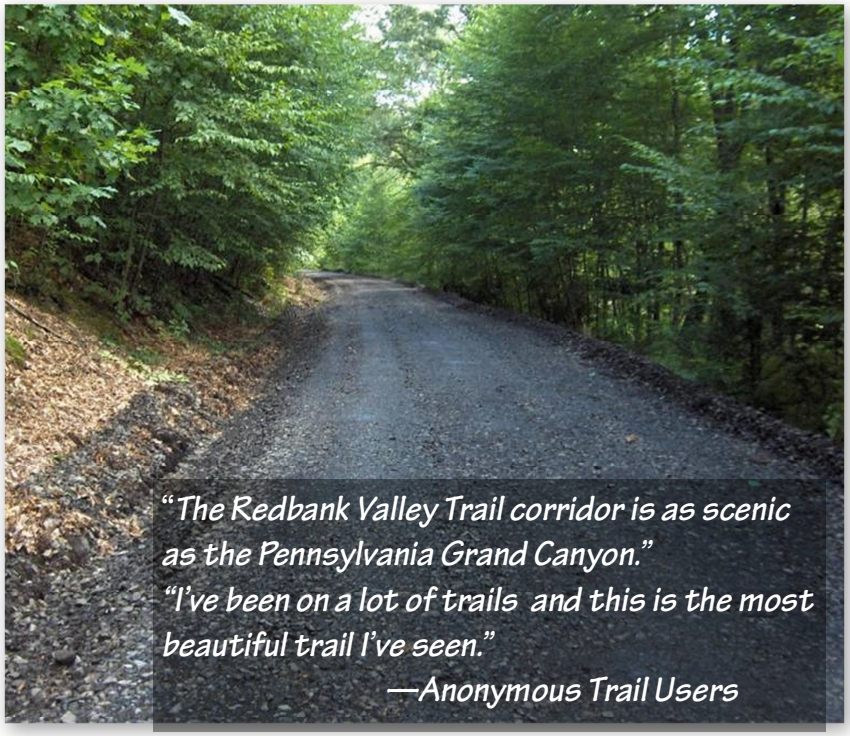
REDBANK VALLEY TRAIL FEASIBILITY STUDY



"The Redbank Valley Trail corridor is as scenic as the Pennsylvania Grand Canyon."
"I've been on a lot of trails and this is the most beautiful trail I've seen."
—Anonymous Trail Users

Redbank Valley Trails

Mackin

FINAL STUDY—JUNE 2011

ACKNOWLEDGEMENTS

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On behalf of the Redbank Valley Trails Association (RVTA), we would like to thank all of the RVTA members and volunteers for their contributions to not only the completion of the Trail Feasibility Study, but for all of their hard work, time, and energy that they have dedicated to the Redbank Valley Trails Association and making the dream of a rail-trail along Redbank Creek a possibility.

FUNDING

This project was financed in part by the Northwest PA Regional Planning and Development Commission's Greenways Block Grant Program to advance the implementation of the County and Northwest Regional Greenways Plan, made possible by funding from the Pennsylvania Department of Conservation and Natural Resources (DCNR) with matching funds provided by Allegheny Valley Land Trust, Jefferson County Development Corporation and the Redbank Valley Trails Association.

TECHNICAL ASSISSTANCE

The Redbank Valley Trail Feasibility Study was prepared on behalf of the Redbank Valley Trails Association, Allegheny Valley Land Trust, and New Bethlehem Borough Council by:

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SECTION 1: PROJECT BACKGROUND

REDBANK VALLEY TRAIL STATS:

Total Length = 51 miles

- 42 miles from Allegheny River to Brookville
- 9 additional miles from Lawsonham to Sligo Spur

Potential Trail Connections

- Armstrong Trail
- Baker Trail
- Brookville Branch
- Erie-to-Pittsburgh Mega Greenway
- Great Allegheny Passage

Potential Trail Towns

- New Bethlehem
- Hawthorn
- Summerville
- Brookville

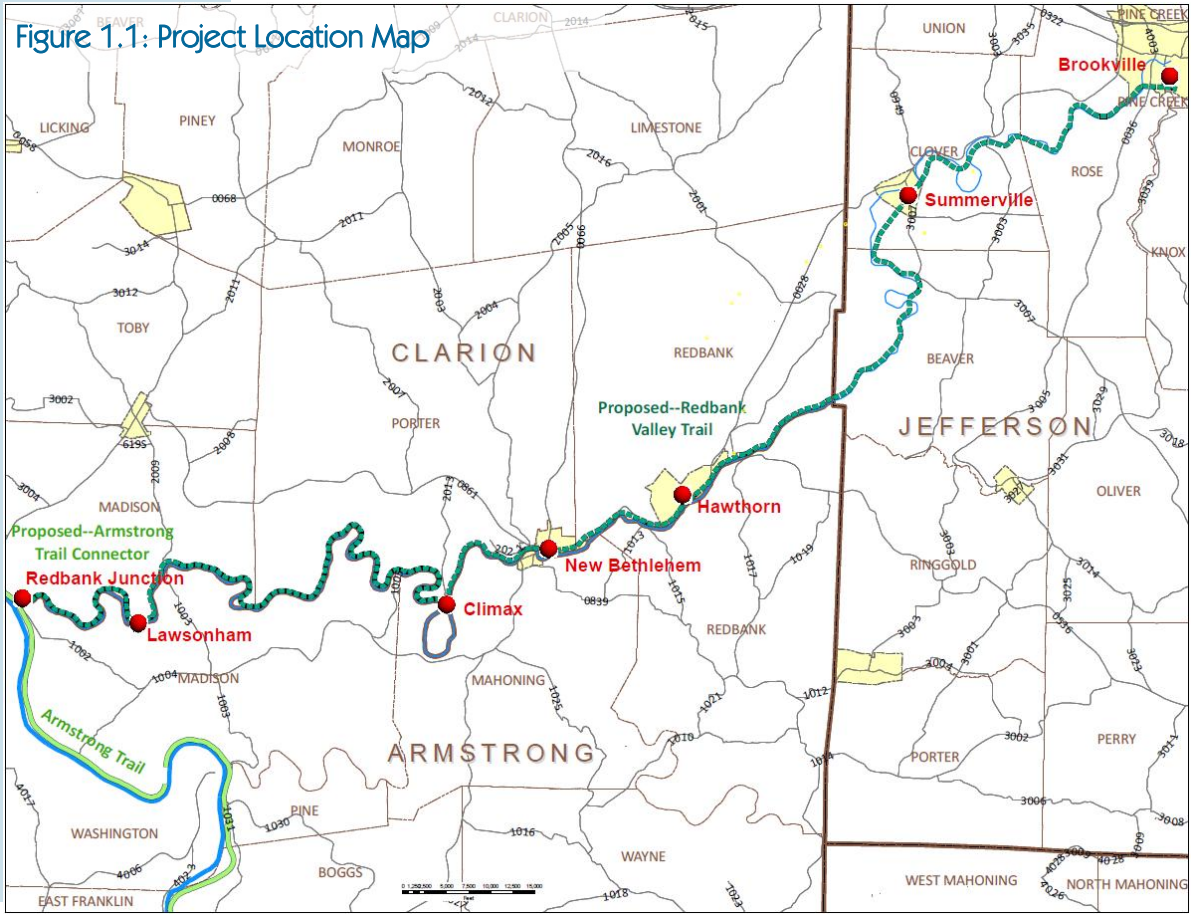
PROJECT LOCATION

The Redbank Valley Trail is located in Clarion, Armstrong, and Jefferson Counties in north central Pennsylvania. The trail corridor follows the north bank of Red Bank Creek, along the route of the former Mt. Laurel Railroad, also known as the Redbank Junction Railroad. Beginning at the Allegheny River at Redbank Junction, the corridor follows the creek through Lawsonham, St. Charles, Climax, New Bethlehem (the midpoint), Hawthorn, Summerville to where the trail ends near the intersection of 2nd Street and Western Avenue in Brookville. The trail connects with the Armstrong Trail, located along the eastern bank of the Allegheny River, and to the Erie-to-Pittsburgh Mega Greenway and the Great Allegheny Passage from Pittsburgh to Cumberland, MD where it joins the C&O Canal Towpath, ultimately connecting to Washington, D.C.

PROJECT HISTORY

The last trains ran on the Redbank Valley Trails corridor in November 2007. The corridor was officially railbanked in June of 2010 by the

Figure 1.1: Project Location Map



Allegheny Valley Land Trust (AVLT). The Allegheny Valley Land Trust is a 501(c)3 nonprofit organization with an office in Kittanning, PA.

Railbanking is a process of converting inactive rail lines into recreational trails, which can be converted back to active rail lines if necessary. This process allows the railroad company to transfer the interest in the land to a private or public agency to use the land for any purpose consistent with future restoration of railroad and service (source: www.constructionlawsignal.com). The corridor was railbanked for nonmotorized uses only; such as bicycling, walking and hiking.

RVTA MISSION STATEMENT

"To Promote the Conversion, Maintenance, and Management of the Railroad Right-of-Way into the Redbank Valley Trail for Recreation and Fitness Use. The Association Shall Promote Preservation and Protection of the Natural Resources Found Along the Right-Of-Way and Recognition of Sites of Historic Significance."

AVLT owns the land but intends to transfer ownership to the Redbank Valley Trails Association (RVTA) including all deed restrictions and with DCNR's approval. RVTA is a certified 501(c)3 nonprofit organization whose mission is to develop and maintain the 51-mile Redbank Valley Trails for year round use to include, without limitation, pedestrians, bicyclists, and cross country skiers. The RVTA holds monthly board meetings and has been actively raising money for trail development. Annual memberships can be purchased for the RVTA at a cost of $10/individual, $25/family, $50/ business/organization, and $150/lifetime individual. The RVTA has been active; clearing the corridor of trash and debris, rolling and grading sections of the trail, and redecking 9 out of 27 bridges. Information on the RVTA can be found online at www.redbankvalleytrails.org.

In 2010, Mackin Engineering Company was hired to prepare a Feasibility/Planning Study in order to document the existing conditions within the trail corridor, identify current issues and concerns, identify potential opportunities, and provide realistic recommendations and cost estimates for trail construction and maintenance. The feasibility study began in November of 2010 and concluded in June of 2011.

REVIEW OF PREVIOUS PLANS AND STUDIES

The first step of the feasibility study is to gather and review pertinent background information to provide a baseline for why the feasibility study is being completed and ensure that duplicate work is not being performed. Reviewing previously completed studies provides a snapshot of the existing conditions including, but not limited to, the history and setting of the trail; overview of how the trail fits into its surroundings; nearby recreation facilities, open space, natural areas, waterways, historic and cultural sites, and other trails. The planning studies were reviewed and excerpts are included in order to provide a justification for the RVTA to apply for future funding for trail development.

Clarion County Comprehensive Plan—2004

While the Redbank Valley Trails is not mentioned in the County Comprehensive Plan, the concept of recreational trails is supported by the County Comprehensive Plan, as follows:

- Provide further education about the use and value of the County's natural resources from both an economic and ecological vantage.
- Support continued maintenance of and expansion of pedestrian transportation systems, whether for recreation, or utilitarian use.

Clarion County Greenways Plan—2008

The Clarion County Greenways Plan identifies several priority trail opportunities, of which, the Armstrong Trail and Redbank Valley Trails are included. Excerpts from the plan are included below:

Armstrong Trail - *"The Armstrong Trail is a recreational and transportation corridor opened to non-motorized traffic, and maintained by the Allegheny Valley Land Trust. Currently, the segment between East Brady and the mouth of Redbank Creek is unimproved. However this segment of corridor has been secured by the Allegheny Valley Land Trust for trail use. We recommend Clarion County continue to work with the Allegheny Valley Land Trust and East Brady Borough, Brady Township, and Madison Township to improve this trail corridor with the County's support in rail-banking."*

Redbank Creek Trail – *"This proposed trail runs along the north bank of Redbank Creek following the route of the former Mt. Laurel Railroad, also known as the Redbank Junction Railroad. This former rail line extends from the mouth of Redbank Creek at the Allegheny River to Summerville, Jefferson County passing through Lawsonham, New Bethlehem, and Hawthorn along the way. The section between the mouth of Redbank Creek and Lawsonham has been secured by the Allegheny Valley Land Trust, and is open to trail use, but unimproved. The Allegheny Valley Land Trust is in the process of securing the corridor for trail use from Lawsonham, through New Bethlehem, to Brookville in Jefferson County."*

The Redbank Creek Trail (i.e. the Redbank Valley Trail) was identified as an exceptional priority corridor in the Clarion County Greenways Plan (2008) to be advanced in the short-term, one to three years.

Note: the County Plan also recommended that New Bethlehem Borough pursue a trail town initiative, as follows: *"During this greenway planning process Redbank Renaissance, Inc. and the New Bethlehem Area Chamber of Commerce showed strong support and desire to advance trail town efforts in Clarion County. This interest should be capitalized on before it wanes. We recommend the Northwest Commission and Clarion County Planning Department assist these organizations in completing a trail town audit and master plan."*

Lawsonham to Sligo Trail – *This proposed trail follows the former Sligo Branch of the Pennsylvania Railroad running approximately 10 miles from Lawsonham, along Redbank Creek, to Sligo, along Licking Creek, in south central Clarion County. This proposed spur trail will connect Rimersburg and Sligo residents to the proposed Redbank Creek Trail, the Armstrong Trail, and the Allegheny River Trail. High priority corridor—to be advanced in the long-term, five to ten years.*

Proposed Red Bank Creek Water Trail — *Brookville to Summerville – 10.5 miles, Jefferson County. Canoeable early December through May. Do not put in above Brookville as there is a dangerous drop on the North Fork under U.S. Route 322. Summerville to New Bethlehem – 16.5 miles.*
Canoeable early December through late May. New Bethlehem to Rimer on the Allegheny River – 27.8 miles. Canoeable late November through late May. Shuttle Points: Stream right, below dam at State Route 28/66 Bridge crossing the creek in New Bethlehem, Climax, St. Charles, Lawsonham, immediately below bridge on right.

North Central Pennsylvania Greenways Plan—2010

The North Central PA Greenways Plan, completed in June of 2010, identifies the Redbank Valley Trail as the #1 (exceptional) priority in Jefferson County and #2 priority in the entire north central region. The plan notes its connections to the Allegheny River, Erie to Pittsburgh Greenway, and the Baker Trail (via Summerville). *"In addition to the recreation and transportation benefits this trail corridor will provide, it is also located along several natural systems greenway corridors in Jefferson County, including: Redbank Creek, North Fork Redbank Creek, Mill Creek, and Little Toby Creek...With the recommendation of Brookville and Summerville as potential trail towns and the development of the Redbank Creek land based trail, these combined initiatives provide the potential for expanded economic development activities in Brookville and Summerville Boroughs."*

Redbank Creek Watershed Conservation Plan—2007

Western Pennsylvania Conservancy (WPC) completed a Watershed Conservation Plan for the Redbank Creek Watershed. The plan includes broad-based data about recreational, historical, socio-economic, and natural resources throughout the region and identified local needs and concerns. Management recommendations were identified to improve the quality of life; those which pertain to the Redbank Valley Trails system and support the recommendations contained within this plan are included below.

Goal 5-4. Increase and enhance accessible recreational facilities and activities.

- Create a water trail for Redbank, Sandy Lick, and North Fork Redbank creeks.
- Develop trails for specific uses, such as ATVs, hiking, biking, and horseback riding.
- Establish specific recreational-use areas and access, including boat launches, canoe access points, and trailheads.
- Establish winter recreation activities, such as snowmobile or cross-country skiing trails.
- Establish a public park, walkway, or trail from New Bethlehem to Redbank High School, providing access to Redbank Creek.
- Acquire and develop areas along the stream for primitive camping.
- Enhance camping experience through facility and program updates, encouraging more visitors to experience the natural environment.
- Enhance amenities, such as bathrooms and parking lots, at recreational facilities.
- Upgrade equipment at Alcola Park, and increase utilization of available facilities.

Goal 5-5. Connect recreational facilities by linking, extending, or enhancing existing trails with new trails and community parks.

- Provide better access by establishing well-defined trailheads.
- Increase maintenance of trail corridors to provide a safer recreational opportunity.
- Improve the Lawsonham Low Grade section of the Armstrong Trail.
- Provide a connection to East Brady along the Armstrong Trail.
- Rehabilitate and re-open the East Brady Narrows Tunnel.
- Increase funding for trail development and maintenance.

Goal 5-6. Preserve railroad corridors.

- Explore the possibility of connecting inactive railroad corridors and trails from surrounding areas to existing trails.

- Protect the Low Grade Secondary railroad corridor, which will be inactive from Sligo to Lawsonham and from Lawsonham to Brookville
- Highlight historical sites along railroad corridors through the use of interpretive signage.
- Investigate the preservation of railroad corridors and encourage uses, such as rails-to-trails, that preserve these corridors and offer recreational opportunities.

Goal 5-7. Increase the marketing of recreational activities in the region leading to an increase in tourism.

- Utilize local recreational facilities to host community festivals and events.
- Develop and distribute maps identifying recreational facilities and lands open to the public.
- Utilize local tourism-promotion agencies to highlight individual recreational opportunities.
- Establish a campaign to market local resources to community residents who may not be aware of the opportunities available in the area.

Goal 5-8. Enhance recreational opportunities for sportsmen.

- Improve water quality in order to aid the recovery of the local fishery as a local resource for recreation and tourism.
- Preserve the right to hunt, fish, and canoe; and educate sportsmen about areas open to public usage.
- Establish a river access point at the mouth of Redbank Creek
- Establish additional or enhance existing public access points to streams and trails, including amenities, such as parking and restroom facilities.

PUBLIC PARTICIPATION

As part of the Redbank Valley Trail Feasibility Study, a series of meetings were held over the five-month period to gather input and feedback into the planning process. As the feasibility study was completed in conjunction with the New Bethlehem Trail Town Master Plan, many of the meetings served both projects. A summary of each meeting is included below.

RVT Committee Meeting #1

The kick-off meeting was held on Wednesday, December 15, 2010 at 5:30pm and the following items were discussed:

- Introduce Mackin as the project consultant and review the overall scope and schedule for the project.
- Present and discuss the results of the physical inventory and assessment, which was conducted by Mackin between December 1 and December 7, 2010.
- Schedule a meeting for February 10, 2011 with the municipal officials from all impacted municipalities to discuss support for and any concerns with the trail as well as any interest in participating as a trail town.
- Schedule a public meeting for March 3, 2011 as an open house from 5-8pm to present the draft trail feasibility study recommendations as well as the proposed trail town concepts for New Bethlehem Borough.

Municipal Officials Meeting

A meeting was held on Thursday, February 10, 2011 at 7:30pm, to which all municipal officials from the municipalities along the entire RVT corridor were invited. A total of 16 people attended the meeting, representing New Bethlehem Borough, Brookville Borough, Beaver Township, Clover Township, Madison Township, and Rose Township, along with the RVTA, AVLT, candidates for Clarion County Commissioner, and local residents and businesses. The meeting included a presentation by Mackin and McCollom Development Strategies regarding the trail and the trail town initiative followed by an open question and answer session, as follows:

- Funding concerns—attendees asked what funding will still be around in light of the current federal/state budget crisis.
  - *Response—DCNR is funding priority one trails (trails at least 50 miles in length) and which are part of the statewide mega-greenways as well as trail town initiatives. The RVT will need fundraising and volunteer help; trails are built as a result of local support. The RVTA is currently conducting presentations to local municipalities and organizations in a fundraising effort. Since July of 2010, over 3,000 hours of volunteer time have been logged on the trail.*
- Adjacent landowners—attendees asked whether Mackin had contacted (or was planning to) all of the adjacent landowners along the trail corridor.
  - *Response—Mackin was not contracted to contact all of the adjacent landowners; however, the AVLT and RVTA have been in discussions with many landowners. Interested landowners are encouraged to attend the March 3, 2011 public meeting or are asked to contact Mackin directly to discuss any concerns or issues they have.*
- River access—attendees asked whether the project was going to address public access to Redbank Creek.
  - *Response—As part of the trail inventory and analysis, Mackin identified several potential areas that could be developed as public access points for Redbank Creek. These areas are noted on the maps; however, the RVTA will need to contact the property owners to determine their interest in pursuing the development of public river access areas.*
- Trail users—attendees asked how many trail users could be expected to use the trail.
  - *Response—The Great Allegheny Passage (350 miles) sees between 50,000 to 70,000 trail users per season (April to November). The usage level of the RVT will depend on factors such as the length of usable trail (the longer the trail, the further people will travel to use it) and connections to other regional trails, such as the Armstrong Trail and Baker Trail.*

RVT Public Meeting

The public meeting was held on Thursday, March 3, 2011 from 5-8pm as an open house. The meeting was advertised via local newspapers, meeting announcements, and website postings. There were 38 people in attendance, representing many municipalities along the trail corridor. The open house featured a number of different stations, each designed to provide information to the public regarding the status of the Trail Feasibility Study and the Trail Town Master Plan.

- Looped Presentation—a PowerPoint presentation

was run on a continuous loop that provided the background and status of the trail and the trail town initiative. Photos of the existing conditions and potential opportunities were included to graphically illustrate both projects.

- Trail Maps—large-scale maps of the trail corridor were on display, on which the public was encouraged to mark any additional issues or opportunities within the corridor.
- Trail Town Conceptual Plans—renderings of the proposed improvements for New Bethlehem were on display for the public to view and provide feedback regarding the draft recommendations.
- Survey—a survey was available to everyone in attendance. Three (3) surveys were completed.

RVT Committee Meeting #2

The second RVT Committee meeting was held on Monday, March 14, 2011 at 7:00pm and the following items were discussed:

- Discuss the outcomes from the municipal officials and public meetings.
- Review the draft recommendations, which cover marketing and branding of the trail, signage standards, trail construction requirements, trail segments, trailheads and other amenities, and trail/road crossings.
- Review the draft cost estimates for each of the draft recommendations.

RVT Committee Meeting #3

The third and final RVT Committee meeting was held on Monday, April 11, 2011 at 7:00pm and the following items were discussed:

- Review the revised recommendations and draft Trail Concept Plan, including maintenance needs.
- Review the revised cost estimates for each of the draft recommendations.
- Finalize the remaining steps for project completion.

Additional Meetings

RVTA and Redbank Renaissance members have been presenting information, maps and displays to various groups including the Brookville and Redbank Valley Chambers of Commerce and displaying information at various public events including the March 25, 2011 Flood Commemoration and regular monthly Redbank Valley Trails Association meeting where attendance averages between 16 and 32 people each month. Information on the trail and trail town planning is available on the Redbank Valley Trails Association website at www.redbankvalleytrails.org and on the Redbank Renaissance, Inc. website at www.redbankren.org. Local newspapers have featured several stories on the trail and its development.

SECTION 2: PHYSICAL INVENTORY AND ASSESSMENT

A Physical Inventory and Analysis was completed for the 42-mile trail corridor, starting at the Allegheny River and ending in Brookville. Mackin's Landscape Architect and Environmental Scientist conducted the inventory in December, 2010 over a four-day window; focused on a 50-foot wide corridor centered on the existing railroad bed centerline. The weather conditions during the field observations varied from rain during the morning hours of day one to snow flurries with several inches of accumulation over the following three days. Temperatures varied with high temperatures in the mid-30's to lows in the single digits. Prior to the first day of the inventory, the region had approximately four inches of rain over a one week period.

TRAIL MAPPING

The physical features of the trail, including photographs and mile markers, were digitally documented by latitude and longitude coordinates using a Trimble GeoXH GPS instrument with sub-meter accuracy. As part of the physical inventory, the following features were identified and recorded as part of the trail mapping and analysis.

- Adjacent or Intersecting Surface Waters
  - Potential wetlands
  - Named/unnamed tributaries
  - Vernal pools
- Significant Natural Features
  - Geological features, including rock outcroppings
- Significant Cultural Resources
  - Section 106 historic or archaeological features
  - Section 4(f) resources
- Wildlife Analysis
  - Dominant vegetation
  - General land cover/land use
  - Noxious weeds / invasive species
  - Threatened or endangered species
- Hazardous Waste
  - Evidence of hazardous waste
  - Illegal dumping areas
  - Evidence of abandoned mine drainage (AMD)
- Crossings
  - State and local roads
  - Private driveways
  - Agricultural access / livestock crossings

Wide Corridor with Unimproved Surface

Narrow Corridor with Improved Surface

- Structures
  - Bridges , tunnels, and any missing structures
- Adjacent Land Uses
  - Residential homes in close proximity
  - Commercial/industrial businesses nearby
  - Agricultural areas

Mapping these features allowed Mackin personnel to accurately locate places of interest, areas of opportunity for development, potential hazards within the corridor and future trail connections.

PHYSICAL FEATURES

Trail Corridor and Surface

The condition of the trail's surface and width of the corridor vary significantly along the alignment. There are sections that have had little if any activity on them for years, and others that have recently been improved to accommodate trail users. The existing topography and the railroad corridor's parallel location to Redbank Creek result in areas with a wide open character to constrained conditions with rock outcrops on the up-slope side and steep slopes to the water's edge.

A majority of the corridor can be characterized as open with a twenty-five to thirty (25–30) feet width. There are areas in each segment in which the corridor is constricted to as little as twelve to fifteen (12-15) feet. In general terms, the western portion of the corridor between the Allegheny River and Lawsonham has little if any existing ballast material in the rail bed; ballast material exists consistently between Lawsonham and the Alcola Cemetery in Hawthorn; the ballast has been rolled and graded for approximately 13 miles between Hawthorn and beyond Summerville to Baxter; and existing ballast exists within the corridor between Summerville and Brookville.

Adjacent Land Uses

The trail corridor's adjacent land use is primarily residential and/or agricultural land; however, the land immediately adjacent to the corridor is wooded and undeveloped due to the location of the railroad

alongside Redbank Creek. The developed/farmed areas of these adjacent lands occur on top of the ridges, sometimes hundreds of feet above the rail bed. There are a few areas where the trail does border residential, commercial, and industrial uses. These areas are where the corridor passes though towns such as Lawsonham, New Bethlehem, Fairmount City, Hawthorn, Mayport, Summerville, and Brookville.

Water Resources

In addition to Redbank Creek, several streams were noted that run under and/or parallel to the proposed trail. The streams identified were either perennial (continuous running water throughout the year), intermittent (seasonal water flows), or ephemeral (streams with defined bed and bank that flow only during and immediately after precipitation). All of the water resources have been plotted on the project mapping.

These streams travel under the proposed trail through either existing pipe crossings or stone arch culverts/ bridges. In some instances the pipes beneath the trail which carry these waters have been blocked and/or crushed, and trail washouts have occurred. The locations of the washout areas are identified on the project mapping. The conditions of the stone arch culverts and bridges along the corridor have been investigated, and are discussed later in this section.

Geologic Resources

The most prevalent natural features other than the streams along the trail alignment are the rock outcroppings adjacent to the trail surface. These features are a result of the railroad bed and corridor being cut into the steep hillsides. The outcroppings occur at regular intervals along the alignment.

Cultural Resources

Section 106 of the National Historic Preservation Act aims to identify historic properties that may be affected by undertakings of a Federal Agency. Potential sites which may fall under Section 106 are noted on the trail

Industrial Adjacent Land Uses

Residential Adjacent Land Uses

Cemetery and Open Space Adjacent Land use

Potential Wetlands Adjacent to the Trail

mapping; however it will be up to the Trail Association to further investigate whether or not these features are of significance prior to construction if federal funds are being used. A hand-drawn map of the corridor with detailed historical information was given to the trail organization by a New Bethlehem resident. A copy of this map is included in Appendix A.

The Redbank Watershed Conservation Plan notes one site along the corridor that although not listed on the National Register of Historic Places, has historic significance. Built in 1872, the Lawsonham Stone Arch Railroad Bridge is located along Redbank Creek at the southern border of Clarion County. The site has local historical significance and the Watershed Plan recommends that it be preserved.

Geologic Features Adjacent to the Trail

Section 4(f) of the Department of Transportation Act of 1966 states that, "special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." The United Valley Soccer Association fields in Hawthorn are privately owned and while the Redbank Valley Municipal Park is nearby, it is not adjacent to the trail corridor. If any historic sites are identified, Section 4(f) regulations apply and coordination with the state may be required.

Dominant Vegetation

In general, the corridor is situated between forested lands on either side of the trail. The dominant tree species identified during the physical inventory and assessment were Hemlock, Spruce, Maple, Oak, Pine, Beech and Sycamore.

Invasive plant species were identified within the corridor; the primary species found was Japanese knotweed, but small patches of Multiflora rose were also seen. The populations in each identified area ranged between 20-30 plants, and locations were identified where only one plant existed. The identification of these species was limited to the 50' wide study corridor; however, it is important to note that Japanese knotweed was present along the creek's

edge, outside of the corridor.

A Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental review was conducted (December 2010) and the results noted the potential presence of several endangered species and plant species of concern. *Baptisia australis* (Blue false-indigo), a PA plant species of concern, is known to be found in many locations along Redbank Creek . *B. australis* prefers open woods, stream and river banks and sandy Floodplains.

The PNDI review also determined that potential impacts to *Myotis sodalis*, the Indiana bat, may be associated with construction of the trail. Seasonal tree-cutting activities may be recommended. Coordination with both PA Department of Conservation and Natural Resources and the US Fish and Wildlife Service should be conducted prior to design and construction of the proposed trail. A copy of the PNDI review, which includes the tree-cutting limitations, can be found in Appendix B.

Property owners along the trail corridor noted the sightings of *Haliaeetus leucocephalus*, Bald Eagle, nests near the corridor. Coordination with the PA Game Commission should be conducted prior to design and construction of the proposed trail.

Areas of Concern

The presence of railroad ties was noted, either in place atop ballast (parallel to the Redbank Valley Trail) or piled alongside the trail. There were also several locations of illegal dumping noted; the types of material identified included mattresses, tires and scrap metals. Potential sources of hazardous waste identified along the trail included 55 gallon drums. These sites are noted on the project mapping.

There were also areas where abandoned mine drainage (AMD) was noted within the trail corridor, primarily within the drainage swale adjacent to the trail surface. In some instances the AMD has washed out the trail on its way towards the creek. The specific location of the

Cultural Resources Adjacent to the Trail Corridor

Mix of Hardwood and Evergreen Trees

Railroad Ties Adjacent to the Trail Corridor

Trail Crossing at State Route 28

Bridge Over Mortimer Run at Mile 1.02 to Redbank Creek near the Allegheny River

AMD, including the trail washouts have been identified and located on the project mapping.

Crossings

There are 21 at-grade road crossings along the 42 mile trail corridor. Eleven crossings are across rural roads, six crossings are in New Bethlehem, one crossing is in Heathville and two crossings are in Summerville. Table 3.1 lists the at-grade crossings and provides information regarding road names, surface material, average daily traffic and sight distance issues.

It was noted during the physical inventory and analysis that many of the adjacent landowners are accessing the railroad corridor via private gravel and earthen pathways/drives. In some cases these pathways crossed the railroad corridor to obtain access to the water's edge. These locations were noted and are shown on the project mapping. There were no instances of agricultural access or livestock crossings noted.

Structures

The trail corridor is situated on the former railroad right-of-way and so all of the bridge structures were designed to carry railroad loads. The tracks have been removed; however, old railroad tie deck system is still present on the bridges.

Mackin's Structural Engineers conducted a cursory review of the 24 bridges and 3 tunnels located on the Redbank Valley Trail. The review consisted of visual observation of all major components of the bridges including deck, steel girder superstructure, concrete abutment and pier substructure, concrete and stone arch barrels, wingwalls and headwalls. The review of the tunnels included visual observations of the portals, sidewalls, roof and roof lining. The cursory review did not include bridge and tunnel inspections, design, or testing on any bridge or tunnel components.

Steel Bridges— Each of the fifteen steel bridges consists of 1, 2 or 3 span configuration with lengths ranging from 30' to 270'. The decks consist of timber

ties with timber railings on some bridges. The tie decks rest on steel girders that are supported by stone abutments and piers. Generally, the steel bridges are in fair to satisfactory conditions. The timber tie decks are typically in fair condition; however, each will need to be replaced with new deck for trail use. The new deck shall include safety railings with a rub rail on both sides and it should meet the AASHTO standards for Pedestrian Bridge with bicycle use. Paint on steel girders is peeled off and is in fair condition with area of surface rust. The steel is in satisfactory condition with very minor or no section loss noted. On almost all bridges the stone abutments are supplemented with concrete buttresses in front of the stems. It appears that these measures were constructed to correct a deteriorated condition some time after the original construction. The stone abutments and piers exhibit various minor defects such as loss of mortar in joints, vegetation growing, and minor cracking in masonry stones.

Two bridges display moderate defects; Bridge No. 35.92 with a ½" wide full height crack in the west abutment back-wall, and Bridge No.37.96 with a large area with many open mortar joints (up to 1" wide) throughout back-wall, abutment stem and wingwalls. Bridge No. 41.28 displays a masonry stone cracked under the northeast bearing. Stone piers of Bridge Nos. 37.96 and 41.00 over Redbank Creek are protected against erosion and undermining with rip-rap or cofferdam installation.

Stone Arch Bridges— Seven structures are stone arches that carry a stream under the trail corridor. All arch structures are in satisfactory to good condition with minor defects, such as open mortar joints in headwalls and arch barrels. Headwalls on two of the structures show minor outward shift, and trees growing out of the headwall.

Concrete Box Culvert Bridge—Structure at the Rattlesnake Run crossing (Bridge No. 37.18) is constructed of a concrete box culvert. All components of the box are in good condition. The wingwalls, headwalls, side walls, and the top and bottom slabs

Heathville Bridge

Bridge Leading into the Brookville Tunnel

Stone Arch Bridge

Missing Bridge at Middle Run Road

Long Point Tunnel

exhibit no defects.

Bridge at Middle Run Road—The bridge over Middle Run and Middle Run Road has been previously removed. A new bridge is needs to be constructed at this location for safe passage by the trail users over the stream and roadway. A pre-fabricated concrete structure (cost efficient) or a pre-fabricated steel span can be installed.

The Long Point Tunnel is on a curved alignment and is 644' long. It is constructed of stone masonry walls with a 4-course brick lining at the entrances (approximately 50 feet long). It displays several minor deficiencies of spalled and deteriorated brick portions. Stone masonry of both portals is in fair to satisfactory condition with very minor deficiencies of cracked stones and open mortar joints. Remaining portion of tunnel consists of natural rock and it appears to be in stable condition. Drainage ditch is present along north wall and is in satisfactory condition.

The Climax Tunnel also has a curved alignment and is 517' long. End portions (50' to 70') of the tunnel are constructed of stone walls and cut stone arch. The mortar joints of these end portions display deteriorated conditions and water is seeping through and forming large icicles, which creates unsafe condition. Concrete buttresses are constructed at both portals to supplement the portal walls; it appears that the buttresses were constructed some time after the original construction was completed. Several large pieces of rock (10' x 10') are laying on top of west portal headwall, with a crack in the portal head stone creating a very unsafe condition. A ¼" wide x 20' long crack is present in the roof at the west end of tunnel. A large hole (12' diameter x 4' deep) is present near the west end of the tunnel in roof liner with bricks fallen off. Also a few other areas display deteriorated conditions in the brick liner. All deficiencies should be repaired prior to using the tunnel for trail use. A drainage ditch is located along the north wall and is in satisfactory condition.

The Brookville Tunnel also consists of stone walls and cut stone arch roof at both ends, and the remaining portion consists of stone walls and brick lined arch. A very large hole (10' wide x 20' long x 5' deep) is present near the west end of tunnel in the roof and east wall with bricks fallen off and lying on ground. A 5' to 8' deep void exists above the brick lining with potentially loose or deteriorated rock. The drainage ditches on both sides are in good condition.

Climax Tunnel

Climax Tunnel—Hole in the Roof

Brookville Tunnel

TRAIL TYPE AND USE

The Redbank Valley Trail is proposed to have an overall corridor clearance of approximately twenty (20) feet, with a trail surface of ten (10) feet width. The trail will be designed to accommodate non-motorized uses including pedestrians, bicyclists and seasonal uses including cross country skiers. The trail shoulders are recommended to be turf grass and should be a minimum of three (3) feet on either side.

Where the trail enters and exits towns along its alignment, it is recommended that the width be increased to twelve (12) feet. In areas where the corridor is constricted, the trail surface may be reduced to a minimum of eight (8) feet; three (3) foot shoulders should remain on both sides of the trail surface. In these areas it may be necessary to install timber fencing along the creek-side of the trail to protect trail users from steep slopes towards the creek. Figure 3.1 depicts the proposed trail width and corridor clearance.

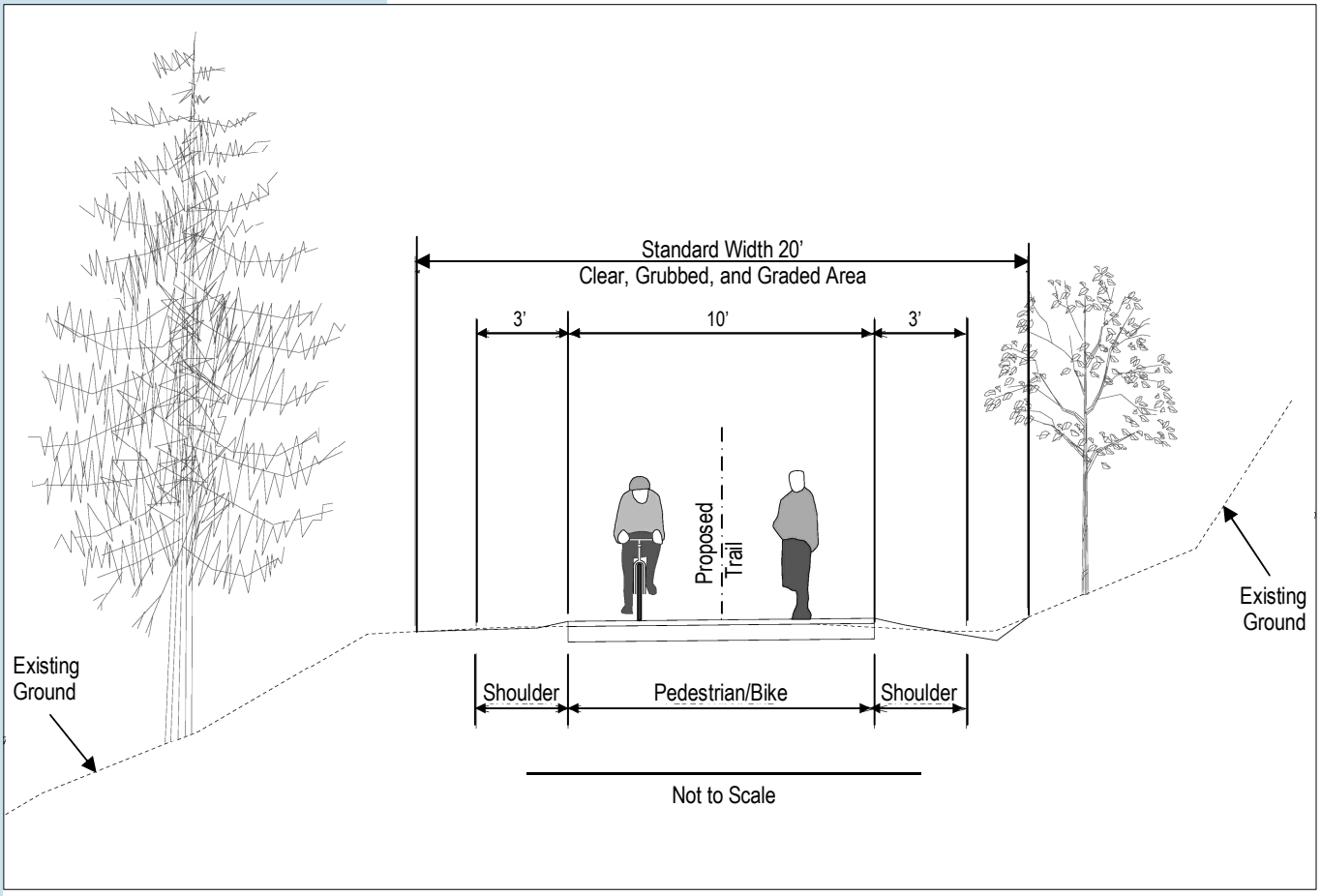


Figure 3.1 Typical Trail Section

TRAIL SURFACE

The standard trail surface is recommended to be American Association of State Highway and Transportation Officials (AASHTO) #10 crushed limestone above a layer of either compacted existing ballast material or new 2A Limestone material. Where a new layer of 2A limestone is installed, a geotextile material is recommended between the new stone and the compacted sub-grade for separation and stabilization purposes.

A bituminous approach pad at each road and bridge crossing is proposed to eliminate 'tracking' of the trail surface materials, to improve bicycle stopping ability and to allow for traffic markings (for trail users) at each crossing. The installation of detectable warning surfaces (DWS) is recommended at each crossing.

Minimal grading is expected to construct the trail; the finished surface of the trail should have a two (2) percent cross slope and follow the existing super-elevation of the rail bed. Wherever possible, the trail surface should be sloped away from the creek and towards the toe of the upslope side of the trail.

Along the 13-mile stretch of the Redbank Valley Trail which has had the existing ballast graded and rolled, it is recommended that re-grading be completed to remove the curb/lip of ballast material that exists on one side of the trail. This measure will facilitate proper drainage and allow for a grass shoulder to be constructed on both sides of the trail. During the development of this report, it was noted that the RVTA preferred having the curb/lip on one side of the trail to act as a physical barrier between the trail and the steep slope towards Redbank Creek. If the curb/lip is not removed, it is recommended that the RVTA monitor its function over time. Figure 3.2 shows the existing curb/lip while Figure 3.3 depicts the three proposed trail cross sections.

Figure 3.2 Existing Curb/Lip Along Improved Trail

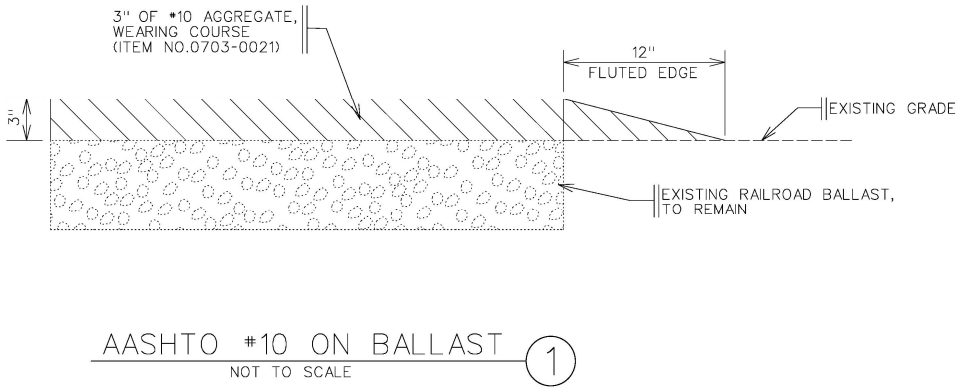
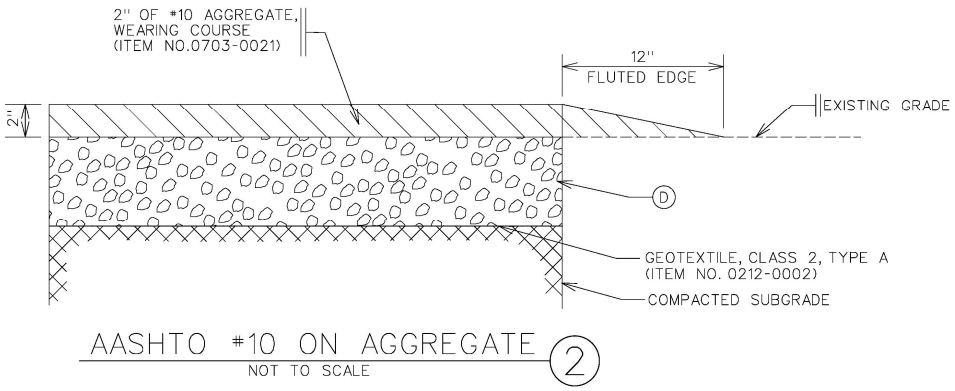
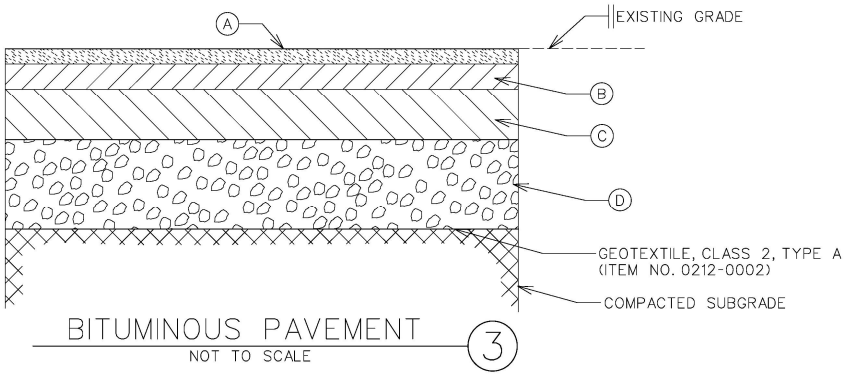


Figure 3.3 Trail Cross Sections





LEGEND

(A) - SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, PG 64-22, <0.3 MILLION ESALS, 9.5 MM MIX, 1½" DEPTH, SRL-L (ITEM NO. 0409-0385)

(B) - SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BINDER COURSE, PG 64-22, <0.3 MILLION ESALS, 19.0 MM MIX, 2½" DEPTH (ITEM NO. 0409 6350)

(C) - SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BASE COURSE, PG 64-22, < 0.3 MILLION ESALS, 25.0 MM MIX, 4" DEPTH (ITEM NO. 0309-0322)

(D) - SUBBASE 6" DEPTH (No. 2A)

DRAINAGE

Establishing new and maintaining existing drainage swales to convey upland and trail surface runoff is recommended along the entire trail alignment. Removal of debris and overgrown vegetation should be completed within existing swales. Where no drainage swale exists, a minimum three (3) foot width by one and one half (1-1/2) foot depth 'V' channel should be constructed.

The existing drainage pipes beneath the trail, including headwalls and endwalls, should be inspected for proper function; cleaning of clogged pipes and replacement of crushed pipes may be necessary. New pipe crossings at trail washouts will be required. All new pipe crossings should be installed with precast concrete headwalls and endwalls; using concrete provides the Trail Association with a durable materials and minimal long-term maintenance requirements. Figure 3.4 is a PennDOT diagram of a concrete endwall.

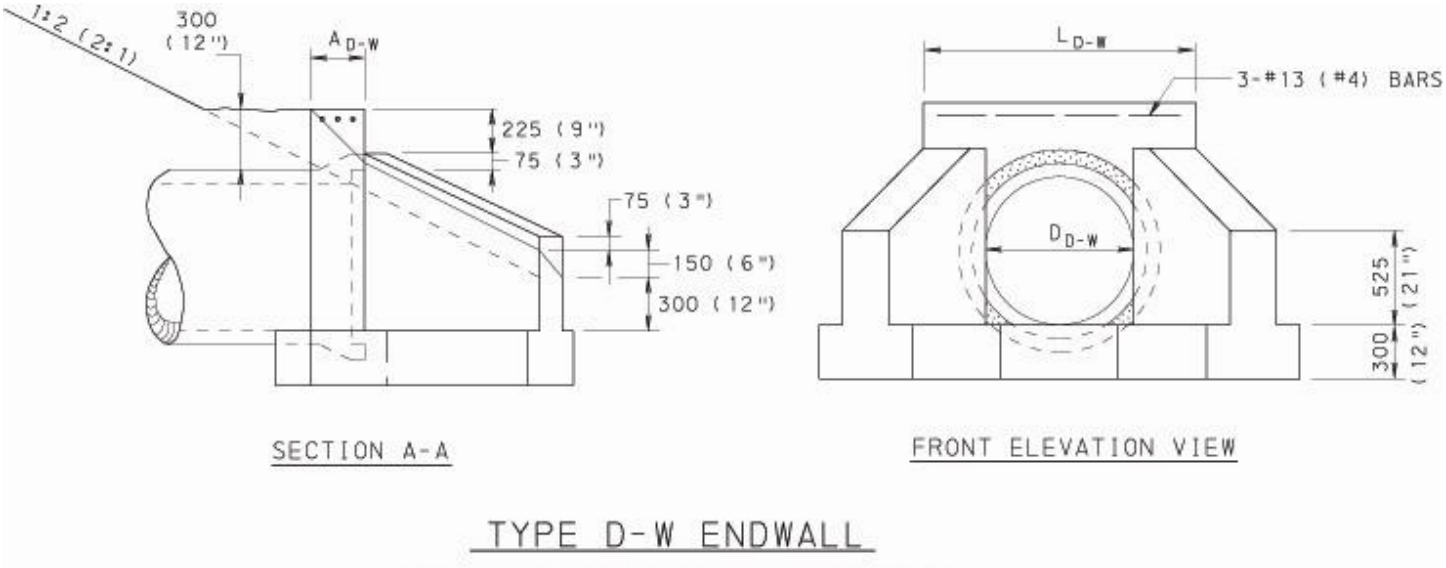


Figure 3.4 PennDOT Concrete Endwall Detail

CROSSINGS

Road Crossings

All of the 21 road crossings are at-grade and recommended improvements include signing and pavement markings on both the trail and roadways. Signage to warn motorists of the Redbank Trail are to be placed 300' from each crossing and stop signs at each side of the crossing are to be installed for bicycle and pedestrian control. Bicycle/pedestrian trail crossing pavement markings are recommended on two of the asphalt roadways, and painted crosswalks should be installed at each asphalt roadway. Pavement markings on the asphalt trail approaches may include double yellow lines that indicate separation of trail traffic and stop bars at the stop signs. Table 3.1 lists the at-grade crossings and the signing and pavement marking at each. Figure 3.5 shows the Manual of Uniform Traffic Control Device (MUTCD) example of signing and pavement markings for a shared-use path roadway crossing.

Recommendations at the intersections of the Trail and State Routes 2009 (Lawsonham) and 0028 (the Fish Basket crossing in Fairmount City) include signage and pavement markings only. These recommendations meet minimum safety standards, but the RVTA may want to install additional safety measures that increase motorist's awareness at these crossings. The installation of flashing traffic beacons is an option at these locations; the beacons notify motorists of the trail crossing, and can be fitted with sensors to flash only when trail users approach the crossing. The beacons are available with a solar power source, which minimizes both initial and long-term maintenance costs. A decorative asphalt crosswalk is also an option to increase visibility of the crosswalk for both motorists and trail users; however, this would need to be approved by PennDOT as they may not wish to add crosswalks at a crossing without a traffic signal.

Table 3.1 At-Grade Crossings

Road Name	Road Material	Average Daily Traffic	Sight Distance Issues	Stop signs (R1-1, 24"X24") on trail (both directions)	Bicycle/Pedestrian (W11-15, 30"X30"), Trail X-Ing (W11-15P, 24"x12"), Downward Diagonal Arrow (W16-7P, 24"X12")	Bicycle/Pedestrian (W11-15, 30"X30"), Trail X-Ing (W11-15P, 24"X12"), 300 FT (W16-2AP, 24"X18")	White 8" Parallel Crosswalk Pavement Markings (LF)	White 24" Zebra Striped Crosswalk Pavement Markings(LF)	Bicycle With Rider Symbol & Arrow Pavement Marking Legends
None - driveway	Dirt	<100	No						
SR 2009 (Lawsonham Rd)	Asphalt	650	Yes, EB & WB looking left & right; Obstructed by hillside and foliage.	2	2	2		50	2
Lawsonham Rd (T-460)	Gravel	<100	EB looking left and right; Obstructed by hillsides and foliage.	2	2	2			
SR 1005 (Saint Charles Rd)	Asphalt	125	EB & WB looking north; Obstructed by hillside and foliage	2	2	1	40		
Liberty Street	Asphalt	100-1000	No	2	2			50	
Lafayette Street	Asphalt	100-1000	No	2	2			50	
PA 66 (Wood Street)	Asphalt	4,100	No	2	2	2		50	
Brinker Ave (T-684)	Asphalt	100-1000	EB & WB looking north; Obstructed by house.	2	2	1	40		
Dovers Pike Ave	Asphalt	100-1000	No	2	2		40		
Fairmount Ave	Asphalt	100-1000	No	2	2		40		
PA 28 (Brookville St)	Asphalt	6,100	High speeds (45 MPH); SB traffic cannot see trail to the right.	2	2	2		50	2
None - cemetery driveway	Dirt	<100							
None - driveway	Gravel	<100							
Walker Flat Rd (T-750)	Asphalt	>1000	EB & WB Looking NW up towards SR 28; Obstructed by hillside and grass/bushes.	2	2			50	
PA 536 (Mayport Rd)	Asphalt	1,500	EB & WB looking NW. Obstructed by house; High speeds (40 MPH).	2	2	1	40		
Strauser Rd	Asphalt	450	EB & WB looking east. Obstructed by trees.	2	2	1	40		
Yount Road	Tar & Chip	<100	No	2	2				
SR 3007 (State Street)	Asphalt	900	No	2	2			50	
Brogan Street	Asphalt	<100	EB & WB looking NW; Obstructed by hillside and trees. Upgrade however.	2	2	1	40		
Moore Road	Tar & Chip	<100	EB & WB looking left & right; Obstructed by hillside SB & trees NB.	2	2	2			
SR 3003 (Mount Pleasant Rd)	Asphalt	400	No	2	2				
			Totals	36	36	15	280	350	4

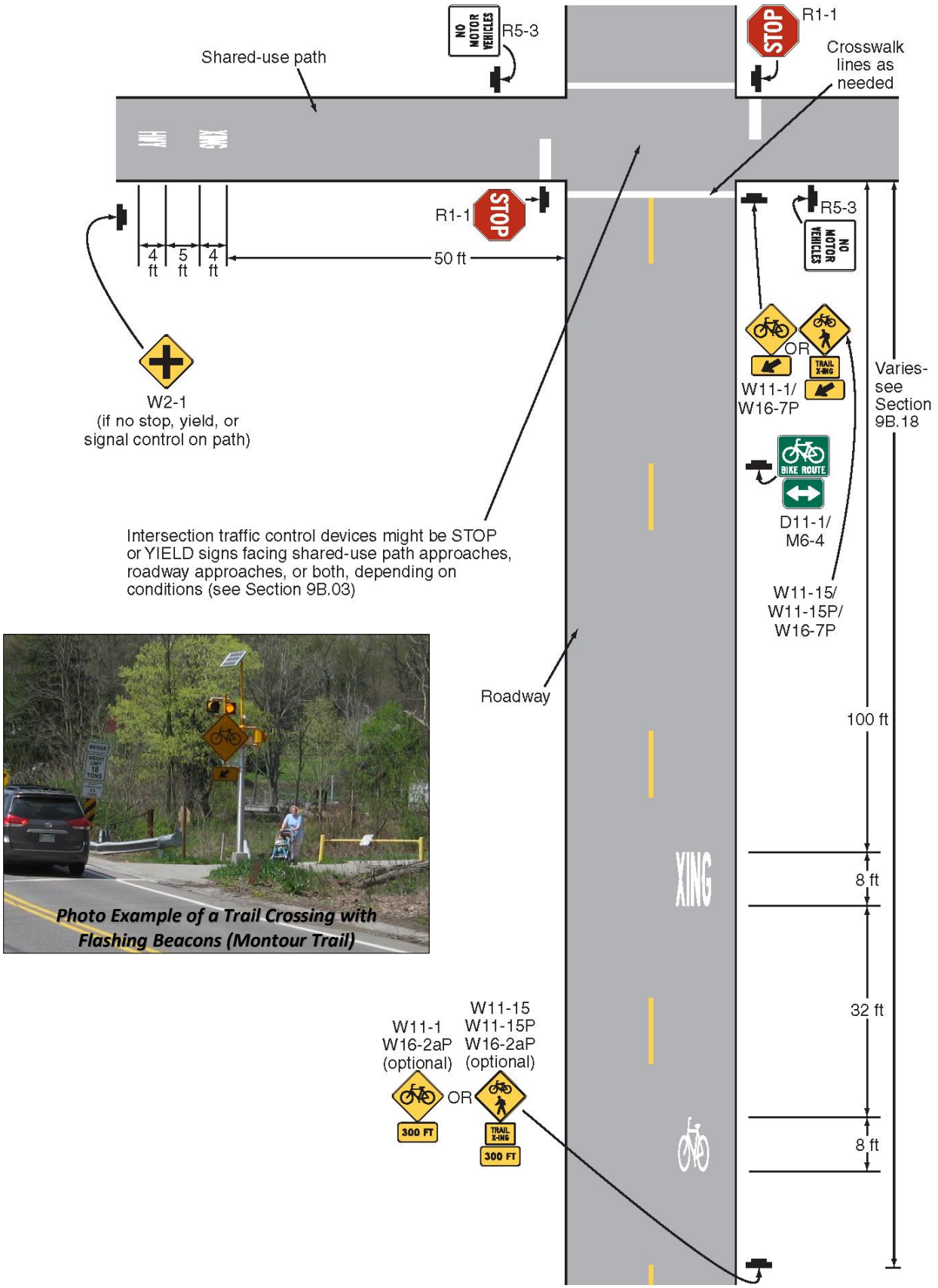


Photo Example of a Trail Crossing with Flashing Beacons (Montour Trail)

Figure 3.5 Example of Signing and Markings for a Shared-Use Path Crossing

Wherever feasible, the trail's alignment at all road crossings should be oriented perpendicular to the vehicular travel lanes. The result of such alignment is as short a distance across the road as possible. Any crossings and improvements within state road right-of-way will require coordination and approval with the local PennDOT District. It is recommended that the RVTA meet with PennDOT during the design phase to discuss crossing state routes; the RVTA has already had a coordination meeting with PennDOT for the crossing at State Route 0028. PennDOT representatives suggested that the crossing be located west (down-hill towards New Bethlehem) of the trail's current alignment to reduce the length of the crossing and that barriers be added alongside the trail to direct trail users to the crossing, increase safety and visibility for both bicyclists and motorists.

Grated Controls

Trail crossings may also include access control gates and bollards to limit unauthorized vehicle use in the corridor. Figure 3.6 shows a typical gated control to be installed at road crossings and trail access points. Access control gates are not required at each of the intersections in New Bethlehem, rather at the

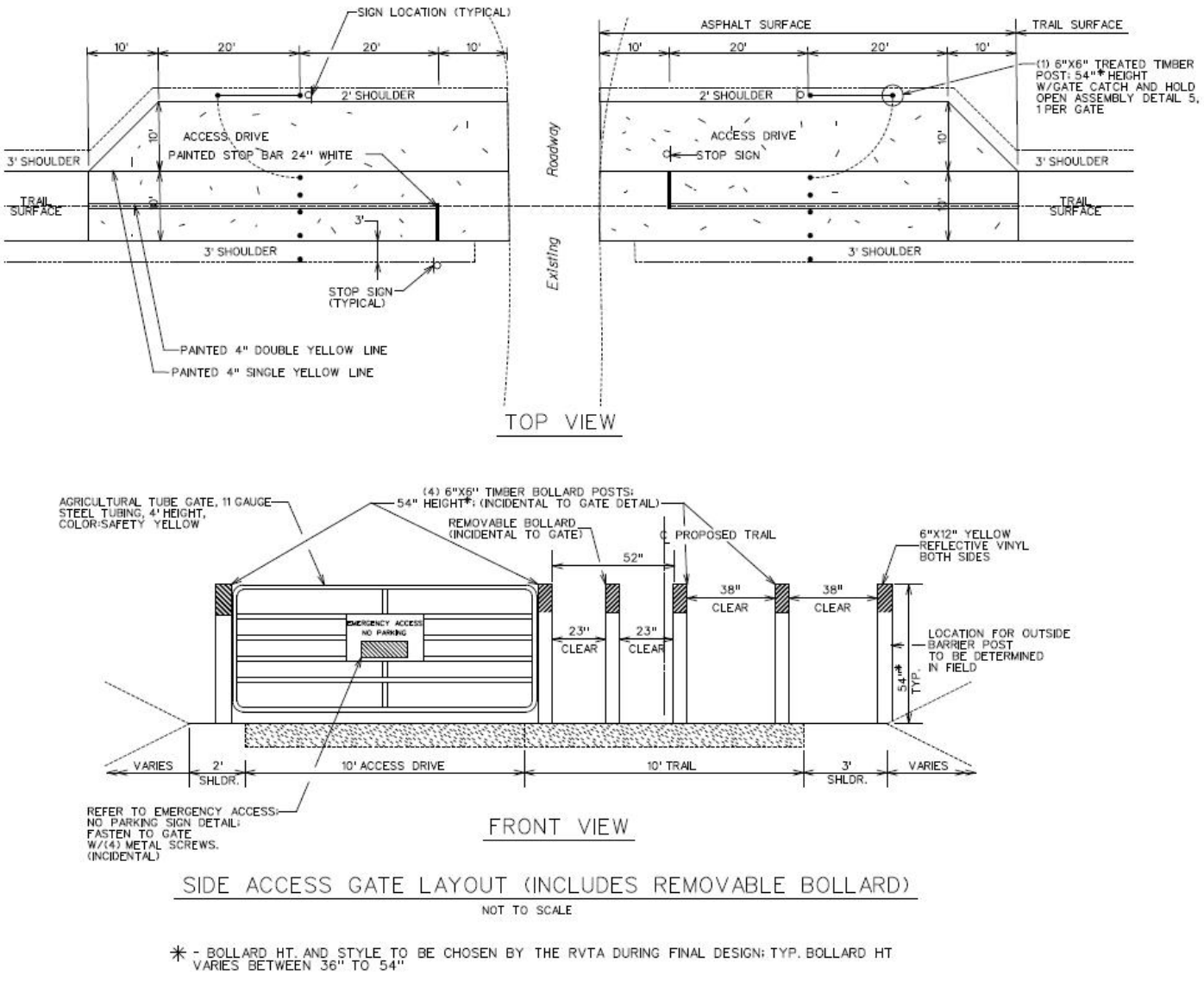


Figure 3.6 Trail Access Controls

intersections where the trail enters and leaves the town. Gates have been included in the cost estimate at all other road crossings. Where emergency access is required, emergency management services should be given a master key to open all locked access gates.

TRAILHEADS

The facilities proposed at each trailhead will vary based on available land, the number of potential users served and the ability to access, maintain, secure and police each facility. The ideal design for each trailhead should include parking, shelter, shade and water. For the purpose of cost estimating, each trailhead has been designed to accommodate approximately 20 vehicles and include a single unit composting toilet, shelter/pavilion, informational kiosk, trash receptacle, signage and access gates.

Facilities should be designed as low maintenance using indigenous materials such as the region's timber and stone. Night use of the trail is not to be encouraged; therefore only security lighting should be explored for trailheads in populated areas such as New Bethlehem, Summerville, and Brookville. The collection of trash at trailheads should be a decision made during the implementation stage; some trail groups have found if no

Figure 3.7 Example of a Trailhead Design from the Montour Trail

trash receptacle is available, trail users will take the trash with them, thus saving the Trail Association maintenance time and dollars. Figure 3.7 depicts a trailhead showing the layout of the parking area in relation to the trail along with a photo of an existing trailhead on the Allegheny Highlands Trail that shows a pavilion, restrooms, and drainage areas.

Armstrong Trail/Allegheny River Trailhead

A trailhead is recommended to be developed along the Armstrong Trail, on the southern side of the intersection of the Allegheny River and the Redbank Creek. A trailhead along the Redbank Valley Trail is prohibitive as there is limited vehicular access to the trail at its western end. There is an existing bridge which crosses the Redbank Trail at this location. The bridge would require rehabilitation prior to use; rehabilitation costs are not included as part of this project's cost estimates, but the AVLT is applying for a grant to rehabilitate the bridge this year (2011).

Lawsonham Trailhead

The AVLT owns additional lands outside the railroad corridor approximately 500' east of SR2009 that could be used as a trailhead. The property's location would require a length of access drive and trail surface running parallel to one another to provide access. This location is also the base of the Sligo trail spur.

Climax Tunnel (western portal)

Land acquisition or agreement would be required to construct a trailhead at this location; however, a recently replaced bridge at SR1009, the Hunter's Moon Lodge Bed and Breakfast, the Climax Tunnel and the transition between Segments 3 and 4 of the trail alignment make this an important location for a trailhead.

New Bethlehem Trailhead

A trailhead is proposed in the center of town on property owned by the AVLT and is near the Borough-owned municipal parking lot. Detailed recommendations and conceptual drawings for this site are included in the New Bethlehem Trail Town Master Plan.

United Valley Soccer Association Trailhead

A trailhead is proposed at the United Valley Soccer Association fields that would be accessed via Center Street, approximately 100' southeast of SR28. The United Valley Soccer Association owns the parcel of land, and coordination would be required prior to development. There is an existing gravel driveway that should be used as part of the parking/access surface. An existing storage shed will need to be relocated and/or worked into the trailhead design. This trailhead location also has an existing access to the Redbank Creek; the circulation and layout of the design should facilitate trailer parking and turn-around areas.

Summerville Trailhead

A trailhead is proposed adjacent to the Summerville Post Office on land owned by the Allegheny Valley Land Trust. This proposed trailhead is adjacent to State Street and has an existing town store nearby.

Brookville Trailhead

A trailhead is proposed to be developed in Brookville, the eastern terminus of the 42 mile corridor. The trail can be accessed via 2nd Street and is approximately ¾ miles from SR28 and downtown Brookville; access from the trailhead to SR28 would need to be coordinated and signed along local roads. The RVTA does not own property outside the railroad right of way in this location, which means there will need to be coordination with the owners of the Brookville Glove Company and Bill's Bar to explore property acquisition and/or shared parking areas. This location is situated with a direct visual to two successive bridges, a tunnel and then another bridge, which when developed has the potential to be a powerful driver to bring visitors to the corridor. This is also hindrance to developing a trailhead in the immediate future since the trail will be inaccessible until the bridges and tunnel are renovated. The original train depot exists adjacent to the trailhead site; the depot is owned by Brookville Glove Company, and has been renovated with an addition. A small structure with potential historical significance exists on the site. If a trailhead is not feasible at this location, the Borough Building parking lot located across 2nd Street could be utilized as a parking area for trail users.

The RVTA is also pursuing discussions with 13 landowners along a potential branch line not owned by the AVLT or part of the railbanked corridor to bring the trail closer into the Brookville business district with a terminus near the Brookville Lumber Company, across from the Giant Eagle food store.

PARKING AREAS

There were several locations along the corridor that have access to the trail, but a full trailhead was either not warranted or sufficient land to construct did not exist. In these locations, parking areas have been recommended. The parking should be constructed to accommodate approximately ten vehicles and include trail entrance, accessible parking and emergency access signage. The proposed parking areas are at:

- Leatherwood Station Road,
- approximately one mile west of New Bethlehem adjacent to the PennDOT maintenance yard/shed,
- at Heathville Road
- at Moore Road

Additional parking areas were discussed at Coders Run and in Baxter, but it was recommended that these locations not be developed due to their close proximity to proposed trailheads or limited access due to narrow or unimproved roads.

ADJACENT PROPERTY OWNERS

The relationships between the RVTA and the adjacent property owners are arguably the most important element in implementing a successful trail project. Given the length of the Redbank Valley Trail corridor, there are many different corridor characteristics that a trail user will experience. Although a majority of the corridor can be characterized as 'natural,' there are locations where a more 'rural' condition exists.

While one of the assets of a trail is having points of interest along the way, there may be some cases where visual screening and/or physical barriers between the trail and surrounding land uses is warranted. An example of where the RVTA may consider screening is a few hundred feet west of St. Charles Road where dilapidated structures exist on the property south of the trail corridor. Conversely, the adjacent property

owners may also desire to screen their properties from view of the trail. It is vital that the RVTA work with these landowners to address any potential conflicts or concerns to ensure that the trail peacefully coexists with its neighbors.

The installation of gated controls will be necessary where adjacent landowners are accessing the corridor, and in some instances the creek, via private gravel and earthen pathways/drives. It is recommended that these crossings be coordinated between the RVTA and private landowners to set limitations and develop expectations of how they will be used and secured. Legal agreements for these crossings are not likely required, but may be developed if the RVTA sees it necessary. All legal agreements will be contingent upon the rail bank agreement between the RVTA and railroad company.

Figure 3.8 shows a typical chain gate that can be installed at private property access points. The use of two locks on a single chain allow for multiple keys to be given out to different entities with access to the property. For example, a chain gate my need to be opened by the property owner as well as a gas well company.

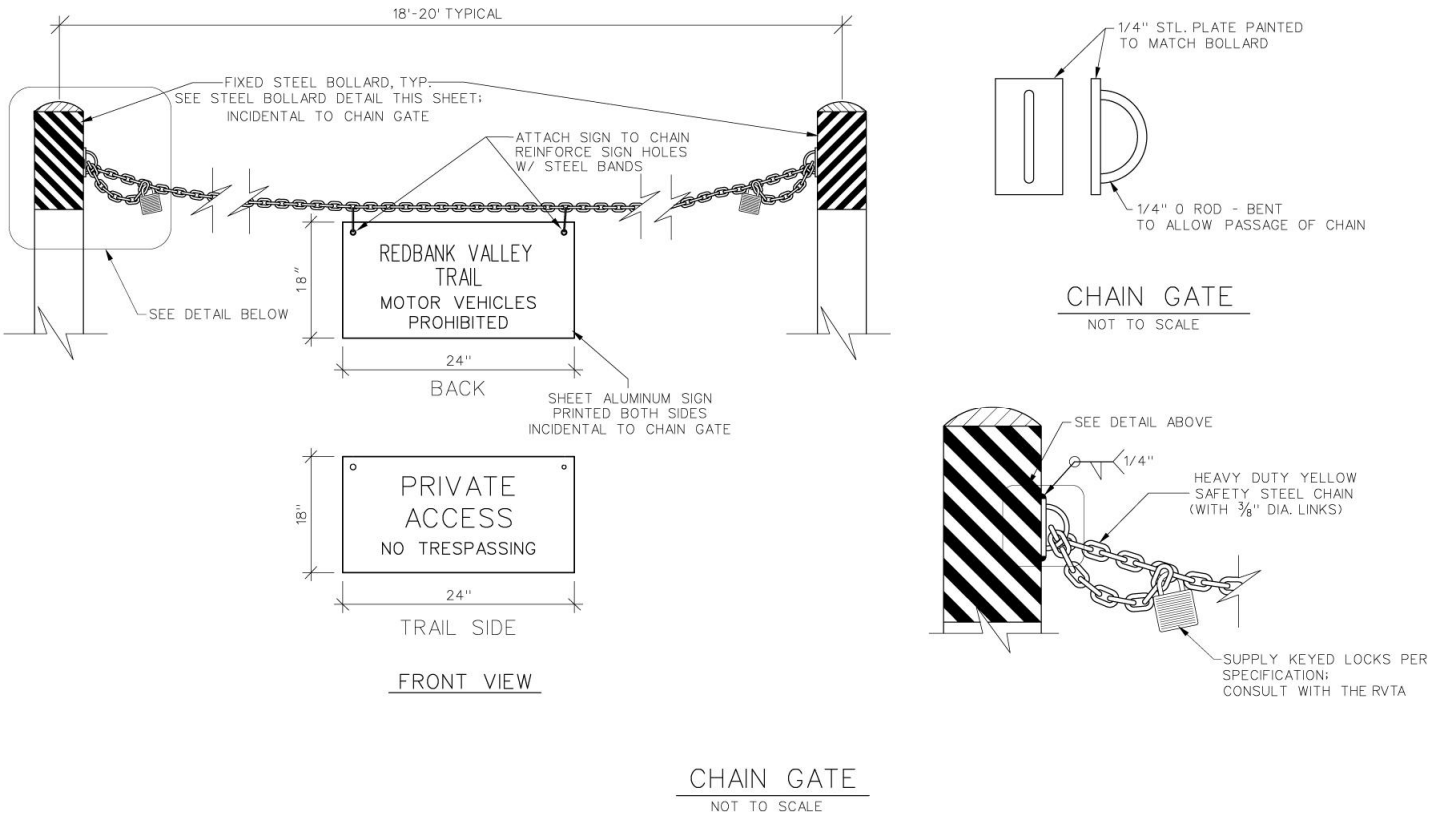


Figure 3.8 Typical Chain Gate

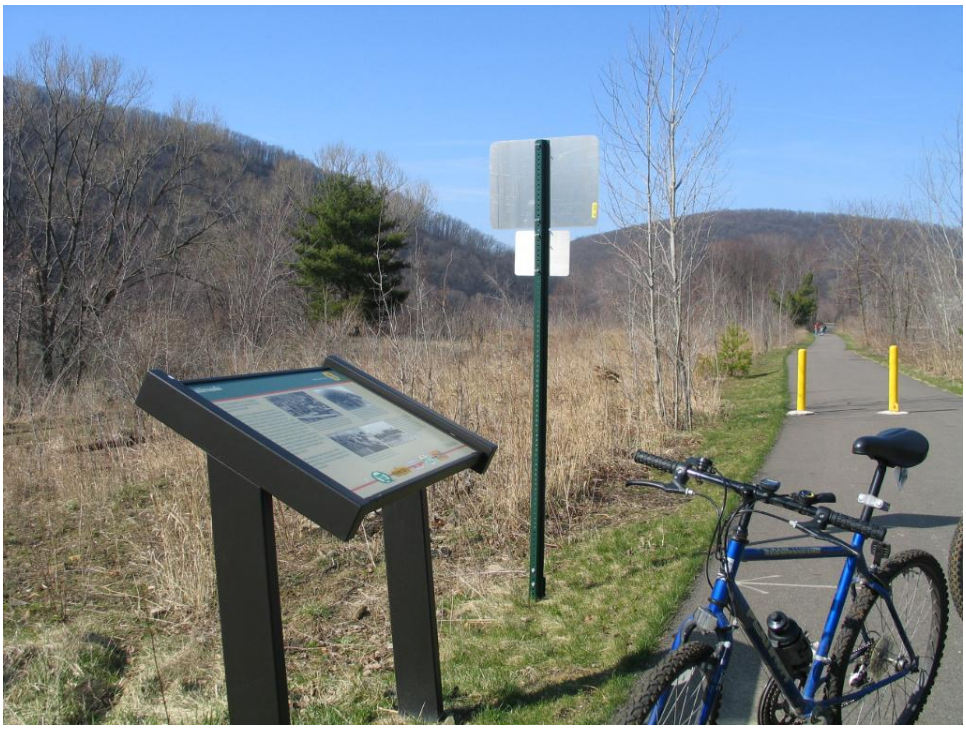


Figure 3.9 Interpretive Trail Signage

Figure 3.10 Examples of Various Signage At a Trailhead

Figure 3.11 QR Code Graphic

SIGNAGE

Signage along the trail can be implemented on a segment by segment basis, but the Trail Association will need to develop an approach to signing at a comprehensive level. The creation of a signage manual is recommended to identify the various types and sizes of signage as well as the materials, colors and styles of each. It is recommended that the RVTA work with the Erie to Pittsburgh Mega-Greenway to develop compatible themes and styles for signing of the trail.

Signing along the trail should be limited to directional, informational, regulatory and interpretive signage only. The signage material should be indigenous to the region, and information should be clearly conveyed via simple messages using legible fonts. The use of signage should focus on creating a safe condition along the trail corridor, but be minimized to avoid significant long-term maintenance costs. All new signage, excluding standard traffic control signage at road crossings and trailheads, should include the RVTA logo. Figure 3.9 is an example of a low-profile interpretive sign along a shared use trail. Figure 3.10 shows an example of a trail owner/sponsor sign alongside a regulatory sign post.

The existing mile markers along the trail should be restored, or their design used as the basis for new mile markers. Informational kiosks and interpretive signage should be constructed of durable materials that resist fading; laminated graphics are recommended for these sign types since they allow for quality graphical displays protected from the elements and vandalism. The location of interpretive signage should be explored as the trail is developed. Mackin identified the locations of natural features and cultural resources along the entire corridor, and each of these locations could have some type of interpretive signage. As funds become available the RVTA can identify and provide signage at some of the best examples of these features.

A recent technologic advancement that may be incorporated into the signage design along the Redbank Valley Trail is the use of QR Codes. QR, which is short for quick response, is a unique bar code that can be interpreted by dedicated readers and some smart phones. These codes were initially created for tracking parts in vehicle manufacturing; however, this technology has value as an interpretive feature along the corridor. The QR Codes could be placed on interpretive and informational signage, and provide access to streaming video and audio to tell a story about features and services provided along the corridor. This advancement is valuable from an ADA perspective, providing audio interpretation and information to disabled trail users. Figure 3.11 is an example of a QR Code graphic.

The use of this technology is limited to cellular phone coverage and reception, which was unavailable along the entire 42 mile corridor at the time of this study. The RVTA will need to determine where coverage exists and incorporate this technology accordingly. Once the trail is developed and people are using the corridor, the RVTA may want to contact local emergency service providers to discuss increasing cellular coverage along the trail; if implemented, this measure will provide additional opportunities to use QR Codes.

STRUCTURES

Prior to designing the repairs, it is recommended that all bridges and tunnels be evaluated in detail to determine the extent of repairs required. Based on the findings repairs should be designed and construction plans be prepared. Also, construction bid documents should be prepared so that bids for the repair work can be obtained. The following repair tasks are recommended for the bridges and tunnels:

Bridges

- Install new timber deck with safety railings on both sides on all steel bridges for pedestrian and bicycle use.
- Investigate and repair moderate deficiencies, in abutments of two (2) steel girder bridges.
- Install safety railings on bridge approaches (see Figure 3.12). The actual length of the approach railings will be dependent upon site conditions; however, based upon previous bridge designs, approximately 50' is recommended to provide safe conditions at the approaches.
- Remove all vegetation from the bridge substructure and stone arch masonry headwalls.
- Investigate for erosion and undermining at pier foundations of the bridges over the Redbank Creek, install rock lining where required.
- Construct a new bridge structure over the Middle Run Road, or create an alternate route.
- Evaluate structural conditions of all bridges; perform an in-depth review.

Figure 3.12 Example of a Timber Approach Railing at Bridge

Figure 3.13 Tunnel Improvements

Tunnels

- Perform in-depth review, identify and repair all major deficiencies in the tunnel portals, walls and roof areas of each tunnel.
- Remove large pieces of rock and repair the west portal headwall of the Climax Tunnel.
- Repair cracks, spalled areas and voids in all tunnels (Figure 3.13).
- Remove debris (brick piles) from all tunnels.
- Clean and open the drainage ditches of all tunnels.
- Install lighting in all tunnels – powered by solar energy if feasible.

ENVIRONMENTAL CLEARANCE

To initiate the environmental clearance for the design and construction of the trail, the RVTA should schedule a meeting with the PADEP Northwest District to discuss the environmental requirements and to determine permitting procedure for trail. The RVTA should include discussions regarding the Lawsonham to Sligo Spur in conjunction with the Redbank Valley Trail. This meeting should precede any environmental studies and/or permitting to determine the most appropriate course of action for the development of the trail. Permitting/ studies that may be required include the following:

- Permitting associated with any impacts to aquatic resources within the project corridor is regulated under Chapter 105 of the Pennsylvania Code and Section 404 of the Federal Clean Water Act. Activities covered under this permit may include new pipe installation and pipe replacements, wetland fills, and any other impacts to streams and wetlands in the project area. Coordination with PADEP would determine the level of permitting required (DEP Bureau of Watershed general permits or Chapter 105/Section 404 PADEP/USACE Joint Permit application).
- A Wetland and Stream Identification, Delineation, and Functional Assessment should be completed to identify resources within the project area. This assessment includes field identification and survey of wetlands and watercourses within identified project corridor; is sufficient for submission with the 105/404 permit application(s); and is valid for 5 years.
- Section 106 coordination (Cultural Resources) may be required depending on the type of permitting required for the project. Under Chapter 105 general permitting, no nationally or locally listed historic resources may be impacted as a result of the proposed trail activities. In addition, the discovery of any archaeological artifacts would be adequately protected and promptly reported to the PA Historic and Museum Commission (PHMC). If a Chapter 105/Section 404 single and complete permit is required, coordination with PHMC will be required from the onset of the permitting process.
- Because AVLT is the owner/operator of the trail, a Phase I Environmental Site Assessment (ESA) (Hazardous Waste Investigation) is recommended for liability protection ("due diligence") to identify any potential hazardous or residual waste areas that may be a result of activities that have occurred since the rail banking agreement has been initiated. If federal funding is used for any stage of the project, the results of a Phase I ESA will be required for clearance under the National Environmental Policy Act (NEPA).
- Lastly, Pennsylvania state law requires that an erosion and sediment pollution control plan be prepared for any earth disturbing project, regardless of size. If the project's disturbed area is more than one acre, or introduces a new 'Point Source Discharge' to Waters of the Commonwealth, a National Pollutant Discharge Elimination System (NPDES) permit will be required. It is recommended

that the Trail Association contact the County Conservation Districts to discuss permitting and coordination requirements.

TRAIL CONSTRUCTION

The corridor was divided into five segments to provide the Trail Association with manageable lengths of trail for a phased implementation. The five segments, listed geographically from the Allegheny River to Brookville, are:

- Segment 1 – The Allegheny River to the Long Point Tunnel
- Segment 2 – The Long Point Tunnel to the Climax Tunnel
- Segment 3 – The Climax Tunnel to the Alcola Cemetery in Hawthorn
- Segment 4 – The Alcola Cemetery to Summerville
- Segment 5 – Summerville to Brookville

Considerations used to develop the individual segments included:

- Identifying lengths of trail that could be constructed in a in a single phase.
- Provide vehicular access to at least one, if not both ends of each segment.
- Focus on the developed towns along the corridor and the 13 miles of existing improved trail.
- Promote connections of towns along the trail.
- Think 'regionally' and connect the Redbank Valley Trail with the Armstrong Trail, the Baker Trail, the Pittsburgh to Erie Greenway and the Great Allegheny Passage.

By developing the five Segments for construction of the Redbank Valley Trail, this Feasibility Study provides the RVTA with a strategic plan for implementation. The sequence in which the five segments are constructed will be determined based upon available funding dollars and sources. For example, if funding is coming from a local donor, the RVTA will want to focus on connecting the local population centers in New Bethlehem and Brookville (Segments 3, 4 and 5). However, if the funding is coming from Federal or State dollars, a more regional approach should be considered to connect the 42 mile corridor to a greater 'Trail Network' (Segments 1 and 2). Ultimately, it will be the responsibility of the RVTA to utilize the information contained in this study to make informed decisions regarding implementation as funds become available.

Segments 1 – The Allegheny River to the Long Point Tunnel and 2 – The Long Point Tunnel to the Climax Tunnel

Segments 1 and 2 have been combined together since they connect the Redbank Valley Trail corridor to a larger regional network of trails including the Armstrong Trail and the Erie-to-Pittsburgh Mega-Greenway, a high priority for DCNR. If costs allow, it is recommended that these segments be pursued as one segment. However if cost prohibitive, the two segments can be constructed separately.

Segment 1 is 8.4 miles in length and segment 2 is 8.7 miles. The 17+ miles is primarily of a 'natural' character; Lawsonham is the largest populated area along Segment 1, and St. Charles along Segment 2. Three trailheads are being proposed along these two segments; one at the Allegheny River, one in Lawsonham and another at the west portal of the Climax Tunnel. One parking area is recommended along Segment 2 where Leatherwood Station Road intersects the Redbank Valley Trail.

There are three road crossings along Segment 1 and one crossing along Segment 2. The only crossing which requires special attention is at SR2009 Lawsonham Road; the gradient of the roadway and limited sight distances will require pavement markings on the roadway to provide advanced warning of the trail crossing.

It was noted during the site investigation that Segment 1 has not been disturbed or traveled on for quite some time, and the conditions along the first seven miles is evidence of that statement. There is very little existing ballast in this area, and the poor drainage has resulted in trail washouts (ten noted in the first seven miles, and twelve on the entire segment). The trail inventory and assessment also identified five potential wetlands along Segment 1 and one along Segment 2. The presence of invasive species along both segments was minimal; three locations were noted, all along Segment 2.

The lack of ballast material along these segments, primarily between the Allegheny River and Lawsonham, will require the new trail be constructed without the use of existing ballast materials.

Each segment has one bridge and one tunnel; the potential high cost of renovating the tunnels may necessitate the two segments being constructed in separate phases. The opportunity exists for the RVTA to discuss alternative routes around the Longpoint Tunnel with the adjacent property owners. This measure would allow trail users to travel the entire 17+ miles. Longpoint is primarily a natural stone lined tunnel and may not require as extensive repair as the brick lined Climax tunnel. The steep topography surrounding the Climax Tunnel makes an alternative route infeasible.

These two segments offer a scenic experience to the trail user; four scenic viewsheds and one picnic/rest area were mapped along Segment 1; one scenic viewshed and six picnic/rest areas were mapped along Segment 2.

Segment 3 – The Climax Tunnel to the Alcola Cemetery in Hawthorn

This 5.5 mile segment has the shortest distance of all the segments and has the lowest overall construction cost. This segment connects the Climax Tunnel with 13 miles of improved (graded and rolled ballast) trail between the Alcola Cemetery and Summerville. There are two bridges along this segment as well as the missing bridge at Middle Run. The segment travels through New Bethlehem, which is the most urban condition along the corridor.

There are eight road crossings within this segment; six of those are in New Bethlehem; one crossing of SR28; and one dirt road crossing at the Alcola Cemetery. The road crossings in New Bethlehem should be constructed without access control to minimize the number of gates and bollards that the RVTA will need to maintain. It is our experience that the trail users in an urban environment will police the trail sufficiently to keep unauthorized vehicles of the surface.

There is one trailhead proposed in New Bethlehem, which is being designed within the Trail Town Master Plan (detailed information, cost estimates, and conceptual drawings can be found in that report). There are two parking areas being proposed in segment 3; one near the PennDOT maintenance yard west of New Bethlehem and the other at Fairmount Avenue, at the missing bridge over Middle Run.

The trail alignment at the missing bridge will need to be coordinated if no replacement bridge is constructed prior to opening the trail for use. The Trail Association has contacted the adjacent landowner at this location to determine if an agreement can be reached for trail users to access the property to bypass the missing structure; any agreement reached should be legally recorded to ensure the access is available in perpetuity.

Eleven instance of invasive species (Japanese Knotweed) were identified within this segment. Invasive species eradication should occur immediately to avoid further spreading. Instructions for eradicating Japanese Knotweed are available from DCNR; the instructions have been included in Appendix C. This segment also includes two potential wetlands and four washouts (one area west of New Bethlehem and three washouts east of New Bethlehem). There is also a potential washout located within New Bethlehem across from the mini-mall where stormwater from Penn Street and above is flowing down across the trail.

AMD was identified adjacent to the trail east of New Bethlehem, behind the M&S Meats building.The RVTA should work with the adjacent landowner and local watershed groups to identify ways in which the AMD can be remediated.There are passive ways to treat the drainage, including settling ponds with aquatic vegetation and top-dressing the slopes adjacent to the trail with lime, but treating the discharge at the source is going to provide the highest degree of remediation.

Three potentially historic sites and one picnic opportunity are also within this segment.

Segment 4 – The Alcola Cemetery to Summerville

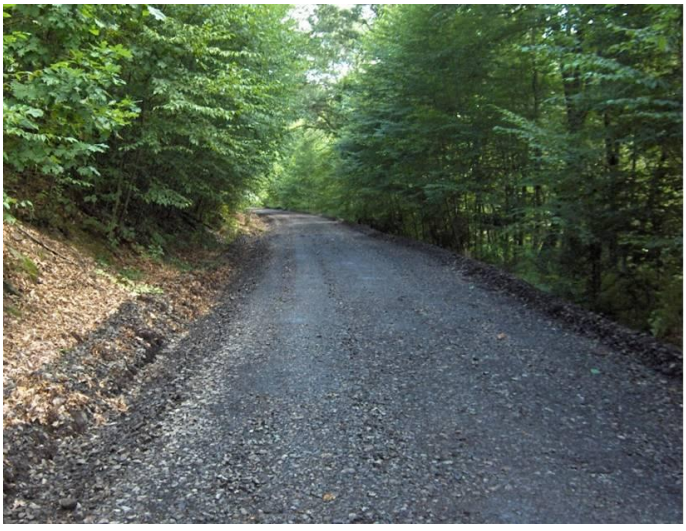
The ballast material along this eleven and one half mile segment of the Redbank Valley Trail was graded and rolled in the summer of 2010. This condition results in the segment being the lowest cost to construct on a per mile basis. There are five bridges along Segment 4; all of which were re-decked in the Spring of 2011 and are open for use. As described earlier, minor re-grading of the ballast material and the placement of #10 limestone is all that is required to complete the trail surface along this segment.

There are seven road crossings; one in Hawthorn, one in Mayport, one in Heathville, two rural roads and two in Summerville. With the exception of SR3007 in Summerville, each of the road crossings requires only standard advanced warning signage along the trail and roadway. It is recommended that additional pavement markings be applied to SR3007 to increase the advanced warning for motorists approaching the trail crossing.

There are two trailheads proposed along this Segment, one at the United Valley Soccer Association and the other in Summerville. One Parking area is proposed at the intersection of the trail and Heathville Road. The locations of the trailheads and parking areas along this segment create an ideal opportunity for trail users to park two vehicles, at separate trailhead/parking areas, and travel the trail between the two.

The character of this Segment changes from rural in Hawthorn and Mayport to more scenic and natural through Heathville and into Summerville. There are two scenic viewsheds and two picnic areas within the more scenic section that have been identified on the project mapping.

There is an existing river access/boat launch at Heathville Road that seems to be in disrepair, and it was not



evident at the time of the field assessment whether the launch is in use. It is recommended that the RVTA coordinate with the owner of this boat launch to discuss the potential for trail users to access the Creek in this location.

There was one invasive species location and one AMD location noted on the project mapping between Mayport and Heathville. The RVTA should attempt to eradicate the invasive species as a first priority and identify the source and impact of the AMD.

Segment 5 – Summerville to Brookville

Segment 5 is a 7.4 mile stretch between Summerville and Brookville that exhibits the same natural character of the latter half of Segment 4. The scenic qualities coupled with seven bridges and one tunnel makes this Segment both costly and beautiful. This segment is the highest cost per mile to develop.

One trailhead is proposed in Brookville at the eastern terminus of the Redbank Valley Trail. This trailhead is situated with a direct visual connection across two bridges and through the Brookville Tunnel; a powerful visual that can be used to advertise the trail once developed. A parking area is proposed at the intersection of the trail and Moore Road. This parking area is at the northwestern corner of the intersection, and is located between the two bridges on either side of Moore Road.

There are two road crossings within the segment, one at Moore Road and the other at SR1003 (Mount Pleasant Road). The intersection at Moore Road has limited sight distance due to the hillside and existing trees. Neither intersection requires any additional signage other than the standard advanced warning signage along the trail and roadway.

There were two drainage issues located along the corridor between the bridge in Baxter and Brookville. There are eight instances of invasive species that will require eradication and one potential wetland; the invasive species are all mapped between Moore Road and Brookville.

There is one picnic/rest area proposed approximately one mile east of Summerville; this location is in a level,

wooded area away from the Redbank Creek, and offers the trail users a place to stop unlike any others along the corridor. Two scenic viewsheds have been noted on the project mapping. A potentially historic location, which is outside the railroad corridor was noted approximately one mile west of the bridge in Baxter; it is recommended that the RVTA explore the significance of the structure for potential interpretive signage.

TRAIL SPURS AND CONNECTIONS

There are several existing and future trail connections along the 42 mile corridor that the RVTA should consider priorities to further regionalize the Redbank Valley Trail. The Armstrong Trail at the Allegheny River is one of those connections; a shared trailhead is proposed along the Armstrong Trail. A trail spur at Lawsonham exists that will connect the town of Sligo to the North. There is also a bridge owned by the AVLT that crosses the Redbank Creek and connects the corridor to South Bethlehem. The bridge is in need of rehabilitation and cannot be crossed safely in its current condition. Coordination should continue between the RVTA and the AVLT to identify funding and programming to rehabilitate the bridge, and install the appropriate means of access control to limit unauthorized travel across the bridge.

Another connection that must be considered is that of the trail and the Redbank Valley High School in New Bethlehem. The front entrance to the high school fronts the intersection of SR 0028 and Penn Street, and the trail corridor is approximately 100' northwest of the intersection. It is recommended that the RVTA coordinate with the School District and PennDOT to install a mid-block crossing at this intersection. The requirements for the crossing may include signage and pavement markings similar to those noted in the road crossing heading of this section. Once the students cross SR 0028, Penn Street should be signed as a 'Share the Road' condition. This connection could be funded through a Pennsylvania Safe Routes to School grant.

CONSTRUCTION COST ESTIMATES

The estimates for construction are an opinion of probable costs, using current (2011) construction prices for publicly bid and federally funded trail construction projects using prevailing wage levels. These costs should be used as budget numbers for development. Final costs will be a result of detailed engineering and design, the specific materials identified for construction and current labor and market rates.

Cost estimates will be affected by many elements including but not limited to the following:

- Number of bidding contractors
- Supply and demand of the local market
- Bidding time (when contractors are busy, and toward the middle or end of the construction season, prices are typically higher)
- Site location and ease/difficulty of access to the project site
- Scope of the project
- Total quantities being installed
- Cost of oil, gasoline and asphalt products
- Environmental concerns and permitting
- Inflation

Although the estimates have been developed using public bid unit costs, some of the improvements can be completed by Public Works, volunteer groups, and through in-kind donations of equipment and material to reduce the total cost. Each segment can be divided into projects and phased in over time.

Table 3.2 contains the design parameters that are being considered for the construction of the trail.

Table 3.2: Trail Design Parameters

Item/Description	Construction Parameter
Clearing and Grubbing	Clearing on average a 25' corridor
Invasive Species Eradication	Per locations identified during field view (vary between 1 and approximately 50 individual plants per location).
Earthwork/Grading	Grading at 20' width by 6" depth; including rolling and compacting the surface to achieve a cross-sloped condition of 2% at the trail and 4% graded shoulders. At existing ballast area-same as above, but blade and roll/compact surface; do not excavate.
Cleaning Existing Drainage Ditch	Removing debris and overgrown vegetation from existing ditch on a per linear foot basis.
New Drainage Ditch	Construction of a new 3' width by 1.5' depth "V" channel
Cleaning Existing Pipe Culverts	Pipes up to 36" in diameter
New Pipe Crossing	18" average diameter at 40' length, High-Density Polyethylene smooth lined corrugated pipe
Pipe Outlet Protection	Rip-rap lined swale, approximately 2 cubic yards per outlet (outlets placed at all new and existing pipes)
Headwalls and Endwalls	Precast concrete; Type D, S, DW all including apron bases
Trail Surfacing	• #10 AASHTO fine graded, crushed limestone- or - • Asphalt wearing c. and binder c. as noted
Trail Section Construction	• 10' trail width typical including 3' shoulders • 12' trail width where alignment passes through towns (Lawsonham, St. Charles, New Bethlehem, Hawthorn, etc.) • Where ballast exists, only 2" depth #10 limestone to be placed; ballast to be rolled prior to limestone being placed • Where no ballast exists, placement of geotextile material, 6" 2A limestone and 2" #10 limestone • Where ballast has been graded/rolled, existing ballast lip/curb to be knocked down and 2" #10 limestone to be installed • Timber railings at narrow corridor locations

Table 3.2: Trail Design Parameters (continued)

Item/Description	Construction Parameter
Trail Heads	• Gravel parking area for approximately 20 vehicles (60' x 100') • Composting toilet facility (single unit) • Shelter/pavilion (15' x 25') • Information Kiosk • Trash Receptacle (can be removed from final design depending upon whether maintenance time/cost for collection is to be incurred) • Signage (trail sign/logo, emergency services, and accessible parking signs) • Side access gates (2) for maintenance vehicles entering/exiting the trail
Parking Areas	• Gravel parking area for approximately 10 vehicles (60' x 50') • Signage (trail sign/logo, emergency services, and accessible parking signs
At-Grade Crossing	• 60 linear feet asphalt approaches at each side of road crossing • Pavement markings and signage on asphalt approaches • Crossing ahead signage along roadways (4 signs total, 2 signs each direction) • In-line access gates (removable bollards) at each side of road
Rest/Picnic Areas/Scenic Views	• Clearing of approximately 500 SF (25' x 25') • Bench at scenic views • Picnic Table (1 at each rest area)
Signage	• Mile markers, monument type sign with decorative trail logo • Interpretive signage at unique natural features, laminated graphics (24" x 36") on metal/wooden pedestal
Access Control -At trail corridor crossings	• Bollards (2) and chain at private property, including no trespassing/ private property signage
Landscape Screening	• A mixture of canopy trees, evergreen trees and evergreen shrubs (cost developed on a per linear foot basis)

Table 3.2: Trail Design Parameters (continued)

Item/Description	Construction Parameter
Bridge Decking and Railing	• Cost reflected on a linear foot basis • 10' clear between railings • 3'-6" high railings with rub-rail • 8' height chain link fence where bridge travels over a road (safety for driver's below)
Bridge Approaches	• 10 linear feet asphalt approaches at each end of structure • 50 linear feet of timber approach railing at both sides of each end of structure (recommended for safety, but actual length may be dependent upon site conditions)
Tunnels	• Portal repairs • Wall and roof repairs (spalled areas) • Tunnel wall drainage repairs • Major crack repairs – epoxy injection • Side ditch cleaning and/or 6" perforated underdrain installation (length of tunnel plus 50' to outlet) • Reflective delineators along both walls at 50' interval

CONSTRUCTION COST ESTIMATES

SEGMENT	SEGMENT DESCRIPTION	MILEAGE	TOTAL COST	COST PER MILE
1	Allegheny River to the Long Point Tunnel	8.4	$2,824,546	$336,255
2	Long Point Tunnel to the Climax Tunnel	8.7	$2,133,516	$245,232
3	Climax Tunnel to the Alcola Cemetery	5.5	$1,535,439	$279,171
4	Alcola Cemetery to Summerville	11.5	$1,568,559	$136,396
5	Summerville to Brookville	7.4	$2,589,166	$349,887
	TOTAL	**41.5**	**$10,651,225**	

Entire Corridor Costs	UNIT	UNIT TOTAL
Environmental Clearances Agency Coordination Meeting Wetland and Stream I&D, and Functional Assessment Phase 1 Environmental Site Assessment (Haz. Waste) Section 106 Clearance Chapter 105/Section 404 Permitting	LS	$30,000
Bridge Inspections (review of 24 bridges, inspection report, conclusions, recommendations for repairs and estimated costs; estimated 3 days field investigation)	LS	$17,850
Tunnel Inspections and Design (in-depth inspection and rehabilitation design of three tunnels along RVT)	LS	$80,000

	GRAND TOTAL	**41.5**	**$10,779,075**	**$259,737**

Alternate Bid Items and Costs (not included in the Trail Construction Costs)

DESCRIPTION	UNIT COST	COMMENTS
Porta-John	$1,000.00	Instead of Composting Toilet at Trailheads

NOTES:

The estimates for construction are an opinion of probable costs, using current (2011) construction prices for publicly bid and federally funded trail construction projects using prevailing wage levels. These costs should be used as budget numbers for development. Final costs will be a result of detailed engineering and design, the specific materials identified for construction and current labor and market rates. Although the estimates have been developed using public bid unit costs, some of the improvements can be completed by Public Works, volunteer groups, and through in-kind donations of equipment and material to reduce the total cost. Each segment can be divided into projects and phased in over time.

Segment 1 - Allegheny River to the Long Point Tunnel - Approximately 8.4 miles

DESCRIPTION	UNIT	QTY	UNIT COST	SUBTOTAL	COMMENTS
Trail					
Clearing and Grubbing	AC	20	$750.00	$15,000.00	Assumes clearing on average a 20' corridor
Earthwork/Grading	CY	16,600	$18.00	$298,800.00	Grading at 20' width x 6" depth
Cleaning Existing Ditches	LF	33,750	$6.00	$202,500.00	Removing debris and overgrown vegetation from existing swale
Linear Drainage Swale	LF	11,250	$25.00	$281,250.00	Typical "V" ditch; 3' wide x 1.5' deep
Cleaning Existing Pipe Culverts	LF	100	$20.00	$2,000.00	Up to 36" Diameter
New Pipe Crossing	LF	520	$60.00	$31,200.00	18" average diameter, 40' length
Pipe Outlet Protection	CY	36	$100.00	$3,600.00	R-4 rip-rap, 2 CY per end pipe
Concrete Headwall	EA	10	$2,500.00	$25,000.00	PennDOT Type D-W Endwall
12' Trail Width Sections					1.4 miles (1/2 mile each side of Lawsonham)
2A Limestone	SY	9,800	$8.00	$78,400.00	At 6" depth
#10 Limestone	SY	9,800	$5.00	$49,000.00	At 2" depth
Geotextile	SY	9,800	$1.50	$14,700.00	Class 2, Type A
10' Trail Width Sections					7.0 miles
2A Limestone	SY	41,100	$8.00	$328,800.00	At 6" depth
#10 Limestone	SY	41,100	$5.00	$205,500.00	At 2" depth
Geotextile	SY	41,100	$1.50	$61,650.00	Class 2, Type A
Timber Fence	LF	650	$45.00	$29,250.00	Barrier at edge of shoulder; fall protection between corridor and creek
Trail Head	LS	2	$47,825.00	$95,650.00	
Parking Surface	SY	650	$14.00		Gravel Surface, 2A Limestone 6" Depth, approximately 60' x 100'
Single Unit Composting Toilet	EA	1	$19,000.00		Clivus Multrum - M54 Trailhead Series
Shelter/Pavilion	EA	1	$8,000.00		10' x 10' with Shingle Roof and Reinforced Concrete Pad
Informational Kiosk	EA	1	$2,000.00		
Signage	EA	1	$225.00		
Trash Receptacle	EA	2	$750.00		Informational
Side Access Gate	EA	2	$4,000.00		Side Access Gate and Bollards
At-Grade Crossings	LS	3	$16,500.00	$49,500.00	Includes signs, pavement markings, access gates and bituminous approach pads
Flashing Beacon	EA	1	$15,500.00	$15,500.00	At intersection of trail and SR 2009
Gated Access Locations	EA	2	$1,750.00	$3,500.00	Bollards and chain at private property
Rest Areas/Scenic Viewsheds					
Clearing	SY	300	$0.50	$150.00	Approximate 500 SF (20' x 25') each

Benches/Picnic Tables	EA	4	$1,000.00	$4,000.00	installed on ground, includes concrete footing
Signs					
Mile Markers	EA	8	$500.00	$4,000.00	Monument type markers; pre-cast concrete, decorative/branding
Interpretive Signage	EA	5	$600.00	$3,000.00	Natural Features, History, etc.; 24" x 36" Laminated panel with post
Landscape Screening/Buffer	LF		$70.00	$0.00	Canopy trees, evergreen trees, and evergreen shrubs
Trail Subtotal				**$1,801,950**	
Structures					
Bridges					
Prior to mile 1; LF approx.	LF	65	$500.00	$32,500.00	
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	Each end of structure
Timber Approach Railing	LF	200	$45.00	$9,000.00	Both sides of each end of structure
Tunnels					
Long Point tunnel	LS	1	$189,500.00		
Portals	EA	2	$25,000.00	$50,000.00	
Wall & Roof Spall Repairs	CY	50	$1,000.00	$50,000.00	
Wall Drainage	EA	24	$3,000.00	$72,000.00	
Crack - Epoxy Injection	LF	100	$100.00	$10,000.00	
Tunnel Drainage	LS	1	$7,500.00	$7,500.00	
Structures Subtotal				**$232,166**	

Trail Segment 1 Subtotal	**$2,034,116**
Erosion and Sedimentation Controls (10%)	$180,195.00
Maintenance and Protection of Traffic (2%)	$40,682.32
Mobilization (8%)	$162,729.28
Contingency (10%)	$203,411.60
Engineering and Design (10%)	$203,411.60
SEGMENT 1 TOTAL	**$2,824,546**

Segment 2 - Long Point Tunnel to the Climax Tunnel - Approximately 8.7 miles

DESCRIPTION	UNIT	QTY	UNIT COST	SUBTOTAL	COMMENTS
Trail					
Clearing and Grubbing	AC	21	$750.00	$15,750.00	Assumes clearing on average a 20' corridor
Hazardous Waste Removal	CY	15	$4,000.00	$60,000.00	Railroad ties, barrels/drums, etc.
Removal of Debris Piles	CY	1	$1,000.00	$1,000.00	Remove and dispose of debris
Rock Slides					
Rock Clearing	CY	30	$30.00	$900.00	Removal of large rocks from trail corridor
Toe of Slope Stabilization	LF	600	$100.00	$60,000.00	Improvements at slope toe to catch falling rocks; large rock placement
Invasive Species Eradication	EA	3	$500.00	$1,500.00	Selective removal of invasive species
Earthwork/Grading	CY	8,500	$18.00	$153,000.00	Grading at 10' width x 6" depth
Cleaning Existing Ditches	LF	34,125	$6.00	$204,750.00	Removing debris and overgrown vegetation from existing swale
Linear Drainage Swale	LF	11,375	$25.00	$284,375.00	Typical "V" ditch; 3' wide x 1.5' deep
Cleaning Existing Pipe Culverts	LF	40	$20.00	$800.00	Up to 36" Diameter
New Pipe Crossing	LF	80	$60.00	$4,800.00	18" average diameter, 40' length
Pipe Outlet Protection	CY	10	$100.00	$1,000.00	R-4 rip-rap, 2 CY per end pipe
Concrete Headwall	EA	10	$2,500.00	$25,000.00	PennDOT Type D-W Endwall
10' Trail Width Sections					
#10 Limestone	SY	51,000	$5.00	$255,000.00	At 2" depth
Topsoil	CY	1,800	$20.00	$36,000.00	Fill Material/Topsoil to be chocked into shoulder to contain trail sub-surface & surface
Timber Fence	LF	1,900	$45.00	$85,500.00	Barrier at edge of shoulder; fall protection between corridor and creek
Trail Head	LS	1	$47,825.00	$47,825.00	
Parking Surface	SY	650	$14.00		Gravel Surface, 2A Limestone 6" Depth, approximately 60' x 100'
Single Unit Composting Toilet	EA	1	$19,000.00		Clivus Multrum - M54 Trailhead Series
Shelter/Pavilion	EA	1	$8,000.00		10' x 10' with Shingle Roof and Reinforced Concrete Pad
Informational Kiosk	EA	1	$2,000.00		
Signage	EA	1	$225.00		
Trash Receptacle	EA	2	$750.00		Informational
Side Access Gate	EA	2	$4,000.00		Side Access Gate and Bollards
Parking Area	LS	1	$5,000.00	$5,000.00	
Parking Surface	SY	325	$14.00		Gravel Surface, 2A Limestone 6" Depth, approximately 60' x 50'
Signage	EA	2	$225.00		

At-Grade Crossings	LS	1	$16,500.00	$16,500.00	Includes signs, pavement markings, access gates and bituminous approach pads
Gated Access Locations	EA	3	$1,750.00	$5,250.00	Bollards and chain at private property
Rest Areas/Scenic Viewsheds					
Clearing	SY	3,000	$0.50	$1,500.00	Approximate 500 SF (20' x 25') each
Benches/Picnic Tables	EA	6	$1,000.00	$6,000.00	installed on ground, includes concrete footing
Signs					
Mile Markers	EA	8	$500.00	$4,000.00	Monument type markers; pre-cast concrete, decorative/branding
Interpretive Signage	EA	3	$600.00	$1,800.00	Natural Features, History, etc.; 24" x 36" Laminated panel with post
			Trail Subtotal	**$1,277,250**	
Structures					
Bridges					
Leatherwood Run at St. Charles Rd	LF	56	$500.00	$28,000.00	
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	Each end of structure
Timber Approach Railing	LF	200	$45.00	$9,000.00	Both sides of each end of structure
Tunnels					
Climax Tunnel	LS	1	$227,500.00		
Portals	EA	2	$25,000.00	$50,000.00	
Wall & Roof Spall Repairs	CY	100	$1,000.00	$100,000.00	
Wall Drainage	EA	20	$3,000.00	$60,000.00	
Crack - Epoxy Injection	LF	100	$100.00	$10,000.00	
Tunnel Drainage	LS	1	$7,500.00	$7,500.00	
			Structures Subtotal	**$265,666**	

Trail Segment 2 Subtotal	**$1,542,916**
Erosion and Sedimentation Controls (10%)	$127,725.00
Maintenance and Protection of Traffic (2%)	$30,858.32
Mobilization (8%)	$123,433.28
Contingency (10%)	$154,291.60
Engineering and Design (10%)	$154,291.60
SEGMENT 2 TOTAL	**$2,133,516**

Segment 3 - Climax Tunnel to the Alcola Cemetery - Approximately 5.5 miles

DESCRIPTION	UNIT	QTY	UNIT COST	SUBTOTAL	COMMENTS
Trail					
Clearing and Grubbing	AC	10	$750.00	$7,500.00	Assumes clearing on average a 20' corridor - excludes one mile length in New Bethlehem
Removal of Debris Piles	CY	1	$1,000.00	$1,000.00	Remove and dispose of debris
Invasive Species Eradication	EA	11	$500.00	$5,500.00	Selective removal of invasive species
Earthwork/Grading	CY	5,400	$18.00	$97,200.00	Grading at 10' width x 6" depth
Cleaning Existing Ditches	LF	21,780	$6.00	$130,680.00	Removing debris and overgrown vegetation from existing swale
Linear Drainage Swale	LF	7,260	$25.00	$181,500.00	Typical "V" ditch; 3' wide x 1.5' deep
Cleaning Existing Pipe Culverts	LF	20	$20.00	$400.00	Up to 36" Diameter
New Pipe Crossing	LF	80	$60.00	$4,800.00	18" average diameter, 40' length
Pipe Outlet Protection	CY	20	$100.00	$2,000.00	R-4 rip-rap, 2 CY per end pipe
Concrete Headwall	EA	10	$2,500.00	$25,000.00	PennDOT Type D-W Endwall
12' Trail Width Sections					2.3 miles (1/2 mile each side of New Bethlehem)
#10 Limestone	SY	16,200	$5.00	$81,000.00	At 2" depth
Topsoil	CY	450	$20.00	$9,000.00	Fill Material/Topsoil to be chocked into shoulder to contain trail sub-surface & surface
10' Trail Width Sections					3.2 miles
#10 Limestone	SY	18,800	$5.00	$94,000.00	At 2" depth
Topsoil	CY	630	$20.00	$12,600.00	Fill Material/Topsoil to be chocked into shoulder to contain trail sub-surface & surface
Timber Fence	LF	300	$45.00	$13,500.00	Barrier at edge of shoulder; fall protection between corridor and creek
Trail Head	LS	1	$50,000.00	$50,000.00	Detailed cost included in the New Bethlehem Trail Town Project
Parking Area	LS	1	$5,000.00	$5,000.00	
Parking Surface	SY	325	$14.00		Gravel Surface, 2A Limestone 6" Depth, approximately 60' x 50'
Signage	EA	2	$225.00		
At-Grade Crossings	LS	3	$16,500.00	$49,500.00	Includes signs, pavement markings, access gates and bituminous approach pads
Flashing Beacon	EA	1	$15,500.00	$15,500.00	At intersection of trail and SR 0028
At-Grade Crossings (no access control)	LS	5	$13,000.00	$65,000.00	Includes signs, pavement markings and bituminous approach pads
Gated Access Locations	EA	1	$1,750.00	$1,750.00	Bollards and chain at private property

Rest Areas/Scenic Viewsheds					
Clearing	SY	50	$0.50	$25.00	Approximate 500 SF (20' x 25') each
Benches/Picnic Tables	EA	1	$1,000.00	$1,000.00	installed on ground, includes concrete footing
Signs					
Mile Markers	EA	4	$500.00	$2,000.00	Monument type markers; pre-cast concrete, decorative/branding
Interpretive Signage	EA	3	$600.00	$1,800.00	Natural Features, History, etc.; 24" x 36" Laminated panel with post
Landscape Screening/Buffer	LF	200	$70.00	$14,000.00	Canopy trees, evergreen trees, and evergreen shrubs
Trail Subtotal				**$871,255**	
Structures					
Bridges					
Leasure Run	LF	45	$500.00	$22,500.00	
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	Each end of structure
Timber Approach Railing	LF	200	$45.00	$9,000.00	Both sides of each end of structure
Middle Run	LS	1	$200,000.00	$200,000.00	
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
Structures Subtotal				**$242,832**	

Trail Segment 3 Subtotal	**$1,114,087**
Erosion and Sedimentation Controls (10%)	$87,125.50
Maintenance and Protection of Traffic (2%)	$22,281.74
Mobilization (8%)	$89,126.96
Contingency (10%)	$111,408.70
Engineering and Design (10%)	$111,408.70
SEGMENT 3 TOTAL	**$1,535,439**

Segment 4 - The Alcola Cemetery to Summerville - Approximately 11.5 miles

DESCRIPTION	UNIT	QTY	UNIT COST	SUBTOTAL	COMMENTS
Trail					
Clearing and Grubbing	AC	14	$750.00	$10,500.00	Assumes 10' clearing - graded and rolled corridor - clear 5' each side of trail
Hazardous Waste Removal	CY	5	$4,000.00	$20,000.00	Railroad ties, barrels/drums, etc.
Removal of Debris Piles	CY		$1,000.00	$0.00	Remove and dispose of debris
Retaining Wall Repair/Reconstruction	SFF	300	$100.00	$30,000.00	Remove and reconstruct retaining wall
Invasive Species Eradication	EA	1	$500.00	$500.00	Selective removal of invasive species
Earthwork/Grading	CY	5,600	$18.00	$100,800.00	Grading at 10' width x 3" depth
Cleaning Existing Ditches	LF	7,000	$6.00	$42,000.00	Removing debris and overgrown vegetation from existing swale
Linear Drainage Swale	LF	5,000	$25.00	$125,000.00	Typical "V" ditch; 3' wide x 1.5' deep
Cleaning Existing Pipe Culverts	LF	80	$20.00	$1,600.00	Up to 36" Diameter
New Pipe Crossing	LF	240	$60.00	$14,400.00	18" average diameter, 40' length
Pipe Outlet Protection	CY	34	$100.00	$3,400.00	R-4 rip-rap, 2 CY per end pipe
Concrete Headwall	EA	34	$2,500.00	$85,000.00	PennDOT Type D-W Endwall
12' Trail Width Sections (Over Existing Ballast)					2.3 miles (1/2 mile each side of Hawthorn and 1/2 mile west of Summerville)
#10 Limestone	SY	16,200	$5.00	$81,000.00	At 2" depth
Topsoil	CY	450	$20.00	$9,000.00	Fill Material/Topsoil to be chocked into shoulder to contain trail sub-surface & surface
10' Trail Width Sections (Over Existing Ballast)					9.2 miles
#10 Limestone	SY	54,000	$5.00	$270,000.00	At 2" depth
Topsoil	CY	1,700	$20.00	$34,000.00	Fill Material/Topsoil to be chocked into shoulder to contain trail sub-surface & surface
Timber Fence	LF	60	$45.00	$2,700.00	Barrier at edge of shoulder; fall protection between corridor and creek
Trail Head	LS	2	$47,825.00	$95,650.00	
Parking Surface	SY	650	$14.00		Gravel Surface, 2A Limestone 6" Depth, approximately 60' x 100'
Single Unit Composting Toilet	EA	1	$19,000.00		Clivus Multrum - M54 Trailhead Series
Shelter/Pavilion	EA	1	$8,000.00		10' x 10' with Shingle Roof and Reinforced Concrete Pad
Informational Kiosk	EA	1	$2,000.00		
Signage	EA	1	$225.00		
Trash Receptacle	EA	2	$750.00		Informational

Side Access Gate	EA	2	$4,000.00		Side Access Gate and Bollards
Parking Area	LS	2	$5,000.00	$10,000.00	
Parking Surface	SY	325	$14.00		Gravel Surface, 2A Limestone 6" Depth, approximately 60' x 50'
Signage	EA	2	$225.00		
At-Grade Crossings	LS	7	$16,500.00	$115,500.00	Includes signs, pavement markings, access gates and bituminous approach pads
Gated Access Locations	EA	5	$1,750.00	$8,750.00	Bollards and chain at private property
Rest Areas/Scenic Viewsheds					
Clearing	SY	1,000	$0.50	$500.00	Approximate 500 SF (20' x 25') each
Benches/Picnic Tables	EA	4	$1,000.00	$4,000.00	installed on ground, includes concrete footing
Signs					
Mile Markers	EA	13	$500.00	$6,500.00	Monument type markers; pre-cast concrete, decorative/branding
Interpretive Signage	EA	4	$600.00	$2,400.00	Natural Features, History, etc.; 24" x 36" Laminated panel with post
Trail Subtotal				**$1,073,200**	
Structures					
Bridges					
Town Run	LF	57	-	-	Bridge re-decked
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	Each end of structure
Timber Approach Railing	LF	200	$45.00	$9,000.00	Both sides of each end of structure
Oak Ridge Road	LF	31	-	-	Bridge re-decked
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
Pine Run in Hawthorn	LF	57	-	-	Bridge re-decked
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
No name, west of Heathville Road	LF	221	-	-	Bridge re-decked
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
Heathville Run	LF	57	-	-	Bridge re-decked
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
Structures Subtotal				**$50,830**	

Trail Segment 4 Subtotal	**$1,124,030**
Erosion and Sedimentation Controls (10%)	$107,320.00
Maintenance and Protection of Traffic (2%)	$22,480.60
Mobilization (8%)	$89,922.40
Contingency (10%)	$112,403.00
Engineering and Design (10%)	$112,403.00
SEGMENT 4 TOTAL	**$1,568,559**

Segment 5 - Summerville to Brookville - Approximately 7.4 miles

DESCRIPTION	UNIT	QTY	UNIT COST	SUBTOTAL	COMMENTS
Trail					
Clearing and Grubbing	AC	18	$750.00	$13,500.00	Assumes clearing on average a 20' corridor
Invasive Species Eradication	EA	9	$500.00	$4,500.00	Selective removal of invasive species
Earthwork/Grading	CY	7,200	$18.00	$129,600.00	Grading at 10' width x 6" depth
Cleaning Existing Ditches	LF	29,250	$6.00	$175,500.00	Removing debris and overgrown vegetation from existing swale
Linear Drainage Swale	LF	9,750	$25.00	$243,750.00	Typical "V" ditch; 3' wide x 1.5' deep
Cleaning Existing Pipe Culverts	LF	80	$20.00	$1,600.00	Up to 36" Diameter
New Pipe Crossing	LF	80	$60.00	$4,800.00	18" average diameter, 40' length
Pipe Outlet Protection	CY	40	$100.00	$4,000.00	R-4 rip-rap, 2 CY per end pipe
Concrete Headwall	EA	20	$2,500.00	$50,000.00	PennDOT Type D-W Endwall
12' Trail Width Sections					1.0 miles (1/2 mile east of Summerville and 1/2 mile west of Brookville)
#10 Limestone	SY	7,040	$5.00	$35,200.00	At 2" depth
Topsoil	CY	200	$20.00	$4,000.00	Fill Material/Topsoil to be chocked into shoulder to contain trail sub-surface & surface
10' Trail Width Sections					6.4 miles
#10 Limestone	SY	37,500	$5.00	$187,500.00	At 2" depth
Topsoil	CY	1,250	$20.00	$25,000.00	Fill Material/Topsoil to be chocked into shoulder to contain trail sub-surface & surface
Timber Fence	LF	600	$45.00	$27,000.00	Barrier at edge of shoulder; fall protection between corridor and creek
Trail Head	LS	1	$43,825.00	$43,825.00	
Parking Surface	SY	650	$14.00		Gravel Surface, 2A Limestone 6" Depth, approximately 60' x 100'
Single Unit Composting Toilet	EA	1	$19,000.00		Clivus Multrum - M54 Trailhead Series
Shelter/Pavilion	EA	1	$8,000.00		10' x 10' with Shingle Roof and Reinforced Concrete Pad
Informational Kiosk	EA	1	$2,000.00		
Signage	EA	1	$225.00		
Trash Receptacle	EA	2	$750.00		Informational
Side Access Gate	EA	1	$4,000.00		Side Access Gate and Bollards
Parking Area	LS	1	$5,000.00	$5,000.00	
Parking Surface	SY	325	$14.00		Gravel Surface, 2A Limestone 6" Depth, approximately 60' x 50'
Signage	EA	2	$225.00		

At-Grade Crossings	LS	2	$16,500.00	$33,000.00	Includes signs, pavement markings, access gates and bituminous approach pads
Gated Access Locations	EA	1	$1,750.00	$1,750.00	Bollards and chain at private property
Rest Areas/Scenic Viewsheds					
Clearing	SY	1,000	$0.50	$500.00	Approximate 500 SF (20' x 25') each
Benches/Picnic Tables	EA	2	$1,000.00	$2,000.00	installed on ground, includes concrete footing
Signs					
Mile Markers	EA	6	$500.00	$3,000.00	Monument type markers; pre-cast concrete, decorative/branding
Interpretive Signage	EA	3	$600.00	$1,800.00	Natural Features, History, etc.; 24" x 36" Laminated panel with post
			Trail Subtotal	**$996,825**	
Structures					
Bridges					
Moore Road west	LF	212	$500.00	$106,000.00	
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	Each end of structure
Timber Approach Railing	LF	200	$45.00	$9,000.00	Both sides of each end of structure
Moore Road east	LF	267	$500.00	$133,500.00	
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
Concrete Backwall Repairs	LS	1	$10,000.00	$10,000.00	
No name (247 per RR Val Map)	LF	240	$500.00	$120,000.00	
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
Mortar Joint Repairs	LF	250	$50.00	$12,500.00	
Codders Run	LF	36	$500.00	$18,000.00	
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
No name (245 per RR Val Map)	LF	212	$500.00	$106,000.00	At Brookville Tunnel; west end
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
No name (244 per RR Val Map)	LF	172	$500.00	$86,000.00	At Brookville Tunnel; east end
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	

No name (243 per RR Val Map)	LF	67	$500.00	$33,500.00	At Brookville Tunnel; east end
Bridge Approach (10 LF Asphalt)	SY	22	$53.00	$1,166.00	
Timber Approach Railing	LF	200	$45.00	$9,000.00	
Tunnels					
Brookville Tunnel	LS	1	$221,500.00		
Portals	EA	2	$25,000.00	$50,000.00	
Wall & Roof Spall Repairs	CY	70	$1,000.00	$70,000.00	
Wall Drainage	EA	28	$3,000.00	$84,000.00	
Crack - Epoxy Injection	LF	100	$100.00	$10,000.00	
Tunnel Drainage	LS	1	$7,500.00	$7,500.00	

Structures Subtotal	**$918,162**

Trail Segment 5 Subtotal	**$1,914,987**
Erosion and Sedimentation Controls (10%)	$99,682.50
Maintenance and Protection of Traffic (2%)	$38,299.74
Mobilization (8%)	$153,198.96
Contingency (10%)	$191,498.70
Engineering and Design (10%)	$191,498.70
SEGMENT 5 TOTAL	**$2,589,166**

Redbank Valley Trails

Trail Concept Plan ~ Miles 1-5

Mackin

0 430 860 1,720 Feet

Data Source:
Pennsylvania Spatial Data Access (PASDA), PennDOT, PA Game Commission (PGC)

Legend

- Mile Marker
- County Boundary
- Borough
- Township
- State Game Land
- AVLT Property
- River or Pond
- Stream

Trail Alignment
- Redbank Trail
- Armstrong Trail
- Lawsonham to Sligo Spur

- Tunnel
- Bridge
- At-Grade Road Crossing
- Culvert

Existing Features
- Public Park
- Boat Launch
- Tubing
- Bed & Breakfast
- Erosion
- Rock Slide
- Wetland
- Vernal Pool
- Invasive Plant Species
- Hazardous Site
- Issue (cars, junk, etc.)

Proposed Amenities
- Trailhead (left)
- Trailhead (right)
- Parking Area
- Trail/Property Access
- Creek Access
- Picnic Area Opportunity
- Interpretive Opportunity
- Historic Site
- Rock Outcrop
- Scenic View
- Camping Opportunity

N

Begin Segment 1

0

Armstrong Trail/
Allegheny River
Trailhead

1

2

3

4

5

MADISON

MADISON

WASHINGTON

Sr1002

Rails To

Friendly

River Hill

Spurdic

Pin Oak

Traister

Traister

Swartz

Lynn Buzzard

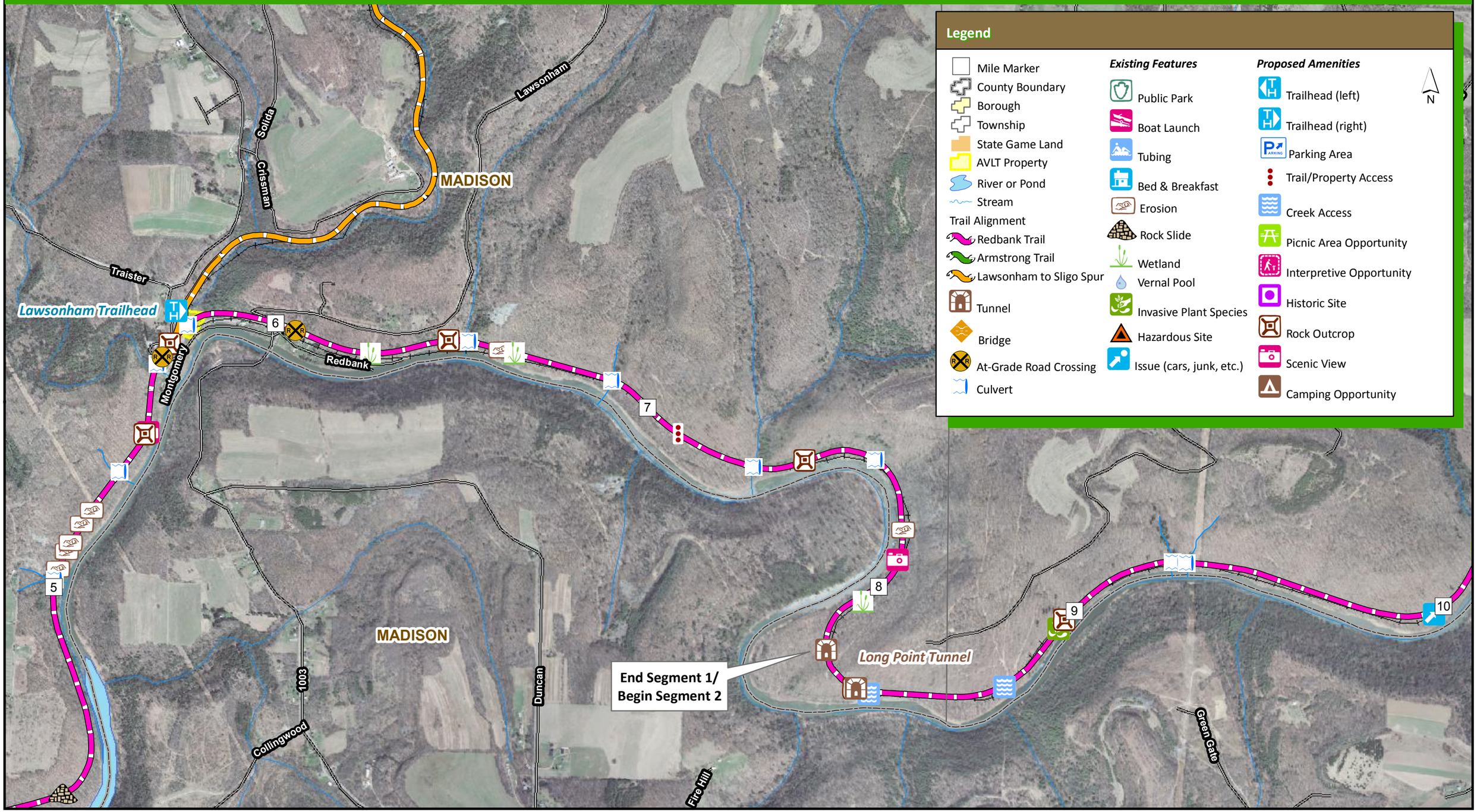
Redbank Valley Trails

Trail Concept Plan ~ Miles 5-10

Mackin

0 480 960 1,920 Feet

Data Source:
Pennsylvania Spatial Data Access (PASDA), PennDOT, PA Game Commission (PGC)



Legend

- Mile Marker
- County Boundary
- Borough
- Township
- State Game Land
- AVLT Property
- River or Pond
- Stream

Trail Alignment
- Redbank Trail
- Armstrong Trail
- Lawsonham to Sligo Spur
- Tunnel
- Bridge
- At-Grade Road Crossing
- Culvert

Existing Features
- Public Park
- Boat Launch
- Tubing
- Bed & Breakfast
- Erosion
- Rock Slide
- Wetland
- Vernal Pool
- Invasive Plant Species
- Hazardous Site
- Issue (cars, junk, etc.)

Proposed Amenities
- Trailhead (left)
- Trailhead (right)
- Parking Area
- Trail/Property Access
- Creek Access
- Picnic Area Opportunity
- Interpretive Opportunity
- Historic Site
- Rock Outcrop
- Scenic View
- Camping Opportunity

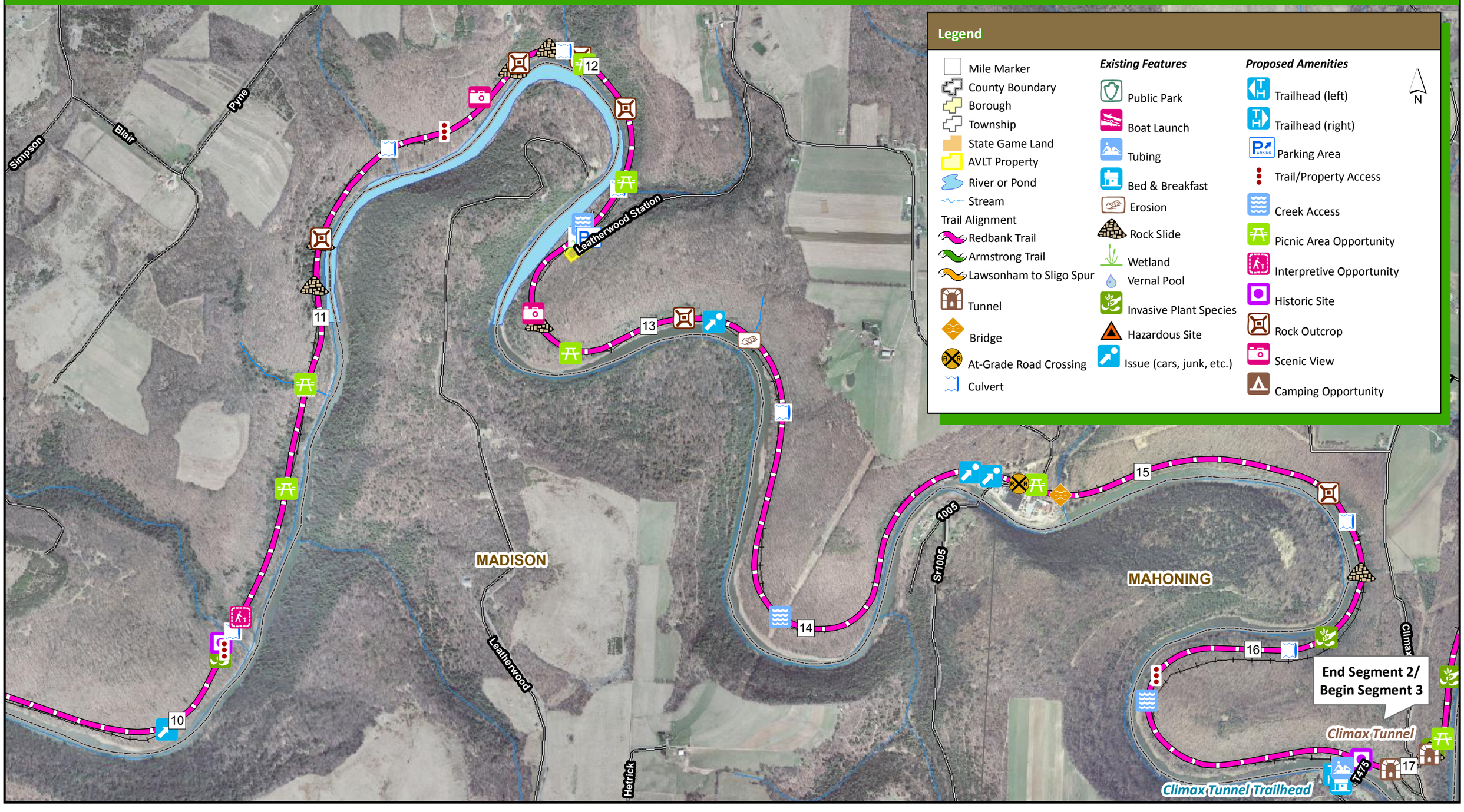
Redbank Valley Trails

Trail Concept Plan ~ Miles 10-17

Mackin

0 440 880 1,760 Feet

Data Source:
Pennsylvania Spatial Data Access (PASDA), PennDOT, PA Game Commission (PGC)



Legend

- Mile Marker
- County Boundary
- Borough
- Township
- State Game Land
- AVLT Property
- River or Pond
- Stream

Trail Alignment
- Redbank Trail
- Armstrong Trail
- Lawsonham to Sligo Spur

- Tunnel
- Bridge
- At-Grade Road Crossing
- Culvert

Existing Features
- Public Park
- Boat Launch
- Tubing
- Bed & Breakfast
- Erosion
- Rock Slide
- Wetland
- Vernal Pool
- Invasive Plant Species
- Hazardous Site
- Issue (cars, junk, etc.)

Proposed Amenities
- Trailhead (left)
- Trailhead (right)
- Parking Area
- Trail/Property Access
- Creek Access
- Picnic Area Opportunity
- Interpretive Opportunity
- Historic Site
- Rock Outcrop
- Scenic View
- Camping Opportunity

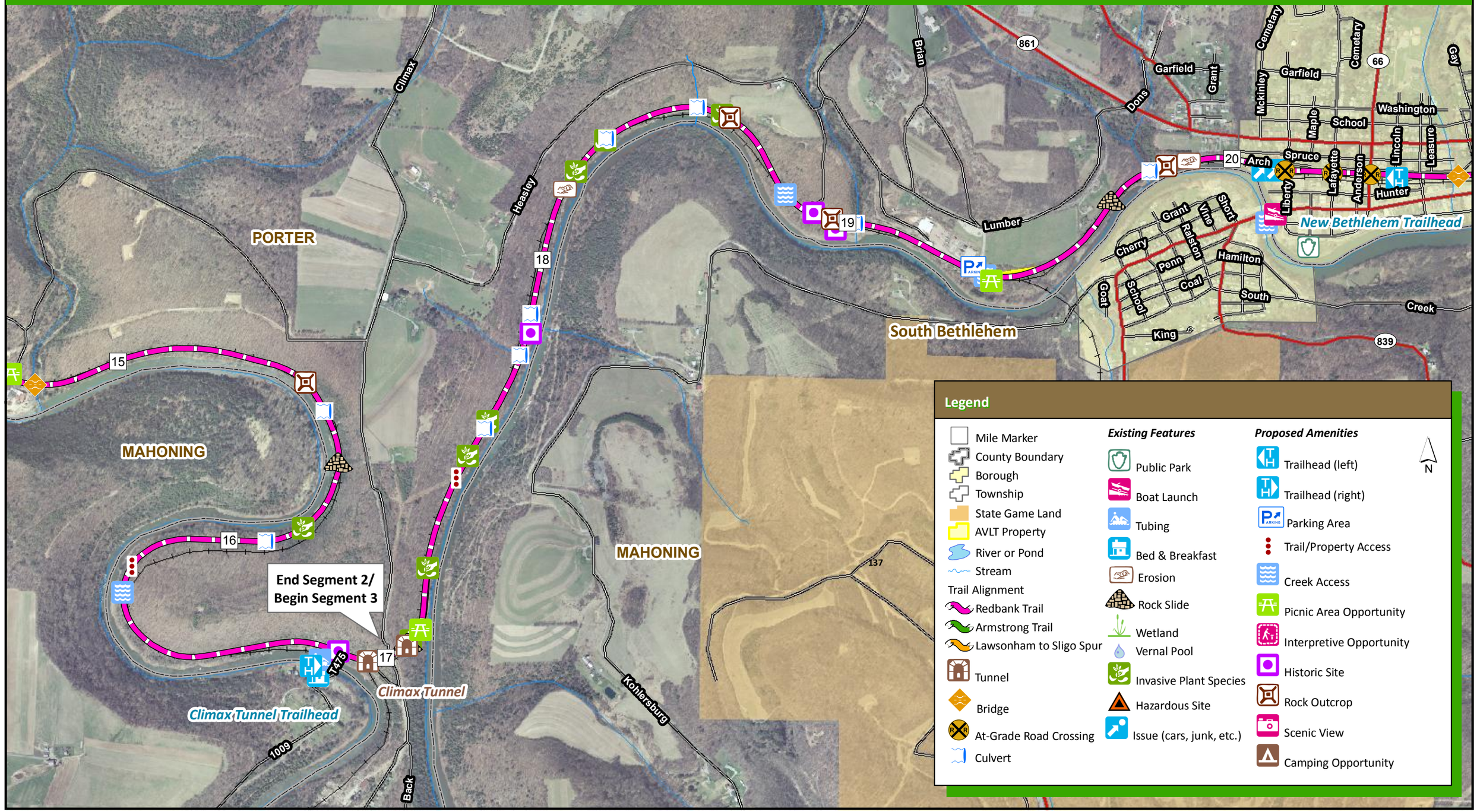
Redbank Valley Trails

Trail Concept Plan ~ Miles 17-20

Mackin

0 440 880 1,760 Feet

Data Source:
Pennsylvania Spatial Data Access (PASDA), PennDOT, PA Game Commission (PGC)



Legend

- Mile Marker
- County Boundary
- Borough
- Township
- State Game Land
- AVLT Property
- River or Pond
- Stream

Trail Alignment
- Redbank Trail
- Armstrong Trail
- Lawsonham to Sligo Spur
- Tunnel
- Bridge
- At-Grade Road Crossing
- Culvert

Existing Features
- Public Park
- Boat Launch
- Tubing
- Bed & Breakfast
- Erosion
- Rock Slide
- Wetland
- Vernal Pool
- Invasive Plant Species
- Hazardous Site
- Issue (cars, junk, etc.)

Proposed Amenities
- Trailhead (left)
- Trailhead (right)
- Parking Area
- Trail/Property Access
- Creek Access
- Picnic Area Opportunity
- Interpretive Opportunity
- Historic Site
- Rock Outcrop
- Scenic View
- Camping Opportunity

N

Redbank Valley Trails

Trail Concept Plan ~ Miles 20-25

Mackin

0 550 1,100 2,200 Feet

Data Source:
Pennsylvania Spatial Data Access (PASDA), PennDOT, PA Game Commission (PGC)

Legend

- Mile Marker
- County Boundary
- Borough
- Township
- State Game Land
- AVLT Property
- River or Pond
- Stream

Trail Alignment
- Redbank Trail
- Armstrong Trail
- Lawsonham to Sligo Spur
- Tunnel
- Bridge
- At-Grade Road Crossing
- Culvert

Existing Features
- Public Park
- Boat Launch
- Tubing
- Bed & Breakfast
- Erosion
- Rock Slide
- Wetland
- Vernal Pool
- Invasive Plant Species
- Hazardous Site
- Issue (cars, junk, etc.)

Proposed Amenities
- Trailhead (left)
- Trailhead (right)
- Parking Area
- Trail/Property Access
- Creek Access
- Picnic Area Opportunity
- Interpretive Opportunity
- Historic Site
- Rock Outcrop
- Scenic View
- Camping Opportunity

N

REDBANK
Hawthorn
New Bethlehem
MAHONING
REDBANK

Hawthorn Soccer Fields Trailhead
New Bethlehem Trailhead

End Segment 3/
Begin Segment 4

Penn, Longview, Truittsburg, Pine, Peach, Center, Arch, Oak, Linden, Walnut, Cherry, Harper, Yost, Main, Maple, Wants, Park, Carrow, Walker Flat, Sugar Valley, Town Run, Maple, Oak, Church, 4th, 3rd, Pine, 1st, Cedar, Oak Ridge, Oak Ridge Hill, Mount Zion, T803, T804, Short, T619, Fairmont, Highland, Dreyer, Doverspike, Penn, Taylor, Strawberry, Short, Willow, Creek, Cemetery, Grant, Mckinley, Garfield, Franklin, Washington, Maple, School, Lincoln, Leasure, Keck, Spruce, Arch, Liberty, Anderson, Hunter, Vine, Short, Maple, Water, Hamilton, T500

25, 24, 23, 22, 21, 20, 28, 861, 839

Redbank Valley Trails

Trail Concept Plan ~ Miles 25-30

Mackin

0 625 1,250 2,500 Feet

Data Source:
Pennsylvania Spatial Data Access (PASDA), PennDOT, PA Game Commission (PGC)

Legend

- Mile Marker
- County Boundary
- Borough
- Township
- State Game Land
- AVLT Property
- River or Pond
- Stream

Trail Alignment
- Redbank Trail
- Armstrong Trail
- Lawsonham to Sligo Spur

- Tunnel
- Bridge
- At-Grade Road Crossing
- Culvert

Existing Features
- Public Park
- Boat Launch
- Tubing
- Bed & Breakfast
- Erosion
- Rock Slide
- Wetland
- Vernal Pool
- Invasive Plant Species
- Hazardous Site
- Issue (cars, junk, etc.)

Proposed Amenities
- Trailhead (left)
- Trailhead (right)
- Parking Area
- Trail/Property Access
- Creek Access
- Picnic Area Opportunity
- Interpretive Opportunity
- Historic Site
- Rock Outcrop
- Scenic View
- Camping Opportunity

N

Strauser
Cunningham
Pucalik
Dewey
Ford
T331
Fryer
BEAVER
Fields
Patton
Zion
Hickory
Hickroy
Water
Salem
536
George
REDBANK
RINGGOLD
25
26
27
28
29
30

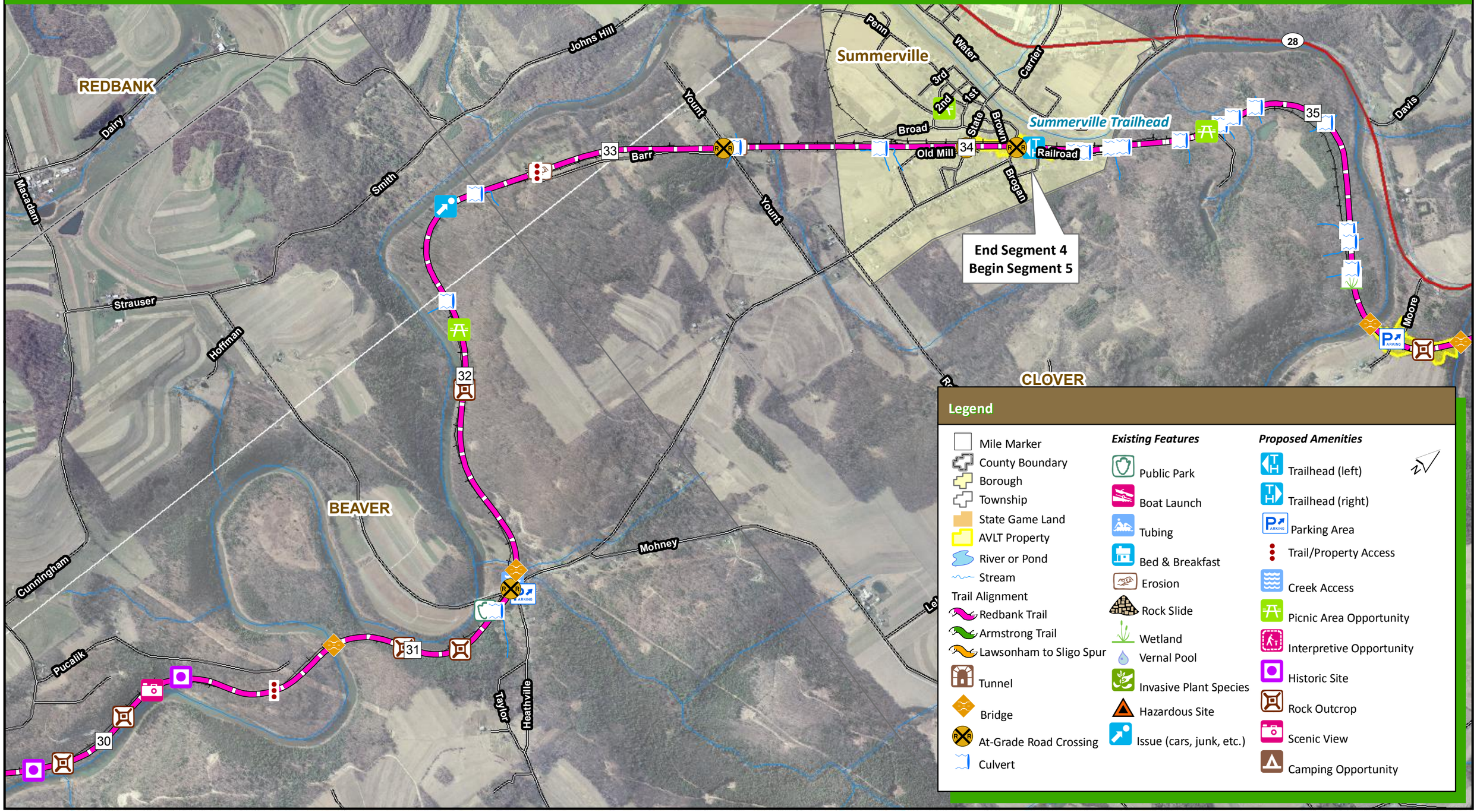
Redbank Valley Trails

Trail Concept Plan ~ Miles 30-35

Mackin

0 550 1,100 2,200 Feet

Data Source:
Pennsylvania Spatial Data Access (PASDA), PennDOT, PA Game Commission (PGC)



Legend

- Mile Marker
- County Boundary
- Borough
- Township
- State Game Land
- AVLT Property
- River or Pond
- Stream

Trail Alignment
- Redbank Trail
- Armstrong Trail
- Lawsonham to Sligo Spur
- Tunnel
- Bridge
- At-Grade Road Crossing
- Culvert

Existing Features
- Public Park
- Boat Launch
- Tubing
- Bed & Breakfast
- Erosion
- Rock Slide
- Wetland
- Vernal Pool
- Invasive Plant Species
- Hazardous Site
- Issue (cars, junk, etc.)

Proposed Amenities
- Trailhead (left)
- Trailhead (right)
- Parking Area
- Trail/Property Access
- Creek Access
- Picnic Area Opportunity
- Interpretive Opportunity
- Historic Site
- Rock Outcrop
- Scenic View
- Camping Opportunity

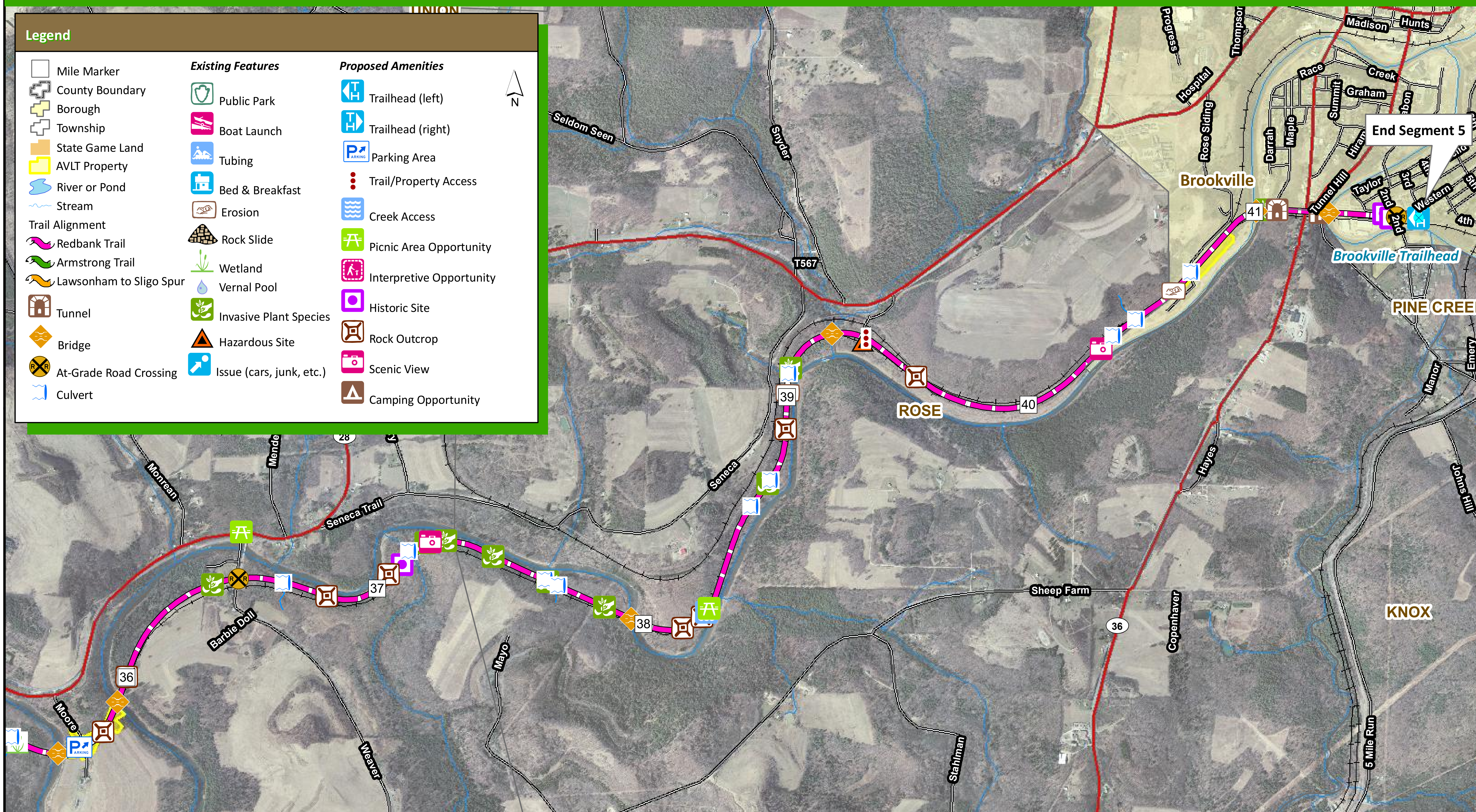
Redbank Valley Trails

Trail Concept Plan ~ Miles 35-42

Mackin

0 650 1,300 2,600 Feet

Data Source:
Pennsylvania Spatial Data Access (PASDA), PennDOT, PA Game Commission (PGC)



Legend
Mile Marker
County Boundary
Borough
Township
State Game Land
AVLT Property
River or Pond
Stream
Trail Alignment
Redbank Trail
Armstrong Trail
Lawsonham to Sligo Spur
Tunnel
Bridge
At-Grade Road Crossing
Culvert
Existing Features
Public Park
Boat Launch
Tubing
Bed & Breakfast
Erosion
Rock Slide
Wetland
Vernal Pool
Invasive Plant Species
Hazardous Site
Issue (cars, junk, etc.)
Proposed Amenities
Trailhead (left)
Trailhead (right)
Parking Area
Trail/Property Access
Creek Access
Picnic Area Opportunity
Interpretive Opportunity
Historic Site
Rock Outcrop
Scenic View
Camping Opportunity
N
End Segment 5
Brookville
Brookville Trailhead
PINE CREEK
ROSE
KNOX
UNION
36
37
38
39
40
41
Seldom Seen
Snyder
T567
Progress
Thompson
Hospital
Rose Siding
Darrah
Maple
Summit
Race
Creek
Graham
Madison
Hunts
Tunnel Hill
Taylor
2nd
3rd
Western
4th
5th
Seneca
Seneca Trail
Monrean
Barbie Doll
Moore
Weaver
Mayo
Sheep Farm
Copenhaver
Stahlman
5 Mile Run
Hayes
Johns Hill
Manor
Emery

SECTION 4: MAINTENANCE AND FUNDING

Maintenance responsibilities along a trail corridor typically belong to the trail owner. The reality in most instances is that these organizations have less than sufficient man-power, material and budget to adequately maintain the trail. This situation makes it vital that the RVTA design and construct with minimal maintenance requirements in mind, and foster good relationships with local volunteer groups and adjacent property owners.

The 42-mile corridor of the Redbank Valley Trail will almost certainly require a coordinated effort between members of the RVTA in the towns along the trail's alignment. The trail association should also consider maintenance agreements with other persons or organizations to perform some of the maintenance responsibilities. Potential organizations to contacting include local scout groups, community groups such as churches, business owners and contractors, sport and athletic groups, environmental groups, municipality's public works departments, county court systems or corrections department and school districts.

Another way to delegate the maintenance responsibilities is to market an adopt-a-trail program similar to many Departments of Transportation. This concept works in a manner in which community groups, local businesses and even private landowners agree to accept the maintenance responsibilities along a portion of the corridor. Although these groups may not have the equipment or skills to conduct extensive repairs along the trail, they will more than likely be able to provide routine tasks such as grass shoulder cutting, debris clean-up and invasive species eradication. Perhaps the most beneficial function that these groups provide to the RVTA are the additional sets of eyes that can identify and report hazards such as drainage issues early, before they cause substantial trail damage.

There are a multitude of maintenance tasks which need to be performed along the corridor, however not all tasks need to occur at the same interval. The following sections describe in detail both routine and long-term maintenance requirements, and provide information regarding the frequency and man-power required to conduct each task.

ROUTINE MAINTENANCE

Routine maintenance tasks should be conducted by the RVTA and volunteers, and should be conducted at various intervals. Table 4.1 Routine Maintenance Tasks outlines some of the routine responsibilities. This table is a guideline that the RVTA can adjust based on the volume of traffic on the trail and seasonal use.

Table 4.1 Routine Maintenance Tasks

Maintenance Task	Interval	By Whom
Security patrol	Daily	RVTA, municipalities and volunteers
Trash and debris removal	Weekly	RVTA, volunteers or contractors
Vegetation control, grass	Weekly	RVTA and volunteers
Inspect for maintenance	Monthly	RVTA and volunteers
Clear culverts and drains	Every fall and after storms	RVTA and volunteers
Vegetation control, brush	Twice per year	RVTA and volunteers
Snow and debris removal	As needed	RVTA and volunteers
Minor repairs	As needed	RVTA and volunteers
Replace missing and/or damaged signage	As needed	RVTA and volunteers
Clean restrooms	Weekly; varies seasonally	RVTA or contractors
Clean pavilions at trailheads	Weekly	Volunteers
Bridge deck/railing weather sealing	As needed	Volunteers or contractors
General Maintenance and cleanup at trailheads	Weekly	RVTA and volunteers

An extensive maintenance schedule was created in the 2005 publication of the *Rail-Trail Maintenance and Operation* Report developed by the Rails to Trails Conservancy Northeast Regional Office. Many of the items listed in this report fall into the category of maintained 'As-Needed'; this will be the case for much of routine maintenance that occurs along the corridor.

LONG TERM MAINTENANCE

Deferred, or long-term maintenance, needs include more costly items that require inclusion in the RVTA's budget; the trail association's annual budget should include contributions to a long-term maintenance fund. Fundraising and donations may also be required to assist with the cost of significant maintenance tasks. One of the most significant tasks is trail resurfacing. The *Rail-Trail Maintenance and Operation* Report noted that on average an asphalt trail was resurfaced every 17 years and an aggregate trail every 9 years.

On-going inspection of the bridges and tunnels along the trail will also be required. Typically, bridges over a roadway should be inspected every two years. The bridges over the Redbank Creek and the tunnels should have a cursory inspection at this same two year interval.

MAINTENANCE COSTS

The maintenance on rails to trails is most commonly done on an as-needed basis using volunteer labor. This scenario does not lend itself to a trail association developing a detailed budget for annual maintenance operations. The *Rail-Trail Maintenance and Operation* Report does provide valuable information regarding average costs for annual maintenance. The average trail length studied was over 20 miles and the costs were broken down on a dollars per mile basis. The study found that the average maintenance and operations costs were approximately $1,500 per mile, regardless of the trail surface. The annual cost was higher for government run trails ($2,000 per mile), and volunteer run trails had an annual cost of approximately $700 per mile. It is important to note that costs will often depend on whether equipment and materials must be purchased or are donated by local companies.

FUNDING

The biggest question that arises for trail projects is usually "how are you going to pay for it?" There are many opportunities for funding trail projects, such as:

- Grants (government funding programs, corporate grants, and private foundations)
- In-Kind Services/Donations
- Corporate Giving
- Fundraising Programs and Private Donations

Grants

There are a number of public and private grant sources, including foundations, that provide funding for trails. Appendix D provides a listing of potential grant sources, types of projects funded, and a link to their websites. However, it is important to note that most trails are constructed as a result of local efforts and it will take a strong commitment to raise money to provide the matching funds often required.

In-Kind Services/Donations

Many grant sources will accept in-kind services as a replacement for cash matches. The RVTA has resources at its disposal that can easily be turned into in-kind services. Examples of in-kind services/donations for a trail project include:

- Building materials
- Equipment use/rental/purchase
- Professional expertise
- Meals for volunteers

Corporate Giving

The National Trails Training Partnership (http://www.americantrails.org/resources/funding/Funding.html) provides useful information regarding asking corporations to donate money for trail projects. *"Treat them exactly the same way you would a private donor or a foundation. Do not overlook the biggest and the smallest businesses in your community. Corporate citizens like to be a visible, viable part of where they do business. Really, really keep an open mind when approaching businesses. All types of 'givers' generally receive MANY more requests than they can fund. Being turned down does not mean the 'ask' wasn't worthwhile-- only that there were too many projects for them all to be funded."*

Fundraising Programs and Private Donations

The National Trails Training Partnership (NTTP) recommends the following in terms of developing fundraising programs, "Contrary to the *Be first, be daring, and be different* quote: copy successful programs. Don't try an unproven strategy unless you can afford the risk and have great confidence. You'll save time and effort by not reinventing wheels." The following are examples of potential fundraising ideas that the RVTA should consider adopting; tweaking the concepts to fit their needs.

Membership Campaigns—The RVTA already has a membership campaign, but it is recommended that they continue to expand it and renew their efforts each year. Consideration should be given to providing members, particularly corporate members, with benefits such as sponsorship for events. The RVTA can also divide their campaign into different programs to which people can donate money towards a specific area of interest, such as trail construction, maintenance, tree plantings, trailheads, river access areas, interpretive signs, trail maps/brochures, and keeping the trail website up-to-date.

Buy-a-Foot-of-Trail Campaigns—The RVTA could market sections of the trail to local businesses/ corporations to "buy a foot of trail" whereby they would donate money by the foot. The Wamego Community Foundation Trail Fund in Kansas charges $150/foot of trail. The success of this program depends on trail location, trail type, and local popularity of trails. The NTTP offers that long rural bicycle trails may be difficult to fund with this method but smaller sections within towns and urban areas may be easy to market.

Merchandise—Selling merchandise that advertises the trail can raise money; however, it should not be expected to raise significant funds. If this is pursued, the RVTA should find something different and useful to sell. The NTTP states that T shirts do not work as there are simply too many available.

"Change for the Better" Program—Local merchants donate money per sales transaction to the trail organization. A small outdoor equipment store donated 25 cents into a jar on the counter for every sale and asked customers to match it, raising approximately $1,000/month for the Pikes Peak Area Trails Coalition.

Voluntary/Temporary Tax—Similar to Change for the Better Program, except it is run by many retailers. Customers are asked to donate 25 cents, or some other amount, or their loose change after every sale for a specific purpose. When enough money is collected to fund the trail, the "tax" is lifted.

Challenge Grants—Ask a funder or donor to issue their next grant or donation as a challenge; it is a great publicity tool: "If we don't raise $10,000 by March 31, we'll lose this $10,000 challenge grant money!" The Pikes Peak Area Trails Coalition raised $17,000 in addition to the original $10,000 challenge grant.

The "All-Aboard for the Boardwalk" fundraising Campaign—Millbrook Marsh Nature Center invited individuals to purchase one or more boards of their boardwalk. The RVTA could adapt this to sell boards for the bridges, bricks for the tunnels, etc.

Events—Most trails host events throughout the year as not only a way to raise money, but to also raise support for and awareness of the trail. The Montour Trail in southwest Pennsylvania hosts an annual 5K/10K Run and 2-Mile Walk ($20-25 entry fee), Tails for Trails – 5K Dog Walk ($10-20 entry fee). Other trails offer events such as a Twilight Walk and Guided Tours. The RVTA is encouraged to develop their own creative twist for trail events and may want to consider partnering with other community events such as the Peanut Butter Festival, the Clarion County Fair, and the Brookville Festival.

SECTION 5: APPENDICES

APPENDIX A: RAILROAD HISTORY

APPENDIX B: PNDI RECEIPTS

APPENDIX C: JAPANESE KNOTWEED FACT SHEET

APPENDIX D: FUNDING SOURCES

FAIRMOUNT CITY MINES – CLARION CO.

STARTED UP IN 1871 BY JONES & BRINKER. THIS FIRM WAS COMPOSED OF WILSON JONES AND CAPTAIN JACOB M. BRINKER. THEY INITIALLY PURCHASED 1,200 ACRES OF VALUABLE COAL LAND FROM LOCAL PROPERTY OWNERS, AND BY 1881, WHEN THE LONG RUN AND STAR MINES WERE OPENED, THEY OWNED 5000 ACRES OF COAL LANDS IN REDBANK AND PORTER TOWNSHIPS. THE FIRST SHIPMENT OF ONE 22 TON RAILCAR (22 1-TON MINE CARS) WAS SHIPPED ON NOVEMBER 4, 1873. BY 1881, THE FAIRMOUNT MINE WAS PRODUCING 45 HOPPERS DAILY (APPROXIMATELY 900 TONS). THE STANDARD GONDOLA ON THE ALLEGHENY RAILROAD AT THE TIME WAS A 20 TON WOODEN CAR. THE COAL WAS IN HIGH DEMAND IN BUFFALO, WHERE AN ENORMOUS AMOUNT WAS SHIPPED TO CANADA AND THE UNITED KINGDOM. THIS WAS DUE TO ITS SUPERIORITY AS A STEAM AND GAS COAL, AND A HIGH QUALITY COKING COAL.

THE COMPANY BUILT A BATTERY OF 28 BEEHIVE COKE OVENS NEAR MIDDLE RUN, AND APPROXIMATELY 100 COMPANY HOMES OF THE SHAFT-TYPE FOR THE MINERS AND COKERS. SEE ATTACHED DIRECTORY FOR FAIRMOUNT CITY FOR 1877, TO GAIN AN IDEA OF HOW VITALLY IMPORTANT MINING WAS TO THE TOWN. THE COMPANY STORE WAS OPERATED BY J. FRANK McNUTT.

IN 1881, FAIRMOUNT COAL AND IRON SOLD OUT TO A BUFFALO SYNDICATE HEADED BY B.K. JAMISON. THE COMPANY WAS THEN KNOWN AS FAIRMOUNT COAL AND COKE. AT THIS TIME, THE SUBSIDIARY "LONG RUN" COAL AND IRON COMPANY IN STARBURG WAS ALSO SOLD TO THE BUFFALO SYNDICATE. IT WAS LATER KNOWN AS NORTHWESTERN COAL AND IRON CO., AFTER STAR NO. 2 WAS OPENED ON THE WEST SIDE OF TOWN. WITH THIS SALE, MESSRS JONES AND BRINKER RELOCATED TO BUFFALO, WHERE THE COAL COMPANIES HAD THEIR HEADQUARTERS. THE SALE PRICE PAID FOR THE FAIRMOUNT OPERATION WAS $260,000. THIS COAL BOOM CAUSED LOCAL REAL ESTATE UNDERLAID BY COAL TO RISE TO $200.00 PER ACRE IN 1881.

FAIRMOUNT COAL & COKE OFFICIALS:

S. TAYLOR SHAFFER – 1880's & EARLY 90's – SUPERINTENDENT AT STARBURG AND FAIRMOUNT NOS. 1, 2, 3, 4

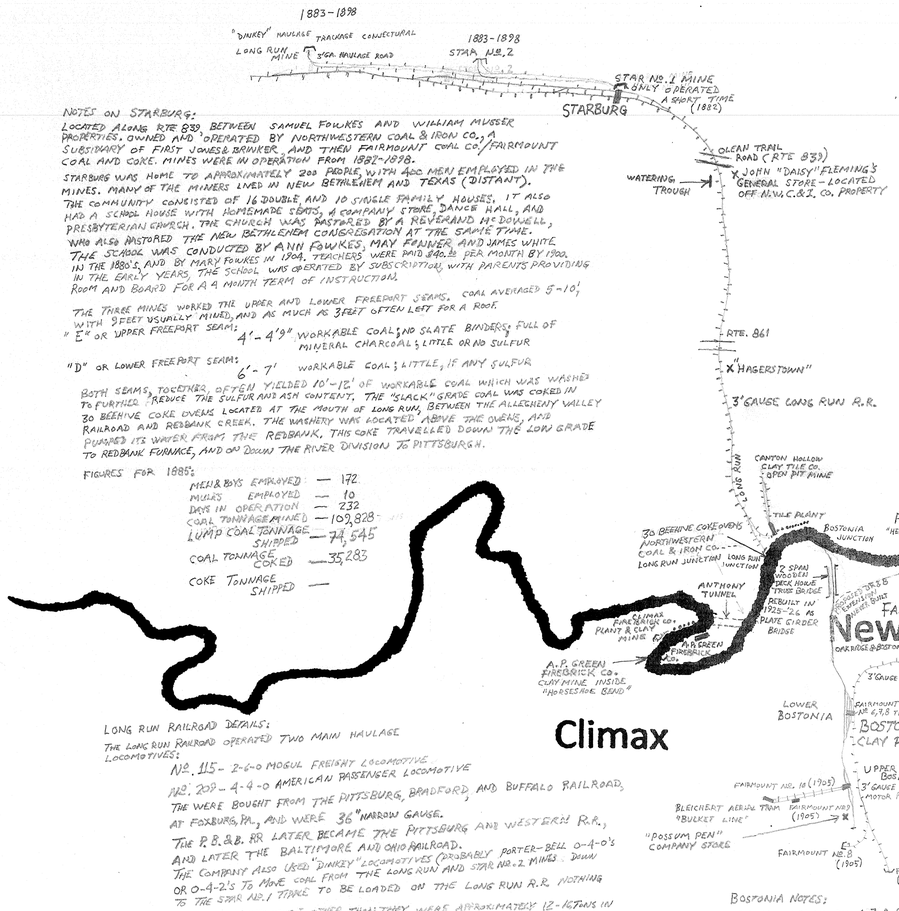
J.A. BEAM – SUPERINTENDENT – FAIRMOUNT NOS. 1-14 — 1905
LOCAL OFFICE – GLOBE HOTEL, NEW BETHLEHEM, PA.

E.C. ROBERTS – GENERAL SUPERINTENDENT – 1905
CORPORATE OFFICES – BUFFALO, N.Y.

POTTERIES:

G.W. ARBLASTER 1875 – 1902
CORNER PEARL & LIBERTY ST.
KNOWN AS "PIONEER POTTERY"
CLAY WAS MINED IN DEEP HOLLOW BETWEEN COTTAGE HILL AND NEW BETHLEHEM CEMETERY.
DESTROYED BY FIRE – 1902
$8,000 UNINSURED LOSS

G.W. ARBLASTER 1893 – 1923
HAWTHORN
GAS-FIRED
LATER TOOK P.W. BOYD INTO BUSINESS – FIRM BECAME KNOWN AS "G.W. ARBLASTER AND COMPANY"
BOUGHT OUT AND SHUT DOWN IN 1923 BY SCIO CHINA, OF OHIO, TO ELIMINATE IT AS A COMPETITOR



LONG RUN RAILROAD DETAILS:

THE LONG RUN RAILROAD OPERATED TWO MAIN HAULAGE LOCOMOTIVES:

NO. 115 – 2-6-0 MOGUL FREIGHT LOCOMOTIVE
NO. 209 – 4-4-0 AMERICAN PASSENGER LOCOMOTIVE
THEY WERE BOUGHT FROM THE PITTSBURG, BRADFORD, AND BUFFALO RAILROAD, AT FOXBURG, PA., AND WERE 36" NARROW GAUGE.
THE P.B.&B. AR LATER BECAME THE PITTSBURG AND WESTERN R.R., AND LATER THE BALTIMORE AND OHIO RAILROAD.
THE COMPANY ALSO USED "DINKEY" LOCOMOTIVES (PROBABLY PORTER-BELL 0-4-0'S OR 0-4-2'S TO MOVE COAL FROM THE LONG RUN AND STAR NO. 2 MINES DOWN TO THE STAR NO. 1 TIPPLE TO BE LOADED ON THE LONG RUN R.R. NOTHING IS KNOWN ABOUT THESE, OTHER THAN THEY WERE APPROXIMATELY 12-16 TONS IN WEIGHT, AND CARRIED THEIR WATER IN SIDE TANKS OR SADDLE TANKS.
THE LONG RUN RAILROAD USED 20 TON WOODEN COAL HOPPERS WITH DROP-BOTTOM DOORS. THERE WOULD HAVE BEEN SOME FLATS TO HAUL MACHINERY, AND POSSIBLY A COUPLE SMALL BOX CARS TO HAUL SUPPLIES TO THE COMPANY STORE, AND ALSO SOME SORT OF WAY CAR (CABOOSE). REUBEN POWELL WAS AN ENGINEMAN ON THE LONG RUN R.R.

NORTHWESTERN COAL & IRON CO.'S MINES WERE "MECHANIZED" TO THE EXTENT THAT THEY USED HARRISON PNEUMATIC "PUNCHERS" AND STEAM-POWERED AIR COMPRESSORS TO POWER THEM. STEAM ENGINES, WINCHES, AND HOISTS WERE ALSO IN USE, BUT THE MINE MULE AND DRIVER BOY REIGNED SUPREME!

AVERAGE WEEKLY WAGES FOR A SKILLED MINER WERE $32.00 (REMEMBER THOSE TEACHERS? – $40.00 PER MONTH)
MINERS RECEIVED 35-40 CENTS PER TON FOR MACHINED (PUNCHER) COAL, AND ABOUT 80 CENTS A TON FOR PICK-DUG COAL.
A 14 YEAR OLD DRIVER BOY MADE 25 CENTS FOR A 10 HOUR DAY.

NOTES ON STARBURG:

LOCATED ALONG RTE 839, BETWEEN SAMUEL FOWKES AND WILLIAM MUSSER PROPERTIES. OWNED AND OPERATED BY NORTHWESTERN COAL & IRON CO., A SUBSIDIARY OF FIRST JONES & BRINKER, AND THEN FAIRMOUNT COAL CO./FAIRMOUNT COAL AND COKE. MINES WERE IN OPERATION FROM 1881-1898.
STARBURG WAS HOME TO APPROXIMATELY 200 PEOPLE, WITH ABOUT MEN EMPLOYED IN THE MINES. MANY OF THE MINERS LIVED IN NEW BETHLEHEM AND TEXAS (DISTANT).
THE COMMUNITY CONSISTED OF 16 DOUBLE AND 10 SINGLE FAMILY HOUSES. IT ALSO HAD A SCHOOL HOUSE WITH HOMEMADE DESKS, A COMPANY STORE, DANCE HALL, AND PRESBYTERIAN CHURCH. THE CHURCH WAS PASTORED BY A REVEREND McDOWELL, WHO ALSO PASTORED THE NEW BETHLEHEM CONGREGATION AT THE SAME TIME.
TAX SCHOOL WAS CONDUCTED BY ANN FOWKES, MAY FRAUER, AND JAMES WHITE IN THE 1880'S, AND BY MARY FOWKES IN 1904. TEACHERS WERE PAID $20.00 PER MONTH BY 1900. IN THE EARLY YEARS, THE SCHOOL WAS OPERATED BY SUBSCRIPTION, WITH PARENTS PROVIDING ROOM AND BOARD FOR A 4 MONTH TERM OF INSTRUCTION.

THE THREE MINES WORKED THE UPPER AND LOWER FREEPORT SEAMS. COAL AVERAGED 5-10' WITH 3 FEET USUALLY MINED, AND AS MUCH AS 3 FEET OFTEN LEFT FOR A ROOF.

"E" OR UPPER FREEPORT SEAM: 4'-4'9" WORKABLE COAL; AND SLATE BINDERS; FULL OF MINERAL CHARCOAL; LITTLE OR NO SULFUR

"D" OR LOWER FREEPORT SEAM: 6'-7' WORKABLE COAL; LITTLE, IF ANY SULFUR

BOTH SEAMS, TOGETHER, OFTEN YIELDED 10'-12' OF WORKABLE COAL WHICH WAS WASHED TO FURTHER REDUCE THE SULFUR AND ASH CONTENT. THE "SLACK" GRADE COAL WAS COKED IN 30 BEEHIVE COKE OVENS LOCATED AT THE MOUTH OF LONG RUN, BETWEEN THE ALLEGHENY VALLEY RAILROAD AND REDBANK CREEK. THE WASHERY WAS LOCATED ABOVE THE OVENS, AND PUMPED ITS WATER FROM THE REDBANK. THIS COKE TRAVELLED DOWN THE LONG GRADE TO REDBANK FURNACE, AND ON DOWN THE RIVER DIVISION TO PITTSBURGH.

FIGURES FOR 1885:

MEN & BOYS EMPLOYED	172
MULES EMPLOYED	10
DAYS IN OPERATION	232
COAL TONNAGE MINED	109,828
LUMP COAL TONNAGE SHIPPED	74,545
COAL TONNAGE COKED	35,283
COKE TONNAGE SHIPPED	—

MIDDLE RUN NOTES:

FAIRMOUNT COAL & COKE ORIGINALLY OWNED THE TILE PLANT ON MIDDLE RUN. IN THE 1920'S, THE TILE PLANT AND FAIRMOUNT 12 WAS SOLD TO BOSTONIA COAL & CLAY PRODUCTS CO.

BOSTONIA NOTES:

FAIRMOUNT MINES 6, 7, 8, 9, 10, AND 12 WERE SOLD TO BOSTONIA COAL & CLAY PRODUCTS CO. IN THE MID TO LATE 1920'S

NOTES ON BOSTONIA COAL & CLAY PRODUCTS CO. LOCOMOTIVES:

#5 – 75 TON SHAY } DETAILS UNDER PINE RUN RAILROAD

#15 – 80 TON SHAY }

#20 – 90 TON HEISLER – 3 TRUCKS – C.N. 1591 – BUILT NEW FOR BC&CR CO. IN 1929
(THIS ENGINE WAS BUILT TO AN OLDER PATTERN, NO LONGER BEING PRODUCED BY 1929, EITHER BECAUSE:
[1] HEISLER HAD IT IN STOCK, UNSOLD FOR A LONG TIME
OR
[2] IT WAS BUILT TO USE UP OLDER PARTS IN STOCK
} EITHER WAY, THEY GOT A BREAK ON THE PRICE FROM HEISLER
REUBEN POWELL WAS AN ENGINEMAN FOR BOSTONIA COAL AND CLAY, AND ALSO TRAINED THE STEAM ENGINE IN THE DINNER HOUSE
THIS HEISLER IS NOW CASS RAILROAD NO. 6 IN WEST VIRGINIA, AND IS STILL IN SERVICE.

WALLWORK NOTES:

THIS WAS ORIGINALLY HAWTHORN COAL CO.'S (1925) "HAWTHORN 1"
WALLWORK COAL CO.
HAWTHORN NO. 1
WALLWORK COAL CO. (FORMERLY HAWTHORN COAL CO.)

HAWTHORN COAL CO. ORIGINALLY BOUGHT AN 80 TON, 3 TRUCK HEISLER, #20 (C.N. 1533), BUT SHORTLY SOLD IT TO PINE RUN COAL CO., AND HAD THE P.R.R. SWITCH HAWTHORN FROM, THEN ON, JESS WALLWORK ALSO HAD THE PENNSY DO HIS SWITCHING, TOO.

NOTES ON PINE RUN COAL CO.:

THESE WERE ORIGINALLY COBAUGH COLLIERIES CO. MINES
PINE RUN ALSO WORKED FAIRMOUNT COAL & COKE CO.'S MINES NOS. 3 AND 4/5 FROM 1919-1925. THEN SHUT THEM DOWN.
PINE RUN ALSO OPERATED BROOKS NO. 1 ON CATHCART RUN (POWDER MILL HOLLOW)
PINE RUN NO. 1 WAS LOCATED AT KAYLOR (1905)
PINE RUN NO. 2 WAS LOCATED AT EAST BRADY (1905)
OFFICES WERE IN LEECHBURG
THE COMPANY EMPLOYED 1400 MEN.

COBAUGH COLLIERIES CO. LOCATED AND BUILT WHAT LATER BECAME THE PINE RUN RAILROAD, IN THE SUMMER OF 1903.

TWO ENGINEMEN (ENGINEERS) ON THIS RAILROAD WERE CECIL TROUPE AND J.I. GREENAWALT.

PINE RUN RAILROAD LOCOMOTIVES:

#5 – 75 TON – 3 TRUCK SHAY – C.N. 2070 – BUILT 1908 – FORMERLY:
NUMBERED #5 ON ALL OF THESE
[1] LAGUN LUMBER CO. 1909
[2] COBAUGH COLLIERY CO. 1912
[3] FAIRMOUNT COAL & COKE CO. 1912
[4] PINE RUN COAL CO. 1926
[5] BOSTONIA COAL & CLAY PRODUCTS CO. — SOMETIME AFTER 1926

#10 – 70 TON – 3 TRUCK SHAY – C.N. 2737 – BUILT 1914 – FORMERLY:
NUMBERED #10 ON BOTH
[1] FAIRMOUNT COAL & COKE CO. 1914
[2] PINE RUN COAL CO. 1926

#15 – 80 TON – 3 TRUCK SHAY – C.N. 2948 – BUILT 1917 – FORMERLY:
NUMBERED #15 ON ALL
[1] FAIRMOUNT COAL & COKE CO. 1917
[2] PINE RUN COAL CO. 1924
[3] BOSTONIA COAL & CLAY PRODUCTS CO. 1926

#20 – 80 TON – 3 TRUCK HEISLER – C.N. 1533 – BUILT 1926 – FORMERLY:
KEPT #20
[4] HAWTHORN COAL CO. 1926
[2] PINE RUN COAL CO. 1926-1929
REPOSSESSED BY HEISLER AND RE-SOLD IN 1929

ALL WERE LETTERED "PINE RUN RAILROAD"

FAIRMOUNT COAL AND COKE CO.'S LOCOMOTIVES:

NO. 1 – 2-8-0 CONSOLIDATION BOUGHT SECOND-HAND FROM ALLEGHENY VALLEY R.R. LETTERED "OAKRIDGE AND BOSTONIA R.R. NO. 1"
NO. 2 – 4-6-0 TEN WHEELER BOUGHT SECOND-HAND FROM ALLEGHENY VALLEY R.R.
NO. 5 – 3-TRUCK SHAY – 75 TON – C.N. 2070 – BUILT 1908 } LETTERED: "FAIRMOUNT COAL & COKE CO."
NO. 10 – 3 TRUCK SHAY – 70 TON – C.N. 2737 – BUILT 1914 }
NO. 15 – 3 TRUCK SHAY – 80 TON – C.N. 2948 – BUILT 1917

STEEL HOPPERS:
NOTE: AFTER THE SHAYS WERE BOUGHT, NOS. 5 AND 15 SHIFTED MINES 6-10 IN BOSTONIA, BUT WERE NOT USED BY BOSTONIA COAL AND CLAY PRODUCTS
'GL
GLc
GLA
GLG
H21
H21A
H22
H25

WOODEN (GONDOLA) HOPPERS:
VARIOUS ALLEGHENY VALLEY RR. CLASSES
GG CLASS P.R.R.
OBVIOUSLY THEY LOADED OTHER RAILROAD COMPANIES' HOPPERS, TOO.
DURING WORLD WAR I, GONDOLAS AND BOX CARS WERE ALSO USED FOR COAL LADING.

FAIRMOUNT COAL & COKE ENGINEMEN:
[1] SAM WECKERLY [4] RUBE POWELL
[2] BILLY CRAW
[3] JOHN CASE

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

December 29, 2010

IN REPLY REFER TO
SIR # 35429

SANDRA MATEER
REDBANK VALLEY TRAILS ASSOCIATION
209 LAFAYETTE STREET
NEW BETHLEHEM, PA 16242

RE: Species Impact Review (SIR) - Rare, Candidate, Threatened and Endangered Species
REDBANK VALLEY RAILS TO TRAILS STUDY DEVELOPMENT
NEW BETHLEHEM Township/Borough, CLARION County, Pennsylvania

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code. The absence of recorded information from our files does not necessarily imply actual conditions on site. Future field investigations could alter this determination. The information contained in our files is routinely updated. A Species Impact Review is valid for one year only.

_X_ ***NO ADVERSE IMPACTS EXPECTED FROM THE PROPOSED PROJECT***

___ Except for occasional transient species, rare, candidate, threatened or endangered species under our jurisdiction are not known to exist in the vicinity of the project area. Therefore, no biological assessment or further consultation regarding rare species is needed with the Commission. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

___ An element occurrence of a rare, candidate, threatened, or endangered species under our jurisdiction is known from the vicinity of the proposed project. However, given the nature of the proposed project, the immediate location, or the current status of the nearby element occurrence(s), no adverse impacts are expected to the species of special concern.

If you have any questions regarding this review, please contact the biologist indicated below:

_X_	Douglas Fischer	814-359-5195	____	Kathy Gipe	814-359-5186
_____	Nevin Welte	814-359-5234	____	Bob Morgan	814-359-5129

Thank you in advance for your cooperation and attention to this important matter of species conservation and habitat protection.

SIGNATURE: _____ DATE: December 29, 2010
Christopher A. Urban
Chief, Natural Diversity Section

pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

BUREAU OF FORESTRY

December 14, 2010

PNDI Number: 21068

Sandra Mateer
Redbank Valley Trails Association
209 Lafayette Street
New Bethlehem, PA 16242

Re: Redbank Valley Trails Feasibility Study
Madison, Porter, and Redbank Townships & Hawthorn and New Bethlehem Boroughs; Clarion County
Beaver, Clover, and Rose Townships & Brookville and Summerville Boroughs; Jefferson County

Dear Ms. Mateer,

Thank you for submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number 21068 for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources of concern under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only. **Please indicate the project number "21068" on all future correspondence regarding the Redbank Valley Trails Project.**

NO IMPACT ANTICIPATED:

PNDI records indicate species or resources of concern are located in the vicinity of the project. However, based on the information you submitted concerning the nature of the project, the immediate location, and our detailed resource information, DCNR has determined that no impact is likely.

Due to the nature of the project, no vegetation cutting or ground disturbance is anticipated outside of the existing railway corridor for trail construction. As a result, no impact is anticipated to *Baptisia australis* (Blue false-indigo), a PA Plant Species of Concern, proposed for listing as PA Threatened. *B. australis* prefers open woods, stream and river banks and sandy floodplains; flowering from May to June. Populations of this species are found in many locations along Redbank Creek.

DCNR recommends the following VOLUNTARY steps to help prevent the spread of invasive species:

- The area of disturbance should be minimized to the fullest extent that would allow for trail construction; this will help to lessen the area of soil and vegetation disturbance associated with this project.

- If possible, please clean all construction equipment and vehicles thoroughly (especially the undercarriage and wheels) before they are brought on site, this will remove invasive plant seeds from the equipment and undercarriages of the vehicles that may have been picked up at other sites.

- Avoid using seed mixes that include invasive plant species (like Crown vetch) to re-vegetate the area. Please also attempt to use weed-free straw or hay mixes when possible. A complete list of all Pennsylvania invasive plants can be found here: *http://www.dcnr.state.pa.us/forestry/wildplant/invasivelist.aspx*

This response represents the most up-to-date summary of the PNDI data files and is valid for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map).

This finding applies to impacts to DCNR only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure the U.S. Fish and Wildlife Service, PA Game Commission, and the Pennsylvania Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Sincerely,

Mr. Kelly L. Sitch, Environmental Review Specialist FOR Chris Firestone, Wild Plant Program Mgr.
Ph: 717-425-5370 ~ Fax: 717-772-0271 ~ c-ksitch@state.pa.us

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

2001 ELMERTON AVENUE
HARRISBURG, PA 17110-9797

"To manage all wild birds, mammals and their habitats for current and future generations."

Division of Environmental Planning and Habitat Protection
717-783-5957

ADMINISTRATIVE BUREAUS:

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FISCAL MANAGEMENT.....717-787-7314
CONTRACTS AND PROCUREMENT.....717-787-6594
LICENSING.....717-787-2084
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INFORMATION & EDUCATION.....717-787-6286
WILDLIFE PROTECTION.....717-783-6526
WILDLIFE HABITAT MANAGEMENT.....717-787-6818
REAL ESTATE DIVISION.....717-787-6568
AUTOMATED TECHNOLOGY SERVICES.....717-787-4076

www.pgc.state.pa.us

February 1, 2011 **Large Project PNDI Review**

Ms. Sandra Maater
209 Lafayette Street
New Bethlehem, Pennsylvania 16242

Re: Redbank Valley Trails Feasibility Study – Former Rail Line
Clarion and Jefferson Counties, Pennsylvania

Dear Ms. Maater,

Thank you for submitting your Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental Review request. The Pennsylvania Game Commission (PGC) screened this project for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

Potential Impact Anticipated

PNDI records indicate species or resources of concern are located in the vicinity of the project. The PGC has received and thoroughly reviewed the information that you provided to this office, as well as PNDI data, and has determined that potential impacts to the following endangered species may be associated with your project:

Scientific Name	Common Name	PA Status	Federal Status
Myotis sodalis	Indiana Bat	PE	LE

Next Steps

Indiana bats are a federally listed endangered species under the jurisdiction of the U.S. Fish and Wildlife Service. As a result, our agency defers comments on potential impacts to Indiana bats to the U.S. Fish and Wildlife Service.

This response represents the most up-to-date summary of the PNDI data files and is valid for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements under this agency for an additional year.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Sincerely,

Olivia A. Braun
Environmental Planner
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management
Phone: 717-787-4250, Extension 3128
Fax: 717-787-6957
E-mail:OBraun@state.pa.us

A PNHP Partner

Pennsylvania Natural Heritage Program

OAB/oab

cc: Pamela Shellenberger, U.S. Fish & Wildlife Service
Librandi Mumma, PGC
DuBrock, PGC
Brauning, PGC
Butchkoski, PGC
File

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

February 9, 2011

Sandra Mateer
209 Lafayette Street
New Bethlehem, PA 16242

RE: USFWS Project #2011-0196

Dear Ms. Mateer:

This responds to your letter of November 23, 2011, requesting information about federally listed and proposed endangered and threatened species within the area affected by the proposed Redbank Valley Trails feasibility study project in Clarion and Jefferson Counties, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

The proposed project is located within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. Due to the close proximity of the project area to a known Indiana bat hibernaculum (i.e., within ten miles), removal of trees and forested areas within the project area could result in the direct take of roosting Indiana bats, which could be injured or killed when trees are cut. Studies have found that forested areas located within ten miles of hibernacula provide important foraging and roosting habitat for Indiana bats, especially during the fall and spring, when bats are building up their fat reserves prior to and after hibernation. In addition, female maternity colonies and individual male bats may be found in the vicinity of hibernacula throughout the summer months.

To avoid the direct take of Indiana bats, tree-cutting activities should be carried out from November 16 to March 31, during which time bats are hibernating. If any tree-cutting is necessary from April 1 to November 15, the following trees greater than or equal to five inches diameter breast height (d.b.h.) should not be cut or physically disturbed (*e.g.*, while harvesting any adjacent trees) in order to avoid killing or injuring roosting Indiana bats: 1) dead or dying trees and snags (including lightning struck trees) with exfoliating bark; 2) live trees (such as shagbark and shellbark hickory) which have exfoliating or defoliating bark in the trunk or branches; and 3) trees or snags that have characteristics typical of roost sites for Indiana bats (*i.e.*, have exfoliating or defoliating bark, or contain cracks, crevices, or holes that could be used

by the species as a potential roost), especially trees with sun exposure to the trunk. Tree-clearing from November 16 to March 31 may proceed without these restrictions.

Based on a review of the project information, including the size of the project area and the anticipated effects on forested habitat, the Service has determined that the proposed project will not have a significant adverse effect on overall habitat quality for the Indiana bat. Therefore, if a seasonal restriction on tree cutting is implemented to avoid the direct take of Indiana bats, construction of the proposed project is not likely to adversely affect this species. If you are unable to implement the above measures to avoid adverse effects, however, further consultation with this office will be necessary.

This response relates only to endangered and threatened species under our jurisdiction, based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing other Service concerns under the Fish and Wildlife Coordination Act or other authorities.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

If you have any questions regarding this matter, please contact Pamela Shellenberger of my staff at 814-234-4090.

Sincerely,

Clinton Riley
Field Office Supervisor

Japanese knotweed

***Polygonum cuspidatum* Siebold & Zucc.**

(synonyms: *Polygonum zuccarini* Small, *Fallopia japonica* Ronse Decraene, or *Reynoutria japonica* Houtt.)

and

Giant knotweed

***Polygonum sachalinense* F.W. Schmidt ex Maxim.**

[synonyms: *Fallopia sachalinensis* or *Reynoutria sachalinensis* (F. Schmidt ex Maxim) Nakai]

Buckwheat Family (Polygonaceae)

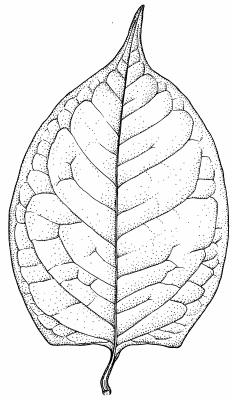
DESCRIPTION

Japanese knotweed and giant knotweed are herbaceous perennials that form large colonies of erect stems that can reach 9 feet in height. They spread by vigorous rhizomes (horizontal stems that grow just below the soil surface).

Japanese knotweed and giant knotweed are very similar in appearance and are known to hybridize. The best character for separating them is the shape of the leaf base, those of Japanese knotweed are truncate (squared-off) at the bottom, while those of giant knotweed are heart-shaped.

Height - Individual stems are 3–9 feet tall depending on the vigor of the colony.

Japanese knotweed with flower buds



P. cuspidatum

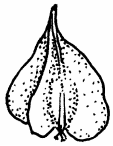
Stem - The hollow, bamboo-like stems are erect and unbranched or with a few branches toward the tip. Despite their size, knotweed stems are annual; they die back to the rhizome at the end of the growing season. New shoots emerge in April and grow rapidly; early in the season they can grow 3–4 inches per day.

Leaves - Leaves are alternate on the stem, simple, 4–6 inches long and almost as wide, and dark green. Japanese knotweed leaves are abruptly squared-off (truncate) at the base; those of giant knotweed have a heart-shaped base. Both narrow to a pointed tip.

Flowers - Both Japanese knotweed and giant knotweed have numerous small, greenish-white lowers that are produced in late summer. Japanese knotweed bears only male or female flowers on a given plant.

Giant knotweed blooms have both male and female parts in the same flower. However, appearances can be difficult to interpret as both the male and female flowers of Japanese knotweed have vestigial organs of the other sex present.

Fruit and seed - The seed (technically a fruit called an achene) of both knotweeds is shiny black, 3-angled, and about 1/6 inch long. It is enclosed in a winged calyx that contributes to its buoyancy. The seeds have no dormancy requirement and germinate readily.



winged calyx which encloses the fruit (achene) of *P. cuspidatum*

Roots - Roots are present along the rhizome and can extend quite deeply into the soil making knotweed effective in preventing erosion.

DISTRIBUTION AND HABITAT

Japanese knotweed is native to Japan; giant knotweed comes from Sakhalin Island in northern Japan. They were introduced into North America for ornamental use in the late 1800s. Japanese knotweed is now widely naturalized in Europe and North America. In the east it extends from Newfoundland to North Carolina. It is also widespread in the Midwest and in coastal areas of the Pacific Northwest. It is most commonly found lining the banks of creeks and rivers where it often forms an impenetrable wall of stems; it also occurs in wetlands, waste ground, and along roads and railroads. In Pennsylvania knotweed has also been extensively planted at strip mine reclamation sites.

EFFECTS OF INVASION

Dense stands of knotweed exclude other plant species leading to very limited biological diversity in infested sites.

REPRODUCTION AND METHODS OF DISPERSAL

Japanese knotweed and giant knotweed both spread vegetatively by the growth and fragmentation of rhizomes. Even a 1–2 inch-long piece of rhizome dislodged by flooding can initiate a new colony when it is deposited downstream. Knotweed also grows from seeds, which are produced in large numbers and dispersed by wind and water. Seed viability is high, and seed bank densities have been measured at 220–1758 seeds per square meter. Highest germination rates occur on exposed mineral soil.

CONTROL

Mechanical - Repeated cutting of the stems reduces vigor and with persistence might be sufficient to control small, isolated populations. Attempts to dig out the plants are doomed to fail because of the ability of even small segments of rhizome to resprout.

Chemical - Research conducted at Penn State for the National Park service resulted in a recommendation of a foliar spray of glyphosate plus sticker-spreader applied in early June and

again in late August of the same year at the rate of 4 lbs active ingredient per acre. A third application may be needed the following spring if significant regrowth occurs. Rapid establishment of alternative plant cover is an important aspect of control as knotweed seedlings do not compete well with other vegetation.

The British Nature Conservancy Council recommends cutting in late spring or summer followed by an application of glyphosate in the fall. At least two additional applications will be needed to control the regrowth.

Biological - No biological control options are currently available.

NATIVE ALTERNATIVES FOR REVEGETATION OF STREAM BANKS

The following species are suggested for establishing native plant cover after knotweed has been removed: ***shrubs*** - winterberry holly (*Ilex verticillata*), spicebush (*Lindera benzoin*), buttonbush (*Cephalanthus occidentalis*), silky willow (*Salix sericea*), pussy willow (*Salix discolor)*, American elderberry (*Sambucus canadensis*), alder (*Alnus serrulata* and *A. incana* ssp. *rugosa);* ***herbaceous species***- riverbank rye (*Elymus riparius*), wild-rye (*Elymus villosus*), big bluestem (*Andropogon gerardii*), switch grass (*Panicum virgatum*), wingstem (*Verbesina alternifolia*), joe-pye-weed (*Eupatorium fistulosum* and *E. maculatum*), boneset (*Eupatorium perfoliatum*).

REFERENCES

McCormick, L. H. and T. W. Bowersox. 1998. Eradication and control of Japanese knotweed at the Staple Bend Unit, Allegheny Portage Railroad National Historic Site. Penn State School of Forest Resources, University Park, PA.

Niewinski, A. T., T. W. Bowersox, and L. H. McCormick. 1999. Reproductive ecology of giant (*Polygonum sachalinensis*) and Japanese (*Polygonum cuspidatum*) knotweed. National Park Service Technical Report NPS/PHSO/NRTR-00/079. University Park, PA.

Reeder, Kathleen Kodish and Brian Eick. 2001. Northeast parks' regional strategy to control knotweed. Park Science 21: 33-35.

Rhoads, Ann Fowler and Timothy A. Block. 2000. The Plants of Pennsylvania: An Illustrated Manual. University of Pennsylvania Press, Philadelphia, PA.

Rhoads, Ann Fowler and William McKinley Klein. 1993. The Vascular Flora of Pennsylvania: Annotated Checklist and Atlas. American Philosophical Society, Philadelphia, PA.

Internet resources – http://www.paflora.org, http://www.invasivespecies.gov, http://tncweeds.ucdavis.edu

Invasive species fact sheet prepared by:
Ann F. Rhoads and Timothy A. Block
Morris Arboretum of the University of Pennsylvania
100 Northwestern Ave., Philadelphia, PA 19118
April 2002

APPENDIX D: FUNDING SOURCES

Grant / Program Name	Description	Website Address
Council on Foundations	The Council on Foundations is a national nonprofit association of approximately 2,000 grantmaking foundations and corporations.	http://www.cof.org/
CVS Caremark Community Grants	Program awards grants up to $5,000 to nonprofit organizations for programs targeting children with disabilities; programs focusing on health and rehabilitation services; and public schools promoting a greater level of inclusion in student activities and extracurricular programs, and initiatives that give greater access to physical movement and play.	http://info.cvscaremark.com/community/our-impact/community-grants
Foundation Center	A database of foundations and other funding sources.	http://foundationcenter.org/
Foundation for Pennsylvania Watersheds	Awards grants to 501(c)3 nonprofit organizations for local efforts to protect healthy, natural streams, to clean up pollution and to restore degraded wildlife habitat..	http://www.pennsylvaniawatersheds.org/?page_id=3
Grants.gov	Provides information on hundreds of federal grants that can be used to support a variety of programs.	http://www.grants.gov/
Mantis Awards for Community and Youth Gardens	Each year, Mantis presents the Mantis Awards for charitable and educational garden projects that enhance the quality of life in their host communities. Any nonprofit garden program may apply, including schools, churches, correctional facilities, parks departments, youth camps, community gardens, and many others.	http://www.kidsgardening.com/grants.asp
National Fish and Wildlife Foundation	The National Fish and Wildlife Foundation provides funding on a competitive basis to projects that sustain, restore and enhance the Nation's fish, wildlife, plants and their habitats through our Keystone Initiative Grants and other Special Grant Programs.	http://www.nfwf.org/AM/Template.cfm?Section=Grants
National Recreation and Park Association (NRPA)	NRPA provides education for professionals and the public on the essential nature of parks and recreation and advocates for increased national funding for parks and recreation through federal grants and initiatives.	www.nrpa.org
National Tree Trust	The mission of the National Tree Trust is to promote healthy communities by providing resources that educate and empower people to grow and care for urban and community forests.	http://www.nationaltreetrust.org/
PA CleanWays	A non-profit organization that helps communities take action against illegal dumping and littering.	http://www.pacleanways.org/

APPENDIX D: FUNDING SOURCES

Grant / Program Name	Description	Website Address
Pennsylvania Council on the Arts (PCA) – Local Government	Provides grants to local governments to assist in funding arts programs, arts projects, regrant programs, and pass through projects.	http://pacouncilonthearts.org/pca.cfm?id=46&level=Third
Pennsylvania Department of Conversation and Natural Resources (DCNR) – Community Conservation Partnerships Program (C2P2)	C2P2 grants are open to local / county governments and non-profit organizations to assist with recreation projects; three basic types: planning, acquisition and development. Includes grants for community recreation, land trusts, rails-to-trails, rivers conservation, snowmobile/ATV, heritage areas, land and water conservation fund, and recreational trails.	http://www.dcnr.state.pa.us/brc/grants/
Pennsylvania Department of Conversation and Natural Resources (DCNR) – Peer to Peer Technical Assistance	Grants of up to 90 percent of eligible costs ($10,000 maximum) to study problem-specific issues dealing with the administration of park and recreation facilities and/or services. These are short-term projects conducted primarily by experienced park and recreation professionals who work closely with community leaders.	http://www.dcnr.state.pa.us/brc/grants/itagrant.aspx
Pennsylvania Department of Conversation and Natural Resources (DCNR) –TreeVitalize	TreeVitalize is a public-private partnership to help restore tree cover, educate citizens about planting trees as an act of caring for our environment, and build capacity among local governments to understand, protect and restore their urban trees.	http://www.treevitalize.net/index.aspx
Pennsylvania Department of Conservation and Natural Resources (DCNR) – Wild Resource Conservation Program (WRCP)	The Wild Resource Conservation Program is accepting grant applications for projects in the following areas: Effects of Climate Change on Biodiversity; Education; Wildlife Action Plan Priorities; Wild Plant Management; and General Biodiversity Projects	http://www.dcnr.state.pa.us/wrcp/grants/index.aspx
Pennsylvania Department of Environmental Protection (DEP) – Community Cleanup Program	The DEP Community Cleanup Program assists local partners with cleaning up illegal dumpsite. The community cleanup program is a partnership among community organizations, environmental groups, local business and industry, and local, county and state governments. The program brings together these partners to identify illegal dumps, prioritize cleanups, coordinate cleanups and provide surveillance and enforcement.	http://www.depweb.state.pa.us/landrecwaste/cwp/view.asp?a=1418&Q=505004&landrecwasteNav=|

APPENDIX D: FUNDING SOURCES

Grant / Program Name	Description	Website Address
Pennsylvania Department of Environmental Protection (DEP) – Environmental Education	School districts, private schools, nonprofit groups and county conservation districts may apply for funding to develop new or expand current environmental education programming. This program is a reimbursement program with a 20 percent matching funds component, with certain exceptions.	http://www.depweb.state.pa.us/enved/cwp/view.asp?a=3&q=473224
Pennsylvania Department of Environmental Protection (DEP) – Growing Greener Watershed Grants	Restore watersheds and streams, reclaim mined lands, remediate AMD	http://www.depweb.state.pa.us/growinggreener/site/default.asp
Pennsylvania Department of Environmental Protection (DEP) – PA Conservation Works!	One-time grants for motivated local governments and non-profit entities with shovel-ready projects that will save or conserve a minimum of 25 percent of all energy used.	https://www.grants.dcnr.state.pa.us/_documents/conservation_works___7000_bk_dep4250.pdf
Pennsylvania Department of Labor and Industry – PA Conservation Corps Program	Offers grants to municipalities for conservation, recreation, historic preservation, graffiti removal and repair of vandalism. Funds may be used to purchase materials and services.	http://www.portal.state.pa.us/portal/server.pt/community/pennsylvania_conservation_corps/10573/project_grants/599288
Pennsylvania Fish and Boat Commission (PFBC)	The Commission has a number of grant programs that provide funding in support of fishing, boating and aquatic resource conservation; including the Boating Facility Grant Program, the Boating Infrastructure Grant Program, and the Coldwater Heritage Partnership.	http://www.fish.state.pa.us/grants.htm
Pennsylvania Humanities Council	Humanities Grants foster collaborative learning through public programs. Examples of humanities projects include discussion groups exploring books or films, workshops, walking tours, panel discussions, exhibitions with interpretive programs, and craft demonstrations integrating conversations about the craft.	http://www.pahumanities.org/resources/grants.php
Pennsylvania Infrastructure Investment Authority (PENNVEST); Green Infrastructure Projects	PENNVEST actively funds Green Initiatives that promote and encourage environmental responsibility in our communities that are creative and innovative with green solutions for water quality management.	http://www.portal.state.pa.us/portal/server.pt/community/programs/9322/green_initiatives/541807
Pew Charitable Trust	Provides grants related to environment, culture, and health and human services.	www.pewtrusts.com/grants

APPENDIX D: FUNDING SOURCES

Grant / Program Name	Description	Website Address
Recreational Trails Program (administered by PA DCNR through the Community Conservation Partnerships Program C2P2)	This program provides funding to states to make grants for trail and trail-related projects. Funding to this program is provided to the Commonwealth through the Federal Highway Administration (FHWA) and the Intermodal Surface Transportation Act (ISTEA) of 1991 which included the Symms National Recreational Trails Act (NRTA), and the National Highway System Designation Act of 1995 (NHS Act). The program can be used the purchase trail maintenance equipment. Note: This program is one of the only to fund trail maintenance.	http://www.fhwa.dot.gov/environment/rectrails/
Trail Volunteer Fund of The Pittsburgh Foundation	Provide grants to purchase tools, materials, and supplies to be used by volunteer trail projects that create, maintain, or enhance the network of trails suitable for bicycle touring in western Pennsylvania and interconnected trails in nearby areas.	http://they-working.org/
Deutsche Bank Americas Foundation	$2,500 Environmental Sustainability Grant is used to purchase trail markers	American Discovery Trail Society (800) 663-2387 or adtsociety@aol.com