

# Town of Malta Linkage Study

**Proposed Shared-Use Trail Guidelines  
Malta, New York**

**August 2003**

*Prepared for:*



**Capital District  
Transportation Committee**

*Prepared by:*



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### **The Town of Malta Town Board**

David R. Meager, Supervisor  
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Suzanne Daley-Nolen          Gerald Winters

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### **The Town of Malta Zoning Update Committee**

Paul Sausville, Chairman	Miles Cornthwaite
William Cuddy	Sue Nolen
Tim Farnum	James Keller
Bill Parker	Cliff Lange
Steve Shaw	Bill Shaw
Karen Heggen	John Natale
Heather Atkinson	Linda Kovach, Secretary

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    - New York State Department of Transportation
    - Saratoga County Department of Public Works
    - Saratoga County Planning Department

## **II. INTRODUCTION**

### ***A. Purpose***

The purpose of this study is to provide the basic framework as well as design and engineering information, for developing on road and off road shared-use bicycle and pedestrian trails within the Town of Malta. The standards and guidelines contained within this document are specifically geared to provide cost effective facilities that encourage non-motorized modes of transportation to and from the Downtown area of Malta.

### ***B. Need***

Based on the American Association of State Highway and Transportation Officials (AASHTO), the average pedestrian distance traveled is typically five minutes or 1,200+/- linear feet (0.2 miles) and the average bicyclist distance traveled is typically 10,560+/- linear feet (2 miles) at an average speed of 9-10 miles per hour. According to this travel distance defined by AASHTO, the locations of the existing shared-use trails in the Town of Malta do encourage bicycle and pedestrian travel on those trails, but not throughout the Town or to and from the Downtown area. Based on the existing shared-use trails, planning and designing of additional trails for bicyclists and pedestrians is necessary to provide the residents with improved travel routes to and from the Downtown Malta area. The amount of use by bicyclists and pedestrians in the right of way along roadways also demonstrates the need for designated bicycle and pedestrian routes.

### ***C. Benefit***

Residents and visitors to the Town would be able to travel easier and safer along the designated routes within Malta, to and from their homes and to and from Downtown. These shared-use trails would also provide strong linkages to the residential areas of Malta, the Town-wide destination points and to the Downtown area. All of which would increase the value and use of the shared-use trail system. Additionally, the installation of these public resources would provide an additional transportation choice, as well as encourage exercise and outdoor activities, such as biking, walking and running.

## III. EXISTING CONDITIONS

### A. Shared-Use Trails

Existing designated shared-use trails are located in two locations within the Town. Refer to Appendix B- Town of Malta- Proposed Bikeway/Walkway Plan. The types and locations are as follows:

- **Zim Smith Trail** - is located in the southwestern portion of the Town of Malta. The shared-use trail connects Shenantaha Creek Town Park, Ruhle Road Pedestrian Bridge and the Village of Round Lake. The trail follows an abandoned railroad bed between East Line Road and the Village of Round Lake and is approximately 20,000+/- linear feet (4 miles). The shared-use trail is ten feet wide and constructed of asphalt.
- **Dunning Street/ Plains Road Trail** - is located adjacent to Dunning Street and Plains Road, on the northern side of the roadway and expands from the eastern edge of Downtown Malta at Partridge Drum and Foxwander West to the Plains Road Park. The shared-use trail is approximately 7,000+/- linear feet (1.3 miles), ten feet wide and constructed of asphalt.

### B. Destinations

Shared-use destination points are based on the connectivity between the various origins and destinations within the Community that would promote and encourage bicycle and pedestrian travel. These include businesses, areas of public gathering, parking lots and residential areas. There are two main destination categories within the Town of Malta that provide opportunities for linkages between points of interest within the Town. The two categories are as follows:

#### 1. Downtown Malta

The location of the Downtown area is based on the existing businesses, Community activities, and residential areas within the Downtown. The locations and the relationships of each of these to each other determine the boundary of Downtown Malta, which shall be defined as follows:

- **Northern terminus** - David R. Meager Community Center
- **Southern terminus** - Knabner Road
- **Eastern terminus**: Partridge Drum and Foxwander West
- **Western terminus** - Interstate 87 (Interchange 12)

#### *Business and public gathering:*

- Malta Commons, Shops of Malta, Town Hall Complex, Malta Community Center, Parade Ground, Blacksmith Square and the Town Gazebo.

**Residential:**

- Northway Mobile Estates, Highpointe, Collamer Heights, Luther Forest and Malta Gardens.

**2. Town-wide Destination Points**

Destination points are located throughout the Town of Malta. Below are listed the current Town-wide destinations, the neighborhood each one is located, based on the Town of Malta Master Plan, and each one's roadway location. These include the following:

<u>Destination</u>	<u>Neighborhood</u>	<u>Location</u>
Collamer Park	Neighborhood 9	Intersection of East High Street and US Route 9
Historic Village of Round Lake	Neighborhood 14	Southwest section of the Town of Malta
Kayaderosseras Creek Access Point (proposed)	Neighborhood 13	Along Kayaderosseras Creek off of Old Post Road between Grays Road and US Route 9
Plains Road Park	Neighborhood 5	Along Plains Road between Larkspur Drive and Cramer Road
Malta Community Center	Neighborhood 6	Intersection of Bayberry Drive and US Route 9
Ruhle Road Pedestrian Bridge	Neighborhood 4	Along Ruhle Road near Zim Smith Trail
Saratoga Lake	Neighborhood 8	Northeast section of the Town of Malta
Shenantaha Creek Town Park	Neighborhood 4	Western section of the Town of Malta between East Line Road and Zim Smith Trail

## IV. PROPOSED PLAN

### A. General

The proposed Shared-use Trail Guidelines have been written to provide a basis for a more walkable and bicycle-friendly Community. There are four proposed trail classifications that have been designated to allow design flexibility and to accommodate combined bicycle and pedestrian travel. Refer to Appendix A- Potential Future Proposed Shared-use Trail Legislation for the Town to take action upon, Appendix B- Town of Malta- Proposed Bikeway/Walkway Plan for the proposed shared-use trail locations, Appendix C- Bicycle Signage Guidelines for the Capital District for references to signage, Appendix D- Shared-use Trail Alignments for minimum standards for the alignment of shared-use trails within the Town and proposed sections and Appendix E- Proposed Construction Details for standard details for each type of construction. The classifications are as follows:

1. **Shared-Use Trail A** – consists of a ten foot wide asphalt shared-use on road trail with a ten foot grassed drainage swale from the edge of the road and a ten foot drainage swale on the other side of the trail.
2. **Shared-Use Trail B** – consists of a ten foot wide asphalt shared-use off road trail varying in separation width on both sides of the trail from the adjacent vegetation.
3. **Shared-Use Nature Trail** – consists of a soft surface material (dirt, stonedust, woodchips, etc.) trail of a varying width with vegetated drainage swales on both sides of the trail.
4. **Expanded Shoulders** – consist of expanding existing asphalt roadway shoulders to 5 feet with an adjacent drainage swale.

### B. Trail Classifications

The proposed trail types include shared-use trails and nature trails. The locations of the proposed trail types that combine bicycle and pedestrian traffic are based on the present need and benefit to the Town and will provide safer and easier travel within the Town of Malta. Typically shared-use trails and nature trails are located along routes of recreational activity, between dense residential developments, and along roads with posted speed limits of 40mph or greater between Downtown and dense areas of residential developments. Refer to Appendix F- Speed and Traffic Volumes. The locations of the shared-use trails are divided into on road and off road trails in order to maximize connectivity between destination points, existing shared-use trails and to the Downtown area. Refer to Appendix B- Town of Malta- Proposed Bikeway/Walkway Plan for a visual description of the locations of the on road and off road trails, which are as follows:

#### 1. On Road Shared-Use Trail

Proposed Shared-Use Trail A (  )

This trail type is proposed in two locations. These include:

1. **NY Route 67/Dunning Street** - approximately 8,000+/- linear feet (1.5 miles) along the southern side of the NY Route 67/Dunning Street corridor west from the Exit 12 Interchange to the Town line of Ballston. This trail would provide a link between Downtown Malta, the Zim Smith Trail, the proposed shared-use nature trail on the abandoned railroad, Ruhle Road and the Town of Ballston.
2. **NYSERDA Access Road** - approximately 4,500+/- linear feet (0.8 miles) along the access road from the NYSERDA property to the existing Plains Road Shared-use Trail. This trail would provide a link between the NYSERDA property and the Plains Road Shared-use Trail. It would also allow future development within Luther Forest the opportunity to utilize and connect to the trail system at a future date.

### *Expanded Shoulders ( - - - - )*

There are three areas of roadway that are proposed to have five foot expanded shoulders. These are not preferred routes of shared-use travel, but due to the right of way, the traffic volumes on these routes and to continue connectivity in these areas they will be considered informal shared-use routes with the preferred user being bicyclists. These routes include:

1. Along Plains Road from Plains Road Park to NY Route 9P, which would provide a link between Plains Road Park, Cramer Road and Saratoga Lake.
2. Along NY Route 9P from Plains Road to US Route 9, which would provide a link between Saratoga Lake and US Route 9.
3. Along East High Street from US Route 9 to East Line Road, which would provide a link between Collamer Park, proposed shared-use Trail B from East High Street and Kelch Drive, US Route 9 and the northwest section of the Town of Malta.

## **2. Off Road Shared-Use Trails**

### *Proposed Shared-Use Trail B ( ————— )*

This trail type is proposed in two locations. These include:

1. **Old Minnerly Road Corridor** - approximately 5,800+/- linear feet (1.1 miles) in the northwestern section of the Town between Malta Avenue and East High Street. Currently, approximately one half of the right of way for the proposed trail has been secured by the Town, as a part of the Century Farms cluster subdivision. This trail would provide a link between the northwest section of the Town of Malta and East High Street, which would allow connections to other proposed trails.
2. **Connection along proposed Collector Road** - approximately 8,600+/- linear feet (1.6 miles) to the east of the northbound travel lane of Interstate 87 (the Northway) from the intersection of Kelch Drive to East High Street. This trail would provide an optional link between Downtown Malta and Collamer Park other than US Route 9.

way for the proposed trail has been secured by the Town, as a part of the Century Farms cluster subdivision.

3. Along East High Street from East Line Road to the Town of Ballston for approximately 2,100+/- linear feet (0.4 miles). This trail would provide a link between the Old Minnerly Road corridor, the asphalt sidewalk along East High Street from Van Aernem Road to East Line Road and other proposed trails in the northeast section of the Town of Malta and the Town of Ballston. The Town has secured \$40,000 in private funding for this trail and has submitted a grant to improve the box culvert which crosses the Mourning Kill.
4. Developing expanded shoulders (approximately 6,553 +/- linear feet) and a separated asphalt sidewalk (approximately 3,410 +/- linear feet) along East High Street from U.S. Route 9 to East Line Road. This trail would provide a link between the developing areas along East High Street and Collamer Park. It should be noted that a grant application was submitted by the Town of Malta for this portion of the trail from Van Aernem Road to U.S. Route 9.
5. Redeveloping the abandoned railroad line into a shared-use nature/ bike trail from the intersection of Ruhle Road and NY Route 67 to the intersection of US Route 9 and Goldfoot Road. It is anticipated that this connection would be approximately 12,800 feet in length.

While these projects are not the only ones available to the Town, they are the ones that will foster a high degree of connectivity for the more developed areas of the Town. The remaining areas are no less important; however they appear to have a slower rate of development based on the proximity of public water service. In these areas the above criteria should be used. In addition, the traffic volumes in these areas may also determine the most appropriate type of improvement that may be necessary. Although, the New York State Department of Transportation does not have specific set guidelines for traffic volumes and facilities, they reference the FHWA's "Selecting Roadway Design Treatments to Accommodate Bicyclists" (Publication No. FHWA-RD-92-073). This publication does provide design and engineering guidance in this area of evaluation. Six tables, for this publication dealing with the relationship between speed and traffic volumes have been included in Appendix F- Speed and Traffic Volumes for reference. As part of this study the condition of the major roadways within the Town were surveyed and the Average Daily Traffic (ADT) volumes were determined. It should be noted that these tables are intended to be the minimum guidelines to begin the review process of potentially upgrading rural roadways within the Town. The final determination for the improvement should be on a site by site basis and take into consideration other factors as deemed necessary by the Town.

## ***B. Cost Estimate of Proposed Improvements***

The following is a list of costs for the proposed improvements. All estimates include design, bonding, contingency and construction costs. It should be noted that the estimates assume that the project will be completed within the Town or State rights of way and that no other land acquisitions will be necessary. Refer to Appendix G- Proposed Linear Foot Cost Estimate.

### **1. Shared-use trail along southern side of NY Route 67 from the Exit 12 Interchange to the Town line of Ballston**

8,000 L.F @ \$43.10/L.F. = \$ **344,800.00**

3. **Collamer Drive and Mayapple Way** - approximately 350+/- linear feet (0.07 miles) between Collamer Drive and Mayapple Way. This trail would provide a link between two residential areas.

### ***Proposed Shared-Use Nature Trail (— · —)***

This trail type is proposed in two locations. These include:

1. **Abandoned Railroad** – consists of redeveloping the abandoned railroad line into a shared-use nature trail. It extends from the intersection of Ruhle Road and NY Route 67 to the intersection of US Route 9 and Goldfoot Road. It runs parallel and to the east of the existing Zim Smith Trail for approximately 12,800+/- linear feet (2.4 miles). This trail would provide a link between the Village of Round Lake, US Route 9, Ruhle Road, Downtown Malta, the Zim Smith Trail, the proposed redevelopment of the abandoned railroad, and the Town of Ballston.
2. **Connection between Plains Road and Cramer Road**- consists of approximately 2,600+/- linear feet (0.5 miles) that loops between Plains Road Park and Cramer Road. This trail would provide an optional link between Plains Road Park and Cramer Road other than using Plains Road and Cramer Road.

### **3. Combination of On Road and Off Road Shared-Use Trails (····· )**

There are several sections of roadway in which the trail type will vary in width and material (either asphalt or concrete). The width of the road, the existing right of way constraints and the adjacent uses will determine which type will be appropriate. Refer to Appendix B- Town of Malta- Proposed Bikeway/Walkway Plan. These locations include:

1. Along Malta Avenue from Grays Road to Rowley Road for approximately 12,000+/- linear feet (2.3 miles). This trail would provide a link between the northwest and northeast section of the Town of Malta and US Route 9.
2. Along US Route 9 from Malta Avenue to East High Street for approximately 6,300+/- linear feet (1.2 miles). This trail would provide a link between Downtown Malta, Collamer Park and the northern section of the Town of Malta.
3. Along US Route 9 from Knabner Road to the Village of Round Lake for approximately 8,200+/- linear feet (1.6 miles). This trail would provide a link between Downtown Malta and the Village of Round Lake.
4. Along East High Street from East Line Road to the Town of Ballston for approximately 2,100+/- linear feet (0.4 miles). This trail would provide a link between the Old Minnerly Road corridor, the asphalt sidewalk along East High Street from Van Aernem Road to East Line Road and other proposed trails in the northeast section of the Town of Malta and the Town of Ballston.
5. Between US Route 9 and Foxwander West for approximately 2,500+/- linear feet (0.5 miles). This trail would provide an optional link between Downtown Malta and the residential area of Luther Forest other than US Route 9 and Dunning Street.

The above represents existing shared-use trails and proposed shared-use trails and nature trails, more of which could be added as deemed appropriate by the Town.

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## V. IMPLEMENTATION OF GUIDELINES

### A. Schedule of Proposed Improvements

#### 1. General

In order for the Shared-Use Trail Guidelines to be implemented there are certain criteria that must be met, not only by the Town, but also by the Community. These include adopting the Shared-Use Trail Standards in the form of legislation and developing designated shared-use routes throughout the Town.

#### 2. Developing Standards

The proposed Shared-Use Trail Standards have been written to allow design flexibility and to achieve the Town of Malta's vision for a more walkable and bicycle-friendly Community. It is anticipated that these standards will be included within the Chapter 143-Subdivision of Land, Article III-Design Standards, 143.13.2 Shared-Use Trails, of the Code of the Town of Malta and as a stand alone document which would be readily available for residents and developers within the Town. Appendix A- Potential Future Proposed Shared-Use Trail Legislation contains legislation for the Town to take action upon. Appendix C- Shared-Use Trail Alignments provide minimum standards for the alignment of shared-use trails within the Town. Appendix D- Proposed Construction Details provides standard details for each type of construction.

#### 3. Implementing Standards

As part of this study, a priority list has been established for the proposed shared-use trail improvement project within the Town to enhance existing shared-use trails, as well as to provide additional trails where none exist now. The proposed schedule of improvement projects will be driven by two criteria- 1. the need and 2. the funding available for each proposed project. Of the two criteria listed above, the "need" portion can be further broken down into the following sub categories:

- Existing Shared-Use Trails – Does one exist along the proposed improvement route?
- Logical Terminus- Does the improvement have a defined beginning and ending point?
- Connectivity- Does the improvement foster connectivity within the Town?
- Public Sentiment- Will the proposed improvement benefit the Town at large?

The following is a listing of proposed improvement projects that have been determined to be located where there are no formal shared-use trails, have a logical terminus, will provide connectivity between existing facilities and benefit the Town at large. The implementation of these improvements will improve the connectivity within the Town, as well as improve and enhance the existing shared-use paths in the Town of Malta. These include:

1. Approximately 8,000+/- linear feet along the southern side of the NY Route 67/ Dunning Street corridor west from the Exit 12 Interchange to the Town line of Ballston.
2. Approximately 5,800+/- linear feet along the Old Minnerly Road Corridor in the northwestern section of the Town between Malta Avenue and East High Street. Currently, approximately one half of the right of

way for the proposed trail has been secured by the Town, as a part of the Century Farms cluster subdivision.

3. Along East High Street from East Line Road to the Town of Ballston for approximately 2,100+/- linear feet (0.4 miles). This trail would provide a link between the Old Minnerly Road corridor, the asphalt sidewalk along East High Street from Van Aernem Road to East Line Road and other proposed trails in the northeast section of the Town of Malta and the Town of Ballston. The Town has secured \$40,000 in private funding for this trail and has submitted a grant to improve the box culvert which crosses the Mourning Kill.
4. Developing expanded shoulders (approximately 6,553 +/- linear feet) and a separated asphalt sidewalk (approximately 3,410 +/- linear feet) along East High Street from U.S. Route 9 to East Line Road. This trail would provide a link between the developing areas along East High Street and Collamer Park. It should be noted that a grant application was submitted by the Town of Malta for this portion of the trail from Van Aernem Road to U.S. Route 9.
5. Redeveloping the abandoned railroad line into a shared-use nature/ bike trail from the intersection of Rühle Road and NY Route 67 to the intersection of US Route 9 and Goldfoot Road. It is anticipated that this connection would be approximately 12,800 feet in length.

While these projects are not the only ones available to the Town, they are the ones that will foster a high degree of connectivity for the more developed areas of the Town. The remaining areas are no less important; however they appear to have a slower rate of development based on the proximity of public water service. In these areas the above criteria should be used. In addition, the traffic volumes in these areas may also determine the most appropriate type of improvement that may be necessary. Although, the New York State Department of Transportation does not have specific set guidelines for traffic volumes and facilities, they reference the FHWA's "Selecting Roadway Design Treatments to Accommodate Bicyclists" (Publication No. FHWA-RD-92-073). This publication does provide design and engineering guidance in this area of evaluation. Six tables, for this publication dealing with the relationship between speed and traffic volumes have been included in Appendix F- Speed and Traffic Volumes for reference. As part of this study the condition of the major roadways within the Town were surveyed and the Average Daily Traffic (ADT) volumes were determined. It should be noted that these tables are intended to be the minimum guidelines to begin the review process of potentially upgrading rural roadways within the Town. The final determination for the improvement should be on a site by site basis and take into consideration other factors as deemed necessary by the Town.

## ***B. Cost Estimate of Proposed Improvements***

The following is a list of costs for the proposed improvements. All estimates include design, bonding, contingency and construction costs. It should be noted that the estimates assume that the project will be completed within the Town or State rights of way and that no other land acquisitions will be necessary. Refer to Appendix G- Proposed Linear Foot Cost Estimate.

### **1. Shared-use trail along southern side of NY Route 67 from the Exit 12 Interchange to the Town line of Ballston**

8,000 L.F @ \$43.10/L.F. = **\$ 344,800.00**

**2. Redevelopment of Old Minnerly Road Corridor**

5,800 L.F. @ \$47.20/L.F. = \$ **273,760.00**

**3. East High Street from East Line Road to the Town of Ballston Line**

2,100 L.F. @ \$27.00/L.F. = \$ **56,700.00**

**4. East High Street from East Line Road to U.S. Route 9**

6,553 L.F. @ \$29.30/L.F. = \$ **192,000.00**

3,410 L.F. @ \$27.00/L.F. = \$ **92,100.00**

**Total = \$ 284,100.00**

**5. Shared-use nature trail redevelopment of the abandoned railroad**

12,800. L.F. @ \$23.40/L.F. = \$**299,520.00**

The linear foot costs have been prepared using Mean's Cost Estimating Data for 2003, as well as recently constructed projects within the Capital Region. The detailed breakdown of the individual costs has been included within Appendix G.

### ***C. Funding Sources and Strategies***

Currently a number of funding opportunities are available to the Town to finance the potential proposed improvements. The following is a list of the available funding sources, with a brief description.

#### **Federal Sources**

**Recreational Trails Program-** This program is administered by the Office of Parks Recreation and Historic Preservation in New York State and is funded by the Federal Highway Administration and may be used to maintain and restore trails, develop trailside and trailhead facilities, acquire easements or land for trails, and to construct new trails. The federal share for this program is 80%.

**TEA-21 enhancement Program-** The program focuses on pedestrian and bicycle construction and enhancement projects as well as other transportation related projects. This program is funded by the Federal Highway Administration and is administered by The New York State Department of Transportation. The federal share is typically 80%; however this can vary dependent on the level of local participation.

#### **State /Regional Sources**

The Capital District Transportation Committee (CDTC) provides local communities the opportunity to fund various transportation-related improvements through the Transportation Improvement Program (TIP). This program solicits projects on a biennial basis and typically funds them with an 80% Federal /20% State-Local distribution.

The New York State Department of Transportation administers the locally-sponsored federal-aid program, which allows state and federal funds to be used on a variety of local projects. This program also funds programs on a matching grant basis, with local municipal administration of the project.

### **Local Sources**

The Town has a variety of funding sources available to them for transportation improvements. A source is from the Town's general fund. The general fund can be used for new construction of transportation projects or improvements to existing facilities.

The Town could also bond the proposed improvements through the creation of a redevelopment district or a special assessment district organized to provide a specific project benefiting and identifiable group of properties. General obligation bonding arrangements could also be used for projects that are felt to be beneficial to the entire Town.

Lastly, the Town has the opportunity to pay for the improvements through a Town wide tax.

### **Private Sources**

Private interests often provide sources of funding for transportation improvements. Developers, as has been the standard in the Town, construct the local streets within the subdivision, and dedicate the right of way to the Town and participate in the construction of local, collector and arterial streets within and adjacent to their developments. Developers should be considered as a potential source for improvements to the pedestrian circulation systems within the Town.

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# **APPENDIX A**

## **POTENTIAL FUTURE PROPOSED SHARED-USE TRAIL LEGISLATION**

## 143.13.2 Shared-Use Trails

### A. General.

Shared-use trails shall be provided as directed by the Town Board or Planning Board.

### B. Definitions.

Shared-use trail - shall be defined as a walking surface with a minimum width of ten feet with an additional two feet on each side and constructed of bituminous asphalt designed to service pedestrians, bicyclists, rollerbladers/skaters and other non-motorized forms of transportation.

### C. Requirements.

Shared-use trails shall be required adjacent to all proposed Collector Roadways within the Town. Additionally, large commercial and residential projects may be required to provide shared-use trails as directed by the Town Board or Planning Board.

### D. Alignment.

Shared-use trails shall be aligned along the front property line and shall be located within the existing or future road right-of-way. A minimum of five feet should be provided between the leading edge of the shared-use trail and the edge of pavement to facilitate adequate snow storage.

### E. Width.

Shared-use trails shall have a minimum width of ten feet with an additional two feet on each side of trail.

### F. Grades.

Shared-use trails shall conform to the requirements of the following publications:

1. American with Disabilities Act Accessibility Guidelines (ADAAG)
2. New York State Department of Transportation, Highway Design Manual, Chapter 18.
3. American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities.

### G. Shared-Use Trails and Sidewalk Intersections.

All sidewalk and shared-use trail intersections shall be designed to provide adequate maneuvering room and rights of passage for pedestrians. The Town Board and Planning Board shall retain the authority to increase the width of the sidewalk or trail within the intersections based on the anticipated pedestrian traffic.

### H. Dead End Shared-Use Trails.

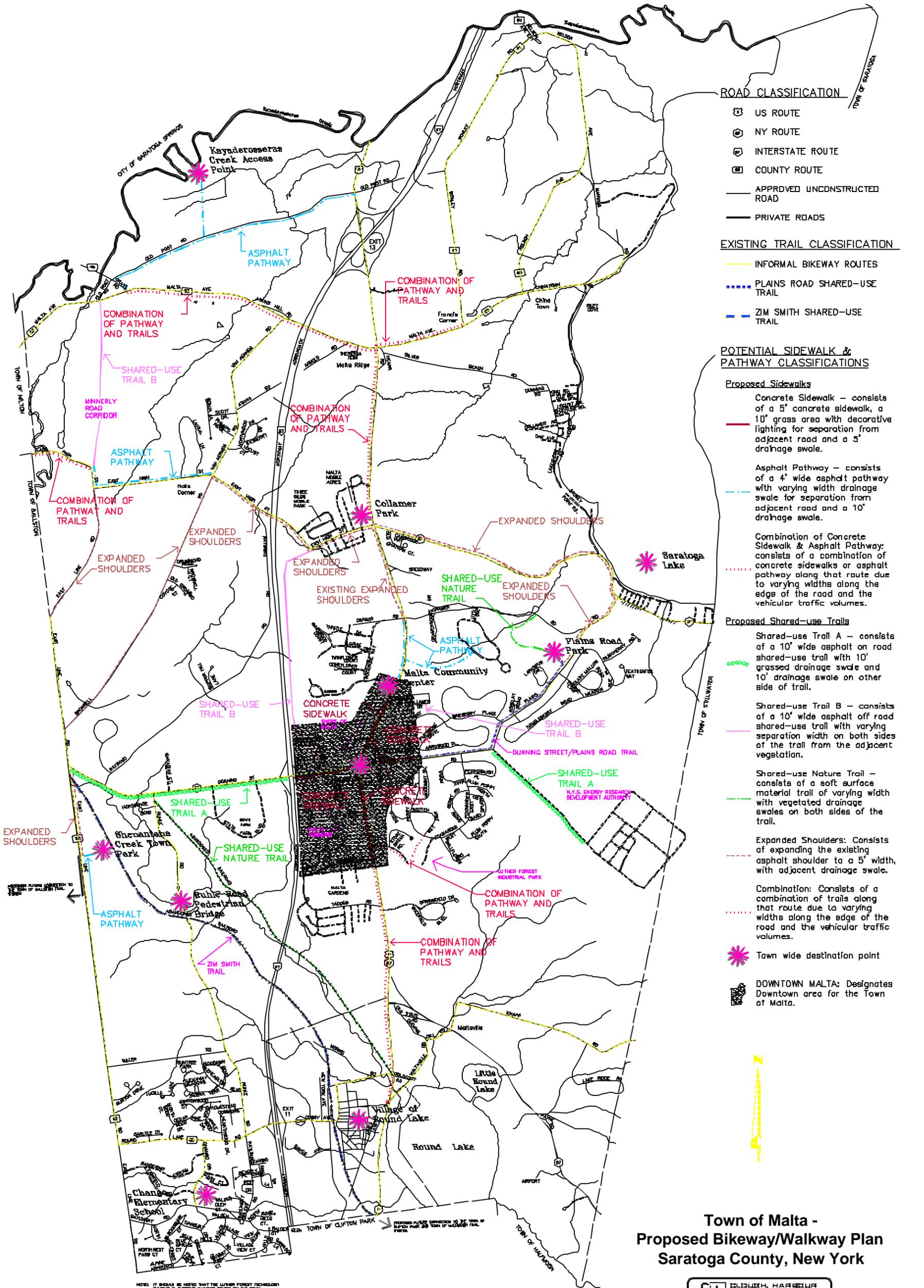
Dead end shared-use trails shall be avoided to the greatest extent practicable.

- I. Intersection with roadways.  
All shared-use trail crossings at a roadway shall be designed in accordance with the latest edition of the ADAAG and signed in accordance with the latest edition of the AASHTO "Guide for the Development of Bicycle Facilities".
  
- J. Protection.  
When a shared-use trail is located adjacent to a fill slope which has a slope of greater than three horizontal feet to one vertical foot or the difference in grade between the paved surface and the toe of the slope is greater than two feet, a barrier, four and a half feet in height shall be erected not less than three feet from the edge of pavement.
  
- K. Materials.  
Shared-use Trail:  
Subbase- 12 inches of Type 4 subbase, (NYS DOT Item No. 304.05), compacted to 95% Proctor density.  
Bituminous Asphalt- 3 inches of Type 3 Binder course pavement (NYS DOT Item No. 403.13) and 1 inch of Type 6 Top course pavement (NYSDOT Item No. 403.16).  
Reinforcement- not required.  
Finish- ADAAG acceptable finish.
  
- L. The applicant shall be required to install pavement markings and other additional signage to ensure the safe passage of all users along all shared-use trails.

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# **APPENDIX B**

## **TOWN OF MALTA- PROPOSED BIKEWAY/ WALKWAY PLAN**



- ROAD CLASSIFICATION**
- US ROUTE
  - NY ROUTE
  - INTERSTATE ROUTE
  - COUNTY ROUTE
  - APPROVED UNCONSTRUCTED ROAD
  - PRIVATE ROADS
- EXISTING TRAIL CLASSIFICATION**
- INFORMAL BIKEWAY ROUTES
  - PLAINS ROAD SHARED-USE TRAIL
  - ZIM SMITH SHARED-USE TRAIL

- POTENTIAL SIDEWALK & PATHWAY CLASSIFICATIONS**
- Proposed Sidewalks**
- Concrete Sidewalk – consists of a 5' concrete sidewalk, a 10' grass area with decorative lighting for separation from adjacent road and a 5' drainage swale.
  - Asphalt Pathway – consists of a 4' wide asphalt pathway with varying width drainage swale for separation from adjacent road and a 10' drainage swale.
  - Combination of Concrete Sidewalk & Asphalt Pathway: consists of a combination of concrete sidewalks or asphalt pathway along that route due to varying widths along the edge of the road and the vehicular traffic volumes.

- Proposed Shared-use Trails**
- Shared-use Trail A – consists of a 10' wide asphalt on road shared-use trail with 10' grassed drainage swale and 10' drainage swale on other side of trail.
  - Shared-use Trail B – consists of a 10' wide asphalt off road shared-use trail with varying separation width on both sides of the trail from the adjacent vegetation.
  - Shared-use Nature Trail – consists of a soft surface material trail of varying width with vegetated drainage swales on both sides of the trail.
  - Expanded Shoulders: Consists of expanding the existing asphalt shoulder to a 5' width, with adjacent drainage swale.
  - Combination: Consists of a combination of trails along that route due to varying widths along the edge of the road and the vehicular traffic volumes.
  - Town wide destination point
  - DOWNTOWN MALTA: Designates Downtown area for the Town of Malta.

**Town of Malta - Proposed Bikeway/Walkway Plan Saratoga County, New York**



NOTE: IT SHOULD BE NOTED THAT THE LUTHER FOREST TECHNOLOGY CENTER IS CURRENTLY UNDER REVIEW BY THE TOWN. PROVISIONS FOR PARKING AND BICYCLE LANE TO THE DOWNTOWN AREA, AS WELL AS OTHER AND PROPOSED FACILITIES SHOULD BE PROVIDED WITHIN THE OVERALL DEVELOPMENT PLAN.

# **APPENDIX C**

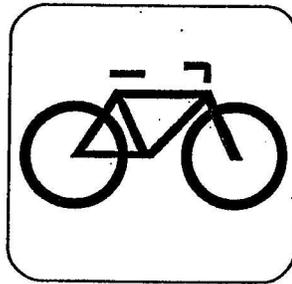
## **BICYCLE SIGNAGE GUIDELINES FOR THE CAPITAL DISTRICT**

# **BICYCLE SIGNAGE GUIDELINES**

**FOR THE**

**CAPITAL DISTRICT**

**MAY 2001**



Prepared by the Capital District Transportation Committee's  
Bicycle and Pedestrian Task Force

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## **THE NEED FOR BICYCLE SIGNAGE GUIDELINES**

The Capital District region has a variety of off-road and on-road bicycle routes. From the regional Mohawk-Hudson Bike/Hike Trail to more local trails such as the Zim Smith Trail and the Uncle Sam Trail or the signed recreational bicycle routes in Saratoga Springs, there is a wide range of choices for outdoor recreation. Local municipalities are responsible for most aspects of trails including maintenance.

This guidebook establishes guidelines for all municipalities to reference when signing bike routes or multi-use trails. Consistency should be established in order for bicycle signs to be highly recognizable and therefore more user-friendly. With all municipalities in the Capital District referring to these guidelines we will be able to create a highly identifiable bicycle network that many bicyclists can use whether for commuting or recreation and many motorists can use to recognize their responsibilities in sharing the road. Uniformity will help create a higher awareness of the bicycle information that is being conveyed and help increase the participation of cyclists in the area.

This guidebook will serve as a reference for those municipalities who are unfamiliar with signing bicycle routes and trails. It is not intended to be a replacement for the state Manual of Uniform Traffic Control Devices (MUTCD) in regards to bicycle sign standards but does highlight certain sections of the state MUTCD along with the state designated sign reference numbers. If the state MUTCD does not cover certain aspects of signage, municipalities can refer to the Federal Highway Administration (FHWA)'s Manual on Uniform Traffic Control Devices (MUTCD). These manuals along with this guidebook will ensure uniformity in the Capital District. The regional element of signing our trails and routes is very important. This can make grant applications more successful and can help reduce individual administration, production, and replacement costs for municipalities.

## APPLICATION OF SIGNS

Bicycle-use related to signs on highways and bikeways serve three basic purposes: regulating bicycle usage, directing bicyclist along pre-established routes, and warning of unexpected conditions. Care should be taken not to install too many signs. A conservative use of regulatory and warning signs is recommended as these signs, if used to excess, tend to lose their effectiveness. The frequent display of guide signs, however, aids in keeping the bicyclist on the designated route and does not lessen their value. Some signs for the bicyclist can also serve the motorist and the pedestrian.

FHWA's MUTCD 9B-1, 1999

Signs are very important to convey information to the cyclist in the Capital District. We want to be able to guide users, not overwhelm them. Signs also help to promote the existence and acceptance of bicycle routes and bicycle use. However, the overuse of signs may result in the wrong effect - cyclists ignoring signs. The above advice from the federal MUTCD should always be considered when placing signs on bike routes.

## **TRAIL/ROUTE IDENTITY SIGNAGE**

**Purpose:** Trail/route identity signage is intended to promote the trail for tourism and direct trail users.

1. Bike routes and multi-use trails should have a name or number to identify the trail or route whether they are on-road or off-road.
2. An off-road trail identity sign can be more detailed than an on-road identity sign. It can have some identifiable symbol or logo along with the trail name or number.
3. The off-road trail identity sign should be placed at every entrance to the trail and at forks or intersections in the trail.
4. If an established bike trail has a portion of its trail or a connection on-road, the same name or number should be used both on and off-road so as to continue the identity of the trail. However, the New York State Department of Transportation (NYSDOT) does not allow for unapproved signs that do not adhere to the state MUTCD to be used on-road, so any logo or symbol cannot be used on-road.
5. One of the five signs in the newly approved state MUTCD should be used to identify on-road bike routes. Please refer to page fourteen of these guidelines for a description of this type of signage.



From Trails Master Plan, Town of Clifton Park, pg. 37

## **TRAIL IDENTITY SIGNAGE CONTINUED**

### **The Regional Trail**

1. To create an identity for the regional trail, the Mohawk-Hudson Bike/Hike Trail, all municipalities that own or maintain the trail should use the Mohawk-Hudson Bike/Hike Trail name for identity. This will help when promoting the trail for tourism and directing cyclists who are unfamiliar with the area to the trail.
2. Recognizing that separate municipalities own and maintain the trail and want to establish some sort of municipal identity, municipalities may add another similarly colored and proportioned municipal identity sign below the Mohawk-Hudson Trail sign.
3. Parts of the Mohawk-Hudson Bike/Hike Trail that have been identified as a stand-alone municipal trail should be renamed as unique "sections", e.g. Town of Colonie section, Crescent section) of the Regional Trail. This section identity sign should be placed below the Mohawk-Hudson Trail sign.
4. The Hudson River Greenway Trail System and New York State Canal Trail System logos should be included at kiosks or trailheads along the regional trail. The regional trail represents the linking point of these two larger regional bike/hike trail systems at Cohoes/Waterford. Contact the organizations for information on installing their trail identity signs.

## TRAILBLAZING

**Purpose:** Trailblazing signs are unique indicators that show the direction of a specific trail or route.

1. A trail identity sign should be used with a directional arrow (of a similar color and size) underneath to create a trailblazing sign. Both signs must adhere to state MUTCD standards if on-road.
2. The identity sign and arrow should be placed together on an individual post or pole so that the two signs are understood as one piece of information.
3. In regards to installation of the signs:
  - i) If two different routes cross each other's paths it is highly desirable for each route's trailblazing sign to be on a separate post.
  - ii) For on-road signs, however, it is advisable to try to use the same post due to the consideration of limited space and visual clutter. A space on the pole should be left between the two groupings of signs so that the comprehension of which arrow goes with which trail/route can be ensured.
  - iii) Another option is to mount the signs on a "Y" post, with the different trail signs side by side.
4. Trailblazing signs should generally be used when there is a change in direction or a choice for the trail user at a fork or an intersection. See page eight for on-road guidelines.



**An example of a confusing mix of signs.**

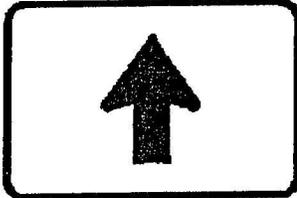
## TRAILBLAZING CONTINUED

### On-Road Signs

1. Municipal standards and state MUTCD standards must be followed when placing signs on-road. "Bicycle Route Guide signs should be repeated at regular intervals to ensure that bicyclists approaching from side streets know they are traveling on an officially designated bikeway", FHWA's MUTCD 2000, 9B-17.
2. Depending on the complexity of the route, on-road trail identity signs should be used at every intersection or just beyond the intersection if it can still be visible.
3. If there is a marked bike lane through an intersection, a sign would be unnecessary.
4. The American Association of State Highway Officials (AASHTO) recommends placing on-road route signs every quarter mile in urban areas. Signs should be placed approximately every two miles in rural areas.



M6-3



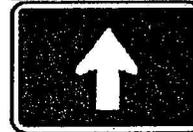
M13-43



M14-27



M6-1



M14-43

## INFORMATION SIGNS

Purpose: Information signs are used to indicate amenities, sites and other major attractions that are along the trail or off the trail nearby.

1. Historic, scenic, recreational, and cultural sites should be signed.
2. Amenities that should be signed are restrooms, picnic areas, drinking water, phones and other bicycle services.
3. Information signs should be consistent with similar state MUTCD signs.
4. The color "blue" should be used for service guidance, which is consistent with the state MUTCD.
5. The color "brown" should be used for recreational, cultural and scenic guidance, which is consistent with the federal MUTCD.
6. The state MUTCD symbol signs (18" x 18") should be used to indicate the location of telephones, picnic areas, restrooms and drinking water.
7. A directional arrow of a similar color and size can be placed underneath to aid the trail user in locating the amenity or site off the path.



M12-3



M10-7



M11-3

## DISTANCE /DESTINATION SIGNS

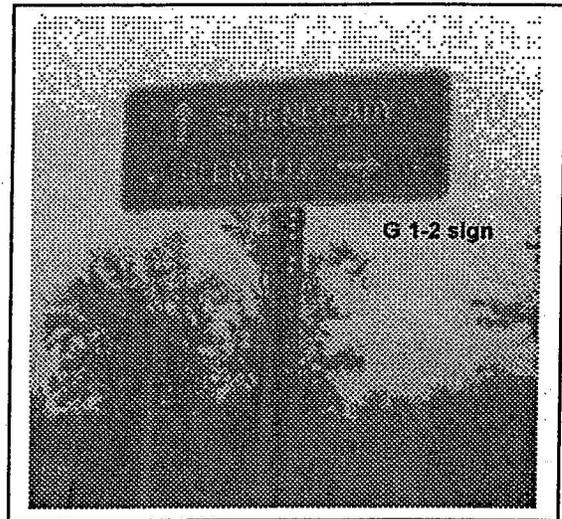
1. Distances should be indicated on signs in both miles and kilometers.
2. Green and white directional signs (24" x 6") should be used to be consistent with the state MUTCD directional signage.
3. Direction/destination signage should be used at all major entrances.
4. Direction/destination signage should be used at all paths heading off the main trail to indicate where these secondary trails lead, such as a street or a park.
5. Municipalities should use discretion as to the number of these types of signs they use.
6. A trail map should be placed at every major entrance to the trail.



G 1-1  
24" x 6"



G 1-1  
24" x 6"



## WARNING SIGNS

Purpose: To indicate the need to take caution and be prepared for unexpected changes.

1. Warning signs should be used to indicate sharp curves, steep hills, narrow bikeways, intersections and other unexpected changes on a trail or route.
2. Warning signs on bike trails should be yellow and diamond-shaped, which is consistent with state MUTCD standards.



W2-15  
18" x 18"



W2-17  
18" x 18"



W3-8  
18" x 18"



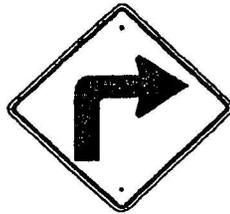
W7-5  
18" x 18"



W6-2  
18" x 18"



W3-20  
18" x 18"



W1-2  
18" x 18"



W1-4  
18" x 18"



W1-3  
18" x 18"



W1-10  
18" x 18"

## REGULATORY SIGNS

Purpose: Regulatory signs inform road/trail users of the regulations governing the route. Examples include stop signs, yield signs, movement exemptions and prohibitions.

1. The smaller size of the stop and yield sign shown below should be used on bike trails.
2. "No parking" signs (R7-9) should be used along a bike lane where it is necessary to restrict parking.
3. R4-4 signs should be used when right-turning motor vehicles merge with bike traffic on designated bike lanes.
4. Trail etiquette should be conveyed through regulatory signs if there is potential conflict between different types of trail users. The rectangular R9-6 sign can be used when there is conflict between bikes and pedestrians.



R1-1  
18" x 18"



R1-2  
24" x 24" x 24"



R7-9  
12" x 18"



R4-4  
36" x 30"



R9-6  
12" x 18"

## **INTERPRETIVE SIGNAGE**

**Purpose:** Interpretive signage is a narrative sign that gives a description about the surrounding area, whether it be about historic events, wildlife, natural resources or a variety of other subjects.

1. Interpretive signage should be a consideration for any bike trail, especially if it will be promoted as a tourist destination.
2. A consistent color and shape should be used throughout one trail to increase recognition of the sign usage. Different materials can be used to give individual trails a unique character.
3. Wayside areas should be provided to read the interpretive signs.

### **The Regional Trail**

1. Regional trail interpretive signage should be consistent with an agreed-upon corridor standard (e.g. some type of framework or "look" to the signs).
2. Regional trail interpretive signage should be organized around a theme or themes. If different interpretive themes are displayed along the trail, the sign panels should be color-coded for each theme (i.e. green for natural resources, blue for historic events, and orange for cultural information).

## **MILEAGE MARKERS**

**Purpose:** Mileage markers are used to help emergency providers locate those in need on the trail.

1. Mileage markers should be used on any length of trail especially those that are isolated and/or do not have many access points.
2. Mileage markers should be consistent throughout one trail whether they are signs or on-road pavement markings.
3. They should be located close to a trail identity sign.
4. Mileage markers should be placed so that they can be read from both directions.
5. Major entrances to a trail should show an example of a mile marker for information purposes before someone uses the trail.

### **The Regional Trail**

1. The Mohawk-Hudson Bike/Hike Trail mileage markers should start at zero in Cohoes, head west towards Schenectady, and south, towards Albany. The west-leg should be marked "M" for the Mohawk River and the south leg should be marked "H" for the Hudson River. As the trail grows on both ends, mileage markers can be added easily.

## OTHER ON-ROAD SIGNAGE

Guidelines for on-road bike signage must follow the state MUTCD. The following is only a summary of signage information from the state MUTCD. Please refer to the official state MUTCD for exact recommendations.

### A. Bike Route Signs

- Used to designate local, regional and inter-regional and interstate bike routes.
- Directional arrows should be used with bike route sign to indicate directional change.



M6-1



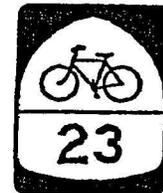
M6-2



M6-3



M6-4



M6-5

### B. On-road bicycle crossing warning sign for motorists

The diamond-shaped Bicycle Crossing Warning (W5-6) sign "alerts the road user to unexpected entries into the roadway by bicyclists, and other crossing activities that might cause conflicts", FHWA's MUTCD 2000, 9B-15.



W5-6



W5-17

### C. Shared Roadway

The Shared Roadway sign (W5-17) is rectangular and has a black legend and border and yellow background.

This sign is to be used in conjunction with the W5-6 bicycle crossing sign to warn of locations on bicycle routes where the highway geometry or other roadway conditions (e. g. poor lines of sight, narrow bridges) require bicycles to travel within the roadway rather than on a shoulder.

The bicycle symbol pavement marking may also be used to indicate a shared roadway. When there is no bicycle lane or useable shoulder, the symbol should be placed on the roadway as near to the right edge as practicable. A directional arrow can be used with this symbol to indicate the proper side of the road to bicycle on. For more information, please refer to the state MUTCD: Bicycle Markings 262.24.

## **PLACEMENT OF SIGNS**

### **On-Road**

Refer to municipal standards and state MUTCD standards.

### **Off-Road**

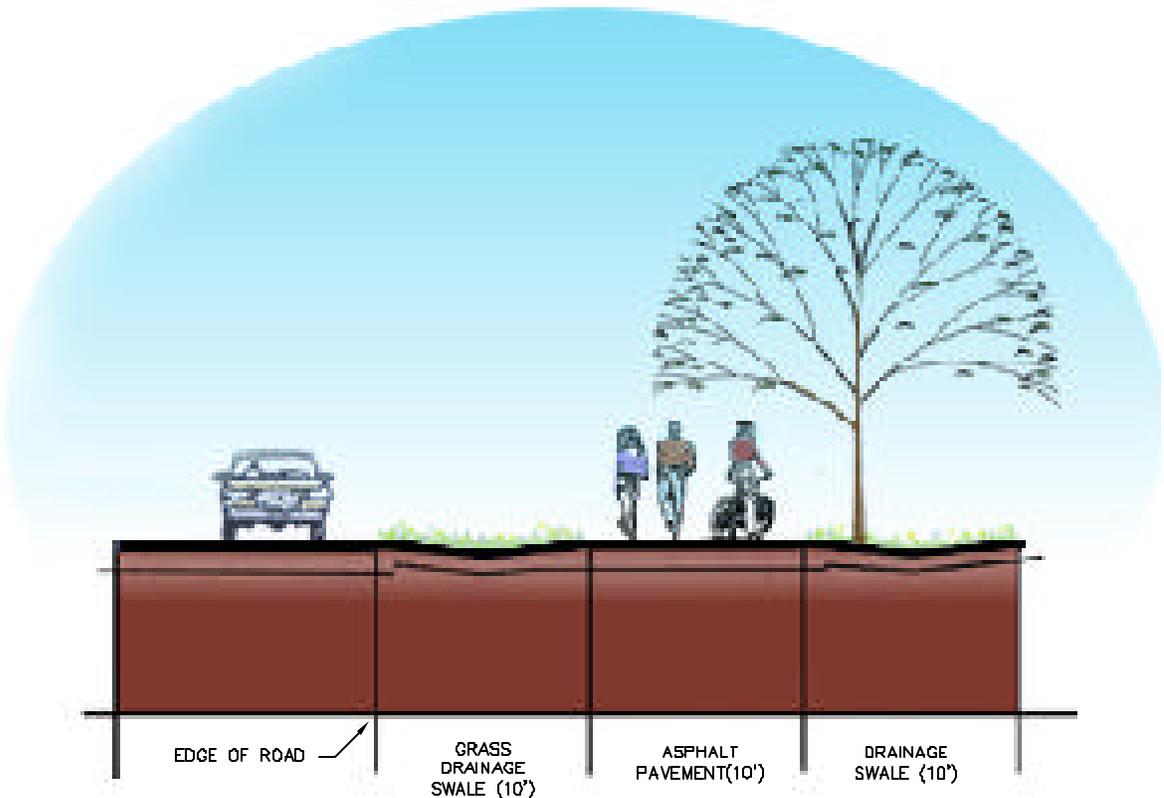
1. A sign should be posted a minimum of 4 feet high to a maximum of 5 feet high, measured from the bottom of the sign to the near edge of the path surface.
2. A sign should have sufficient lateral clearance from the edge of the path to facilitate maintenance. However sign visibility should be considered. AASHTO suggests a minimum distance of 3 feet to a maximum distance of 6 feet from the path.

## **MAINTENANCE OF SIGNS**

1. Signs should be checked after each winter season for fading, wearing or other factors that decrease sign visibility.
2. Signs should be maintained in an upright position.
3. Signs should be highly visible. Trees, grass and other vegetation should be routinely cleared from around sign locations so as to maintain visibility.
4. Missing or damaged mileage markers should be replaced immediately.

# **APPENDIX D**

## **PROPOSED SHARED-USE TRAIL ALIGNMENTS**



EDGE OF ROAD

GRASS  
DRAINAGE  
SWALE (10')

ASPHALT  
PAVEMENT(10')

DRAINAGE  
SWALE (10')

ON ROAD SHARED-USE TRAIL



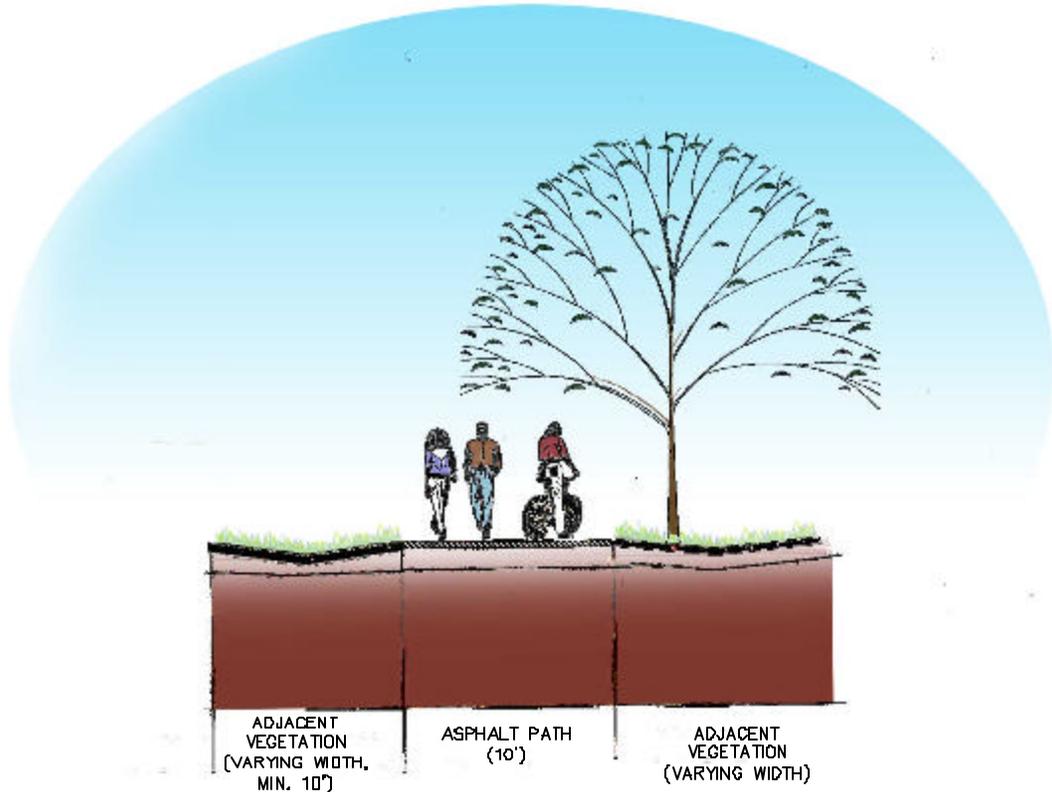
Scale in feet

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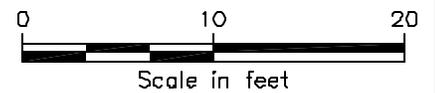
Town of Malta Linkage Study  
Saratoga County, New York  
CHA Project No. 11161-1001

SHARED-USE TRAIL A -  
TYPICAL ON ROAD SHARED-USE TRAIL  
**TOWN OF MALTA**

**CHA** CLOUGH, HARBOUR  
& ASSOCIATES LLP  
ENGINEERS, SURVEYORS, PLANNERS  
& LANDSCAPE ARCHITECTS  
11 WINNERS DRGLE - ALBANY, NEW YORK - 12208  
318-483-4800



OFF ROAD SHARED-USE TRAIL

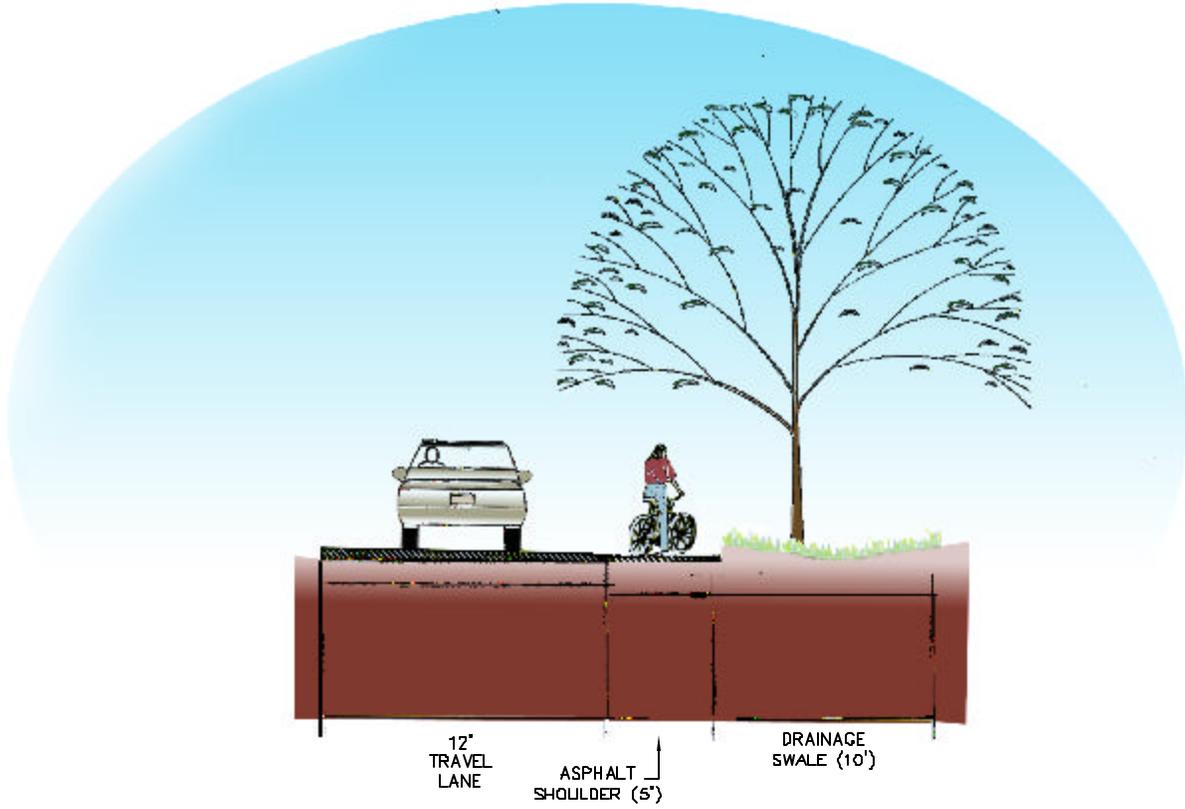


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Town of Malta Linkage Study  
Saratoga County, New York  
CHA Project No. 11161-1001

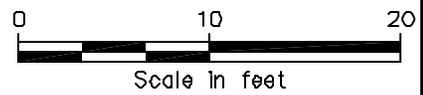
SHARED-USE TRAIL B -  
TYPICAL OFF ROAD SHARED-USE TRAIL  
TOWN OF MALTA

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918-467-2800



12' TRAVEL LANE      ASPHALT SHOULDER (5')      DRAINAGE SWALE (10')

ON ROAD SHARED-USE TRAIL

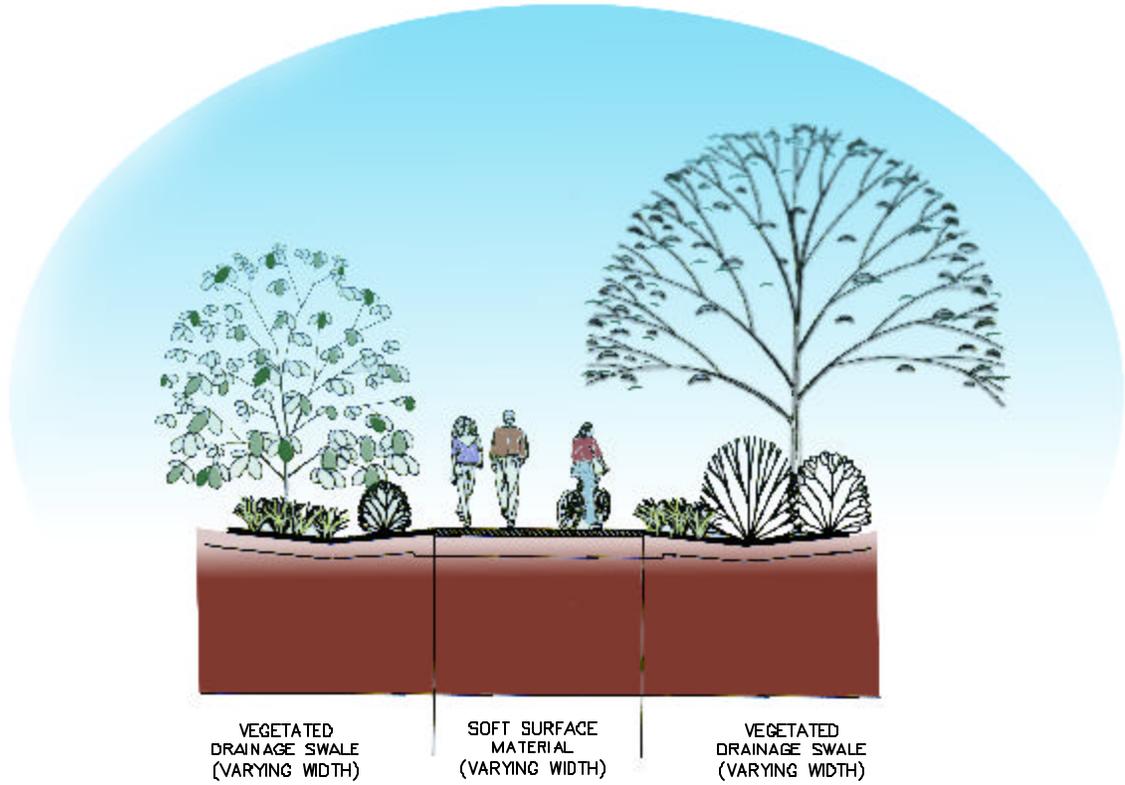


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Town of Malta Linkage Study  
Saratoga County, New York  
CHA Project No. 11161-1001

5' EXPANDED SHOULDER -  
TYPICAL ON ROAD SHARED-USE TRAIL  
**TOWN OF MALTA**

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ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS  
11 WINNERS CIRCLE - ALBANY, NEW YORK - 12206  
518-483-4800



OFF ROAD SHARED-USE NATURE TRAIL



Scale in feet

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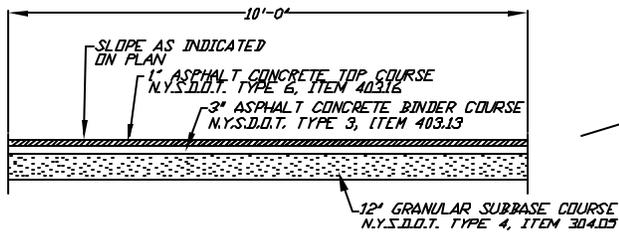
Town of Malta Linkage Study  
 Saratoga County, New York  
 CHA Project No. 11161-1001

OFF ROAD SHARED-USE  
 NATURE TRAIL  
**TOWN OF MALTA**

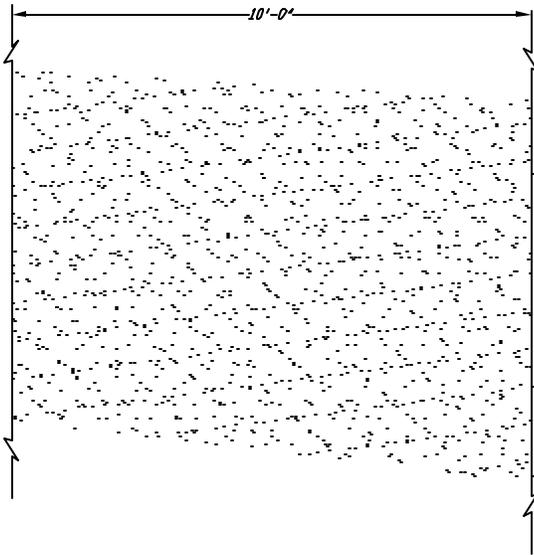
**CHA** CLOUGH, HARBOUR & ASSOCIATES LLP  
 ENGINEERS, PLANNERS & LANDSCAPE ARCHITECTS  
 111 W. WINDSOR CIRCLE - ALBANY, NEW YORK - 12208  
 518-453-4500

# **APPENDIX E**

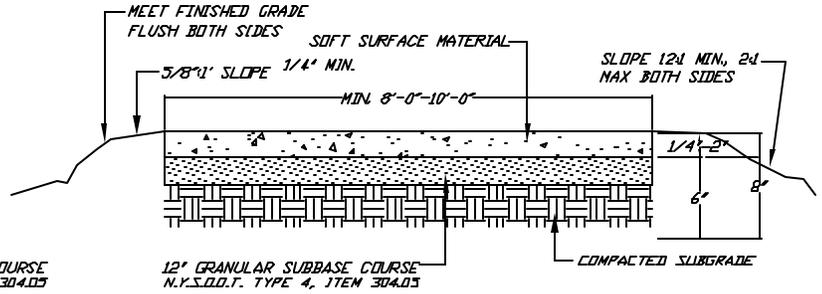
## **PROPOSED CONSTRUCTION DETAILS**



SECTION VIEW  
NO SCALE



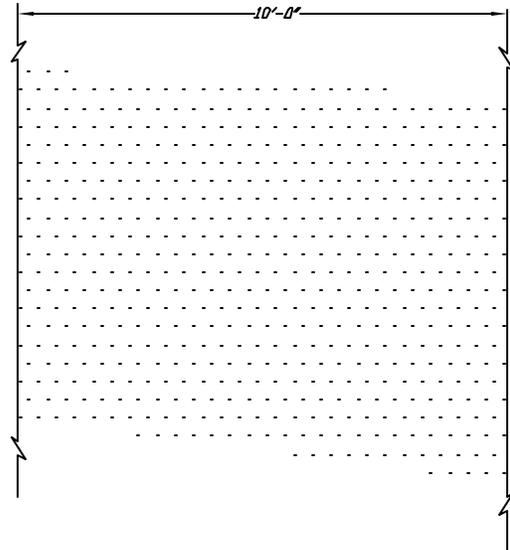
PLAN VIEW  
ASPHALT SHARED-USE DETAIL  
NO SCALE



SECTION VIEW  
NO SCALE

NOTES:

1. SUBGRADE TO BE COMPACTED TO 95% MAXIMUM DENSITY PER AASHTO T-99 OR ASTM D-698 STANDARDS AT THE OPTIMUM MOISTURE CONTENT.
2. FINAL ALIGNMENT SHALL BE APPROVED BY THE ENGINEER.
3. TRAIL TO BE ROUTED TO AVOID DAMAGE TO TREES AND ANY OTHER SIGNIFICANT SITE RESOURCES.
4. SOFT SURFACE MATERIAL INCLUDES DIRT, STONEDUST, WOODCHIPS, ETC.



PLAN VIEW  
SOFT SURFACE SHARED-USE NATURE TRAIL DETAIL  
NO SCALE

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Town of Malta Linkage Study  
Saratoga County, New York  
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SHARED-USE TRAIL DETAILS  
TOWN OF MALTA

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# **APPENDIX F**

## **SPEED AND TRAFFIC VOLUMES**

BIKEWAY SURVEY- ROADWAY CONDITIONS 2002									
Town of Malta Linkage Study									
	Road Section	Line Width (Direction)	Lane Width (Direction)	Shoulder (yes/no) Width (Direction)	Shoulder (yes/no) Width (Direction)	Total Road Width	Posted Speed Limit (MPH)	Road Condition (Good, Fair, Poor*)	Average Daily Traffic (ADT)
1	Malta Ave. - West of Northway	10'3" (W)	10'1" (E)	3'9" (W)	4'3" (E)	28'4"	55	Good	7100
2	Malta Ave. - East of Northway	10'1" (W)	9'7" (E)	2'11" (W)	3'3" (E)	25'11"	40	Fair	2100
3	Rowley Road	10'6" (N)	10'4" (S)	4'11" (N)	2'2" (S)	26'11"	55	Fair	675
4	Nelson Ave	10'9" (W)	10'2" (E)	2'6" (W)	2'2" (E)	25'7"	55	Fair-Poor	200
6	East High St.	11' (W)	11' (E)	no	no	21'10"	45	Fair-Poor	2150
7	East Line Rd	10'2" (S)	12' (N)	no	no	22'2"	55	Good-Fair	1025
8	East Line Rd (CR 82)	10'2" (S)	12' (N)	no	no	22'2"	55	Good-Fair	5250
9	NY Rt. 9P	10'2" (SW)	9'11" (NE)	3' (SW)	3'3" (NE)	26'4"	45/35	Fair	10,100
10	US Rt. 9 (North of NY 9P)	12'	12'	8'	8'	64'	55	Good	9,200
11	US Rt. 9 (North of CR 108)	12'	12'	8'	8'	64'	45	Good	8,450
12	US Rt. 9 (South of CR 108)	12'	12'	8'	8'	64'	45	Good	12,000
13	NY Rt. 9P	10'2" (SW)	9'11" (NE)	3' (SW)	3'3" (NE)	26'4"	45	Fair	10,100
14	Rt. 67	9'11" (W)	10'3" (E)	2'10" (W)	3'8" (E)	26'7"	45	Poor	14,300
15	Round Lake Rd	10'5" (NE)	10'5" (SW)	4' (NE)	2'8" (SW)	26'6"	20	Good	5725
Road Condition Legend:									
Good= Road in no need of improvement with Fresh lines and markings, no pot holes or heaving, no hazard to bicycle									
Fair= Limited improvement, no potholes, little to no heaving, lines faded, limited inconvenience for bicycles									
Poor= Potential immediate need for improvement, potholes and heaving, faded lines, impractical for bicycle to ride on									
M:\11161\data\Bike_Roadway_9_02									

- Date  
- Author  
- Title

## 1. INTRODUCTION

This manual is based on the answers to two key questions:

1. What is the Federal policy goal for bicycle use?
2. Who is the "design bicyclist?"

### POLICY GOAL FOR BICYCLE USE

The two basic policy alternatives are to: (a) accommodate current bicycle use and/or (b) increase the level of use. A review of recent policy statements by the Congress, the U.S. Department of Transportation, and the Federal Highway Administration makes it clear the Federal policy goal for bicycling is to accommodate current use and to encourage increased use, while enhancing safety.<sup>(2,3,4)</sup> Therefore, the recommendations in this manual are oriented to meeting the needs of current and potential bicyclists using the highway system.

### THE "DESIGN BICYCLIST"

Nearly 100 million people in the United States own bicycles.<sup>(5)</sup> The Bicycle Federation of America estimates that fewer than 5 percent would qualify as experienced or highly skilled bicyclists. Since the policy goal is to accommodate existing bicyclists and encourage increased bicycle use, there will be more novice riders than advanced bicyclists using the highway system. Therefore, any roadway treatments intended to accommodate bicycle use must address the needs of both experienced and less experienced riders. One solution to this challenge is to develop the concept of a "design cyclist" and adopt a classification system for bicycle users such as the following:

- Group A—Advanced Bicyclists: Experienced riders who can operate under most traffic conditions, they comprise the majority of the current users of collector and arterial streets and are best served by the following:
  - Direct access to destinations usually via the existing street and highway system.
  - The opportunity to operate at maximum speed with minimum delays.
  - Sufficient operating space on the roadway or shoulder to reduce the need for either the bicyclist or the motor vehicle operator to change position when passing.
- Group B—Basic Bicyclists: These are casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. Some will develop greater skills and progress to the advanced level, but there will always be many millions of basic bicyclists. They prefer:

- Comfortable access to destinations, preferably by a direct route; either low-speed, low traffic-volume streets or designated bicycle facilities.
- Well-defined separation of bicycles and motor vehicles on arterial and collector streets (bike lanes or shoulders), or on separate bike paths.
- Group C—Children: Pre-teen riders whose roadway use is initially monitored by parents, eventually they are accorded independent access to the system. They and their parents prefer the following:
  - Access to key destinations surrounding residential areas, including schools, recreation facilities, shopping, or other residential areas.
  - Residential streets with low motor vehicle speed limits and volumes.
  - Well-defined separation of bicycles and motor vehicles on arterial and collector streets, or on separate bike paths.

While other distinctions can be added, these lists support combining groups B and C bicyclists in most situations. Therefore, a "design cyclist" concept is proposed that recognizes two broad classes of bicyclists: group A riders and group B/C riders.

Generally, group A bicyclists will be best served by designing all roadways to accommodate shared use by bicycles and motor vehicles. This can be accomplished by:

- Establishing and enforcing speed limits to minimize speed differentials between bicycles and motor vehicles on neighborhood streets and/or by implementing "traffic-calming" strategies.
- Providing wide outside lanes on collector and arterial streets built with an "urban section" (i.e., with curb and gutter).
- Providing usable shoulders on highways built with a "rural section" (i.e., no curb and gutter).

Generally, group B/C bicyclists will be best served by a network of neighborhood streets and designated bicycle facilities, which can be provided by:

- Ensuring neighborhood streets have low speed limits through effective speed enforcement or controls and/or by implementing "traffic calming" strategies.
- Providing a network of designated bicycle facilities (e.g., bike lanes, separate bike paths, side-street bicycle routes) through the key travel corridors typically served by arterial and collector streets.
- Providing usable roadway shoulders on rural highways.

Table 1. Group A bicyclists, urban section, no parking.

average motor vehicle operating speed	annual average daily traffic volume (AADT)											
	less than 2,000				2,000 – 10,000				over 10,000			
	adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance	
less than 30 mi/h	sl 12	truck, bus, rv		wc 14	sl 12	truck, bus, rv		wc 14	wc 14	truck, bus, rv		wc 14
		sl 12	wc 14			wc 14	wc 14			wc 14		
30–40 mi/h	wc 14	wc 14	wc 15	wc 15	wc 14	wc 15	wc 15	wc 15	wc 14	wc 14	wc 15	wc 15
41–50 mi/h	wc 15	wc 15	wc 15	wc 15	wc 15	wc 15	sh 6	sh 6	wc 15	wc 15	sh 6	sh 6
over 50 mi/h	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6

1 mi/h = 1.61 km/h

**Key\*:** wc = wide curb lane    sh = shoulder    sl = shared lane    bl = bike lane    na = not applicable.

Table 2. Group A bicyclists, urban section, with parking.

average motor vehicle operating speed	annual average daily traffic volume (AADT)												
	less than 2,000				2,000 – 10,000				over 10,000				
	adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance		
		truck, bus, rv				truck, bus, rv				truck, bus, rv			
less than 30 mi/h	WC 14	WC 14	WC 14	WC 14	WC 14	WC 14	WC 14	WC 14	WC 14	WC 14	WC 15	WC 15	WC 14
30–40 mi/h	WC 14	WC 14	WC 15	WC 15	WC 14	WC 15	WC 15	WC 15	WC 14	WC 15	WC 15	WC 15	WC 15
41–50 mi/h	WC 15	WC 15	WC 15	WC 15	WC 15	WC 15	WC 16	WC 16	WC 15	WC 15	WC 16	WC 16	WC 16
over 50 mi/h	na	na	na	na	na	na	na	na	na	na	na	na	na

1 mi/h = 1.61 km/h

**Key\*:**

wc = wide curb lane    sh = shoulder    sl = shared lane    bl = bike lane    na = not applicable

\*See page 11 for definitions.

Table 3. Group A bicyclists, rural section.

average motor vehicle operating speed	annual average daily traffic volume (AADT)													
	less than 2,000				2,000 – 10,000				over 10,000					
	adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance			
less than 30 mi/h	sl 12	truck, bus, rv		wc 14	sl 12	truck, bus, rv		wc 14	wc 14	wc 14	truck, bus, rv		sh 4	sh 4
		sl 12	wc 14			wc 14	wc 14				wc 14	sh 4		
30–40 mi/h	wc 14	wc 14	sh 4	sh 4	wc 14	wc 15	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4	sh 4	
41–50 mi/h	sh 4	sh 4	sh 4	sh 4	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	
over 50 mi/h	sh 4	sh 6	sh 6	sh 4	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	

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**Key\*:** 1 mi/h = 1.61 km/h  
 wc = wide curb lane    sh = shoulder    sl = shared lane    bl = bike lane    na = not applicable

Table 4. Group B/C bicyclists, urban section, no parking.

average motor vehicle operating speed	annual average daily traffic volume (AADT)											
	less than 2,000				2,000 – 10,000				over 10,000			
	adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance	
		truck, bus, rv				truck, bus, rv				truck, bus, rv		
less than 30 mi/h	wc 14	wc 14	wc 14	wc 14	wc 14	wc 14	wc 14	wc 14	bl 5	bl 5	bl 5	bl 5
30–40 mi/h	bl 5	bl 5	bl 5	bl 5	bl 5	bl 6	bl 6	bl 5	bl 5	bl 6	bl 6	bl 5
41–50 mi/h	bl 5	bl 5	bl 5	bl 5	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6
over 50 mi/h	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6

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1 mi/h = 1.61 km/h

**Key\*:**

wc = wide curb lane   sh = shoulder   sl = shared lane   bl = bike lane   na = not applicable

\*See page 11 for definitions.

Table 5. Group B/C bicyclists, urban section, with parking.

average motor vehicle operating speed	annual average daily traffic volume (AADT)											
	less than 2,000				2,000 – 10,000				over 10,000			
	adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance	
less than 30 mi/h	wc 14	truck, bus, rv		wc 14	wc 14	truck, bus, rv		wc 14	bl 5	truck, bus, rv		bl 5
		wc 14	wc 14			wc 14	wc 14			bl 5	bl 5	
30–40 mi/h	bl 5	bl 5	bl 5	bl 5	bl 5	bl 6	bl 6	bl 5	bl 6	bl 6	bl 6	bl 6
41–50 mi/h	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6	bl 6
over 50 mi/h	na	na	na	na	na	na	na	na	na	na	na	na

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**Key\*:**

1 mi/h = 1.61 km/h  
 wc = wide curb lane    sh = shoulder    sl = shared lane    bl = bike lane    na = not applicable

\*See page 11 for definitions

Table 6. Group B/C bicyclists, rural section.

average motor vehicle operating speed	annual average daily traffic volume (AADT)											
	less than 2,000				2,000 – 10,000				over 10,000			
	adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance		adequate sight distance		inadequate sight distance	
less than 30 mi/h	sh 4	truck, bus, rv		sh 4	sh 4	truck, bus, rv		sh 4	sh 4	truck, bus, rv		sh 4
		sh 4	sh 4			sh 4	sh 4			sh 4	sh 4	
30–40 mi/h	sh 4	sh 4	sh 4	sh 4	sh 4	sh 6	sh 6	sh 4	sh 6	sh 6	sh 6	sh 6
41–50 mi/h	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6	sh 6
over 50 mi/h	sh 6	sh 6	sh 6	sh 6	sh 8	sh 8	sh 8	sh 8	sh 8	sh 8	sh 8	sh 8

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1 mi/h = 1.61 km/h  
**Key\*:** wc = wide curb lane   sh = shoulder   sl = shared lane   bl = bike lane   na = not applicable

\*See page 11 for definitions.

# **APPENDIX G**

## **PROPOSED LINEAR FOOT COST ESTIMATE**



Comp By: MJC  
 Check By:  
 Project #: 11161-1001-1101



**CLOUGH, HARBOUR & ASSOCIATES LLP**  
 ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS

Date: 4/16/2002  
 Time: 10:11 AM  
 Project Eng. N. Schwartz

File Name: m:\CampagnaEst01\Estimate02\11161EST

Subject: Typical Sections for Shared-Use Trails Costs per Linear Foot

Location: Town of Malta, Saratoga County, New York

**CONSTRUCTION COST ESTIMATE**

Item Number	Item Description	Unit	Quantity	Material Cost	Labor Cost	Equip. Cost	Total Bare Unit Cost	Total Bare Cost	OH & P Cost	Total w/ OH & P Cost
<b>Typical 5' Concrete Sidewalk</b>										
1	Strip Topsoil 200HP Dozer Ideal Cond. Clay	CY	0.19		\$0.23	\$0.55	\$0.78	\$0.14	\$0.89	\$0.16
2	Cut & Fill Common, 300 HP Dozer, 300' Haul, 4 Pas	CY	0.37		\$3.37	\$4.65	\$8.02	\$2.97	\$8.13	\$3.01
3	Grade Subgrade for Subbase Course	SY	0.67		\$0.13	\$0.13	\$0.26	\$0.17	\$0.33	\$0.22
4	Geotextile Fabric, Woven	SY	0.67	\$1.26	\$0.16		\$1.42	\$0.95	\$2.12	\$1.41
5	Pavement Subbase Crushed Stone (DOT Type II)	CY	0.15	\$11.60	\$1.48	\$2.54	\$15.62	\$2.31	\$22.51	\$3.33
6	Fine Grade Area to be Paved, Large Area	SY	0.67		\$0.24	\$0.24	\$0.48	\$0.32	\$0.57	\$0.38
7	6" Concrete Sidewalk with Mesh	SF	5.00	\$1.83	\$1.78	\$0.03	\$3.64	\$18.20	\$5.32	\$26.60
8	Topsoil & Seed Residential	SY	1.00	\$1.88	\$2.73		\$4.61	\$4.61	\$5.60	\$5.60
9	Mob/Demobilization, Gen. Cond. & Bond (10%)	LS	100%				\$6.03	\$6.03	\$6.03	\$6.03
							<b>Subtotal</b>	=		<b>\$46.75</b>
							<b>15% Contingency</b>	=		<b>\$7.01</b>
							<b>Total</b>	=		<b>\$53.80</b>
10	Granite Curb, Split Face, Straight, 5" x 16"	LF	1.00	\$6.71	\$2.97	\$1.02	\$10.70	\$10.70	\$15.33	\$15.33
<b>Typical 5' Concrete Sidewalk</b>										
1	Strip Topsoil 200HP Dozer Ideal Cond. Clay	CY	0.19		\$0.23	\$0.55	\$0.78	\$0.14	\$0.89	\$0.16
2	Cut & Fill Common, 300 HP Dozer, 300' Haul, 4 Pas	CY	0.37		\$3.37	\$4.65	\$8.02	\$2.97	\$8.13	\$3.01
3	Grade Subgrade for Subbase Course	SY	0.67		\$0.13	\$0.13	\$0.26	\$0.17	\$0.33	\$0.22
4	Geotextile Fabric, Woven	SY	0.67	\$1.26	\$0.16		\$1.42	\$0.95	\$2.12	\$1.41
5	Pavement Subbase Crushed Stone (DOT Type II)	CY	0.15	\$11.60	\$1.48	\$2.54	\$15.62	\$2.31	\$22.51	\$3.33
6	Fine Grade Area to be Paved, Large Area	SY	0.67		\$0.24	\$0.24	\$0.48	\$0.32	\$0.57	\$0.38
7	6" Concrete Sidewalk with Mesh	SF	5.00	\$1.83	\$1.78	\$0.03	\$3.64	\$18.20	\$5.32	\$26.60
8	Topsoil & Seed Residential	SY	0.56	\$1.88	\$2.73		\$4.61	\$2.56	\$5.60	\$3.11
9	Mob/Demobilization, Gen. Cond. & Bond (10%)	LS	100%				\$6.03	\$6.03	\$6.03	\$6.03
							<b>Subtotal</b>	=		<b>\$44.27</b>
							<b>15% Contingency</b>	=		<b>\$6.64</b>
							<b>Total</b>	=		<b>\$50.90</b>
10	Granite Curb Str. Type 4-1/2"X12", Split Face (Moun	LF	1.00	\$5.87	\$4.09	\$1.70	\$11.66	\$11.66	\$16.72	\$16.72

Comp By: MJC  
 Check By:  
 Project #: 11161-1001-1101



**CLOUGH, HARBOUR & ASSOCIATES LLP**  
 ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS

Date: 4/16/2002  
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 Project Eng. N. Schwartz

File Name: m:\CampagnaEst01\Estimate02\11161EST

Subject: Typical Sections for Shared-Use Trails Costs per Linear Foot

Location: Town of Malta, Saratoga County, New York

**CONSTRUCTION COST ESTIMATE**

Item Number	Item Description	Unit	Quantity	Material Cost	Labor Cost	Equip. Cost	Total Bare Unit Cost	Total Bare Cost	OH & P Cost	Total w/ OH & P Cost
<b>4' Separated Asphalt Pathway</b>										
1	Strip Topsoil 200HP Dozer Ideal Cond. Clay	CY	0.24		\$0.23	\$0.55	\$0.78	\$0.19	\$0.89	\$0.21
2	Cut & Fill Common, 300 HP Dozer, 300' Haul, 4 Pas	CY	0.48		\$3.37	\$4.65	\$8.02	\$3.86	\$8.13	\$3.91
3	Grade Subgrade for Subbase Course	SY	0.67		\$0.13	\$0.13	\$0.26	\$0.17	\$0.33	\$0.22
4	Geotextile Fabric, Woven	SY	0.67	\$1.26	\$0.16		\$1.42	\$0.95	\$2.12	\$1.42
5	Pavement Subbase Crushed Stone (DOT Type II)	CY	0.15	\$11.60	\$1.48	\$2.54	\$15.62	\$2.34	\$22.51	\$3.38
6	Fine Grade Area to be Paved, Large Area	SY	0.67		\$0.24	\$0.24	\$0.48	\$0.32	\$0.57	\$0.38
7	Asphalt Concrete Driveway/Sidewalk 3" Thick	SY	0.56	\$4.31	\$2.12	\$0.22	\$6.65	\$3.72	\$9.67	\$5.42
8	Asphalt Concrete Driveway/Sidewalk 1" Thick	SY	0.56	\$1.31	\$1.08	\$0.11	\$2.50	\$1.40	\$3.57	\$2.00
9	Topsoil & Seed Residential	SY	0.89	\$1.88	\$2.73		\$4.61	\$4.10	\$5.60	\$4.98
10	Mob/Demobilization, Gen. Cond. & Bond (10%)	LS	100%				\$1.53	\$1.53	\$1.53	\$1.53
							<b>Subtotal</b>	=		<b>\$23.46</b>
							<b>15% Contingency</b>	=		<b>\$3.52</b>
							<b>Total</b>	=		<b>\$27.00</b>
<b>5' Expanded Shoulder</b>										
1	Strip Topsoil 200HP Dozer Ideal Cond. Clay	CY	0.28		\$0.23	\$0.55	\$0.78	\$0.22	\$0.89	\$0.25
2	Cut & Fill Common, 300 HP Dozer, 300' Haul, 4 Pas	CY	0.56		\$3.37	\$4.65	\$8.02	\$4.46	\$8.13	\$4.52
3	Grade Subgrade for Subbase Course	SY	0.67		\$0.13	\$0.13	\$0.26	\$0.17	\$0.33	\$0.22
4	Geotextile Fabric, Woven	SY	0.67	\$1.26	\$0.16		\$1.42	\$0.95	\$2.12	\$1.42
5	Pavement Subbase Crushed Stone (DOT Type II)	CY	0.15	\$11.60	\$1.48	\$2.54	\$15.62	\$2.34	\$22.51	\$3.38
6	Fine Grade Area to be Paved, Large Area	SY	0.67		\$0.24	\$0.24	\$0.48	\$0.32	\$0.57	\$0.38
7	Asphalt Concrete Driveway/Sidewalk 3" Thick	SY	0.56	\$4.31	\$2.12	\$0.22	\$6.65	\$3.72	\$9.67	\$5.42
8	Asphalt Concrete Driveway/Sidewalk 1" Thick	SY	0.56	\$1.31	\$1.08	\$0.11	\$2.50	\$1.40	\$3.57	\$2.00
9	Topsoil & Seed Residential	SY	1.11	\$1.88	\$2.73		\$4.61	\$5.12	\$5.60	\$6.22
10	Mob/Demobilization, Gen. Cond. & Bond (10%)	LS	100%				\$1.67	\$1.67	\$1.67	\$1.67
							<b>Subtotal</b>	=		<b>\$25.47</b>
							<b>15% Contingency</b>	=		<b>\$3.82</b>
							<b>Total</b>	=		<b>\$29.30</b>
<b>Off Road Shared-Use Nature Trail</b>										
1	Strip Topsoil 200HP Dozer Ideal Cond. Clay	CY	0.37		\$0.23	\$0.55	\$0.78	\$0.29	\$0.89	\$0.33
2	Cut & Fill Common, 300 HP Dozer, 300' Haul, 4 Pas	CY	0.74		\$3.37	\$4.65	\$8.02	\$5.94	\$8.13	\$6.02
3	Grade Subgrade for Subbase Course	SY	1.22		\$0.13	\$0.13	\$0.26	\$0.32	\$0.33	\$0.40
4	Geotextile Fabric, Woven	SY	1.22	\$1.26	\$0.16		\$1.42	\$1.74	\$2.12	\$2.59
5	Stone Dust, 4" Thick	SY	0.27	\$1.75	\$0.73	\$0.16	\$2.64	\$0.72	\$3.84	\$1.05
6	Fine Grade Area to be Paved, Large Area	SY	1.22		\$0.24	\$0.24	\$0.48	\$0.59	\$0.57	\$0.70
7	Topsoil & Seed Residential	SY	1.11	\$1.88	\$2.73		\$4.61	\$5.12	\$5.60	\$6.22
8	Mob/Demobilization, Gen. Cond. & Bond (10%)	LS	100%				\$3.03	\$3.03	\$3.03	\$3.03
							<b>Subtotal</b>	=		<b>\$20.34</b>
							<b>15% Contingency</b>	=		<b>\$3.05</b>
							<b>Total</b>	=		<b>\$23.40</b>