

Trail & Path PLANNING

A Guide for Municipalities



A Linking Landscapes Resource





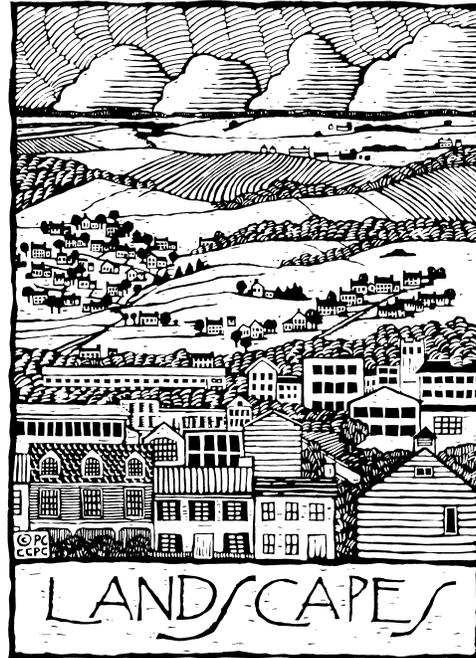
CHESTER COUNTY BOARD OF COMMISSIONERS

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Trail & Path PLANNING

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A Linking Landscapes Resource
Prepared as an Implementation Tool of



Prepared by the Chester County Planning Commission

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Trail & Path Planning: A Guide for Municipalities



Introduction

Public Trails are Now Being Planned as Municipal Infrastructure

Until recently, many municipalities in Chester County never had to address the need for trails in their community, but that situation is rapidly changing. In some rural municipalities, with wooded areas or abandoned rail corridors, trails are now being considered as a way to attract trail users to older village centers that are in need of revitalization. In more developed areas that have experienced growth, municipal officials now find themselves trying to meet the growing recreation needs of their constituents in an environment where there is less open land available for new parks. In many of these communities, the solution to this dilemma is to establish public trails.

The Chester County Planning Commission (CCPC) has created this guidebook to assist municipalities that wish to address trails & paths in their comprehensive plan, official map and zoning and subdivision and land development ordinances. This guidebook can also be used by individuals who wish to learn more about how public trails & paths are planned and constructed by local governments. This publication is the second in a series that have been designed to implement the policies of Chester County's open space plan, *Linking Landscapes*. *Linking Landscapes* has also been designated as Chester County's Greenways Plan by the Pennsylvania Department of Conservation and Natural Resources.

Trails are often unobtrusive features that result in minimal disturbance to the landscape. At first glance, establishing a trail may seem like an easy process, sort of like bushwhacking a path through the brush, but with paving. In reality, constructing a trail is more like building a narrow road, but for bikes and pedestrians. Municipalities should approach trail planning with all the seriousness of a highway project. They should only hire trail consultants and engineering firms with experience in designing trails. Municipal officials should also ensure that their adopted plans and ordinances address trails like any other form of public infrastructure.



The County Struble Trail extends through residential neighborhoods...



...while other parts of the trail are located in wooded park-like locations.



Trails such as these in the Eagleview Corporate Center provide an amenity that attracts tenants.

Trails can, and have, provided an economic boost to communities, benefiting businesses that serve trail users and also increasing the value of properties that are close to trails. Trails are an amenity used to sell houses and attract tenants to office parks. However, trails also require ongoing maintenance and security like any other public facility. A properly planned and designed trail can reduce future costs for maintenance and security. Trail planners need to conduct outreach with landowners as part of the planning process, so as to avoid potential future conflicts. The most successful trail projects are those that are designed with input from adjacent landowners.

In resort areas like the Pocono Mountains or re-gentrified urban settings like the Manayunk section of Philadelphia, trails have been built and widely accepted. In many cases, they have become a beloved focus of the community, with broad support by residents and business owners. However, in most Chester County municipalities, trail planning is somewhat new. Some local residents may be unfamiliar with the benefits or responsibilities that come along with hosting a trail. As a result, planners in Chester County must include an education and community outreach component in any trail project. This guidebook has been designed to be both an educational tool and a trail planning tool. When it comes to trail planning in Chester County, you cannot have one without the other.

The Pennsylvania Department of Conservation and Natural Resources (DCNR) provides a wide range of trail & path related information at its Web page, www.pagreenways.org. This site details the economic, health, and quality-of-life benefits of trails and greenways. This site also includes general information and scope of work guidelines for:

- Rails-to-Trails Planning Projects
- Municipal Greenways and Open Space Plans
- Comprehensive Recreation, Park and Open Space Plans

Chapter 1

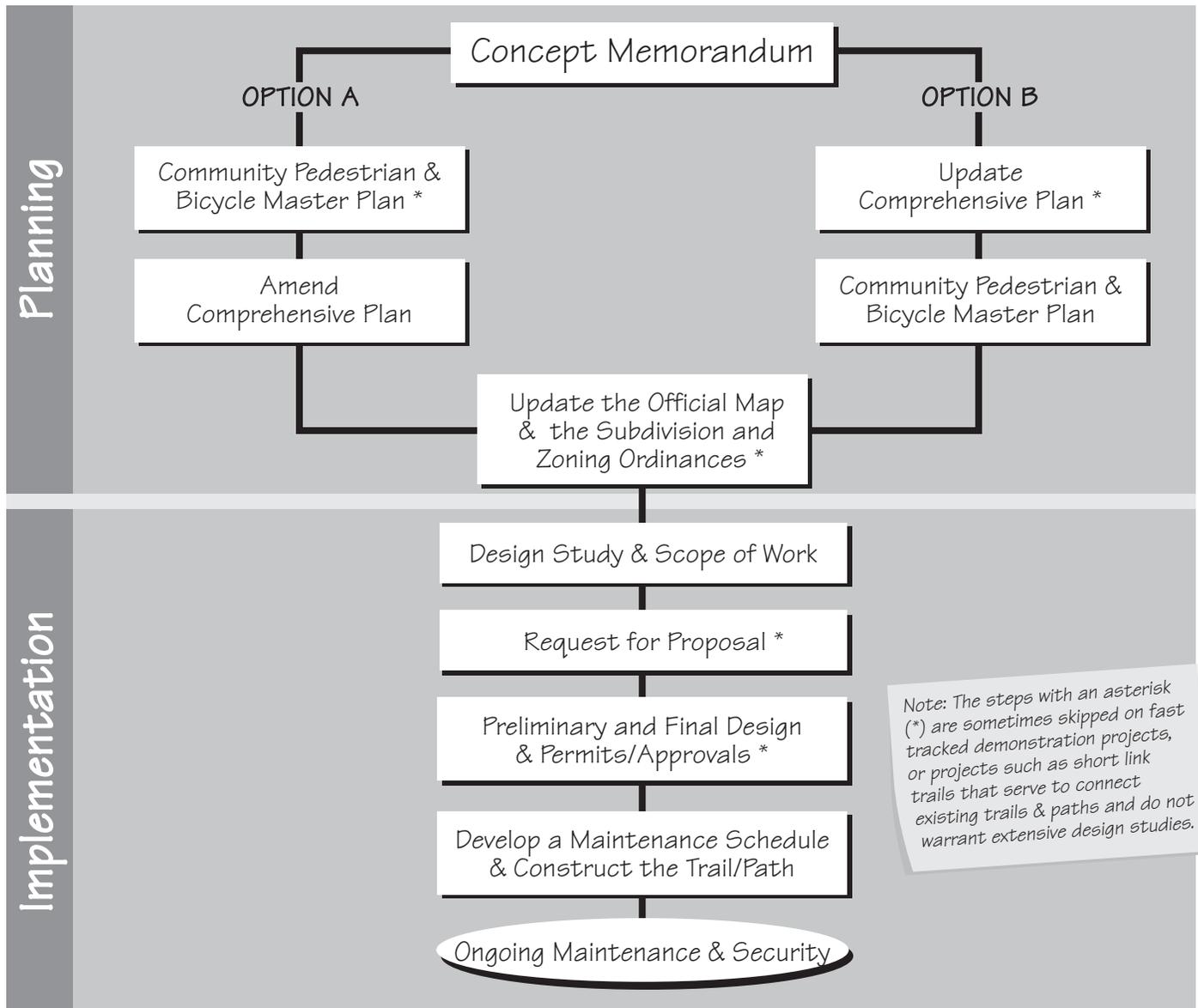


Basic Principles of Trail & Path Planning

Trail & Path Planning: Multiple Options

This guidebook presents ways that municipalities can address trail & path planning in their comprehensive plan, official map, zoning ordinance, and subdivision and land development ordinance (usually call the “subdivision ordinance”). The recommendations of this guidebook are consistent with *Landscapes*, the policy element of the Chester County comprehensive plan, and *Linking Landscapes*, the open space element of the County comprehensive plan. This guidebook is not intended to be, and should not be considered to be, a substitute for design, engineering or legal advice. It does not supercede any laws or regulations regarding land planning.

Figure 1.1: Trail Planning and Implementation Steps





Trails & paths can extend through park settings...



natural areas...



or pass through downtowns or revitalized neighborhoods.

Municipalities that seek to plan for trails & paths should follow the process presented in **Figure 1.1**. This figure breaks the trail & path development process into a series of steps, some of which involve planning, and the rest of which involve implementation. This guidebook focuses on planning for trails & paths and only briefly discusses trail & path implementation. Nonetheless, anyone who wishes to plan a trail & path should be keenly aware of the steps required to design and construct a trail & path, since planning will affect how a trail & path is implemented.

There are many steps that should ideally be followed in order to plan and implement a trail & path. The benefit of following this multi-step process is that it provides trail planners with an overall plan that they can turn to if an unexpected opportunity arises, such as a donation of land by a developer. This approach can also help keep trail & path planning on track if an unforeseen controversy or technical difficulty occurs. Furthermore, thorough planning establishes fair guidelines that can be used to maintain and operate a trail or path once it is built. However, extensive trail & path planning can take many years to complete.

In a perfect world, municipalities would have ample time and money to pursue trails and planning. In reality, trail planning is often an ad hoc process. It is common for local officials to find that they have an opportunity to acquire a trail corridor on short notice. For example, they may be given an offer of donated land by a utility or a railroad company that is abandoning a segment of track. In such situations, local officials may need to react quickly, and come up with a design in a few months so that they can apply for a grant to help fund the acquisition. For this reason, trail planners sometimes have no option but to skip some of the steps in **Figure 1.1**.

In Chester County, there are a number of municipalities that have constructed trails without completing all of the steps presented in **Figure 1.1**. In general, these have been municipalities that have strong and visible support from local elected officials and reliable long-term funding. In some municipalities, trail planners have used the demonstration project approach, in which only one segment of a trail is designed and built. A trail then becomes the centerpiece for a larger effort to plan an entire trail network throughout the municipality. As **Figure 1.1** shows, it is acceptable for municipalities to complete a trails community pedestrian and bicycle master plan before amending their comprehensive plan, (Option A) or to update their comprehensive plan and then pursue a trails master plan (Option B).

Trails, Paths and Networks: Know Your Terms

There is no one standard definition for the word **trail** or **path** either in legal terminology or in the planning or recreation professions. For someone who grew up in a major city, a trail is a paved surface with signs and restrooms used by large numbers of walkers, bicyclists and in-line skaters. For someone who grew up in the country, a trail is an informal hiking route marked by blazes painted on trees that is used by small groups of hikers, mountain bike riders, horse-back riders and cross-country skiers. In common use, the term “trail” is a vague catch-all and there are many kinds of trails.

There are many kinds of trails & paths, some of which are illustrated in **Figure 1.2**. As a result, municipalities should make sure to clearly define what they mean by the term “trail” in any adopted document, such as a zoning ordinance or subdivision and land development ordinance. There is no strict hierarchy in trail planning. Ideally, smaller trails & paths used for only one mode of travel should lead to larger multi-use trails, but very often, trail planners do not have that option. For example, a thin right-of-way in a highly developed community may be the only available area in which to locate a key link of a multi-use trail. Conversely, a wide former rail bed donated by a railroad may be used for a thin walking path. Trail planners need to rely on common sense as they adapt to existing features on the landscapes.



Trail users should be notified that a multi-use trail may be used by bicyclists and pedestrians.

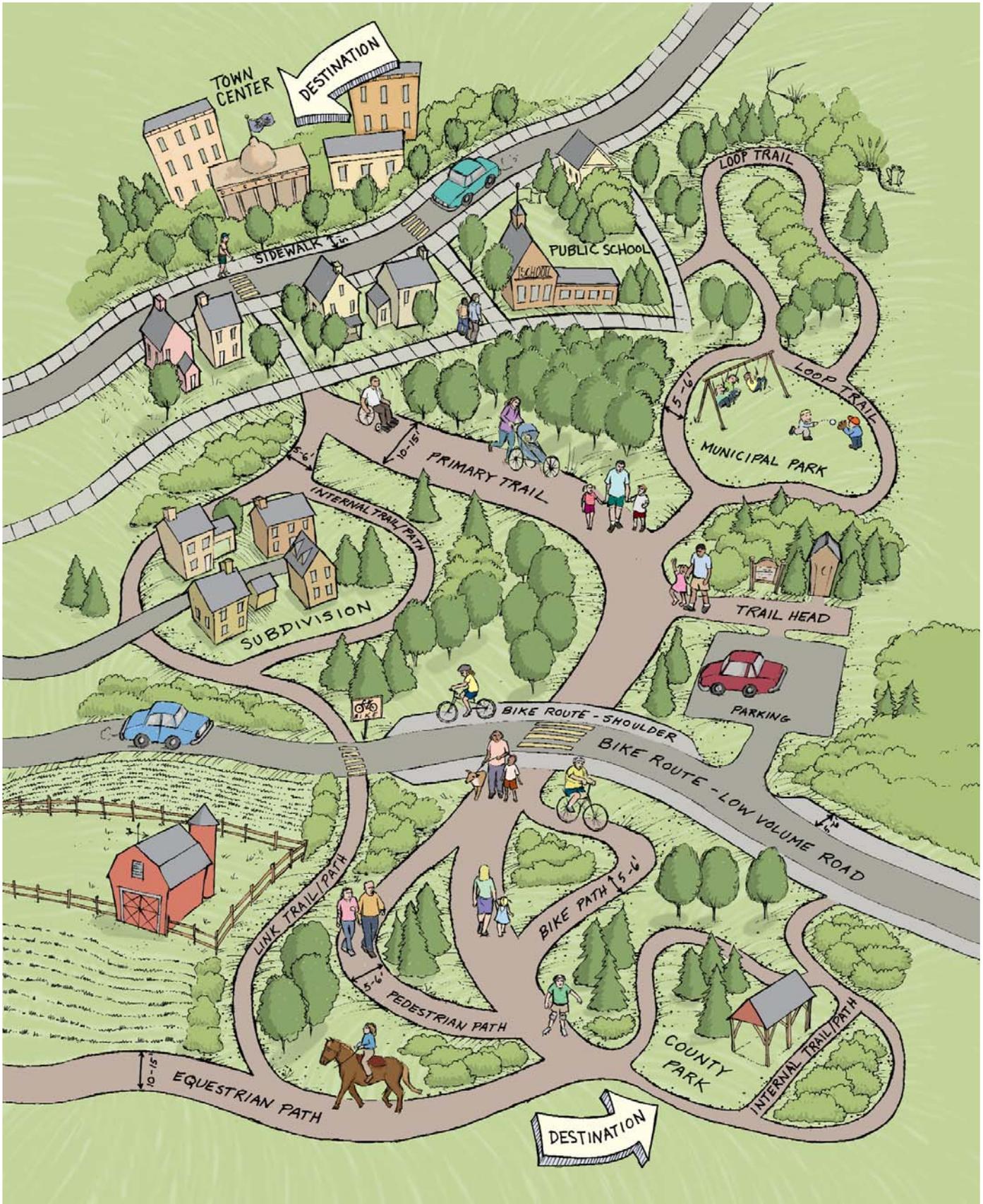


A path typically accommodates only one type of trail user.



A bicycle facility along a roadway is usually called a “bike route.”

Figure 1.2: A Municipal Trail Network



Linking Landscapes: A Plan for the Protected Open Space Network in Chester County (2002) is the open space element of the Chester County comprehensive plan. This document sets County policy regarding open space features including trails. *Linking Landscapes* also has a glossary of terms. The following definitions were based on definitions presented in *Linking Landscapes* and those used by recreation planners and the Pennsylvania Department of Conservation and Natural Resources (DCNR):

Basic Trail & Path Planning Definitions	Comments/Examples
<p>Trail – An off-road facility with a permanent alignment that is open to the general public, and that is designed, constructed and maintained as part of a public park system used for a variety of non-motorized forms of travel including walking, hiking, biking, cross-country skiing or horseback riding.</p>	<p>Trails can include internal trails, primary trails, and loop trails as shown on Figure 1.2. The County Struble Trail is a good example of a multi-use trail.</p>
<p>Path – A facility that is designed, constructed, maintained and used primarily for one form of travel, such as a bicycle path or a walking path.</p>	<p>Paths tend to be smaller and shorter than trails, but there is no universally accepted criteria to determine when a facility should be called a path. East Goshen Township Park includes paths that are posted for foot traffic only.</p>
<p>Bike Route – A roadway shoulder or a low volume roadway used for bicycle transportation.</p>	<p>Coatesville City has bicycle lanes along US Route 30, which constitute a bike route.</p>
<p>Traditional Hiking Route – A hiking pathway that has been used for many years but that has not been constructed into a multi-use trail and is not maintained as part of a public park system.</p>	<p>These routes are now commonly called social trails. The Horse-Shoe Trail that links French Creek State Park with Warwick County Park is a social trail in many locations.</p>

Source: CCPC 2006

The above definitions are presented for the purposes of this document and may be somewhat different from the definitions used by the state or other trail funding agencies. However, trail planners should become familiar with the *Linking Landscapes* definitions, and use them for guidance when formulating definitions to be adopted in municipal plans and ordinances. Ultimately, each municipality needs to develop its own legally defensible definition for terms used in trail planning, including terms dealing with sidewalks. Terms regarding all terrain vehicles (ATVs) should also be addressed even if ATVs are not permitted.

Trail planners should become familiar with the concept of a **network** of trails & paths. In terms of trail & path planning, a network is a combination of trails, paths, sidewalks and other linear facilities used for pedestrian and non-motorized transportation along with destinations. This network approach permits trail planners to be flexible in meeting the needs of their community. For example, within a municipality, there may be one neighborhood that supports the construction of paved multi-use trails, while another may prefer simple packed-earth hiking paths, also known as **primitive trails**. By taking a network approach, in which trails are linked to paths, both neighborhoods can be served. In many communities, a trail & path network also includes a system of bicycle routes along low-volume roadways that interlink with the trail & path system. This way, bicyclists can ride on both multi-use trails and the bicycle routes.

Sensitivity to Landowners is Essential

The most important part of any trail & path planning effort is this: Be sensitive to landowners. These landowners might be residential neighbors, retail businesses or corporations owning industrial parks. Remember, stakeholder input is as essential as design and engineering. Trail & path projects in Chester County can, and have been, stopped because of insensitivity to landowners. Furthermore, many state and County grants require public involvement. **Appendix A** discusses public involvement in detail.

Although trails & paths have become increasingly popular in Chester County, many residents are still not accustomed to having these amenities in their communities. A house is usually an individual's largest investment, and property owners are justifiably concerned with any public project that may have an impact on its value. There are now ample case studies indicating how trails & paths add to the value of nearby real estate, while improving the physical and mental health of nearby residents, especially the young and the elderly. Trails are also a tool for reducing the national obesity crisis, as described in **Figure 1.3**. Nonetheless, addressing public concerns is still important, especially concerns about crime and accidents. Planners should make the public aware that, in order to function properly, public trails & paths need to be:

- Well designed
- Well maintained
- Well policed



The ornamental fence to the right is an effective way to separate the public trail from the adjacent private property.

Figure 1.3: The Obesity Crisis in America

On July 16, 2003, United States Surgeon General Dr. Richard H. Carmona, MD provided testimony before the United States House of Representatives Committee on Education and the Workforce. The following are excerpts from his prepared comments entitled **The Obesity Crisis in America**:

“As Surgeon General, I welcome this chance to talk with you about a health crisis affecting every state, every city, every community, and every school across our great nation. The crisis is obesity. It’s the fastest-growing cause of disease and death in America. Nearly two out of every three Americans are overweight or obese. One out of every eight deaths in America is caused by an illness directly related to overweight and obesity. America’s children are already seeing the initial consequences of a lack of physical activity and unhealthy eating habits. Fortunately, there is still time to reverse this dangerous trend in our children’s lives.

A study conducted in May by the New York City Department of Health and Mental Hygiene and the Department of Education found that, adjusted to national standards, nearly one in four of the children in New York City’s public elementary schools is overweight. Today I will discuss the three key factors that we must address to reduce and eliminate childhood obesity in America. They are: Increased physical activity; Healthier eating habits; and Improved health literacy.

Looking back 40 years to the 1960s, when many of us in this room were children, just over four percent of 6 to 17-year-olds were overweight. Since then, that rate has more than tripled, to over 15 percent. And the problem doesn’t go away when children grow up. Nearly three out of every four overweight teenagers may become overweight adults. In the year 2000, the total annual cost of obesity in the United States was \$117 billion. This year, more than 300,000 Americans will die from illnesses related to overweight and obesity. Obesity contributes to the number-one cause of death in our nation: heart disease. Excess weight has also led to an increase in the number of people suffering from Type 2 diabetes. There are at least 17 million Americans with diabetes, and another 16 million have pre-diabetes. Each year, diabetes costs America \$132 billion.

We know more than ever about the combination of genetic, social, metabolic, and environmental factors that play a role in children’s weight. But the fundamental reason that our children are overweight is this: Too many children are eating too much and moving too little. And especially now, during the summer, we need to encourage all children to be physically active for at least 60 minutes a day. Not only sports, but simple things like taking the stairs, riding their bikes, and just getting out and playing. We need physical activity and healthy food choices in every school in America. And we need community planning that includes neighborhood playgrounds and safe walking paths.”

Planners should let landowners comment on a trail & path corridor before determining the alignment for the trail & path. A trail & path corridor is a wide band that should be at least 75 feet wide but can be over 100 feet wide. A corridor is usually shown on a map as a series of dots or a wide blob that may include adjacent lands. A corridor is not a right-of-way. Letting landowners comment on a corridor makes them aware that the municipality has committed to studying the trail. This technique also lets landowners know that the municipality wishes to have local input to determine where the final alignment should go. This approach shows respect for the landowner, and demonstrates that the municipality was thoughtful in weighing the landowners' concerns with the health, safety and welfare of the community as a whole.

Meetings with landowners can also be used to identify issues, such as areas that flood or locations that are prone to vandalism. Information about these sites can be used to improve the design of the facility so it can provide for better connections, destinations or links to other neighborhoods. Oddly enough, it is often the loudest critics of a proposed trail & path who are the most useful to its planning and design. It is also common for such opponents to become the greatest boosters of a trail or path once it is built.

Trails & paths included as part of a subdivision should be built at the same time as other infrastructure such as sidewalks and roads, prior to the construction of the buildings.

This way a potential landowner can see the actual trail rather than just a plan, and make a more informed decision on a purchase of a house or vacant land. Some Chester County municipalities already require this. Since many trails cross municipal boundaries, trail planners should also ensure their trail & path concept will be consistent with plans (adopted or under consideration) in adjacent municipalities. This approach also avoids a situation where one municipality plans a trail near their municipal boundary, and then finds out that the adjacent municipality is proposing that land near the trail be used for some other land use that is inconsistent with a trail & path.

Lastly, municipal officials should actively seek out communication with trail activists. Trail activists are usually a valuable asset in trail & path planning. However, well meaning trail activists can, and have, angered local landowners by presenting them with informally drawn maps, showing how a trail could cross their property. By distributing maps that have not undergone public review, trail activists can inadvertently jeopardize the very trail they hope to create. Public officials should actively communicate with trail activists and make them aware that the first step in any trail & path project involves contacting the municipality to determine if the concept is consistent with local planning.



Trails can be integrated with nearby tourist attractions and restaurants.



This section of the County Chester Valley Trail was built by a developer as part of the redevelopment of the Route 100 corridor in Exton.

Trail & Path Planning and the Pennsylvania Municipalities Planning Code

The Pennsylvania Municipalities Planning Code (MPC), Act of 1968, P.L. 805, No. 247, empowers municipalities to address trail & path planning through the following municipal plans or ordinances:

- **MPC Section 303(a)(3)** – A comprehensive plan may include a “plan for the movement of people,” which may include “pedestrian and bikeway facilities” and “other similar facilities and uses.”
- **MPC Section 401(a)(3)** – An official map may include “pedestrian ways and easements.”
- **MPC Section 503(3)** – A subdivision and land development ordinance) may include provisions governing the standards by which “walkways” and “other improvements shall be installed as a condition precedent to final approval of plat.”
- **MPC Sections 603(b)(2) and 604(1)** – A zoning ordinance may determine location, construction, and “use of structures.” Zoning ordinances shall be designed promote protect and facilitate “public health,” and “recreational facilities” and “public grounds.”

In some Chester County municipalities, a network of trails & paths has not yet been addressed in their currently adopted plans and ordinances. As a result, these municipalities may not be certain how to respond when issues regarding trails & path arise in their communities. This shortcoming can be resolved within the framework of the MPC by updating municipal plans and ordinances.



The trails & paths in East Goshen Park are a key element in the municipal planning for public health, recreational facilities, and public grounds.

Consistency with County Planning

County planning policies relating to trail & paths are presented in *Landscapes* and in *Linking Landscapes*. *Linking Landscapes* emphasizes the need to plan trails & paths as an intertwined network that includes destinations such as public parks, village centers, playgrounds and public schools. *Linking Landscapes* presents mapping that shows 23 **Regional Recreation Corridors**, which are 2,000-foot wide planning corridors, as shown in **Figure 1.4**. These corridors are not presented as a future County-managed trail system, but rather as linear planning zones that could possibly link key destination points using a combination of County and municipal trails.

When linked together, the Regional Recreation Corridors create a County-wide network linking each borough/city to each County, state and national park within Chester County. *Linking Landscapes* recommends that municipalities consider the Regional Recreation Corridors as possible locations for a trail, path, or recreation oriented greenway, including minor collector trails that link to larger primary trails. *Linking Landscapes* does not require that municipalities build these trails, but it does recommend that they consider them when conducting municipal planning.

PA Act 247, the Municipalities Planning Code (MPC), requires municipalities to submit land use ordinances to CCPC for review. CCPC reviews these ordinances to determine if they are consistent with the County comprehensive plan, which includes *Linking Landscapes*. Municipal ordinances that are consistent with the recommendations in *Linking Landscapes* are more likely to get a positive review. Similarly, municipalities that apply for a County funded trail grant are more likely receive a higher ranking score if they are consistent with *Linking Landscapes*. While there is no specific set of criteria that will make a trail & path project

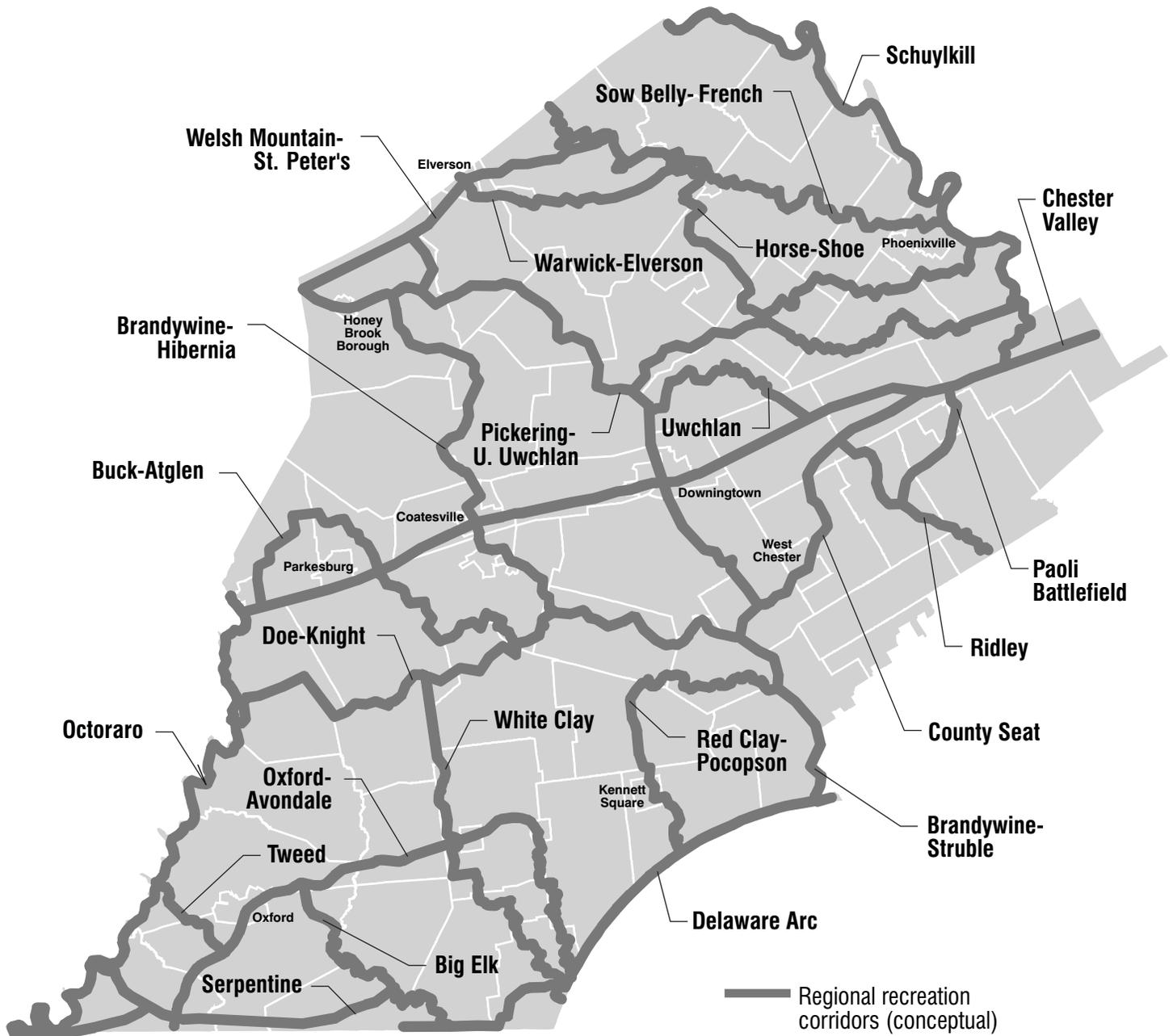
consistent with *Linking Landscapes*, a project will be consistent with *Linking Landscapes* if it links key recreation destinations via trails & paths, even if those trails & paths extend outside the Regional Recreation Corridors.

In January 2005, CCPC published *Open Space Planning: A Guide for Municipalities*, which is a good resource for trail planners who wish to update their municipal plans and ordinances. This guidebook does not present adopted County policies, but instead provide technical assistance in plain English. It also lists a number of topics relating to trails planning that should be included in municipal comprehensive plans. These topics are only recommendations, but they need to be addressed in order for a municipality to receive a grant from the County's Vision Partnership Program (VPP).



The Uwchlan Township municipal trail network links to the County Struble Trail (in the background). Joint planning between the township and the County made this connection possible.

Figure 1.4: Regional Recreation Corridors



Source: *Linking Landscapes*, CCPC, 2002.

Funding Sources for Trail & Path Planning

Municipal trails & paths can be funded using municipal revenues, like any other form of public infrastructure. Some municipalities also gather funds through fee-in-lieu provisions, which are described in **Chapter 5** of this guidebook. However, most trail & path projects are funded using a combination of municipal funds, grants, and donations, usually in the form of land transferred to municipal ownership by a developer or a railroad company.

Private grants for trail planning efforts are sometimes available to municipalities, but these programs tend to have varying funding levels from year to year. Trail planners should become familiar with state, County and federal trail grants. Municipalities should also be aware that they can increase their chances of being awarded state, County and federal grants if they can demonstrate that they are consistent with the adopted trail-related County policies presented in *Linking Landscapes*. Multi-municipal projects are also more likely to receive funding from most grant sources.

When local officials consider applying for a grant, they should be careful to read the grant program manual to determine if this particular grant program is really what they want. Some grants have requirements that may limit the future development of the site in a way that is too restrictive. Grant manuals should also be examined to determine what the grantor wants from an applicant. Most grant manuals include a listing of objectives. If a grant program stresses the health benefits of trails, then the application should address health issues. Above all, make sure that the application is complete and includes all the maps, support letters, deed information, or land appraisal reports that may be required.

Most of the public grant programs available for trails & paths are used for the acquisition of land or the construction of facilities, or both. Grant programs that focus exclusively on planning studies are also available, but in most cases municipalities conduct trail planning as a part of their overall community planning. Because the funding levels of trail planning grants change every few years, it is best to call around to other municipalities, the CCPC, or other counties in Pennsylvania to see what their experience has been with securing funds.

County Grants – Beginning in 1996, Chester County’s Vision Partnership Program (VPP) awards matching grants to municipalities that wish to revise their comprehensive plan, zoning, subdivision ordinance or official map. Community pedestrian and bicycle master plans can also be funded under VPP, either as an approved special project or an adopted section of the comprehensive plan. This is a matching grant. The grant manual and eligibility requirements are periodically revised. Currently, the program provides grants reimbursing 75 percent of projects cost up to \$50,000 per application for adopted documents enabled by the MPC, and up to 50 percent of a project’s cost up to \$20,000 per application for approved special studies. Higher funding levels are available for multi-municipal projects. The VPP manual is posted on line at the CCPC’s Web site at www.chesco.org/planning. Chester County also awards funding for the acqui-



Municipalities have used matching County funds to fund public trails & paths.

tion of land for trails & paths and the construction of trails & paths. That grant is administered by the Chester County Department of Open Space Preservation at www.chesco.org/openspace.

State Grants – Beginning in 1999, the Commonwealth of Pennsylvania began to provide grants to municipalities for trail planning through the Growing Greener Program, which was reorganized in 2005 as Growing Greener II. Most state funded trail acquisition or construction grants start with a planning study. Trail studies can be funded up to 50 percent under the Community Grants program of Growing Greener II. The Rails-to-Trails program also provides up to 50 percent funding for trail studies. Trail planners should contact the Pennsylvania Department of Conservation and Natural Resources (DNCR) Grant Coordinator at the DCNR Southeast Regional Office located in Philadelphia, PA. The regional grant coordinators are an excellent resource who provide hands-on guidance to municipalities before and during the grant applications. Their phone numbers and addresses are regularly updated at the DCNR Web site: www.dcnr.state.pa.us.

Federal Grants – Beginning in 1991, the federal government began to provide funds for trails projects through a series of transportation appropriation bills known as ISTEA, TEA-21 and SAFETEA-LU. These programs provide funding for trails projects, usually large-scale, extensively planned projects. Enhancement grants are administered by the Delaware Valley Regional Planning Commission, which is Chester County’s Metropolitan Planning Organization (MPO). These grants usually fund master planning studies along with design and construction costs. These grants are highly competitive and tend to be awarded for major trail initiatives. They are rarely granted to a municipality, although it has happened in Chester County. It is best to look at the Federal Highway Administration’s Web site or call the Pennsylvania Department of Transportation (PennDOT) to learn more about these grants.

In some cases, trail planners may find that a project is quite simple to design and construct, such as short links or trail sections on flat areas without any road crossings. In these cases, there is no practical need to complete the detailed planning studies that may be required in order to receive state and federal grants. For easily built trail projects, it may be best to use only municipal plans and locally generated funds. A growing number of municipalities in the Delaware Valley are now approaching trail funding by requiring that homebuilders fund and build trails just as they do sidewalks, or else provide a fee-in-lieu if trails are not feasible. In many instances, homebuilders are willing to build the trail since it provides an additional amenity they can use in marketing their development. This requirement has become so commonplace that many developers now have experience with trail design and construction.



State funding has also been used for municipal trails & paths.



Through PennDOT, the state has designated certain roadways in Chester County as part of the BicyclePA network of bike routes.

Trails & Paths: An Expansion of Sidewalk Planning

In Chester County, a number of municipalities have successfully addressed trails & paths by expanding the parts of their existing plans and ordinances that address sidewalks. This is a logical and practical approach, since sidewalks, trails, and paths have similar design and construction features. Furthermore, walkers are the primary users of sidewalks, trails & paths.

The following sections provide detailed information on how municipalities can address trail & path planning in their adopted plans and ordinances. CCPC's experience has shown that regardless of how a municipality addresses trails & paths, there are three overriding principles to consider:

- **Network Planning** – Trails & paths should be planned as a municipal wide network, including multi-use trails, single use paths, roadway or road shoulder bicycle routes, and destinations. **Figure 1.2** illustrates this concept.
- **Construction Timing** – Trails & paths should be included as infrastructure in a subdivisions' improvement guarantee (also called a construction bond), and constructed and assigned ownership along with sidewalks and streets before the residential or commercial structures are constructed. This way, individuals shopping for a property will see for themselves what the final pedestrian facilities are on site, and be able to make a more informed decision.
- **Trail Paving** – Trails & paths should be paved with macadam, concrete or compacted crushed stone, except under special circumstances, such as equestrian trails. Most trails & paths of any significant length pass over

areas that will experience over-land flow during a major storm event. Such run off is likely to erode wood-chips or other non-paved surfaces. When this happens, the homeowners association or the municipality must pay to resurface the trail. To avoid continued ongoing erosion-generated maintenance costs, paved trails & paths are preferred.



Trails & paths can be part of a network that links to sidewalks.

Other Trail & Path Planning Resources

Public trails have been in existence for many years. Some, like the Appalachian Trail and Forbidden Drive in Philadelphia's Wissahickon Park, have been hiked for many decades. However, in southeastern Pennsylvania, trail planning at the municipal level is a relatively new field. Trail planners should make an effort to conduct research and visit other communities that have trail & paths, in order to determine what approach works best for their community.

The planning approach presented in **Figure 1.1** on page 7 is based on the experience of CCPC and the Chester County Parks and Recreation Department. It is meant to be a general guide. Professional trail designers and engineers develop plans based on the *Guide for the Development of Bicycle Facilities, 1999* and *Guide for the Planning, Design and Operation of Pedestrian Facilities, 2004*, both written and published by The American Association of State Highway Transportation Officials (AASHTO). These publications are periodically updated. They present the standard criteria for constructing trail & path facilities.

Trail planners pursuing trail & path planning should also consider reviewing the following other publications, all of which were consulted for the development of this guidebook:

- *Trails for the Twenty-First Century: Planning, Design and Management Manual for Multi-use Trails, 2001* by Karen-Lee Ryan and published by the Rails-to-Trails Conservancy.
- *Oregon Bicycle and Pedestrian Plan, 1995* by the Oregon Department of Transportation.
- *Creating Connections: The Pennsylvania Greenways and Trails How-To Manual, 1998* by Russ Johnson and published by the PA Greenways Partnership and the PA Environmental Council.
- *Community Trails Handbook, 1997* written and published by the Brandywine Conservancy.



Trails & paths can be built along road rights-of-way and function like sidewalks.

Chapter 2



The Comprehensive Plan

Dedicate One Section to Trail & Path Planning

Many municipalities in Chester County address trail & path planning in their municipal comprehensive plan. In the past, when public trails were uncommon, municipalities discussed trails & paths in the “Community Facilities” chapter of their comprehensive plan. Given that recreation facilities have become a more prominent and expensive issue for municipal government, CCPC recommends that comprehensive plans should be updated to include a section/chapter dedicated to “recreation.” This section/chapter should address trails, paths, parks, destinations and other recreation features using a network approach. This section/chapter should relate these trail & path features to bicycle routes and sidewalks, which are both often addressed under the transportation section/chapter.

Furthermore, CCPC recommends that the trail & path section of each comprehensive plan include the following two maps:

- Park and Recreation Plan Map (which may also show trails)
- Trails Network Plan Map (which can include trails, paths, sidewalks or bike routes)

In the past, when there were few public parks and trails in Chester County, some municipalities combined these two maps. However, that is no longer recommended since it now creates a map that is too busy and can be difficult to read. Adding the two **plan maps** listed above will clearly illustrate the municipality’s policies regarding trails & paths in a way text cannot. In some instances, a well-designed trail & path plan map can even serve the function of a community pedestrian and bicycle master plan. Trail planners should be aware that according to PA Act 247, the Municipalities Planning Code (MPC), maps included in a comprehensive plan are a key part of an adopted plan, and not just ancillary illustrations that explain the text. As a result, proposed trail corridors drawn on a map are valid recommendations. Ideally, any trail corridor shown on a map should be addressed in the text and vice versa.

Note: Municipalities that do not wish to give the appearance that they are establishing detailed trail alignments may wish to refer to the Trails Network Plan map as a “Pedestrian Corridor Network Plan Map,” a “Recreation Corridors Plan Map,” or some other wording.



Trails & paths should be addressed in municipal comprehensive plans just like parks and sidewalks.

Comprehensive Plan Trail & Path Issues



Public access and trailhead parking are key elements of trail planning.



Gates can slow bicyclists near a road crossing. Trails & paths should be planned as part of transportation and circulation planning.

Note:
On-road bike routes and off-road bike paths interconnect with roads used by motor vehicles, and so should be included in the transportation section/chapter, but cross-referenced with the community facilities section/chapter since they are also community facilities.

Municipal trail planning is a relatively new field, and some municipal planners are not certain how trails & paths should be addressed in their comprehensive plan. Below is a listing of what goals, objectives and policies regarding trails & paths should be addressed in the comprehensive plan, and where in the plan they should be located. There is no one template that can be used to address these policy elements. Instead, trail planners should seek out examples by contacting the municipal planning commissions of nearby municipalities that have successfully pursued trail & path planning. The plans and ordinances of neighboring communities are a great resource because they present practical examples that have been reviewed and approved by the public, the municipal solicitor and the elected governing officials.

Plan Summary Section/Chapter

- Include an objective calling for a trail & path network as a recreation facility.
- Include an objective calling for a trail & path network as a non-motorized transportation facility.
- Include an objective calling for trails & paths, sidewalks and roads as integral features of new developments.
- Include an objective calling for trails to be addressed in the official map and the zoning and subdivision ordinances.

Background or Introduction Section/Chapter

- Include major multi-use trails (such as County trails) in the regional influences map.
- Address municipal funding for trail & path acquisition, maintenance and security.

Land Use Section/Chapter

- Note that some land uses, such as public parks and common open space (also called homeowner association open space), should be publicly accessible and used for trails & paths that link to primary trails.
- Note that some land uses, such as heavy industry or some forms of agriculture, should not be used for trails & paths.
- Note that open spaces should be linked into a trail network.

Transportation and Circulation Section/Chapter

- Discuss the need for non-motorized transportation facilities.
- Include a discussion of on-road bicycle circulation, bicycle routes and bicycle paths.
- Include a plan map of existing and proposed bicycle routes.

Community Facilities Section/Chapter

- Discuss the economic benefits of trails & paths.
- Define trail, path, route, social trails, internal trail, primary trail, and trail network.
- Include a discussion of pedestrian circulation, sidewalks and trails & paths.
- Include a discussion of sidewalk, trail & path construction phasing, ownership, and maintenance responsibility.
- Include a discussion of sidewalk and trail & path easements, liability and policing.
- Include a plan map of existing and proposed sidewalks, trails & paths.
- Discuss the need for sidewalk, trail, and path design standards and functional classification.

Recreation Facilities Section/Chapter

- Define and discuss the trail & path network that includes trails, paths, sidewalks and bicycle routes.
- Discuss trail & path network destinations, user facilities, parking, and trailheads.
- Discuss trail & path regulation and activities that will be permitted or restricted on trails & paths.
- Discuss trail & path control points such as bridges, suitable road/rail crossings, and key destinations.
- Discuss obstacles including steep slopes, major waterways, heavy industrial manufacturing, major highways or rail lines, and unsuitable road/rail crossings.
- Include a trail & path network map including destinations, control points and obstacles. This map may only be corridors, or a combination of corridors, proposed alignments and existing trails.



Trails & paths are community facilities and should be planned to address liability concerns.

*Note:
Trails, paths and sidewalks are also transportation facilities. Because they are managed and financed more like parks and other community facilities, they should be included in that section/chapter but cross-referenced with the transportation section/chapter.*



Trails & paths often extend into parks and should be included in recreation planning.

Evaluating Trail & Path Opportunities in the Comprehensive Plan

This section presents key topics that should be evaluated when a municipality is addressing trails & paths as part of its comprehensive plan. Such an evaluation can be used to identify the needs and desires of its residents, and determine what kind of a trail & path network should be planned. It can also be used to identify trail & path opportunities along with geographic obstacles (such as major highways or rails corridors) that would be difficult or impractical to cross using a pedestrian-oriented trail & path.

As **Figure 1.1** (page 7) shows, it is common for municipalities to sometimes complete a community pedestrian and bicycle master plan and then adopt it as part of the comprehensive plan. Usually the master plan is more detailed than the open space or recreation chapter of a comprehensive plan. It is ultimately up to trail planners and their elected officials to determine what level of detail is appropriate when addressing trails & paths in their comprehensive plan. The review of topics presented below is a thorough “master plan” approach which can be applied to a comprehensive plan and, if needed, scaled back.

Regardless of how they approach trail & path planning, trail planners should review the manuals for state, County and other trails grants prior to modifying trail text in their comprehensive plan. If the comprehensive plan can be written to incorporate the terminology and overall philosophy of these grant programs, the final project is more likely to receive funding. Remember, the first step to funding the construction of a trail is updating the comprehensive plan.

Identifying Economic Benefits—Trail & path planning should include a general discussion of the economic benefits that trails & paths would be expected to bring to the community. These may be direct benefits, such as increased patronage to businesses used by hikers and bicyclists, and the job growth that it can bring. Such businesses might be restaurants, pharmacies, photo shops, gift shops and sporting goods stores. Indirect benefits might include increased values for real estate located near a trail & path. Industrial parks can also use trail access as a marketing tool to attract tenants. The types of economic benefits are unique to each municipality.

Identifying Health Benefits—In 2003, the U.S. Surgeon General reported that obesity is the fastest-growing cause of disease and death in the nation, with nearly two out of three Americans overweight or obese. With a rising and aging population, the need for trails is expected to increase in years to come. Municipal trail planners can address the obesity crisis and the need for easily accessible facilities that serve a growing elderly population in the comprehensive plan. Demographic and health statistic that relate to the municipality can be used to direct trail planning policy as a health and wellness issue.



This trailside restaurant attracts patrons by providing a bike rack.

Identifying Major Destinations—A trail & path will function best if it has a destination that users want to visit, as noted in the drawing in **Figure 1.2**. Often a trail will be named or marketed based on where it stops or starts. Identifying a trail & path destination (also called its terminus) should be one of the first steps in trail planning. Presenting a **trail-to-nowhere** to a planning commission or at a public meeting should be avoided. By clearly identifying destinations, trail planners can demonstrate that taxpayers' money will be thoughtfully used to provide greater public access to public parks or local tourism centers. If a trail segment goes past a remarkable scenic river valley or some other unique area, that segment may be a destination in itself. Some commonly identified trail & path destinations include:

- Community centers
- Historic centers/districts
- Main streets/downtowns
- Nature preserves/arboretums
- Public parks/playgrounds
- Public schools
- Restaurant districts
- Scenic areas
- Shopping malls
- Train stations
- Transit centers/ bus shelters
- Waterways

Identifying Control Points—A control point, also called a **pinch point**, is a key feature on the landscape that is needed in order for the trail & path to be feasible. For example, there may be a multi-lane highway in a municipality that is only crossed by one bridge that has a sidewalk. This one bridge would be a control point, since it is the only way that a trail & path could safely extend across the highway right-of-way. A control point could also be an abandoned rail bed that was donated to the municipality. Simply put, a control point is a target destination that is essential to the success of the trail & path project. A control point should also be financially possible. An old railroad bridge that needs an exceedingly expensive rehabilitation may not be a viable control point, even if it is well situated to link two existing trails.

Identifying Physical Obstacles—Certain features, like steep hillsides, industrial manufacturing complexes, or multi-lane elevated highways, are simply incompatible with pedestrian use. In recreation planning, these obstacles are called negative control points. They are targets to be avoided. Obstacles should be inventoried early in the trail & path planning process. Features such as electrical substations, active rail lines and dams should also be avoided because they are a public safety concern. Because of national security and anti-terrorism concerns, utility and rail companies may require a buffer separating their properties from the general public. Active farms should also be avoided whenever possible to reduce the potential for damage to crops, infection of livestock, or conflicts between dogs and livestock. Some commonly identified trail & path obstacles include:

- Active rail lines
- Dumps/industrial waste sites
- Elevated/depressed rail beds
- Major river crossings
- Wetland complexes
- Manufacturing plants
- Multi-lane highways
- Prisons/airports/dams
- Steep slopes/cliffs



This trail clearly identifies destinations, directing users to communities with village centers and shopping opportunities.



This bridge crossing over a major highway is a control point. A Jersey barrier protects riders from traffic.



Physical obstacles such as streams can result in trail & path attractions, such as this quaint bridge.



Links between sidewalks and trails & paths should be inventoried.



Potential road crossings should be identified in trail & path planning.



In some places, old trails or hiking routes have become roads and no longer function only as pedestrian or bicycling facilities.

Inventoried Existing Trails, Paths, and Sidewalks –

Municipalities should map all existing public trails, paths and sidewalks in their comprehensive plan, and also map the conditions of these facilities. Because these features must be mapped in the field, municipalities commonly use volunteers to conduct this labor-intensive non-technical task. Volunteers are also more likely to know where social trails are located. Trail planners can develop their own criteria for evaluating the conditions of facilities. Usually the surface of the trail/path/sidewalk is described as good (no repair needed), fair (cracked or eroding, but no need for immediate repair) or poor (in need of repair). This kind of evaluation is commonly done for sidewalks and can easily be applied to trails & paths.

Identifying Road/Rail Crossings –

Some municipalities are bisected by rail lines or limited access roadways. Some of these features can be safely crossed by pedestrians via a bridge or an existing stoplight. Other crossings may have no sidewalks, or sidewalks that are too narrow to be used safely. Municipalities that are planning trails & paths should determine, at least on a conceptual level, where a trail & path could realistically cross major roads and railways. Likewise the road and rail segments that cannot be crossed should be mapped. When making this determination, trail planners should also consider financial and community impacts, such as the cost of restoring an old bridge with a damaged sidewalk or the practicality of having hikers cross a road near the entrance to a truck depot.

Identifying Existing Social Trails and Hiking Routes –

Chester County is home to a number of traditional hiking routes such as the Horse-Shoe Trail and Mason-Dixon Trail. These routes have been hiked for decades, mostly by local trail club members. These trail clubs often have formal or informal agreements with landowners along the route, which gives only the trail club members permission to enter the private property. These routes change periodically, but they should still be mapped. Likewise any significant **social trail** that is used informally should be identified, but not mapped in detail. Social trails may only be simple dirt paths pounded through the underbrush by children. This type of social trail commonly involves trespassing. Social trails should be evaluated as a way to find out where pedestrians wish to travel, but not be automatically regarded as viable future trail alignments.

Identifying Bicycle Routes – Most of the users of trails & paths in Chester County are walkers and bicyclists. However, bicyclists can also use the shoulders of roadways and low-volume roadways. Municipalities should identify and map these bike-ways as “routes.” In many cases, these routes connect to form a network that intersects with multi-use trails that also permit bicycle use. This bicycle route network is a kind of overlay that can co-exist with a trail & path network. The state has also designated certain roadways in Chester County as part of the BicyclePA network, and these should be mapped. In some locations, these routes follow higher volume roadways, and municipalities should feel free to propose alternative routes. Chester County also has a Recommended Bikeway Functional Classification map, which is posted at www.chesco.org under the heading “Transportation.” **Figure 2.1** shows the section of this map around Downingtown Borough.



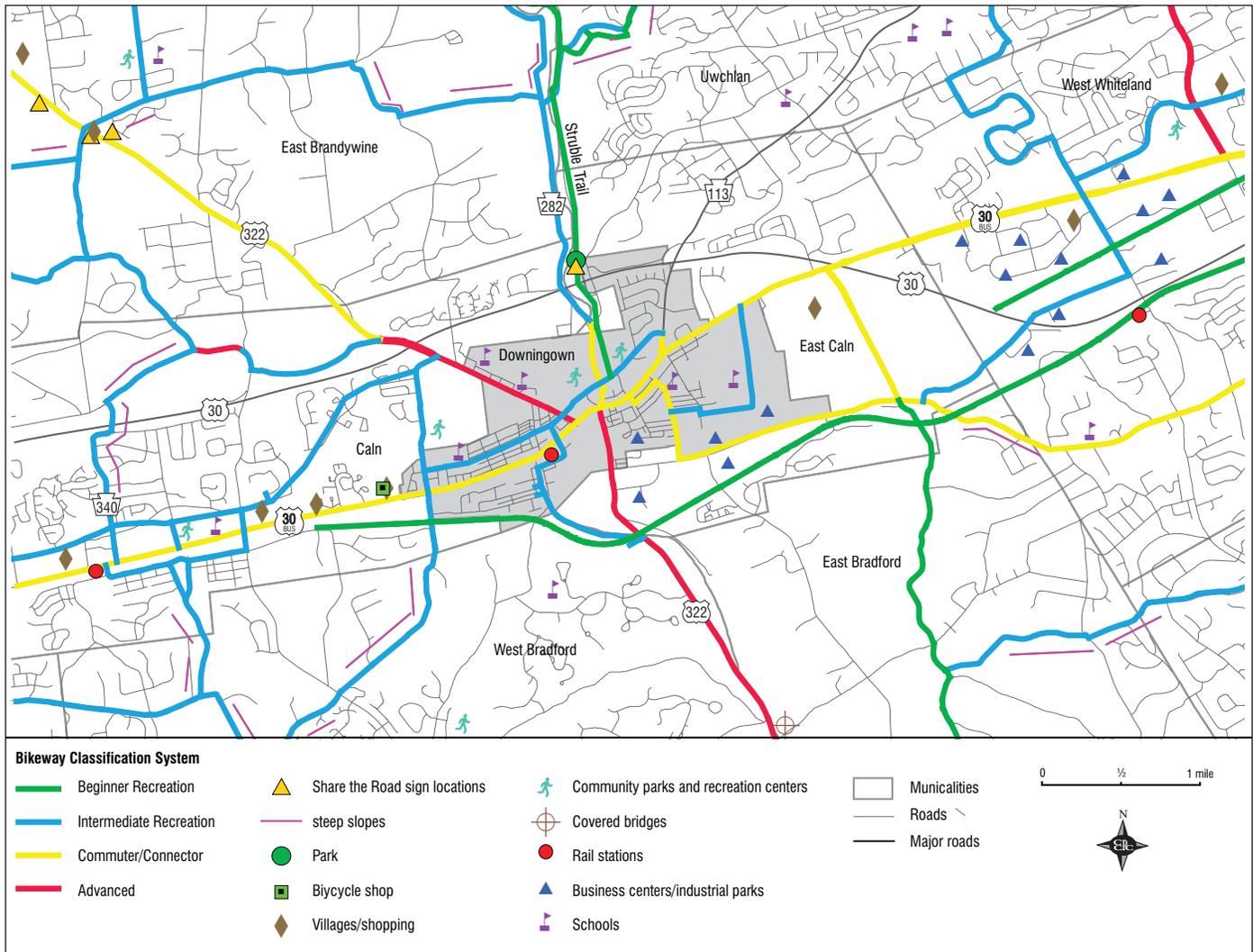
On-road bicycle routes should be inventoried when conducting trail & path planning.

Identifying Bridle Paths – In some of the County’s less developed communities, there are still a large number of properties that have bridle paths. A bridle path is usually a mowed turf area between a farm field and the road that is used for riding horses. In Chester County, there are some clusters of farms whose bridle paths are linked to form a kind of network. In the past, there were informal agreements that permitted neighboring landowners to ride on each other’s land, but liability concerns are now causing some landowners to forbid riding access on their property. In Westchester County, NY, a non-profit bridle path association has placed easements on a large network of bridle paths surrounding the Town of Bedford. These bridle paths are limited to use by equestrians and hikers. No such network of eased bridle paths exists in Chester County, but they should be considered in communities with a sizable horseback riding population.



Bridle paths and horse paths are an important element of trail & path planning in many parts of Chester County.

Figure 2.1: Chester County Recommended Bikeway Functional Classification-Downingtowntown Area



Identifying Possible Links to Existing Networks—Trail planners should identify any feasible way that existing trails, paths, sidewalks and bicycle routes could link together. Such links may include trails & paths within the municipality that link to those in adjacent municipalities. Ideally, the neighboring municipality will also be planning a network that is well-suited to accept new links. Linking into existing networks expands the recreation opportunities for trail & path users. Furthermore, a municipality is more likely to receive state or County funding if a trail & path project links to a larger network. Possible links to privately owned trails, such as those within an industrial park or the grounds of a hospital or private school, should also be evaluated.



This trail in Uwchlan Township links into the existing sidewalk grid.

Identifying Links to Primary Trails—A basic principle in motor vehicle planning is that small local roads lead to larger distributor roads, which in turn lead to collector roads and major arterials, which are multi-lane highways. In trail & path planning there is a similar but a more simplified hierarchy in which smaller internal trails or paths lead to a wider primary trail. The primary trail should be a multi-use trail that can be reached by other trails, hiking paths, bicycle paths or bicycle routes. Trail planners should regard this hierarchy as an ideal goal, and not a strict set of rules. The comprehensive plan should identify how internal trails could link to a primary trail. Usually there are a small number of primary trails within a municipality. Internal trails can also link to primary trails in neighboring municipalities. This issue also relates to trail functional classification, like the one illustrated in **Figure 1.2**.



The secondary trail to the right links into a primary trail.

Identifying Links to County Trails—In Chester County, the County Parks and Recreation Department has committed to constructing three regional County trails: the County Chester Valley Trail, the County Schuylkill Trail and the County Struble Trail. These County trails will serve as the primary trails for the more densely populated eastern and central parts of Chester County. In each municipal comprehensive plan, trail planners should document how their trail & path network could link to County trails, or explain why such a link is not feasible due to obstacles, costs or other reasons. A municipality is more likely to receive state or County funding if a trail & path project links to a County trail. There are no state or federal trails in Chester County, leaving municipal/County partnerships as the only option for County-wide trail planning.



The Uwchlan Township trail, to the left, links into the County Struble Trail, to the right.

Designating Public versus Internal Trails – Over the last decade, it has become quite common for new developments to include paths that extend through the development. Such paths are usually one lane (4 to 6 feet wide) and used mostly for walking, with occasional bicycle use, mostly by children. These paths are usually called internal trails, since they are designed to serve the residents of the community. Often, an internal trail will have a **link trail** that will connect it with a nearby primary trail. Policies regarding the ownership, liability and maintenance of internal trails should mirror those of sidewalks, since internal trails are basically a sidewalk that is not along a street. An internal trail that is part of a community network shown on an adopted plan map should be publicly owned, operated and maintained.

Identifying Utility Corridors and Abandoned Rail Lines – Many successful trails in the Delaware Valley have been built along utility corridors or abandoned rail lines. The trail & path planning process should evaluate existing active and

inactive utility corridors, along with so called “paper roads,” that were proposed but never built. Trail planners should be careful to thoroughly determine that a corridor is viable before proposing it for trail & path reuse. Because of National Security and anti-terrorism concerns, many utilities are now less amenable to having their property open to access by the general public. Furthermore, the ownership and right-of-way along rail lines can be complicated. A rail corridor with no tracks on the rail bed can be regarded as abandoned, inactive or even active by state and federal agencies. Each situation is unique, and thorough research is always advisable.



This internal trail in the Rhonda development connects with the playground in the development’s common open space.



Many of the existing trails & paths in Chester County are also sewer or powerline corridors.

Identifying Possible User Facilities – If a municipality proposes to establish a segment of trail it may wish to identify user facilities along that trail. This should be done regardless of whether the trail is long or short, since some short trails get high-density use. Such facilities might include:

- Public restrooms
- Parking
- Restaurants/deli's
- Grocery stores
- Pharmacies
- Public phones
- Water fountains
- Hardware stores
- Bicycle repair shops

Potential user facilities may already exist along a proposed trail corridor. For example, parking lots serving train stations or office parks might also serve weekend trail users.

Restrooms in shopping malls or municipal parks may also be well suited for trail users. Trail planners should coordinate with the owners of parking and restroom facilities before designating them as possible trail user facilities. Some businesses may be eager to provide facilities as a way to generate more customers on weekends. It is sound planning to identify user facilities even if there is no immediate need for them. This way, if the need for them arises, the facilities can be built in a coordinated fashion and with minimal delay.

Identifying Possible Trailheads – A trailhead is an area designated as the official starting point or access point to a trail, usually a large multi-use trail. A trailhead may be as simple as a gravel parking lot with a sign or kiosk that shows a trail map and a list of trail rules. Conversely a trailhead could be a constructed entranceway with a ranger station and restrooms or a tourist-oriented gateway in the middle of a historic downtown. The comprehensive plan should inventory these existing areas as possible trailheads, along with vacant properties along the trail corridor whose locations may be well situated to support a trailhead.



User facilities, such as this restroom in Ridley Creek State Park, are important trail & path destinations.



Trailheads provide information, present rules and regulations, help give the trail a unique identity.

Identifying Legal, Liability and Management Constraints—When evaluating a possible trail & path, trail planners need to consider legal, liability and management issues. For example, a historic rail bridge may provide an ideal link between two existing trails. However, maintaining this old structure in perpetuity may cost more than the municipality can realistically afford. Likewise if this trail is to be used by children or unsupervised young adults, the liability insurance may eliminate the possibility of using the bridge. Road crossings are another major concern, since it is the municipality that will be responsible for providing and maintaining signage and line striping. Trail planners should coordinate with PennDOT and any rail companies regarding crossings. Planning for trails & paths should also consider all of the easement, regulatory and legal issues that are evaluated when planning any public facility.



Like any public facility, trails & paths present a unique set of liability and management constraints which should be considered in the planning process.

Addressing Key Trail & Path Policies in the Comprehensive Plan

The comprehensive plan sets policies to be enacted through zoning and other enforceable ordinances. However, the comprehensive plan should also provide background to explain why a policy is worthy of consideration. The following section presents key policies that should be considered when planning for trails & paths.

Addressing Developer-Built Trails & Paths—The municipal comprehensive plan should establish a policy regarding the construction of trails & paths by homebuilders as part of the land development process.

Such a policy can help to avoid disputes that can, and have, arisen when homeowners oppose the developer's construction of a trail in their subdivision, even though the trail was included in the approved construction plans. Trail planners should know that homeowner's may not always be aware that trails are going to be built in their new subdivision, even though it is clearly noted on plans. Or residents may see the plans but not fully appreciate the significance of the trails until after they have moved in.

In some instances, municipalities have had no option but to accept that an approved trail will not be built. This turn of events is unfortunate since the municipality loses out on an amenity that would have involved no expenditure of tax dollars. To avoid this situation, municipalities should make a policy that all trails & paths included in approved development plans must be built along with sidewalks, roadways and other infrastructure prior to the construction of houses. Trails & paths should also be included in the performance guarantee. Municipalities should set policy as to whether the trails & paths will be municipally owned and maintained, similar to determination for sidewalks or roads. This approach helps the homebuyer make a more informed decision, since he or she can see what the finished trail or path looks like before buying the unit.



Trails & paths should always be constructed before or during the construction of the buildings they will serve.

Addressing the Paving of Trails & Paths—The comprehensive plan should address, in general terms, the type of paving used on developer-built trails & paths. In the past, some homebuilders have constructed walking paths within subdivisions that were not paved for year-round use. These paths were covered with loose gravel or woodchips. Unfortunately, such loose paving can erode when there is a major rainstorm that generates heavy runoff. The ongoing repair of eroded trails is a major management issue in parks and natural areas throughout the United States, impacting small and large trails alike. Municipalities should therefore set a policy that all developer-built paths should be paved, so that recurring maintenance cost do not have to burden the local government or homeowners associations. Just like sidewalks, paths should be paved. Examples of the costs of different paving types are presented in **Appendix C**.



Compacted gravel can be used in low volume paths.



Macadam is preferred for paths since it has lower maintenance cost and is less susceptible to stormwater erosion.



This compacted gravel trail has a coarse stone curb to protect it from stormwater erosion.



This section of the County Struble Trail has a macadam paving, which is also suitable for light use by access vehicles.

Addressing Liability—Broadly speaking, state laws address trail & path liability on both public and private property. Municipalities have liability for municipally owned trails & paths in much the same way that they have liability for sidewalks and parks. PA Act 586 of 1965, the Recreational Use of Land and Water Act addresses liability on trails & paths that pass through private property. The stated purpose of this act is “to encourage owners of land to make land and water areas available to the public for recreational purposes by limiting their liability.” In regard to trails & paths, this law is designed to provide protection to landowners from lawsuits as long as there is no charge for using the trail & path, and as long as there is no “willful or malicious failure to guard or warn against a dangerous condition, use structure or activity.” Municipalities should consult their solicitors for guidance regarding liability.

Addressing Ownership—The comprehensive plan should set general policy regarding who will own and maintain a trail & path once it is built. Trail planners should develop an approach that works given the unique features of their community, keeping in mind that ownership of a trail should only be assigned to parties who are capable of maintaining it. Some municipalities have trails that extend onto or near large tracts of land, like farms or privately held preserves. The comprehensive plan needs to address if or how these properties will be accessed, or if a recreation easement is needed. Above all, it is important to set the ground rules so that government officials and private landowners have a clear understanding of their responsibilities.

Trail planners should address trail & path ownership much like they address the ownership and maintenance of sidewalks. As with sidewalks, trails & paths can be the responsibility of the municipality, a homeowners association, or individual landowners. Any trail that is a key link in a municipal-wide network should be publicly owned. As a trail network grows, municipalities may find that some privately-owned local trails are used as key trail links, even though they were not planned that way. In such cases municipalities should consult with the owner and consider taking ownership.

Security and Emergency Vehicle Access—Security is an essential component of any trail & path project, and it should be addressed early in the planning process, when the project is still in the concept stage. Addressing security involves determining who will police the trail at all hours of the night and day. It is important to know during the design stage if state or municipal police will provide security, or whether there will be a trained and armed corps of park rangers, such as those who patrol County Parks in Chester County. Security affects trail & path design, especially lighting. If local police in cruisers are to patrol a trail at night, it is important for the trail to be located near roadways, so that the trail surface can be illuminated by the police car’s spotlight. Trail planning should ensure that the trail & path can be accessed by emergency vehicles including police cars and ambulances. In many cases, emergency vehicles will not be able to drive along all parts of a trail & path, but thought should be given to how all parts of the trails will be accessed.



Appropriate signing is one tool for addressing trail & path liability.



Whoever owns a trail or path should have the staff and funding available to manage and repair it.



Emergency vehicle access should always be considered in planning a trail & path.



Handicapped accessibility is important for trails & paths, especially since so many users are elderly.

ADA Compliance—The Americans with Disabilities Act (ADA) of 1990 is a civil rights law that prohibits discrimination on the basis of disability. The ADA prohibits public entities from constructing sidewalk or trail facilities that are inaccessible to people with disabilities. Although the current ADA Accessibility Guidelines (ADAAG) do not specifically address sidewalk and trail design, the guidelines do contain provisions that are applicable to sidewalks and trails. Designers should follow the applicable guidelines in ADAAG whenever possible. In some cases it may be structurally impractical to fully implement ADA requirements at all points in a trail network. In general, trail planners should make an effort to assure that any new multi-use trails on gradually sloping terrain comply with ADA so as to provide disabled users with an opportunity for recreation. The Chester County Parks and Recreation Department addresses ADA compliance by ensuring that trails have a stable surface installed to a profile slope of 4.65 percent or less.

and Recreation Department addresses ADA compliance by ensuring that trails have a stable surface installed to a profile slope of 4.65 percent or less.

Addressing ATV Use—State policies permit municipalities to designate trails or paths as non-motorized transportation facilities unsuitable for All Terrain Vehicles (ATVs). ATVs are motorized recreational vehicles, including snowmobiles. In recent years, the Department of Conservation and Natural Resources (PA DCNR) has opened suitable trails on State Forest Lands to ATV use, but not other state properties. In Pennsylvania, all ATVs, except those used solely for business or agricultural purposes, need to be registered and titled with DCNR. According to DCNR rules, ATVs may be operated “only on streets and highways designated and posted as an ATV road by the government agency having jurisdiction over that road.” It is illegal to ride an ATV on private property without permission from the landowner. Furthermore, the DCNR regards riding an ATV in “an area, or on a trail or roadway that is not open to ATV use,” as an illegal operation. Municipalities that have designated their community trails for non-motorized use are therefore consistent with DCNR policies.



Municipalities have the option of restricting ATVs from trails & paths.

Evaluating User Needs in the Comprehensive Plan

One of the most important aspects of trail & path planning is evaluating user need. This task is commonly initiated by a municipal Environmental Advisory Committee (EAC) or a Parks and Recreation Commission. Trail planners can also gauge the public's preferences by consulting a Citizen Advisory Committee, holding public meetings, or conducting surveys. The results of this outreach are often found in the appendix of a comprehensive plan and referenced as the justification for a policy or objective. In recreation planning, gathering public input evaluates **user needs**. The **user** is anyone who might use a recreation facility, including a trail or path. Information gathered about potential users is essential in determining the type and size of a trail & path, and what kind of effort will be required to properly manage and police the facility.

User Surveys—The goal of a user survey (and other public outreach efforts described in **Appendix A**) is to identify the types of users that will patronize a trail & path. A general survey created for a comprehensive plan can easily be modified to also serve as a trail & path user survey. Questions can be added such as:

- If there was a network of trails in your neighborhood, how often would you use them?
- What recreation features would you use if they were present in your community? (Give a listing of options that include trails, bicycle routes or paths, and equestrian paths or bridle paths.)
- What recreation activities would you like to see in your community? (Give listing of options that includes walking, hiking, bicycling, in-line skating, horseback riding, and mountain biking.)



The design of a trail & path should consider user needs along with physical constraints.



The design of a trail & path network will vary based on the type of user.

Identifying the Types of Users—When planning and designing a trail & path, it is essential to know who is going to use it. Will it be the elderly, families with children and dogs, or active adults using bicycles and in-line skates? Will parts of the network have different users? These questions need to be addressed to assure that the trail is not underdesigned, such as a one-lane walking path that ends up being used by in-line skaters and bicyclists. To avoid an under-designed trail, planners should identify what recreation activities are popular in their community. It is important to remember that strictly enforcing rules at all points along a long trail can be difficult, even with a well-staffed corps of rangers. Therefore, it is more practical to design a trail with multiple uses than to attempt to ban popular uses.

Rather than creating a trail with limitations that will be difficult and impractical to enforce, trail planners should strive to determine what uses are likely to occur, and then modify the trail design to accommodate them. Often it is impossible to accommodate all users. For example, if a rail bed with many bridges is donated to the municipality, it may be impossible to use that facility for horseback riding due to the low clearance of the bridges. In many cases, different users in a trail & path network can be accommodated by separating them into single use paths. This usually involves dividing a section of trail into a slow moving walking path and a fast moving bicycle path.

Citizen's Advisory Committees and Trail Users Groups—A specially appointed Citizen Advisory Committee (CAC) is a task force that can be useful in gathering information about potential trail & path users and other design issues. Ideally, the CAC should represent a broad range of interests including recreation enthusiasts, local businesses operators, and representatives with expertise in real estate acquisition and transportation. The CAC can also be called upon to gather information in the field, such as the conditions and locations of sidewalks, and the suitability of road shoulders for use as bicycle routes. There are a number of trail clubs and trail users groups in the Delaware Valley as listed in **Appendix D**. The groups can be a great source of background information since they are keenly aware of existing conditions in the field. Typically these trail clubs and groups are also activists that also engage in pro-trail lobbying activities. They should not be regarded as a neutral party.



A Citizens Advisory Committee (CAC) for a trail along a utility corridor might include a representative of the utility company.

Recommending a Trail & Path Network in the Comprehensive Plan

The comprehensive plan can recommend that a network of trails, paths, sidewalks and bicycle routes be established. It can also recommend specific trails & paths. These recommendations can be quite general and presented as an overall concept, or quite detailed, even serving as a preliminary community pedestrian and bicycle master plan. Some communities have constructed trails & paths based on recommendations in their comprehensive plan, bypassing other master planning and moving directly to design studies or engineering plans. Article XI of the MPC also permits multi-municipal comprehensive plans that address infrastructure such as trails. In considering which approach to take, municipalities should take funding sources into account. Some state and County grants may encourage - or even require - a detailed community pedestrian and bicycle master plan, in which case a comprehensive plan-based approach may be insufficient.

Establishing Trail & Path Corridors – Trail & path corridors should be included in a comprehensive plan and depicted on a plan map. These corridors should be depicted as a large dotted line or a wide band of 75 feet or wider. The corridor may have to be narrower in areas such as bridge crossings or other control points. Likewise, negative control points like a junkyard should be left out of a corridor to make it clear that the site is not being considered for recreation. Existing trails or specific trail alignments that have already gone through some kind of master planning can also be included on this mapping. However, it is important to differentiate between a trail and a corridor, and include that distinction clearly in the legend of the trails network plan map.

Greenway and Heritage Corridors – Trails & paths can be built as part of a larger greenway or heritage corridor. These corridors are usually located along valleys that include a mix of trails, navigable waterways, historic sites, and wooded areas. There are many benefits to developing trails & paths as part of a larger greenway or heritage corridor. A trail is often the central feature that brings users into a greenway or a heritage corridor. Such trails are recreational, but they also serve to raise public awareness about natural or cultural resources. As a result, trails within these corridors are well suited to receive grants. A heritage corridor can also give the trail a marketing identity, usually symbolized by a logo that appears on signs along the trail and throughout the corridor.

Trail Functional Classification – Trails & paths should be designed and built according to the function they will have. Trails with different users - such as walkers, bicyclists or equestrians - must be constructed differently. In most communities, there will be less than ten different kinds of possible trail/sidewalk designs, which, all together, represent a trail functional classification. The comprehensive plan should give general parameters as in **Figure 2.1**, but not list trail widths or other construction related details. Those details should be included in the subdivision and land development ordinance. The subdivision ordinance may list multiple design options for each functional classification. As new technologies evolve, the subdivision ordinance can be periodically amended, with or without updating



Trails are often the central unifying feature of a heritage corridor.



The trail functional classification can determine what types of users are, and are not, permitted.



Municipal trail standards can ensure uniformity for road crossings and other features.

the generalized functional classifications presented in the comprehensive plan.

Establishing Municipal Trail Standards – Public trails & paths need to follow engineering guidelines set forth by the American Association of State Highway Transportation Officials (AASHTO). Therefore, it is not necessary for a comprehensive plan to include detailed trail & path engineering standards. However, for the sake of clarity, trail planners may wish to include a general discussion of trail & path standards regarding right-of-way width, trail width, surface types, trail grade, vertical clearance, and horizontal clearance. Such standards are usually mentioned as a recommendation item in the comprehensive plan but presented in detail in the subdivision ordinance, along with

standards for other similar features such as sidewalks and roadways.

Prioritizing Segment Planning and Construction – In the comprehensive plan, trail planners should prioritize the construction of trail & path segments. This discussion should be generalized in municipalities where local surveys show that there is a low interest in trails. The benefit of such a generalized approach is that it will help avoid controversy. The downside is that it is less likely to be implemented. When using this less specific approach, the goal should be to establish policies that will be flexible enough to permit trails & paths to be pursued at some point in the future. Some communities that never had much interest in trails may come to see this situation change quite quickly after they get an influx of young families with children or after a rail line is abandoned.

Municipalities that choose to actively construct a municipal trails & paths network can use their comprehensive plan to prioritize the construction of segments within the network. These can be included on a plan map that shows specific trail corridors. In general, the establishment of a network begins with the construction of one multi-use trail that links to at least two destinations. Ideally, the goal should be to build one segment that will be used as a primary trail and then expand the network out from the primary trail. However, in some communities it may be best to make the first trail & path an existing walking path even if it is not a primary trail.



Trail & path planning should be prioritized so that communities with a strong interest in trails & paths are served in a timely manner.

Figure 2.2: Generalized Functional Classifications for Elements of a Trail & Path Network

Classification (Users)	Type of Use	Time of Use	User Capacity
Bicycle Route – Road Shoulder (Bicyclists)	Recreational bicycling and commuting by young adults and adults.	Intermittent use with increased use on weekends, after evening rush hour and before morning rush hour.	Mostly individuals or pairs, with occasional groups.
Bicycle Route – Low Volume Roadway (Bicyclists)	Recreational bicycling and commuting by young adults and adults.	Intermittent use with increased use on weekends, after evening rush hour and before morning rush hour.	Mostly individuals or pairs, with occasional groups.
Trail-Multi Use (Walkers, hikers, bicyclists, & in-line skaters)	Mostly recreational use for many types of non-motorized users of all ages.	Low to heavy use with increased use on weekends, after evening rush hour and before morning rush hour.	Individuals and small to large groups.
Path-Pedestrian (Walkers & hikers)	Mostly recreational use for pedestrians only of all ages.	Low to moderate use with increased use on weekends, after evening rush hour and before morning rush hour.	Individuals and small to large groups.
Path-Bicycle (Bicyclists)	Mostly recreational use for bicyclists only of all ages.	Low to moderate use with increased use on weekends, after evening rush hour and before morning rush hour.	Mostly individuals or pairs, with occasional groups.
Path-Equestrian (Horses/double track, walkers, & hikers)	Recreational use for equestrians and pedestrians only by young adults and adults.	Intermittent use with increased use on weekends, after evening rush hour and before morning rush hour.	Mostly individuals or pairs, with occasional groups.
Path-Internal (Walkers & bicyclists within a development)	Mostly recreational use by pedestrians and bicyclists of all ages.	Low to moderate use at all times throughout the day.	Individuals and small groups.
Sidewalks (Walkers)	Recreational and commuting use by pedestrians of all ages.	Low to heavy use, at all times throughout the day.	Individuals and small to large groups. Varies widely based on land use.

Source: CCPC 2006

Recommending a Regional Trail Planning Study—In many instances, a trail must cross through multiple municipalities in order to provide a viable recreation experience and link two destinations. In such cases a regional trail planning study is needed to ensure that the trail & path has a consistent plan and design. The comprehensive plan can make such a recommendation. It is prudent to ensure that each municipality involved has a similar recommendation in their comprehensive plan or in an adopted proclamation. A regional trail planning study can be anything from a generalized concept study to a multi-municipal community pedestrian and bicycle master plan as described below. A regional trail planning study can also be conducted through a multi-jurisdictional initiative or a recreational commission or authority.



A community pedestrian and bicycle master plan can help link parks to residential areas via trails & paths.

Recommending a Community Pedestrian and Bicycle Master Plan—Some municipalities in Chester County have pursued trail & path planning by completing a municipal wide community pedestrian and bicycle master plan. Such a plan should address not just one trail, but all the trails, paths, sidewalks, bicycle routes and destinations including schools within a community. It can also address bridle paths and other non-motorized transportation. This plan can be recommended in a comprehensive plan. Once completed, parts or all of the master plan can be adopted as part of the comprehensive plan. This approach gives the study more legal standing and indicates a high

level of support by local elected officials. Detailed trail design standards presented in a community pedestrian and bicycle master plan can also be included in the subdivision ordinance.

Recommending a Design Study—In some instances, a community pedestrian and bicycle master plan can provide sufficient detail so that it can be used as the final planning document for a trail & path project. In such cases, the design and engineering plans are created based on the alignments presented in the master plan. However, it is often necessary to complete a design study for a segment of trail identified in the master plan, especially if that segment involves engineering and construction issues such as stream culverts or retaining walls. The design study will focus on the final alignment and address issues such as road crossings, right-of-way acquisitions, and costs. Based on this document, preliminary/final designs can be created. Often, a design study is only needed for the large primary trails within a network. Smaller connector paths are then built by developers or the municipality using **design-build plans**, which are drawn-up in the field and constructed soon after. In the past, the design study was called a **feasibility study**.

Recommending Updates to Ordinances—In most cases, a municipality that wishes to pursue a municipal trail & path network will have to update its zoning ordinance and its subdivision ordinance. Municipalities may also find it necessary to create an official map, or update it. The comprehensive plan should therefore recommend, in clear and straightforward language, that these three planning tools should be revised or created to reflect the trail & path policies included in comprehensive plan.

Comprehensive Plan Example: Pocopson Township

Pocopson Township adopted a new comprehensive plan in October 2001. This plan addressed trails & paths in the text excerpts presented below. (Since 2001, the township has created a detailed trail master plan, which has refined their overall trail planning.) The Pocopson comprehensive plan did not include a trails & paths map. However, a map entitled *Recommendations Plan* showing existing and proposed trails was included in the municipality's *Open Space Recreation and Environmental Resource Plan* (OSRER), adopted in February of 1993. The proposed trails were presented using dotted lines, which is an appropriate way to mark a corridor whose final alignment has not yet been determined. Since the OSRER is a component of the municipal comprehensive plan, Pocopson Township has included a map of existing and future trails in its comprehensive plan.

CHAPTER 1: PLAN SUMMARY

Page 13: Recreation Facilities & Programs Recommendations

“Objective: Continue to work toward completion of the Township trail system, addressing linkage, accessibility, general suitability, interconnection of open space and recreational sites and appropriate uses, per the recommendations of the Township’s Open Space, Recreation and Environmental Resources Plan.

- Action: Amend the zoning ordinance to include overlay provisions to promote conservation of priority open space resource areas.
- Priority: Immediate.
- Charge: Planning Commission.
- Discussion: This will enable the Township to prioritize the preservation of those areas with the most potential to expand the objective discussed above.

Page 17: Transportation Recommendations

“Objective: Require non-motorized travel facilities throughout the Township (bicycle routes, hiking trails, equestrian trails).

- Action: Amend the Subdivision and Land Development Ordinance to include requirements for pedestrian circulation in areas of high-intensity use.
- Priority: Immediate.
- Charge: Planning Commission.
- Discussion: In order to move pedestrians safely through these areas.”

Note:

This text demonstrates that trails & paths are an integral part of municipal recreation planning. Furthermore, it describes how the trail map included in the open space plan will be used to update the zoning, which is also a map-based planning tool. This summary establishes a priority and clarifies the role of the municipal planners in this effort.

Note:

This text demonstrates how trail & paths are an integral part of transportation planning, specifically pedestrian circulation. It emphasizes that some travel facilities should be planned for non-motorized travel, and sets forth that the subdivision ordinance should be the tool for addressing requirements for pedestrian circulation in areas of high-intensity use.

CHAPTER 2: LAND USE AND HOUSING PLAN

Pages 21 and 22: Results of the Township Opinion Survey

“In mid-1998, a Township wide opinion survey was conducted in order to seek residents input on issues...When asked what type of recreation facilities they would like to see developed (assuming some types of facilities were to be developed), trails for hiking, equestrian, and bicycling uses received a far higher rating than any other types of facilities.”

Note:

This text demonstrates that there is a documented public need for trails & paths, which can have an impact on overall municipal land use.

CHAPTER 3: COMMUNITY SERVICES AND FACILITY PLAN

Page 40: Open Space Plan Recommendations

“Continue formal establishment of Township trails system, and seeking in particular to acquire missing links in established corridors...In addition the use of walking trails and passive recreation should continue to be encouraged and supported by the Township on the 314 acres overseen by the Brandywine Valley Association in the north-central portion of the Township.”

Note:

This text sets forth that trails & paths provide a public service much like any other necessary utility. It also demonstrates that a trail & path network can extend beyond public property and into private property, in this case a nature preserve.



Trails & paths are transportation infrastructure and should be addressed in local ordinances.

CHAPTER 4: TRANSPORTATION PLAN

Page 52: Pedestrian, Bicycle and Equestrian Circulation

“In addition to vehicular circulation in Pocopson Township, pedestrian and bicycle circulation should be required for Township residents. In addition to the obvious health and environmental benefits, pedestrian and bicycle circulation can help decrease congestion on local roads and create recreational opportunities. In a rural community such as ours, with no centralized commercial facilities, the potential that exists is primarily for open space trail network and sidewalks within subdivisions. Currently, therefore, no opportunities for a linkage between residential and commercial uses are being completed. However, with the new development of a new public school near the intersection of Route 926 and Pocopson Road and the Township’s plan to permit higher-intensity uses, opportunities for such a linkage may expand. The following recommendations for pedestrian circulation design features should be considered:

- A sidewalk or trail linkage should be implemented between the new school and any nearby residential or commercial facilities, such as links to the recommended traditional village.
- Crosswalks should be installed (along with vehicular speed controlling devices) along Pocopson Road or on new roadways promoting safe pedestrian access.
- Pedestrian islands and pedestrian activated signals should be installed where they are necessary to ensure the personal safety of pedestrians.

Although the Township’s steep terrain limits the potential for bicycle travel, Route 842 is used as a bicycle commute route to West Chester Borough. We should consider consulting with a group such as the Chester County Cycling Committee regarding bicycle specific road improvements.”

Note:

This text notes that trails & paths are valid transportation features that should be required, not just encouraged. It sets forth that specific new developments should include trail & path planning. It also addresses the need to ensure safety at crossings by considering trails & paths as a integral part of future road planning. Lastly it demonstrates that roadways can be used as bicycle routes and not just for motor vehicles.



In many Chester County communities, access to equestrian paths enhances real estate values.

APPENDIX 4: TRANSPORTATION INVENTORY

Page 100: Non-Motorized Circulation Opportunities

“Pedestrian circulation opportunities in a rural community like Pocopson primarily consist of opportunities for trail networks and sidewalks within residential subdivisions. Since there are no areas for dense residential or commercial development, either within or adjacent to the Township, there are no local destinations for pedestrian movement. The Township’s Open Space, Recreation and Environmental Resources Plan contains an inventory of existing trails in the Township and recommendations for future trails and linkages. These trails primarily serve a recreational function, rather than a transportation function, however.

The Township road system also provides opportunities for bicycle travel and the Township’s proximity to the employment center in and around West Chester Borough could make bicycle travel a useful commuting alternative to automobile travel. Because of the steep grades found on many roadways within the township, however, bicycle travel is not likely a viable means of transportation except for a very small percentage of the population.”

Page 100: Planning Implications

“Opportunities for pedestrian and bicycle travel are very limited in the Township. While a local trail system will be of great use from a recreational perspective and while our roads provide excellent opportunities for recreational bicyclists, it is unlikely that pedestrian or bicycle travel will be significant factors in the Township’s circulation system in the coming years.”

Note:

This text supports the policies presented in the main text of the comprehensive plan and explains that trail & path planning in the Township will focus mostly on recreation rather than commuting. It justifies this approach by noting that there are steep slopes that limit bicycle commuting to the nearest employment center.

Note:

This text emphasizes that bicycle planning should be pursued, but not be viewed as a means to resolve overall transportation circulation issues.

Chapter 3



The Official Map and Ordinance

Uses of the Official Map

Section 401 of PA Act 247, the Municipalities Planning Code (MPC) authorizes municipalities to adopt an official map that shows “appropriate elements or portions of elements of the comprehensive plan” that relate to public lands and facilities. These facilities may include existing and proposed “public grounds” or “pedestrian ways and easements.” Trail planners can use the official map to map a proposed municipal trail network. In order for an official map to have regulatory authority, a stand-alone ordinance must also be adopted setting forth the purpose and function of the official map. Once adopted, both the official map and its ordinance must be recorded with the County recorder of deeds.



The official map can reserve land to ensure that trails & paths logically link to other park and community features.

Drawing a trail alignment on an official map does not by itself constitute the official establishment of, or opening of, the trail. Nor does it obligate the municipality to build or maintain the trail. Instead, the official map ordinance allows a municipality to defer issuing development permits for a limited period of up to one year, during which time the municipality must either buy the property or allow the development to proceed. The official map sets aside the land upon which future trails can be built by either public or private entities. The official map should be drawn before-and concurrent with-updates to the zoning and subdivision ordinances, so that these ordinances can include text that refers to the official map.

According to the MPC, a landowner must submit written notice to the municipality if he or she intends to develop a parcel of land. If this property is crossed by a proposed trail that is drawn on the official map, the municipality has one year in which to protect the corridor either by an easement or in-fee acquisition. The municipality should notify the developer that such protection will be pursued. In some cases, a municipality will also request that the developer transfer ownership of the trail to the municipality once it is built. In a sense, the official map gives the municipality the right of first refusal. As long as the proposed trail is on the official map, the municipality has one year in which to decide to ease or acquire the land to be used for the trail (or not.)

Features drawn on the official map do not need to be surveyed. However, the official map should be sufficiently detailed to clearly indicate what tax parcels will be crossed by a potential trail corridor. Once a municipality chooses to implement the easement or acquisition of a trail corridor, the area eased or acquired will have to be surveyed. Trail planners should be sure to consult environmental maps from the comprehensive plan before drawing a trail corridor on an official map. This way the corridor will avoid crossing through areas not suited for trails such as large wetlands, water bodies or steep slopes. Whenever possible, the official map should always be cross-referenced with other municipal plans and ordinances.

Planners should consider drawing the following features on an official map:

- Existing/proposed internal paths (within a development).
- Existing/proposed primary trails (usually only one or two within a municipality).
- Existing/proposed trails & paths (paths may be designated as bicycle, pedestrian, or equestrian paths).
- Existing/proposed bicycle routes (on an official map these are usually roadway shoulders).
- Destinations (may include trail heads, schools, parks, playgrounds, open spaces and downtown centers. These features will not be publicly acquired but can be included on the official map to illustrate the overall trail network.)

All of these features can be listed in a map legend under the heading “Trail System” or “Trail Network.” This approach will clarify to the reader that the map is detailing a municipal-wide infrastructure, which may be useful if one of the trail segments presented on the map is challenged. Bicycle routes presented on the official map should refer to roadway shoulders rather than low-volume roadways. Bicycles are permitted on most roadways, making it unnecessary to designate low-volume roadways as bicycle routes on the official map. Wherever possible, the official map should use the terminology and trail functional classification that is found in the comprehensive plan.



Trail & path destinations, from parks to village centers, should be included on an official map.

Official Map Ordinance Example: Kennett Township

In 2001, Kennett Township adopted a six-page stand-alone official map ordinance entitled:

“An Ordinance Establishing, Regulating and Determining for Lands in Kennett Township: The Mapping and Reservation of Land for Future Public Streets and Public Grounds; the Reservation of Building within Mapped Areas; and Providing for the Adoption, Amendment, and Enforcement of this Ordinance.”

In the introductory “Whereas” statements, the ordinance states:

“WHEREAS, the Planning Commission has assessed present problems and future desires relating to transportation, park and open space needs, and other public facilities...”

Under Section 103: Purpose, the ordinance states:

“This ordinance is enacted for the purpose of serving and promoting the... general welfare: to...provide for the recreational and open space needs of the community; and to facilitate the subdivision of land and the use of land.”

Note:

This title clarifies that the official map addresses public grounds, which would include trails & paths and also the reservation of buildings, which includes land within a residential or industrial development that might be reserved for a trail corridor.

Note:

This text clarifies that the official map relates to future desires for transportation, open space and other public facilities. All three of these descriptions can apply to trails & paths.

Note:

This text sets forth that the official map focuses on the recreation needs of the community, which can include trails. This text also states that the official map deals with both the subdivision of land and the use of land. Therefore, the official map can be used to designate possible future trail corridors that cross over land that will be developed at a future date.

Official Map Example: Uwchlan Township

Uwchlan Township has the most extensive network of constructed trails of any municipality in Chester County. Uwchlan Township's Official Map, presented as **Figure 3.1**, was last amended in 2001. This map shows the features listed below, some of which are included even though they will never be acquired by the township. When taken together, all these features form a municipal-wide trail network including primary trails, destinations, and internal trails & paths:

- School property
- Proposed trail system
- Existing trail system
- Future park development
- Open space (existing and proposed)

There are a number of features on this map that show great foresight by the trail planners who created it. The term **trail system** is used instead of just **trail**, thus emphasizing that the end product is not a single trail but an entire cohesive network. By adding the zoning districts from the zoning ordinance to this map, Uwchlan Township's planners demonstrated that the official map was consistent with the adopted zoning ordinance. The drawings of existing residential structures on the map clearly illustrate that the proposed trail system is practical and reasonable given the development that has already taken place in the township.

Uwchlan Township has been fortunate in that their community hosts a large section of County Struble Trail, a facility designed and operated by the Chester County Parks and Recreation Department (CCPRD). The CCPRD did extensive planning for the County Struble Trail. As a result the township had much of their regional trail planning done for them. This explains why Uwchlan Township does not have extensive trail planning section in their zoning ordinance or subdivision ordinance. As a result, the official map is the dominant ordinance used in trail planning. Most municipalities will not be able to take such an approach.

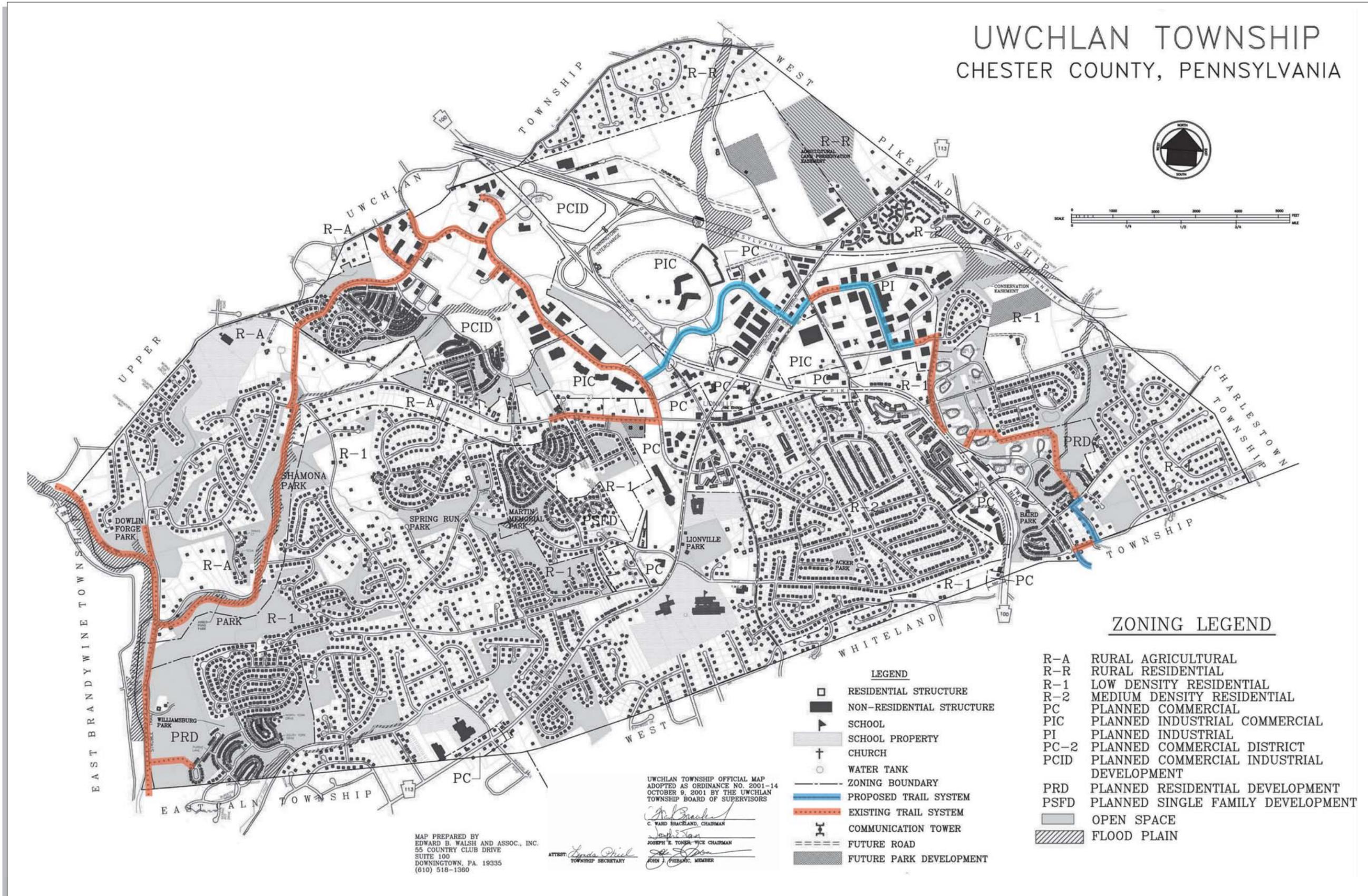
Uwchlan Township's success has been a result of strong political and community support. They are a highly suburbanized community with few large open spaces available for creating new recreational facilities. In such an environment, trails are one of the few options for expanding recreation opportunities to meet the needs of a growing population. In a sense, Uwchlan Township has both opportunities and limitations that support trail planning. It is a testament to its trail planners that the township has been able to use just one tool, the official map, as a way to focus what has evolved into a functioning trail network extending throughout their community.



Uwchlan Township has one of the most extensive municipal trail & path networks in the County.

Figure 3.1:
Uwchlan Township
Official Map

Source: Uwchlan Township, 2001



Chapter 4



The Zoning Ordinance

Where to Address Trails & Paths in the Zoning Ordinance

Section 603 of PA Act 247, the Municipalities Planning Code (MPC) authorizes municipalities to adopt a zoning ordinance that may determine location, construction, and “use of structures.” Zoning ordinances must also be designed to promote protect and facilitate “public health...recreational facilities” and “public grounds.” Since paved trails & paths are structures that promote public health and recreation, and are used by the public, they can be regulated in municipal zoning. The same is true of a municipal trail network as a whole. Section 604 of the MPC notes that provisions of zoning ordinances “shall be designed” to promote and facilitate “recreational facilities” and “public grounds.”

Some municipalities in Chester County have successfully constructed a network of trails without extensively revising their zoning ordinance to specifically address trails. Although this approach is sometimes unavoidable, it is not recommended. Municipalities that do not address trails & paths in zoning are less likely to receive state or County grants to build trails. Furthermore, trail & path projects that encounter controversy are less likely to be delayed or terminated if the zoning ordinance includes provisions for trails & paths.

Because trail & path planning is a new field, there is no single model that should be followed when including trails & paths in a zoning ordinance. However, as with any planning project there is one common sense rule: keep it simple. It is best to have most of the provisions relating to trails & paths grouped into one separate subsection. Other articles and sections can then refer to the trail & path subsection as needed. At a minimum, municipalities should address trail & path planning using the following general outline:

Title, Purpose, Interpretation, and Definitions Article

The General Purpose Section of this article describes the purpose of the ordinance and should include a trails & path subsection. This subsection should explain that one of the purposes of the zoning ordinance is to provide for pedestrian and bicycle transportation linking all parts of the municipality. The exact language may differ depending on the community, but it should emphasize the need for a coordinated network extending throughout the municipality, not just isolated facilities.

The Community Development Objectives Section of this article, which details long-term community goals, should address trails from a user’s perspective. It should state that there is an objective to establish or provide a network of safe, well-



Trails & paths should be addressed in zoning just like common open space, sidewalks or parks.



Trails & paths are a form of community development and should be defined in the zoning ordinance.

designed and well-maintained trails, paths and bicycle routes to be used by the general public. The language used should reflect the policies included in the comprehensive plan. If possible, this text should also reference the official map or an adopted trail network plan map adopted as part of the comprehensive plan.

The definitions in this article should include terms such as “trail,” “path,” “bicycle route,” “trail network,” “trail head,” “open space,” and “common open space.” One of the greatest shortcomings of many zoning ordinances in Chester County is that they simply do not define the basic terms used in trail & path planning. Fortunately this situation is easily remedied, and these definitions can be added, even if trails & paths are not yet addressed in the rest of the ordinance. These

definitions should also be consistent with definitions in the subdivision ordinance, features mapped on the official map, and functional classifications included in the comprehensive plan.

General Provisions/Common Regulations Article

This article, which may be called **general provisions** or **common regulations**, should include a section dedicated entirely to trails & paths. This section should set forth where trails & paths should be constructed, such as in common open space or in areas that would create links. It should also reference the trail subsection of the subdivision ordinance that deals with design standards, functional classification and issues of ownership, liability and maintenance. Such design related issues should be addressed in detail in the subdivision ordinance, but only referenced in the zoning ordinance. The Trails & Paths Section of the General Provisions Article should address key issues relating to the configuration and location of land used for trails & paths including, but not limited to:

- The need for homebuilders to make provisions for the construction and dedication of trails as part of the normal development process.
- The need to logically link existing and proposed trails as part of an integrated network of sidewalks, trails, paths and bicycle routes.
- The need to implement the official map or a trails network plan map included in the comprehensive plan.
- The need to link internal trails (within a development or a neighborhood) to primary trails.
- The need to link to key destinations such as parks, public transportation, schools and town centers.
- The need for minimum trail setbacks from roads and building so as to maintain safety and privacy.
- The need for maximum trail setbacks to ensure access by emergency vehicles.

Open Space Provisions

Provisions for common open space resulting from cluster development can be included in a zoning ordinance as a separate article or as a section under the general provisions/common regulations article. The open space provision may simply be a subsection within the cluster development article. Regardless of its location, open space provisions should address trails & paths. Open space provisions should state that common open spaces are suitable locations for trail & paths. These provisions should also refer to the trail & path section within the general provisions/common regulations article.

Articles Focusing on Specific Zones

Much of a zoning ordinance is composed of articles that deal with specific zoning districts and how they may be developed. A typical zoning ordinance includes residential, commercial and industrial districts. Usually these articles can address trails by referring to the trails subsection under the general provisions/common regulations article. It is best to actually add the words “trail” or “trail network,” rather than just referencing the subsection. Text regarding trails should be obvious and not be “buried.” This way trail & path provisions will not be overlooked by developers or future township officials who many not be familiar with the entire zoning ordinance. It is prudent to briefly mention trails throughout the zoning ordinance, and include a detailed discussion only in the general provisions/common regulations article. Articles dealing with a single zone should address trails & paths in the following locations:

- In the Uses Section, there is usually a subsection that refers to public parks or recreation. This can be amended to include a network of trails, paths, and bicycle routes as permitted uses. As always, emphasize the network.
- The Area, Density and Bulk Requirements or Standards Section should refer to the trail & path subsection of the general provisions/common regulations article. If needed, unique requirements can be added that modify or enhance the text in the general provisions/common regulations article. Such modification may be required in communities that are using innovative zoning techniques.



The need for trails & paths should be addressed in the general provisions/common regulation articles.

Zoning Ordinance/General Provisions

Article Example: North Coventry Township

The North Coventry Township Zoning Ordinance (2003) includes trail definitions and a subsection devoted entirely to pedestrian circulation, which includes trails & paths. A sample of these provisions is presented below:

Section 101: Purpose, under Article 1: Preamble

"This Ordinance is enacted ..., in order to promote, protect and facilitate the public health, safety, and welfare through:

- F. Provision for safe and efficient travel by vehicles, bicycles and pedestrians."
- I. Provisions for...public grounds and other improvements.

Note:

This text, from Sections 101 and 102, clearly demonstrates that trail & path planning is an essential community objective and that the zoning ordinance is being used as a tool for implementing that objective.

Section 102: Community Development Objectives, under Article 1: Preamble

"This Ordinance is enacted to implement the spirit and intent of the 2001 North Coventry Township Comprehensive Plan, 1992 Open Space, Recreation, and Environmental Resources Plan, the 1995 Act 537 Wastewater Treatment Plan and Re-Rating Study, and other applicable codes, ordinances, or studies as amended, which have been formulated according to the following objectives:

- G. Provide for the safe, efficient, and diversified transportation system that addresses both current and future needs of the Township.
- 2. Provide for alternative transportation needs including a network of sidewalks, pedestrian and biking paths, trails, and routes that connect major centers of activity and recreation."

Section 201: Definitions of Terms, under Article 2: Definitions

"Trail—A right-of-way containing a marked or beaten path, either paved or unpaved, for pedestrian, equestrian or bicycle use."

Note:

This text, from Section 201, presents a definition for "trail" that is broad in scope. It includes any parcel of land used for non-motorized uses, and it does not distinguish between trail, path and route. The benefit of this approach is its simplicity. The drawback is that the differing types of trails must therefore be discussed in the other articles, when it might be clearer just to list them in the definitions.

Section 1112: Interior Circulation, under Article 9: Common Regulations

“D. Pedestrian Circulation

The following standards shall apply to all uses, including residential uses, as applicable:

1. The developer shall preserve existing trail and pathways or pedestrian facilities as necessary and desirable to achieve the following:
 - a. Logically continue, link or expand existing pedestrian facilities on, across, and abutting the site.
 - b. Provide pedestrian access to existing or anticipated public bus or train transportation pick up points, public parks, community facilities and commercial areas.
 - c. Implement the Pedestrian Circulation Plan identified on Map 14 of the North Coventry Township Comprehensive Plan of 1989, as amended.
 - d. Provide convenient and logical walkway connections between the entrances of a principle building and its required parking spaces, preferably in conjunction with landscaped planting islands required by Section 1109. A walkway shall be a minimum of six (6) feet wide where it abuts the width of parking spaces where the vehicle may overhang the walkway. Alternatively, wheel stops shall be installed to prevent vehicle overhang.
2. Maximum separation of pedestrian and vehicular routes shall be encouraged for safety and well being of pedestrians. Separation can be in the form of any one combination of the following: horizontal distance; vertical distance (level changes such as overpass, underpasses and embankments); street trees, landscaping, sidewalks and other barriers such as bollards and fences.”

Note:

This text clarifies that trails & paths are to be included in the overall development of land. It emphasizes the need for links to logical destinations and is refers to the Pedestrian Circulation Plan, which is an adopted trails network map.



A zoning ordinance should address trail linkages.

Zoning Ordinance/Common Open Space Example: Elk Township

The Elk Township zoning ordinance, adopted in 2002, includes a cluster development option in its Agricultural Residential District. As a result, trail planners addressed common open space in the article dealing with this land use zone, rather than in the general provisions/common regulations article. This provision is presented below:

Section 605: Cluster Development Option under Article 6: Agricultural Residential District

"F. Open Space Standards

4. Where common open space is designated as separate, noncontiguous parcels, no single parcel shall consist of less than one (1) acre in area. No single area or portion of an area designated as common open space shall be counted toward the minimum required open space wherever such area or portion is less than one hundred and fifty (150) feet in width except in case of a trail corridor or linkage between larger, noncontiguous, open space areas. Any such corridor or linkage shall be a minimum of fifteen (15) feet in width."

*Note:
This text is the only reference to trails & path in this section (605) but it is an important feature because it demonstrates that trails are an approved use of common open space and that the configuration of common open space must have the minimum width needed to accommodate trails.*



Cluster developments set aside open space that can be used for trails & paths.

Zoning Ordinance Example: Pocopson Township

Pocopson Township's zoning ordinance includes text relating to trail & path planning. Many of the provisions that clarify the funding, management and ownership of trails & paths came about through amendments adopted in 2002 and 2003. These amendments were included to implement the trail planning initiatives included in their 2001 comprehensive plan update. The township has taken an extensive and thorough approach to trail planning in their zoning ordinance. Other municipalities may wish to pursue trail & path planning with less of an emphasis on zoning. However, Pocopson Township's zoning provisions are well-constructed examples, some or all of which can be modified for use in other municipalities.

Section 106: Definitions

This section includes two key trail & path related terms, which are:

"Trail: A compacted stone, macadam, or concrete linear structure five to eight feet in width designed to provide alternative transportation and recreation opportunities for use by pedestrians, bicyclists, and/or horseback riders as the Township may determine appropriate."

"Trail and Bikeway System: An integrated system of trails and bikeways designed to link all sections of the Township by paralleling all streets and roads either within the rights of way of such streets and roads or off road within trail easement corridors. The system may be generally delineated by a Trails Map, but precise locations of trails and bikeways shall be determined during subdivision and land development processes or prior to their acquisition. No motorized vehicles shall be permitted to use such trails."

Note:

This text demonstrates a consistent approach to trail planning. These definitions emphasize that trail & path planning occurs at two levels: the trail level and the network level.



The description of a trail & path "system" or "network" should be included in the zoning ordinance.

Section 302: Area Regulations, under Article 3: Residential and Agricultural

Subsection H., which was added to this section in 2002, reads:

*Note:
This text emphasizes that trails & paths are features that are a fundamental aspect of area regulation. Thus, trails & paths are addressed in area regulations along with lot size, yard size, the placement of driveways, and the extent of impervious cover. This text also clarifies that fee in lieu funding can be used for trails.*

“All lots shall provide for the installation and maintenance of trails where it is practical to provide extensions to or links with the Township’s Trail and Bikeway System. Where it is not practical to make extensions to or links with the Trail and Bikeway System, or where portions of the Trail and Bikeway System that will serve the property proposed to be developed have been or will be located on nearby or adjacent properties, a pro-rated fee-in-lieu of contribution shall be made to the Township’s Trail and Bikeway Fund.”

Section 303: Cluster Development as a Permitted Use, under Article 3: Residential and Agricultural

A. Density, Area and Bulk Standards

Subsection A. addresses lot width at street line. Subsection A.B.c. notes that the minimum lot width at the street line may be exceeded provided that:

*Note:
This text sets forth that trails built on open space created through cluster development must meet the Township’s specifications. These specifications are presented as cross sections in the subdivision ordinance.*

“at a minimum, trails consistent with the Townships Trail and Bikeway System shall be located and constructed in the open space in accordance with Township specifications.”

B. Design Standards

Subsection B. addresses open space standards regarding the use, design, ownership, and maintenance of open space. Subsection B.2. b. notes that:

*Note:
This text provides a fee to be paid for by homebuilders who cannot build trails that follow the municipal trail map. The implication is that the municipality does not want trails built unless they are consistent with the municipality’s plan. This reduces the likelihood of a trail-to-nowhere, while focusing limited trail funding on only those trail corridors that are part of the local network.*

“All cluster development under this section shall make provisions for the installation and maintenance of trails and sidewalks linking to the Trail and Bikeway System of Pocopson Township and for the installation of such portions of said system as may be required to serve the property either along the Township or State roads accessing the development or in the open space. Where portions of the Trail and Bikeway System that will serve the property proposed to be developed have been or will be located on nearby or adjacent properties, a pro-rata fee in lieu contribution shall be made to the Township’s Trail and Bikeway Fund.”

Section 406: Open Space, under Article 4: Planned Residential Development
A. Location and Design

The first two paragraphs of this section describe what percentage of a development must remain open space, with different percentages based on the size and type of the development. The third paragraph states that, consistent with the provisions of Section 405.A.2. as noted above:

“an internal trail system through open space areas shall be constructed to link important natural features of the property and various sections of the development and shall be designed to provide connections with sidewalks and the Trail and Bikeway System. The grades of internal trails should be designed with an objective of providing different levels of difficulty, but the trails will generally be less than fifteen percent (15%), but in no case greater than twenty percent (20%) slopes.”

Note:

This text emphasizes that the purpose of a trail & path should be to link destinations within a development as opposed to a trail-to-nowhere. It also recognizes that the trail & path may be so extensive that it must cross moderately steep slopes but that they should not be excessive.



Zoning should clearly state how and under what circumstances trails & paths can or must be extended through common open space.

Note:

This text prioritizes how trail & path construction relates to other open space priorities, such as preserving woodlands or farmlands. Ranking open space preservation based on type such as woodland, farmland, recreation, etc. is useful since there will always be limited public funding for open space preservation.

Note:

This text presents a provision that is important for ensuring that trails & paths can be easily accessed by maintenance vehicles. Such a provision will also make trails more readily accessible to emergency vehicles such as ambulances, which is important to any public recreation facility.

Note:

This text sets forth that trail & path planning in the municipality will take a network approach instead of planning one trail at a time and then considering ways to link them at a later date.

Section 1315: Open Space Standards under Article 13: General Provisions
B. Location and Design of Open Spaces

Subsection B under this heading is “Township Priorities for Restricted Open Space (in order of priority).” There are six preservation priorities listed in this section, and in the number five rank is “Greenways and scenic river and scenic road corridors with trails or riparian buffers.”

Subsection 7 under this heading states that:

“Any open space land offered for dedication to the Township shall be accessible to Township residents and maintenance vehicles from a public road or across a minimum twenty (20) foot wide, easily traversed, right-of-way from a public road.”

C. Trails and Bikeways

The provisions of this subsection state:

“All developments shall make provision for the construction and dedication of the sections of the Township comprehensive Trail and Bikeway System linking their development to the rest of the system or if the linkages along a development’s frontage road or another accessible location has been completed on another property, a pro-rata contribution for trail and bikeway acquisition, construction, and management shall be made for such purposes to the Township Open Space Fund. Sidewalks (as may be required by this ordinance) and trails within developments shall provide safe connection for the development residents to the Township wide system.”



The ownership and management of trails & paths should be detailed in local zoning.

G. Ownership, Protection and Management of Open Space

This subsection details the ownership and management of restricted open spaces that are part of a new development, including trails. It is a detailed and lengthy text summarized in the following outline:

1. Ownership and Protection of Open Space—Designating that common open space must be owned by:
 - a. Developer-owned open space
 - b. Offer of dedication of some or all open space to the Township
 - c. Ownership by a conservation or historic preservation organization
 - d. Ownership by a homeowners or condominium association
2. Required Grant of Conservation Easements—Describing how all common open space must be protected by an easement following these guidelines:
 - a. How an open space conservation easement will be granted
 - b. Different types of open space will be eased, including “right-of-way trail corridors.”
3. Management—At the time of application, the developer must submit a open space management plan with:
 - a. Graphic and narrative description of the management
 - b. A maintenance schedule must be prepared at the time of application.
 - c. A projection of the annual costs
 - d. A provision for leasing certain open space land back to the developer or other qualified entities
4. Final Open Space Plan—With the final plan subdivision, the developer will present a final “Open Space Management Plan.”
5. Enforcement of the Open Space Management Plan—Which will be the responsibility of the Township.
6. Taxation—Which describes how the tax on each open space parcel will be distributed among each tax parcel in the development.

H. Assuring compliance with Open Space Requirements and Completion and Integrity of Open Space Facilities and Improvements

This subsection sets forth that financial security is required for “public improvements such as streets, trails and bikeways,” along with other facilities. The first paragraph of Article 2 states that:

“The Township shall require that financial security be posted at the time of final plan approval to cover the costs of installing required recreational facilities and a time table for their completion shall be provided that shall ensure that half of the facilities shall be completed before building permits representing one third of the total approved dwellings have been issued and the remainder of the facilities completed before building permits representing two thirds of the total approved dwellings are issued.”

Note:

This text emphasizes that trails & paths are regarded as a form of open space. It also requires forethought in the way that trails & paths will be planned, built, managed, and financed in perpetuity. Such an extensive discussion may seem excessive. However, it is useful for resolving future open space management conflicts, which are now becoming more common.



An open space management plan is useful in determining how a trail & path network is maintained.

Note:

This text requires that half of the trails & paths in a development be built before building permits will be issued for the first one third of the dwellings in a development. This regulation ensures that trail & paths will be built concurrently with housing units and not after all the houses have been built.

Chapter 4: The Zoning Ordinance

Trail & Path Planning: A Guide for Municipalities

Chapter 5



The Subdivision and Land Development Ordinance

Where to Address Trails & Paths in the Municipal Subdivision Ordinance

Section 503(3) of PA Act 247, the Municipalities Planning Code (MPC) authorizes municipalities to adopt a subdivision ordinance that may include provisions governing the standards by which “walkways” and “other improvements shall be installed as a condition precedent to final approval of plat.” Ideally trails & paths should be addressed in one section of a subdivision ordinance, but often this approach is impractical without conducting a major reorganization of the entire document. That being the case, trail & path construction standards can still be discussed by amending sections of a subdivision ordinance that deal with streets and roads. Issues relating to liability, ownership and maintenance can be included with sections dealing with homeowner association open space. Issues dealing with developers providing a fee-in-lieu of trails can be included with sections dealing with recreational parks.

The following sections are usually where trail & path planning are addressed in a subdivision ordinance:

Addressing Trails as a Network/System in the Preamble or General Provisions – Under the subsection entitled “purposes,” include a statement indicating that the subdivision ordinance has been adopted to coordinate and provide a system or network of pedestrian and bicycling trails & paths throughout the municipality, as presented in the mapping and trail functional classification adopted in the comprehensive plan, or on the official map, if applicable. Make it clear that it is not simply trails that are needed, but a system. Adding the words “pedestrian and bicycling” will clarify why these trails are being built. Some communities with state parks or large public preserves may wish to add “hiking and horseback riding.”

Municipalities that already have a section under “general provisions” dealing with a system of open spaces can amend it to include a trail system or network. It is important to mention how the subdivision ordinance trail provisions will implement the policies established in the comprehensive plan, official map, community pedestrian and bicycle master plan or whatever kind of text or mapping is being used to document trails & paths proposed for the future. In general, it is better for a subdivision ordinance to refer to an adopted map or plan rather than one that is just approved or “accepted.” Provisions that refer to adopted plan documents are more likely to withstand a legal challenge.



Trails & paths should be addressed in the subdivision ordinance.

The preamble of the subdivision ordinance may also include definitions for terms used in trail planning, but it is usually more efficient to list all definitions only once in the designated “definitions” article. These trail related terms may include:

- Trail
- Path
- Primary Trail
- Internal Path
- Trail Network/System
- Bicycle Route

Trail planners should be careful when defining “open space.” In common language, open space means any undeveloped land and can include parks and trails. In the context of municipal ordinances, open space usually refers to “common open space,” also known as homeowners association (HOA) open space.

Addressing Trail Construction in the Design Standards Article—Trails & paths can be addressed under their own subsection, or the subsection dealing with sidewalks can be expanded and entitled “Sidewalks and Trails” or “Pedestrian Facilities.” More urbanized municipalities, with a grid of sidewalks that will be linked to trails, can discuss both sidewalks and trails in one section. Communities with few sidewalks, or those with a major hiking trail or equestrian paths, may want to discuss trails in its own section.

Text should be included to explain where trails & paths should be provided, including preferred destinations such as schools, parks and downtown areas. This text can note that trails & paths should be provided within common open space in order to provide access to and across it. Language can also be added requiring that land proposed for development provide trails & paths in accordance with the comprehensive plan, official map, or some other municipal mapping.

This article should provide design standards, which are construction guidelines dealing with features such as the width of the tread and the type of paving used. These standards can be presented in text form, but it is prudent to include typical sections, which are schematic drawings of a trail & path cross-section sample. Ideally, these standards should be compiled and first published in the municipality’s community pedestrian and bicycle master plan. In Chester County, it is common for drawings relating to streets and sidewalks to be included in municipal subdivision ordinances. These drawings, along with trails drawings, can be grouped together in the subdivision ordinance appendix. Trail planners should also consider including a chart that provides the design standards for each of the trail & path functional classifications included in the comprehensive plan. Such a chart might have the general format of the chart presented in **Figure 5.1**.



Addressing trail & path construction in the design standards article can provide uniform guidelines for all trails & paths in the municipality.

Figure 5.1: Generalized Design Standards for Elements of a Trail & Path Network

Classification (Users)	Typical Tread Widths ^a	Typical Right-of-Way (ROW)	Typical Surface
Bicycle Route: Road Shoulder (Bicyclists)	Commonly 5 ft., ranging from 4 ft. ^b to 14 ft. ^c	Bicycle routes are always within the road ROW. CCPC recommends ROW for roads with one lane in each direction be 25 feet to either side of centerline.	Macadam
Bicycle Route: Low Volume Roadway (Bicyclists)	These roads typically have 24 ft. of travel lanes. Bikes typically use 5 ft., on the right.	Bicycle routes are always within the road ROW. CCPC recommends ROW for roads with one lane in each direction be 25 feet to either side of centerline.	Macadam
Trail: Multi-Use (Walkers, hikers, bicyclists, & in-line skaters)	Commonly 10 ft., ranging from 8 ft. ^b to 12 ft. ^b or more.	Enough to accommodate the typical 30 ft. ^d trail easement (tread along with adjacent drainage ditch and landscape buffer), ranging from 24 ft. ^e to 75 ft. ^e	Macadam
Path: Pedestrian (Walkers & hikers)	Commonly 5 ft., ranging from 4 ft. ^e to 6 ft. ^e	Varies. Usually a “shy zone” extending 2 feet to either side of the tread must be grubbed, cleared or mowed, and this should be included in the ROW.	Macadam preferred. Gravel acceptable.
Path: Bicycle (Bicyclists)	Commonly 5 ft., ranging from 4 ft. ^b to 8 ft. ^f	Varies. Usually a “shy zone” extending 2 feet to either side of the tread must be grubbed, cleared or mowed, and this should be included in the ROW.	Macadam
Path: Equestrian (Horses/double track, walkers, & hikers)	Commonly 10 ft., ranging from 9 ft. ^f to 14 ft. ^g	Varies. Usually a “shy zone” extending 2 feet to either side of the tread must be grubbed, cleared or mowed, and this should be included in the ROW.	Natural ground
Path: Internal (Walkers & bicyclists within a development)	Commonly 6 ft., ranging from 4 ft. ^e to 6 ft. ^e	Varies. Usually a “shy zone” extending 2 feet to either side of the tread must be grubbed, cleared or mowed, and this should be included in the ROW.	Macadam preferred. Gravel acceptable.
Sidewalks (Walkers)	Commonly 4 ft., ranging from 4 ft. ^h to 6 ft. ⁱ or more.	Sidewalks are typically within the road ROW. CCPC recommends ROW for roads with one lane in each direction be 25 feet to either side of centerline.	Concrete

Source: CCPC 2006

Notes:

- ^a Tread is the actual surface portion of a trail upon which users travel excluding the shoulder. In general, the maximum tread width is used in heavy-use or urban settings, while the minimum is used in low-use or rural settings, except for “Bicycle Route: Road Shoulder,” which is the opposite.
- ^b *Pennsylvania Pedestrian and Bicyclist Safety and Accommodation*. 1999. Pennsylvania Department of Transportation and Walkable Communities, Inc.
- ^c *Allegheny County Parks Comprehensive Master Plan*. 2001. Allegheny Co. Pennsylvania Parks Department.
- ^d CCPRD preferred trail easement is 30 ft. and their preferred trail ROW is 60 ft.
- ^e *Guidelines for Trail Development within Montgomery County PA*. Undated (Circa 2005), Montgomery County Commissioners (Montgomery County, Pennsylvania).
- ^f *San Miguel County Trail Design Standards*. 1992. Telluride Regional Pathways Initiative/San Miguel County, Colorado Planning Department.
- ^g *Community Trails Handbook*. 1997. The Brandywine Conservancy.
- ^h *Time Saver Standards for Landscape Architecture*, 2nd Ed. 1998. Harris & Dines, McGraw-Hill
- ⁱ *Oregon 1995 Bicycle and Pedestrian Plan*. 1995. Oregon Department of Transportation.

Appendix B includes trail design standards used in three different counties in the United States. These are construction standards for county facilities and not text from a municipal subdivision ordinance. Each of these charts lists features using a maximum and a minimum value, and in some case a **preferred** value is noted. This approach is needed because trails are often retrofitted into already built communities, where ample right-of-way may not be available at all locations along the corridor. For similar reasons, municipalities may also need to include a range of acceptable and preferred values in dealing with trails & paths. Trail planners should anticipate adding options for trail designs to their subdivision ordinance, since trail engineering and construction is a constantly evolving field. Having multiple trail & path design options also gives developers more flexibility when including trails & paths as part of new construction or redevelopment.



Ownership and liability should be addressed in the subdivision ordinance.

Addressing Trails in the Construction, Inspections, and Acceptance of Public Improvements Article –

Most municipalities use this article to clarify who is responsible for the ownership, liability and management of common open space after a development is built. This subsection can also be used to address ownership, liability and management roles for trails. It is best for this subsection to include the words “trail” or “path” rather than to use the word “public facilities” as a catch-all term that includes trails & paths. This specific language is needed because trails & paths are often built on common open spaces that may not be publicly owned.

Most municipalities use this subsection to require that streets and sidewalks be built before or concurrent with the houses they serve. This kind of regulation often requires that half the sidewalks be built before one third of the units are constructed, or some variation on this basic concept. Municipalities can expand this discussion to include trails & paths. Discussing the phased construction of a trail & path network can help avoid a situation where there is miscommunication between the developer and the homebuyer, and the

homebuyer is not aware that a trail will be built in their community. This unfortunate situation has occurred at a number of locations in Chester County, pitting neighbor against neighbor, and involving local officials in an unpleasant controversy that can be easily avoided by amending just one paragraph in the subdivision ordinance.

Addressing Trail Fee-in-Lieu in the Design Standards Article –

Many municipalities include a fee-in-lieu provision in their subdivision and land development ordinance which permits developers to pay a fee instead of constructing parks or recreation facilities that are needed to serve the population that move into the houses they build. Section 503 (11) of the MPC permits fee-in-lieu provisions. Municipalities use a variety of techniques to determine the appropriate amount of



Developers can build trails & paths much like they build playgrounds.

fee that must be paid. Usually this fee is deposited in a fund that is used specifically to acquire municipal parkland.

Trail planners that wish to fund municipal trails & paths should make sure that their fee-in-lieu provision clearly states that trails & paths can be funded just like parks. That way a developer may pay a fee instead of building trails, and that fee can be used to build trails in a more needed location. Fee-in-lieu is not an impact fee. An impact fee is a fee that is paid by a developer based on the anticipated impact of a development. The MPC places strict limitations on how impact fees may be imposed. In general, impact fees are not used for trail projects.

Trail planners should not assume that their existing park-oriented fee-in-lieu provisions can be applied to trail & path. Many fee-in-lieu provisions make certain assumptions about what acreage of parkland is needed to accommodate a given household. With trail & path projects, such acreage-based standards are impractical. For example, a half-mile trail with a 25-foot right of way would cover twice as much land as one with a 50-foot right of way, but both could meet the same user need. For this reason, it is valuable to have an official map (preferably) or detailed comprehensive plan trails map. These maps will let developers know if their project is crossed by a trail corridor, and if so they will build it. Or if they do not build it, they will pay a fee. The municipal solicitor should review the provision that sets forth how the fee is calculated.

In order for a fee-in-lieu provision to be valid, the justification for it must be presented in the open space or recreation section of comprehensive plan. Many municipalities in Chester County have successfully implemented fee-in-lieu provisions using this approach. The most direct way to amend a subdivision ordinance fee-in-lieu subsection is to simply add the term “trails” to the list of fundable projects. If an existing fee-in-lieu text already refers to “recreation facilities,” trail planners can add “trails” to their definition of recreation facilities. Either way, the subdivision ordinance states that trails, like parks, can be the subject of fee-in-lieu provisions.

Trail Considerations for Revising the Entire subdivision ordinance—Trails & paths can be established for all forms of development, both public and private. Municipalities that wish to address trails & paths in their subdivision ordinance, may have to add text relating to “trails & paths” to any article or subsection that covers common open space or public facilities, which need to be included in plans for new development. In most instances, such an update to the subdivision ordinance requires that text dealing with sidewalks, open spaces or recreation facilities be amended to read “sidewalks and trails” or “open spaces including trails,” or “recreation facilities including trails.” Trails need not be discussed in detail in each article, rather they can be mentioned with a reference to the subsection where they are addressed at length.



Trails & paths can be addressed in the subdivision ordinance much like sidewalks.

Subdivision and Land Development Ordinance Example: Pocopson Township

The Pocopson Township subdivision ordinance, as adopted in 1997 and revised in 2002 and 2003, includes the following trail & path regulations:

ARTICLE 1-GENERAL PROVISIONS

“Section 102: Purposes

M. To coordinate public and privately owned open spaces and to provide a system of walking trails through the Township and developments.”

*Note:
This text discusses trails & paths in the same sections as sidewalks. These subsections require that trails link to specific pedestrian oriented destinations, and require that new developments provide land for trails that will be a part of, or link to, the township-wide network as described in the zoning ordinance.*

ARTICLE 6-DESIGN STANDARDS AND IMPROVEMENT SPECIFICATIONS

“Section 604: Recreation Areas and Community Assets

B. Provision shall be made for reservation and/or dedication of suitable areas for parks, playgrounds, trails or other recreation areas. Where the board determines that the size, location, natural features, or configuration of the subdivision or land development make the requirement of such areas unreasonable or infeasible on the particular site, the applicant shall provide off-site arrangements nearby or make a pro rata contribution for public acquisition and/or development of such sites.”

“Section 607: Sidewalks and Trails

A. Sidewalks shall be provided in areas of high potential pedestrian use, such as the vicinity of schools, commercial centers, or high-density residential development. In addition, trails shall be provided in cluster developments to provide access to and across common open space areas. The Board of Supervisors shall also require land proposed for subdivision or land development to provide trails in accordance with the comprehensive Trail and Bikeway System (as defined in Section 106 of the zoning ordinance) or provide links to the system, and to identify such public use trails on the plan.

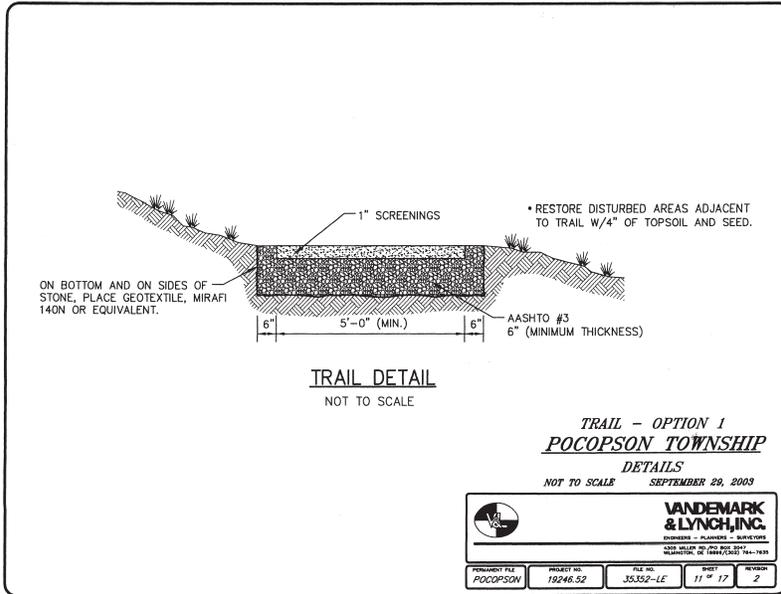
B. When constructed, sidewalks shall be either concrete or bituminous mix with a minimum of four (4) feet width and four (4) inches thick except at driveway crossings when the sidewalk thickness shall be increased to six (6) inches.”



Sidewalks and trails & paths are all parts of one pedestrian network.

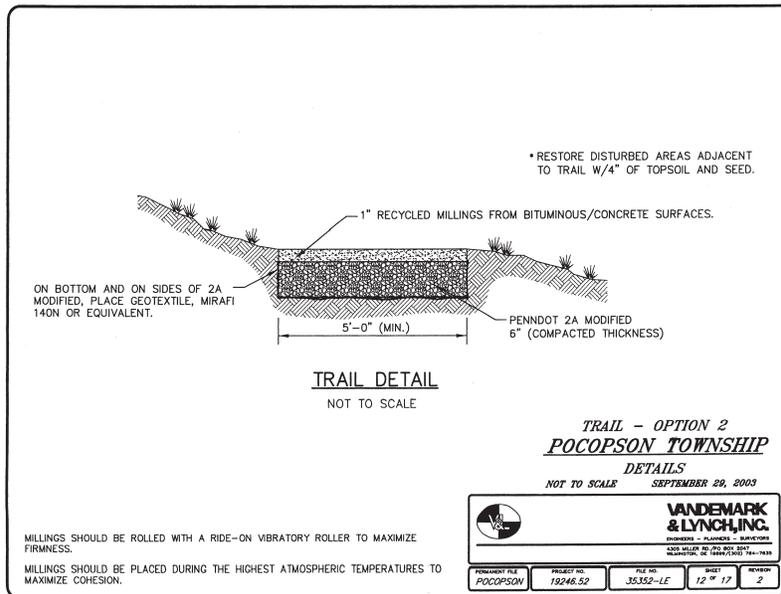
ARTICLE 10-APPENDICES

Sheet 11, Trail Detail (Option 1)



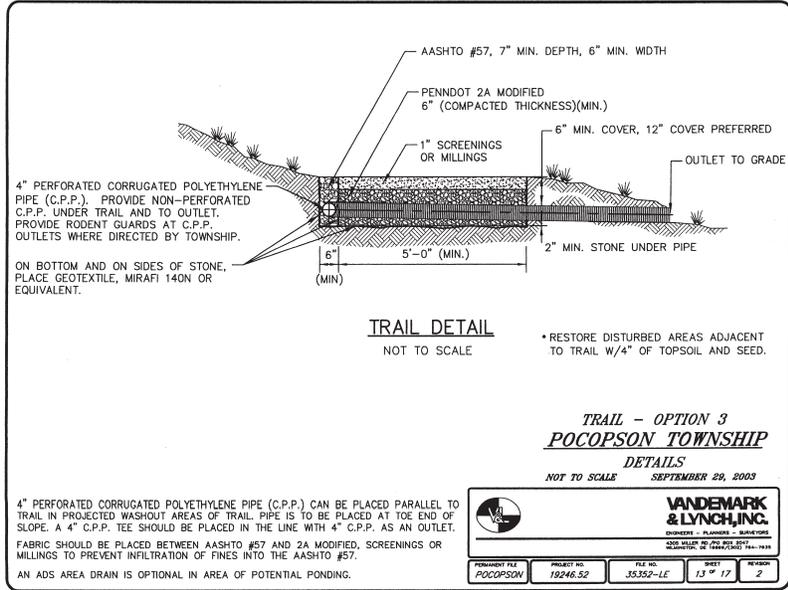
Note:
Article 10 is an appendix that presents multiple options for trail pavement and width because trails may extend through areas with varying topography or changes in right-of-way width. This approach gives specific illustrated construction guidelines rather than text only descriptions that can sometimes be vague. This regulation is flexible, and it provides homebuilders with reasonable options that they can use to suit the different types of developments they may build.

Sheet 12, Trail Detail (Option 2)

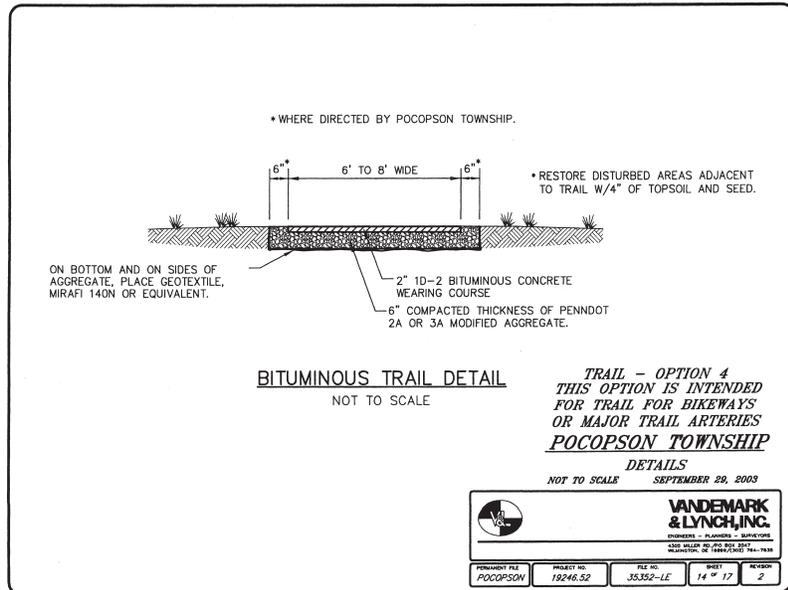


ARTICLE 10-APPENDICES (CONTINUED)

Sheet 13, Trail Detail (Option 3)



Sheet 14, Trail Detail (Option 4)



Subdivision Ordinance/Fee-in-lieu Provisions Example: North Coventry Township

The North Coventry Township subdivision ordinance, adopted in 2003, addresses fee-in-lieu for trails in the following sections:

ARTICLE 1: GENERAL PROVISIONS

“Section 202: Definitions of Terms

Open Space, Common: A parcel or parcels of land or an area of water or a combination of land and water within a development site, designed and intended for the use and enjoyment by residents of such development and possibly the general public. Common open space shall be substantially free of structures, but may contain such improvements as are in the finally approved development plan, and shall not include individually owned private yards, streets, and off-street parking areas unless provided in conjunction with a recreational facility.

Open Space, Usable: Open space as defined under “open space, common” but excluding area covered by buildings..., but including impervious surfaces associated with recreation site improvements such as bicycling and walking trails, game courts and open sided shelters.

Walkway, Public: Any place designed or maintained for public pedestrian uses, without regard to ownership.”

Note:

This text clearly states that a trail is a type of usable open space, even though the word “trail” is not defined. It also distinguishes “common open space” which is a type of parcel from “usable open space” which is a land area within common open space that may include paved features such as trails. This terminology is essential to interpreting the subsection presented on the following page.



Common open space can be defined so that it includes trails & paths.

ARTICLE 6: DESIGN STANDARDS

“Section 652: Community Facilities, Park Land and Open Space

G. Fee-In-Lieu Dedication

2. The fee shall be equal to the fair market value per acre of the land being developed (determined at the time of filing of the application for subdivision approval), multiplied by the acreage of land that would have been required for dedication or reservation.
5. Any such fees received by the Township in lieu of park and open space shall be deposited in a special account to be maintained by the Township and to be used for obtaining future park or open space lands. Fees deposited to this account shall be administered as required by Section 503 (11) the Pennsylvania Municipalities Planning Code, as amended.”

*Note:
This text, from Subsection 652.G.2., describes the amount of fee that will be required. Subsection 652.G.5. notes that these fees can be used to obtain future open space lands rather than common open space thus indicating that trails can be acquired with these funds.*

Subdivision Ordinance/Design Standards Example: London Grove Township

The London Grove Township subdivision and land development ordinance was amended in 2003 to include new trail definitions and a new subsection devoted entirely to trails. A sample of these extensive new provisions are presented below:

ARTICLE 3: DEFINITIONS

“Section 301: Definitions of Terms

Trail—A corridor through which passes, or will pass, a pedestrian or equestrian access way or bikeway as part of the London Grove Township Comprehensive Trail System or as otherwise authorized or designed by the Township. A trail is to serve transportation, commuting, and/or recreational functions as part of an inter-modal transportation system. Trails should exclude all motorized vehicles except motorized wheelchairs or as authorized by the Township for maintenance, management and emergency purposes.

Multi-Use Arterial Trail—A type of trail that is part of the London Grove Township Comprehensive Trail System and that offers low-speed transportation and recreation opportunities to pedestrian, bicycle, and equestrian users. Such trail segments provide the principle connecting routes between destinations within the Township and to multi-municipal and regional trail systems beyond the Township.

Bikeway—A type of trail corridor designed for bicycle traffic as part of the London Grove Township Comprehensive Trail System or as otherwise authorized by the Township. Bikeways may serve transportation and/or recreation functions. Except where a designated bikeway route is contained within a road cartway or road shoulder, bikeways shall exclude all motorized vehicles except motorized wheelchairs or as authorized by the Township for maintenance, management, and emergency purposes.

Local/Collector Trail—A type of trail that is part of the London Grove Township Comprehensive Trail System and that is designated as an on-site recreation resource as a means of connection to one or more multi-use arterial trails. Such trail may, but need not, serve multi purpose functions.

Trail Cartpath—The area within a trail right-of-way that is designed and constructed for regular use by the intended trail users and provided with an appropriate surface for that purpose.

Trail Shoulder—The areas within a trail right-of-way that are immediately adjacent to the trail cartpath and designed in accordance with the standards of this ordinance.”

Note:

This text includes definitions which demonstrate that there are different categories of trails with different functions. This terminology is essential to interpreting the subsection presented on the following page.



A bikeway can include off-road trails & paths along with on-road bike routes.

ARTICLE 6: DESIGN STANDARDS AND REQUIRED IMPROVEMENTS

“Section 616: Trails

A. Existing Trails

1. On any tract containing an existing trail, as shown on the Comprehensive Trail System Map or as otherwise identified by the applicant or the Township, the plan for development of the tract shall incorporate and protect the continuing viability of the trail.

Note:

This text emphasizes the need to maintain existing trails and link them to a larger network.

B. Creation of New Trails and Trail Links

11. Hierarchy of trail components

Within the Township’s Comprehensive Trail System, each trail shall be designated as one of the following components, as defined in Article II of this ordinance:

- a. Multi-Use Arterial
- b. Bikeway
- c. Local/Collector

12. Trail Widths

- a. The minimum right-of-way, cartpath, and shoulder widths for all new trails in the Township shall be as follows:

Type of Trail	Right-of way		Shoulders
		Cartpath	
Multi-Use Arterial	12'	8' (5' min. for one way)	2' (per shoulder)
Bikeway	12'	8' (5' min. for one way)	2' (per shoulder)
Local/Collector	12'	6' (5' min. for one way)	1-2' (per shoulder)

- b. Any trail within a public park shall have a minimum cartpath of eight (8) feet and minimum shoulders of two (2) feet.
- c. Additional right-of-way and/or cartpath widths may be required by the Board of Supervisors for the following purposes:
 1. To promote public safety and convenience
 2. To assure proper management of stormwater runoff
 3. To accommodate special topographical circumstances which may result in cut/fill slopes extending beyond the standard trail width. These should in all circumstances be included within the trail width to assure accessibility for maintenance operations.
- d. Trail widths less than prescribed in this section shall not be permitted.”

Note:

This text presents trails as a hierarchy based on a functional classification. It then provides design standards, which are flexible in terms of the cartpath width. The 12-foot trail right-of-way presented here is not as wide as is common for most multi-municipal, multi-use trails.



Trail & path width will vary depending on use and existing physical conditions.

Appendix A



Stakeholder and Public Involvement

Building Consensus in Three Steps

Planners have many options for trail & path planning. They can present plans in the comprehensive plan, or present a concept that is then used as the basis for a community pedestrian and bicycle master plan, which can be approved or adopted as part of the comprehensive plan. Regardless of the approach, **all trail & path planning must include stakeholder and public involvement.** This effort should focus on getting local government, stakeholders and the public to come to consensus in three steps:

- **Consensus on the Concept**—in which all stakeholders accept that a trail & path should be created to link two or more destinations that are well suited to pedestrians or bicyclists. These destinations are sometimes called control points, or positive control points. The project concept can also avoid negative control points, such as major highway interchanges or active rail yards.
- **Consensus on the Corridor**—in which all stakeholders accept that a trail & path should be built somewhere within a broad linear corridor that connects two or more destinations. If possible, multiple corridors can be mapped that provide alternative routes that begin and end at the same destination.
- **Consensus on the Alignment**—in which all stakeholders accept the exact location where a trail should be constructed. If possible, multiple alignments can be mapped that provide alternative routes that begin and end at the same destinations.

Stakeholder involvement and community outreach can save time and taxpayer's money. A key to this outreach is to take notes and document comments received, both supporting and critical of the project. Although a trail & path can often be built in one year, planners should expect the planning process to last for two to three years, or more. This is especially true in parts of Chester County where some residents must be introduced to the benefits of a trail before they are willing to approve any plan for its construction.

It may be possible to complete a trail & path planning project without extensive public outreach, especially if there is overwhelming political or financial support. However, it is always best to make sure a project is feasible according to municipal ordinances prior to presenting it to the public. Political support is also important in trail planning. In the 1990s, nearby Montgomery County constructed a large network of trails that is a model for the region. However, this effort was only possible because it was championed by a prominent elected official, who made it a major plank of his election campaign.

Many trails projects are initiated by trail enthusiasts who draw a detailed map showing the route they hike, and then present it at a public meeting. Trail planners should be aware that such an approach can, and has, caused conflict between trail & path supporters and opponents. For this reason, trail & path projects should be reviewed by municipal planners and impacted public agencies, such as state or County parks, before they are presented to the public.



Consensus building is important to trail & path planning.

The Chester County Planning Commission recommends that the following process be used when conducting outreach for a trail & path project.

- **Municipal Input** – Involves meeting with representatives of the municipality(ies) involved, such as a municipal manager or a supervisor, or the chairperson of the municipal parks, recreation, open space or trail committees. If these representatives agree that the trail project is worth pursuing, a brief memorandum outlining the general concept should be provided to the municipality for their review. After this review, the concept memorandum should be finalized to document that the municipalities agreed to continue the project. The final document should be distributed to the parties involved.
- **Public Agency Input** – Meetings should be held with public agencies such as PennDOT, SEPTA, or state agencies like the Bureau of Forestry, or the Bureau of State Parks, who might have properties linked to the proposed trail. They should be provided with a copy of the concept memorandum for their review and comment. They should be asked to provide a letter either detailing their comments or stating that they have none.
- **Elected Officials Input** – A preliminary community pedestrian and bicycle master plan should be prepared with an evaluation of existing conditions and possible corridors. This draft should be reviewed by the planning commission for each municipality involved and, if needed, the managers of any public property, such as a state park, that may be impacted. Based on these comments, the plan should be finalized, and presented for approval or adoption by the municipal supervisors/board or, in the case of a park, by its director.
- **First Public Meeting** – This meeting should be held to review the concept that has been included in the preliminary community pedestrian and bicycle master plan. The public should also be asked to add features that should be included in the inventory including social trails, possible trail destinations, and areas that are prone to crime or vandalism. This meeting may also be used to distribute surveys on what type of trail & path would be preferred. It can also be used to identify stakeholders that can be contacted for more detailed input.
- **Input from Stakeholders** – Meetings should be held with groups such as hiking clubs, bicycling clubs, or non-profit land trusts. Meetings can also be held with landowners that own residential properties next to a trail, or industrial parks whose parking lots could be used by trail users on weekends. These meetings can be used to identify conflicts or potential problems, as well as opportunities for partnerships and economic development. This input can be used to modify the Community Pedestrian and Bicycle Master Plan.
- **Second Public Meeting** – Once a trail & path corridor or plan is established, it should be presented on a map for review by the public. It is best if multiple corridors are presented on the mapping, all of which link to the key destinations. This way the public can see that multiple options were considered. The public can comment on which corridor they prefer.
- **Final Meeting** – At the end of the planning process a meeting should be held with the public and all stakeholders to show them the final results of the planning effort. If the project is scheduled to proceed to construction, this meeting can present a schedule for design studies and construction. This meeting can also give notice that more public meetings will occur during the next phases.

Appendix B



Trail & Path Design Standards

Design Standards are a Part of Overall Trail & Path Planning

Design standards describe the length, width and construction features of trails & paths. These standards are often the centerpiece of a municipal trail & path planning effort. Although design standards are just one of many essential elements of trail & path planning, they tend to spur a great deal of public interest. Design standards are easy for most people to visualize and understand compared with less tangible topics like right-of-way dedication and fee-in-lieu provisions. Although design standards may spur public interest, trail planners should make sure that the public is aware that there is much more to trail & path planning than just the construction requirements. As noted in **Chapter 1**, the key to constructing a trail & path that is safe for public use is to ensure that it is:

- Well designed
- Well maintained
- Well policed

Trail & path design standards should be included in the municipal subdivision and land development ordinance. The standards should be based on the functional classification presented in the comprehensive plan. Trail & path design standards should follow up-to-date engineering criteria as listed in *Guide for the Development of Bicycle Facilities*, 1999 and *Guide for the Planning, Design and Operation of Pedestrian Facilities*, 2004, both written and published by the American Association of State Highway Transportation Officials (AASHTO). Trail planners should make sure that their municipal engineer reviews trail & path design standard to ensure that they will result in safe, well built facilities. AASHTO guidelines are periodically updated, and so trail & path standards will have to be periodically revisited.

In many respects trail & path design standards are like road design standards. They must be safe and well built to accommodate public use and ongoing maintenance. However, unlike roads, trails are built to accommodate many types of users (bicyclists, children, and horses), who require facilities of differing sizes and surfaces. Furthermore, trails are often built on odd shaped parcels of land as opportunities arise, and commonly have to snake their way through already developed communities. This means that trail planners have to be flexible and sometimes accept whatever right-of-way is available. For this reason many design standards list a range of design options along with a preferred option. As **Figure B.1** shows, the AASHTO standards for shoulder width lists 3 feet as preferred, and 2 feet as the minimum.



Trail & path design standards can help to reduce conflicts between the various types of trail users.

Figure B.1: A Comparison of Multi-Use Trail Design Standards

	AASHTO	Trails for the 21st Century	Community Trails Handbook	Allegheny County, PA	Montgomery County, PA	San Miguel County, CO
Paved Width	10 ft. min.	14 ft. pref., 10 ft. min.	12 ft.	10 ft.	12 ft. pref., 8-10 ft. min.	10 ft. min.
Shoulder Width (each side)	3 ft. pref., 2 ft. min.	2 ft. min.	2 ft., 5 ft. cleared	N/A	4-5 ft. pref., 2 ft. min	N/A
Vertical Clearance	8 ft. min., 10 ft. at underpasses	8 ft. pref., for tunnels 10 ft	8 ft.	8 ft.	10 ft. pref., 8 ft. min.	10 ft.

Sources:

Community Trail Master Plan, 2005. Upper Uwchlan Township.

Allegheny County Parks Comprehensive Master Plan, 2001, Allegheny County Parks Department.

San Miguel County Trail Design Standards, 1992. Telluride Regional Pathways Initiative San Miguel County, Colorado Planning Commission.

Community Trails Handbook, Brandywine Conservancy, 1997.

Guide for the Development of Bicycle Facility, AASHTO, 1999.

Guide for the Planning, Design and Operation of Pedestrian Facilities, AASHTO, 2004.

Trails for the Twenty-First Century, Karen-Lee Ryan, 1993.

The following pages present design standards for three communities. The design standards are from various sources and do not come from adopted subdivision ordinances. However, the principles used in these examples can be applied to a subdivision ordinance. The example for Allegheny County, PA, (**Figure B.2**) which includes the urbanized City of Pittsburgh, is from a county parks master plan. Allegheny County is home to an extensive network of trails, many located on former rail-beds that once served the steel industry. The example from mostly suburban Montgomery County, PA. (**Figure B.3**) comes from a grant manual used to ensure that all County funded trail grants use the same construction guidelines. The example from San Miguel County Colorado, home to ski resorts around the Town of Telluride, is from a regional planning initiative (**Figure B.4**). In this largely rural undeveloped county, tourism is a major economic contributor, and many visitors hike, mountain bike, or ride horses on trails in the non-winter months.

Figure B.2: Allegheny County Parks Trail Planning Design Standards

Trail Type	Width	Clear Zone	Clearance (Height)	Surface	Grade
Hiking/walking trail	4 ft.	N/A	8 ft.	Firm and stable	5% or less 8.3% max for <200 linear ft. 10% max for <30 linear ft. 12.5% max for <10 linear ft.
Pedestrian trail	5 ft.	N/A	8 ft.	Crushed stone or bituminous	5% or less 8.3% max for < 200 linear ft. 10% max for <30 linear ft. 12.5% max for <10 linear ft.
Multi-use pedestrian trail (walking jogging, strolling, roller blading, etc.)	10 ft.	2 ft.	8 ft.	Bituminous	5% or less 8.3% max for < 200 linear ft. 10% max for <30 linear ft. 12.5% max for <10 linear ft.
Bicycle trail	10 ft.	2 ft.	8 ft.	Bituminous	5% or less, greater grades acceptable if AASHTO sight and stopping distance requirements are met.
On-road bicycle lane*	5 ft.	N/A	N/A	Bituminous	5% or less, greater grades acceptable if AASHTO sight and stopping distance requirements are met.
On-road bicycle/ wide curb lane	14 ft.	N/A	N/A	Bituminous	5% or less, greater grades acceptable if AASHTO sight and stopping distance requirements are met.
Mountain bike trail	2 ft.	3 ft.	8 ft.	Compacted earth	10% maximum
Equestrian trail	4 ft.	2 ft.	10 ft.	Natural earth	10% or less 20% for <100 linear feet

Note: * Bicycle lane width should be determined by Bicycle Level of Service Analysis, minimum width five feet.

Source: Allegheny County Parks Comprehensive Master Plan. 2001. Allegheny County Parks Department.

Figure B.3: Design Standards for County Funded Trails in Montgomery County, PA

Standard Description		Trail Classification Type			
		Multiuse	Pathway	Retrofit Sidewalk	On Road Improvements for Bicyclist
Trail Width (75 ft. trail corridor width minimum)	Desirable	12 ft.	6 ft.	10-12 ft. (Multi-use w/o bike lane: two way shared use) ^a .	Bike Lane: 6-5 ft.
	Minimum	8-10 ft.	4 ft.	6-8 ft. (Multi-use w/o bike lane: two way shared use) ^b .	Bike Lane: 4 ft.
Trail Shoulder Width	Desirable	4-5 ft.	2 ft.	4 ft. (Multi-use w/o bike lane: two way shared use)	Road Shoulder: 8-6 ft.
	Minimum	2 ft.	2 ft.	2 ft. (Multi-use w/o bike lane: two way shared use)	Road Shoulder: 4 ft.
Trail Surface Type ^c	Desirable	Macadam	Macadam/ Cinder	Concrete	Macadam
	Minimum	Cinder	Cinder	Macadam (if acceptable by local zoning regulations)	Macadam
Trail Grade (longitudinal slope)	Desirable	1-3%	1-3%	1-2%	
	Minimum	5%	5%	5%	-
Trail Surface Grade (cross slope)	Desirable	1%	1%	1%	-
	Minimum	2%	2%	2%	-
Vertical Clearance	Desirable	10 ft.	10 ft.	10 ft.	-
	Minimum	8 ft.	8 ft.	8 ft.	-
Horizontal Clearance (edge of trail vegetation clearance)	Desirable	4-5 ft.	2 ft.	4 ft.	-
	Minimum	2 ft.	2 ft.	2 ft.	-
Design Speed	Desirable Grades	20 mph	3-7 mph	8-15 mph	25-30 mph
Viewshed (linear feet, line of sight within a corridor)	Desirable	200-175 ft.	75 ft.	200-175 ft.	-
	Minimum	150 ft.	50 ft.	150 ft.	-
Signage	Trail	Sign dimensions for trail and bicycle facilities are presented in a separate section of the Montgomery County trail guidelines.			
	Roadway				

All trail surface depths are assume to be 2-4 in., and all trail sub-surface depths are assumed to be 4-8 in.

Notes:

- ^a. 6 ft. (typical pedestrian sidewalk)
- ^b. 4 ft. (typical pedestrian sidewalk)
- ^c. Macadam should be considered for trail grades over 2%.

Source:

Guidelines for Trail Development within Montgomery County, Pennsylvania, undated (circa 2005), Montgomery County Commissioners. The Montgomery County Trail Design standards were derived from multiple sources including:

- *Bicycling Road Map*, Montgomery County Planning Commission, 1999.
- *Community Trails Handbook*, Brandywine Conservancy, 1997.
- *Guide for the Development of Bicycle Facilities*, AASHTO, 1999.
- *Guide for the Planning, Design and Operation of Pedestrian Facilities*, AASHTO, 2004.
- *Manual on Uniform Traffic Control Devices for Streets and Highways*, FHWA, 2003.
- *Trails and Greenway Clearinghouse*, www.trailsandgreenways.org, Rails to Trails Conservancy.
- *Trails for the Twenty-First Century*, Karen-Lee Ryan, 1993.

Figure B.4: Trail Design Standards for San Miguel County, Colorado

Trail	Cross Slope Range	Tread Width	Clearance		Surface Materials		Cross Slope	Maximum Profile	Switch-back Radius
			Horiz.	Vert.	Preferred (Acceptable)	Not Appropriate			
Access									
Disabled access	1-10%	7 ft.	+4 ft.	10 ft.	Asphalt or concrete	Natural or gravel	<2%	5% ave. 8.33% max.	-
Hiking									
Walking	0-10%	10 ft. min.	+4 ft.	10 ft.	Asphalt or concrete	Natural or gravel	4%	5% ave.	-
Standard	10-70%	24-36 in.	+4 ft.	10 ft.	Natural or gravel	Asphalt or concrete	4%	12%	2 ft.
Back country	10-90%	18-24 in.	+3 ft.	8 ft.	Natural (gravel)	Asphalt or concrete	4%	12%	2 ft.
Mountain Bike									
Single track	10-70%	24-36 in.	+4 ft.	10 ft.	Natural or gravel	Asphalt or concrete	4%	12%	4 ft.
Rural double track	0-30%	48-96 in.	+4 ft.	10 ft.	Natural or gravel	Asphalt or concrete	4%	12%	4 ft.
Equestrian									
Mountain single track	10-70%	18-24 in.	+6 ft.	10 ft.	Natural or gravel	Asphalt or concrete	4%	12%	8 ft.
Rural double track	0-30%	48-96 in.	+6 ft.	10 ft.	Natural or gravel	Asphalt or concrete	4%	12%	8 ft.
Nordic									
Single track	0-70%	12 in.	5 ft.	+6 ft.	Nat. or grav. (asph. or conc.)	-	N/A	10% desired	N/A
Double track	0-70%	12/12 in.	10 ft.	+6 ft.	Nat. or grav. (asph. or conc.)	-	N/A	10% desired	N/A
Skate Lane	0-70%	8 in.	10 ft.	+6 ft.	Nat. or grav. (asph. or conc.)	-	N/A	10% desired	N/A
Road Bike									
One way	0-10%	5 ft.	+4 ft.	10 ft.	Asphalt or concrete	Natural or gravel	2%	5% desired	35 ft. at 15 mph
Two way	0-10%	8 ft.	+4 ft.	10 ft.	Asphalt or concrete	Natural or gravel	2%	5% desired	35 ft. at 15 mph
Multi-Use									
Urban	0-10%	10 ft.	+4 ft.	10 ft.	Asphalt or concrete	Natural or gravel	2%	5% ave.	-
Rural	0-30%	24-36 in.	+6 ft.	10 ft.	Natural or gravel	Asphalt or concrete	4%	12%	8 ft.
Mountain	10-90%	24-36 in.	+6 ft.	10 ft.	Natural or gravel	Asphalt or concrete	4%	12%	8 ft.

Source: San Miguel County Trail Design Standards, 1992. Telluride Regional Pathways Initiative/San Miguel County, Colorado Planning Department.

Appendix B: Trail & Path Design Standards

Trail & Path Planning: A Guide for Municipalities

Appendix C



Trail & Path Costs

Cost Estimates

The following tables present estimated costs associated with the construction of trails as presented in planning studies and master plans from throughout the United States. Trail planners should only use these estimates to evaluate the relative range of costs associated with trail & path construction. These are presented as case studies and may not represent the costs of trail construction in Chester County. Because of unpredictable changes in the cost of fuel and petroleum products, such as asphalt, local planners should get up-to-date cost estimates before generating trail & path cost estimates. These estimates were not generated by Chester County. They are not, and should not be considered to be a substitute for professional guidance regarding the cost of constructing trail & path projects.

Figure C.1: Montgomery County, PA Estimates for Constructing Trail Surfaces (2005)

Cost Range per Linear Foot	Cost Range per Mile	Trail Feature
\$53.00 to \$77.00	\$279,840 to \$406,560	12-foot multi-use: concrete
\$26.50 to \$38.50	\$139,920 to \$203,280	6-foot multi-use: concrete
\$26.00 to \$43.00	\$137,280 to \$227,040	12-foot multi-use: macadam
\$13.00 to \$21.50	\$68,640 to \$113,520	6-foot multi-use: macadam
\$11.00 to \$21.00	\$58,080 to \$110,880	12-foot multi-use: cinder
\$5.50 to \$10.50	\$29,040 to \$55,440	6-foot multi-use: cinder

Source: *Guidelines for Trail Development within Montgomery County, Pennsylvania*, undated (circa 2005), Montgomery County Commissioners.

Figure C.2: Asheville, NC Greenway Facility Development Costs (2002)

Cost per Foot	Cost per Mile	Trail Feature
\$340.91	\$1,800,000	12-foot wood deck/boardwalk trail
\$94.70	\$500,000	12-foot concrete multi-purpose trail
\$56.82	\$300,000	12-foot asphalt multi-purpose trail
\$12.31	\$65,000	8-foot woodchip pedestrian trail
\$9.47	\$50,000	8-foot bare earth equestrian trail
\$7.58	\$40,000	6-foot bare earth hiking/mountain biking trail
\$4.73	\$25,000	Landscaping
\$1.36	\$7,200	On-road bicycle lane re-striping
\$40,000 each		Restrooms
\$30,000 each		Parking lot 40 cars
\$7,500 each		Parking lot 10 cars
\$1,000 each		Information signs
\$200 each		Direction signs/warning signs

Source: Asheville Greenways Master Plan Report, November 2002. The City of Asheville NC/Trust for Public Lands.

Figure C.3: Saratoga County, NY Preliminary Cost for Champlain Canal Trail (2002)

Cost per Foot	Cost per Mile	Trail Feature
\$42.61	\$225,000	Asphalt surface: for high maintenance urban sections
\$18.94	\$100,000	Crushed stone surface: preferred in rural sections between towns
\$1.89	\$10,000	Urban bike lanes: enhancement of bike route in urban sections
\$0.95	\$5,000	Signage: integrated with the "Lakes to Lock Passage"
\$10,000 each		Culverts/drainage: includes canoe and kayak access
\$25,000 each		Parking and trailheads located in urban areas to enhance economic development
\$5,000 each		Interpretation: including signage and milepoint sculptures

Source: Saratoga County, NY, Champlain Canal Trail Concept Plan, Final Version, October 1, 2002. The Canalway Trail Partnership/New York Parks & Conservation Association.

Figure C.4: Iowa Trails Plan 2000 Estimated Costs (2000)

Cost per Foot	Cost per Mile	Trail Feature
\$35.83	\$189,200	Non-motorized multi-use trails (single treadway) concrete surface: 10 foot width
\$20.21	\$106,700	Non-motorized multi-Use trails (single treadway) asphalt surface: 10 foot width
\$18.94	\$100,000	Pedestrian trail concrete surface: 5-foot width
\$12.99	\$68,600	Pedestrian trails asphalt surface: 6-foot width
\$12.71	\$67,100	Non-motorized multi-use trails (single treadway) granular surface: 10 foot width
\$7.39	\$39,000	Granular hiking trails: 5-foot width
\$3.77	\$19,900	Wood chip hiking trail: 5-foot width
\$1.25	\$6,625	Natural surface/mountain bike trails: 5-foot width

Source: Iowa Trails 2000, 2000. Iowa Department of Transportation.

Appendix C: Trail & Path Costs

Trail & Path Planning: A Guide for Municipalities

Appendix D



Trail & Path Planning Resources

Local Bicycle, Hiking and Trail Organizations

The following organizations represent trail and bicycling enthusiasts in Chester County.

<p>Appalachian Mountain Club Delaware Valley Chapter 1528 Nudian Street, Philadelphia PA 19146 www.amcdv.org</p>	<p>Mason-Dixon Trail System 719 Oakbourne Road West Chester, PA 19382 www.masondixontrail.org</p>
<p>Bicycle Coalition Greater Philadelphia 100 South Broad Street, Suite 1355 Philadelphia, PA 19110 www.bicyclecoalition.org</p>	<p>Phoenix Iron Canal Trail Association 20 Manoven Street Phoenixville, PA 19460</p>
<p>Chester County Trail Club PO Box 2056 West Chester, PA 19380 www.cctrailclub.org</p>	<p>White Clay Creek Bicycle Club 28½ West Reamer Avenue Wilmington, DE 19804 www.whiteclaybicycleclub.org</p>
<p>The Horse Shoe Trail Club PO Box 182 Birchrunville, PA 19421 www.hstrail.org</p>	<p>Wilmington Trail Club P.O.Box 1184 Wilmington, DE 19899 www.wilmingtontrailclub.org</p>

Bicycle, Hiking and Trail Organizations

The following organizations provide information on trails at the state and national level.

<p>American Hiking Society 1422 Fenwick Lane Silver Spring, MD 20910 www.americanhiking.org</p>	
<p>Keystone Trail Association P.O.Box 129 Confluence, PA 15424 www.kta-hike.org</p>	
<p>National Park Service Trails and Rivers Conservation Assistance Program 200 Chestnut St., 3rd Floor Philadelphia, PA 19106 www.nps.gov/rtca</p>	
<p>PA DCNR Pennsylvania Online Rails-to-Trails Guide PO Box 8767 Harrisburg, PA 17105 www.dcnr.state.pa.us/railtrails</p>	<p>PA DCNR Pennsylvania Growing Greener Grants www.dcnr.state.pa.us/growinggreener</p>
<p>Rails-to-Trails Conservancy 1100 17th Street, NW Washington, D.C. 20036 www.railtrails.org</p>	<p>Rails-to-Trails Conservancy Trails and Greenways Clearinghouse www.trailsandgreenways.org</p>
<p>PA Advocates for Nutrition & Activity 845 Sir Thomas Court, Suite 9 Harrisburg, PA 17109 www.panaonline.org</p>	

Chambers of Commerce and Tourist Bureaus

The following organizations are involved with promoting recreation and tourism in Chester County.

<p>Brandywine Conference & Visitors Bureau One Beaver Valley Road Chadds Ford, PA 19317 www.brandywinecountry.org</p>	<p>Main Line Chamber of Commerce 175 Strafford Avenue, Suite 130 Wayne, PA 19087 www.mlcc.org</p>
<p>Chester County Conference & Visitors Bureau 17 Wilmont Mews, Suite 400 West Chester, PA 19382 www.brandywinevalley.com</p>	<p>Oxford Area Chamber of Commerce 23 South Third Street Oxford, PA 19363 www.oxfordpa.org</p>
<p>Chamber of Commerce of Greater West Chester 119 North High Street West Chester, PA 19380 www.gwcc.org</p>	<p>Phoenixville Area Chamber of Commerce 171 East Bridge Street Phoenixville, PA 19460 www.phoenixvillechamber.org</p>
<p>Downingtown Area Chamber of Commerce 38 West Lancaster Avenue Downingtown, PA 19335 www.downingtownchamber.org</p>	<p>Southern Chester County Chamber of Commerce 206 East State Street Kennett Square, PA 19348 www.scccc.com</p>
<p>Exton Region Chamber of Commerce 233 West Lincoln Highway, 2nd Floor Exton, PA 19341 www.ercc.net</p>	<p>Tri-County Chamber of Commerce 152 High Street, Suite 360 Pottstown, PA 19464 www.tricountyareachamber.com</p>
<p>Great Valley Regional Chamber of Commerce 7 Great Valley Parkway, Suite 210 Malvern, PA 19355 www.gvrcc.org</p>	<p>Western Chester County Chamber of Commerce 50 South First Avenue Coatesville, PA 19320 www.westernchestercounty.com</p>

Trail Planning Publications

The following publications are useful in trail planning and many of them are available for free or online.

Trail Planning and Maintenance

Community Trails Handbook, 1997, The Brandywine Conservancy.

Creating Connections: The Pennsylvania Greenways and Trails How-To Manual, 1998, by Russ Johnson, published by the PA Greenways Partnership and the PA Environmental Council.

Oregon Bicycle and Pedestrian Plan, 1995, Oregon Department of Transportation

Rail Trail Maintenance & Operation, 2005, The Rails-to-Trails Conservancy Northeast Regional Office.

Trails for the Twenty-First Century: Planning, Design and Management Manual for Multi-Use Trails, 1993, Karen-Lee Ryan, The Rails-to-Trails Conservancy.

The Benefits of Trails

Benefits of Greenways: A Pennsylvania Study, 2002, Pennsylvania Greenways Partnership Commission.

The Economic Benefits of Parks and Open Space, 1999, Lerner and Poole. Trust for Public Land.

The Economic Benefit of Trails, 1994, American Hiking Society.

Economic Benefits of Trails and Greenways, Undated, circa 2003, Rails to Trail Conservancy.

Opportunity Knocks: Open Space is a Community Investment, 2003, Michael Frank, PA Department of Conservation and Natural Resources and the Heritage Conservancy.

Parks and Economic Development, 2001, John L. Crompton, American Planning Association.

Open Space and Community Planning

Cluster Subdivision Design Guide, 2003, Chester County Board of County Commissioners.

Community Recreation and Parks: A Handbook for Pennsylvania Municipalities, 2003, Susan E. Abele, PA Department of Conservation and Natural Resource and the PA Recreation and Park Society, Inc.

Growing Green with Infrastructure, 2003, Karen Williamson, PA Department of Conservation and Natural Resources and the Heritage Conservancy.

Implementing a Municipal Open Space Program: A Guide for Pennsylvania Municipalities, 2003, Michael Frank, PA Department of Conservation and Natural Resources & the Heritage Conservancy.

Park, Recreation and Open Space; A Twenty-First Century Agenda, 2000, Alexander Garvin, American Planning Association.

Public Finance for Open Space: A Guide for Pennsylvania Municipalities, 2003, Gary Gordon, PA Department of Conservation and Natural Resources and the Heritage Conservancy.

Subdivision and Land Development, Planning Series #8, 1991, (Reprinted 1994) Phillip E. Robbins, Pennsylvania Department of Community Affairs.

Appendix D: Trail & Path Planning Resources

Trail & Path Planning: A Guide for Municipalities

Appendix E



Trail & Path Glossary

Glossary

The following terms are used in trail planning and design. Most of these terms were based on terms presented in *Trails Primer: A Glossary of Trail, Greenway, and Outdoor Recreation Terms*, 2001, compiled by Jim Schmid of the South Carolina Department of Parks, Recreation and Tourism, Columbia, South Carolina, which is posted online (as of 2006) by South Carolina State Trails Program.

Abutment: Structure at either extreme end of a bridge that supports the superstructure (sill, stringers, trusses, or decks) composed of stone, concrete, brick, or timber. (See photograph.)

Access Points: Designated areas and passageways that allow the public to reach a trail from adjacent streets or community facilities.

Access Trail: Any trail that generally connects the main trail to a road or another trail system.

Aggregate: Surface material made up of broken stone ranging in size from broken stone or gravel to sand. (See photograph.)

Asphalt (Macadam): Petroleum-based surface material that provides a smoothly paved surface that is suitable for bicycles and in-line skates. It is preferred in urban areas where trails are often used for commuting to and from work or school.

At-Grade Crossing: A trail crossing a roadway on the same elevation. Ideally, a safe at-grade crossing has either light automobile traffic or a traffic signal that can be activated by trail users. (See photograph.)

Base: The primary excavated bed of a trail upon which the tread, or finished surface lies.

Base Course: The layer or layers of specified material of designed thickness placed on a trailbed to support surfacing.

Bed: The excavated surface on which a trail tread lies.

Bike Path: A facility that is designed, constructed, maintained and used primarily for bicycle use.

Bridleway (Bridle Path): Public or private way designed and maintained primarily for equestrian use. Other non-motorized uses may be permitted.

Carrying Capacity: In a broad, generic sense, the amount of use a given resource can sustain before an irreversible deterioration in the quality of the resource begins to occur.



Abutment



Aggregate



At-Grade Crossing



Clearing Height

Center Line: An imaginary line marking the center of the trail. During construction, the center line is usually marked by placing a row of flags or stakes (to indicate where the center of the trail will be).

Clearing: Removal of windfall trees, uproots, leaning trees, loose limbs, wood chunks, etc. from both the vertical and horizontal trail corridor.

Clearing Height (Vertical Clearance): The vertical dimension which must be cleared of all tree branches and other obstructions that would otherwise obstruct movement along the trail. (See photograph.)

Clearing Width (Limit): The outer edges of clearing areas (cleared of trees, limbs, and other obstructions) as specified by trail use.

Concrete: A composition of coarse and fine aggregates, portland cement, and water, blended to give a hard, unyielding, nearly white pavement which can be finished to any degree of smoothness. Concrete is most often used in urban areas with anticipated heavy use or in areas susceptible to flooding.

Control Point (Target): A features that trail users will want to naturally head towards or try to avoid (such as a view, an obstacle, etc.). This feature should be flagged and used to help layout a trail. (See photograph.)



Control Point (Target)

Course: An even layer of stones, similar to a course of bricks, that forms a foundation, intermediate layer, or cap stone layer in a stonewall.

Critical Point: The outside edge of the trail. It is called the critical point because this is where trail maintenance problems (often related to drainage) usually begin. Rounding the outside edge helps water to leave the edge of the trail.

Cross Section (Typical Cross Section or Typical): Diagrammatic presentation of a trail or path profile which is at right angles to the centerline at a given location.

Crosswalk: Any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface. (See photograph.)

Crusher Fines (Crusher Run, Crushed Stone): Refers to any limestone, granite, or gravel that has been run through a crusher that is used to form a hard tread surface, which once wetted and compacted creates a smooth trail surface for high-use areas.

Difficulty Rating: A subjective rating of trail difficulty based on an average user with average physical abilities. For example the US Forest Service uses Easy, More Difficult, Most Difficult. Many other agencies use the following:

- Easy is defined as relaxing, posing minimal difficulties and able to be traveled with little physical effort.
- Moderate is defined as not requiring excessive or extreme physical effort.
- Difficult is defined as physically strenuous requiring excessive or extreme physical effort.



Crosswalk

Double-Track Trail: A trail that allows for two users to travel side by side or make passes without one user having to yield the trail. Double-track trails are often old forest roads. (See photograph.)

Drainage Ditch (Ditching): Open ditches running parallel to the trail tread that collect water and carry it away from the site. A drainage ditch is also an element of a waterbar, providing an escape route for water diverted from the trail by the bar.

Extended Trail: Trails over 100 miles in length (as defined in the National Trails System Act).

Feeder Path or Trail: A trail designed to connect local facilities, neighborhoods, campgrounds, etc. to a main trail.

Fill (Material): Gravel or soil used to fill voids in trail tread and to pack behind retaining walls and other structures.

Grade: Slope expressed as a percentage (feet change in elevation for every 100 horizontal feet, commonly known as “rise over run”). A trail that rises 8 vertical feet in 100 horizontal feet has an 8 percent grade. Grade is different than angle; angle is measured with a straight vertical as 90 degrees and a straight horizontal as 0 degrees. A grade of 100 percent would have an angle of 45 degrees. (See “Rise and Run.”)

Grade-Separated Crossing: Overpasses or tunnels that allow trail users to cross a railroad right-of-way or street at a different level than trains or traffic. (See photograph.)

Greenway: A linear corridor of open space, usually established along streams, ridges or abandoned rail lines, that is used for recreation or resource preservation or restoration. A greenway can vary in width and length, and should link destinations such as downtowns, historic districts, parks or nature preserves.

Intermodal: Refers to connections between modes of transportation, such as automobile, transit, bicycle, or walking.

Interpretive Sign or Display: An educational sign or display that describes and explains a natural or cultural point of interest on or along the trail. (See photograph.)

Interpretive Trail: Short to moderate length trail (1/2 to 1 mile) with concentrated informational stops to explain associated views, natural flora and fauna, and other features.

Loop Trails: Designing trail systems so that the routes form loops, giving users the option of not traveling the same section of trail more than once on a trip.

Mode: A particular form of travel, such as walking, bicycling, carpooling, bus, or train.

Multimodal: Facilities serving more than one transportation mode or transportation network comprised of a variety of modes.



Double-Track Trail



Grade-Separated Crossing



Interpretive Sign or Display



Multiple-Use (Multi-Use) Trail

Multiple-Use (Multi-Use) Trail: A trail that permits more than one user group at a time, such as a horse-back rider, hiker, mountain bicyclist, etc. (See photograph.)

Nature Trail: Moderate length trail (3/4 to 2 miles) with primary function of providing an opportunity to walk and study interesting or unusual plants or natural features at users pleasure. The ideal nature trail has a story to tell. It unifies the various features or elements along the trail into a related whole. (See photograph.)

Path: A facility that is designed, constructed, maintained and used primarily for one form of travel, such as a bicycle path or a walking path.

Pavement: That part of a trail having a constructed surface for the facilitation of wheeled trail traffic.

Plan and Profile Sheets: Drawings (usually prepared for trail construction) used to record horizontal and vertical geometry of a trail alignment as well as other required improvements to the trail corridor.

Primitive Trail: A trail, usually unpaved with a natural dirt surface, that is often located in a natural area isolated from development.

Recreational Carrying Capacity: The number of recreational opportunities that a specific unit of a recreation resource can provide year after year without appreciable biological or physical deterioration of the resource or significant impairment of the recreation experience.

Rise and Run: A measurement of grades and slopes, expressed as a proportion of the amount of vertical rise in a given horizontal run. For example, "1:4" means that the grade or slope rises 1 unit for each 4 units of horizontal run. Taking this one step further, 1:4 is a 25 percent grade or slope, where 25 percent is obtained by dividing 1 by 4 and expressing the result as a percentage. (See "Grade.")

Secondary Trail: A short trail used to connect to a primary trail or a branching of a primary trail. Secondary trails encourage movement between two primary trails or facilitate dispersal of use through secondary branching. (See photograph.)

Shoulder: Usually paved portion of a highway, which is contiguous to the travel lanes, allowing motor vehicle use in emergencies. They can also be for specialized use by pedestrians and bicyclists.

Shy Distance: The distance between the trails edge and any fixed object capable of injuring someone using the trail.

Side Trails: Dead-end trail that access features near the main trail.

Sight Distance: The visible and unobstructed forward and rear view seen by a trail user from a given point along the trail.

Single-Track Trail: A trail only wide enough for one user to travel and requires one user to yield the trail to allow another user to pass.



Nature Trail



Secondary Trail

Single Use Trail: One that is designed and constructed for only one intended user such as hiker use only. (See photograph.)

Slope, Percent: Number of feet rise (vertical) divided by feet of run (horizontal) times 100 to get percent slope; example: 15-feet of rise over 100-feet of run is a 15% slope.

Social Trail: A trail or path that developed informally from repeated use. (See photograph.)

Soil Cement (cement-treated base): A mixture of pulverized soil combined with measured amounts of portland cement and water and compacted to a high density. As the cementing action occurs through hydration, a hard, durable semi-rigid material is formed. It must have a seal coat to keep out moisture and a surface that will take wear.

Standards, Design: The specific values selected from the trail or greenway design criteria become the design standards for a given trail or greenway project. These standards will be identified and documented by the designer.

Sub-base: On paved trails the sub-base lies between the sub-grade and the trail surface, and serves as a secondary, built foundation for the trail surface (concrete or asphalt). The purpose of the sub-base is to transfer and distribute the weight from the trail surface to the sub-grade. The sub-base is usually a four to six-inch graded aggregate stone (gravel), which provides bearing strength and improves drainage.

Sub-grade: The native soil mass that makes up the primary foundation of the trail that supports the tread surface. Topography, soils, and drainage are the key factors comprising the sub-grade.

Substrate: Intermediate layer overlying bedrock and under topsoil. Underlying layer of loose/soft material below topsoil.

Surfacing: Material placed on top of the trailbed or base course that provides the desired tread. It lessens compaction of soil, provides a dry surface for users, and prevents potential erosion and abrasion.

Trail: An off-road facility with a permanent alignment that is open to the general public, and that is designed, constructed and maintained as part of a public park system used for a variety of non-motorized forms of travel including walking, hiking, biking, cross-country skiing or horseback riding

Trailbed: The finished surface on which base course or surfacing may be constructed. For trails without surfacing, the trailbed is the tread.

Trailhead: An access point to a long distance trail often accompanied by various public facilities, such as parking areas, toilets, water, directional and informational signs, and a trail use register. Designed and managed for those embarking on an overnight or long-distance trip whereas a Staging Area usually caters to day use. (See photograph.)

Tread (Treadway): The actual surface portion of a trail upon which users travel excluding backslope, ditch, and shoulder. Common tread surfaces are native material, gravel, soil cement, asphalt, concrete, or shredded recycled tires.



Single Use Trail



Social Trail



Trailhead

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