

Feasibility Study for Various Rails to Trails Projects Within The County of Cumberland



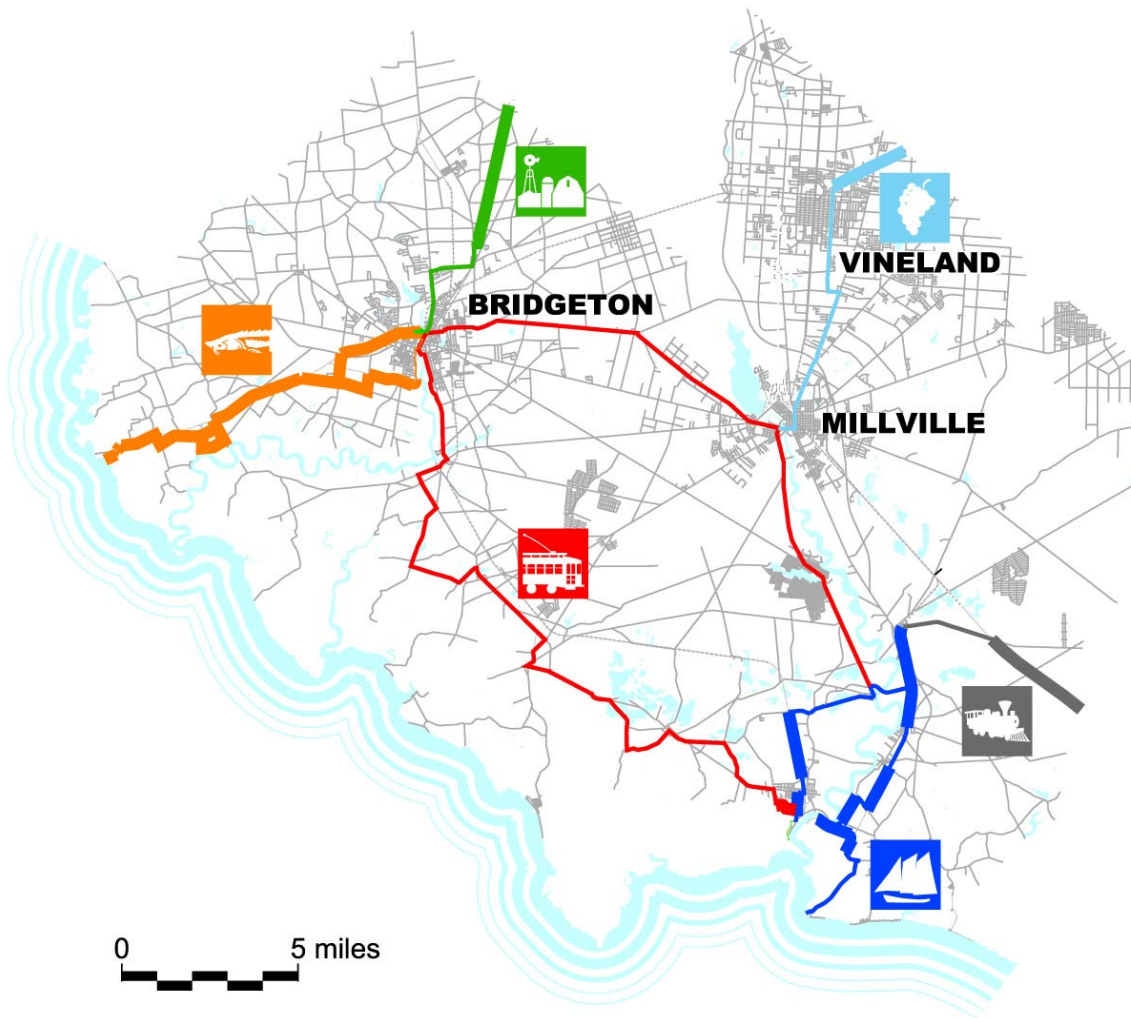
Submitted to:

**The County of Cumberland
790 East Commerce Street
Bridgeton, NJ 08302**

June 29, 2010

Submitted by
Campbell Thomas & Co.
1504 South Street
Philadelphia, PA 19146-1636
215-545-1076
www.campbellthomas.com

in association with
Menke & Menke, LLC
and
Strauss and Associates



Cumberland County's Proposed Trail Network

The preparation of this report has been financed in part by the U.S. Department of Transportation, Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or uses thereof.

Feasibility Study for Various Rails-to-Trails Projects within the County of Cumberland, New Jersey

Table of Contents

I. Introduction	
A. Project Scope	2
B. Project Partners	2
C. Regional Context.....	3
D. Benefits of the Trail	3
E. Study Goals and Objectives	4
F. Trail Characteristics	5
G. Projected Use.....	8
H. Examples of Other Multi-Use Trails	9
I. Summary of Key Recommendations	12
J. Determination of Feasibility	13
II. Recommendations	
A. Trail Alignments.....	14
B. Trail and Trailhead Facilities.....	35
C. Partnering with Local Businesses	36
D. Treatment of Trail Corridors	36
E. Proposed Easements and Property Acquisition.....	37
F. Operation and Maintenance.....	38
G. Opinion of Probable Costs	43
H. Project Phases	44
I. Implementation and Project Management Strategy	44
J. Potential Funding Sources	47
III. Methodology	
A. Existing Plans and Field Survey.....	48
B. Public Participation	48
C. Trail Alignment	49
D. Trail Easement Valuation	49
IV. Inventory and Analysis	
A. Physical Conditions.....	53
B. Analysis Maps	55
C. Usage Feasibility	55
D. Railroad Corridor History and Current Ownership.....	55
E. Feasibility of Rail-with-Trail Corridors.....	57
V. Appendices	

I. Introduction

A. Project Scope

This study investigated the feasibility of creating multi-use (walking, bicycling and equestrian) trails on various railroad rights-of-way in Cumberland County, New Jersey.

One hundred and five (105) miles of railroad have been constructed in Cumberland County. With some of this mileage still in service, some inactive, and the remainder abandoned, this study determined which sections may present opportunities for rail-to-trail, or rail-with-trail. The feasibility of various segments was determined based on factors including the current status of the railroad, right-of-way ownership, level of demand by potential users, level of local support, and anticipated costs of construction and maintenance.

Where segments of available railroad right-of-way are separated by some distance, this study investigated ways that these railroad rights-of-way might be connected into a useful network.

The study's findings are presented in the form of an executive summary, a computer-based slide show, and this written narrative including an appendix consisting of detailed maps and spreadsheets.



Pennsylvania – Reading Seashore Lines bridge over Muskee Creek in Maurice River Township

B. Project Partners

The progress that has been achieved would not have been possible without the talent and vision of the project's many partners. These partners generously contributed their time and ideas through participation on the Trail Study Committee.

Members of the study committee met on five occasions: Tuesday, November 24, 2009; Monday, January 11, 2010; Tuesday, March 16, 2010; Thursday, April 15, 2010; and Thursday, May 27, 2010.

Project partners include among others:

- Cumberland County Department of Planning and Development
- Cross County Connection Transportation Management Association
- Association of New Jersey Environmental Commissions
- Delaware Bay Schooner Project
- American Littoral Society, Delaware Bay Watershed
- Citizens United to protect the Maurice River and its Tributaries
- Cumberland Development Corporation
- Cumberland County Tourism and Recreation

C. Regional Context

The twenty-first century finds an emerging network of long-distance trails beginning to take shape in southern New Jersey. In various stages of completion, design and conceptual planning, three of these long-distance trails are set to converge in Cumberland County. These trails include one that will connect Camden to Bridgeton, another linking Atlantic City to Vineland, and one joining Cape May to southeastern Cumberland County.

In addition to the planned long-distance multi-use trails, the federally designated Bayshore Heritage Scenic Byway traverses the southwestern edge of the county, linking historic sites and towns parallel to the Delaware Bay.

Please refer to the Potential Regional Links Map in the appendix.

D. Benefits of the Trail

Cumberland County New Jersey is exceptionally rich with natural, historical, and cultural assets. This study investigates the opportunities to link these attractions with a non-motorized transportation system that will benefit area residents and visitors alike. The trail network will enhance the quality of life for existing residents not only by providing for alternative (non-motorized) commuting and recreation, but also by stimulating economic revitalization of the traditional main streets in the corridor's historic towns.

Potential recreational business activities that could be generated by the trail network include: eateries, bed and breakfasts, bicycle rental, recreation activities, sightseeing excursions, bicycle related shops and equestrian support centers.



High Street, Millville

The proposed trail network will enhance mobility and connectedness within

Cumberland County, as well as adjoining counties. The trail network will also provide safe walking and bicycle commuting opportunities to businesses, parks, schools and the like. The enhanced recreational opportunities that this trail system will provide are an attraction to workers in the "knowledge industries," making the county more competitive in the new economy.

The trail network will encourage economic development by making use of the urban facilities offered by several town centers including **Bridgeton, Millville** and **Vineland**. Bringing the trail network through these historic industrial and commercial centers provides mutually for the benefit of the town and the trail users. Town centers and their related businesses will provide amenities to trail users in the form of restaurants, hotels, shops and site-seeing. Thus, the trail users will bring a new source of income to help grow current businesses and create opportunity for the development of new ones.

E. Study Goals and Objectives

This study assesses the feasibility of creating multi-use trails on various railroad rights-of-way in Cumberland County. The objectives of this study are to evaluate the feasibility of creating rails-to-trails (or rails-with-trails), and where appropriate, make recommendations to guide the creation of the trails.

A map of physical and cultural resources and constraints was prepared as the basis for determining optimal trail alignments. Among the features inventoried were transportation rights-of-way, land ownership, preserved farmland, and open space. Opportunities for linkage to other elements of the regional transportation system, trail destination points, and open space networks were identified.

During the inventory and analysis phase, the current landowners of the abandoned rail rights-of-way were identified by utilizing the County's GIS-based property records. Please refer to Property Ownership Maps, P1 through P7, included in the appendix.



Abandoned Central Railroad of New Jersey rail-bed approaching south end of Water Street in Bridgeton

As the study progressed, meetings were held with the Study Committee. Workshops were held to engage the public in sharing information and ideas. Members of the Study Committee are key advocates for the implementation of this project. Issues of trail implementation and maintenance were presented, critiqued and agreed upon by consensus of the Study Committee.

A phased implementation plan for the trail network is included in this report. This phased implementation plan is supported by opinions of probable construction costs for the trail network's various segments.



Well-designed trails are a valued asset to a community

F. Trail Characteristics

This section describes various trail types that may be recommended in Cumberland County. Depending on the context and the volume and travel mode of expected trail users, various trail widths and surfaces may be recommended.

Unpaved Trails



Unpaved trails are usually the native soil or sand material that predominates along the trail. In some cases, other materials are imported and mixed, often to make the surface more stable for trail use. Edging is often used due to the probability of the material migrating beyond the edges, and to establish a border beyond which adjacent plants should not cross. Organic material such as shredded bark tends to disappear over time and needs to be replenished periodically.



Gravel and Stone Trails



Fine crushed stone, or crushed stone mixed with limestone fines, are sustainable trail surfaces favored by hikers, equestrians, and most bicyclists. Crushed stone surface trails are an option where the terrain is flat or nearly so, and where the trail alignment does not traverse a known floodway. In addition, crushed stone surface trails are permeable by rainwater, so construction of such trails does not add impervious surface to the watershed.

Asphalt Trails

Paved trails are almost predominantly asphalt, set on a base of crushed stone. In the case of abandoned railroads, a well compacted subbase of crushed stone is already in place. Designed for light use by maintenance and emergency vehicles, the asphalt surface is favored by cyclists riding narrow-tire bicycles. A parallel earth- or crushed-stone-surface path may be designated for use by joggers and equestrians.



Concrete and Unit Paver Trails

Trails of poured-in-place cement concrete are common near urban areas, typically set on a base of crushed stone. Abandoned railroads provide a ready-made subbase in the form of well-compacted ballast stone. Trail users accustomed to sidewalks are sometimes more comfortable with this type of paving, and the lightness of the material can be cooler underfoot, especially on a hot sunny day. Joints can be an issue, with both expansion and contraction joints required on a regular basis. In urban parks, unit pavers are also quite prevalent. With pavers, a well compacted well-drained subbase is of critical importance.



Specialized Trails



Unusual conditions sometimes call for specialized treatments. Two are shown here.

1) In **sensitive wetlands**, raised wooden walkways are suitable for allowing access while protecting the resource (above, left and right). Railings are not often needed unless crossing a deep water body. 2) **Bridle paths** (right) can either share the trail (preferably a soft surface), or



Trailheads

In order to attract visitors to the trail system, facilities should be provided. These include rest rooms, possible interpretation of the ecology, geology or history of the surrounding area, handout maps and guides, and possibly vending machines for drinks and snacks. The size of a structure that could house these functions is remarkably similar to that of the train stations that were once at these same locations. Right: the now demolished Mauricetown train station is the appropriate size to house trailhead facilities, and with a small parking area could serve as a trailhead at a former station site.



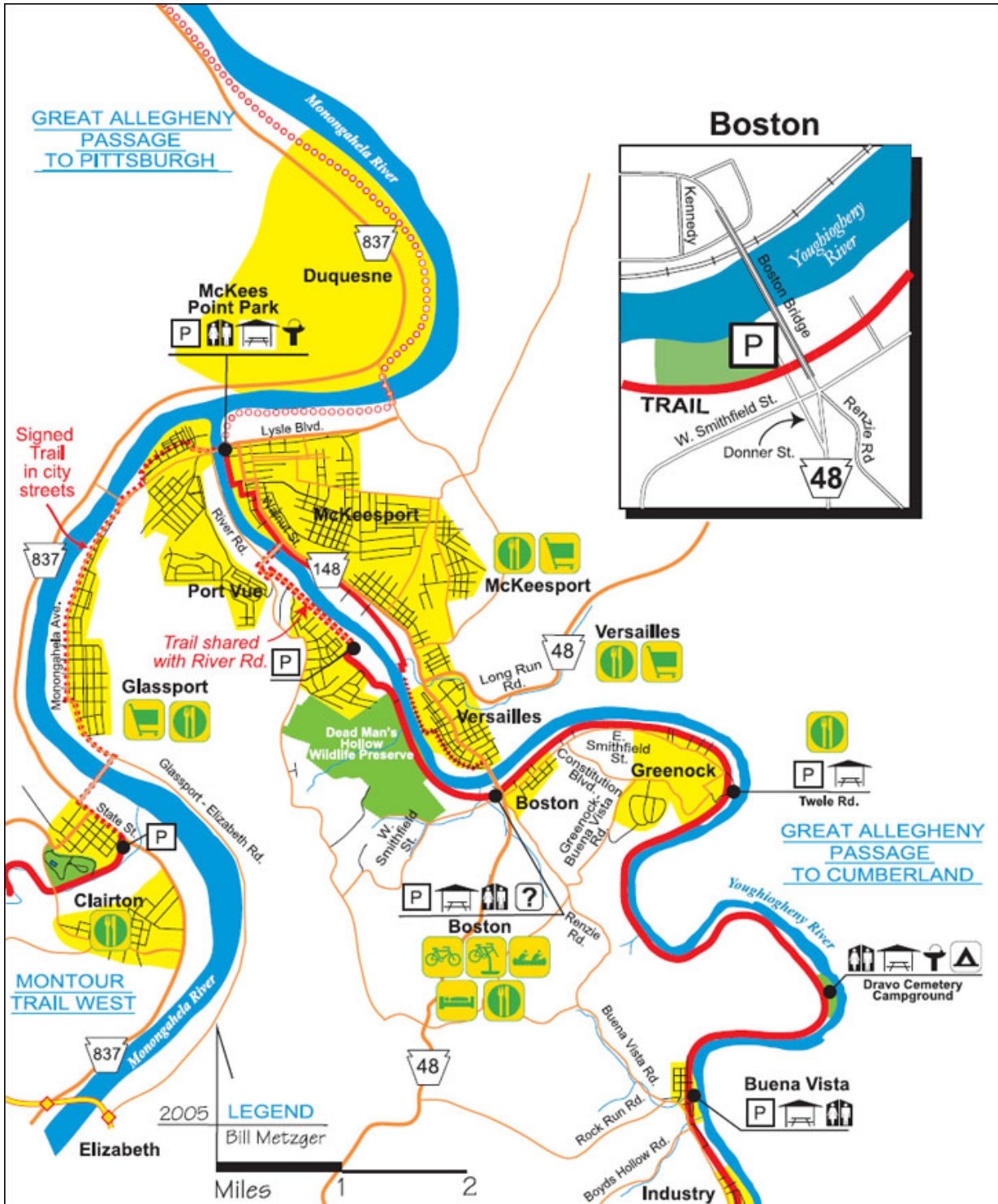
G. Projected Use

Cumberland County's rail-trails, as envisioned, will appeal to a broad spectrum of users. It is intended that the highest benefit of these trail corridors will be the reestablishment of non-motorized connections between towns, parks, residential and business communities, cultural, natural and historic resources. The trail network is further envisioned as a strategic element of the future growth and development of the region's potential for increased markets in heritage tourism and economic development.

Fortunately the region has several multi-use trails already in place including, within the county, the trolley trail between Bivalve and Port Norris, and in adjacent counties, the Elephant Swamp Trail and the Woodbine Railroad Trail. The possibility that trails could be constructed here in Cumberland County has sparked the interest and momentum that has led to this study. The citizens that use these trails have realized and appreciated the many benefits of trails and greenways. Some current uses that would be immediately enhanced include: local joggers, hikers, and anglers; recreational and commuting bicyclists; and employees of local businesses.

H. Examples of Other Multi-Use Trails

The **Great Allegheny Passage** links Pittsburgh with Cumberland, Maryland, at which point the trail connects with the C&O Canal National Historical Park, whose towpath goes all the way from Cumberland to Washington DC. Much of the route is a rail-trail. An excellent on-line guide is available with maps, lists of services and contacts, at www.atatrail.org. The evidence of trail-related



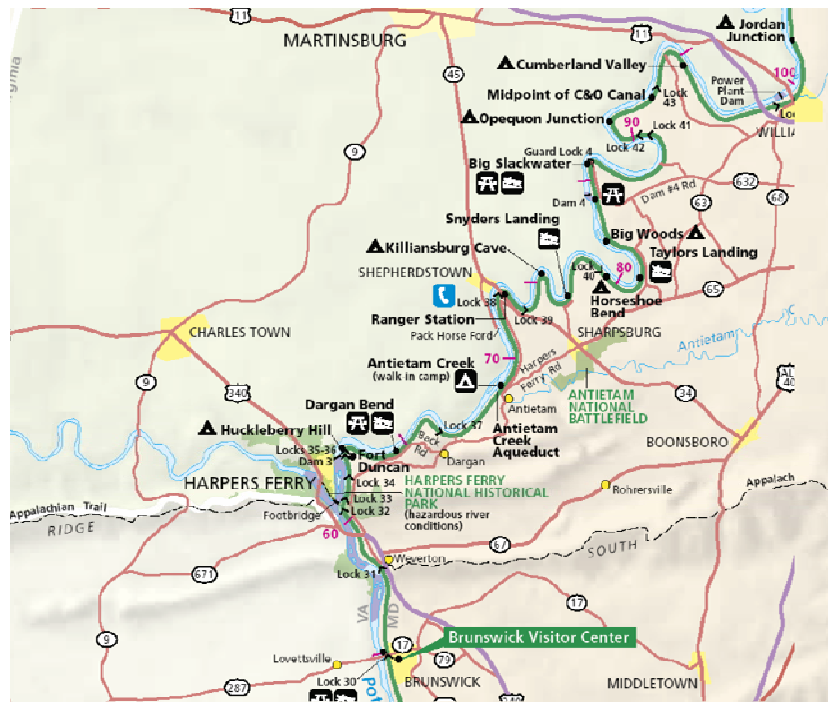
Section Map 2 of the Allegheny Trail Alliance – Note shared Trail sections and services

economic revitalization of the small towns through which it passes is quite evident. Over time, the trail is being located completely off-road; however, it has made good use of on-road detours to provide a continuously signed route. One section of the on-line map is on the previous page; note how the routes use existing streets to link off-road sections.

Although bicycling and hiking are the two most popular activities, certain sections of the Great Allegheny Passage with grassy areas are open to equestrians, and other users include fishermen and cross-country skiers. Most of the trail is a packed, crushed limestone surface.

Chesapeake & Ohio Canal National Historical Park: As noted by the National Park Service, “Preserving America’s colorful canal era and transportation history, the Chesapeake & Ohio Canal National Historical Park is 184.5 miles of adventure. Originally, the C&O Canal was a lifeline for communities and businesses along the Potomac River as coal, lumber, grain and other agricultural products floated down the canal to market. Today millions of visitors hike or bike the C&O Canal each year to enjoy the natural, cultural and recreational opportunities available.”

The C&O Canal begins at the fall line at tidewater in Georgetown, and heads off into the wilderness through steep mountains. The Gettysburg to Hanover Trail will, it is hoped, link with the C&O Canal via the Grand History Loop. Many of the rural towns along the C&O depend heavily on trail users for their business, and vice-versa.



The C&O Canal at Harpers Ferry and Antietam



Decorative Trail Section in Cumberland MD

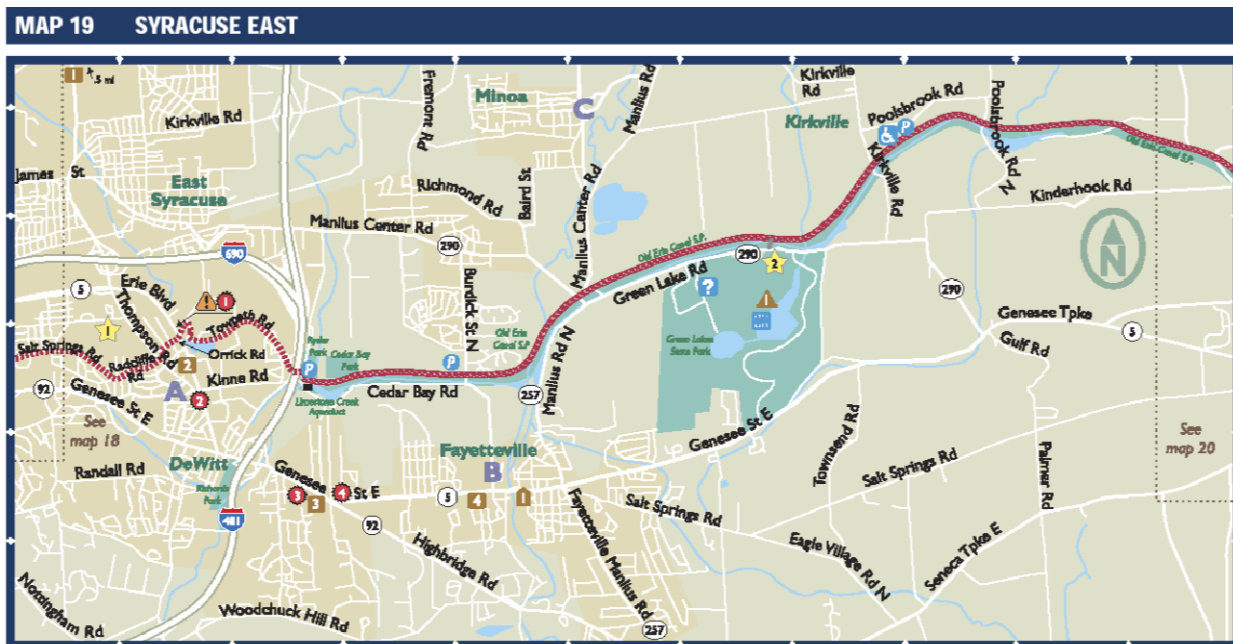


C&O Towpath in rural area east of Cumberland

As may be the case with the Gettysburg to Hanover Trail, the width and surfacing of the C&O towpath varies depending upon its location in small and large towns, and rural areas. The majority of the towpath is surfaced with crushed stone.

The Erie Canalway Trail: Named for the famous canal opened in 1825, between Albany on the Hudson River and Buffalo on Lake Erie, the Erie Canalway will eventually span 524 miles across New York State following existing and previous routes of the canal. Already over 200 miles are open and in use. Here again, the trail is an economic lifeline for many older rural towns bypassed by modern transportation routes. In urban centers, the trail enhances the quality of life through its recreational and non-motorized transportation assets, while giving access to the canal and adjacent rivers.

However, the guidebook published by Parks and Trails New York reflects the use of temporary on-road segments linking the completed off-road sections. The sample map section (Map 19 Syracuse East) illustrated here shows the trail as it comes out of the eastern end of Syracuse.



The Erie Canalway Trail leaves streets in Syracuse and then follows the historic canal into the countryside

Here again, as with other long-distance trails, the type and width of paving varies depending upon



Canalway Trail at Lift Lock



The Trail passes the Stockade Historic District

location and volume of usage. Also, while some of the trail is on the former towpath, much is also on old railbeds, as much of the old towpath was lost when the canal was significantly upgraded to its current 200'-width and use as a barge canal in the early 20th century.

The East Coast Greenway: The trail network in Cumberland County will hardly be an isolated trail. There will be numerous links to a virtually endless system of eastern trails, including the East Coast Greenway. The Bridgeton – to – Camden trail will, at its north end, connect to the ECG. The Greenway extends from Maine to Florida, and is planned to be an “urban Appalachian Trail” linking



The East Coast Greenway

cities. Of course, there is a good bit of countryside between the great eastern cities, and as a result, the trail’s character varies tremendously from one region to another. Trail conditions and standards also vary tremendously, from rural towpaths to sophisticated urban waterfront trails in Manhattan. Given the length of the ECG, and the costs of development, it will be some time before the goal of a completely off-road trail is reached. However, as with the Erie



The ECG crossing the Delaware River

Canalway Trail, signage of temporary on-road routes is already in place, and guidebooks are available for some sections. As an example, the entire route through Pennsylvania has been designated and signed as “Bicycle Route E” as part of the state’s system of state-wide bicycle touring routes.

A twelve-page New Jersey East Coast Greenway guidebook is available both as a printed copy, and on-line at www.greenway.org. With development of different sections the responsibility of different agencies and groups, the East Coast Greenway Alliance acts as the principal advocate for the development of the Greenway. A continuous routing from Maine to Florida should be in place in 2010.

I. Summary of Key Recommendations

A brief summary of recommendations includes the following:

1. Six major trails are recommended.



Maurice River Trail



Sturgeon Trail



Bridgeton – to – Camden Trail



Bridgeton – Millville – Mauricetown Loop



Cumberland – to – Cape May Trail



Vineland – to – Atlantic City Trail

2. Trail implementation should be phased. A detailed discussion of recommendations for four key phases of construction is given in Section II.G.
3. The **Maurice River Trail** offers the most promise at this time, because:
 - This trail would provide recreational and non-motorized commuter access to the Bayshore Discovery Project in Bivalve.
 - This trail would link the historic town centers of Port Norris, Dorchester, and Leesburg
 - This trail would enhance non-motorized access to historic East Point lighthouse
 - Several links in the proposed trail are already in place:
 - The rail-trail between Bivalve and Port Norris is already in use
 - The abandoned CNJ railroad north of Port Norris is now in public ownership
 - The abandoned River Road north of Matt’s Landing is now in use as a rail-trail
 - The abandoned PRSL railroad east of Matt’s Landing is in use as a rail-trail

J. Determination of Feasibility

Several factors weigh in favor of the feasibility of the Maurice River Trail:

- A committed Trail Study Committee is comprised of dedicated advocates for the project.
- The Maurice River Trail is not intended to exist in isolation, but rather is joined at three key points by two other proposed multi-use trails: the Trolley Trail, and the Cumberland to Cape May Trail.
- The Maurice River Trail (and indeed the entire trail network put forth in this report) would serve as a key element in a local pedestrian and bicycle network, linking population centers, work places, schools and recreation areas.

Challenges to the development of the Maurice River Trail include cost, both of construction and of easement acquisition. Several pieces of right-of-way will need to be purchased, or easements negotiated, with private property owners. In addition, rail-banking will need to be approved by Winchester & Western Railroad. The absence of a rail-trail authority, or indeed of a parks and recreation department, in Cumberland County is a decided disadvantage. However, the formation of such a governmental authority or the willingness of non-profit agency to assume responsibility for maintenance of the trail may offset that.

This report includes preliminary estimates of probable development costs for the trail network and, in the appendix, detailed plans showing property owners from whom easements may need to be secured.

II. Recommendations

A. Trail Alignments



Maurice River Trail

Length = 17.4 miles
(4.4 miles trail + 13.0 miles on road)

The Bivalve-Mauricetown-East Point Trail begins at the Bayshore Discovery Project on the Maurice River in Bivalve, then through Port Norris, Mauricetown, Dorchester and Leesburg, ending at East Point Lighthouse. The Trail traverses Commercial Township and Maurice River Township.

The first eight hundred feet of Trail utilizes the painted bike lanes on High Street. At the intersection of High Street and Miller Avenue is the entrance to the Port Norris Pathway, a 3800-foot long existing multi-use trail constructed on the rail-bed of the long-abandoned Bridgeton-to-Bivalve trolley line. The Maurice River Trail would use this existing trail north to Port Norris.

The multi-use trail ends at Main Street / Route 553. Signage would direct trail users 900 feet east on Main Street, to the intersection with Memorial Avenue.

At Memorial Avenue, signage would direct trail users north 2200 feet to the intersection with Yock Wock Road. Memorial Avenue was constructed on the abandoned rail-bed of the Central Railroad of New Jersey Maurice River branch. Though only 20-feet wide, low traffic volume and good sight distance make this a reasonable on-road trail segment.



Informal trail on abandoned CNJ right-of-way south from James Moore Road in Commercial Township

Beginning at Yock Wock Road and running just under two miles to James Moore Road / Route 614 is the abandoned rail-bed of the Central Railroad of New Jersey Maurice River branch, now in public ownership. This study recommends the construction of a crushed-stone-surface multi-use trail on this railroad bed. Please refer to Property Ownership Map no. P6.

At the north end of the multi-use trail, signage would direct trail users to proceed east on James Moore Road / Route 614, 3300 feet to the intersection of North Avenue / Route 649. Pavement width of this road is 26 feet; much of the land between the edge of pavement and existing right-of-way line is low-lying and subject to inundation.

At the intersection with North Avenue / Route 649, trail users are directed north for 1000 feet along North Avenue. Both the cartway width and right-of-way on North Avenue / Route 649 are wider than that of James Moore Road (38 feet and 66 feet respectively).

The trail bears right at Mauricetown Bypass / Route 649. Similar to North Avenue, trail users share the 38 foot wide cartway with motor vehicle traffic for 1900 feet until the intersection with Noble Street / Route 744.

At Noble Street / Route 744, signage again advises trail users to bear right. Noble Street is 40 feet in width (two 12 foot travel lanes plus two 8 foot shoulders), and traffic volumes and speeds are considerably lower. Noble Street is followed for approximately 9000 feet, to the intersection with Front Street in the village of Mauricetown.

Signage will direct trail users to turn left on Front Street, proceeding north along a beautiful block of Victorian residences to the intersection with Highland Street.

Beyond that point, trail users are directed to continue straight on Buckshutem Road for 1300 feet to the intersection with Mauricetown Bypass (Route 670).



Examples of fine Victorian architecture line Front Street in Mauricetown

Cartway width on the Mauricetown Bypass is 42 feet: two 12 foot lanes with 9 foot shoulders. After 1200 feet of roadway, is the bridge over Maurice River. The quarter-mile long bridge structure carries a 30-foot wide cartway and one four-foot long sidewalk (on the south side). After the bridge lands in Maurice River Township, trail users continue for 4100 feet on the Mauricetown Bypass to the inactive grade crossing of the Winchester & Western Railroad.

Use of the 6300 feet of Winchester & Western's inactive Maurice River branch between the Mauricetown Bypass and Dorchester is contingent upon obtaining permission from W&W. The Railroad has not abandoned this section, but it has been decades since trains operated here and the restoration of freight service is extremely unlikely. It is hoped that Winchester & Western will allow this section of railroad to be "rail-banked;" i.e., leased for use as a public trail unless and until rail service is reinstated. Please refer to Property Ownership Map no. P4.

The condition of a 25-foot long timber trestle over Clear Run (a tributary of the Maurice River) will need to be assessed before it can be utilized as a trail bridge. Ideally the existing structure can be retrofitted with a wooden deck and railings. If the trestle cannot be adapted for trail use, one option is to leave it in place and construct a new single-span pre-fabricated trail bridge above it, utilizing low-environmental-impact screw piles at either end for support.



Winchester & Western railroad was built on berm parallel to the east shore of the Maurice River

South of Carlisle Place Road in Dorchester, the abandoned rail-bed has been taken as the right-of-way for a public road. Railroad Avenue's cartway width is a relatively narrow 24 feet, but light traffic volume and excellent sight distance (due to its origins as a railroad) make it a reasonably comfortable on-road route for trail users.

In Leesburg, Railroad Avenue reaches a dead-end below Leesburg-Belleplain Road (Route 710), ending 550 feet short of High Street. An informal trail does connect to High Street, although one section of the former right-of-way was sold into private ownership. This study recommends the construction of a public multi-use trail connecting Railroad Avenue to High Street, possibly utilizing adjacent parcels owned by PSEG. Please refer to Property Ownership Map no. P5.

South of High Street, 4100 feet of rail-bed is now owned by Public Service Enterprise Group. It is hoped that PSEG will be amenable to negotiation of a trail easement, so that this section of trail can be constructed. South of this point, 2700 feet of rail-bed is now in private hands. Until the property owners are interviewed, it is not known if an off-road trail is feasible here. If negotiation of trail easements (or sale of right-of-way) across these privately owned properties is not possible, lightly-travelled Newell Road can serve as an on-road segment of trail.

At Menhaden Road, signage would direct trail users to proceed west on Menhaden Road, sharing the road with motor vehicle traffic approximately half a mile (2600 feet) to the trailhead of the old River Road multi-use path to Matt's Landing.

The existing old River Road multi-use trail has a blacktop surface, suitable for cycling and walking. After 4500 feet, the old River Road multi-use trail ends at Route 736 in Matt's Landing. From that point, trail users would be directed to follow Route 736 west for approximately one-quarter mile along the marinas to the end of Route 736.



Abandoned PRSL Maurice River branch parallel to Newell Road south of Leesburg

Route 736 in Matt's Landing ends at an intersection with an earthen road built atop the rail-bed of the abandoned Pennsylvania-Reading Seashore Lines Maurice River branch. Trail users would share this unpaved road, which sees very limited motor vehicle traffic. A short spur to the west leads in the direction of the site of the vanished town of Maurice River. Trail users are rewarded with a beautiful scenic vista of the river, Bivalve and Shell Pile.



Abandoned PRSL railroad right-of-way is now an earth-surfaced road in Matt's Landing

Trail users not wishing to explore the spur may instead turn left, following the unpaved road eastward for approximately a mile. This is an exceptionally fine reach of trail / road, following the top of a dike, adjacent to open water for much of its length.

At the end of the former railroad bed, the unpaved road continues a further half-mile until it reaches East Point Road. Trail users would be directed by appropriate signage to follow East Point Road, sharing the 20-foot wide asphalt surface with a light volume of motor vehicle traffic.

After about two miles on East Point Road, the driveway to the East Point Lighthouse is on the right. After 1000 feet on the unpaved driveway, the parking area for the lighthouse is reached.

Addition of amenities such as year-round restroom facilities could add to this location's value as a trail-head.



East Point Light House



Maurice River Trail – Port Elizabeth Spur

Length = 1.7 miles
(1.7 miles trail; no miles on road)

The Port Elizabeth Spur of the Maurice River Trail would connect Port Elizabeth to the Maurice River Trail at the Mauricetown Bypass / Route 670, in Maurice River Township. The connection would be made at the point where Phase I of the Trail starts south from Route 670 on the rail-bed of the former PRSL Maurice River Branch (described above).

From the connection point, the Port Elizabeth Spur would utilize an unused Pennsylvania-Reading Seashore Lines rail-bed, now owned by Winchester & Western Railroad. As described above, construction of this section of trail is contingent upon W&W allowing “rail-banking” of this section of inactive railroad. Please refer to Property Ownership Map no. P4.

Two railroad bridges (one crossing Muskee Creek just south of Route 47, the other crossing an unnamed tributary immediately north) have fallen into disrepair. Several options present themselves. If inspection of the existing piers determines that their integrity is suitable, then a deck suitable for trail users and light maintenance / patrol vehicles could be constructed upon them. Alternately, a single-span pre-fabricated trail bridge might be placed above the existing bridge, utilizing low-environmental-impact screw piles as foundations.



Winchester & Western Railroad bridge over Muskee Creek adjacent to Route 47 near Bricksboro

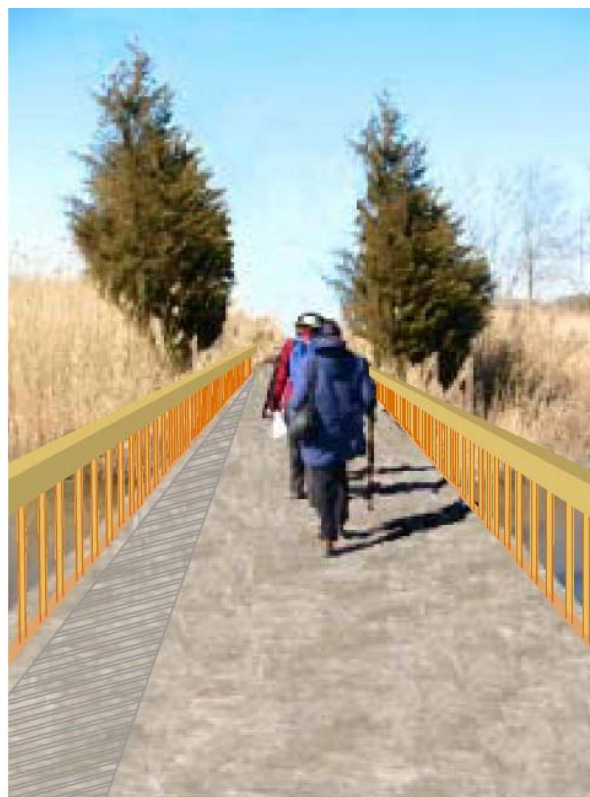
The at-grade crossing of Route 47 / Delsea Drive will require careful analysis. Traffic volumes and prevailing speeds are high, and sight distance as perceived by drivers of northbound vehicles is limited by horizontal geometry (a left-hand sweeping curve). Some sort of signalization might be appropriate at this location, possibly push-button-actuated by trail users. In addition, the trail crossing might be moved some distance north, away from the former railroad grade crossing. This would improve the northbound traffic’s sight distance. Side paths separated from the roadway of Route 47 would convey trail users to the crossing.

Approximately one-and-one-half miles north of the connection with the main Maurice River Trail, is the Maurice River Township Elementary School. The school grounds are immediately adjacent to the ex-PRSL rail-bed / proposed trail. Development of the Port Elizabeth Spur could thus offer non-motorized alternative transportation to students and to school employees. In addition, the existing school parking lot could serve as a trail-head during those times when school is not in session.

The Port Elizabeth Spur would extend about a quarter mile north of the elementary school, to the grade crossing with Weatherby Road (adjacent to the intersection of Broadway and Church Street). This gives access to the northern section of Port Elizabeth, and to a future connection with the proposed Cumberland to Cape May Trail described elsewhere in this report.



De facto trail along Winchester & Western rails south from Weatherby Road in Port Elizabeth



“Before and after” rendering of the former Pennsylvania-Reading Seashore Lines bridge over Muskee Creek in Maurice River Township



“Before and after” rendering of the former Pennsylvania-Reading Seashore Lines rail-bed south of Leesburg, near Newell Road





Sturgeon Trail

Length = 16.7 miles
(7.1 miles trail + 9.6 miles on road)

The Sturgeon Trail, commemorating Cumberland County's historic caviar industry, would connect Bayside to Bridgeton utilizing, where possible, the abandoned rail-bed of the Central Railroad of New Jersey in Greenwich Township, Hopewell Township, and the City of Bridgeton. Two branches of the abandoned CNJ railroad separate near Bowentown and enter Bridgeton from in two places: from the west through Bridgeton City Park, and from the south via Water Street. (Implementation of just these two branches of trail east of Bowentown would create an eight-mile loop in Bridgeton city and adjacent Hopewell Township.)

The trail would begin at the site of the historic railroad pier at Caviar Point, within the boundaries of PSEG's Bayside Tract. The Bayside Tract is a 4500-acre PSEG Estuary Enhancement Program property, intended to restore salt marshes and adjacent uplands while allowing public access. Motor vehicle access is limited to roads and parking areas within the Tract.



Abandoned CNJ railroad begins at Caviar Point within PSEG's Bayside Tract

This study recommends that the Trail utilize existing paved and unpaved roadways within PSEG's Bayside Tract, rather than recommending the construction of multi-use trail on the abandoned CNJ rail-bed. This recommendation is based on the fact that traffic volumes and speeds within the Tract are low enough that sharing the road should be comfortable for both cyclists and hikers alike. After 9000 feet, Bayside Road ends at a "T" intersection with Tindall Island Road.

At this point, signage would direct rail users to share the road with motor vehicles for two-and-a-half miles on the following roads: Tindale Island Road, Bacon's Neck Road, Pier Road, and Market Lane to Ye Greate Street in Greenwich.

Once on Ye Greate Street, signage would direct trail users approximately one-half mile north to the site of the grade crossing of Ye Greate Street with the abandoned CNJ railroad. Because it was abandoned many decades ago, the right-of-way of the former CNJ railroad is now in private hands. Please refer to Property Ownership Map no. P1.



Some portions of the abandoned CNJ railroad, such as the crossing of Pine Mount Creek in Greenwich Twp., are not recommended for the Sturgeon Trail

If private property owners are amenable, it is hoped that trail right-of-way can be purchased, or trail easements negotiated. This study recommends that in the event that property owners do object (and some have already made their opposition known), then an alternate trail alignment be developed that does not cross the objectors' property. This study does not recommend the acquisition of private property by eminent domain.

If property owners agree, this study recommends the construction of a multi-use trail on the abandoned CNJ right-of-way between Ye Greate Street / Route 623 and Trench Road / Route 699. The first two miles of trail are in Greenwich Township; the last mile in Hopewell. The two mile stretch of abandoned right-of-way in Greenwich Township is held by six private property owners. Ownership in Hopewell Township is a mix of private and public, with at least one owner expressing interest in allowing the trail through his property. Please refer to Property Ownership Map no. P2.

The alignment suggested in this report ends the multi-use trail at a point one-half mile east of Elk Lake, where connection would be made with Trench Road / Route 699. Trail users would share the road for approximately one mile, to the intersection of Trench Road and Barretts Run Road. At this point, the Sturgeon Trail splits into two branches. One enters Bridgeton from the west; the other from the south.

Sturgeon Trail West Branch

From the intersection of Trench Road and Barretts Run Road, the West Branch follows Barretts Run Road / Route 661 for approximately three-quarters of a mile to the intersection with Greenwich Road. This is the location of the former grade crossing of the CNJ railroad.



Line of trees follows the abandoned CNJ railroad eastward from intersection of Barretts Run Road and Greenwich Road

From this point eastward toward Bridgeton, this study recommends that a new multi-use trail be constructed on the abandoned CNJ rail-bed. The approximately mile-and-a-half length of rail-bed (between Barretts Run Road and the municipal boundary of the City of Bridgeton) is owned by one property owner. It is hoped that this right-of-way can be purchased or a trail easement negotiated.

Once across Shiloh Pike / Route 49, the former CNJ right-of-way is owned by the City of Bridgeton. One quarter mile farther east, Northwest Avenue would be crossed at-grade. A short side path along Northwest Avenue would allow connections with the West Avenue School and the Bridgeton High School, thus providing walkable and bikeable access to school students, teachers and employees and qualifying the Sturgeon Trail as a "Safe Routes to School" project.



Abandoned CNJ right-of-way at Northwest Avenue in Bridgeton (school complex is to the left)

Approaching Bridgeton City Park, a new trail bridge will need to span the Raceway (canal). Then an existing earthen drive, along the east shore of the Raceway and Eddy Pond, may serve as a trail to the intersection of Mayor Aitken Drive and Washington Street. A safe at-grade crossing of this intersection will need to be designed.

Depending on results of an engineering study, a push-button actuated pedestrian crossing signal may be warranted.

Once across Mayor Aitken Drive, two possible routes present themselves. One possible alignment turns north through Bridgeton City Park, returning to the abandoned rail-bed. Now owned by Cumberland County Utilities Authority, the railroad crossed the Cohansey River on a wood trestle. Though still standing, two spans of the trestle have been removed and the trestle fenced off in order to prevent pedestrian access. Those spans could be replaced and the trestle re-opened to public use. A short section of trail would bring hikers and cyclists to Cohansey Street at Irving Avenue.

Alternately, the Cohansey River could be crossed by utilizing the existing sidewalks and cartway of the Washington Street Bridge. A more cost-effective option than restoring the railroad trestle, this option also has the added advantage of bringing trail users past downtown businesses (e.g., Trolley Barn Ice Cream) on Washington Street.



Trail users may use Washington Street bridge rather than restoring this dismantled bridge in Bridgeton

Both West Branch options (rebuilt rail bridge or Washington Street bridge) would direct trail users south on Laurel Street to the center of Bridgeton, where connection could be made with the proposed Bridgeton – Millville – Mauricetown Loop described elsewhere in this report.

Sturgeon Trail South Branch

From the intersection of Trench Road and Barretts Run Road, the South Branch of the Sturgeon Trail follows Trench Road / Route 699 almost a mile to the intersection with Cumberland Drive / Route 613. At that point, signage would direct trail users to turn left and travel about one-half of one mile to the former grade crossing of the CNJ railroad.

This study recommends the construction of a multi-use trail on the mile-and-a-half of abandoned CNJ rail-bed between Cumberland Drive and Water Street in Bridgeton. The mile of rail-bed between Cumberland Drive and Cubby Hollow Road is privately owned, so construction of this section of trail is contingent upon permission being granted by that owner. The short section of rail-bed between Cubby Hollow Road and Dutch Neck Road / Route 650 is also privately owned, so construction there is also contingent upon the approval of that owner.



City-owned former CNJ right-of-way eastward from Dutch Neck Road in Bridgeton

The half-mile of rail-bed between Dutch Neck Road / Route 650 and Water Street in Bridgeton is owned by the City of Bridgeton, and already serves as a de facto footpath.

Trail users will be directed to use Water Street for almost a mile until it ends at Broad Street.

A right turn crosses the Cohansey River to downtown Bridgeton, and connection with the proposed Bridgeton – Millville – Mauricetown Loop described elsewhere in this report.

Completion of both the West Branch and the South Branch of the Sturgeon Trail would provide an 8-mile loop in Bridgeton and adjacent Hopewell Township. Approximately half of that loop (4.2 miles) would be trail, with the remainder (3.6 miles) on-road.



**Rendering of possible boardwalk at remains of railroad pier at Caviar Point, Bayside.
Red lines indicate outline of historic railroad track**



Before-and-after rendering of abandoned CNJ rail-bed at Elk Lake, Hopewell Township



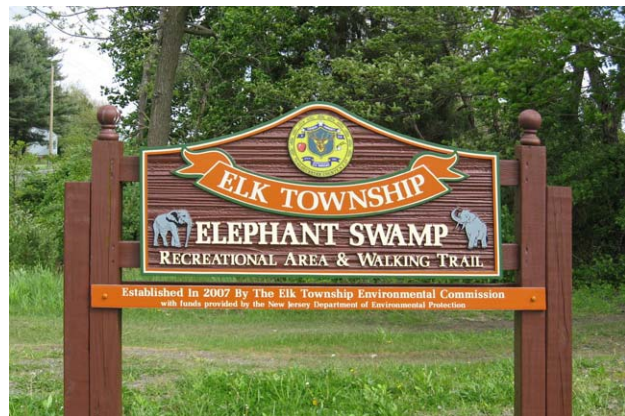
Bridgeton to Camden Trail

Length = 7.5 miles
(4.3 miles trail + 3.2 miles on road)

The Bridgeton to Camden Trail – eight miles of which would be in Bridgeton and in Upper Deerfield Township in Cumberland County – would utilize the former right-of-way of the Pennsylvania-Reading Seashore Lines “Bridgeton Secondary.” Between Camden and Glassboro, design is now (June 2010) underway for a single-track light rail transit line. Because the PRSL was at one time a two-track railroad, a parallel multi-use trail is envisioned between Camden and Glassboro.

Between Glassboro and Bridgeton, portions of this rail line have already been developed as a multi-use trail. Elk Township in Gloucester County has completed several miles of the Elephant Swamp Trail, and other sections are in use as de facto trails.

The implementation of this section of trail within Cumberland County is envisioned as a link in a 40-mile trail that will link Cumberland County to Glassboro, Camden, and Philadelphia – there making connection with the Maine-to-Florida East Coast Greenway.



Elk Township in Gloucester County has developed a portion of the abandoned PRSL as a multi-use trail

Almost all of the former PRSL Bridgeton Secondary between Bridgeton and the Cumberland county line has reverted to private ownership. Therefore, implementation of this trail is contingent upon acquiring the consent of fourteen different private property owners in Upper Deerfield Township. Please refer to Property Ownership Map no. P3.

Because the railroad in Bridgeton is still in use as a freight railroad – and because the owner (Winchester & Western) will not permit “rail-with-trail” within their rights-of-way – an on-road routing will be necessary for the first three miles, between downtown Bridgeton and Carll’s Corner.

The envisioned route follows Laurel Street through Bridgeton and into Upper Deerfield Township, then along Old Deerfield Pike / Route 606, Laurel Heights Drive / Route 662, and Cornwell Drive / Route 622 to Carll’s Corner at Route 77.

Careful design consideration will be necessary in and around Carll’s Corner. The roads that converge in this area have been widened to multi-lane highways with turning lanes, with no provision for cyclists or pedestrians. Dedicated bike lanes, a side path, or some combination may be among the potential solutions here. In order to avoid crossing the main intersection, it may be prudent to place a side path on the north side of Cornwell Drive and the west side of Route 77 – space permitting. Frequent driveways and parking lot entrances cause potential conflicts between side-path users and turning motor vehicle traffic. Situations as complex as this warrant thorough traffic and safety analysis in order to determine the best solution.

The rail-bed through Carll's corner has been obliterated by the afore-mentioned road widening and commercial development, but is still in place northward from a point 900 feet north of the intersection of Route 77 and Northwest Avenue. The side path (or bike lanes) will need to extend along Route 77 to that point, connecting there with the abandoned rail-bed.

As stated previously, fourteen different property owners hold title to the four miles of right-of-way from Carll's Corner to the county line. One of those owners is Conrail (who have indicated that their parcel is for sale) but that parcel totals only 800 feet long. If implementation of this trail is considered a future possibility, then this parcel, located between Finley Road / Route 617 and Richards Road / Route 605, should be purchased at this time.

Six roads are crossed at grade by this alignment, all of them in Upper Deerfield Township. At four of these locations sight distance is adequate, although prevailing speeds of the motor vehicle traffic appear to be rather high.

At Weber Road / Route 729, the grade crossing occurs at a sharp curve. The grade crossing at Deerfield Road / Route 540 occurs at a compound five-point intersection. Safety analyses should be conducted to determine how best to protect trail users at each of these crossings.

Much of this rail-bed traverses an agricultural landscape consisting of scattered woodlands and extensive open fields. In the decades since abandonment, mature trees have grown along the rail-bed. A trail built on this alignment would benefit from the shade canopy provided by these trees, and would provide a fine experience for trail users.

Please turn to the next page to view a "before-and-after" rendering of the Bridgeton – to – Camden Trail in Upper Deerfield Township.



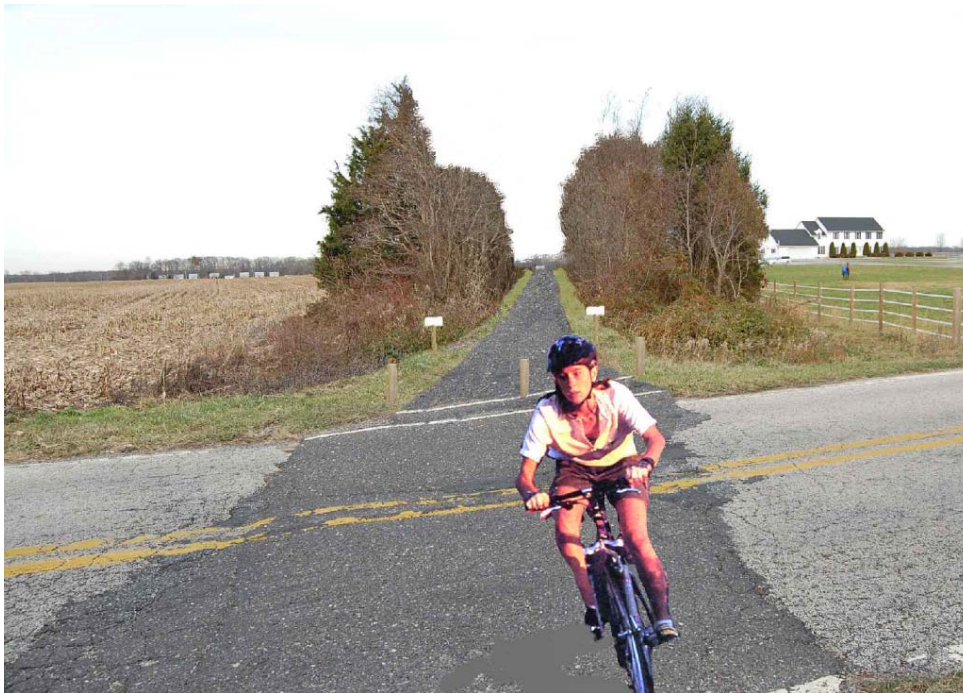
The congested area adjacent to Cornwell Drive and Route 77 (Carll's Corner) will require careful study



The abandoned Bridgeton Secondary crosses Big Oak Road in Upper Deerfield Township



“Before and after” rendering of the abandoned Bridgeton Secondary, where it crosses Richards Road in Upper Deerfield Township





Bridgeton – Millville – Mauricetown Loop

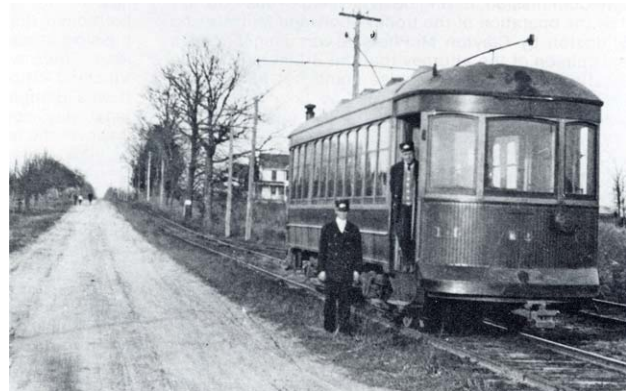
Length = 46.4 miles
(1 mile on existing trail; 45.4 miles on road)

A dearth of available railroad rights-of-way between Bridgeton, Millville and Mauricetown leaves few options for new trails. The freight operator, Winchester & Western Railroad, has a policy of not allowing “rails-with-trails” within active rights-of-way. Safety and liability are the stated concerns.

In order to connect this study’s five proposed rail-trails into a cohesive county-wide network, the Bridgeton – Millville – Mauricetown Loop is envisioned as an on-road bicycle network. Every effort has been made to place the bike routes on roads with wide shoulders, low traffic speeds and volumes, or ideally a combination of those favorable conditions.

In some cases, recommended routes need to utilize roads that would benefit from improvements to better accommodate bicycles. Roads that have been designated as bike routes by this study (or previous studies) should have these improvements included in any future re-striping, re-surfacing or rebuilding projects.

In the years just before and just after 1900, a network of electric trolley lines was constructed in Cumberland County, connecting Bridgeton with Port Norris and Millville, and Millville to Vineland. Between 1922 and 1931 the entire trolley network was replaced by buses. As was often the case with trolley companies, rails were usually laid alongside public roadways whenever possible, this being more cost-effective than building a new rail-bed on private right-of-way. The few surviving (abandoned) trolley rights-of-way (e.g. north of Newport and north of Millville) offer little



Cumberland County’s trolleys often ran alongside public roads, within the public right-of-way

in the way of connectivity and are not recommended for conversion to rail-trail at this time. The Bridgeton - Millville - Mauricetown Loop does follow to a greater or lesser extent some of the old trolley network, so the trolley icon seems appropriate.

The Bridgeton – to – Mauricetown segment traverses the City of Bridgeton, Fairfield Township, Lawrence Township, Downe Township, and Commercial Township. The segment follows along or parallel to the federally designated Bayshore Heritage Scenic Byway.

Beginning in the center of Bridgeton, at the intersection of Broad and Laurel Streets, connection is made with the Sturgeon Trail South and West Branches. One block of Pearl Street, and then the one-way pair of South Avenue and Grove Street are followed for one and one-half miles to the point where those streets converge at the Bridgeton city line and become Bridgeton-Fairton Road / Route 609.

Narrower sections of Route 609 (for example the 26 foot wide roadway that crosses the Clarks Pond embankment) should be improved for cyclists and pedestrians when the next scheduled re-striping / re-paving / reconstruction occurs. Such improvement is in fact recommended for all on-road sections recommended in this report.

After a mile-and-a-half sharing the road on Route 609 in Fairfield Township, the village of Fairton is reached. Signage would direct trail users to turn right and follow Main Street / Route 553 for a quarter mile through Fairton, then another right turn onto Back Neck Road / Route 601. The next left is New England Cross Road, which is followed for a mile to the point where it meets with Cedarville Road / Route 553 and Sayres Neck Road / Route 648. Near this point is the historic Fairfield Presbyterian Old Stone Church, erected in 1780.



Fairfield Presbyterian's Old Stone Church, built in 1780. This section of Route 553 has wide shoulders

The Back Neck Road – New England Cross Road diversion from Route 553 is one of five diversions proposed for this segment. These are intended to enable trail users to enjoy roadways with lower traffic volumes and lower prevailing speeds. However, more experienced cyclists or bicycle commuters may well choose to utilize the more-direct Route 553 with its wide paved shoulders.

At this point, the second diversion from Route 553 commences with a right turn onto Sayres Neck Road / Route 648, then Bowers Creek Road / Route 653, then Mulford Avenue to Main Street Cedarville.

Main Street / Route 553 is then followed for three miles to Newport.

Trail signage would direct trail users to turn right on Back Route / Route 629, then Baptist Road / Route 656, and Methodist Road / Route 732 through the village of Newport.

For two miles, the designated route returns to Main Street / Route 553.

Turkey Point Road and Maple Avenue constitute the fourth diversion from Route 553. These quiet roads take trail users through woodlands and alongside scenic lakes and open bodies of water.



Turkey Point Road and Maple Avenue near Dividing Creek with adjacent marshes, woodland, and lakes

Route 553 is returned to for a distance of half a mile, from the village of Dividing Creek to the point where Main Street meets Dragston Road.

Here, signage would direct trail users to bear left and follow Dragston Road / Route 614, then Route 725 until that road ends once again at Route 553.

Main Street / Route 553 is followed for just over a mile to the outskirts of the village of Port Norris. Trail signage would direct trail users to turn right and proceed south on Strawberry Avenue. This low-traffic volume road is followed to its end, which is the beginning–point of an existing mile-long multi-use trail that skirts the tidal mud flats between Port Norris and Bivalve. At a point adjacent to High Street, is a small parking area that serves as a trail head. Just across High Street is the Bayshore Discovery Project and New Jersey’s tall ship the A. J. Meerwald.

This location also serves as the western end-point of the Maurice River Trail. Trail users wishing to continue on to Mauricetown can follow the Maurice River Trail north for six miles to do so.

The Mauricetown – to – Millville segment connects Mauricetown to Millville, utilizing the cartway of Routes 670 and 627.

The intersection of Buckshutem Road / Route 670 and Mauricetown Bypass / Route 649 is the junction of the Maurice River Trail and the Trolley Trail. Northbound trail users would encounter signage instructing those wishing to follow the Maurice River Trail to turn right, with those wishing to follow the Trolley Trail instructed to continue straight through the intersection to continue north on Buckshutem Road.

After four miles on Buckshutem Road / Route 670, the town of Laurel Lake is reached. Signage would direct trail users to bear right on Silver Run Road / Route 627. Four more miles on Silver Run Road brings trail users to Millville. A quarter mile on Cedar Street reaches Main Street / Route 555.

At this point connection is made to the Vineland to Atlantic City Trail, described elsewhere in this report.

The Millville – to – Bridgeton segment connects Millville and Bridgeton by utilizing the cartways of Route 49, Route 608, and Route 552.

From the intersection with Cedar Street, signage directs trail users one mile west along Main Street / Route 49.

The on-road trail would then utilize Carmel Road / Route 608 for four miles, then six miles on Irving Avenue / Route 552 to Bridgeton.

The final half mile on Laurel Avenue in Bridgeton is shared with the on-road routing of the Bridgeton – Camden Trail. In downtown Bridgeton the trail meets with the Sturgeon Trail South Branch, and back to the Bridgeton – to – Mauricetown segment of the Trolley Trail.



Cumberland to Cape May Trail

Length = 5.5 miles
(2.9 miles trail + 2.6 miles on road)

The Cumberland to Cape May Trail is envisioned as the northern end of a future rail-trail that will connect Cumberland County with Cape May.

Within Cumberland County, this trail will connect with the proposed Maurice River Trail in Port Elizabeth. When constructed, the Maurice River Trail would follow the former PRSL railroad to an end-point at Weatherby Road. The Cumberland to Cape May Trail would begin at this point by sharing the cartway of Weatherby Road for two-and-a-half miles east.

From that point southward, this study recommends that a new multi-use trail be constructed on the abandoned rail-bed of the PRSL. The former right-of-way is part of Belleplain State Forest. After three miles, the Cape May County line is reached.

Once gaps in Cape May County are closed, this trail will connect to three miles of existing multi-use trail in the borough of Woodbine named the "Woodbine Railroad Trail," and ultimately on to Cape May.



Existing trail parallels abandoned PRSL rail-bed south from Weatherby Road



Vineland to Atlantic City Trail

Length = 10.1 miles
(2.1 miles trail + 8.0 miles on road)

The Vineland to Atlantic City Trail begins in Millville, utilizes existing roads to Vineland, then continues on an inactive railroad owned by the State of New Jersey to the Atlantic County line. This is envisioned as the western end of the trail system now in place and being expanded in Atlantic County.

Until such time as connection is made in Atlantic County, this trail also stands on its own merits, both as an on-road bicycle route linking Vineland and Millville, and as an off-road trail providing access to the suburban neighborhoods two miles northeast of downtown, to Fiocchi Park, and to Vineland's business district.

It must be stressed that the multi-use trail portion of the Vineland to Atlantic City Trail will only be feasible if the State of New Jersey allows "rail-banking" of the inactive line between Vineland and the county line. Although this freight line has been inactive for many years, there is potential for re-activation at some point in the future. Therefore abandonment is unlikely. If the State does allow rail-banking, the trail would be constructed with the understanding that the trail would be removed if railroad service returns. At that point, an alternate alignment for the trail would need to be worked out.

The Vineland to Atlantic City Trail begins at Main and Cedar Street in Millville (where connection is made with the Trolley Trail).

The Vineland to Atlantic City Trail proceeds east on Millville's Main Street six blocks to the intersection with Third Street.

At that point, signage will direct trail users to turn north on Third Street for almost a mile until the intersection with Wheaton Avenue / Route 555.

At this point trail users will bear right onto Wheaton Avenue / Route 555 for three miles to the intersection with Grant Avenue.

After a left turn, Grant Avenue is followed for approximately a quarter mile to East Avenue.

Trail users are directed to right turn on East Avenue and follow that for three miles, through the Landis Avenue business district, to Hendee Road. At that intersection a right turn is made and after a short distance a new multi-use trail begins parallel to the left-hand side of the roadway.

After Hendee Road curves away to the right, the trail built on the rail-bed continues straight for two miles, to the Atlantic County line. Grade crossings will need to be designed at Valley Avenue, Oak Road / Route 681, Hadsell Avenue, Main Road / Route 555, and Vine Road. If it can be coordinated with adjacent Atlantic County, a short section across the county line will bring trail users to the intersection of Brewster Road / Route 672 and Wheat Road / Route 619.

Just inside Cumberland County, if a short (700 foot long) trail easement can be negotiated with the owners of one parcel (Block 1905, Lot 16), the trail can be connected to the Little League ball field at Fiocchi Park.

Main Road / Route 555 carries a high volume of motor vehicle traffic at relatively high speeds. This grade crossing will need careful design consideration. Pushbutton-actuated traffic signals may be appropriate here.



Inactive tracks looking west from Vine Road



Before and after rendering of potential trail along Hendee Road in Vineland

B. Trail and Trailhead Facilities

1. Parking and Access

Strategically located destination and arrival points along the trail corridor are often referred to as “trailheads.” These points are generally best placed with approximately similar distances between each to provide users with points of access, information and accommodation. The preferred distance between trailhead locations varies based primarily upon the number (density) of users. Trailheads can be placed in appropriate locations to accommodate users, limit access to the site, and concentrate amenities in a relatively compact area. More often than not, multiple smaller scale trailheads serve major corridors best by distributing users throughout the corridor rather than one or two central parking areas.

2. Comfort Accommodations

Often subconsciously, trail users gauge the usability of a trail by the level of basic physical accommodations that were available during the experience. The key to providing accommodations is not volume or frequency as much as communication of the location of the amenities. As long as users know where they can find a detailed orientation map, restroom, source of potable water, and rest areas, they will have confidence in venturing out on their ride or trek.

In addition to parking, seating, picnic and rest areas, information kiosks and orientation signs and restrooms are the basic elements that provide an attractive and well used trailhead. Rest facilities can range from port-a-john type portable units to highly sophisticated permanent restroom facilities that tie into the local sanitary sewer system. Alternately, restroom facilities can now be provided with long-life expectancy (extremely durable) composting toilet units with fans that run on solar powered roof panels. Such technology, as can be seen at Hawk Mountain Preserve in Berks County, Pennsylvania, is reducing the requirements of locating near existing infrastructure.

3. Signage and Orientation

First and last impressions of any facility are often based upon the level of ease in which one can comprehend, visualize and orient with a facility. Properly placed, durable and graphically attractive orientation signs can quickly direct and orient a first time visitor to appropriate areas of the trailhead and the trail or equestrian facility and the overall regional trail system. The first map that a visitor experiences should provide a clear sense of “you are here,” and where you can or should navigate. More detailed information can be provided in the form of written brochures including written policy and more detailed maps. These maps and text can convey details such as facility regulations, local resources (stores), eateries and attractions. For example, bicyclists want to know where they can find a local bike repair shop, hikers want to know where natural areas are located and equestrians need to know where they can purchase oats, hay, straw or possible additional tack supplies.

4. Emergency Contact

As important as proper orientation, emergency contact is critical to all users. With the increasing number of cell phone users today, chances are good that trail users are never far from a source of emergency contact. In extreme cases of emergency, such as a severe trail accident, users need to know where the closest hospital, doctor, emergency room or veterinarian can be located. All of Cumberland County is within the 911 service area.

5. Location of Trailhead Facilities

Trailhead facilities should take advantage of existing parks and public facilities in Bridgeton, Bivalve, and Bayside. Possible and logical trailhead locations for walkers and bicyclists could include locating enhanced facilities at the connection points between the six proposed trails.

Equestrian trailhead facilities will require more land area and will need to be located at strategic points within the corridor. These points require direct access to the trail system and will need to provide the basic access, parking, stable and corral facilities. Parking areas need to include generous space for the turning of horse trailers. Equestrian trailheads may range from more rustic accommodations in more remote places, to possibly highly sophisticated, more complex facilities where appropriate.

C. Partnering with Local Businesses

Using the trail system to promote local businesses may provide needed trail facilities as restaurants and the like provide toilets and such to their customers.

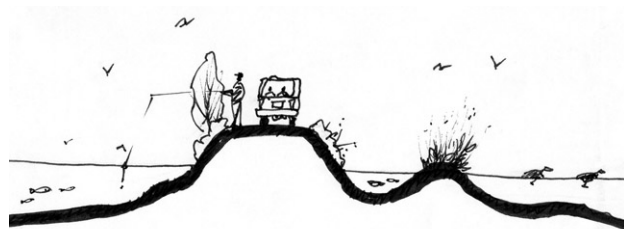
D. Treatment of Trail Corridors

The rail-trails recommended by this study traverse the wonderfully diverse landscapes that make up Cumberland County. These range from berms elevated only slightly above tidal waters (e.g. the Maurice River Trail in Matt's Landing), to dense woodlands (e.g. Sturgeon Trail in Hopewell Township) to open agricultural lands (e.g. Bridgeton – to – Camden Trail in Upper Deerfield Township) to urban and suburban landscapes (e.g. Vineland – to – Atlantic City trail in Vineland).

Each presents a unique experience for trail users. Carefully designed landscaping placed at the same time as the trail is built can enhance both the trail and the trail's environs.

Berm at Water's Edge

The abandoned Pennsylvania-Reading Seashore Lines branch to Matt's Landing is already in use as an unpaved, single-lane roadway. This study recommends utilizing this as part of the Maurice River Trail alignment. The vistas across the river and adjacent tidal pools are breathtaking. Built by the railroads one hundred years ago, these earth berms are stabilized by grasses, shrubs and occasional low trees.



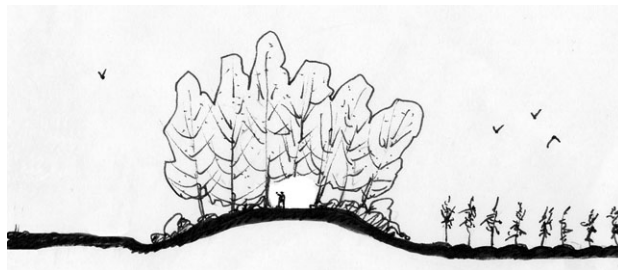
Woodlands

Mature native deciduous groupings of cherry, oak and some evergreens such as holly and hemlocks predominate in the woodlands of Cumberland County. Thinning out some understory plants adjacent to the trail can enhance the effectiveness of the older specimens. A porous trail surface, consisting of fine crushed stone or permeable asphalt pavement, would allow rainwater to re-charge the soil (and the aquifer), and prevent undue concentration of stormwater runoff and consequent erosion.

Agricultural

Passing through farmland, very often the abandoned railroad has reverted to woodland, with the mix of deciduous and evergreen trees acting as de facto windbreak between farm fields. Careful

placement of the trail within the right-of-way (a gently curving alignment rather than a strictly straight one) can avoid the felling of mature specimens that provide welcome shade during summer months. As described above, understory shrubs and groundcovers should be selectively thinned adjacent to the trail.



Urban / suburban

The inactive rail line in Vineland, with its rails and ties still in place, is difficult to mow and maintain, the result being a “no-man’s land” of brush, weeds and windblown litter. By removing the rotted ties and rusted rails and creating a multi-use trail in its place, a marvelous off road bike and hiking trail is provided. Landscape improvements might include the placement of appropriate shrubs and compatible shade trees along the trail, particularly in locations adjacent to residential neighborhoods and roadways.

In every case, the planting of native species is encouraged.

E. Proposed Easements and Property Acquisition

This study examines the viability of six trail corridors in Cumberland County. At best, abandoned railroads will comprise only about one-quarter of the trail network’s length, and the greater portion of those abandoned railroads are held by private property owners. That said, this study does not recommend the use of eminent domain to secure trail easements or rights-of-way from private property owners.

The next stage in the implementation of a trail network would include a comprehensive program of interviews with the property owners with whom easements would need to be negotiated or rights-of-way purchased.

Implementation of that portion of the Maurice River Trail north and south of Mauricetown Bypass / Route 670 is contingent on obtaining the consent of Winchester & Western Railroad to “railbank” three miles of inactive railroad. If W&W agrees, the trail would be built on the rail-bed with the understanding that should the railroad ever re-activate the line, provision would be made for either a new parallel trail or a trail on a new alignment.

In order to construct the Vineland - to - Atlantic City Trail, approval to “railbank” two miles of former Central of New Jersey track will need to be obtained from the state of New Jersey, who owns the line.

A map showing existing ownership patterns along the proposed trail corridors is provided in the appendix.

F. Operation and Maintenance

1. Proposed Agency Responsibilities

The proposed trail network passes through twelve of fourteen municipalities in Cumberland County. More populous townships may be able to expand their parks maintenance programs to include the new trails; less populous jurisdictions are less able to assume maintenance responsibilities. A critical next step in the Trail implementation process is to clarify and formalize maintenance responsibilities for each trail segment.

Here are several possible alternatives to management the development of the different rail-trail in Cumberland. The solution for any particular segment may involve one or several of these approaches.

a. County and Local Municipality Resources: Cumberland already manages an extensive network of County roads. Since all of the potential trails examined “go somewhere,” they are eligible for transportation funding. Incorporating trails and side-paths into plans for the upkeep and improvement of County roads can make projects more attractive for funding. The expertise to design, manage and improve roads and trails clearly exists in the County. Similarly, several municipalities have parks. Multi-use funding which includes trails for both recreation and travel to and through the parks makes park funding more attractive to the funding sources. Here again, the design, management, and construction skills of these municipalities can include trail development.

b. Supplementing Existing Agency Resources with Private Resources: Large amounts of funding are available from private sources such as foundations and corporate programs. However, such sources rarely make contributions to governments and public agencies. One successful strategy is for a foundation to fund an appropriate non-profit to staff the management of trail and environmental projects. Sometimes this staff is assigned to work with the appropriate governmental agency.

c. Creating a Trail Authority: Some counties and other municipalities have created a trail authority to develop and manage trails. A good board and other strategies assure strong public involvement and support. An authority can seek the numerous sources of public funds available, and provide high-quality, long-term maintenance and management of trail, often in cooperation with local municipalities, non-profits, trail supporters and volunteers.

d. State and Federal Resources: Trails are often developed by state and federal agencies. Those parts of the trail system in Cumberland passing through such lands should be considered for such development and management as part of those resources.

e. Private Non-Profit Agency Development: Many trails have been developed, managed and maintained by Non-Profits as part of their conservation and/or health initiatives. This can be done successfully either along, or in partnership with other groups, agencies, and governments.

f. Volunteer and “Friends” Groups: Often part of non-profits, but not always, groups of “trail friends” and volunteers often plan, build and manage trails, particularly soft-surface and hiking trails. For multi-use trails, volunteers often work in collaboration with agencies for expensive items such as bridges and storm repair, while performing day-to-day maintenance and special improvement projects. Again, the mix of involvement will depend on the nature of any specific trail segment, and the strengths of any particular group or groups.

2. Overview and Description

Successful operation will rely on a continued and regular program of maintenance of the trail and associated support facilities. A Maintenance and Management Program will not only ensure a quality recreational or travel experience for the trail user but is also an essential ingredient of a risk management plan for the trail operator. Sufficient manpower and resources must be devoted to a regular maintenance schedule in order to meet these goals.

Among the factors determining maintenance requirements are existing landscape character and the nature and quality of capital improvements.

Another key element of the maintenance and management system of the trail would revolve around communication and information that would allow trail users to provide feedback and report on issues concerning trail maintenance and safety issues. This component of maintenance would be facilitated through the establishment of a trail users' organization as mentioned as well as through effective signage throughout the Trail providing users with information on who to contact regarding such matters. A thoughtfully designed and maintained web site could be effective in this regard.

The maintenance guidelines that follow are necessarily somewhat generalized, and will need to be re-evaluated at such a time when a detailed capital improvement program has been defined. The maintenance implications of trail improvements should be reviewed carefully when considering capital improvements. One particular area of concern, given the existing landscape conditions, is the problem of drainage and flooding that can quickly undermine pavement structures. Money saved during the trail development process may be spent many times over if inadequate design and development creates a greater than normal maintenance burden. Trail maintenance is a major program that is related to trail safety, attractiveness, and image. The trail operator risks liability for accidents, if maintenance is ignored or negligently executed.

It is anticipated that the operating agencies will develop management systems for their respective segments of the trail. It is recommended that consulting agreements for trail design services include a requirement that a detailed trail maintenance manual and schedule be provided.

The elements of this system should include:

- Inventory of the Trail and its related facilities.
- Setting of maintenance goals and standards for the quality of maintenance, hours of operation, etc.
- Developing the tasks necessary to achieve maintenance quality levels.
- Assigning the maintenance tasks to designated groups or individuals.
- Monitoring the quality and frequency of the work.
- Implementing a control system for tracking accomplishments and relevant costs.
- Evaluating the maintenance management program.

3. Table of Maintenance Tasks and Operations

Important maintenance tasks that management agencies must consider are indicated in the following Major Maintenance Tasks table as follows:

TABLE OF MAINTENANCE TASKS AND OPERATIONS

ACTIVITY	DESCRIPTION	FREQUENCY	COMMENTS
Mowing	4-foot min. wide each side of trail (where applicable)	3-4 times annually	Flail type mower best - less debris on trail
Pruning	Prune woody vegetation 4-feet back from sides of trail – 14-foot vertical clearance – remove invasive vines	Annually	Vegetation Management Program may reduce this task long term
Removal of Trees/ Limbs	Evaluation/ removal of unhealthy or dead trees and limbs	Annual	Fallen trees may remain as access control and to minimize disturbance
Signage	Maintain directional and informational signs	Permanent signs - periodically as required	
Access Control	Replace damaged access control devices	Periodically as required	Estimated frequency: 10% annually due to vandalism
Trail Surface (on local roads)	Resurface	Periodically as required	Based on municipal schedule
Trail Surface (gravel road)	Repair surface damage from vehicles, erosion, etc.	Periodically as required	Based on municipal schedule
Trail Surface (boardwalk)	Replace damaged areas	Periodically as required	Spur trails only
Drainage Structures	Clean inlets, keep swales clear of debris	Minimum - Annually	Complete rehabilitation during construction would dramatically reduce necessity for this type of maintenance after storms
Litter Pick Up	Trailside-litter pickup Access area litter pickup	Weekly or as required Weekly	Encourage continued user 'carry-in, carry-out' policy
Trash Collection	Removal of trash from receptacles at access areas	Weekly	Problems with non-user trash. Some agencies do not have trash containers at access points for this reason
Bridges	Inspection by Prof Engr (P.E.) every 2 years Maintenance of bridge to ensure structural integrity	Annually by NJDOT, Municipal or County Engineer	Bridges associated with public roads are already on a regular inspection schedule.
Graffiti Control	Repaint bridges/abutments as	Annual/spot basis	

ACTIVITY	DESCRIPTION	FREQUENCY	COMMENTS
	required		

4. Law Enforcement and Safety

Trail managers should take necessary steps to provide both a safe trail for the users and to protect themselves from liability claims. Where possible, hazardous conditions and attractive nuisances should be identified and removed during the original construction of the trail. Those that cannot be removed should be fenced off and/or have warning signs posted.

If trail segments are opened in phases, as is recommended in this study, clear mention should be made at all trail entrances and in any printed/electronic material (especially trail signage, maps, guidebooks and pamphlets) that portions of the trail are still not yet fully developed nor open to the public and that users must exercise the necessary care when using the Trail.

An effective maintenance program is critical for trail safety. The maintenance program should provide for regular safety inspections. Proper tree trimming and vegetation management are an important part of the safety program. This includes trimming of vegetation to maintain adequate sight distance for traffic safety and crime prevention purposes.

Several individuals at public meetings expressed concern that conflicts might arise between trail usage and hunting. A program to encourage awareness by both hunters and trail users of the need for responsible usage is critical.

In addition to reducing trail hazards, documentation of trail maintenance activities is essential in combating possible liability claims. Through written records of good maintenance practices, the managing agencies will be able to protect themselves from liability claims. In terms of property ownership and liability, it should be noted that New Jersey's recreational use laws largely protect landowners from liability related to recreational use of their properties as long as no fee is charged and the landowners use due diligence to maintain the property and/or warn recreational users of any safety hazards.

With the ever-increasing use of cell phones by the general public, including trail users, aspects of security have changed in recent years. Users are very well prepared to report and locate questionable activity on or within trail corridors. User surveillance tends to deter potential criminal activity.

5. Trail Facilities and Orientation Systems/Markings

A trail marking and orientation system benefits both users and trail managers. Signs should be erected at all cross streets and highways, even expressways, identifying the name of the cross street. Similarly, town names should be posted where the trail enters a town. This system helps trail managers to coordinate maintenance activities. The trail marking system could also help save lives in the event that emergency services might be required.

6. Vegetation Management

Effective vegetation management is a critical dimension of the maintenance program. Effective vegetation management is necessary to preserve and enhance the natural and scenic interest of the

Trail. Effective vegetation management is an important component of trail safety. Adequate sight distance along the trail should be maintained for crime prevention purposes. Hazardous tree limbs and other obstructions should be promptly removed.

The following system-wide standards for vegetation management are proposed:

1. *Mowing* - Herbaceous material should be mown three to four times a year a minimum of 4-feet from the trail edge (where the trail adjoins meadows, roadways or grain fields. A flail type mower is recommended as rotary types blow the screenings, gravel and mulch (surfacing) off the trail.
2. *Removal of Vegetation from Trail surfaces* – In order to maintain the integrity of trail surfaces, invasive vegetation should be eradicated through very limited and selective application of herbicides.
3. *Woody vegetation control* - Trees and shrubs should be controlled by an annual mowing along the edges of the trail (where trail is adjacent to fields, meadows and managed grass areas). Removal of woody vegetation in this width should minimize the need for frequent mechanical or hand pruning to maintain adequate horizontal and vertical clearances. Selective removal or “limbing up” of trees should also be scheduled to maintain or create desirable views from trail. Trees should also be kept clear of all drainage structures, bridges and walls that may be subject to mechanical damage by tree roots.
4. *Invasive Plant Species and Vegetation Control*: Vegetation control should discourage poison ivy along the trail and the removal of invasive plant species such as Mile a Minute weed.



Loading oysters onto railroad cars at Bivalve

G. Opinion of Probable Costs

1. Acquisition and Construction

In the opinion of the consulting team, the probable cost for Phase I of the Trail network (Phase I of the Maurice River Trail) will be approximately \$2 million. Implementation of the entire trail network, including all four phases, would total approximately \$10.6 million.

The budgetary opinion of probable construction costs presented in this report is based on analysis of trail characteristics across each segment of trail. Linear foot costs for each trail type are derived from CTC's experience with trails of similar characteristics in the New Jersey – Southeast Pennsylvania region. The typical linear foot cost for each trail type is adjusted by a factor reflecting special construction characteristics within the segment. An assumption has been made that trail widths and surfacing will reflect an initial lower volume of trail use, and, in many places, a rural environment. Over time, upgrades and widening of the trail may be considered.

The Summary of Probable Costs table follows. For a detailed analysis of probable construction costs, please refer to the appendix.

SUMMARY OF PROBABLE COSTS

Phase	Miles Off-Road TRAIL	Miles On-Road	Construction Cost	Easement Acquisition	Total Cost
Phase I	4.5	11.3	\$1,760,196	\$318,390	\$2,078,586
Phase II	7.1	9.6	\$3,137,227	\$246,240	\$3,383,467
Phase III	6.0	49.6	\$2,773,525	\$498,002	\$3,271,527
Phase IV	5.0	10.6	\$1,832,177	-	\$1,832,177
Total	22.6	81.2	\$9,503,125	\$1,062,632	\$10,565,757

A complete description of the methodology by which the value of easements was estimated is presented in Section III.D.

2. Maintenance Costs

Maintenance costs generally range from \$5,000 to \$7,000/per mile/per year for similar trails. We recommend that the responsible agencies use a figure of \$7,000 per mile to estimate maintenance costs during the first year after development. This figure can be evaluated at the end of the first year. This cost can be used for fundraising purposes as well as to solicit volunteer help for maintenance.

Many trail operators have been able to supplement their maintenance program by creating partnership agreements with local businesses, clubs and organizations. Formal cooperative agreements can be made with these partners that clearly define the roles and responsibilities of each party. Developing an effective maintenance management system is an on-going process.

H. Project Phases

A trail system of this size cannot be implemented all at once. Thus, a phased implementation is recommended. Four phases have been envisioned, beginning with construction of the first portion of the Maurice River Trail. The four phases have been depicted on four maps, included as Appendix F. The probable cost of each phase, both by construction and by acquisition, is included as Appendix G and Appendix H respectively.

I. Implementation and Project Management Strategy

1. The Need to Carefully Plan Project Phases: Few trail and transportation projects of the length and cost of a County-wide Rail-Trail system get built all at once. We have outlined on the cost estimate spreadsheet proposed priorities for development. This approach will result in the following benefits:

- Each phase of development will result in a **well-used trail segment** with no “dead ends”
- Each phase of development will **lay the groundwork** for additional phases
- Each phase of development is estimated to be **fundable in a logical manner**.

2. Action Steps and Rough Timetable for the First Phase: Here are the key action steps for trail implementation

Date	Action Item	Responsible Party
2010	Take the project on a “road show” Post the Rail-Trail Study on the County Web-site and in libraries Identify funding source for Managing Party Bring in potential Managing Party or Partner Identify first phase of development Identify and make application for detailed design of Phase One Using the Feasibility Study, contact property owners to begin discussions regarding future easements.	County County County County/Mg’g Party (if not County) County/Mg’g Party Mg’g Party Mg’g Party
2010-2011	Work closely with local municipalities, towns, citizens and parties of interest to develop detailed design criteria for Phase One. Meet with stakeholders for other trail segments Development “on-road” version of Phase One and other phases. Post on website, and make brochures available to the public. Run public walks/rides to showcase the potential trail system and its opportunities for recreation, travel, and economic development	Mg’g Party Mg’g Party Mg’g Party / Volunteers Mg’g Party / Volunteers
2011	Obtain funds for detailed design of Phase One, and retain consultant to prepare detailed plans, specifications, and cost estimates Apply for acquisition and construction funding	County/Mg’g Party (if not County) County/Mg’g Party (if not County)
2012	Acquisition of Easements Development of detailed trail alignment depending upon	County/Mg’g Party (if not County) County/Mg’g Party (if

	easements obtained and other planning input	not County)/ Consultant
2013	Obtain construction funding / begin construction of Phase One	County/Mg'g Party (if not County)

Implementation and Management Strategies:

1. The Need for Project Management: Even if a wealthy oyster captian were to appear from the past and bequeath millions to the County for a trail system, who would take charge of the detailed planning, design, right-of-way acquisition, construction and management of the trail system? Believe it or not, many municipalities around the country obtain numerous grants, and end up returning the funds because no one has the time to manage the project. Here are several alternatives to solving this problem. Just as we have a mix of Federal, State and local roads in New Jersey, the solution for each trail segment comprising the County-wide system will likely have a different strategy, or mix of strategies.

2. Management Alternatives: Here are several possible alternatives to management the development of the different rail-trail in Cumberland. The solution for any particular segment may involve one or several of these approaches.

a. County and Local Municipality Resources: Cumberland already manages an extensive network of County roads. Since all of the potential trails examined “go somewhere,” they are eligible for transportation funding. Incorporating trails and side-paths into plans for the upkeep and improvement of County roads can make projects more attractive for funding. The expertise to design, manage and improve roads and trails clearly exists in the County. Similarly, several municipalities have parks. Multi-use funding which includes trails for both recreation and travel to and through the parks makes park funding more attractive to the funding sources. Here again, the design, management, and construction skills of these municipalities can include trail development.

b. Supplementing Existing Agency Resources with Private Resources: Large amounts of funding are available from private sources such as foundations and corporate programs. However, such sources rarely make contributions to governments and public agencies. One successful strategy is for a foundation to fund an appropriate non-profit to staff the management of trail and environmental projects. Sometimes this staff is assigned to work with the appropriate governmental agency.

c. Creating a Trail Authority: Some counties and other municipalities have created a trail authority to develop and manage trails. A good board and other strategies assure strong public involvement and support. An authority can seek the numerous sources of public funds available, and provide high-quality, long-term maintenance and management of trail, often in cooperation with local municipalities, non-profits, trail supporters and volunteers.

d. State and Federal Resources: Trails are often developed by state and federal agencies. Those parts of the trail system in Cumberland passing through such lands should be considered for such development and management as part of those resources.

e. Private Non-Profit Agency Development: Many trails have been developed, managed and maintained by Non-Profits as part of their conservation and/or health initiatives. This can be done successfully either along, or in partnership with other groups, agencies, and governments.

f. Volunteer and “Friends” Groups: Often part of non-profits, but not always, groups of “trail friends” and volunteers often plan, build and manage trails, particularly soft-surface and hiking trails. For multi-use trails, volunteers often work in collaboration with agencies for expensive items such as bridges and storm repair, while performing day-to-day maintenance and special improvement projects. Again, the mix of involvement will depend on the nature of any specific trail segment, and the strengths of any particular group or groups.



Millville Traction Company trolley on High Street, Millville looking south from Pine Street circa 1900








J. Potential Funding Sources

A detailed listing of funding sources is given in the Appendix, and should be reviewed in detail for funding opportunities for each segment of proposed rail-trail.

Note that often different sources should be consulted for the different elements of trail development, namely

- Trail project management
- Right-of-Way Acquisition
- Trail Permitting and Design
- Trail Construction
- Trail Maintenance and Management

The following table is a **Trail Funding Matrix**, linking each proposed trail with the major appropriate sources. This list varies trail by trail depending on the trail's location (e.g. within the Pine Barrens, or within the Delaware Estuary) and who it serves (e.g. schools).

		Key Federal Sources							Key State Sources					Private Sources			
		Healthy People 2010 Community Implementation Grants	Community Development Block Grants	US Dept of Agriculture Community Programs	Coastal Zone Funding	SAFE-TEA LU (Federal Surface Transportation Program)	SAFE-TEA LU (Transportation Enhancements Program)	SAFE-TEA LU (Safe Routes to School Program)	NJ Transportation Trust Fund 's Local Aid Program	Green Acres Program	Smart Growth Planning Grants	New Jersey Pinelands Commission Grants	NJ State Joint Facility Funding	Office of Natural Resource Damage Assessment Funding	PSE&G Foundation	William Penn Foundation	Small Grants - Other Foundations and Private Sources
	Maurice River Trail	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Maurice River Trail Spur	•	•	•		•	•	•	•	•	•		•	•	•	•	•
	Sturgeon Trail	•	•	•	•	•	•	•	•	•			•	•	•	•	•
	Vineland to Atl. City Trail	•	•	•		•	•		•	•	•	•	•	•	•	•	•
	Bridgeton - Millville - Mauricetown Loop	•	•	•	•	•	•		•	•	•		•	•	•	•	•
	Cumberland to Cape May Trail	•	•	•		•	•		•	•	•		•	•	•	•	•
	Bridgeton North Trail	•	•	•		•	•	•	•	•	•		•	•	•	•	•

III. Methodology

A. Existing Plans and Field Survey

This feasibility study builds upon previous studies, planning efforts, current field surveys, interviews and workshops. The findings in this report are the products of information found in existing planning studies, synthesized with field observations, and input from the public participation process.

Information on existing conditions was obtained from Cumberland County in the form of GIS data layers and high-resolution aerial photography flown in 2007. This information was supplemented and updated by field observation. Information on property ownership was obtained from the Cumberland County parcel database, current as of December 2008.

Planning documents incorporated into this study are these:

Bicycle Facilities Inventory and Analysis, 2007, Cross County Connection Transportation Management Association. This study recommends construction of three of the Cumberland County rail-trails also recommended by this report: Sturgeon Trail (West Branch), Bridgeton – to – Camden Trail, and Cumberland – to – Cape May Trail.

Cumberland County Bike Trail Study, 2000, prepared for the Cumberland County Board of Chosen Freeholders and the County Planning Board. This study's inventory of county roadways was a contributing factor in determining which county roads are suitable as on-road connectors.

B. Public Participation

Public participation has been a critical aspect of the trail planning process for the study. Benefits of public participation include:

- Stakeholders and their constituents can exchange ideas and learn about the recreational, environmental and socio-economic benefits of the proposed trail, as well as give voice to their concerns.
- Public participation is an opportunity for consensus building. Conflict and delay are minimized.
- Additional resources to support trail implementation and management are discovered.

Public workshops were conducted on Tuesday, February 2, 2010; Thursday, March 25, 2010 and Wednesday, April 28, 2010.

Another mode of public participation has been direct outreach with principal stakeholders. Meetings (in person or by telephone) were held with the following individuals:

Fred Winkler
Jonathan M. Broder
Miki Krakauer

Winchester & Western Railroad Company
Conrail, Vice President and General Counsel
New Jersey Department of Transportation Freight Services

Wade Sjogren
Meghan Wren
Roy Kaneshiki
Lee Burke
Kim Gauntt
Tony Stanzione
Jody Carrara

President, Whibco Inc.
Executive Director, Delaware Bay Schooner Project
Cumberland County Cultural and Heritage Commission
Open Space Advisory Committee / South Jersey Wheelmen
Cumberland County. Recreation Commission
Cumberland Development Corporation
Association of NJ Environmental Commissions

C. Trail Alignment

Alignments that offered a quality trail experience were given priority where possible. For example, the existing trail and earth-surfaced roads in Matts Landing offer beautiful vistas across the Maurice River and adjacent open bodies of water.

The proposed trail corridors were reviewed by the Trail Study Committee with no major revisions recommended.

D. Trail Easement Valuation

Background

For the purposes of this study, the consultant team has designated and valued priority segments for future public use, access and management. Despite the historic and extensive system of rail service to (and through) Cumberland County, the corridors available for rail-trail use today are short, disaggregated and held by multiple private and public entities. The fragmented ownership results from successive rail corridor abandonments by the operators with subsequent reversion of title beginning in the 1920s and continuing through the 1980s. As a result, the reestablishment of trail corridors atop abandoned lines requires the valuation, negotiation and purchase and assembly of small strips from wide range of landowners. This is not an impossible task *per se*, but one that requires thoughtful consideration, policy coordination and financial commitment by Cumberland County planners and elected officials at several levels of government.

The Valuation Problem

In traditional railroad right-of-way corridor valuation the buyer and seller engage appraisers who establish the fair market value of the subject property by examining sales of “comparable” rail lines. Because rail lines are not frequently exchanged the appraiser will examine and adjust comparable sales from other regions and/or states over several years. The appraiser will look closely at the property rights acquired by the buyer vs. property rights retained by the seller or third parties, such as utilities, public entities and private access or use easements, leases and the like. The appraiser will follow a similar methodology when valuing rail-trail transactions, which have become increasingly frequent in the New Jersey – Southeast Pennsylvania region over the last few years. In many respects, there is a better body of comparable sales for rail-trail projects than for active freight rail (or passenger) corridor sales.

As noted, traditional methods for rail valuation rely on the highest-and-best use *finding* as a continuous corridor for transportation or common carrier purposes. On the other hand, the valuation of a rail-trail project often turns on a highest-and-best use as a public recreational

corridor or access area akin to a park or open space. This finding typically relies on comparable sales of small parcels, short line segments bearing higher per acre unit values and/or limited rights including easements and leases limited to public access. Alternatively, many rail-trail valuations include analysis parcels of land acquired by government for active or passive recreational purposes, such as ball fields or forest land, as well as conservation easements for habitat and farmland preservation. Together, this alternative universe consisting of *like-kind* public land transactions plays an important role in valuing rail-trail projects.

It is critical to note that where a rail-trail project must be assembled from scratch or reassembled from multiple private and public owners the appraisal task is entirely different. The appraiser cannot value the line as a continuous corridor but much look “across-the-fence” to adjacent property values for guidance on valuing each small parcel. Such is the case before Cumberland County, as many of the segments comprising this rail-trail study have the look and texture of a continuous rail corridor – albeit overgrown – but exist as a checkerboard of separate legal ownerships and valuation requirements.

Valuation Approach

Based on mapping prepared by Campbell, Thomas & Co. there are over sixty (60) separate tax parcels and property owners that comprise the six priority corridors referenced in this rail-trail study. Should the corridors be reassembled with public money – Green Acres or equivalent – then each parcel will require an appraisal, an enormous task. However, for efficiency purposes Strauss and Associates has been asked to apply our land acquisition expertise to furnish Cumberland County with “tracking” values to better approximate the preliminary cost of assembling each corridor.

For this task we have assumed the County will acquire an easement for public recreational trail purposes. This easement is roughly equivalent to a farmland preservation easement insofar as it represents a permanent restriction on title, yet allows the owner use of the underlying “restricted fee-simple interest” as well as the remainder (non-eased) portion of the property. The proposed trail easement does not force property subdivision nor does it prohibit cross-access for private driveways, utilities or calculation of the eased area for gross site area density, an important element in property development and value. Moreover, the trail easement that we envision is limited to a width of 30’ which permits construction of a 10’ wide improved trail surface with adequate buffer offsets for shade trees, slope, drainage and trail maintenance. With this “conceptual easement” in place we are free to apply our valuation methodology to the various corridors.

To estimate corridor values for the seven trail corridors we compiled and subsequently applied comparable sales data from the following sources:

- Publicly-recorded deed records (2008-2010);
- TREND real estate closing records for vacant and improved properties in Bridgeton City, and Commercial, Downe, Greenwich and Mauricetown Townships (2008-2010);
- Cumberland County farmland preservation program appraisal data for closed and pending easement projects (2008-2010);
- NJ DEP / Green Acres Program appraisal reports and staff meetings to review closed and tabled open space preservation and trail projects (2005-2009);
- Privileged and confidential appraisal data from our files; and
- Confirmation of market data with Cumberland County real estate professionals.

In addition, we inspected all six corridors, both visually and physically (where practical), examining key conditions such as land use, property improvements, legal and physical road access and abutting property conditions. Data that appears on our rail-trail valuation spreadsheet (please refer to appendix) has been assembled for reliance by Campbell, Thomas & Co. utilizing tax parcel and GIS layers furnished by Cumberland County.

Valuation Findings

Based on data contained in the attached spreadsheet, “**Cumberland County Rail-Trail Estimated Acquisition Cost,**” we anticipate trail assemblage will cost \$1.06 million in 2010 dollars. This cost estimate is spread over +/-20 miles of potential trail corridor, of which approximately one-fourth (5 miles) is already owned by government and is assumed for a nominal consideration transfer. In addition, our cost estimate is limited to the real property (easement) value and does not include project management soft costs, principally, appraisal, title, survey, legal closings and staffing.

How were our values derived? In areas where the trail corridor passes through farmland, appurtenant woodland or wetlands we have used as our benchmark two-year averaged unit values furnished by the Cumberland County farmland preservation program. Within the limits of this study, we believe the value of an acre of eased trail corridor is *roughly-equivalent* to an acre of eased (preserved) farmland. While a farmland preservation easement is intended to extinguish most residential development (*prohibitive*) and a trail easement is written to allow public access and use of a property for a recreational purpose (*permissive*), we have found that the two easement forms demonstrate a rough-equivalency when applied to the Cumberland County land market for this unique land use sub-category.

As noted, this equivalency is applied to areas where the trail passes through raw land in the form of farmland, woodland and wetlands (about 80-85 percent of total linear run for this study). We have further derived the per acre (unit) value based on a “high-medium-low” continuum by applying the trail’s impact on the abutting property. Where the impact is high the trail is deemed to impose a more severe effect on its remainder “mother” or appurtenant lot and is pegged to a value of \$10,130 per acre. Where the impact on the remainder or appurtenant lot is low – usually because the corridor runs through isolated forest or wetlands or where the mother or appurtenant parcel is (itself) of low utility – then a value of \$6,250 per acre was applied. For impacts judged “medium” a midpoint value of \$8,190 per acre was employed.

Where the trail passes through improved properties, i.e., within the City of Bridgeton and villages of Greenwich, Dorchester and Leesburg, we have derived unit values from TREND real estate closing data. For each trail segment we looked closely at whether the trail occupied a portion of a larger improved residential or commercial lot, and how close physically the trail is located *vis-a-vis* the known improvement, thereby permitting us to adjust for degree of impact and value assigned to the easement. There are several small but highly-valuable trail segments that run through Bridgeton and adjacent portions of Hopewell and Upper Deerfield Townships, including parcels with retail and office businesses or dwellings.

In addition, we estimated a unit value for continuous rail corridors where lengthy trail segments are owned by Winchester & Western Railroad or Unimin Co. Both of these entities are in the business of operating railroads for extractive use purposes and may consider partitioning their rail corridors for future *rail-with-trail* use through an easement, lease or license agreement. In this

instance, we developed an opinion of value based on a long-term (permanent) property interest that accommodates the *rail-with-trail* model and adjusted the unit cost to fit current real estate conditions. In addition, we examined two appraisals and failed purchase offers for similar corridors in South Jersey, and benchmarked our unit values substantially above said appraisals recognizing that they likely failed because of the seller's position (and our concurrence) that the appraised values were erroneously derived and simply too low.

Finally, where the trail corridor runs through publicly-owned lands, including properties owned by the State of New Jersey and various municipalities, we have assumed a zero dollar cost for transfer. We believe that supportive governmental units will – or should – enter into a management agreement with the trail sponsor to permit public use absent a cash sale. The transfer may take several forms, such as fee, easement, lease, license or management agreement.



Mauricetown Station, circa 1900

This location is the inactive grade crossing of the Winchester & Western at the Mauricetown Bypass

IV. Inventory and Analysis

A. Physical Conditions

1. Natural Features: Opportunities and Constraints

Of special significance to this study is Cumberland County's unique geography – its tidal rivers, salt marshes, woodlands, farms and historic towns and cities. The distribution of these features influenced Cumberland County's early industries, which in turn determined where railroads were built. The decline of certain of these industries, then, led to the incremental abandonment of the railroads, or portions of them.



Google Earth view of Bivalve showing Maurice River winding north toward Millville

Because the available abandoned railroad rights-of-way are located in separate parts of the county and are not linked together, this study recommends on-road bike facilities to connect them. The physical condition of the road network, and the speed and volume of motor vehicle traffic on those roads, is of utmost importance when considering which roads to designate as links in the trail network. The Cumberland County Bike Trail Study, completed in 2000,

conducted a comprehensive inventory of the County road network, and its findings were a contributing factor in deciding which roads to include in this study's recommendations.

In general, roads with low to moderate motor vehicle volume and roads with wider cartway widths were favored. In those cases where there is room for improvement, it is hoped that designation of those roads (and adoption of this report by the County) will mean that bicycling/pedestrian improvements to those roads will be carried out, perhaps as part of the regular maintenance cycle. In other words when a designated road needs to be re-stripped, re-paved or rebuilt, any new design will accommodate bicycle and pedestrian traffic through the use of bike lanes, wider paved shoulders, or side paths.

2. Cultural Features, Historic Sites and Land Use

The consulting team inventoried existing and proposed land use, cultural features, and destination and activity nodes within and adjacent to the study area.

One purpose of the trail network is to connect important cultural features within the community, such as schools and parks. Other important features include museums, historic sites, business districts and employment nodes.

A partial list of key features identified includes:

- Bayshore Discovery Project
- Historic Mauricetown
- East Point Lighthouse
- Caviar Pier
- Historic Greenwich
- Elk Lake / Hopewell Township Open Space
- Cumberland Manor
- Bridgeton Business District
- Bridgeton City Park
- Cumberland County College
- Vineland Business District
- Millville Business District
- Wheaton Arts & Cultural Center
- Belleplaine State Forest

3. Ownership Patterns

Current owners of the abandoned railroad rights-of-way were identified. Ownership was listed based on current record data as of December, 2008. Detailed ownership maps are included in the appendix.

B. Analysis Maps

A composite Analysis Map (derived from GIS data, field surveys and aerial photography) was prepared to summarize the conditions inventoried. This map serves as the background for the maps included in the appendix.

C. Usage Feasibility

The rail-trail network will connect Cumberland County's cities, employment centers, natural areas and cultural attractions through a combination of multi-use trails and on-road bicycle facilities.

Recreational users of the trail system are anticipated to include:

- Joggers, hikers and walkers
- Bicyclists
- Anglers
- Equestrians

As an integral part of Cumberland County's transportation system, and with links to many neighborhoods, towns, employment and commercial centers, the study anticipates use for local travel and commuting. Major benefits identified in interview and public workshops include:

- The ability to avoid traffic congestion.
- The ability to commute in a highly desirable, relaxing environment.
- The competitiveness afforded by "short-cuts" created by placing portions of the trail off-road. Distances by trail may be much less than those on the highway for many trips.

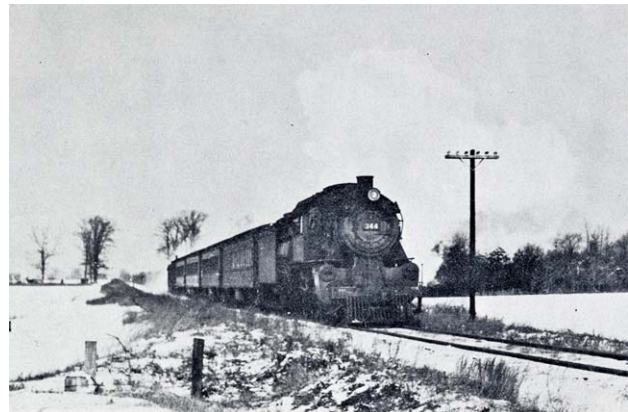
D. Railroad Corridor History and Current Ownership

Of 105 miles of railroad constructed in Cumberland County, 62 miles are still in service and 43 miles have been abandoned.

Of the 43 miles of abandoned railroad in the County, 33 miles are held by private owners and 10 are in public ownership.

Of the 10 miles of abandoned railroad that are publically owned, 4 miles have had public roads built on them.

These four railroad categories (in service, private abandoned, public abandoned, public road) were inventoried and integrated into the GIS-based county map developed by the consulting team for this study. Please refer to the Railroad Maps included in the appendix.



Northbound passenger train on the Bridgeton Secondary in the late 1930s

Because the majority of railroads in the County are in active service today, the owners and operators were contacted and asked about their positions regarding rail-with-trail, rail-banking, and rail-to-trail.

Rail-with-trail is a shared-use corridor, where a trail and an active railroad run adjacent and parallel to one another, sometimes separated by a fence. This has the advantage of serving an area with both a multi-use trail and freight service, each of which provide complementary economic development advantages. With rail-with-trail, security for the railroad is enhanced. This is because vagrants, vandals and ATV-riders (all of whom pose a safety and liability concern to railroads) tend to be deterred by the presence of trail users (most of whom carry cell phones).



Rail-with-trail provides both the benefits of a multi-use trail and railroad service to a community

Winchester & Western, owner of the majority of the active freight tracks in Cumberland County, has stated that the company will not allow “a trail adjacent to or alongside any railroad over which we currently operate.” This includes the freight line to Seabrook owned by Upper Deerfield Township and operated by W&W.

Conrail Shared Assets, which operates the active railroads in and around Vineland, indicated that the railroad would evaluate any proposal for rail-with-trail on a case-by-case basis.

New Jersey Department of Transportation Freight Services stated that rail-with-trail might be considered, although safety and liability are concerns that would need to be addressed by any proposal.

Rail-banking may be a possibility when a railroad is inactive, but not abandoned. With rail-banking, a trail replaces the unused tracks (instead of running alongside the tracks as rail-with-trail does). The trail is built with the understanding that should the decision be made to re-instate rail service, the trail would need to be removed and built either alongside the right-of-way, or elsewhere.

This study recommends that portions of the Maurice River Trail and the Vineland – to – Atlantic City trail be created by rail-banking portions of the Winchester & Western Railroad, and the state of New Jersey-owned railroad in Vineland, respectively. Please refer to Section II.A of this report.

Rail-to-trail is the creation of a permanent trail on an abandoned railroad corridor.

In order to determine location feasibility, the four classifications of railroad (in service, private abandoned, public abandoned, public road) were superimposed over a comprehensive GIS-based map, seamlessly coordinating data including the location of urban centers, commercial and cultural attractions, roadways, waterways, parkland, and property ownership data.

Analysis of this information, combined with field visits and input from three public workshops, yielded six potential trail corridors.

E. Feasibility of Rail-with-Trail Corridors

Rail-with-trail may be an option when a multi-track railroad abandons one or more tracks, but maintains one or more tracks in service. A trail can then be built on the unused portion of the track-bed, adjacent and parallel to the remaining railroad track(s). In some cases, fencing is installed between the trail and the active railroad tracks.



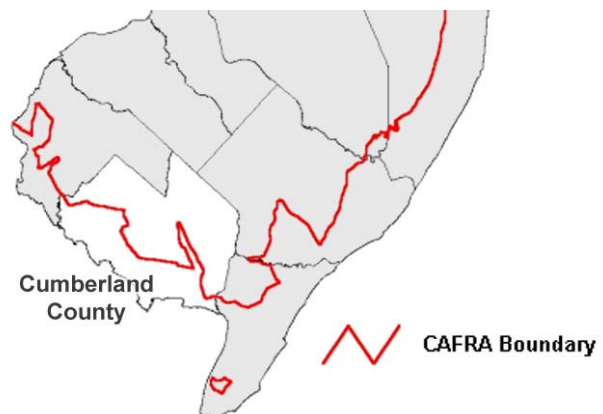
When just one track is abandoned of a double-track railroad, there is room for a multi-use trail

With the exception of Pennsylvania-Reading Seashore Lines' double-track electrified railroad north from Vineland, the railroads in Cumberland County were built as single track lines. This means that earthwork (cuts and fills) and bridges were built with just adequate width to accommodate a single railroad track.

So in the case of single-track railroads, unless that single track is removed, there is insufficient space for a multi-use trail.

To construct a trail within or just outside the railroad right-of-way (without using the existing rail-bed) would require careful design and potentially expensive construction, including cut-and-fill earthwork, new structures and drainage systems. Such construction would likely create disturbance of natural habitats and other adverse environmental impacts. Such construction is certainly not impossible, but there must be sufficient demand for the trail in order to justify the effort and expense.

In addition, any construction will be subject to approval by the New Jersey Department of Environmental Protection under the state Coastal Areas Facilities Act (CAFRA), in that portion of the county within the CAFRA boundary.



Coastal Areas Facilities Act boundary in southern New Jersey

A railroad must grant permission before rail-with-trail can be implemented. Some railroads allow trail construction, some allow it only with fencing, and some forbid trail construction. Safety and liability are often mentioned as concerns, as well as restrictions imposed by insurance providers. As stated in Section IV.D, Winchester and Western railroad has stated that W&W will not allow "a trail adjacent to or alongside any railroad over which we currently operate." Both Conrail Shared Assets and New Jersey Department of Transportation Freight Services, when contacted by the consulting team, did not categorically

rule out rail-with-trail but indicated that any approval would be on a case-by-case basis and any proposal must address safety and liability concerns.

V. Appendices

- A. Potential Regional Trail Links Map
- B1. Recommended Trails Map – North
- B2. Recommended Trails Map – South
- C1. Railroad Map - North
- C2. Railroad Map - South
- D1. Trail Corridor Ownership Map – North
- D2. Trail Corridor Ownership Map – South
- E. Property Ownership Maps P1 through P7
- F1. Trail Network Map – Phase I
- F2. Trail Network Map – Phase II
- F3. Trail Network Map – Phase III
- F4. Trail Network Map – Phase IV
- G. Preliminary Opinion of Probable Cost – Construction
- H. Preliminary Opinion of Probable Cost – Acquisition
- I. Potential Funding Sources