

Appendix C

Trail Development Standards

Due to the accident along the Corrigan Drive multi-use trail in South Park in April 2001, much attention has been given to the issue of the safety of trail users in the county parks. Safety concerns were first recognized in the late 1980s and in 1990 the County completed the *North Park and South Park Trail Improvement Feasibility Study*. This study focused on improving safety for trail users in North and South Parks. The primary concern addressed in the 1990 study was conflicts between the various trail users. Specific safety concerns addressed by the study include:

- Use of sidewalk by bicyclists
- Bicyclists using the vehicular cartway due to congestion in the designated bike lane at North Park
- Dangerous intersection crossings

In terms of trail needs, the 1990 Study documented the following trail uses throughout the Allegheny County parks system:

- Bicycling
- Walking
- Hiking
- Equestrian
- Cross Country Skiing
- Therapeutic/ Braille Trails

The analysis of current park uses conducted for the Comprehensive Master Plan confirms that these uses are still valid. In addition, mountain biking has become a popular activity in the parks system during the past ten years.

Most of the recommendations documented in the 1990 *Trail Improvement Feasibility Study* were never implemented. Today, many of the concepts recommended in the Study remain valid. However, the improvement standards presented in the study are outdated and do not reflect recent developments in pedestrian and bicycle facility planning. Therefore, the County should use updated standards for trail development projects in North Park, South Park, and other parks in the system.

Sources of current guidelines and standards for pedestrian and bicycle facilities include:

- “Guide for the Development of Bicycle Facilities,” American Association of State Highway and Transportation Officials, 1999
- “A Policy on Geometric Design of Highways and Streets,” American Association of State Highway and Transportation Officials, 2000
- “The Bicycle Compatibility Index; A Level of Service Concept, Implementation Manual,” US Department of Transportation, 1998
- “Manual on Uniform Traffic Control Devices,” Federal Highway Administration
- “Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide,” Federal Highway Administration, 2000
- “Trail Building Basics,” International Mountain Biking Association
- “Guidelines for Establishing In-Line Skate Trails in Park and Recreational Areas,” International In-Line Skate Association

Based on these guidelines and standards, revisions and additions to the recommendations of the 1990 study are proposed in the following areas:

- Location of bicycle lanes
- Separation between bicycle lanes and pedestrian paths
- Trail widths
- Maintenance
- Policy issues
- Education
- Enforcement

A. Location of Bicycle Lanes

The AASHTO “Guidelines for the Development of Bicycle Facilities” reinforce the concept that federal and state regulations address bicycles as vehicles. As such, bicycles are governed by the general rules common to all vehicles, in particular the requirement that vehicles drive on the right side of the road in their direction of travel.

The recommendation in the 1990 study for a two-way bicycle lane on one side of the road violates this regulation. Instead, the County should establish bicycle lanes on each side of a two-way road to provide the cyclist with the opportunity to travel with the direction of motor vehicle traffic, a requirement of the Motor Vehicle Code.



Contra-flow bicycle lane

Should a proposed bike lane be suitable only in one direction along a two-way road, the County should not develop a one-way route or should limit vehicular travel to one direction and add a contra-flow bicycle lane, as it can be guaranteed that a one-way bicycle lane will be used for two-way travel.

Another option, if space permits, is to provide a protected multi-purpose trail parallel to an existing vehicular lane of travel but separated from the road by a minimum distance of five feet and a physical barrier 42" in height. Although this configuration is not provided for in the AASHTO Guidelines for the Development of Bicycle Facilities, PennDOT has indicated that they are willing to review such proposals on a case-by-case basis. Generally, a protected multi-purpose trail is installed only for short distances where it is the only means of providing continuity along the trail. Safe intersection crossings are required to transition the cyclist back to the bicycle lanes.

It is recommended that all trail design standards (for both on-road and shared use trails), and corresponding trail development, follow the standards set forth in the following documents:

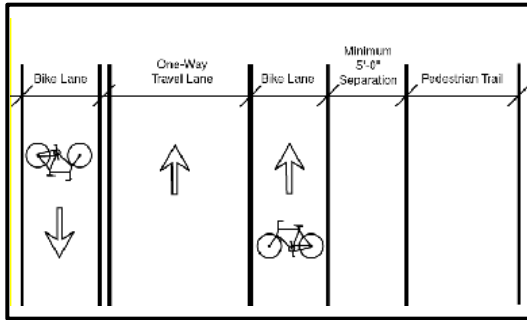
- American Association of State and Highway Transportation Officials, "Guide for the Development of Bicycle Facilities," current edition
- Federal Highway Administration, "Manual on Uniform Traffic Control Devices"

A synopsis of current trail planning design standards is provided in Table C-1.

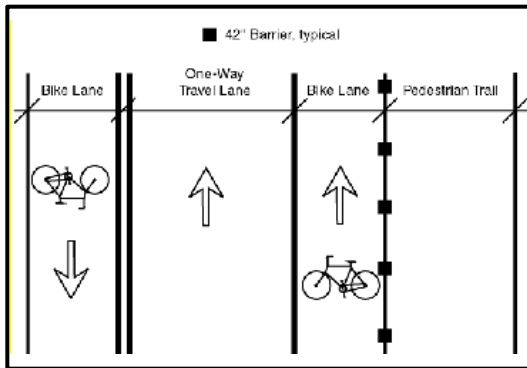
**Table C-1
Trail Planning Design Standards**

Trail Type	Width	Clear Zone	Clearance	Surface	Grade
Hiking/walking trail	4'	n/a	8'	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'	n/a	8'	crushed stone, 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'	2'	8'	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'	2'	8'	bituminous	5% or less, greater grades acceptable if AASHTO sight and stopping distance requirements are met
On-road bicycle lane ¹	5'	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'	n/a	n/a	bituminous	5% or less, greater grades acceptable if AASHTO sight and stopping distance requirements are met
Mountain bike trail	2'	3'	8'	compacted earth	10% maximum
Equestrian trail	4'	2'	10'	natural earth	10% or less 20% for <100 linear ft

¹Bicycle lane width should be determined by Bicycle Level of Service Analysis, minimum width five feet



Minimum five-foot separation between bike lane and pedestrian trail



42" tall barrier between bike lane and pedestrian trail

B. Bicycle Lane and Pedestrian Path Separation

The 1990 *Trail Improvement Feasibility Study* recommended that an 8" x 8" wolmanized timber edge be placed between the bicycle lane and the pedestrian trail to define the pedestrian trail from the bicycle lane. This presents a serious hazard to bicyclists and pedestrians alike. The AASHTO "Guide for the Development of Bicycle Facilities" recommends that the pedestrian trail be separated from the bicycle lane by minimum five feet. Where this is not possible, a 42" tall barrier should be placed between the bicycle lane and the pedestrian path to reinforce the path as a separate facility from the roadway. The barriers must be carefully located so as to not interfere with the lines of sight of drivers, bicyclists, and pedestrians.

C. Trail Widths

Although minimum standards for trail width have been established for each type of trail, the width must be considered on a case-by-case basis.

It is recommended that all on-road bike lanes follow the recommendations of the Federal Highway Administration's "Development of the Bicycle Compatibility Index: A Level of Service Concept, Final Report," December 1998 and the American Association of State and Highway Transportation Officials' "Policy on Geometric Design of Highways and Streets," current edition. The Bicycle Compatibility Index is a system to determine a roadway segment's ability to accommodate the average adult bicyclist. It is recommended that on-road trail segments be designed to achieve the highest Bicycle Compatibility Index rating that is feasibly possible, as expressed in terms of Bicycle Level of Service (BLOS). However, it is also recommended that the County establish a minimum BLOS rating of C for all trail segments. Consideration must also be given to volume of use because the width required to attain the recommended BLOS rating may not be sufficient to accommodate the number of users.

To address this issue, it is recommended that the County conduct a study to quantify the number and type of trail users who are currently using the trails in North and South Parks. User counts should be taken during peak periods so that the widths of bicycle lanes and pedestrian trails can be designed to accommodate peak use.

D. Maintenance

A maintenance plan is a necessity to properly support trail networks in the county parks system. The plan should establish the level of care and frequency of maintenance activities. In addition, it

should establish a means for pedestrians and bicyclists to report trail segments that are in need of maintenance.

The goal of trail maintenance is to maintain a smooth surface, free of potholes and debris. Glass, sand, litter and fallen leaves often accumulate and must be routinely swept or vacuumed. Pavement edges should be uniform, free of abrupt drop-offs, and not be allowed to unravel. Snow plowing should be used to maintain bicycle facilities in the winter, while deicing materials and abrasives should be avoided as they can damage bicycles and create safety hazards. Signs, lane markings, and striping should be inspected regularly and kept in good condition.

E. Policy Issues

As part of official bicycle lane standards and policies for the Allegheny County parks system, the County should work with local municipalities on regulatory approaches to promoting safe bicycle travel. Regulations should be established to address the following:

- Ban all motorized vehicles, other than maintenance vehicles, from bike lanes, in the form of a local ordinance
- Require the use of helmets when bicycling, in the form of a local ordinance
- Require reflectors, headlights, and reflective clothing when riding bicycles during non-daylight hours, in the form of a local ordinance
- Adopt standards for lane markings and signage for bike lanes, in local land development and subdivision regulations
- Support shared use paths and bicycle compatible roadway design, through local land development and subdivision regulations
- Require bicycle parking facilities to be placed at commercial buildings, in local land development and subdivision regulations

F. Education

The County should institute a safe bicycling and motoring education programs to complement the development of bicycle facilities. A safe bicycling program should provide instruction on the basics of bicycling, compliance with the Pennsylvania Bicycle Driver's Manual, the Pennsylvania Motor Vehicle Code, and defensive bicycling tactics. These programs can be funded with TEA-21 and other trail-related funding programs. ASHTO recommends programs be developed to reach four audiences: young bicyclists, parents of young bicyclists, adult bicyclists, and motorists.

Given the results of the CPSC study “Bicycle Use and Hazard Patterns in the United States,” it is recommended that the County provide educational programs to teach parents to be able to identify when their children are able to safely utilize the various types of bicycle facilities located throughout their community. This will allow those children who are ready to use the facilities to do so.

G. Enforcement

To reinforce the recommended education programs, the County must commit to enforcing violations of the local ordinances and the state Motor Vehicle Code. The County Police should enforce not only motorized vehicle violations, but pedestrian and bicycle violations as well.

