

Chapter 4: Trails as a Recreation Facility

OVERVIEW

Pedestrian paths and multi-use trails have become increasingly popular for satisfying open space and recreational needs. They are a priority at regional, state, and national levels as evidenced in recent local rail-to-trail projects and the development of the East Coast Greenway. Trails can satisfy a wide range of recreational interests and serve as an alternative to automobile travel. Areas such as abandoned railroad rights-of-way and utility corridors provide unique opportunities for open space preservation, recreation, and as linear parks.

BENEFITS OF TRAILS

Trails provide connections between communities and natural and historic resources, enhance recreational opportunities, and often conserve linear open spaces. They also provide a valuable recreational and fitness opportunity for various groups of people including: walkers, joggers, and bicyclists.

Trail Connections

Between Communities

Trails can connect communities along and across streams using roadways or trail bridges. When a roadway or pedestrian bridge connects greenways on either side of a stream, it provides an opportunity to link one town to the next and benefits both communities better than a separate greenway park on each side. As such, communities should attempt to find ways to link parkland and trails on the opposite sides of a stream.

Natural and Historical Resources

Trails can connect people to nature and history. Trails can not only connect people with historic sites, they can also function as a “heritage trail” that follows the route of a historic Native American path or troop movements during a Revolutionary War battle such as the Battle of Brandywine.

Trails can also bring people closer to nature and help increase their understanding and appreciation of the natural environment. People are more likely to respect and steward a stream if they can legally access and walk alongside it. Access also makes it easier to maintain the stream and its banks through volunteer work days and stream cleanups.

Interpretive signage can enhance the trail user experience by drawing attention to natural, historic, and cultural features along a trail (e.g., remnants and ruins of the past, the story behind an old barn foundation or mill structure, important wetland, or other features). The interpretive signage installed in the Route 291/13 Corridor through the riverfront communities (where the East Coast Greenway is being built) serves to educate residents and visitors about industrial heritage, local arts, and other cultural assets and environmental resources.

Alternative Transportation

Trails not only serve recreation and wellness purposes, they also fulfill another role as an alternative means of transportation to the automobile. Instead of driving or taking a bus to school, students with access to a trail have another means of getting to a destination. Following the events of September 11,

2001, it was realized that trails can serve as alternative evacuation routes, as they can help reduce congestion on roadways and may actually be quicker.

Trails can help to increase employment opportunities for residents without an automobile by providing connections to public transportation. Users with a trail between their neighborhood and a transit station have an option other than the automobile for travel. Also, trails can save commuters gasoline and vehicle maintenance costs. The IRS estimates that an automobile cost, on average, \$5,820/year in car payments, insurance, maintenance, etc. (IRS, 2005). If pedestrian and/or bicycle trips can be substituted for auto trips, part of this money can be used for other purposes that could improve the quality of life.

Health Benefits

There is a definitive connection between trails and health, as health is directly related to regular physical activity. Since trails provide the opportunity for a pedestrian or bicycle transportation connection, their existence encourages healthy habits. Whenever a walking or bicycling route is made more convenient or safer for individuals and families, healthy habits will increase. See Chapter 5: Recreation Programming, for a more complete discussion on the link between recreation and health.

TRAIL CLASSIFICATIONS

Functional Types of Trails

In *Trail and Path Planning: A Guide for Municipalities* (2007), Chester County identifies different types of trails. A *Trail* is typically a permanent off-road facility, which is open to the public and generally part of a larger park or greenway system. It is often multi-use, allowing for various forms of non-motorized recreation such as bicycling, hiking, or horseback riding. A *Path* is a trail that has been designed, constructed, and maintained for a specific form of recreation or travel, such as walking, or bicycling. Paths are usually shorter than trails. *Bicycle Routes* are usually found in conjunction with existing facilities, such as a roadway shoulder. For example, a bike route may simply be a striped bike lane along a low traffic roadway. A *Traditional Hiking Route* is an unimproved trail that is not officially part of a trail system, also known as “social trail” or “desire path.”

Trails are sometimes self-contained within one or two parks, such as a fitness loop trail in a park or on homeowners association property. Loop trails within parks are popular park amenities; however, it is preferred that they and other trails connect to a larger network. Networked trails provide access between destinations and can be used not only for recreation, but also as an alternative means of transportation. Connecting trails together as a network requires cooperation between many public and private groups. Trails as a network will be covered in Volume II: Countywide Greenway Plan.

The National Recreation and Park Association classifies types of trails. The following is adapted from the NRPA pathway classifications (Page 95) (Mertes and Hall 1996):

1. *Park Trail* – Trails and paths located within greenways, parks, and natural resource areas. The focus is on recreational value and harmony with the natural environment. These can be designated as single purpose (paths) or multi-purpose trails, hard-surfaced or unpaved.
2. *Connector Trails* – Multipurpose hard-surfaced trails that emphasize safe travel for pedestrians to and from parks and around the community. The focus is both on recreation and transportation. Connector trails can be constructed in rights-of-way such as abandoned rail lines, utilities, or roadsides.

3. *On-Street Bikeways* – Paved segments of vehicular roadways can serve to safely separate bicyclists from vehicular traffic.
 - a. Bike Route – Designated portions of a road for preferential or exclusive use by bicyclists.
 - b. Bike Lane – Portions of the roadway shoulder designated for bicycle use by painted lines and signage.

Hybrid On-street Bikeways:

 - c. Bicycle Track – A bicycle lane with a concrete barrier, curb or other physical barrier between lane and street, in effect creating a separated trail on the street surface.
 - d. Bicycle Boulevard – A street that uses bollards and plantings to block some intersections from vehicular traffic while allowing bicycles to travel the entire length of the street (Arvidson 2008).
4. *All-Terrain Bike Trail* – Off-road trail for all-terrain (mountain) bikes. These can be thought of as a single-purpose park trail.
5. *Equestrian Trail* – Loop trails developed for horseback riding, usually located in larger parks and natural resource areas. Sometimes developed as multipurpose trails, also allowing hiking and all-terrain biking.

Trail Types by Physical Configuration

Trails can also be grouped by their ability to handle specific levels of traffic due to their width or the hardness of their surface. The following three types were developed by NRPA (Mertes and Hall 1996).

Type I trails are actually two parallel hard-surfaced paths used in situations where use patterns dictate separate paths for pedestrians and bicyclists/in-line skaters. An example would be a trail around a lake or waterfront, or within the shoulder of a collector street or parkway (as seen in park trails and connector trail types). Separated lanes of this type are not very common today. As an alternative, multi-use trails anticipating higher amounts of traffic are sometimes built wider (10-12 feet), with signage or striping designating lanes for pedestrians or bicyclists/in-line skaters.

Type II trails are hard-surfaced trails more suited to lighter use patterns, such as from a housing subdivision to a natural resource area, or between a parkway or thoroughfare and a nearby housing development (as seen in park trails and connector trails types).

Type III trails are suited for areas requiring minimum impact, such as nature preserves. Soft-surfaced trails and paths in natural resource areas are typical of this type (as seen in the park trails type).

Rail Rights-of-Way Trails

An abandoned rail right-of-way can serve as an ideal route for a trail. Rail right-of-way conversion, nicknamed “rails-to-trails” or “rail trails,” has become very popular nationwide. Rail trails often cover great distances through multiple municipalities. Advantages to developing a trail along a railroad right-of-way are that they are usually fairly level and are under one owner for long distances.

Rails-to-Trails Program

In 1983, the U.S. Congress amended the National Trails System Act to address the growing number of abandoned rail corridors across the country. When a railroad plans to abandon a rail corridor, public agencies and/or qualified private organizations are given the opportunity to lease the corridor for public use. This leasing process is referred to as railbanking. Railbanking preserves the corridor for future rail use by converting it to a public trail in the interim. The railroad and the interested party agree to lease

terms that prevent the rail right-of-way from abandonment. Many rights-of-way contain easements that revert back to adjacent landowners when a land is officially abandoned. Preserving the rail right-of-way prior to abandonment secures the legal standing of the right-of-way. It is important to consider that trails on railbanked land are subject to potential future restoration of rail service (Rails-to-Trails Conservancy n.d.).

It is also important to note that not all trails along former rail rights-of-ways are on railbanked land. One of the most popular examples of a rail trail in Delaware County is the Radnor Trail, which was built



Figure 4-1: Radnor Trail

on the former Philadelphia and Western rail line. This right-of-way is no longer owned by the railroad, but rather by PennDOT. See case study below. The Chester Creek Trail is also a rail-to-trail corridor, much of which is along an inactive rail line. SEPTA owns the right-of-way and has agreed to a 30-year lease with the Friends of the Chester Creek Branch to use the right-of-way. The various segments of the trail are in different stages of design and development. One section of the Chester Creek Trail is proposed as rail-with-trail. A case study for the Chester Creek Trail can be found later in this chapter.

Rails-with-Trails

There are several successful examples of “rails-with-trails,” or a trail built alongside an active railroad either within or directly alongside its right-of-way. The 2013 report, *America's Rails-with-Trails: A Resource for Planners, Agencies and Advocates on Trails Along Active Railroad Corridors*, produced by the Rails to Trails Conservancy, documented that rails-with-trails trails can be a resourceful method of securing land for multi-use trails. The report examined the experiences and lessons learned for 88 rails-with-trails in 33 states, based on a survey of trail managers and the results of Conservancy's ongoing 20-years of study. Data supports exemplary safety records and evidence of successful liability protection for railroads and trail managers (Rails-to-Trails Conservancy 2013).

Case Study: Radnor Trail

The Radnor Trail is a 2.4-mile long rail-trail in Radnor Township which opened to the public in 2005. It is a fully paved multi-use trail that is practical for various forms of recreation such as walking, bicycling, running, in-line skating, dog-walking, and strollers.

The trail follows the former Pennsylvania & Western Railroad (P&W) right-of-way and can be accessed at seven locations, with Sugartown Road and Radnor-Chester Road the current terminal access points. A narrower trail (about 5 ft. wide) extends north on Radnor-Chester Road, connecting the Radnor Trail to Lancaster Avenue. The Radnor Trail is available for public use from dawn to dusk. The trail is maintained by Radnor Township's Department of Parks and Recreation, along with support from the Radnor Historic Society and the Friends of the Radnor Trail. See Appendix I-K for more details regarding the design and development of the Radnor Trail.

Utility Rights-of-Way Trails

Another type of right-of-way that could be used for a trail is the utility right-of-way. Power line and underground utility and fuel pipelines, as well as sewer and communications rights-of-way, are examples. In other counties, PECO has been agreeable to allowing paved multi-use trails on its rights-of-way. One reason companies may not mind a public trail on their right-of-way is that it would help provide easier access for maintenance vehicles, enabling them to drive the length of it using the trail instead of navigating the road network to different stops or driving off-road. The various utility and fuel transmission companies that own or lease space in a right-of-way each have their own concerns regarding safety and security that need to be addressed as part of a trail feasibility study for a corridor.



Figure 4-2: Concord Township Park Trail

Stream Valley Trails

Stream valleys are great places to locate public trails because they can be scenic and provide closeness to nature. They are usually relatively level and unobstructed. A trail located near a streambank can provide easier access to the stream, making it a favorable destination for environmental education programs and stream clean-up events. They also provide access to the water for anglers of all abilities. However, depending on the distance from the streambank, floodplain/wetland issues and significant permitting requirements may arise during the design and development processes. These matters should be taken into account when planning a trail.

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Inactive rail or utility rights-of-way sometimes follow streams, making it easier to secure a long distance trail, as in the case of Chester Creek, Foxes Run, and Naylor's Run. A sanitary sewer right-of-way may present the benefit of having a previously cleared route for a trail, but clearing does not necessarily secure access rights. A trail builder will often have to secure the rights along a stream parcel by parcel in the form of negotiated easements or fee-simple land acquisition.

Road-Based Connections

The street network represents an opportunity to provide pedestrian connections on sidewalks and bikeways through the development of bike lanes and share the road designations. These road-based connections can be joined to pedestrian and multi-use trails to further extend the non-motorized network.

Bikeways

Bicycling has both recreational and transportation benefits. Bicycle users are able to go farther and faster than by walking or hiking. Bicycling is a legal activity carried out on-road or off-road. Legally, a bicycle is a vehicle and is allowed on most roadways. In Delaware County, there is a lack of adequate and safe biking facilities for both the on- and off-road bicyclists.

As far as off-road trails are concerned, several short multi-use trails presently exist in the County, but they are generally only a few miles in length. This situation should improve in the years to come since more bike trails and multi-use trails have been proposed in many municipalities.

One example of a proposed bike trail is the East Coast Greenway Trail, which will stretch from Maine to Florida, through the riverfront municipalities of Delaware County. The East Coast Greenway route will include both on- and off-road segments. Another proposed multi-use trail is the Chester Creek Trail, which is slated to run through several Chester Creek stream valley municipalities. For an in-depth analysis and recommendations regarding bicycling topics and bike routes, please consult the *Delaware County Bicycle Plan* (2009).

Complete Streets

Delaware County 2035 (2013) defines a complete street as "a street designed and operated to enable safe, attractive, and comfortable access and travel for all users, including pedestrians, bicyclists, motorists, and public transport users of all ages and abilities." A street accommodating only automobile traffic is not complete. As such, the plan recommends that some streets be designed or upgraded to facilitate the travel of bicyclists, pedestrians, transit users, and people with disabilities. The *Delaware County Bicycle Plan* makes recommendations on how more streets in the County can be completed to accommodate these other modes of transportation. A complete street can be a type of trail, and could also be considered a greenway, especially if it contains trees and greenspace at its side, or if it connects people to parks.

Considerations regarding road-based connections include surfacing, dimensions, and vehicular lane crossings. A bikeway or complete street could also include such items as interpretive and directional signage and bike racks for users to temporarily store bicycles while stopping at restaurants or other businesses.

TRAIL DEVELOPMENT

Trail Design

The design and placement of trails should meet the standards of PennDOT and AASHTO (American Association of State and Highway Transportation Organizations). All pedestrian trails should also comply with the Americans with Disabilities Act (ADA) standards, though hiking paths are often an exception due to topography and other considerations. The AASHTO standards for trail width are 12 feet for “urban,” and 10 feet for suburban trails. The recent trend for paved trails in Delaware County has been for an 11 foot wide paved area (as seen at the Chester City Riverwalk Trail and the Lansdowne Gateway Trail). The Radnor Trail has a 10-foot wide paved area, but is adjoined by a six-foot wide cinder path, and a three-foot wide stone shoulder. Pedestrian-only trails, such as those found through areas with steep terrain or heavily forested areas, are typically much narrower (3-4’ depending on specific terrain).

Depending on its purpose and the intended amount of traffic, a trail can be made of various surface materials such as asphalt, porous paving, crushed stone, gravel, or wooden boardwalk decking. There are various cost and environmental factors to consider for each. Paving provides more support for high traffic and requires less maintenance costs, but is more expensive at the time of installation. Stone or gravel may cost less to install, but will have a higher lifetime cost due to the need for more frequent maintenance. Porous paving lets stormwater infiltrate through the surface, but is more expensive than traditional asphalt.

Private Property Concerns

The fragmented nature of Delaware County’s development pattern can make trail planning difficult even for short trails connecting destinations. For this reason, every attempt should be made to locate trails on public property. However, if public right-of-way is unavailable, approaching private property owners for permission to put a trail easement on their land may be the next option.

Condemnation of private land for trail purposes is viewed as an option of last resort. Alternative routing as well as negotiated access rights (easements) are preferred. When encountering unwilling landowners or neighborhoods, it is often best to find an alternative route. This could mean taking the trail to the other side of a stream or on a brief on-road detour. When trails are proposed adjacent to private land, compromises, such as a fence, berm, or other visual barrier, may help in negotiating access.

Landowner Protection from Liability Lawsuits

The Pennsylvania Recreational Use of Land and Water Act (referred to as “RULWA”) provides immunity protection for landowners (private and governmental) who invite or permit people to come onto their land for recreational uses such as trails. Landowners do not assume responsibility, or incur liability, for bodily injury or property damage suffered by any recreational user invited onto the property for a

Case Study: Chester Creek Rail Trail

The Chester Creek Rail Trail is a multi-phase trail project planned in western Delaware County. It is the result of grassroots efforts by interested parties to develop a trail in a SEPTA right-of-way. Phase I, a 2.8 mile stretch of the trail, is located mostly in Middletown Township and will begin construction in 2015. Phase I represents the middle section of the trail. Phases II and III will undergo planning and design studies in the coming years. See Appendix I-K for more details regarding the design and development of the Chester Creek Rail Trail.

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recreational purpose. RULWA provides landowners with immunity from being sued, except in cases where a malicious failure to guard or warn against a dangerous condition on the land can be proven. Pennsylvania courts interpreting RULWA have found that an easement holder is also entitled to the same scope of protection as a landowner. A Model Public Access Easement and additional information and clarification of RULWA can be obtained from the PA Land Trust Association website at www.Conservationtools.org. Municipalities or property owners should consult with their attorneys for more information regarding the latest case law concerning RULWA.

Safety and Security on Trails

There are many myths about trails in relation to safety and security. While no park or public space is 100% safe from crime, many rights-of-way or undeveloped public open spaces are made much safer just by building a public trail on them. A formal trail opens the areas to the eyes and ears of legitimate users running, pushing strollers, or riding bicycles. Most of these trail users carry cell phones, so the wait for a 911 call to report suspicious activity or call for help may only be as long as the next passerby.

A trail is not isolated if it is being used. Studies and statistics time after time have shown that safety concerns are based on false perceptions rather than real danger. Radnor Township Police reported no incidents of “assaults, attacks, or disorderly conduct” on the Radnor Trail between 2005 (its opening) and 2013. Since lighting and nighttime policing can be costly or a nuisance to trail neighbors, many trails are closed at night. Light poles may make sense, however, for short connectors or trails at waterfronts or close to popular evening attractions such as stadiums, amphitheaters, or shopping centers (Miller 2010).

Stormwater

As is the same with any land improvement, stormwater management should be carefully considered and addressed in the trail design process. The County’s model Act 167 stormwater management ordinance requires infiltration of runoff, as well as control of peak runoff, from all paved surfaces over a certain size. The ordinance contains a diagram indicating how to achieve stormwater infiltration. Permeable pavement, such as porous asphalt, may be a good way to achieve stormwater control on trails. Trails developed in stream valleys also need to consider riparian buffer requirements. Several municipal stormwater management ordinances in the County permit limited paving for recreational trails within a riparian buffer. Due to the sensitivity and importance of riparian buffers, special design considerations to limit the amount of disturbance in the riparian buffer should be undertaken. This may include the use of different paving materials, decreasing the trail width, or increasing the amount of vegetation alongside the trail.

EXISTING TRAILS

Many recreational trails currently exist throughout Delaware County. Map 4-1 shows where known formally established trails of all types are located. For a complete listing of these trails, see Appendix I-J.

Existing trails in Delaware County are largely located within parks or other recreation areas. Many of these trails are simple earthen paths that have developed from desire paths. They can vary from simple loop trails within a park, such as at the Concord Township Park, to more elaborate web of trails such as the network found at Ridley Creek State Park. The other prominent type of trail in the County may be classified as a connector trail, which links parks or open space with other areas of interest. Connector trails are typically formalized with paved pathways and amenities along its course. The Radnor Trail, for

example, connects Encke Park, the Wayne Arts Center, and the Wayne/St. Davids downtown area via a former rail right-of-way.

Due to limited mapping information for existing trails, the County and municipalities would benefit from compiling a geo-referenced inventory of existing trails. This may include the lengths and surface material in order to provide a clearer picture as to the status of trails in the County. Providing this information to the public would increase awareness of the accessibility to a variety of trails within the County.

In addition to existing trails within the County, several more trails have been proposed. Proposed trails that are part of the Countywide Primary Trail Network are highlighted in Volume II: Countywide Greenway Plan.

Map 4-1: Existing Trails



*Map 4-1 displays existing trails which were mapped in GIS; it does not include all existing trails in the County

VISION FOR A DELAWARE COUNTY TRAIL NETWORK

Increased interest in local trail planning efforts has led to the formation of a regional coalition of stakeholders whose purpose is to identify and promote priority trail corridors and opportunities for connections. As discussed in Chapter 1: Introduction and Background, the Circuit is a regional effort to coordinate trail planning and building efforts. Several Circuit trails have already been constructed, but many are only in the planning and design phases. When developing a vision for a trail network, it is

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important to consider connections beyond a municipality and to examine multi-municipal and regional connections. Trails and paths should be planned as an intertwined network that includes destinations such as community and neighborhood parks, schools, and town centers without specific regard to municipal boundaries.

Countywide Primary Trails

The Delaware County Primary Trail Network is a conceptualized network containing linear planning zones that have the potential to link key destination points using public trails. The Delaware County Planning Department refers to these linear planning zones as Countywide Primary Trails. These make up a network of long-distance multi-municipal trails identified as the spines or main arterials of a countywide trail system. Map 4-2 shows these Primary Trails, which are intended to be Type I and Type II (hard-surface) off-road connector trails owned or managed at the County, municipal, or multi-municipal level. Existing earthen and/or crushed stone trails that represent direct, long-distance routes or continuations of paved trails are included in this category, but should be considered for paving as degree of use warrants.

When combined, the 25 recommended Primary Trails form a network of interconnected non-motorized travel and recreation connections near and between all corners of Delaware County, as well as to existing and proposed trails in adjacent counties. This network will provide County residents, some of which live in the most densely populated urban centers, with non-motorized access to major publicly-owned recreation land and facilities. Such access can help to spur economic development in the County's urban centers in two ways. First, the network will draw trail users into existing downtown commercial districts, creating the possibilities for increased recreation-based commerce. Second, the existence of regional trails in densely developed areas will also provide their multitude of residents with increased access to open space and recreational facilities, a feature which has been shown to increase the value of residential housing and increase municipal tax revenues (GreenSpace Alliance; Delaware Valley Regional Planning Commission 2011).

The 25 Primary Trails identified in this plan are presented as the general locations for possible links in a countywide network of trails, and should not be regarded as a detailed plan for all future trail or municipal trail alignments in the County. Primary Trail Corridors are not presumed to be the only logical locations for multi-municipal multi-use trails. In fact, unforeseen changes in land use in the County may make some of these recommended Primary Trail Corridors impractical or infeasible to implement.

Volume II: Countywide Greenway Plan highlights the corridors that are considered Primary Trail development opportunities. Planning beyond the conceptual stage should be completed as part of the implementation of greenway segment and corridor plans. Examples of plans to be developed subsequent to conceptual plans include trail feasibility studies and trail design and engineering plans.

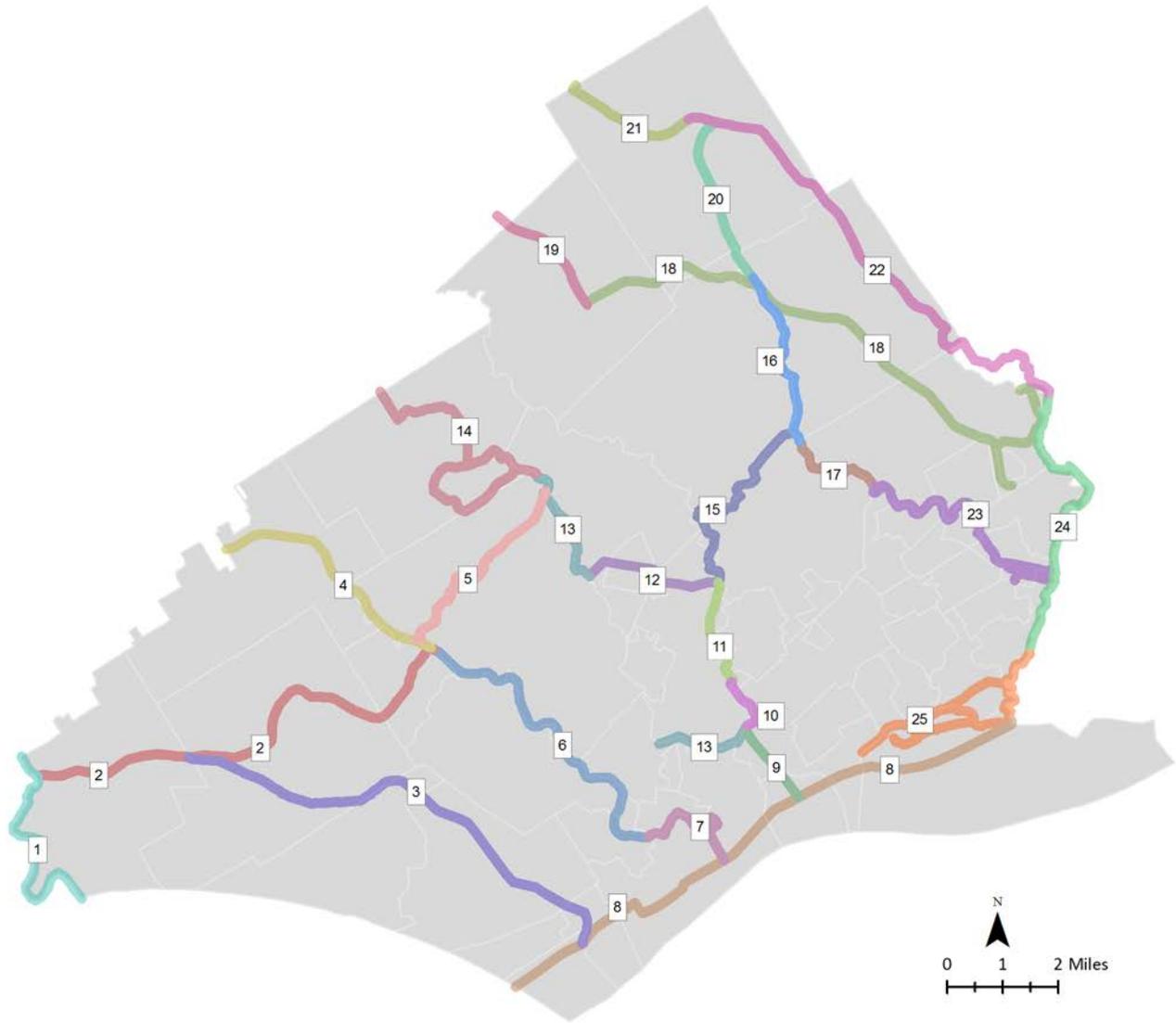
For a more comprehensive look at the Trails Network and how it relates to The Circuit, refer to Volume II: Countywide Greenway Plan.

Vision for Trail Planning and Development

There are a number of ways that the County and municipalities can pursue desired trail connections.

People do not limit their activities to destinations within specific municipal boundaries. As such, the County recommends that municipalities coordinate when planning and developing trails. Two adjacent

Map 4-2: Countywide Primary Trail Network



- | | | |
|---|--|--|
| 1 - Brandywine Creek Greenway | 10 - Blue Route Bikeway - Leiper to Kinder Connector | 19 - Route 252 Bicycle Route |
| 2 - Octoraro Rail Trail | 11 - Blue Route Bikeway - Leiper-Smedley Trail | 20 - Blue Route Bikeway - Ithan-Darby Creek Valley |
| 3 - PECO Right-of-Way Trail | 12 - Media-Smedley Connector Trail | 21 - Radnor Trail |
| 4 - Chester Creek Trail - North Extension | 13 - Ridley Creek Greenway (North & South Sections) | 22 - Forge to Refuge Trail |
| 5 - Rocky Run Trail | 14 - Ridley Creek State Park Trails | 23 - Darby Creek Stream Valley Park Trail |
| 6 - Chester Creek Trail | 15 - Blue Route Bikeway - Smedley to Darby Creek | 24 - Cobbs Creek Trail |
| 7 - Chester Creek Trail - East Coast Greenway (ECG) Connector | 16 - Darby Creek Trail - Haverford Township | 25 - Heinz Refuge Trails |
| 8 - East Coast Greenway | 17 - Darby Creek Trail - Drexel Hill Connector | |
| 9 - Blue Route Bikeway - East Coast Greenway (ECG) Connector | 18 - Newtown Square Branch Rail Trail | |

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municipalities may only need to connect to the same Primary Trail (perhaps one at their boundary) to connect their municipal trail and open space networks. In addition to making trail connections between County Parks and the surrounding communities, the County is in a position to recognize and foster such multi-municipal connections and provide assistance for implementation of the Countywide Network. It can act as a convener to bring municipal staff, elected officials, and stakeholders together to identify and plan for a common network.

Municipalities should consider making local trail connections to both the Primary Trail and the regional trail networks when possible. This can be accomplished through a local planning process associated with development of a comprehensive plan, open space plan, or both. It is important that conceptual plans for municipal trail networks identify safe pedestrian and bicycle connections between existing parks and public open space sites. Connecting these spaces provides an added layer to municipal open spaces beyond individual park-based trails. Another important step in planning and developing municipal trail network is identifying gaps in the existing county or municipal systems. The plan could then review potential connections, emphasizing those that bridge the gaps and increase connections for residents.

TRAIL PLANNING GUIDEBOOKS AND REFERENCES

There are many publications available for purchase or internet download that can help citizens and government officials learn about trail development, funding, management, and maintenance. The following is a short list of resources recommended for municipalities and trail organizations to use when planning for trail projects.

Pennsylvania Trail Design & Development Principles: Guidelines for Sustainable, Non-motorized Trails

Pennsylvania Department of Conservation and Natural Resources (DCNR), Pashek Associates, 2013

This guide presents a compilation of best practices, guidelines, and do's and don'ts for the planning, design, construction, and management of all types of non-motorized trails. Much attention is paid to guide the construction of trails that are both physically and environmentally sustainable. It also presents methods for developing trails that create fun, desirable, and enjoyable experiences for trail users.

Trail and Path Planning: A Guide for Municipalities

Chester County Planning Commission, 2007

This comprehensive trail planning guide for municipal officials was prepared as an implementation resource for Chester County's *Linking Landscapes* (2002) plan. Although it contains Chester County specific elements, it is also very applicable to other communities in Pennsylvania. It includes basic trail planning principles and instructions for incorporating trails into the comprehensive plan, the municipal official map, and trail-friendly zoning and SALDO ordinances. The document also contains design standards, and cost examples.

Creating Connections: The Pennsylvania Greenways and Trails How-To Manual

Pennsylvania Environmental Council for the Pennsylvania Greenways Partnership, Russ Johnson, 1998

This document is a trail guide promoted by the state through the Pennsylvania Greenways Partnership, with funding by the William Penn Foundation, the Howard Heinz Endowment, and PA DCNR. The Partnership's purpose is to develop a coordinated approach for the planning, promotion, and funding of greenway projects. This guidebook was heavily promoted statewide as a resource to help communities

plan and develop trails. There are many other previous publications listed in its bibliography that may also be helpful.

Community Trails Handbook

Brandywine Conservancy, 1997

This early trail planning resource examines management liability, case law, and legislative acts. Funding programs and trail implementation techniques are also discussed. Case studies, mainly from southeastern Pennsylvania, provide good examples from the planning and development experiences of others. Whole chapters are dedicated to “The Design Process” and “Ownership, Management, and Liability.” Model ordinance language to enable trail connections through the zoning and subdivision and land development ordinance is presented in an appendix.

See also:

- DCNR’s list of publications on their website for additional resources, many of which (including some of the above) are available for free download:
<http://www.dcnr.state.pa.us/brc/elibrary/brcpublications/index.htm>
- ConservationTools.org, a website of the Pennsylvania Land Trust Association, also has a library section with a list of trail resources available for free download (including “Creating Connections”).

ACTIONS

Objective

OS 3 Create a Countywide trail network that enhances quality of life by connecting people and places

Actions

Delaware County will...

- OS 3.1** Study, plan for, and promote the development of Countywide Primary Trails.
- OS 3.2** Work with municipalities to inventory existing trails and produce a user-friendly trail guide.
- OS 3.3** Coordinate multi-municipal trail planning efforts with local governments.
- OS 3.4** Coordinate with the regional trail efforts outlined in the Circuit.
- OS 3.5** Identify potential bicycle and pedestrian connections between existing trails and the County’s parks system.
- OS 3.6** Identify and suggest potential local connections between linear open spaces.
- OS 3.7** Provide technical assistance to municipalities in identifying potential bicycle and pedestrian connections to existing trails and public open spaces.
- OS 3.8** Implement planned trails when, where, and to the degree appropriate.

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Municipalities are encouraged to...

- OS 3.9** Further study and plan for development of municipal trail networks.

- OS 3.10** Inventory existing trails and provide information concerning trails to the public in a user-friendly format.

- OS 3.11** Identify pedestrian and bicycle connections between public open spaces and recreational sites within their jurisdictions.

- OS 3.12** Coordinate with adjacent municipalities to provide for linear linkages between neighboring municipal open space and trail systems.

- OS 3.13** Identify potential bicycle and pedestrian connections to Primary and regional trails.