

A FEASIBILITY STUDY for the
**Pennsylvania Highlands Trail
Network**
In the Quakertown Region

Bucks County, Pennsylvania



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Pennsylvania Highlands Trail Network

Quakertown Region Feasibility Study

December 5, 2013

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Executive Summary

The Pennsylvania Highlands Trail Network [PHTN] is envisioned as a long-distance footpath, some 300 miles long, the central spine of which will traverse the Pennsylvania Highlands from the Delaware at Riegelsville to the Maryland Border at South Mountain. At Riegelsville the PHTN will connect with the existing 160 mile New York/New Jersey Highlands Trail.

The goal of this study is to determine the feasibility of potential PHTN trail alignments through the Quakertown region. By researching and assembling an inventory of the relevant history and geography of the area including previous planning studies, topography, land uses, ownership patterns, railroad and utility rights-of-way, and existing trail networks, a thorough overview of the study area has been developed. Public and stakeholder participation was garnered at a series of well-attended workshops. This study integrates these factors and assesses the trail alignment alternatives on the basis of feasibility, potential quality of trail users' experience, cost, and practicality.

This study's recommendations are summarized as:

Short Term Vision

- The PHTN **Northern Route** extends the existing Saucon Valley Rail Trail south from Coopersburg into Quakertown. The unused SEPTA Bethlehem Branch would be reconstructed for use as a rail-trail, or rail-with-trail, as far south as California Road in Richland Township. A combination of new, existing, and proposed multi-use paths would bring the trail as far south as Fourth and Mill Streets in Quakertown. Existing sidewalks and proposed share-the-road signage and pavement markings would bring trail users into the historic business district of Quakertown.
- The PHTN **Southern Route Multi-use Trail** connects the historic business district of Quakertown (and the PHTN Northern Route) with Weisel Hostel in Nockamixon State Park to the east, and the existing Kumry Road trail-head to the west. The recommended alignment between Quakertown and Nockamixon consists of an on-road alignment including Erie Road and Axe Handle Road (a side path for pedestrians would be constructed along Thatcher Road). Existing sidewalks and streets within Quakertown borough would be augmented with share-the-road signage and pavement markings. West of Quakertown, closing three gaps in the existing four mile-long asphalt multi-use trail would connect the Kumry Road trail-head near Unami Creek with Quakertown borough, while greatly expanding safe non-motorized access to Trumbauersville Elementary School.

Mid Term Vision

- The PHTN **Sellersville Extension** is a multi-use trail that connects the historic business district of Quakertown to points south using a combination of new, existing, and proposed multi-use paths and on-road alignments. The trail alignment includes on-road segments traversing Quakertown Swamp (the largest inland freshwater wetland in southeastern Pennsylvania). At Perkasio,

connection is made with the existing Sellersville - Perkasie - East Rockhill Bicycle / Walking Path System.

Long Term Vision

- The PHTN **Southern Route Foot-path** connects Nockamixon State Park with the Unami Creek valley. The recommended trail is comprised of a combination of rugged foot-path and rural road alignments. The proposed alignment does not approach Quakertown, but does run adjacent to the southwestern branch of Quakertown Swamp. The Southern Route Foot-path also serves State Gamelands 196 and West Rockhill Township's Manderfield Preserve.

The relationship between the Northern Route, Southern Route Multi-use Trail, Sellersville Extension and Southern Route Foot-path is depicted on a map found on page 4.

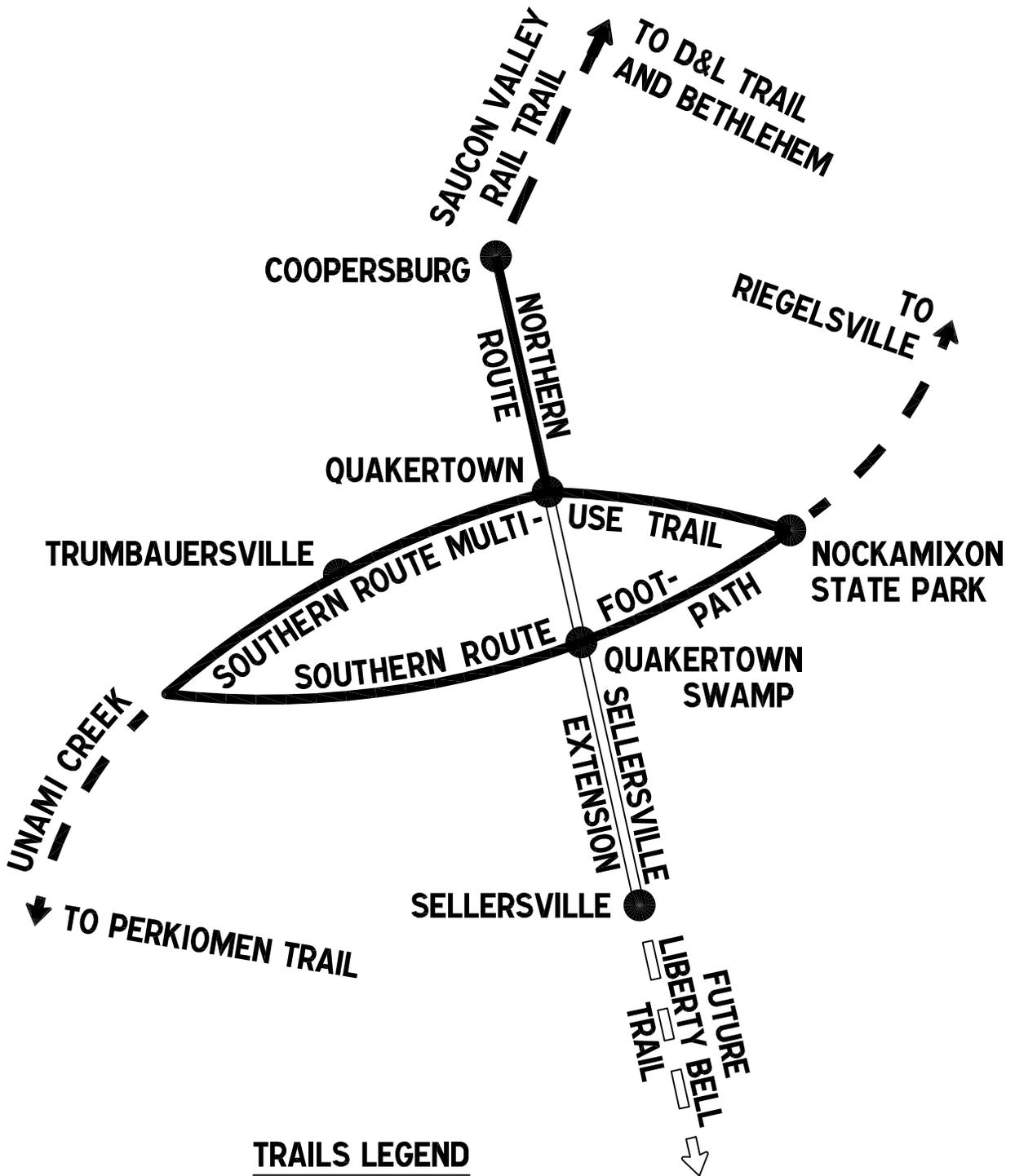
Opinions of the probable cost of each trail alignment are summarized as:

- **Northern Route: \$1,143,154 to \$1,313,258**
- **Southern Route Multi-Use Trail: \$1,320,088**
- **Southern Route Foot-path: \$863,737**
- **Sellersville Extension: \$1,319,453 to \$2,011,064**

The methodology utilized to determine these approximate cost figures is detailed in this report.

Several trails in the Quakertown region have been built by the municipalities (notably Milford and Richland townships), and it is anticipated that the elements of the Pennsylvania Highlands Trail Network recommended in this study will be implemented by municipalities as well (e.g., Springfield, East Rockhill and West Rockhill townships, and the borough of Quakertown). Indeed many of the PHTN trail routes recommended in this study are based upon conceptual trail plans already envisioned by the municipalities.

Because the Quakertown region spans several townships and boroughs, coordination between local governments will be essential. This study recommends that the trail study committee that was formed to conduct this study, continue to meet on a regular basis. The Appalachian Mountain Club has expressed willingness to convene these regular meetings and to facilitate efforts towards implementing the trail network.



TRAILS LEGEND

PHTN NETWORK		
LINKING TRAILS		
RECOMMENDED BY THIS STUDY		
OUTSIDE THE STUDY AREA		



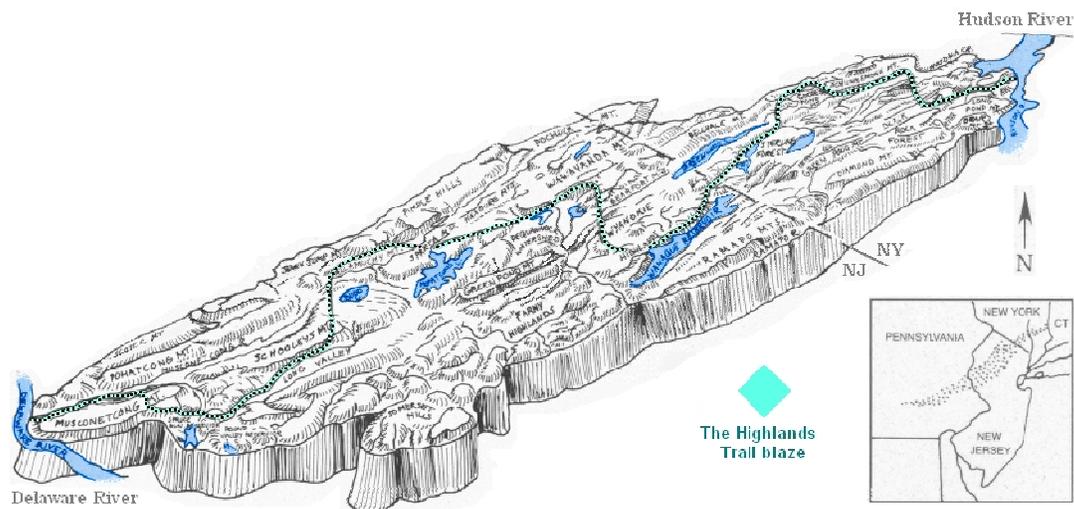
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PENNSYLVANIA HIGHLANDS TRAIL NETWORK QUAKERTOWN REGION RECOMMENDED TRAILS MAP

Introduction

The Appalachian Mountain Club (AMC) is working with partner organizations as well as local, state and county governments to develop the Pennsylvania Highlands Trail Network (PHTN) within the 1.9 million-acre, 13 county Pennsylvania Highlands region.

The plan to develop a trail through the Mid-Atlantic Highlands region began to take shape in the early 1990s when the New York-New Jersey Trail Conference began a multi-year effort to establish the NY/NJ Highlands Trail, covering over 160 miles from the Hudson River near Storm King Mountain to the Delaware River at Riegelsville, PA.



In 2006, AMC initiated discussions about extending the Highlands Trail into Pennsylvania when it convened two Roundtable Meetings at Nolde Forest and Kings Gap Environmental Education Centers. Participants included county planners, state park managers, land conservancies and recreational groups. These discussions helped to gauge the potential and interest for a PA Highlands Trail Network.

An outcome of the Roundtable Meetings was the formation of a region-wide PA Highlands Trail Steering Committee, which was created in 2007 with participants representing land trusts, state parks, trail organizations, and county planning commissions from across the PA Highlands Region.

The Steering Committee participants helped form the vision and mission statements for the PHTN:

Mission Statement: To create a trail network that promotes and protects the Pennsylvania Highlands and provides communities with a physical connection to the outdoors through close-to-home recreation.

Vision: An interconnected trail network linking people to where they live in the Pennsylvania Highlands by providing recreational opportunities and protection of natural, scenic, and historical resources.

The Pennsylvania Highlands Trail Network study area encompasses over three thousand square miles. In order to better facilitate the process of locating the trail through such a wide area, the study area in Pennsylvania has been divided into six segments. These are:

1. Riegelsville - Quakertown Region
2. Unami Hills - Perkiomen Trail
3. Perkiomen Trail - Horse-Shoe Trail
4. Horse-Shoe Trail - Lebanon Valley - Conewago Trail
5. Conewago Trail - Mason Dixon Trail
6. Mason Dixon Trail - Appalachian Trail

This study -- the Quakertown Region Master Trail Plan -- focusses on the western portion of PHTN Segment 1.

Appalachian Mountain Club's previous study of potential PHTN alignments in Segment 1 resulted in two recommendations: From Riegelsville a **Northern Route** which would follow the D&L Trail north to Bethlehem and approach Quakertown from the South Bethlehem Greenway and Saucon Valley Rail Trail to the north; also beginning at Riegelsville a **Southern Route** would follow the D&L Trail south to a connector trail at Ringing Rocks County Park and then approach Quakertown from the east via Nockamixon State Park.

This study investigates detailed options for bringing both the Northern Route and the Southern Route into Quakertown. Also investigated are options for traversing the borough, and continuing the PHTN west to the Unami Hills (interfacing with Segment 2). In addition, alternatives are explored and recommendations made for connections to local and adjacent trail networks, notably the Sellersville - Perkasio - East Rockhill Bicycle / Walking Path System.

Types of Facilities Considered

Foot-path

Width may vary from 6 feet to as narrow as a single track, depending on adjacent land uses and projected trail usage. Trail surface may consist of fine-crushed stone, or earth. In either case, drainage is a careful design consideration. A trail profile that conforms to existing terrain is ideal, as rain-water may sheet-flow across the trail. In situations where concentration of rain-water runoff is unavoidable, parallel ditches draining to subsurface piping may convey storm-water from high side of the trail to the low. When the trail traverses extensive low-lying areas such as wetland, a boardwalk structure may be appropriate.



This is described in greater detail below.



Fine-Crushed Stone Multi-Use Trail

Fine-crushed stone, or crushed stone mixed with limestone fines, are sustainable trail surfaces favored by hikers, equestrians, and many bicyclists (although not “road” cyclists who often prefer narrow tires). Fine-crushed stone surface trails are an option where the terrain is flat (or nearly so), and where the trail alignment does not traverse a known floodway. An added benefit of a crushed stone surface is the fact that such surfaces are permeable by rainwater so

construction of fine-crushed stone surface trails does not add impervious area to a watershed.

Asphalt Multi-Use Trail

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



surface path may be designated for use by joggers and equestrians. An alternative to traditional asphalt is the use of porous pavement which provides the benefits of a smooth long-lasting trail surface without adding impervious area to a watershed.



Specialized Trails

Unusual conditions sometimes call for specialized treatments. Relevant to this study (owing to trail alignments adjacent to Quakertown Marsh) is the placement of a trail on an elevated walkway or boardwalk. In sensitive wetlands, raised wooden walkways provide a high quality trail experience to trail users while minimizing adverse impact on the landscape it traverses. This study's recommended Southern Route Multi-use Trail co-locates with an existing trail

boardwalk on the Hunter's Crossing Trail, just north of the point where that trail crosses Trumbauersville Road in Richland Township.

On-Road

Where off-road alignments are not readily feasible, low traffic volume roads can serve as on-road trail alignments. In some cases trails may be placed on low traffic volume roads temporarily, until off-road alignments are implemented. A road's suitability to serve as a trail alignment is dependent on several factors, including motor vehicle traffic volume, prevailing speeds, roadway width, presence or absence of sidewalks, and any limiting geometry (e.g., tight curves) that may shorten sight distance. In some cases an existing roadway may be feasible for cycling, but walking may be unsafe or unpleasant unless a sidewalk or side path is constructed. In those cases where a sidewalk or side path is recommended, narrow right-of-way widths (33 feet is standard in Pennsylvania) often mean that easements must be negotiated with (or rights-of-way purchased from) the property owners who front the road.



Description of the Trail Network

This study recommends two broad corridors for the PHTN in the Quakertown region:

- Northern Route and Sellersville Extension
- Southern Route Alternates (multi-use trail; foot-path)

The Northern Route and the Southern Route's multi-use trail alternates both serve Quakertown. The Southern Route's foot-path alternate follows a more southerly course, through less developed wooded countryside, and does not serve Quakertown directly. The alternates are described in detail in the following section.

Northern Route

Summary

The Northern Route is envisioned as a multi-use trail coming into Quakertown from the north, connecting Coopersburg (and the existing Saucon Valley Rail Trail) with Quakertown's historic town center.

The Northern Route intersects with the PHTN Southern Route Multi-use Trail in Quakertown Borough.

The Northern Route serves:

- Coopersburg Borough
- Village of Shelly
- Melody Lakes mobile home park
- Bucks County SPCA
- Steve Tobin's *Steelroots* outdoor sculptures
- Quakertown Soccer Complex
- Quakertown Memorial Park
- Quakertown Krupp Park (planned)
- Bucks County Public Library, Quakertown Branch
- Quakertown historic town center

The Northern Route is 6.4 miles long. Of that distance, 5.4 miles is proposed new multi-use trail, 0.6 miles utilizes existing multi-use trails, and 0.3 miles utilizes existing sidewalks / roadway (4th Street in Quakertown).

The Northern Route traverses (from north to south) Upper Saucon Township, Coopersburg



Saucon Valley Rail Trail nears completion to Landis Street near Coopersburg in May 2013

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Borough (Lehigh County); Springfield Township, Richland Township, and Quakertown Borough (Bucks County).

Detailed Description

The previous study recommends the co-alignment of the PHTN Northern Route with the multi-use Saucon Valley Rail Trail. At the present time (mid-2013) the Saucon Valley Rail Trail is completed as far south as Landis Street just outside Coopersburg Borough's Living Memorial Park.

The Saucon Valley Rail Trail is built on the former Reading Railroad Bethlehem Branch, today owned by Southeastern Pennsylvania Transportation Authority. SEPTA leases the right-of-way north of Landis Avenue to local municipalities so that the trail can be built and maintained. The period of the lease is thirty years, and the agreement stipulates that in the event that train service is resumed the trail will need to be removed (at this time SEPTA has no plans to resume train service here).



Unused Bethlehem Branch owned by SEPTA at Mine Road in Springfield Township

Unused tracks remain in place on the 3.6 miles of SEPTA-owned right-of-way between Landis Street in Upper Saucon Township and California Road in Richland Township. The right-of-way passes through Coopersburg Borough and Upper Saucon Township in Lehigh County, and Springfield and Richland Townships in Bucks County. Thick vegetation now occupies much of the railroad alignment, but preliminary inspection seems to indicate that the railroad earthwork and structures are largely intact. If that is in fact the case, construction of a multi-use trail south to California Road would be a relatively straightforward and cost-effective endeavor.

In September 2013 John Brunner of Appalachian Mountain Club, Steve Nelson of Bucks County Bicycle Task Force, and the study authors met with SEPTA Director of Real Estate Department Gerald M. Maier. Mr. Maier said that although the restoration of passenger rail service is unlikely in the near future, SEPTA has leased the railroad to East Penn Railroad, a freight-hauling short line, from Lansdale north through Quakertown to a point near the Bucks - Lehigh County line, just south of Coopersburg. SEPTA does not object to a trail on the railroad, but permission will need to be secured from East Penn Railroad (EPRY). Mr. Maier indicated that when SEPTA's lease to the short line is up for renewal (in a year and a half) SEPTA's new lease could include a proviso that a trail may be built on the unused railroad until



East Penn Railroad serves industries and stores inactive freight cars on SEPTA's former Bethlehem Branch

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such time as rail service is reinstated, or it may be built as a rail-with-trail due to the fact that the right-of-way contains two sets of tracks.

South of California Road, EPRY provides freight service to several customers in the Quakertown area and points south, while also utilizing excess track capacity for freight car storage (mainly empty LPG - liquefied petroleum gas - tank cars). Because active freight customers in the Quakertown area include Shelly Enterprises, FiberMark and Tech-Ag, it is not anticipated that the railroad south of California Road will be abandoned in the foreseeable future. In addition, United States Cold Storage is currently considering constructing a half a million square foot distribution facility along the railroad on the vacant industrial site at Pumping Station Road. This site is being considered in part due to the availability of railroad freight service. The active (and potentially more active) status of the railroad south of California Road makes rail-to-trail conversion unlikely.

At the present time, addition of a rail-with-trail to the active freight railroad south of California Road seems unlikely. Therefore this study investigated the best “non-railroad” trail alignment to continue the trail to Quakertown and points south.

Two options present themselves, for the half mile between the end of the available portion of the SEPTA railroad right-of-way, and the intersection of California Road and East Pumping Station Road. One option is a multi-use side path along the west side of California Road, an element of Richland Township’s Trails Master Plan (2006). The second option is a multi-use trail through woodlands and along the edges of open fields on an undeveloped parcel on the north side of Reservoir Road; then across land owned by Bucks County SPCA south of Reservoir Road. Because the right-of-way width of California Road is inadequate to accommodate a multi-use side path, either option would require the negotiation of easements or purchase of right-of-way from private property owners and from the SPCA.

Continuing south, the potential trail alignment takes into consideration tentative plans to re-align West Pumping Station Road. At the present time West Pumping Station Road intersects with California Road at a signalized intersection 750 feet south of the intersection with East Pumping Station Road. Tentative plans would re-align West Pumping Station Road so that it intersects at the same point as East Pumping Station Road. The existing traffic signals would be moved to the new



California Road south from Reservoir Road



Steve Tobin’s Steelroots sculptures along California Road between Penn Am Drive and East Pumping Station Road

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location. The proposed trail alignment first crosses California Road from its west to its east side, then East Pumping Station Road at the new signalized intersection. Pushbutton actuated pedestrian signals and crosswalks should be part of the new intersection's design. If the trail is constructed before the intersection is re-aligned, the crosswalks would be at the same locations. In that case, traffic would be controlled by a three-way stop sign (as it is now).

For the half mile between East Pumping Station Road and Penn Am Drive, the recommended trail alignment is on the east side of California Road. This stretch is comprised of the wide lawns of several industrial properties upon which are situated a number of large sculptures of Steve Tobin's *Steelroots* series. Existing right-of-way constraints may dictate that the multi-use side path be placed alongside the east curb line of California Road. However, if the owners of the industrial properties are amenable, a more interesting trail alignment would take a slightly more sinuous path generally parallel to but more distant from the roadway with its traffic and noise. The broad lawns of these properties already host Tobin's *Steelroots* sculptures.

At the intersection of California Road and Penn Am Drive, the trail alignment turns east and follows the north curb line of Penn Am Drive as a side path for a distance of a thousand feet.

At the intersection of Penn Am Drive and Pacific Drive, the trail alignment crosses Penn Am Drive, turns south, and follows the west curb line of Pacific Drive as a side path for a distance of a quarter mile.

At the point where Pacific Drive curves sharply to the east, a de facto footpath already links Pacific Drive to an existing asphalt trail on the grounds of the Quakertown Soccer Complex. This study recommends the trail alignment either follow the de facto footpath or, depending on property ownership, follow a nearby parallel alignment. This is a very short link, approximately 50 to 200 feet in length, depending on the exact alignment chosen.

The proposed trail then co-locates with an existing asphalt trail that traces the perimeter of the Quakertown Soccer Complex, for a distance of six-tenths of a mile. At this point the trail crosses from Richland Township into Quakertown Borough.

Here the trail alignment may do one of two things. One possible alignment continues to co-locate with the existing asphalt trail as it skirts the edges of ball-fields in Quakertown Memorial Park. The existing trail connects



Aerial photo shows existing earth-surface path connecting Pacific Drive to Quakertown Soccer Complex asphalt trail



Site of future Krupp Park. 4th Street curves off to the left

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with the recently completed extension of 4th Street, past the Bucks County Public Library Quakertown Branch. Cyclists may use the wide roadway while pedestrians are accommodated by the concrete sidewalk, to the intersection of 4th Street and Mill Street. The other possible alignment is contingent on construction of Quakertown Borough's planned Krupp Park. A network of paths is planned for the park, and the trail alignment may utilize these to the intersection of 4th Street and Mill Street.

Once across Mill Street, the proposed trail alignment utilizes existing sidewalks and pavement of 4th Street to Broad Street, for a distance of a quarter mile to Quakertown's historic business district. Signage and pavement markings would remind motorists and cyclists to share the road. Directional signage would help trail users navigate one block along Broad Street to 3rd Street where linkage would be made with the Southern Route Multi-use Trail, and with the Sellersville Extension.

Sellersville Extension

Summary

The Sellersville Extension is envisioned as a multi-use trail beginning in Quakertown's historic town center, using a combination of proposed and existing multi-use trails and on-road routes to connect with the extensive Sellersville - Perkasio - East Rockhill Bicycle / Walking Path System.

The Sellersville Extension intersects with the Southern Route foot-path at Quakertown Swamp, co-locating for a distance of two miles along Rock Hill Road.

The Sellersville Extension alignment serves:

- Quakertown historic town center
- Richland Township Station Road Park (planned)
- Quakertown Farmers Market "Q-Mart"
- Strayer Middle School
- Richland Elementary School
- Quakertown Christian School
- Quakertown Swamp
- State Gamelands No. 139
- Village of Rock Hill
- Markey Centennial Park
- Pennridge High School
- Pennridge North Middle School

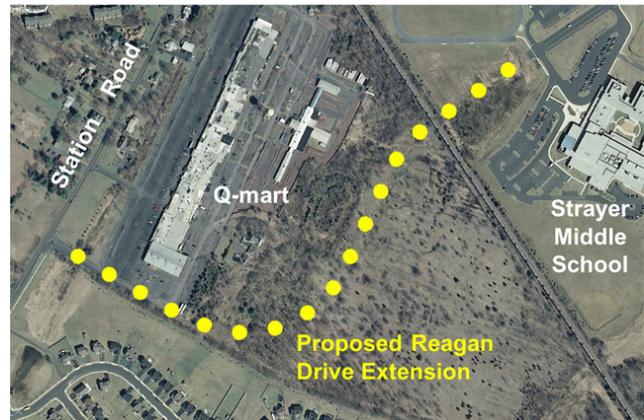
The Sellersville Extension is 8.4 miles long. Of that distance, 3.4 miles is proposed new multi-use trail, 0.8 miles utilizes existing multi-use trails, and 4.2 miles uses existing low-volume roadways.

The Sellersville Extension traverses (from north to south) Quakertown Borough and East Rockhill Township (Bucks County).

Detailed Description

Beginning in Quakertown's historic business district, the proposed trail alignment follows the existing sidewalks and the roadway of 3rd Street. A short section (150 feet) of Juniper Street is used due to an offset intersection with 3rd Street. Existing sidewalks accommodate trail users on foot, while *sharrow* bicycle pavement markings encourage motor vehicles to share the road.

At the present time 3rd Street dead ends at the borough line, with the small stream Beaver Run a short distance beyond. Across the borough line, Richland Township plans to develop Station Road Park (although there is no time frame for when this might happen). A network of multi-use trails is proposed for the park, including connection with an existing trail that serves an adjacent townhouse community (Beaver Run Drive / Terrace Drive). This study recommends linking the Station Road Park trail network to 3rd Street Quakertown by way of a new trail bridge over Beaver Run. In the event that the development of the park is delayed, the trail can be built regardless. Because the parcel is owned by Richland Township a temporary trail could be constructed along the field edges, to Station Road. (Due to its temporary status, that portion of the trail not within Beaver Run's floodway may be constructed with a crushed stone rather than an asphalt surface.)



conceptual plan showing possible alignment of Reagan Drive Extension

Either by utilizing the proposed Station Road Park trail network, or by constructing a temporary stone-surface trail through the township-owned land, the trail alignment reaches Station Road opposite an entrance driveway to Quakertown Farmers Market (Q-Mart). This location is slated for a major road improvement: a future "roundabout" traffic circle that will serve as an intersection between Station Road and a proposed new street called Reagan Drive Extension. This study recommends that the trail alignment cross Station Road at the new roundabout, and then follow the alignment of Reagan Drive Extension as a side path on the south side of the right-of-way. The proposed road will require a new at-grade crossing of the SEPTA railroad now operated by EPRY, and the multi-use side path should be an integral part of that design. The length of Reagan Drive Extension (and the parallel side path) will be one half mile.

The trail alignment then follows 800 feet of an existing asphalt side path on Reagan Drive at Strayer Middle School.

At this point the trail alignment would collocate with trails proposed in the Richland Township Trails Master Plan. On school district property, at a point between Strayer Middle School and Richland Elementary School where a



Existing side path on Reagan Drive at Strayer Middle School

trailhead parking lot has already been built, the trail alignment turns south and traverses open space known as the Lisbon Tract. A new trail bridge would span Morgan Creek. The trail alignment then follows an existing earthen utility road at the edge of property owned by Quakertown Christian School (also a component of the Richland Township Trails Master Plan). The trail alignment reaches Paletown Road at the intersection with Rocky Ridge Road.

The trail crossing of Paletown Road will require careful design consideration. Although sight lines are good, motor vehicle traffic poses a potential hazard due to high prevailing speeds. Paletown Road is a state highway.

The trail south of Paletown Road will utilize existing Rocky Ridge Road. Sight lines are good and traffic volumes low. After a quarter of a mile, two options present themselves.



1971 aerial photo shows Smoketown Road bridge over Bethlehem Branch (since removed)

First Option

Just north of the point where Rocky Ridge Road curves sharply to the east, a road bridge once crossed the railroad (which at this point runs through a deep rock cut). The first option erects a new trail bridge across the railroad at this location. Once across the railroad, the trail alignment turns south on existing Muskrat Road. As is the case with Rocky Ridge Road, sight lines are adequate and traffic volumes low. After a short distance Muskrat Road occupies an earthen causeway traversing the heart of Quakertown Swamp. The largest Great Blue Heron rookery in Pennsylvania is visible from the road.

A small gravel parking area is located on Muskrat Road near the intersection with Rich Hill Road.

Second Option

The second option uses existing roadways rather than a new trail bridge over the railroad. This alignment misses the widest views of Quakertown Swamp (and does not offer trail users views of the Great Blue Heron rookery). A mile and a half in length, this route utilizes Rocky Ridge Road, Rockhill Road, and Rich Hill Road. Signage and “sharrow” pavement markings may facilitate cyclists and motorists sharing the roadway. Due to somewhat higher traffic volumes, prevailing speeds, and situations of limited sight distance, a pedestrian-scaled side path along



Narrow bridge carries Rocky Ridge Road over Bucks Creek at Quakertown Swamp

Rockhill Road and Rich Hill Road should be considered. Narrow public right-of-way widths mean that a side path may not be easily possible without the permission of adjacent landowners. This alignment rejoins the first option at the intersection of Muskrat Road and Rich Hill Road.

The next segment of trail alignment utilizes existing Muskrat Road for a distance of one quarter of a mile to an intersection with Rockhill Road (a different section of Rockhill Road than the one referenced above).

The trail alignment then turns left on Rockhill Road and uses the existing roadway for a distance of two miles until Rockhill Road ends at a “T” intersection with Threemile Run Road. As in the previous section, a side path for pedestrians on Rockhill Road may be advantageous; but here again narrow public right-of-way widths mean that a side path may not be easily possible without the permission of adjacent landowners.



On-road trail alignment on Rockhill Road serves the village of Rock Hill

At the intersection with Threemile Run Road, the trail alignment turns left and utilizes a quarter mile long section of paved multi-use side path recently completed by East Rockhill Township.

The proposed trail alignment extends the existing side path a further one-half mile on the west side of Threemile Run Road. This same alignment is indicated as a Recommended Greenway Route Off-Road Linkage on East Rockhill Township’s Park and Recreation Plan.

The next segment of proposed trail alignment follows another Recommended Greenway Route Off-Road Linkage from East Rockhill Township’s Park and Recreation Plan. This one-quarter mile long section of multi-use trail leaves Threemile Run Road, running south-eastward and connecting with an existing multi-use trail that traces the perimeter of Willard H. Markey Centennial Park.



Trail alignment utilizes one-half mile of existing trail along the perimeter of Willard H. Markey Centennial Park

The existing paved perimeter trail in Markey Centennial Park is followed for a distance of one half mile. The trail crossing of Ridge Road (PA Route 563) at the existing intersection with the park access drive warrants careful design consideration. Sight distance is reasonably good, but prevailing speeds are high.

The recommended trail alignment continues by following another component of East Rockhill Township’s Park and Recreation Plan, labeled as a Recommended Greenway Off-Road Route Linkage,

from Ridge Road to the Pennridge High School / Pennridge North Middle School complex. Once on school district property, the proposed trail alignment descends the hillside following the alignment of an existing earthen access road along a tree line between ball-fields. The final section of trail widens the existing sidewalk on the west side of Fifth Street to multi-use side path standards, to the intersection of the school drive, Fifth Street, and Campus Drive.

Sight distance is good, but motor vehicle traffic volumes and prevailing speeds on Fifth Street may warrant an upgrade of the existing crosswalk at the intersection of the school drive, Fifth Street, and Campus Drive. Fifth Street is a state highway.



Tree row and earthen access road along ball fields behind Pennridge North Middle School

Campus Drive is followed for a distance of one-quarter mile to the entrance of the Sellersville - Perkasio - East Rockhill Bicycle / Walking Path System. Campus Drive's existing sidewalks can accommodate pedestrians while cyclists utilize the wide residential roadway. The Sellersville - Perkasio - East Rockhill Bicycle / Walking Path System is a multi-use asphalt-surface trail extending three-and-one-half miles along East Branch of Perkiomen Creek to Main Street Sellersville, with branches connecting adjacent points.

Southern Route

Summary

The Southern Route is envisioned a path that approaches Nockamixon State Park from the east. At Nockamixon State Park, the Southern Route splits into two branches: The Southern Route Multi-use Trail serving Quakertown and adjacent residential suburbs, and the Southern Route Foot-path serving Quakertown Swamp and wooded highlands to the west.

The Southern Route Multi-use Trail intersects the Northern Route at Quakertown borough. The Southern Route Foot-path intersects the Northern Route at Quakertown Swamp.

The Southern Route Multi-use Trail and the Southern Route Foot-path converge in the south-western corner of the study area, at the confluence of Butter Creek and Unami Creek. From that point the Highlands Trail alignment continues along Unami Creek into Montgomery County and Study Area 2 (Unami Hills - Perkiomen Trail).

The Southern Route Multi-use Trail alignment serves:

- Nockamixon State Park

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- Weisel Hostel
- Neidig Elementary School
- Quakertown historic town center
- Quakertown Community High School
- Quakertown Elementary School
- St. Luke's Hospital
- Richland Friends Meetinghouse (and historic oak)
- Trumbauersville Elementary School
- Milford Township open space along Unami Creek

The Southern Route Foot-path alignment serves:

- Nockamixon State Park
- Weisel Hostel
- East Rockhill Township open space along Threemile Run
- State Gamelands No. 139
- Village of Rock Hill
- Quakertown Swamp
- State Gamelands No. 196
- Manderfield Preserve

Downstream of the convergence of the Southern Route Multi-use and Southern Route Foot-path alignments, the recommended Pennsylvania Highlands Trail alignment serves

- Milford Township former Gerhart Mill site / Norris property
- Village of Finland

The Southern Route Multi-use Trail alignment is 15.5 miles long. Of that distance, 1.4 miles is proposed new multi-use trail, 3.9 miles utilizes existing multi-use trails, 6.4 miles uses existing low-volume roadways, and 3.9 miles is new foot-path (alongside Thatcher Road, and south of Kumry Road trailhead).

The Southern Route Multi-use Trail alignment traverses (from east to west) East Rockhill Township, Richland Township, and Milford Township (Bucks County).

The Southern Route Foot-path alignment is 14.7 miles long. Of that distance, 9.1 miles is proposed new foot-path, 1.6 miles utilizes existing trails, and 3.9 miles uses existing low-volume roadways.

The Southern Route Foot-path alignment traverses (from east to west) East Rockhill Township, West Rockhill Township, and Milford Township (Bucks County).

Detailed Descriptions

Previous study recommends the PHTN Southern Route enter Nockamixon State Park from the east. Existing trails and roadways within the park bring the trail alignment to Bucks County Weisel Hostel, in the western portion of the park.

From Weisel Hostel, two alignments are envisioned. The Southern Route Multi-use Trail and the Southern Route Foot-path are not mutually exclusive; rather they serve different modes of hiking and, in some places, other users as well as different parts of the study area.



Bucks County Weisel Hostel in Nockamixon State Park

The **Southern Route Multi-use Trail** alignment leaves Weisel Hostel utilizing existing Clymer Road. Low traffic volumes and reasonable prevailing speeds make this a suitable road for cyclists and walkers. Clymer Road is followed for a distance of 2000 feet, to the intersection with Axe Handle Road.

Axe Handle Road is then followed for a distance of two miles. Relatively low prevailing speeds and traffic volumes make Axe Handle Road a good candidate for sharing the roadway with cyclists and pedestrians. Locations where sight distance is limited may be addressed with warning signage, pavement markings, or by trimming roadside vegetation.

Thatcher Road is then followed for a distance of a quarter mile. Here speeds are considerably higher; signage and pavement markings may encourage motorists to look out for trail users. A traffic study may be warranted to determine whether construction of a side path is prudent here. The Thatcher Road bridge over Tohickon Creek has been recently replaced, and has wide shoulders. Thatcher Road is a state highway.

At the intersection with Erie Road, the trail alignment turns west towards Quakertown. Erie Road is a scenic, narrow township road, but it does serve as a congestion-bypass short cut for motor vehicle traffic. Therefore traffic volumes and prevailing speeds tend to be higher: so much so that a side path along Erie Road may be warranted. Moreover, the advisability of a side path along Erie Road should be determined by conducting a traffic study. If a side path is not warranted, then pavement markings and signage may be



Erie Road looking west from Thatcher Road

sufficient to calm traffic and alert trail users to oncoming motor vehicle traffic. After one mile, Erie Road crosses the borough line from Richland Township into Quakertown and becomes Erie Street. At that

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point the pavement widens and sidewalks begin. A short section of Ambler Street is used due to Erie Street's offset intersection with that street. The sidewalks and pavement of Erie Street are followed to the intersection with Hellertown Avenue (PA Route 212).

The trail alignment utilizes existing sidewalk and roadway of Hellertown Avenue (PA Route 212) for a distance of 900 feet to the intersection with Broad Street (PA Route 313). Signage and pavement markings (e.g. sharrows) should be installed to remind motorists and trail users to share the road. The intersection of Hellertown Avenue and Broad Street is a signalized intersection of two numbered state highways. At the present time three of four crossings have painted crosswalks. This intersection should be upgraded with push button-actuated pedestrian signals crosswalks at all four crossings.



Historic brick crosswalk on Broad Street in Quakertown, between railroad crossing and Hellertown Avenue

The trail alignment then follows Broad Street for a distance of about one quarter mile, to its intersection with Third Street in Quakertown's historic town center. Traffic volumes are heavy; as is the case with Hellertown Avenue, signage and sharrow pavement markings facilitate cyclists and motorists sharing the road. Existing sidewalks accommodate hikers.

Leaving the historic town center, the existing sidewalks and roadway of Third Street are followed, along tree-lined residential blocks, approximately three tenths of a mile to Park Avenue. A short distance of Juniper Street is utilized due to an offset intersection of Third Street. Traffic volumes and speeds are low.

Park Avenue is then followed for a distance of one mile to the intersection with West End Boulevard (PA Route 309). Existing sidewalks accommodate pedestrians. Sharrow pavement markings are recommended, to remind motorists and cyclists to share the road. Even with on-street parking permitted for much of its length, Park Avenue may be of sufficient width to allow installation of dedicated bike lanes.



Park Avenue Quakertown

Careful consideration should be given to the design of a safe crossing of West End Boulevard (PA Route 309). In 2011, average daily traffic volume on West End Boulevard through this intersection was 33,000. Including turning lanes, Route 309 is six lanes wide at this point, and crosses Park Avenue at a sixty degree angle (thirty degrees sharper than the optimal 90° angle), resulting in

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awkward turning movements and long crossings for pedestrians. At the present time this is a signalized intersection with a push-button for pedestrians. However, there are no dedicated pedestrian (walk / don't walk) signal heads and no painted crosswalks. This study recommends the installation of dedicated pedestrian signals and painted crosswalks at the intersection of Park Avenue and West End Boulevard (PA Route 309).

The trail alignment continues on Park Avenue for a distance of 2000 feet, until Park Avenue ends at a "T" intersection with Mill Road. As on the prior section of Park Avenue, existing sidewalks accommodate walkers, and cyclists share the roadway with motor vehicles.

The intersection of Mill Road and Park Avenue marks the transition from the "on-road" portion of the Southern Route Multi-use Trail, to the "off-road" trail portion.

Signage and painted crosswalks are recommended, to convey trail users to the south side of Mill Road. South from Mill Road, a short (600 foot long) section of new multi-use trail is proposed. This would convey trail users from the intersection of Mill Road and Park Avenue to the beginning of the Hunters Crossing Trail (at the present time the Hunters Crossing Trail begins at the back corner of a strip mall parking lot).



Hunters Crossing Trail, view north from Grey Fox Circle

The recommended trail alignment then follows two and a half miles of existing multi-use trail: the Hunters Crossing Trail and the Brayton Gardens Trail. Most of this trail is an 8 foot wide asphalt multi-use path, but short segments follow low-traffic-volume residential streets and sidewalks instead. This study recommends the placement of directional signage along the trail.

At the present time the Hunters Crossing Trail and Brayton Gardens Trail are separated by a steel guide rail along Trumbauersville Road (S.R. 4015). The uninterrupted guide rail and high prevailing motor vehicle speeds make this a difficult crossing for trail users. Recently Richland Township obtained a \$713,000 Pennsylvania Community Transportation Initiative grant to implement traffic calming measures here, improving the trail crossing by installing a painted crosswalk, a concrete refuge island, and solar powered lamps. Construction is expected to begin in 2014.



Illustration of Trumbauersville Road Gateway Project

The Brayton Gardens Trail ends at Dovecote Drive. There exists a yet-to-be-implemented plan to construct a parking area and ball fields on public open space at this location. The parking area, once constructed, could serve as a trail-head both for the existing trail and for extensions proposed by this study.

Currently there is a one-mile long gap between the end of the Brayton Gardens Trail, and the beginning of Barrel Run Trail at Trumbauersville Elementary School. Cyclists and walkers (including school children) cannot safely navigate this gap because the only available way is along Tollgate Road. This state road (S.R. 4049) is narrow and has high traffic volumes and prevailing speeds.

This study recommends constructing a multi-use trail to close this mile-long gap. The recommended alignment is within the power line right-of-way that parallels Barrel Run. If landowner concerns can be successfully addressed and permission can be obtained, the alignment would traverse open space owned by Tollgate Landing Homeowners Association. The open space straddles both sides of the boundary between Richland and Milford Townships.



Power line right-of-way along Barrel Run east from Trumbauersville Road, Milford Township

An at-grade trail crossing of Trumbauersville Road (S.R. 4015) will need to be designed. Crosswalks, warning signage, and push-button actuated signals may be appropriate here.

The trail alignment then co-locates with the existing asphalt Barrel Run Trail for three-quarters of a mile. This high quality trail, recently completed, includes links to adjacent residential neighborhoods.

The Barrel Run Trail currently terminates at Creamery Road in Milford Township, then resumes again four-tenths of a mile to the west at Allentown Road. This study recommends that a multi-use trail be implemented that would close this gap in the existing trail system. Because the land on both sides of this stretch of Barrel Run is private property, implementation of this trail may not be easily possible without the permission of landowners. Both Creamery Road and Allentown Road will need carefully designed at-grade trail crossings. Allentown Road is a state road (S.R. 4027).



Unami Creek Trail trail-head at Kumry Road

An existing asphalt multi-use trail network continues west from Allentown Road, and this study recommends co-location with this trail.

Three side branches of this completed section of Unami Creek Trail connect with Streamview Way,

Buttonwood Lane, and Sycamore Drive. The main trunk of this trail network extends eight-tenths of a mile from Allentown Road to a trail-head on Kumry Road that includes space for sixteen automobiles.

This study recommends that the Kumry Road trail-head serve as the transition point between multi-use trail, and foot-path. West of the trail-head, this study recommends the trail continue as a rugged foot-path.

Because of relatively high prevailing speeds and narrow cartway widths, this study recommends the construction of a foot-path on the north side of Kumry Road from the existing trail-head to Unami Creek, a distance of a quarter mile. A new trail bridge would convey trail users over Unami Creek, alongside the existing one-lane Kumry Road bridge. Once on the west bank of the creek, trail users would cross Kumry Road at a new at-grade crossing. Preliminary field view indicates that sight distance would be adequate at this location, but relatively high prevailing speeds and the growth of vegetation adjacent to the roadway are concerns that should be addressed.



Unami Creek flows beneath Trumbauersville Road bridge

Continuing southward from an informal gravel parking area on the west bank of Unami Creek, the recommended trail alignment runs along the creek for a mile and a half. Milford Township's 1999 Open Space Plan identifies the Unami Creek corridor as a Primary Conservation Area. With the exception of the parcel of township-owned land south of Trumbauersville Road, ownership is divided among multiple private owners. Without the consent of these owners, implementation of this segment of trail may not be easily possible.

At the confluence of Unami Creek and Butter Creek, the Southern Route Multi-Use Trail Alternate meets with the Southern Route Foot-path Alternate. The trail alignment continues south along Unami Creek. If a duck-under beneath the Trumbauersville Road bridge over the creek isn't feasible, an at-grade crossing will need to be designed. The trail alignment traverses township-owned open space between Trumbauersville Road and the Pennsylvania Turnpike Northeast Extension bridge over Unami Creek. There is ample space beneath the turnpike bridge for the trail to pass. Pennsylvania Turnpike Commission has plans to replace this bridge to accommodate widening the turnpike from its current configuration of four lanes with narrow shoulders to six lanes with wide shoulders. The consultants designing the new turnpike bridge have been made aware of Milford Township's intention to locate a trail alongside



Nursery Road historic through-truss bridge over Unami Creek

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the stream beneath the new bridge.

West of the turnpike the trail alignment crosses more township-owned land, including the Norris property. Milford Township is considering adding public amenities at the Norris tract, including the possibility of constructing a community center, a dance hall, or a nature center.

The trail alignment follows Unami creek through the village of Finland to the Montgomery County (Marlborough Township) line.

The **Southern Route Foot-path** alignment leaves Weisel Hostel by co-locating with existing foot-paths in Nockamixon State Park.

South of the park boundary, the trail alignment continues for a distance of three miles along the banks of Threemile Run. This concurs with East Rockhill Township's designation of Threemile Run as both a Floodplain Greenway and an Off-Road Linkage.



Threemile Run flows through arch culvert beneath PA Route 313

The trail alignment crosses Dublin Pike (PA Route 313). Dublin Pike is a high-speed two-lane highway that will require either a carefully designed at-grade crossing, or a duck-under utilizing an existing drainage culvert. The culvert that allows Threemile Run to flow beneath Dublin Pike is a low concrete arch. Adequate head-room for the trail exists only near the center of the arch (not at the sides near the abutments) so a unique solution will need to be devised if the trail is to pass through that culvert. Suspending a lightweight metal-grate footway from the archway is one possible solution. Any potential solution will need to be evaluated for its effect on adjacent flooding by analyzing the drainage area's land uses and projected rainfall intensities, and modeling how the resultant storm-water passes through the hydraulic opening before and after installation of the footway. If at some point in the future PennDOT schedules this culvert for replacement, the new bridge design should allow sufficient clearance for both the stream and the trail.

Though this recommended trail alignment is designated by East Rockhill Township as an Off-Road Linkage, it does traverse private property. Without the permission of landowners, implementation of the trail here will not be easily possible.

The next quarter mile of trail alignment utilizes the existing asphalt side path alongside Threemile Run Road, from School House Road to Rock Hill Road.



Rockhill Road looking northwest from Threemile Run Road

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Two miles of trail utilizes relatively low-traffic-volume Rockhill Road, and a short section of Muskrat Road. This coincides with this study's recommended alignment for the Northern Route and Sellersville Extension. A side path for pedestrians on Rockhill Road and Muskrat Road may be advantageous, but narrow public road right-of-way widths mean that a side path may not be easily possible without the permission of adjacent landowners.

At the point where the Texas Eastern Gas Pipeline crosses Muskrat Road, the recommended trail alignment leaves the roadway and heads west for one mile to Old Bethlehem Pike. The trail alignment traverses a portion of the Quakertown Swamp, and is labeled as a "Recommended Greenway Route - Off-Road Linkage" in East Rockhill Township's Park and Recreation Plan. A trail bridge will need to be constructed across Bucks Creek. Some private property owners, or the adjacent Upper Bucks Christian School, will need to grant easements or sell rights-of-way if this section of trail is to be implemented. Approximately half of this section of recommended trail alignment utilizes what county tax maps indicate is a *paper street*, i.e., a public right-of-way for a land development that was never built.



Texas Eastern gas pipeline west from Muskrat Road at Upper Bucks Christian School

The recommended trail alignment meets Old Bethlehem Pike at two intersections, approximately 260 feet apart. The first intersection is that of the (unbuilt) paper street. The second intersection is that of Green Top Road. To connect these, due to high traffic volumes and prevailing speeds, this report recommends a 260 foot long side path or sidewalk along the east side of Old Bethlehem Pike. Trail users would cross Old Bethlehem Pike at the existing intersection with Green Top Road with the aid of proposed warning signage, a painted crosswalk, and push button-actuated warning signals.

The next mile of trail alignment utilizes low traffic-volume township roads: Green Top Road, Catch Basin Road, and Berger Road. At the intersection of Green Top Road and Bethlehem Pike, trail users would cross Bethlehem Pike with the aid of proposed warning signage, a painted crosswalk, and push button-actuated warning signals.



Green Top Road underpass beneath PA Route 309 in West Rockhill Township

Green Top Road crosses beneath the PA Route 309 expressway through an existing underpass.

Green Top Road, Catch Basin Road and Berger Road are open to the public -- as indicated on the current PennDOT Type 5 map -- but Catch Basin Road (south of Green Top Road) and Berger Roads have been

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posted with “Private Property” signs, presumably by an adjacent property owner. If the trail is to utilize these rights-of-way, adjacent property owner privacy concerns will need to be addressed.

1700 linear feet of Berger Road, between Catch Basin Road and Tower Road, is not a passable road but is indicated as a “paper street” on county tax maps. The recommended trail alignment utilizes this right-of-way to Tower Road, and is identified as a Recommended Greenway Route On-Road/Bike Route in the Pennridge Area Greenway Plan.



Petroleum pipeline easement between Tower Road and State Gamelands 196

The recommended trail alignment continues west of Tower Road for a distance of one and one quarter miles to Schukraft Road. This is identified as a Recommended Greenway Route Off-Road Linkage in the Pennridge Area Greenway Plan. Much of this alignment traverses State Gamelands 196, but there are private landowners that will be affected as well. A nearby Interstate Energy petroleum pipeline may be an opportunity to co-locate the trail.

Schukraft Road and Butter Creek Road are narrow country roads with low traffic volumes. Co-locating on these roads will offer trail users views of some of the most beautiful natural landscapes in the study area. Schukraft Road and Butter Creek Road are followed for a distance of about one mile to Allentown Road, and are also identified as part of a Recommended Greenway On-Road/Bike Route in the Pennridge Area Greenway Plan.

A push button actuated warning signal is recommended for the intersection of Butter Creek Road and Allentown Road, along with warning signage and a painted crosswalk.



Schukraft Road near intersection with Butter Creek Road

The trail alignment follows the existing asphalt access road into Manderfield Preserve for a short distance, before leaving the roadway as a foot-path. The Preserve is owned by West Rockhill Township.

This study recommends two miles of new foot-path along Butter Creek between Manderfield Preserve and the Unami Creek. This alignment is identified as a proposed municipal trail in the Bucks County Greenways Map (2010).

At the confluence of Butter Creek and Unami Creek, this the Southern Route Foot-path alternate and the Southern Route Multi-Use Trail alternate converge. (Southern Route Multi-Use Trail alternate is a foot-path at this point; it is a multi-use trail only north of the Kumry Road Trail-head.)

The foot-path alignment continues south along Unami Creek from this point. As described in the previous section, if a duck-under beneath the Trumbauersville Road bridge over Unami Creek isn't feasible, an at-grade crossing will need to be designed. The trail alignment traverses township-owned open space between Trumbauersville Road and the Pennsylvania Turnpike Northeast Extension bridge over Unami Creek. There is ample space beneath the turnpike bridge for the trail to pass. Pennsylvania Turnpike Commission has plans to replace this bridge to accommodate widening the turnpike from its current configuration of four lanes with narrow shoulders to six lanes with wide shoulders. The consultants designing the new turnpike bridge have been made aware of Milford Township's intention to locate a trail alongside the stream beneath the new bridge.



Site of Gerhart Mill along Unami Creek, seen from historic Nursery Road bridge in Milford Township

West of the turnpike the trail alignment crosses more township-owned land, including the Norris property. Milford Township is considering adding public amenities at the Norris tract, including the possibility of constructing a community center, a dance hall, or a nature center.

The trail alignment follows Unami creek through the village of Finland to the Montgomery County (Marlborough Township) line.



Investigating potential trail alignments in the Manderfield Preserve – May 2013

Prioritization of Recommended Improvements

This study recommends a multi-phase implementation of the proposed trail network. This study categorizes projected elements of the trail network as short term, mid term, and long term.

Short Term

- The **Northern Route** is a multi-use trail that brings the Pennsylvania Highlands Trail south from Coopersburg to Quakertown, by extending the Saucon Valley Rail Trail. The unused SEPTA Bethlehem Branch would be reconstructed for use as a rail-trail, or rail-with-trail, as far south as California Road in Richland Township. A combination of new, existing, and proposed multi-use paths would bring the trail as far south as Fourth and Mill Streets in Quakertown. Existing sidewalks and proposed share-the-road signage and pavement markings would bring trail users into the historic business district of Quakertown.
- The **Southern Route Multi-use Trail** connects Quakertown to Weisel Hostel in Nockamixon State Park to the east, and the existing Kumry Road trail-head to the west. The recommended alignment between Quakertown and Nockamixon consists of an on-road alignment including Erie Road and Axe Handle Road (a side path for pedestrians would be constructed along Thatcher Road). Existing sidewalks and streets within Quakertown borough would be augmented with share-the-road signage and pavement markings. Traffic signals would be upgraded to include push-buttons for pedestrians. West of Quakertown, closing three gaps in the existing four mile-long asphalt multi-use trail would connect the Kumry Road trail-head near Unami Creek with Quakertown borough, while greatly expanding safe non-motorized access to Trumbauersville Elementary School.

Mid Term

- The **Sellersville Extension** is a multi-use trail that connects Quakertown to points south using a combination of new, existing, and proposed multi-use paths and on-road alignments. The trail alignment includes on-road segments traversing Quakertown Swamp (the largest inland freshwater wetland in southeastern Pennsylvania). At Perkasio, connection is made with the existing Sellersville - Perkasio - East Rockhill Bicycle / Walking Path System.

Long Term

- The **Southern Route Foot-path** connects Nockamixon State Park with the Unami Creek valley. Recommended trail is comprised of a combination of rugged foot-path and rural road alignments. The proposed alignment does not approach Quakertown, but does run adjacent to the southwestern branch of Quakertown Swamp. Southern Route Foot-path also serves State Gamelands 196 and Manderfield Preserve.

Opinion of Probable Cost

The following table is a summary of the probable costs of construction of the recommendations presented in this study. Costs for design and engineering, construction management, right-of-way acquisition and contingencies have not been included in these figures.

This opinion of costs is based on time-honored practices in the construction industry. The study team does not control the cost of labor, materials, equipment, or a contractor's method of determining prices; nor competitive bidding practices and market conditions. The probable costs of construction represent our best judgment as professionals at the time of preparation. The study team cannot guarantee that proposals, bids and construction costs will not vary from these estimates. *Utilization of in-house forces (e.g. township crews) can result in costs considerably lower than those presented in this report.*

Because the base information used to create the study maps is true-scale GIS data, quantities were determined by measuring the lengths of the various recommended improvements. The unit of measure utilized, is *linear feet*.

Determining the unit cost (i.e., the price in dollars per linear foot) is based on the costs of recent projects in broad proximity to this one.

A unit cost of \$88 per linear foot has been assigned to those alignments that recommend a 12' wide macadam trail surface including new grading, sub-base, and drainage facilities.

A unit cost of \$23 per linear foot has been assigned to those alignments that recommend a 12' wide crushed-stone trail surface on an existing abandoned railroad grade. Cost is adjusted lower due to the utilization of existing earthwork, sub-base, and drainage constructed when the railroad was first built.

A unit cost of \$11 per linear foot has been assigned to those alignments that recommend a soft-surface foot-path. The foot-path should be designed with best practices for sustainably managing storm-water runoff.

A unit cost ranging from \$3 to \$5 per linear foot has been assigned to those on-road alignments requiring new signage and pavement markings.

A unit cost ranging from \$0.50 to \$1 per linear foot has been assigned to those alignments that add signage to existing trails.

The cost of new trail bridges varies from \$22,400 to \$129,000 each depending on their planned width and length. These costs assume the use of pre-fabricated spans and GRS (geosynthetic reinforced soil) abutments rather than traditional cast-in-place concrete.

A draft opinion of probable cost for the facilities recommended in this plan is itemized in detailed tables provided in the appendix. The trail segment designations in the detailed tables match those that appear on maps C and D (included in the appendix).

- **Northern Route: \$1,143,154 to \$1,313,258**
- **Southern Route Multi-Use Trail: \$1,320,088**
- **Southern Route Foot-path: \$863,737**

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- **Sellersville Extension: \$1,319,453 to \$2,011,064**

These figures summarize the probable cost of each alignment. There is a range of costs for the Northern Route and for the Sellersville Extension because final cost will depend upon which alternates are chosen for those segments where multiple alignment options have been identified in the study. Also, Northern Route and Sellersville Extension co-locates with several previously-proposed trails and if those proposed trails are completed before this trail, those costs need not be added to this total.

These figures assume that the trail will be built by private contractors selected by a competitive bidding process. *If the municipalities decide to procure the materials, and township or borough crews construct the trail, costs will be significantly lower.*

It is not anticipated that the significant expenditure summarized above would occur all at once. While short time-frame priorities would ideally be undertaken in the near future, medium time-frame and long time-frame projects will require additional time to design and complete. Thus those projects and their costs can be spread over a period of several years.

Recommendations for Future Action

The existing trails in the Quakertown region were implemented by the municipalities (notably Milford and Richland townships), and it is anticipated that the elements of the Pennsylvania Highlands Trail Network recommended in this study will be implemented by municipalities as well (e.g., Springfield, East Rockhill and West Rockhill townships, and the borough of Quakertown). In the case of the rail-trail recommended by this study, it's noteworthy that railroad owner SEPTA insists that any lease agreement be made with municipal governments (rather than non-profits).

Because the Quakertown region spans five municipalities, coordination between local governments will be essential. This study recommends that the trail study committee that was formed to conduct this study, continue to meet on a regular basis. Appalachian Mountain Club has expressed willingness to convene these regular meetings and to facilitate efforts to implement the trail network.

Potential Funding Sources

Funding for trails, sidewalks and bike lanes involves financing, planning, construction and maintenance. In many instances the sources for each of these differs within one project or portion of project. For instance, a community may provide the maintenance for a portion of a trail which passes through, although the community funded neither the planning nor construction of that trail.

The six major sources for funds each have their goals and agendas:

- **Municipal** (Township, Borough, City): Municipal funds are typically limited, and directed toward local needs and desires such as recreation, paths through parks, and local ped / bike access. In some cases they may entail directing available funds from other sources (such as Safe Routes to Schools) within the community. As noted above, however, the municipality may undertake the maintenance (and thereby responsibility) for portions of trails which pass through and serve that community. Municipalities have several other options at their disposal. These include:
 - In-kind donations of materials, equipment and labor to provide portions of the construction.

- Capital campaign drives directed at a specific project that is seen as significant by the community.
- Bond issues to spread financing over a long term. Like capital campaigns, these require community support.
- **County:** Funding for trails and paths which serve and connect communities within that region and which are seen as part of a greater plan are frequently provided through the region's allocation of available funds from the state and federal government. These may come from FHWA (Federal Highway Administration) 'enhancements,' funds for transit links or the Hometown Streets and Safe Routes to Schools efforts. Delaware Valley Regional Planning Commission is responsible for the direct disbursement of those funds.
- **State:** Pennsylvania is committed to the development of trails and trail systems for both health purposes and as ped/bike corridors for travel within and between communities. Like the regional funds, much of this money is federal funding distributed through the state for these purposes. Unlike regional funding, the state does have specific sources for funding grants for design, acquisition and construction through DCNR and PennDOT as well as DCED for community programs and the Growing Greener initiative. More on these programs follows in this report. There are also programs for preservation and development intended to provide funds for trail development. State parks and game lands, many of which have developed trails, also provide funding and maintain portions of long distance trails.

Other state assistance in the development of a trail and path system can come with the inclusion of such work in PennDOT highway and transportation projects. Also, at the Pennsylvania Historical and Museum Commission, the Keystone Historic Preservation Grant program provides funding support for projects that identify, preserve, promote and protect historic and archaeological resources.

Community Conservation Partnership Program - PA Department of Conservation & Natural Resources

<http://www.dcnr.state.pa.us/brc/grants/index.aspx>

Pennsylvania Community Transportation Initiative - PennDOT

<http://www.smart-transportation.com/pcti.htm>

PA Department of Environmental Protection Coastal Resource Management Program

FY 2013 Coastal Zone Grants <http://www.dep.state.pa.us/river/grants/crmgrants/crmgrants.htm>

Keystone Preservation Projects & Construction Grants

"Grants and Funding" at www.phmc.state.pa.us

Department of Community and Economic Development

Greenways, Trails and Recreation Program (GTRP)

<http://www.newpa.com/find-and-apply-for-funding/funding-and-program-finder/greenways-trails-and-recreation-program-gtrp>

Money from the Marcellus Legacy Fund is being distributed directly to each county in the State. Funding levels are based on population. One of the dedicated uses for this money has to be "Environmental Initiatives", specifically for the "planning, acquisition, development rehabilitation and repair of greenways, recreational trails, open space, natural areas, community conservation and beautification projects, community and heritage parks and water resource management. <http://conserveland.org/articles/116>

In addition, the Commonwealth Financing Authority is providing grants for Greenways, Trails, and Recreation, see below:

You can click through below (or type of past the link into your browser) for additional information on each of the funding categories.

CFA Accepting Act 13 Abandoned Mine, Watershed Restoration, Greenways Grant Applications

The **Commonwealth Financing Authority** (CFA) accepts applications for grants under the Act 13 Marcellus Legacy Fund Programs covering abandoned mine drainage abatement and treatment, watershed restoration and protection, water quality data, greenways, trails and recreation and orphan and abandoned well plugging programs. The last round of applications were due July 31, 2013 and were scheduled to be considered at the CFA's November 13, 2013 meeting.

Abandoned Mine Drainage Abatement: Eligible applications cover projects to restore and maintain stream reaches impaired by abandoned mine drainage and ultimately, to remove these streams from the Department of Environmental Resources Impaired Waters list. Grants will not exceed \$1 million and require a 15 percent match. Program guidelines can be found at <http://www.newpa.com/find-and-apply-for-funding/funding-and-program-finder/abandoned-mine-drainage-abatement-and-treatment-program-amdatp>.

Watershed Restoration Protection: Grants to restore and maintain stream reaches impaired by the uncontrolled discharge of nonpoint source polluted runoff and ultimately to remove these streams from the Department of Environmental Protection's Impaired Waters list. Grants will not exceed \$300,000 and require a 15 percent match. Program guidelines are available at <http://www.newpa.com/find-and-apply-for-funding/funding-and-program-finder/watershed-restoration-and-protection-program>.

Baseline Water Quality Data Program: Grants to use the scientific principles and practices for water sample collection and analysis to document existing groundwater quality conditions on private water supplies. Grants will not exceed \$250,000 and require a 15 percent match. Program guidelines: <http://www.newpa.com/find-and-apply-for-funding/funding-and-program-finder/baseline-water-quality-data-program>.

-- **Greenways, Trails and Recreation:** Grants for the planning, acquisition, development, rehabilitation and repair of greenways, recreational trails, open space, parks and beautification projects. Grants will not exceed \$250,000 and require a 50 percent match, except for applications from municipalities with a population of less than 5,000 which requires a 20 percent match. Program guidelines: <http://www.newpa.com/find-and-apply-for-funding/funding-and-program-finder/greenways-trails-and-recreation-program>.

-- **Orphan or Abandoned Well Plugging:** grants to provide mechanisms to plug abandoned and orphaned wells that have the potential to cause health, safety or environmental concerns. Grants will not exceed \$250,000. Program guidelines: <http://www.newpa.com/find-and-apply-for-funding/funding-and-program-finder/orphan-or-abandoned-well-plugging-program>.

Eligible applicants include local governments, watershed organizations, for-profit businesses (other than producers of natural gas), councils of governments or other authorized organizations (any entity involved in research, restoration, rehabilitation, planning, acquisition, development, education or other activities, which furthers the protection, enhancement, conservation,

preservation or enjoyment of this Commonwealth's environmental, conservation, recreation or similar resources).

The CFA is scheduled to consider guidelines for two additional programs created under Act 13 at its March 20, 2014 meeting-- Flood Hazard Mitigation and Sewage Facilities funding. There will be about \$14 million available under the Act 13 .programs announced.

Notify your legislators: If you plan to apply for funding under this program, *PA Environment Digest* strongly urges you to notify your local House and Senate member that you have applied and make sure they know how important it is to you. For more information, contact Brian Eckert or Matthew Karnell at 717-787-6245 to discuss potential projects before commencing the application process.

- **Regional:**

Regional Trail Program - Delaware Valley Regional Planning Commission

<http://www.dvrpc.org/RegionalTrailsProgram>

Transportation and Community Development Initiative - Delaware Valley Regional Planning Commission

<http://www.dvrpc.org/TCDI>

- **Federal:** Though typically administered through the state, federal programs set goals and directions. These in turn often guide the decision making process of what to build and where. Many are transportation related and work toward reducing pollution through alternative travel, while others promote recreation and health and still others promote community development. Delaware Valley Regional Planning Commission acts as the conduit for these funds.

On July 6, 2012 President Obama signed into law a new two-year transportation bill: MAP-21. Providing \$118 billion for transportation projects over fiscal years (FY) 2013 and 2014, MAP-21 is the first long-term highway authorization enacted since 2005. MAP-21's **Transportation Alternatives** formula program (TAP) encompasses most activities that had been funded by the previous law's Transportation Enhancements, Recreational Trails, and Safe Routes to Schools programs. The funds dedicated to the Transportation Alternatives Program represent 2% of the total MAP-21 budget. Fifty percent of TAP's \$800 million annual allocation will be directed to MPOs / RPOs; all funds are to be distributed through competitive grants.

- **Private Funding:** Grant funding is available through many private avenues, most of which have specific agendas. Key to obtaining such funding is a clear match of the project goals to the funding intent. Often, private grants require a non-profit entity [501(c)3] to receive and administer any funds. Frequently, private funding can be used to meet the matching requirements of many public programs which require some amount of local funding as a good faith indication of local support. Finally there are in-kind gifts and cooperative partnerships which permit a right of way through private lands and develop a cooperative agreement for use, maintenance and safety. These can frequently be seen in rails-with-trails as well as trails that use utility rights of way and cooperative maintenance.

Inventory and Methodology

Existing Plans and Reports

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

Planning documents consulted as part of the planning process include:

- PA Highlands Trail Network, Riegelsville to Quakertown Region, Draft Feasibility Study Report, 2013
- Springfield Township Parks & Recreation Plan 2013-2022, 2013
- Bucks County Bicycle Master Plan, 2012
- Bucks County Open Space and Greenways Plan, 2011
- Bucks County Comprehensive Plan, 2011
- Krupp Park Master Plan, Borough of Quakertown, 2011
- Springfield Township Open Space Plan Update, 2010
- West Rockhill Township Open Space and Park & Recreation Plan, 2010
- Trumbauersville Road Gateway Plan; PennDOT, 2010
- Richland Township Open Space Plan, 2010
- Station Road Park Conceptual Sketch, Richland Township, 2009
- Ronald Reagan Drive Extension, Richland Township; Station Road Park to Third St. Quakertown, 2007
- Quakertown Area Comprehensive Plan Update, 2007
- Richland Township Trails Master Plan, 2006
- East Rockhill Township Park and Recreation Plan, 2006
- Upper Tohickon Rivers Conservation Plan, Richland Township, 2005
- Springfield Township Comprehensive Plan, 2002
- Pennridge Water Resources Plan, prepared for Pennridge Area Coordinating Committee, 2001
- Pennridge Area Greenway Plan, prepared for Pennridge Area Coordinating Committee, 2000
- Milford Township Open Space Plan, 1999

Field Survey

The project team conducted an extensive field survey of the Quakertown region study area to document existing conditions of the roadway system and trail network, including the pavement width of roads and trails, pavement type, location of existing sidewalks and pedestrian connections, and traffic control devices such as signals. Significant investigation was focused on utility easements, rights of way, and abandoned railroad lines that may serve as the spine of the trail or as branches of the trail network. High resolution digital photographs were made to document existing conditions.

GIS-based mapping was completed, oriented within the Pennsylvania State Plane (South Zone) coordinate system. GIS data integrated into the study maps include layers obtained from the Pennsylvania Geospatial Data Clearinghouse such as state roadway centerlines, local roadway

centerlines, existing trails, municipal boundaries, stream centerlines, waterbodies, wetlands, state gameland boundaries, state park boundaries, and high resolution color aerial photography. This data was field checked and the study maps revised where appropriate.

Data obtained from Bucks County Planning Commission and incorporated into the study maps include layers representing sidewalks, protected lands, and proposed municipal trails.

Pennsylvania Department of Highways Type 5 and Type 10 maps were obtained and referred to when determining ownership of roadways in the study area. Based on the PennDOT maps, the symbology of the study maps makes clear the distinction between municipal, state, and privately-owned roads.

Public Meetings

Study committee meetings comprised of stakeholders including local residents, business owners, representatives of local institutions and elected officials were held on these dates:

- March 26, 2013 at Upper Bucks Chamber of Commerce, Quakertown
- April 29, 2013 at Richland Township municipal building
- June 25, 2013 at Milford Township municipal building
- September 30, 2013 at Richland Township municipal building

In addition to the study committee meetings, the public was invited to submit their ideas and concerns at workshops held on these dates:

- April 29, 2013 at Richland Township municipal building
- June 25, 2013 at Milford Township municipal building

The final study is to be presented at a public meeting scheduled for November 14, 2013.



Public workshop at Richland Township municipal building
April 29, 2013

Legal Feasibility: Ownership Patterns in the Study Area

The Quakertown region is a predominantly suburban landscape, with Quakertown Borough a largely built-out town comprised mainly of residential, light industrial and institutional land uses.

Notable exceptions to this broad characterization include the sparsely settled diabase-studded wooded slopes south of Quakertown, and the agricultural areas from Quakertown north to Coopersburg.

The vast majority of the land in the study area is privately owned. The largest public open space in the region is the 5,283 acre Nockamixon State Park. State Gamelands 139 and 196 are located in East Rockhill and West Rockhill Townships, respectively. Public access to these State Gamelands is somewhat limited, as they are mainly landlocked, surrounded by private property. State Gameland 196 may offer an opportunity for routing a portion of the Southern Route Foot-path.

Southeastern Pennsylvania Transportation Authority owns the double-track railroad that runs north-south through the study area. Formerly known as the Reading Railroad Bethlehem Branch, SEPTA leases the railroad to East Penn Railroad, a freight-hauling shortline. EPRY serves industrial customers from Quakertown south, and stores unused rail cars on parallel tracks. EPRY does not use the railroad from California Road north to its lease limits near Coopersburg, but does have the right to do so in future. SEPTA has indicated willingness to amend the terms of the lease when it is up for renewal, to include provision for a trail until such time as railroad service resumes. The opportunity to implement this change will be when the existing lease expires and may be renewed, in mid-2014.



East Penn Railroad freight train in Quakertown

Lehigh Valley Transit Company's Liberty Bell High Speed line is another north-south corridor through the study area. Trolley service was replaced by buses running on parallel roads when the trolley line was abandoned in 1951. This study does not recommend placement of a trail on this alignment for several reasons. From Broad Street in Quakertown on south, the trolley line was located within public road rights-of-way (Main Street, and Old Bethlehem Pike). The tracks were located in the middle of the street in Quakertown, and on the east shoulder of the road in Richland and East Rockhill Townships. Today these are heavily travelled roads and not readily suitable for trail alignment.



1950s photo of Lehigh Valley Transit Company trolley freight train on shoulder of Old Bethlehem Pike south of Quakertown

From Broad Street in Quakertown on north, the LVT trolley line was constructed on private right-of-way. However, the first three-quarters of a mile of trolley track-bed has been obliterated by construction of strip malls on both sides of West End Boulevard (PA Route 309).

From Kile Circle north, much of the abandoned trolley track-bed is intact because after abandonment of trolley service it was purchased by Pennsylvania Power & Light for use as an electric transmission corridor. There are gaps however, in particular a one-half mile missing segment north from Grant Road in Milford Township. Long-distance AT&T fiber optic cable has also been buried beneath the ex-LVT track-



This portion of Liberty Bell high speed line right-of-way has been "plowed under." North from Grant Road in Milford Township

December 5, 2013

bed.

If the LVT trolley right-of-way north of Quakertown were to be considered as a trail, the support of adjacent residential property owners will need to be garnered. Also, a trail alignment will need to be devised to circumvent both the missing segment in Milford Township and the missing segment on both sides of West End Boulevard. The latter, in particular, has no obvious solution. The study authors believe that at the present time, the unused SEPTA railroad on the east side of PA Route 309 seems a more suitable candidate for the trail alignment.

In the Commonwealth of Pennsylvania, the default right-of-way width for a public road is 33 feet. Depending on the width of the paved cartway, in many cases a 33 foot wide right-of-way leaves scarcely enough space for a separate side path for pedestrians or bicycles. For example, a twenty-one foot wide paved road (rather narrow for two-way traffic, but typical in the study area) leaves 6 feet on either side. How to allocate this narrow strip between a useful path and some modicum of separation from motor vehicle traffic is a real challenge.



**Typical township road in the study area:
21 foot wide cartway within 33 foot wide right-of-way**

The construction of a narrow (3-foot wide) foot path, 3 feet from the edge of the roadway, within the existing right-of-way, is a possible solution. The matter is more complicated when the profile of the existing roadway is above or below the surrounding terrain (on a fill or in a “cut” situation). In order to build a side path, the required re-grading will often need to extend outside the legal right-of-way, onto adjacent private property (i.e., in many cases residential front yards). A solution utilized by PennDOT in such situations is to negotiate a temporary construction easement alongside the road right-of-way. After the property’s frontage is re-graded to allow for the new roadway (or side path), the land is restored with appropriate ground cover. In some situations, retaining walls may be appropriate, to minimize the re-grading of adjacent property.

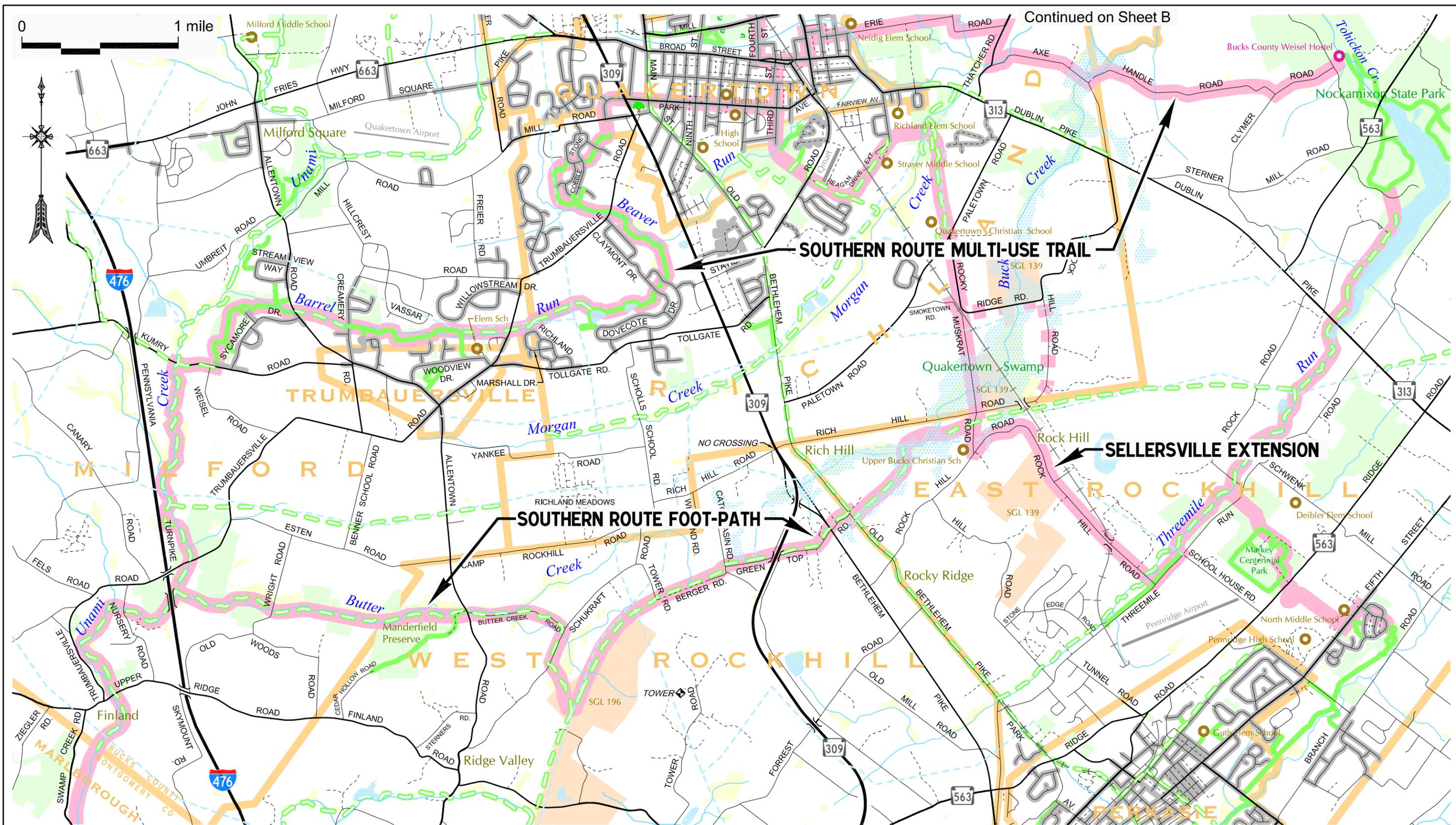
In those cases where the road right-of-way is too narrow to accommodate a side path (e.g., in virtually every case throughout the study area) one potential solution is the acquisition of a narrow strip of land alongside the right-of-way, parallel to the road. If the property owner is amenable, an easement may be negotiated, or the sale of a strip of land arranged. Whether a property owner would be willing to allow an easement (or to sell a strip of land along their property’s frontage) needs to be determined on a case-by-case basis.



**Texas Eastern transcontinental gas pipeline east from Rock Hill
Road in East Rockhill Township**

December 5, 2013

Long distance utility corridors -- including high-tension electric transmission lines and transcontinental pipelines -- traverse the study area (depicted as dashed blue lines on the study maps). Bucks County parcel data does not indicate rights-of-way in these corridors, leading to the conclusion that the power lines and pipelines were likely constructed on easements negotiated with individual property owners, rather than by right-of-way acquisition. The implementation of trails along these utility corridors will be possible only with the permission of the private property owners and the utility companies.



0 1 mile

Continued on Sheet B

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Proposed Trail Corridor	PennDOT Road	Open Space
Existing Trail	Local Road	State Gameland
Existing Sidewalk	Alley or Private Lane	Quakertown Swamp
Proposed Municipal Trail (data compiled by Bucks County Planning Commission)	Railroad	Wetland (approx.)
Utility Corridor	Railroad (not in use)	
	Railroad (abandoned)	
	Municipal Boundary	

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REVISIONS	REMARKS
DATE	DATE
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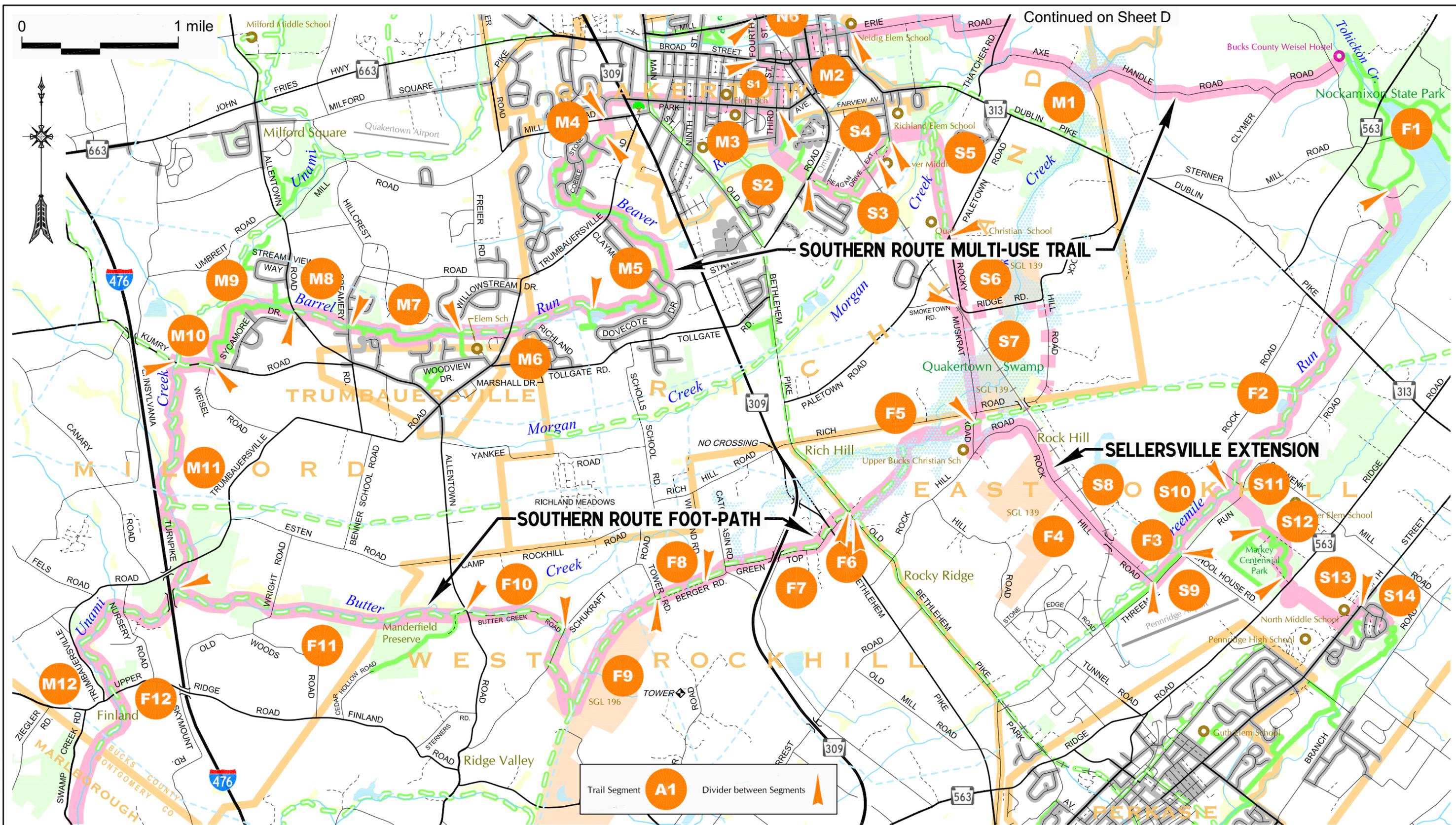


Quakertown Area Master Trails Plan
Appalachian Mountain Club
520 Long Street
Bethlehem Pennsylvania 18018



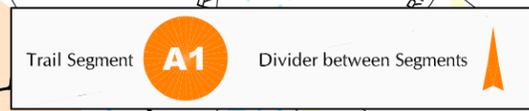
Campbell Thomas & Company
1504 South Street, Philadelphia, PA 19146 215-545-1076

TITLE: Trail Alignments Map - South
DWG NO.: A



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Proposed Trail Corridor	PennDOT Road	Open Space
Existing Trail	Local Road	State Gameland
Existing Sidewalk	Alley or Private Lane	Quakertown Swamp
Proposed Municipal Trail (data compiled by Bucks County Planning Commission)	Railroad	Wetland (approx.)
Utility Corridor	Railroad (not in use)	
	Railroad (abandoned)	
	Municipal Boundary	



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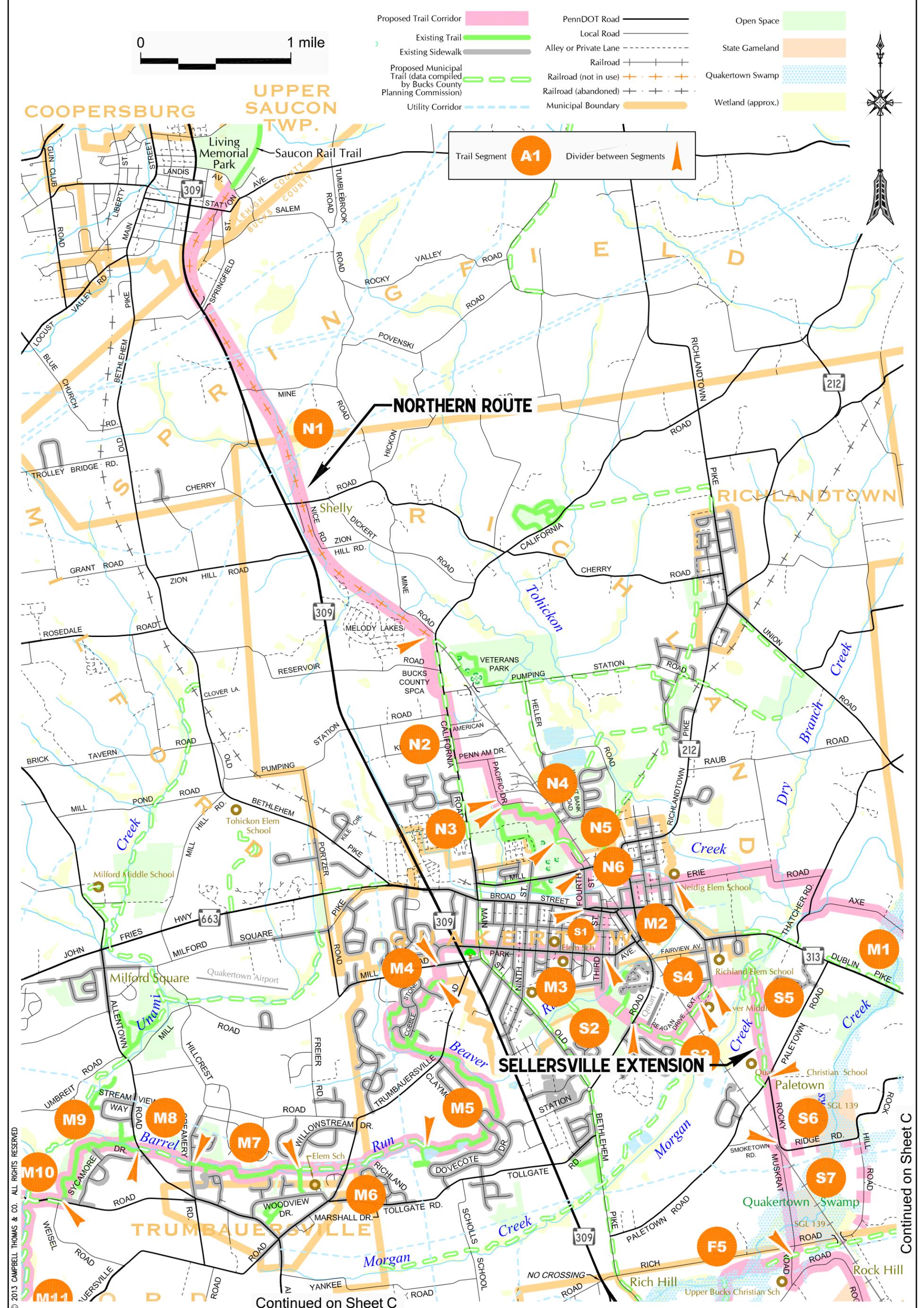
Quakertown Area Master Trails Plan
Appalachian Mountain Club
520 Long Street
Bethlehem Pennsylvania 18018



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TITLE: **Trail Segments Map - South**

DWG NO. **C**



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Continued on Sheet C

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PLOT SCALE: 1"=3000 ft.	CHECKED BY RPT
REVISIONS	REMARKS
DATE	DATE
	November 22, 2013
	PROJECT NO. APP-HIGH

Quakertown Area Master Trails Plan

Appalachian Mountain Club
520 Long Street
Bethlehem Pennsylvania 18018

Campbell Thomas & Company 1504 South Street, Philadelphia, PA 19146 215-545-1076

TITLE Trail Segments Map - North
DWG NO. D

Quakertown Area Trails Master Plan OPINION OF PROBABLE COST

Northern Route

Bucks County, Pennsylvania

Prep'd by Campbell Thomas & Co - 1504 South Street - Philadelphia PA 19146-1636 - Tel:215-545-1076

Segment	Location / Description	Distance (l.f.)	Distance (miles)	Incremental Distance (miles)	Quantity	Unit cost	Cost	Incremental cost	Cost (low)	Cost (high)
N1	12 foot wide crushed stone trail on unused railroad grade - Landis Avenue Coopersburg to California Road Richland Twp.	19266	3.6			\$23	\$443,118			
	Road crossing - crosswalk and signage				3	\$1,500	\$4,500			
				3.6				\$447,618		
N2	12 foot wide macadam side path along California Road, Penn Am Drive, Pacific Drive	7530	1.4			\$88	\$662,640			
	Road crossing - crosswalk and signage				2	\$1,500	\$3,000			
				1.4				\$665,640		
N3	12 foot wide macadam trail connecting Pacific Drive to ball fields trail	220	0.0			\$88	\$19,360			
				0.0				\$19,360		
N4	Signage along existing trail around ball fields	3171	0.6			\$1	\$3,171			
				0.6				\$3,171		
N5	12 foot wide macadam trail on alignment of planned trail within future Krupp Park	1933	0.4			\$88	\$170,104			
	(Could be funded as part of Krupp Park project)			0.4				\$170,104		
N6	4th Street, from Mill Street to Broad Street, Quakertown - signage and pavement markings	1473	0.3			\$5	\$7,365			
				0.3				\$7,365		
			Total	6.4	miles				\$1,143,154	to \$1,313,258

5.4 miles of new multi-use trail

0.6 miles of existing trail

0.3 miles on-road or in-street

Quakertown Area Trails Master Plan OPINION OF PROBABLE COST

Southern Route Multi-use Trail

Bucks County, Pennsylvania

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Segment	Location / Description	Distance (l.f.)	Distance (miles)	Incremental Distance (miles)	Quantity	Unit cost	Cost	Incremental cost	Cost
M1	Clymer Road, Axe Handle Road, Erie Road - signage and pavement markings	19752	3.7			\$3	\$59,256		
	Side path for pedestrians along Thatcher Road	1365	0.3			\$11	\$15,015		
	Road crossing - crosswalk and signage				1	\$1,500	\$1,500		
				3.7				\$75,771	
M2	Erie Avenue, Hellertown Avenue, Broad Street, Third Street - signage and pavement markings	7530	1.4			\$5	\$37,650		
	Upgrade traffic signal				1	\$100,000	\$100,000		
				1.4				\$137,650	
M3	Park Avenue - signage and pavement markings	6309	1.2			\$5	\$31,545		
	Upgrade traffic signal				1	\$100,000	\$100,000		
	Road crossing - crosswalk and signage				1	\$1,500	\$1,500		
				1.2				\$133,045	
M4	12-foot wide macadam trail from Mill Road to beginning of Hunter's Crossing Trail	597	0.1			\$88	\$52,536		
				0.1				\$52,536	
M5	Signage on existing Hunter's Crossing Trail and Brayton Gardens Trail	12173	2.3			\$0.50	\$6,087		
				2.3				\$6,087	
M6	12 foot wide macadam trail linking existing Brayton Gardens Trail to existing Barrel Run Trail	4700	0.9			\$88	\$413,600		
	12 foot wide trail bridge suitable for use by maintenance vehicles and patrol cars				1	\$39,200	\$39,200		
	Road crossing - crosswalk and signage				1	\$1,500	\$1,500		
				0.9				\$454,300	
M7	Signage on existing Barrel Run Trail	4119	0.8			\$0.50	\$2,060		
				0.8				\$2,060	
M8	12 foot wide macadam trail from Creamery Road to Allentown Road (Barrel Run Trail)	1878	0.4			\$88	\$165,264		
	Road crossing - crosswalk and signage				2	\$1,500	\$3,000		
				0.4				\$168,264	
M9	Signage on existing Barrel Run Trail and existing Unami Creek Trail	4322	0.8			\$0.50	\$2,161		
				0.8				\$2,161	
M10	Foot-path Kumry Road trail-head to Unami Creek along Kumry Road	1548	0.3			\$11	\$17,028		
	Trail Bridge across Unami Creek				1	\$73,600	\$73,600		

Quakertown Area Trails Master Plan OPINION OF PROBABLE COST

Southern Route Multi-use Trail

Bucks County, Pennsylvania

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Segment	Location / Description	Distance (l.f.)	Distance (miles)	Incremental Distance (miles)	Quantity	Unit cost	Cost	Incremental cost	Cost
	Road crossing - crosswalk and signage			0.3	2	\$1,500	\$3,000	\$93,628	
M11	Foot-path along Unami Creek	8607	1.6	1.6		\$11	\$94,677	\$94,677	
M12	Foot-path along Unami Creek	8810	1.7			\$11	\$96,910		
	Road crossing - crosswalk and signage			1.7	2	\$1,500	\$3,000	\$99,910	
			Total	15.5	miles				\$1,320,088

1.4 miles of new multi-use trail

3.9 miles of new foot-path

3.9 miles of existing trail

6.4 miles on-road or in-street

Quakertown Area Trails Master Plan OPINION OF PROBABLE COST

Southern Route Foot-path

Bucks County, Pennsylvania

Prep'd by Campbell Thomas & Co - 1504 South Street - Philadelphia PA 19146-1636 - Tel:215-545-1076

Segment	Location / Description	Distance (l.f.)	Distance (miles)	Incremental Distance (miles)	Quantity	Unit cost	Cost	Incremental cost	Cost
F1	Existing foot-paths in Nockamixon State Park	5845	1.1			\$0.50	\$2,923		
	Road crossing - crosswalk and signage			1.1	1	\$1,500	\$1,500		\$4,423
F2	New footpath along banks of Lake Nockamixon and Threemile Run	15314	2.9			\$11	\$168,454		
	Attach footway to underside of existing concrete culvert			2.9	1	\$100,000	\$100,000		\$268,454
F3	Existing multi-use side path	2865	0.5			\$0.50	\$1,433		
				0.5					\$1,433
F4	Existing Rockhill Road and Muskrat Road	10368	2.0			\$0.50	\$5,184		
				2.0					\$5,184
F5	New footpath from Muskrat Road to Old Bethlehem Pike	5626	1.1			\$11	\$61,886		
	footbridge - 40 foot span - across Bucks Creek			1.1	1	\$40,000	\$40,000		\$101,886
F6	Footpath along side of Old Bethlehem Pike	260	0.0			\$11	\$2,860		
	Road crossing - crosswalk, signage, and push button-actuated warning signals			0.0	1	\$50,000	\$50,000		\$52,860
F7	Existing Green Top Road and Berger Road	5507	1.0			\$0.50	\$2,754		
				1.0					\$2,754
F8	New footpath on Berger Road vacant right-of-way	1700	0.3			\$11.00	\$18,700		
				0.3					\$18,700
F9	New footpath from Tower Road through State Gamelands 196 to Schukraft Road	6629	1.3			\$11	\$72,919		
	Road crossing - crosswalk and signage			1.3	1	\$1,500	\$1,500		\$74,419
F10	Existing Schukraft Road and Butter Creek Road	4806	0.9			\$0.50	\$2,403		
	Road crossing - crosswalk and signage				1	\$1,500	\$1,500		
	Road crossing - crosswalk, signage, and push button-actuated warning signals			0.9	1	\$50,000	\$50,000		\$53,903
F11	New footpath from Manderfield Preserve to confluence of Butter Creek and Unami Creek	9792	1.9			\$11	\$107,712		
	Trail Bridge across Unami Creek				1	\$73,600	\$73,600		

Quakertown Area Trails Master Plan OPINION OF PROBABLE COST

Southern Route Foot-path

Bucks County, Pennsylvania

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Segment	Location / Description	Distance (l.f.)	Distance (miles)	Incremental Distance (miles)	Quantity	Unit cost	Cost	Incremental cost	Cost
	Road crossing - crosswalk and signage			1.9	1	\$1,500	\$1,500	\$182,812	
F12	New foot-path along Unami Creek	8810	1.7	1.7		\$11	\$96,910	\$96,910	
			Total	14.7	miles				\$863,737

9.1 miles of new foot-path

1.6 miles of existing trail

3.9 miles on-road or in-street

Quakertown Area Trails Master Plan OPINION OF PROBABLE COST

Sellersville Extension trail

Bucks County, Pennsylvania

Prep'd by Campbell Thomas & Co - 1504 South Street - Philadelphia PA 19146-1636 - Tel:215-545-1076

Segment	Location / Description	Distance (l.f.)	Distance (miles)	Incremental Distance (miles)	Quantity	Unit cost	Cost	Incremental cost	Cost (low)	Cost (high)
S1	4th Street, Broad Street, 3rd Street Quakertown - signage and pavement markings	3417	0.6	0.6		\$5	\$17,085	\$17,085		
S2	12 foot wide macadam trail from 3rd Street Quakertown to Station Avenue Richland Twp partially along alignment of planned trail within future Station Avenue Park	1799	0.3			\$88	\$158,312			
	12 foot wide trail bridge suitable for use by maintenance vehicles and patrol cars				1	\$39,200	\$39,200			
	(Could be funded as part of Station Avenue Park project)			0.3				\$197,512		
S3	12 foot wide side path along alignment of future Reagan Drive Extension	2935	0.6			\$88	\$258,280			
	(Could be funded as part of Reagan Drive Extension)			0.6				\$258,280		
S4	Reagan Drive - signage and pavement markings	780	0.1	0.1		\$5	\$3,900	\$3,900		
S5	12 foot wide macadam trail from Strayer Middle School (Reagan Drive) through Lisbon Tract to Paletown Road	5021	1.0			\$88	\$441,848			
	12 foot wide trail bridge suitable for use by maintenance vehicles and patrol cars				1	\$39,200	\$39,200			
	Road crossing - crosswalk and signage				1	\$1,500	\$1,500			
				1.0				\$482,548		
S6	Rocky Ridge Road - signage and pavement markings	2346	0.4	0.4		\$3	\$7,038	\$7,038		
S7	12 foot wide trail bridge over SEPTA railroad, suitable for use by maintenance vehicles and patrol cars				1	\$250,000	\$250,000			
ALT. A	Muskrat Road to Rich Hill Road - signage and pavement markings	3854	0.7	0.7		\$3	\$11,562	\$261,562		
S7	Ridge Road, Rock Hill Road, Rich Hill Road to Muskrat Road - signage and pavement markings	8581	1.6			\$3	\$25,743			
ALT. B				1.6				\$25,743		
S8	Rock Hill Road - signage and pavement markings	10368	2.0	2.0		\$3	\$31,104	\$31,104		
S9	Existing side path along Threemile Run Road - signage	1355	0.3	0.3		\$1	\$1,355	\$1,355		
S10	12 foot wide macadam trail extension of existing Threemile Run Road side path	2865	0.5	0.5		\$88	\$252,120	\$252,120		
S11	12 foot wide macadam trail from Threemile Run to Markey Centennial Park	1725	0.3			\$88	\$151,800			

Quakertown Area Trails Master Plan OPINION OF PROBABLE COST

Sellersville Extension trail

Bucks County, Pennsylvania

Prep'd by Campbell Thomas & Co - 1504 South Street - Philadelphia PA 19146-1636 - Tel:215-545-1076

Segment	Location / Description	Distance (l.f.)	Distance (miles)	Incremental Distance (miles)	Quantity	Unit cost	Cost	Incremental cost	Cost (low) to Cost (high)	
	Road crossing - crosswalk and signage			0.3	1	\$1,500	\$1,500	\$153,300		
S12	Signage along existing trail at Markey Centennial Park	2698	0.5	0.5		\$1	\$2,698	\$2,698		
S13	12 foot wide macadam trail from Markey Centennial Park through School District property to Fifth Street	3817	0.7	0.7		\$88	\$335,896			
	Road crossing - crosswalk and signage			0.7	2	\$1,500	\$3,000	\$338,896		
S14	Campus Drive - signage	1222	0.2	0.2		\$3	\$3,666	\$3,666		
				Total	8.4	miles			\$1,319,453	to \$2,011,064

3.4 miles of new multi-use trail

0.8 miles of existing trail

4.2 miles on-road or in-street