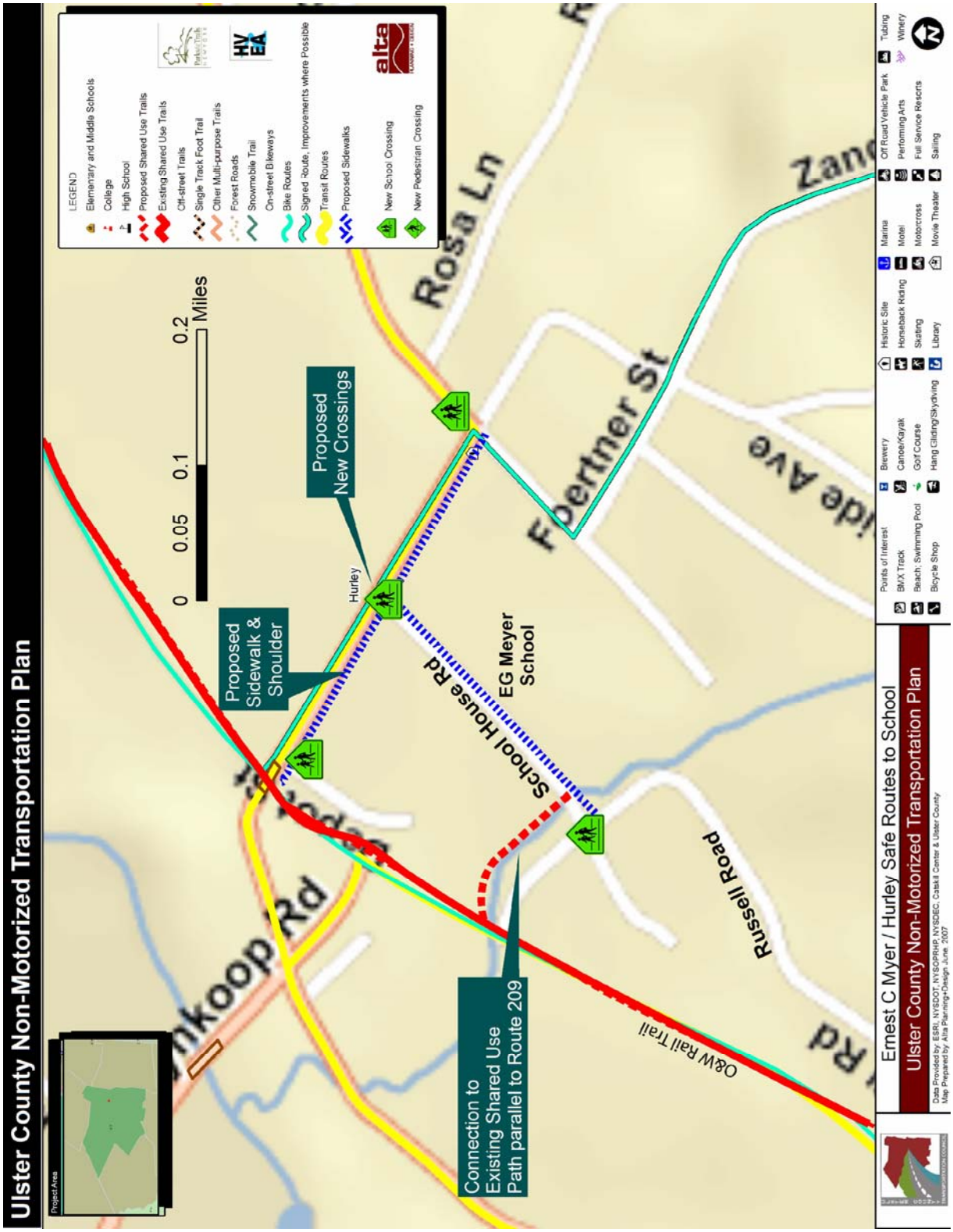
This option is a short term solution. It will create signage and striping improvements for pedestrians in the area surrounding Plattekill Elementary School.



Option 2: Construction of sidepath along Rt. 32 and Huckleberry Turnpike

The proposed sidepath facility will create a safe route to and from the Plattekill Elementary School.

Project 12: Hurley Walkable Community / Safe Routes to School



Project 12: Hurley Walkable Community / Safe Routes to School

Description

The Hurley Safe Routes to School demonstration project will develop bicycle and pedestrian improvements in the school zone to encourage improved safety and access.

Option 1 proposes the addition of sidewalks and/or shoulders and improved roadway crossings to the school.

Option 2 proposes a trail spur from the multi-use path on Route 209 to connect with the school.

Type/Width	Length
1) Concrete sidewalk / 6 ft; 2) 10 ft asphalt shared use trail	0.5 miles 0.125 miles

Context

Route 209 is a major thoroughfare through the County but the area around the school includes quiet residential streets. Existing sections and ROW will need to be fully investigated.

Ownership

County owned 209, town owned roads.

Key Land Uses / Destinations

The Meyer Elementary School is the primary destination for the Safe Routes to School project. In addition to the regular traffic to classes in the morning and the afternoon, the school grounds also offer a playground and other facilities which can be accessed during non-school hours.

Issues

- Schoolhouse Road is narrow with limited site visibility at the school.
- Busy crossing of Route 209 for any students on the west side of town.
- Access to the Route 209 shared use trail

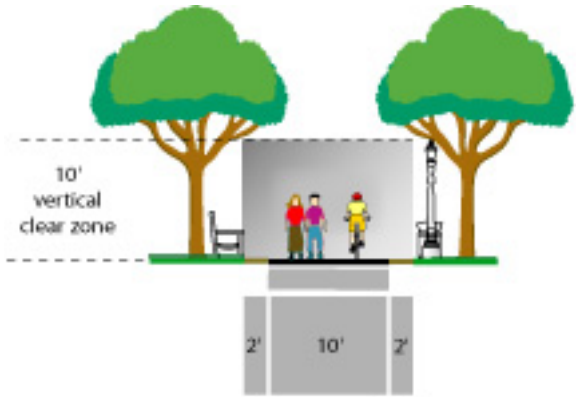
Planning-Level Cost Estimate

Option 1: $0.14M

Option 2: $0.27M

Option 1: Addition of sidewalks

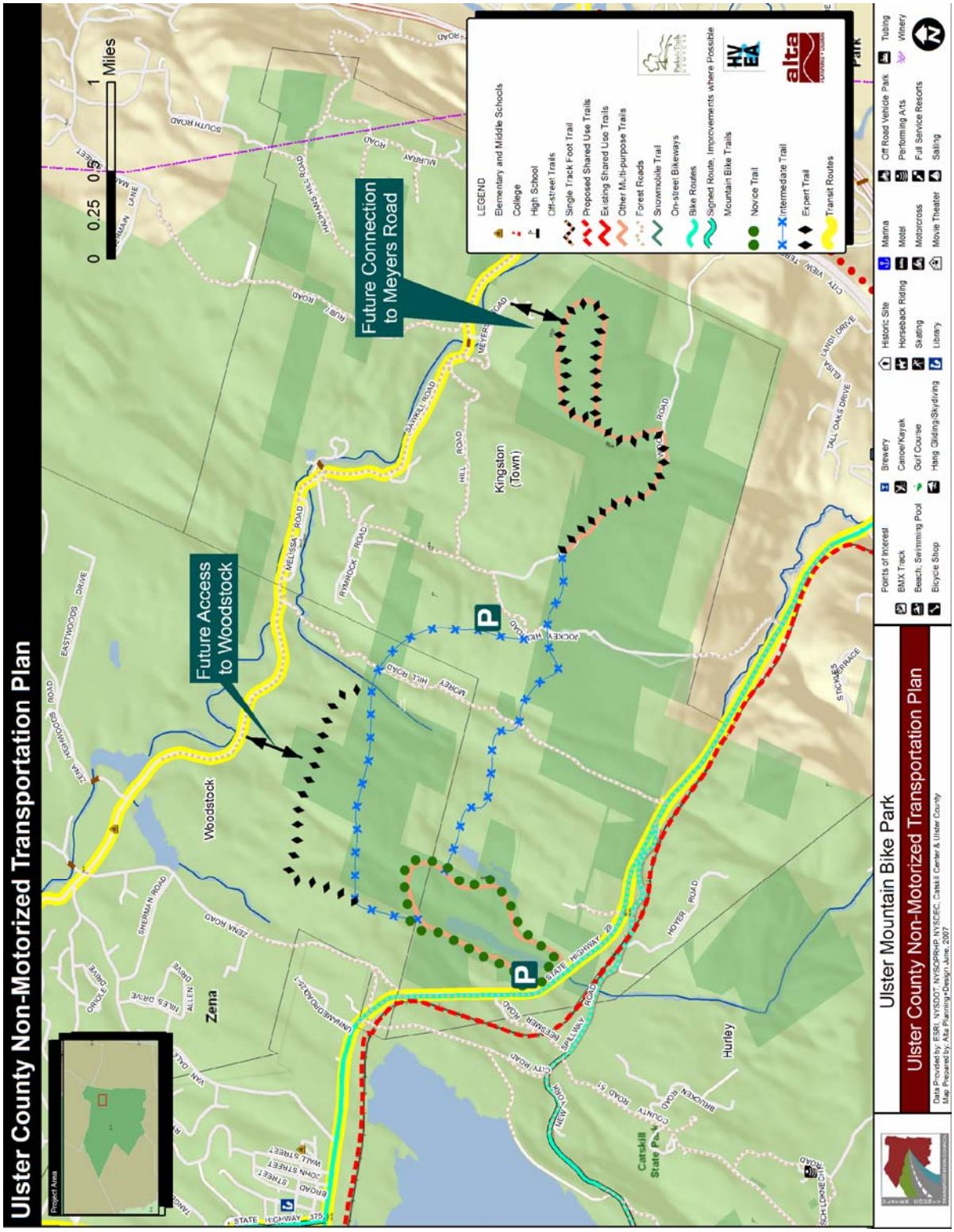
This option will create a safe route for pedestrians in the area surrounding Ernest C Meyer Elementary School in Hurley.



Option 2: Shared-use trail spur from school to Rte 209

This option includes a proposed trail that will connect with Rte 209, providing a safe route to and from school.

Project 13: Ulster Mountain Bike Park



Project 13: Ulster Mountain Bike Park

Description

The Jockey Hill area just north of Route 28 and east of Ashokan Reservoir is currently being used as a mountain bike destination for many off-road riders in the County. Onteora Lake and the surrounding area are currently managed by the New York State Department of Environmental Conservation in cooperation with volunteers from the FATS in the CATS MTB club. The Mountain Bike Park project would upgrade the access to the park and improve the trail facilities though the IMBA design guidelines to make the Park a sustainable mountain bicycling destination.

Option 1 proposes the formal mapping and signage of a system of trails between Route 28A and Sawkill Rd. to the north.
Option 2 proposes upgrades and improvements to the existing Trail System to create a regional destination mountain bike park. The system would include approximately 2 miles of novice trails, 3.5 Miles of Intermediate, & 3.5 Miles of Expert Trails.

Type/Width	Length
Mixed width and terrain depending on difficulty level.	Approximately 9 miles

Context

Off-road trail network with rocky soils. Ownership and land restrictions will need to be investigated. ROW acquisitions may be costly.

Ownership

Mix of public and existing easements through private lands; opportunity for ongoing partnership between volunteers and public sector.

Key Land Uses / Destinations

Access to Onteora Lake for swimming in summer; potential XC skiing in winter.

Issues

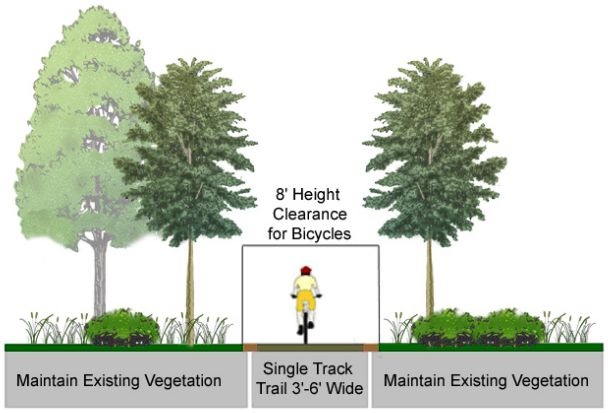
- Private ownership and high acquisition costs
- Rocky soils which are prone to erosion; may require new fill sections
- Need a mix of trails suited to different ability levels
- Connections to potential loops

Planning-Level Cost Estimate

Option 1: $0.03M
Option 2: $0.150M

Option 1: Formal mapping of existing trail system

This option is very cost effective. A map out of existing trails can be developed and provided at trailheads, via local retailers and on-line. Wayfinding signage provides both users and land managers with consistent information.

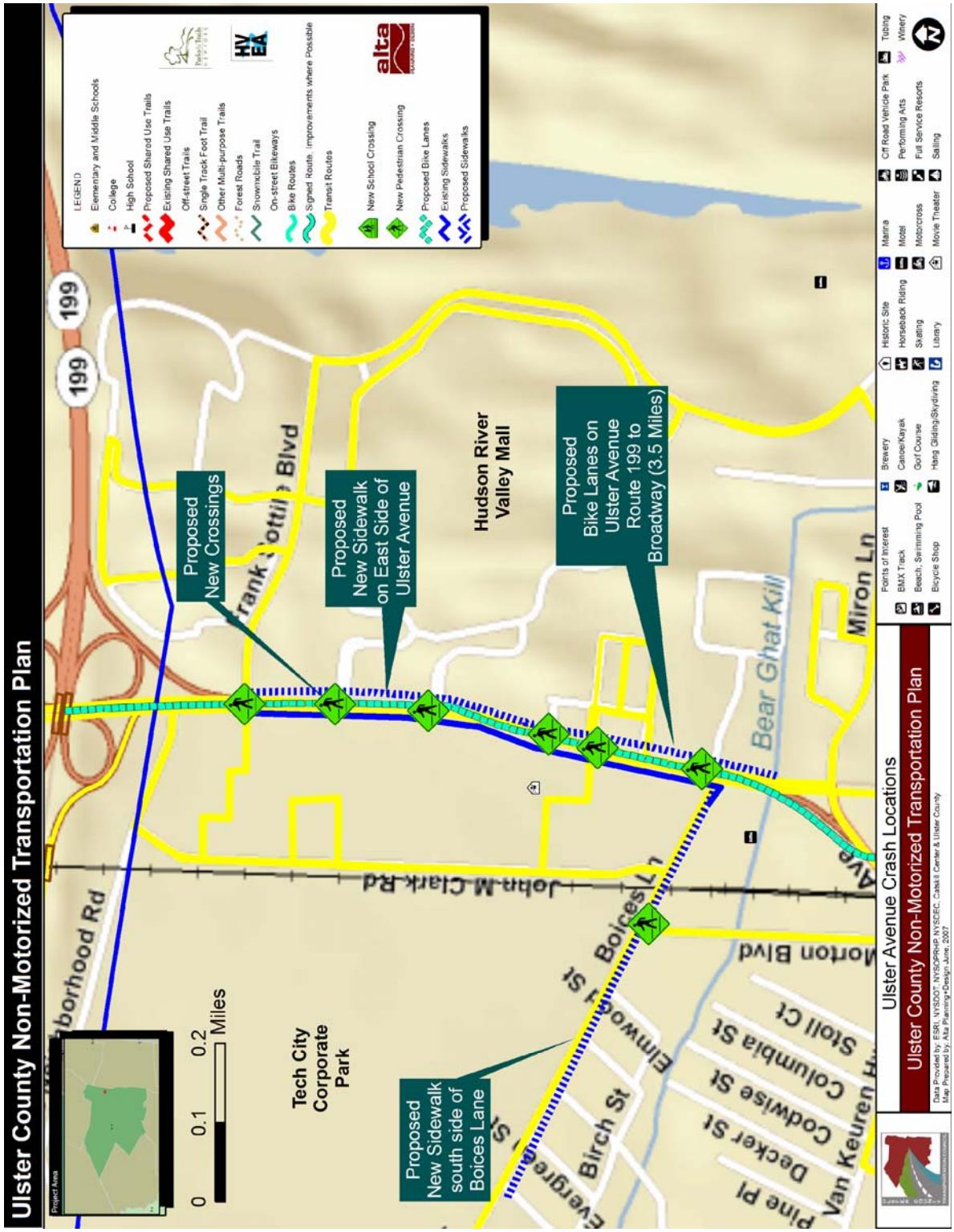


Single Track Trail

Option 2: Upgrades and improvements to existing trail system

This option involves drainage and trail stabilization for ongoing long-term use. The novice, intermediate, and expert trails will be upgraded and improved.

Project 14: Crash Locations – Town of Ulster - Ulster Avenue



Project 14: Crash Locations – Town of Ulster – Ulster Avenue

Description

Ulster Ave. is a major commercial strip just north of the Kingston downtown area. The Ulster crash location project will improve high collision areas and will implement traffic improvements to increase safety.

Option 1 proposes a number of facilities improvements which will increase the safety of pedestrian movement in the corridor and improve transit access as well.

Option 2 proposes the addition of sidewalk on the east side of Ulster Avenue and south side of Boices Lane, as well as bike lanes on Ulster Avenue. These facilities should safely connect to the Hudson Valley Mall as that is a major destination in the corridor.

Type/Width	Length
6 ft concrete sidewalk 4 ft asphalt bike lanes	1.3 miles 3.5 miles

Context

High traffic commercial strip with limited safe pedestrian crossings. Existing sections and conditions of Ulster Avenue and Boices Lane limit roadway widening. Addition of sidewalks and bike lanes will require access management on the existing sections and ROW.

Ownership

Public roadway with adjacent private ownership

Key Land Uses / Destinations

The Hudson Valley Mall is located on the east side of Ulster Ave. and the west side is lined with additional strip malls featuring retail and dining options. The Tech City Corporate Park is located a short distance west of Ulster Ave and could provide a substantial walking population if safe connections existed.

Issues

- High traffic with limited crossing opportunities.
- Broken crossing signals and limited crossing time.
- Multiple driveway conflicts
- Opportunity for private sector partnership

Planning-Level Cost Estimate

Option 1: $0.42M

Option 2: $1.5M

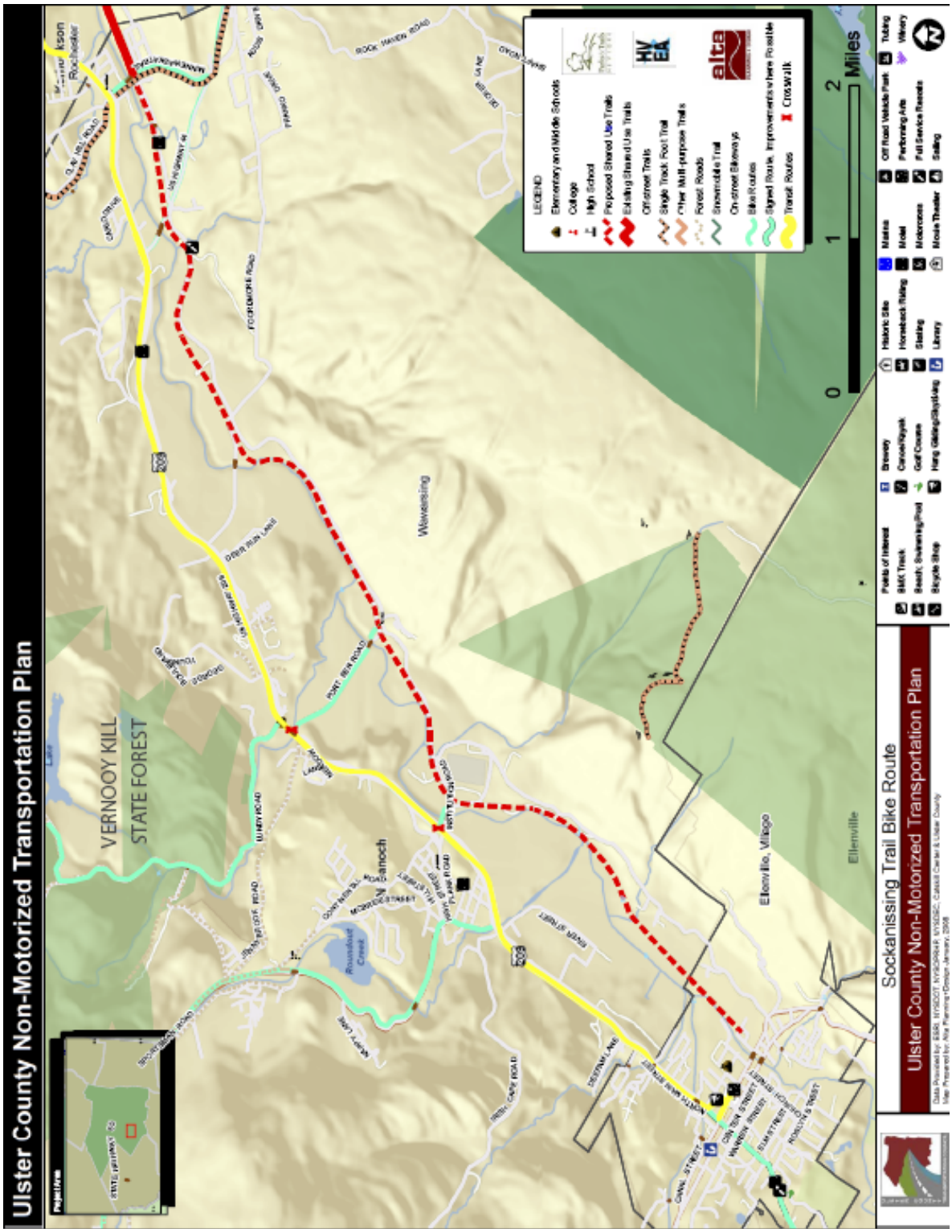
Option 1: Facility Improvements (crosswalks, signals)

This option includes basic improvements within the existing right-of-way. Improvements will include high visibility crossings, pedestrian signals, and signage.

Option 2: New sidewalk and bike lanes

This option will create safe non-motorized options by providing bike lanes and sidewalks as elements of a redesigned roadway.

Project 15: Ellenville D&H Trail



Project 15: Ellenville D&H Trail

Description

The D&H / O&W Trail project will connect the existing D&H/O&W Trail from the Rochester Town Line to Wurtsboro (in Sullivan County) and will include a connector route to the Lundy property conservation area. The proposed linear park has been nicknamed the "Sockanissing Trail" by local advocates to capture the region's historic quality. The priority for this project is to complete the D&H Trail from the Wawarsing / Rochester line through Ellenville to the Wawarsing / Sullivan County line

Option 1 proposes a shared-use trail on the existing railroad right-of-way
Option 2 proposes to include bike lanes / paved shoulders along abutting roadway segments such as Port Ben Road and Institution Road for additional access to the D&H trail.

Type/Width	Length
1) 10 ft asphalt shared use trail 2) 4 ft bike lanes	8 miles 5.75 miles

Context

1) The railroad ROW ownership and land use restrictions will require further investigation.
2) In the proposed bike lane locations, all sections and existing conditions should be examined (some areas may be wide enough to restripe roadway to include bike lanes, and other sections may require full depth widening).

Ownership

Mix of public and private ownership

Key Land Uses / Destinations

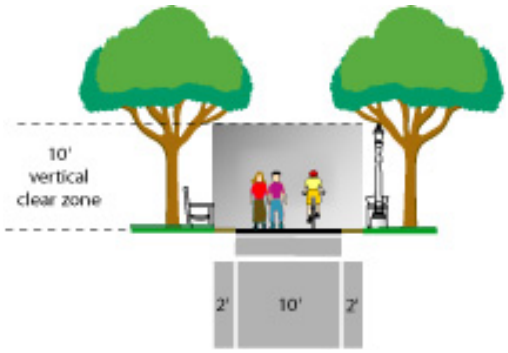
Village of Ellenville, Town of Wawarsing and western sections of Ulster County
Connection to Sullivan County

Issues

- Corridor acquisition
- Opportunity for historical interpretation and connections to public lands
- Potential for rural community economic development
- Port Ben Road is the proposed re-route of the Long Path

Planning-Level Cost Estimate

Option 1: $4.4M
Option 2: $5.5M



Option 1: Shared-use trail along railroad ROW

This option is the most cost effective and would provide a safe, separated trail for non-motorized travel.

Option 2: Addition of bike lanes / paved shoulders

This option is the more costly of the two options, but would provide better access to the D&H trail from abutting roadways.

6. DESIGN GUIDELINES

The design chapter of the Ulster County Non-Motorized Transportation Plan is based on current state and national documents including the AASHTO Guide for Development of Bicycle Facilities, (AASHTO, 1999), the Manual for Uniform Traffic Control Devices (MUTCD) and the NYSDOT Highway Design Manual (Chapters 17 and 18). The Ulster County Non-Motorized Transportation Plan design guidelines use these documents as a baseline for minimum conditions, and are intended to facilitate creative solutions to a wide range of non-motorized facility types. It is recognized that on facilities maintained by the NYSDOT, the State's design guidelines will apply, and that Ulster County has the potential to exceed these minimum guidelines where conditions warrant on facilities within their jurisdiction.

Bicycle Facility Types

Bicycle facilities are generally grouped into two categories: On Street Bikeways and Trails. This section is based on definitions established by AASHTO, the MUTCD and innovative design concepts from other communities in the U.S.

Table 8

Design Type	Category	Width	Surface	Treatment	Function
Bike Lane	On-Street	5'-6'	Asphalt	On-street lane striped and signed to state standards	For bicyclists on roadways.
Signed shared roadways	On-Street	varies	Asphalt	May either be a low volume (less than 3000 cars per day) roadway with traffic calming and signage to create a safe shared use environment, OR a higher volume roadway with wide (14') outside lanes.	Used for designated bicycle routes; can include signage and pavement markings
Bicycle Boulevard	On-Street	varies	Asphalt	Multiple traffic calming treatments combined with bike lanes and or signed shared roadways to create priority streets for bicyclists	Provides a continuous facility on streets with varying widths, volumes and speeds
Shared Curb Lane	On-Street	9 - 12'	Asphalt	Common facility type in low-speed and low-volume street types.	Utilitarian cycling on streets which are not otherwise designated as elements of the bicycle network
Wide Curb Lane	On-Street	12- 14'	Asphalt	Smooth pavement, bicycle compatible storm grates	For skilled bicyclists who are capable of sharing the road with motor vehicles
Shared Use Path	Off-Street	10'-14'	Asphalt, concrete or other	Designed to state standards. Separated from roadway by	Typical application for regional trail and some community pathways and

Design Type	Category	Width	Surface	Treatment	Function
			smooth firm surface	planting strip or vertical curbing.	bikeways. Accommodates bicycles, pedestrians, wheelchairs. Minimizes potential trail crossing conflicts with autos.
Single Track Trail	Off-Street	3-8'	Natural Surface	Designed to meet IMBA guidelines	Designed for mountain bicyclists; can include a variety of off-road bicycling trail types

Shared Use Paths, Greenways and Trails

One of the key elements of designing trails and greenways is to safely integrate these off-street facilities into vehicle traffic. This includes crossing features for roadways with warning signs both for vehicles and trail users. The type, location, and other criteria are identified in the Manual for Uniform Traffic Control Devices (MUTCD). Greenways and trails fall within the umbrella of Shared Use Paths as they are intended for all non-motorized modes of transportation and not just bicycles.

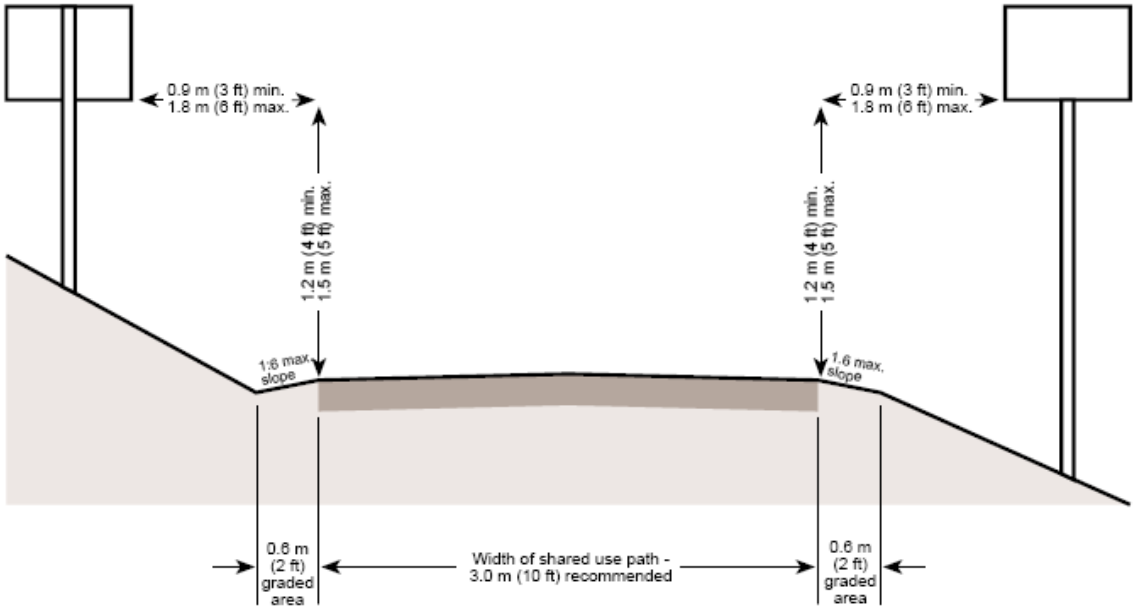
In addition to the following dimensional standards, there is a range of special design considerations unique to Shared Use Paths. Adequate warning distance is based on vehicle speeds and line of sight. Signage should be highly visible; catching the attention of motorists accustomed to roadway signs may require additional alerting devices such as a flashing light, roadway striping or changes in pavement texture. Signing for trail users must include a standard stop sign and pavement marking, sometimes combined with other features such as bollards or a kink in the trail to slow bicyclists. Care must be taken not to place too many signs at crossings lest they overwhelm the user and lose their impact.

Directional signing may be useful for trail users and motorists alike. For motorists, a sign reading "Bicycle Trail Xing" along with a trail emblem or logo helps both warn and promote use of the trail itself. For trail users, directional signs and street names at crossings help direct people to their destinations. Parks & Trails New York has produced a resource guide for trail-roadway intersections, and the document is available on-line at www.ptny.org.

The directional signing should impart a unique theme so trail users know which trail they are following and where it goes. The theme can be conveyed in a variety of ways: engraved stone, medallions, bollards, and mile markers. A central information installation at trailheads and major crossroads also helps users find their way and acknowledge the rules of the trail. They are also useful for interpretive education about plant and animal life, ecosystems, and local history.

A number of striping patterns have emerged over the years to delineate trail crossings. A median stripe on the trail approach will help to organize and warn trail users. The actual crosswalk striping is a matter of local and State preference, and may be accompanied by pavement treatments to help warn and slow motorists. The effectiveness of crosswalk striping is highly related to local customs and regulations. In communities where motorists do not typically yield to pedestrians in crosswalks, additional measures may be required.

Figure 3 - Typical Sections



Shared-use path cross-section from the *AASHTO Guide for the Development of Bicycle Facilities*. This is the most commonly used trail facility guideline in the U.S. Projects built to this cross-section are eligible for most federal and state transportation funding sources.

Based on the results of the previous tasks, public input, agency comments, and applicable design guidelines, a series of typical sections was developed for specific locations on the non-motorized transportation network. A variety of typical cross-sections are required to provide the flexibility needed to respond to site conditions and design opportunities. The typical sections include single track trails, shared-use paths, trails adjacent to roadways, rails-with-trails and water trails. These sections were applied to the previously identified alternatives, and a refinement of those alternatives was produced. Plan views of access, trailheads, or other key support facilities were developed using aerial photos and GIS data, and were included in the description sheets for each potential project.

The graphic below illustrates a typical shared use path design, which is the most common design for Ulster's trail and greenway network. This path is designed to accommodate two-way bicycle and pedestrian traffic, typically has its own right-of-way, and can accommodate maintenance and emergency vehicles. This type of trail is typically paved (asphalt or concrete) but can also be a crusher fines or other smooth surface, as long as it meets ADA requirements. Wider soft shoulders should be provided for runners/joggers if space allows.

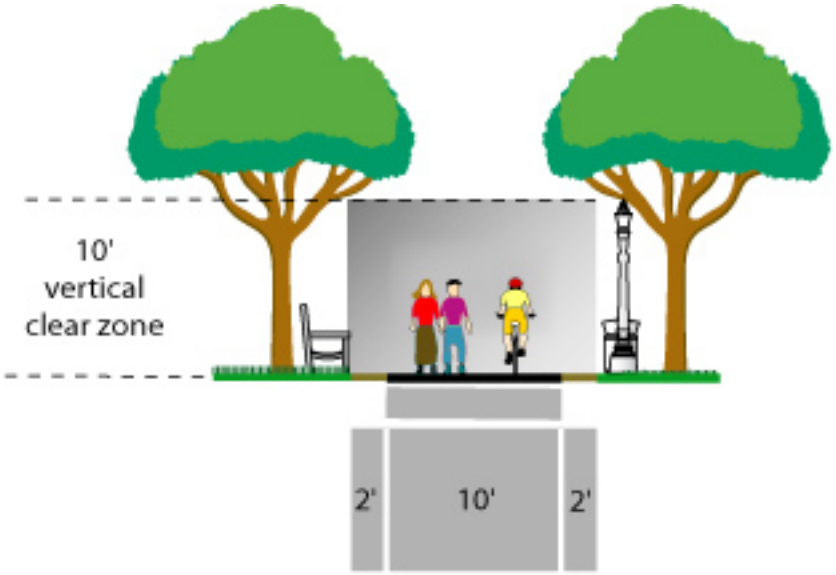


Figure 4 - Typical Shared Use Path Design

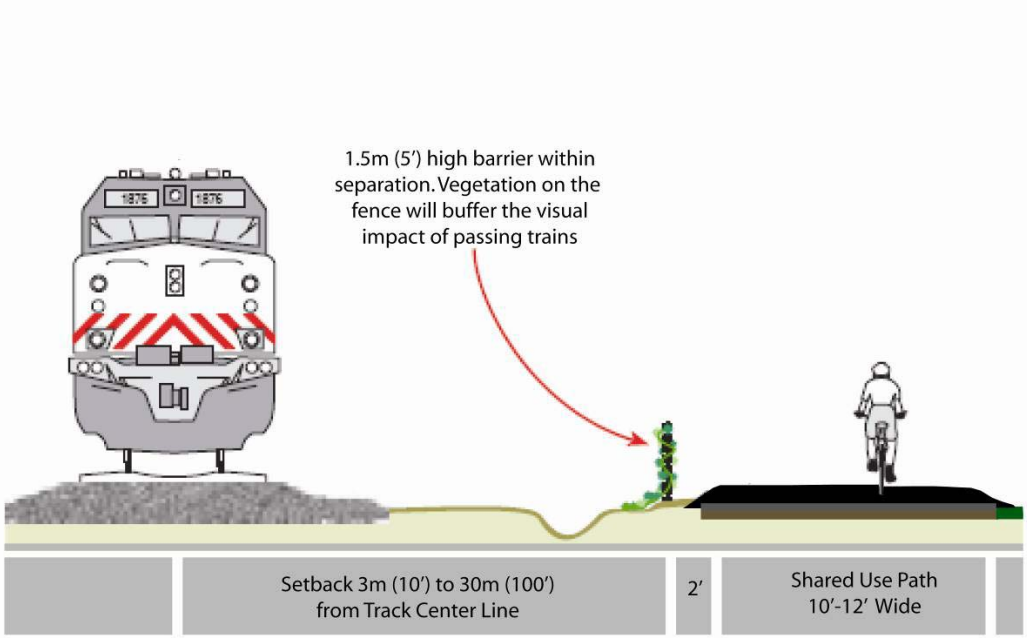


Figure 5 – Rail with Trail / Trail in Active Railroad Corridor

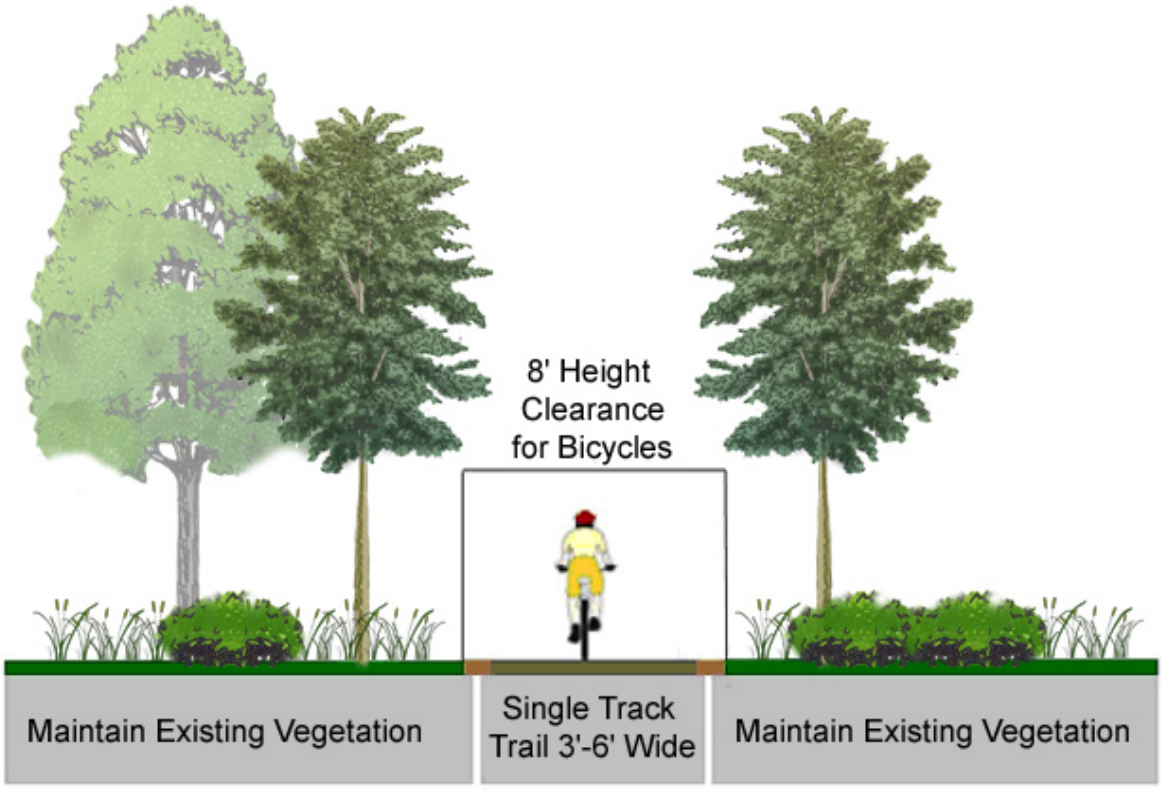


Figure 6 – Single Track Trail

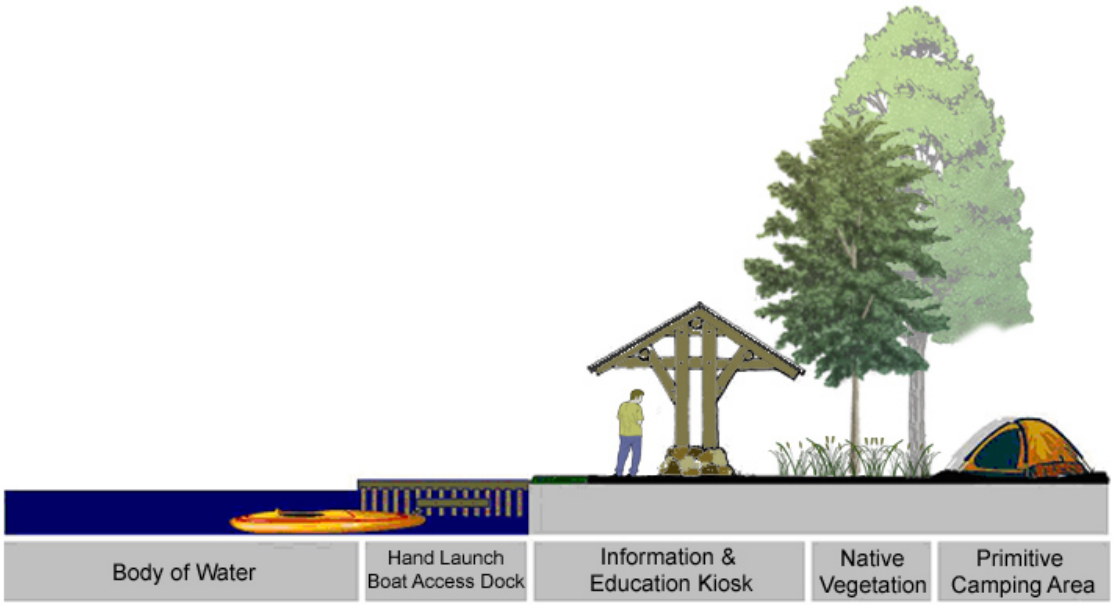


Figure 7 – Water Trail Access Point

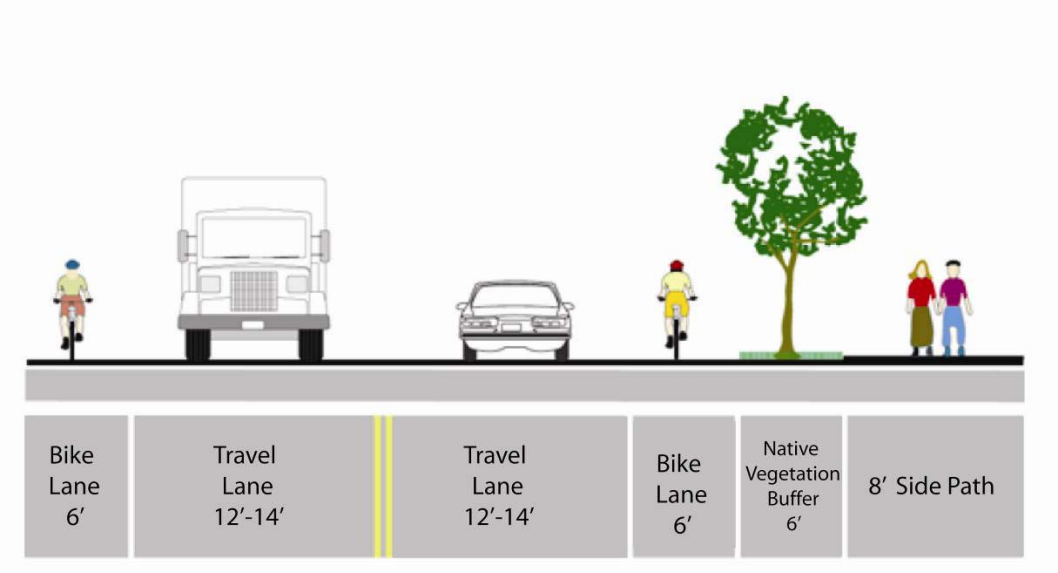


Figure 8 Lane Road with Bike Lanes & 8' Side Path

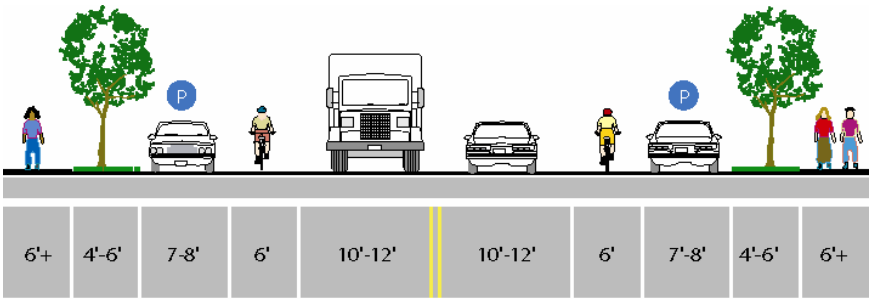


Figure 9 - Bike Lane with On-Street Parking on Moderate Volume Roadway

Provides for shared use with pedestrian or motor vehicle traffic, typically on lower volume roadways.

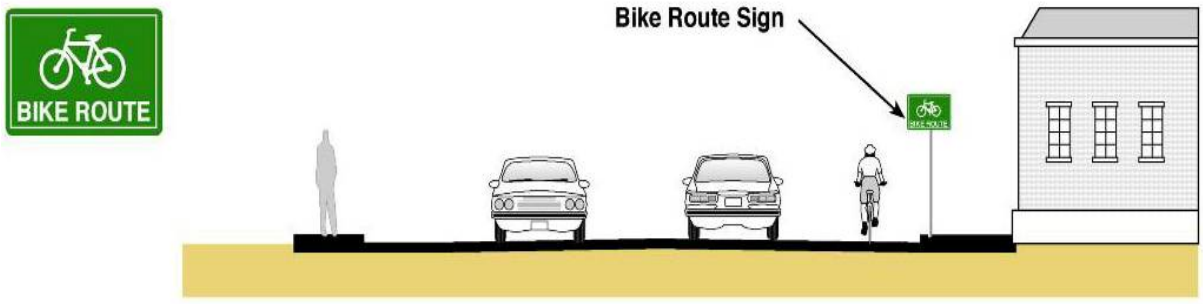


Figure 10 - Bike Route Designation and Signage

Wayfinding

Wayfinding signage is an important part of the non-motorized transportation network. Implementing a well-planned and attractive system of signage can greatly enhance facilities, making their presence aware to motorists, as well as existing and potential non-motorized users. By leading people to facilities that offer safe and efficient transportation, effective signage can encourage residents and visitors to bicycle and walk. Way-finding can include mile-markers, road identification at undercrossings, and informational kiosks.

The *Manual of Uniform Traffic Control Devices* provides specific design details for the placement, and size of standard bicycle facility signage. All bicycle facilities within Ulster County should be signed per the MUTCD. In general, the sizes of signs used on bicycle paths are smaller than those used on roadways. If the sign applies to drivers and bicyclists, then the larger size used for conventional roads should apply.

For on-street facilities, MUTCD standards require both the use of the words "Bike Route" and a bicycle symbol for any route designation. Additional panels are required to provide destination name, route numbers or directional arrows.

For off-street facilities, like shared-use trails and pathways, informational signs should notify users where they are, where they are going, what cross streets they are crossing, how far away destinations are, and what services are available close to the path.

Informational kiosks, complete with maps of the surrounding area, can help provide initial orientation and bearings for bicyclists beginning their journeys at major transit hubs, or transitioning from off-street to on-street facilities.

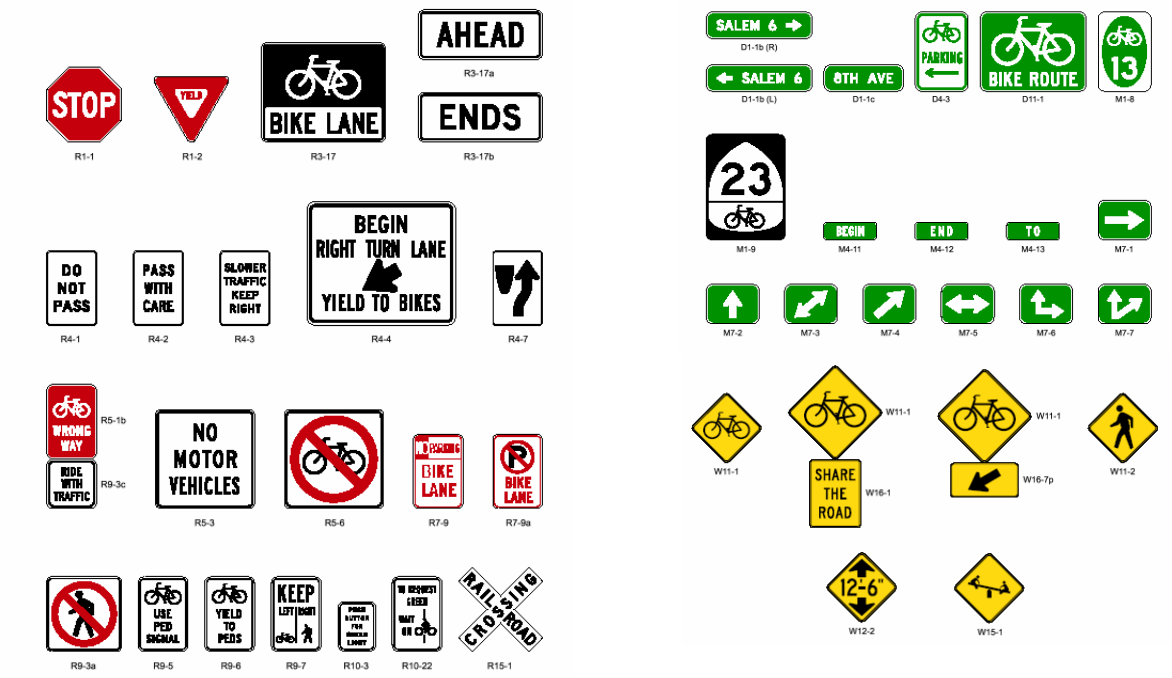


Figure 11: MUTCD Regulatory and Guide Signage for Bikeway Facilities

Destination Signage

Destination signage helps bicyclists use the bikeway network as an effective transportation system. These signs typically display distance, direction and in some cases, estimated travel time information to various destinations. In Ulster County, destination signage would be helpful for downtown destinations areas, college campuses such as SUNY New Paltz and other destinations including shopping centers, parks and schools. Signage can also assist users to navigate towards major bikeways, transit hubs, or greenway trails.

Customized signs provide an opportunity to make signage a unique feature of Ulster County. Many communities in California have customized the bike route logo sign by modifying the upper third portion with a distinct graphic.

Finally, way-finding can help non-motorized trail users avoid difficult and potentially hazardous road scenarios, like steep terrain, dangerous intersections, highway and river crossings, or deteriorating road conditions. The signs below are provided only as point of reference and have not been adopted by the county.

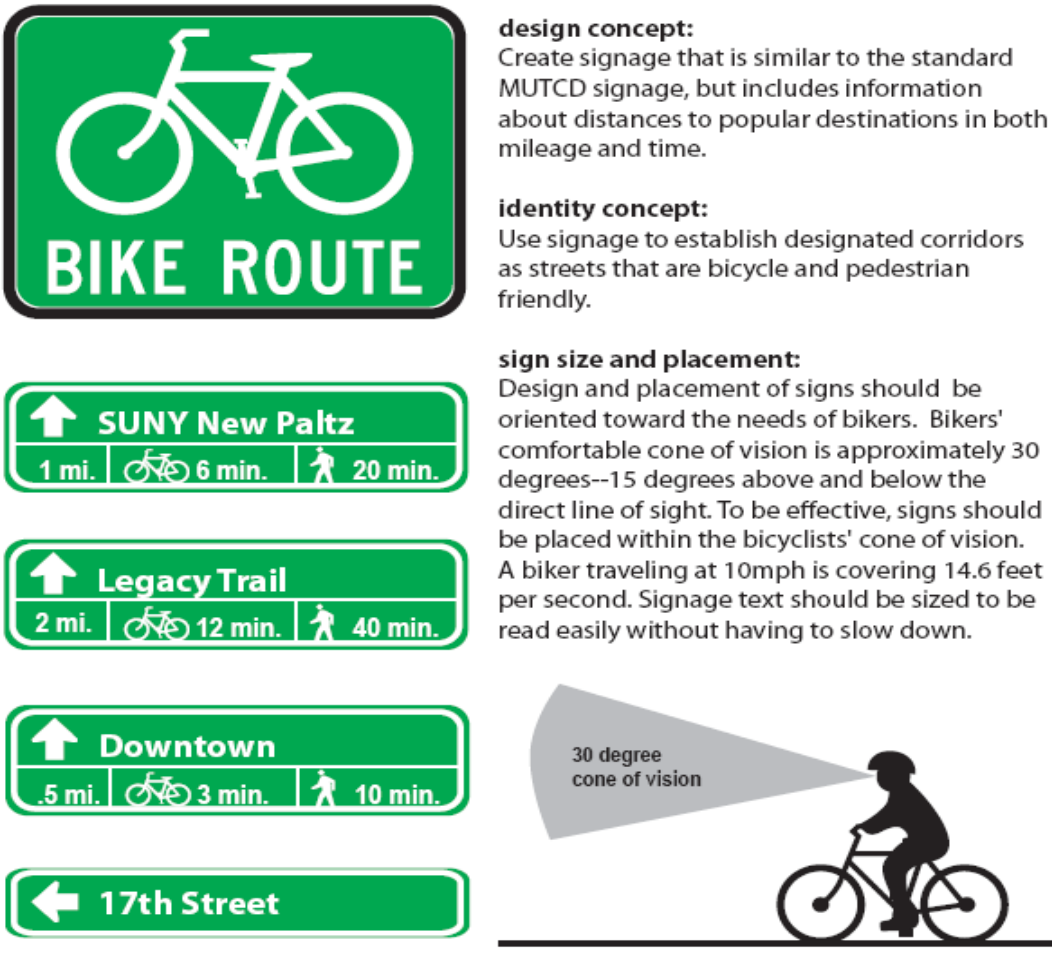


Figure 12: Example of Destination Signage for Ulster County. Signs such as these improve the clarity of travel while illustrating that destinations are really only a short ride away.

7. GOALS AND OBJECTIVES

Goals, objectives and measurable benchmarks will help the UCTC guide the implementation process for the Non-motorized transportation system. Physical implementation, user safety, and quality of service benchmarks can become part of the infrastructure management systems utilized by UCTC. These benchmarks are based on the proposed projects presented in the plan, and include the following performance measures:

Goal 1: Build a connected non-motorized transportation system in Ulster County.
Objective 1-1: One of the great appeals of non-motorized transportation and trails lies in the concept of connectivity. Non-motorized transportation and trails can connect people with the region's conservation areas, parks, and open spaces. Complete the priority trails projects identified in the Non-motorized transportation Plan in the next five years.
Objective 1-2: Connect the entire trail system within 20 years.
Benchmark: Number of miles of trail completed.

Goal 2: Increase the number of people walking and bicycling for transportation and recreation in Ulster County.
Objective 2-1: Double the percentage of work trips made by non-motorized modes by 2020.
Objective 2-2: Increase the number of trail users by 5% per year as measured through count data.
Benchmark: Conduct periodic counts of pedestrian and bicycle travel at key locations on the trail system using the National Bicycle and Pedestrian Documentation Project methodology. Utilize 10-year U.S. Census Journey-to-Work data. *Census 2000* found that 6.1% of Ulster County workers reported either walking or bicycling to work.

Goal 3: Ensure public perception that Ulster County is making facilities and programs available for safe bicycling, walking and trails.
Objective 3-1: Implement "Share the Road/Drive Less - Live More" and Countywide Bicycle Parking Program to improve the public opinion of bicycle and pedestrian access and safety in the County.
Benchmark: Commence periodic UCTC survey of community perceptions on bicycle/pedestrian access and safety.

These benchmarks can be linked to ongoing initiatives to reduce the County's carbon footprint, to improve public health through increased physical activity, to improve traffic safety, and other efforts that connect non-motorized transportation with Ulster County's quality of life.

8. IMPLEMENTATION

This section of the plan provides a guide for implementation of the infrastructure projects, programs and policies that will support the ongoing development of non-motorized transportation in Ulster County.

Project Phasing

The UCTC Non-motorized transportation projects will be implemented in phases over time and as funding becomes available. The plan is intended to be flexible enough to allow projects and programs to be implemented as opportunities are presented. For example, programs such as the "Drive Less, Live More" campaign and County Wide Bicycle Parking can be implemented for less cost than most traditional infrastructure projects, and there is federal money currently available to promote Safe Routes to School projects. The project lists and the priority projects identified in this plan are important steps towards advancing these projects. Local communities, non-profit organizations, businesses and government are all part of the process for moving these projects forward.

Projected Unit Costs

Based on the recommended alternatives, the proposed projects, typical sections, and cost opinions were developed for the proposed system of non-motorized transportation facilities, trailheads, and trail amenities. Cost data were collected from local greenway and trail projects to provide planning-level unit cost estimates to assist with future budgeting and implementation activities. The unit cost data are provided as guidelines based on similar projects and provide as much detail as possible based on planning level data and field observations. Additional engineering design and feasibility studies will be required to advance individual projects to construction. Facility management and maintenance costs are included based on available data from projects in the region.

Paved Shared-Use Paths	$300,000 - $400,000 per mile
Natural Surface Shared-Use Paths:	$200,000 - $250,000 per mile
Single Track Mountain Bike or Hiking Trail:	$10,000 - $20,000 per mile
Staffing / Program Costs:	$6,000 per mile of trail per year
Maintenance Costs:	$5,000 - $15,000 per mile of trail per year(1)

Notes –

(1) –Costs for shared use paths include usage of maintenance equipment, surface repairs, vegetation management, tree/shrub replacement, and bench/kiosk/trash receptacle replacement. Single track trails can be maintained at lower costs. Volunteers can also be utilized for routine litter pickup and trail patrols. Staffing costs include emergency management, trail user programs, and system management costs. Trails built in areas where less landscaping is needed will incur lower annual maintenance and staffing costs.

Funding: "Stand Alone" Projects and Integration into Ongoing Projects

A range of general and specific funding opportunities have been identified for the development and operation of the non-motorized transportation plan in Ulster County. Funding opportunities can include public and private sources, public/private partnerships, inter-municipal agreements, grants, and other funding sources. A list of funding resources is provided in the Appendix of this document.

The Ulster County Transportation Council develops a Transportation Improvement Program (TIP) that lists eligible projects for federal and state transportation funding. It is important for local communities to identify NMT projects as part of the TIP process, and to participate in UCTC's efforts to support a balanced transportation system. There are a wide range of eligible funding sources for NMT projects, and UCTC can help local communities identify these opportunities.

The Federal SAFETEA Transportation Enhancements (TE) program is a significant catalyst for creating non-traditional transportation opportunities. The TE program is administered by NYSDOT and provides funds for 12 categories of programs, including:

- pedestrian and bicycle facilities,
- pedestrian and bicycle safety and education programs, and
- landscaping and scenic beautification.

In cases where federal funding, including Transportation Enhacements, is used for NMT projects, the municipality is required to provide 20% in matching funds. This requirement is often a limiting factor for communities being able to implement NMT projects. Currently, New York State transportation funding (known as the Marchiselli Fund) is only eligible for projects that are within the public highway right of way. While this can include sidewalks, paved shoulders, bike lanes and intersections, it does not include shared-use paths that are on abandoned rail lines, utility corridors or other rights of way. Other state funding sources associated with recreational non-motorized transportation are avialable for these projects. The County can consider a range of alternatives to support funding of NMT projects. The options range from establishing a dedicated funding source using general revenues, to creating a bond act for NMT funding, to identifying a new revenue stream such as a real estate transfer tax or other fee. The priority for this funding should be to provide the matching funds to leverage other fund souces needed to advance components of the NMT system.

In addition to funding 'stand alone' projects, one of the most common ways for local governments to implement the NMT system is through integration with other ongoing infrastructure projects. This can include identifying NMT opportunities in roadway widening, roadway resurfacing, utilities projects, or land development and re-development. The key step to ensuring that this becomes a consistent approach to infrastructure is the adoption of "Complete Streets" policies at the local and county levels. A proposed policy is provided below.

Proposed Draft Ulster County Non-Motorized Transportation (NMT) Policy

Purpose:
County level policies can establish a model and provide useful guidelines for local municipalities. Since UCTC is responsible for planning and programming transportation and the County Planning Department is responsible for reviewing applications, a County NMT policy will ensure consistency of design and operational characteristics of bicycle and pedestrian transportation system for projects which cross municipal boundaries or have multi-jurisdictional impacts,

Proposed Policy:

Ulster County hereby adopts the policy of "Complete Streets" as a guiding principle for our infrastructure. "Complete Streets" are defined as facilities that **"***are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and bus riders of all ages and abilities are able to safely move along and across a complete street."*

The County will support local communities in the development of a complete system of bikeways, pedestrian facilities and shared use paths, bicycle parking and safe crossings connecting residences, businesses and public places. The County will promote bicycling and walking for health, environmental sustainability, exercise, transportation and recreation.

Bicycle and pedestrian facilities shall be provided in new construction, reconstruction and maintenance projects in the County unless one of the following conditions is met:

- Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, bicyclists and pedestrians will be accommodated elsewhere within the right-of-way or within the same transportation corridor.

- The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Disproportionate is defined as exceeding twenty percent of the cost of the larger project.

- In cases where the existing right-of-way does not allow for sidewalks, bike lanes, paths or other improvements, potential alternatives will include the appropriate use of paved shoulders, signage, traffic calming and/or enhanced education and enforcement.

Bicycle and Pedestrian facilities will be provided and maintained in accordance with guidelines adopted by the USDOT, NYSDOT and AASHTO. Site plan and subdivision reviews conducted by the county will incorporate these facilities. On county-maintained roadways, bicycle and pedestrian facilities will be provided in accordance with this policy. County offices and public buildings will provide bicycle parking, lockers and showers in accordance with local zoning and planning regulations.

In addtion to the broad "Complete Streets" approach to infrastructure, there are a range of other county-wide policy issues that relate to non-motorized transportation. Especially in a 'home rule' state, local land use policies are enforced at the community level, and it is

important to integrate walking, bicycling and trails into community planning. The Comprehensive Plan is designed to act as a guide to proper growth management. The following concepts should be considered for future comprehensive planning efforts:

- Ulster County recognizes the need to encourage bicycle and pedestrian travel for both transportation and recreation. These uses conserve energy, contribute to cleaner air, reduce traffic, reduce the need for automobile parking, and improve personal fitness.
- The Comprehensive Plan should assure safe and convenient access to all areas of the community. In addition, the Plan should promote the use of bicycling and walking as viable and attractive alternatives to the use of automobiles.

Policies that can be implemented in the Comprehensive Plan process include the following:

- Provide marked bicycle lanes, sidewalks and safe crossings along collector and arterial roadways.
- Provide paved shoulders where right-of-way is available. In areas of limited right-of-way, minimize adverse affects on NMT travel through traffic calming, education and enforcement programs.
- Include sidewalks, transit shelters and ADA compliance in the design of intersections and traffic control systems.
- Add bicycle and pedestrian facilities to the list of design characteristics necessary for traditional hamlet areas.
- Develop and implement bicycle parking standards in local planning regulations
- Require compliance with the NMT plan for new development including bicyclist, pedestrian, and trail facilities.

Partnerships:
The success of the Ulster Non-Motorized Transportation Plan will depend upon developing community partnerships for implementation, fundraising and promotion of the trail system. As David Dionne, former chair of the East Coast Greenway often says, it is important to "*build the community into the trail, and to build the trails into the community*." Potential opportunities for marketing and promotion of the non-motorized transportation system include:

Publish a Trail Guide for Ulster County: An 'early win' for Ulster County would be to provide literature and trail maps for public use. A trail guide would provide information on access points, existing trails, rental equipment locations, and other information for residents and visitors. This information could be provided in electronic format online, or could be published and made available in hard copy. The map can be funded and produced by revenue from advertising, or can be funded as a public service promotional item.

Friends of Ulster Trails: Most successful trail programs have the support of a local non-profit organization that can advocate, raise funds and collaborate with local officials. A 'friends' organization can serve as a focal point for community support and outreach. The board of this organization can include a broad range of community interests, such as health providers, schools, businesses, bike clubs and other partners.

Annual Events: There are numerous opportunities for Ulster County to promote special events related to the non-motorized transportation system. These could include an Ulster

Trail Triathlon that included kayaking, running and bicycling or a trail clean-up day in accord with National Trails Day. These types of events can provide public awareness, visibility for sponsors and fundraising opportunities for the trail system.

Active Living Seniors: With the significant local population of seniors and retirees, and the need for this population to remain physically active, it will be important to develop programs that connect this population to the non-motorized transportation. Walking and physical fitness programs can be linked to guided tours of existing trails, as well as increased use of new trails as they are developed.

Trips for Kids: Trips For Kids provides the materials, moral support and inspiration that an individual or group needs to help disadvantaged kids discover the joy of mountain biking. Operating in the United States and Canada, they open the world of cycling to at-risk youth through mountain bike rides and Earn-A-Bike programs. The more than forty Trips for Kids chapters combine lessons in personal responsibility, achievement and environmental awareness through the development of practical skills and the simple act of having fun on a bike. Additional information is available at the organization's website, www.tripsforkids.org.

Adopt-a-Trail / Maintenance Program: An 'adoption' program can be established so organizations, individuals and businesses can adopt a mile of trail, an engraved brick or trail marker, a bench, a bike rack, a trailhead or other elements of the trail system. This can facilitate fundraising and maintenance of the trail system, and is a good way to build support for trails with a cross section of community partners. Since UCTC is a planning and programming agency, cooperative maintenance agreements will be needed with the Public Works Department for off-street trails, and with Transportation facilities departments for on-road facilities.

Trips for Kids and bike racks adopted by local partners are examples of opportunities to promote the Ulster Non-Motorized Transportation system.

KEY RECOMMENDATIONS:

The next steps of implementing the Non-Motorized Transportation Plan and the probable lead agency are summarized as follows:

1. Next Phase Projects
The projects identified through the NMTP process can be advanced through the UCTC process with the support of local communities. This will involve ongoing communication and coordination to ensure that projects remain visible to local leaders and participants in the project development process.
Lead: NTAC

2. Project Funding
Funding opportunities are available, and more may be included in the reauthorization of the federal SAFETEA transportation legislation. Other sources include NYS Environmental Bond Act funds and recreational funds available at the county and local level. It will be critical to connect these resources to potential projects in the NMTP.
Lead: UCTC, NYSDOT

3. Friends of Ulster Trails
Successful communities need well-organized advocacy groups to support local government efforts. With the range of interested organizations, a county-wide 'friends of trails' organization would play a key role in advancing the NMT Plan.
Lead: New non-profit (or partnership with an existing 501(c) organization)

4. Continue the NTAC Process
The Non-Motorized Transportation Advisory Committee was a vital part of the public process for the NMT Plan. This Committee can continue to meet as part of UCTC's ongoing public input process.
Lead: UCTC

5. Maintenance Agreements
In the long term, cost-sharing opportunities will exist for maintenance and operations of the trail system in Ulster County. Local communities can share resources to maintain user safety, security and quality of experience as the system continues to grow.
Lead: Public Works Department staff

6. Ulster Trails Map
With the extensive existing system in place, a new County-wide trails map will help connect people with local trails in their communities, and provide an important way to promote the system and educate users about NMT safety.
Lead: County Agencies – UCTC, Open Space Partnership, and Tourism coordinated by UCTC Staff.

7. Annual Event
An annual promotional event can create new partnerships and demonstrate the value of NMT facilities. Several successful events are already held in the County. A coordinated events calendar and 'signature' annual event are great opportunities for the region.
Lead: Friends of Ulster Trails

8. Coordination with the 2009 Hudson-Champlain Quadricentennial Celebration
The 400th celebration of the accomplishments of Hudson, Champlain and Fulton will take place along the Hudson and Champlain Valleys in 2009. The Explore NY program is an opportunity to connect the NMT plan to the State's celebration of these historic events.
Lead: Grand Walk-About Committee

9. Policy Adoption: Complete Streets
It is important to have policies adopted at the county and local levels to ensure that appropriate infrastructure improvements for bicyclists and pedestrians become the standard operating procedure for future projects. The "Complete Streets" policy concept outlined in the NMT plan is a key to integrating facilities for pedestrians, bicyclists and trails into local projects.
Lead: Local Communities

10. Education, Enforcement and Encouragement Programs
While the physical facilities are a major focus of this plan, it is essential to remember that the "other E's" of education, enforcement and encouragement programs are equally important. The Share the Road program and other proposals in the NMT plan will provide important health, safety, environmental and quality-of-life benefits for Ulster County.
Lead: County Agencies / Local Communities

These actions will provide Ulster County with the foundation of a greenway and trail system that will provide lasting benefits to residents, businesses, and visitors. Moving this plan forward will take cooperation, innovation, and leadership. Over time, short-term priorities will get completed, and future phases will build upon early successes. With the vision developed in this plan, non-motorized transportation will be an important part of the future for Ulster County.

9. OPERATIONS AND MAINTENANCE

RECOMMENDED OPERATIONS GUIDELINES

The non-motorized transportation system of Ulster County includes an array of varied components from paved shared-use paths to soft surface trails, road shoulders, sidewalks and streets. Ideally, these should be integrated and operated as seamlessly as possible, offering citizens and visitors a first class system. Because there are multiple agencies with different but complementary missions, coordination and cost-effective management and function is essential. This can be challenging, and sorting out priorities will require concerted effort and clear leadership.

To help achieve a more sustainable operations program, the following actions are suggested:

- The agencies should work together with a written 'Owners Manual" with a specific listing of all functions, frequency of tasks, quality standards, and estimated unit costs and/or staffing requirements. This should be translated into an annual budget that anticipates development of the system in five-year increments.
- The program must be cost-effective with sustainable funding sources identified.
- The program must be goal-oriented and mission-focused based on the written and agreed to policies and guidelines.
- The elected bodies should designate an individual or committee to serve as liaison/advocate for the alternative transportation system.
- The program should have a discrete and adequate funding allocation for the off-street pathway system based on the program manual and annual budget.
- A lead person, with trails development and management skills should be designated to coordinate the system and related programs. This "NMT Coordinator" should partner with the appropriate departments and/or organizations as appropriate to carry out the various operations, management, and programming functions.

The Ulster County Non-Motorized Transportation system should have staff specifically responsible for Operations and Programming, so that education, outreach, encouragement, and safety initiatives can be provided as a high-quality community service.

It is estimated that with the full build-out of the NMT system, annual operations and programming would include the following responsibilities and tasks:

1. Special Events Planning
2. Volunteer Coordination
3. Environmental Education
4. Outreach Programming
5. Program Development
6. Safe Routes to Schools Coordination
7. Health and Fitness Promotion
8. Trail Patrol Coordination
9. Trail Patrol Staff/Volunteers
10. System Engineering/Planning
11. Conservation Stewardship

SYSTEM MAINTENANCE

The quality and condition of the shared-use paths, trails, sidewalks and on-street bicycling system are essential to the long term success of the Non-Motorized Transportation Plan. *System Maintenance* refers to the care, upkeep and smooth functioning of the NMT infrastructure of Ulster County. If the system is well maintained and cared for, it will assure both the safety and enjoyment of the residents and visitors who use it. A proper maintenance program will reduce long-term costs by extending the life of the components and it will also win the continued support of the residents, homeowners, and businesses.

Both on-street and off-street facilities need regular maintenance. Bicycles are more susceptible than motor vehicles to roadway irregularities such as potholes, broken glass, and loose gravel. For example, after repaving, a vertical lip between asphalt layers on a roadway shoulder does not affect a motor vehicle, but may catch a bicycle tire and possibly result in a bicyclist losing control. In addition, special accommodations should be made to provide for bicyclists and pedestrians during construction periods.

Ulster County should evaluate its current street maintenance and repair policies, as well as staffing availability and resources to ensure that they reflect the needs of bicyclists, pedestrians and trail users.

Specific measures to review include:

Plowing. On-street bikeways, paths and sidewalks should be plowed and maintained after snowstorms.

Street sweeping. As motor vehicles travel along the roadway, debris is pushed to the outside lanes and shoulder. Debris also collects at the center of intersections. Roads striped with bike lanes or designated as bicycle routes should be swept more frequently than roads without designated bikeways. Street sweeping on these roadways should include removing debris on the shoulder and at intersections.

Roadway resurfacing should ensure that the transitions between the asphalt sections, drainage inlets and other roadway elements are safe and will maintained for all users.

Minor repairs and improvements. Potholes and cracks along the shoulder of roadways primarily affect bicyclists and should be completed within a timely manner. All repairs should be flush to the existing pavement surface.

Drainage grates. When repaving or maintaining roadways, drainage grates should be inspected to ensure that grate patterns are perpendicular to the road. Replacement of bicycle-unfriendly drainage grates should be a standard operating procedure.

Street resurfacing. When streets are resurfaced, utility covers, grates and other in-street items should be brought up to the new level of pavement. Similarly, the new asphalt should be tapered to meet the gutter edge and provide a smooth transition between the roadway and the gutter pan.

Regular Maintenance of shared-use paths. Shared-use paths require regular maintenance, including trimming adjacent vegetation, sweeping, plowing, and removing trash and debris. The County and local communities should develop a schedule for these routine items and should consider assigning staff to monitor the pathways on a weekly basis to proactively identify maintenance needs.

Actively coordinate with maintenance staff. Maintenance staff and contractors should be made aware of non-motorized related maintenance policies. Maintenance workers should be involved in the development of bicycle, pedestrian and trail-related maintenance policies in order to ensure that staff and understand the users' needs and limitations. After establishing policies, procedures can be established to verify compliance.

Seek Funding for Maintenance Activities through Non-Traditional Venues. A maintenance endowment can be established through private sector and non-profit fundraising to ensure long-term operations and programming needs can be met, in cooperation with public sector funding. Ulster County should encourage and support these types of fundraising efforts.

APPENDICES

Non-motorized Transportation Advisory Committee (NTAC) Participants

Project Identification and Prioritization Criteria

Non-Capital Project Rankings

Funding Sources

Ulster County NMT Plan - NTAC Representatives:

- Aaron Bennett, The Catskill Center, Arkville, NY
- Bill Brandt, Trolley Museum of New York
- Barbara Budik, Town of Saugerties
- *Mircea Catona, UC Department of Public Works
- Linda Cook, Hurley Highway Superintendent
- *Wally Cook, Town of Hurley
- Raymond Costantino, Town of Lloyd
- Richard Cripe, City of Kingston Liaison
- Peter Disclafani, Town of Shandaken
- Dennis Doyle, UCTC (Staff)
- Richard Edling, Trolley Museum of New York
- *Judy Falcon, Kingston City School District (SRTS Liaison)
- Gil Hales, Town of Saugerties
- Doug Havnaer, New Paltz Bike/Ped Committee
- Andrew Helgesen, D&H Canal
- *Mary Howard, UC Area Transit
- Bill Irving, VO2 Velo Bike Club
- Cindy Lanzetta, Town of Marlborough
- Nadine Lemmon, Town of Gardiner
- Peter J. Liepmann, UC Legislator
- Jerry Luke, Town of Lloyd
- Nick Mercurio, Recreational Bicyclist
- John Motzer, D&H Canal
- *Kathy Nolan, Town of Shandaken
- Sheldon Quimby, UC Office of Administration
- *Steven Rice, D&H Corridor Alliance
- *Russ Robbins, NYSDOT
- Keith Savoury, NYSDOT
- *Charlie Schaller, UC Traffic Safety Board
- Alan Stout, New Paltz Bike/Ped Coalition
- Bill Tobin, UCTC (Staff)

* = Project Review - Working Committee (PRJ)

Ulster County NMT Plan:
Project Identification Criteria

Criteria	Description	Weight
Environmental Benefits	Provides conservation values, carbon neutral / energy reduction benefits and/or connects people to nature	10
Resident and Visitor Benefits	Provides health, economic, and quality of life benefits, including increased access to physical activity, improved property values, and community enhancement	10
Transportation / Connectivity	Provides transportation and recreational access to activity centers (schools, employment and commercial districts, parks and public lands) and/or increases potential use of non-motorized travel	20
Regional Benefits	Potential to link into a network that extends throughout the County or provides NMT benefits to multiple communities	10
Multiple Use	Walking, bicycling, in-line skating, equestrians, water trails and a diverse range of user groups will benefit from the proposed project or program.	10
Agency Support	The project has the support of the agency responsible for its development, or has demonstrated public support that can lead to long-term success.	5
Enhances Safety for Non-Motorized Travel	The project will improve NMT safety, including people traveling along and across roadways, bridges, railroads, and waterways.	20
Geographic Diversity	Provides geographic diversity of project and program locations.	10
Implementation	Ease of implementation based on the following factors: intact rights-of-way, funding, or design constraints	5

Ulster County NMT Plan:
Project Prioritization Criteria

Criteria	Points	Maximum Score
Transportation: Increases the use of non-motorized travel to destinations	Access to Schools: 0-3 points max Access to Employment and Retail: 0-3 Access to Parks & Recreation: 0-3 Access to Transit: 0-3 Access to Residential Neighborhoods: 0-3	15
System Connectivity: Provides an essential link in creating a continuous NMT system within the study area.	Provides an essential link in the proposed network; without this link, the system could not be completed: 15-20 points Important as a 'stand alone project, but not critical to the overall system: 5-15 points A long-term element and potential future link in the system: 0-5 points	20
Quality of Life Benefits: Project will provide quality of life benefits to the residents, visitors and businesses of Ulster County.	Increases Tourism: 0-4 points max Environmental / Energy Benefits: 0-4 Potential to attract / retain businesses: 0-4 Increases Public Health / Fitness: 0-4 Improves Traffic Safety: 0-4	20
Multiple Use: Allows for a variety of trail users	Bicyclists: 0-3 points max Pedestrians / Runners: 0-3 Water Trail: 0-3 Equestrian: 0-3 X-C Skiing / Skating: 0-3	15
Agency Support: Project is supported by the organization(s) responsible for its implementation and management	Project has full agency support (7-10 points) Project has potential to receive agency support (minimal "Cost to Readiness") (3-6) Project may be able to receive future support (0-3)	10
Cost: Project can be implemented within the costs provided based on identified opportunities and constraints	Project can be implemented within the following range of unit costs: Less than $200k / mile or location (8-10 points max) $200k - $500k / mile or location (3-7 points) Greater than $500k / mile or location (0-2 points) Non-Capital Projects: 0-10 points based on ability to reach the widest range of people per unit of cost required to develop policy or programs	10
Implementation: Project or program is ready to be advanced to implementation	Presents significant constraints (0-2 points) Requires further study but has the potential to be advanced (3-7 points) Feasible and ready for implementation (8-10 points max)	10

Non-Capital Project Rankings

Rank	Item	Locality	Program Type	Ref #
1	Share the Road Campaign		Encouragement	19
2	Adopt MPO Funding Policy for % of Funding for NMT	County	Policy	65
5	Main Street Demonstration Projects (e.g. Woodstock/Rosendale/Hurley)	Hamlets	Demonstration	14
6	Bicycling and Walking activities at Schools	County	School Policy	68
8	Kingston Trolley Museum rail trail to Rondout	Rondout	Partnership	47
15	Demonstration Project Areas for Main Street Bike / Pedestrian Zone	Phoenicia	Demonstration	95
16	Demonstration Project Areas for Main Street Bike / Pedestrian Zones	Woodstock	Demonstration	96
17	Demonstration Project Areas for Main Street Bicycle/Pedestrian Zone	Rosendale	Demonstration	97
18	Demonstration Project Areas for Main Street Bike / Pedestrian Zone	Hurley	Demonstration	98
19	Demonstration Project Areas for Main Street Bike / Pedestrian Zone	Highland	Demonstration	99
20	Demonstration Project Areas for Main Street Bike / Pedestrian Zones	Ellenville		100
24	Demonstration Project Areas for Bike/Ped Demonstration Technology/Concept (RT 299 Corridor)	County	Demonstration	12
25	"Safe routes, Smart Kids" program"	County	Education	18
32	Urban Elementary School SR2S Plan	tba	SR2S	89
33	Plattekill Elementary School SR2S Plan	Plattekill	SR2S	90
34	Suburban Elementary School Plan	tba	SR2S	91
38	New organization / network for bike/trail groups in Ulster County	County	Advocacy	101
39	Sidewalks provision based on density ranges e.g. 1 unit/acre = s/w 1 side; >/=2 du/acre = sw both sides	County / Local	Policy	60
43	Increase use of in-street crosswalk signage	Local	Policy	58
44	Code for developers to put in sidewalks/paths as part of permit approval	Local	Policy	59
45	Coordinate water access with Bridge reconstruction projects	County	Policy	62
46	Bike / Ped Rest Areas / Kiosks / Facilities	County	Policy	63
47	Mountain Bike Network West of Kingston / New Paltz	County	Diverse Trail Uses	15
48	Enforce and Expand Vehicle and Traffic Law 1151 - Drivers yield to pedestrians in crosswalks	State	Enforcement	22
49	Lane Narrowing – "Road Diets"	County	Demonstration	13
50	Slow speed zones (beyond school zones)	Local	Enforcement	20
52	Motorist education of how to rely less on cars, use bikes for daily errands.	County	Education	17
55	Enforce penalties for motorists in crashes with bikes/peds	State	Enforcement	21
59	Bicycle Encouragement Programs	County	Policy	56
65	Sidewalks / Bike Lanes in all highway Business Zones	County	Policy	64
66	Establish the "Catskill 400" Trail network of the best trails in UC/Catskill area	Catskill Park	Diverse Trail Uses	93
67	Hiking Trails	County	Diverse Trail Uses	16
75	Designated county wide trail system for multiple, all season use	County	Policy	55
76	County trails map	County	Tourism	76
78	Provide signed and striped bike lanes on designated bike routes	County	Policy	53
81	Develop shared services for trail and sidewalk development	County	Policy	57
85	Incentives for employers to encourage employees to walk / Bike to work	County	Advocacy	3
89	Policy recommendations regarding lower speed limits on bike routes	Local	Policy	61
95	Equal treatment for horses in parks, on trails and roads. Share the road and trail education for equestrians, motorists and other users.	County	Equestrian	25
96	Non-paved horse paths--if shared with bikes, post speed limits and rules of the trail	County	Equestrian	26
97	Segway & wheel chair trail access for the disabled	County	ADA	1
99	Bicycle Events in Ulster County - On-line Calendar	County	Tourism	75
100	ADA Access to Transit	County	ADA	2

Funding Sources for Non-motorized transportation and Trails

Funding Program	Requirements	Contact Information
NYSDOT Transportation Enhancements Program (TEP)	Offer communities the opportunity to expand transportation choices (Each project must relate to surface transportation and meet one of the 12 eligible activities)	• http://www.fhwa.dot.gov/environment/te/index.htm Federal Highway Administration (FHWA) Enhancements Information • http://www.fhwa.dot.gov/environment/te/teas.htm (12 activity requirements) • http://www.fhwa.dot.gov/environment/te/relate.htm (Surface transportation requirements) • http://www.enhancements.org/ National Transportation Enhancements Clearinghouse • https://www.nysdot.gov/portal/page/portal/programs/tep NYSDOT Transportation Enhancements Program (TEP)
NYSDOT Surface Transportation Planning (STP)	Flexible funding that may be used by States and localities for projects on any Federal-aid highway, including the NHS, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities	• http://www.fhwa.dot.gov/safetealu/factsheets/stp.htm • https://www.nysdot.gov/portal/page/portal/divisions/policy-and-strategy/transit-bureau/public-transportation/federal-transit-funding/st-program
NYSDOT Hazard Elimination Program	Funds activities to resolve safety problems at hazardous locations and sections, and roadway elements which may constitute a danger to motorists, pedestrians, and bicyclists	• http://www.fhwa.dot.gov/tea21/factsheets/isfty.htm • http://www.fhwa.dot.gov/tea21/index.htm
Governor's Traffic Safety Committee Section 402 highway safety funds	Funds for Local Health Unit staff in the development, implementation, and evaluation of the traffic safety projects by the New York State Department of Health Injury Control Program	• http://www.nhtsa.dot.gov/people/outreach/safedige/Fall1998/n5-111.html • http://www.safeny.com
Safe Routes to Schools (SR2S	Funding for projects and programs to support walking and bicycling to schools	• www.saferoutestoschools.org • NYSDOT SR2S Program

Funding Program	Requirements	Contact Information
Consolidated Local Street and Highway Improvement Program (CHIPS)/ Municipal Streets and Highway Program	• Local highway and bridge capital improvements • Assists localities in matching federal funds for projects • NYS Multi-Modal Funds are also eligible for bike/ped/trail projects	• http://www.dot.state.ny.us/chips/index.html • http://www.dot.state.ny.us/chips/guide.pdf (Guidelines) • http://www.osc.state.ny.us/localgov/muni/releases/marchise.htm
Environmental Protection Fund (EPF) • Title 7 • Title 9	• Allocates funds to DEC and OPRHP for land purchases • Funds to local government and not-for-profit organizations to purchase, develop, and preserve park lands and historic resources	• http://www.dec.state.ny.us/website/opensp/opepfl4.html
Land and Water Conservation Fund/ Municipal Parks Matching Grant Program	Allocates funds for walking and biking projects, and those protecting open spaces	• http://www.nysparks.com/grants/ • http://nysparks.state.ny.us/grants/info.html • http://nysparks.state.ny.us/grants/ProgramInfoLWCF.htm • http://www.nysparks.state.ny.us/grants/ProgramInfoPKS.htm
Hudson River Valley Greenway	Allocates funds for planning and project implementation for those located within the geographic area of the Greenway, including efforts that support trails and bicycling	• http://www.hudsongreenway.state.ny.us/funding/funding.htm • http://www.hudsongreenway.state.ny.us/funding/commgrant.pdf • http://www.hudsongreenway.state.ny.us/funding/compgrant.pdf
NYS Canal Corporation	Offer funds to communities along the canal system to facilitate the construction of local trails and other amenities	• http://www.canals.state.ny.us/busdevel/index.html • http://www.canals.state.ny.us/busdevel/doingbus.html • http://www.canals.state.ny.us/busdevel/doingbus.html#dobusiness
Empire State Development Corporation (Metropolitan Economic Revitalization Funds MERF)	Encourages private investment to create new development	• http://www.nylovesbiz.com/default.asp • http://publications.budget.state.ny.us/fy0405app1/esdc.pdf

Funding Program	Requirements	Contact Information
Empire State Development: Economic Development Fund	Funding to large and small businesses for economic development	• http://www.awib.org/content_frames/articles/empire.html • http://publications.budget.state.ny.us/fy0405app1/esdc.pdf
Division of Housing and Community Renewal (Community Development)	Provide funds to develop housing, for housing preservation, and development activities within communities	• http://www.dhcr.state.ny.us/ocd/pubs/pdf/cpm03.pdf • http://www.dhcr.state.ny.us/ocd/ocd.htm • http://www.dhcr.state.ny.us/ocd/progs/ocdprogs.htm • http://www.dhcr.state.ny.us/ocd/nofas/ocdnofas.htm
NYS Department of Health, Healthy Neighborhoods Program	Provide funds to promote environmentally healthy, safe neighborhoods (NYC, Clinton, Erie, Niagara, Cayuga, Onondaga, Rockland, Westchester)	• http://www.co.clinton.ny.us/departments/health/PR020715.htm (Clinton County) • http://www.ongov.net/Health/environmental.html#neighborhood (Onondaga County) • http://www.co.westchester.ny.us/health/Healthy%20Neighborhood.htm (Westchester County) • http://www.erie.gov/health/offices/eh_healthy_homes.asp (Erie County) • http://www.co.cayuga.ny.us/healthdept/directory.html (Cayuga County)
NYS Department of Health, Healthy Heart Program	Funds programs that make it easier for New Yorkers to choose healthy lifestyles	• http://www.health.state.ny.us/nysdoh/heart/healthy/healthy.htm • http://www.health.state.ny.us/nysdoh/heart/heart_disease.htm
"No Child Left Indoors"	Various national programs to encourage outdoor physical activity and recreation	• www.nrpa.org • "Get out and Play" programs