



Rails-with-Trails:

A Preliminary Assessment of Safety and Grade Crossings

November 2005

Rails-to-Trails Conservancy



Table of Contents

Executive Summary	1
History: Trail Networks and Transportation in Pennsylvania	2
The Use of Rail Corridors for Trails	4
Previous Studies	5
Grade Crossings Survey 2005	6
Liability	7
Trespassers	8
Warning Devices	9
Conclusion	10
Glossary	11
Resources and Acknowledgements	12
Contacts	13
Appendix I: Grade Crossings Survey 2005 Analysis	15
Appendix II: Grade Crossings Survey 2005 Data	17
Appendix III: Highway-Rail Crossings Analysis and Data	23
Appendix IV: Railroad Warning Devices At Trail-Rail Crossings	26



Rails-to-Trails Conservancy
1100 Seventeenth Street, NW • 10th Floor
Washington, DC 20036
202.331-9696 • www.railtrails.org

Executive Summary

Rails-to-Trails Conservancy (RTC) was commissioned by Free Schuylkill River Park to complete this report. The need for this report arose from a discussion between CSX Railroad and the City of Philadelphia over safety and liability concerns regarding street-level access to the Schuylkill River Park Trail in Philadelphia. Currently, grade crossings exist at Locust and Race Streets. These crossings are the simplest and most direct path of access for neighborhood residents.

This paper reviews surveys performed by RTC and the U.S. Department of Transportation in 1996, 2000, and 2002. These surveys found there to be no crashes between trains and trail users on the sixty trails reviewed. In addition, a survey was performed by RTC in 2005 for this paper. Responses were received from 26 trails representing 40 unique grade crossings. Again, it was found that there had been no crashes between trains and trail users.

Although surveys found that no crashes had taken place, issues of liability and safety remain a concern. Although there are numerous techniques for shielding railroads from liability, such as trail insurance, indemnification, and recreational use statutes, limited case law leaves room for uncertainty. Trail user safety is in everyone's interest. At-grade crossings should be designed by a qualified engineer on a case-by-case basis.

History: Trail Networks and Transportation in Pennsylvania

The trails and greenways movement was starting to take hold in America in the early 1990s, just about the time the U.S. Department of Transportation was publishing “The National Bicycling and Walking Study: Transportation Choices for a Changing America.” This study established two goals—to double the number of trips made by bicycling and walking, and to simultaneously reduce bicycle and pedestrian casualties by 10 percent. To achieve these goals, it laid out five action items, the second of which was to plan and construct needed facilities, including trails. The report highlighted eight different categories of trail benefits, stating under transportation that “trails can significantly increase the percentage of bicycling and walking commuter and other utilitarian trips, improve safety, increase access and promote inter-modal travel.” The other trail benefits noted were health and fitness, environmental, recreational, economic, educational, historical and cultural, planning and quality of life.

Pennsylvania soon followed with its own plan to implement the recommendations of the federal study—“Bicycling and Walking in Pennsylvania: A Contract for the 21st Century” (Pennsylvania Department of Transportation, 1996). This plan laid out an impressive vision and planning philosophy:

“Pennsylvania is a place where residents and visitors of all ages can choose to bicycle and walk. People are able to bicycle and walk with confidence, safety and security in every community, both for everyday transportation and to experience and enjoy the remarkable natural resources of the state...State, regional and local government entities in the Commonwealth of Pennsylvania value the importance of walking and bicycling for transportation, health and wellness, and will actively plan and provide for the integration of walking and bicycling into transportation, recreation and tourism systems.”

The plan also identified five key issues facing non-motorized transportation, including “a need for more safe places to bicycle and walk,” “a need to have responsible agencies recognize that pedestrian and bicycle transportation must be treated systematically,” and “a need to reinvent the way government agencies in Pennsylvania take responsibility for bicycling and walking.”

Pennsylvania took further strides in 2001 with “Pennsylvania Greenways: An Action Plan for Creating Connections” (Pennsylvania Greenways Partnership

Commission, 2001). This plan envisioned “a distinguishable greenways network, similar to the Interstate Highway System that is today the backbone of Pennsylvania’s system of roadways.” The plan went on to conclude that “greenways will become one of the Commonwealth’s most powerful tools to achieve sustainable growth and livable communities.” As stated in “Bicycling and Walking in Pennsylvania: A Contract for the 21st Century,”

“The future of bicycling and walking in Pennsylvania is at a cross-roads. The two modes are currently underutilized for transportation purposes and a great potential exists to boost levels of both daily and recreational travel by foot and bicycle. The potential will not be realized without a commitment to change.”



Allegheny Highlands Trail, Pa. (Photo courtesy of Bill Hopkins.)

The Use of Rail Corridors for Trails

If we wish to increase the number of bicyclists and pedestrians it is imperative that we create a transportation infrastructure catered to these users. A successful system that has been emulated across the United States is the creation of trails along former and active railroad corridors. In the United States today there are 110 trails adjacent to active rail lines spanning more than 700 miles and located in 33 states. These transit corridors connect people to jobs, schools and amenities. They connect neighborhoods, communities and towns. They provide an oasis in urban environments and safe locations for active recreation. It is no wonder that the number of rail-with-trail projects is growing at an increasing rate and that more and more communities are interested in building trails within rail corridors.

As this takes place, the railroad industry as well as local municipalities and trail planners have raised some questions about the safety of the intersection of trails, city streets and active rail lines. Specifically, there are concerns regarding at-grade crossings. Whereas the intersection of rail lines and busy city streets is often accommodated by the building of bridges and tunnels, the intersection of rail lines and trails do not always warrant this. In some cases the cost of building a bridge or tunnel would be so great as to defeat the entire project.

The question of creating an at-grade crossing that is safe is complicated by many issues. The first is that there is limited information about pedestrian/bicycle and train crashes. The Federal Railroad Administration (FRA) keeps detailed data on

highway-rail crashes, but there is insufficient data when these crashes involve pedestrians and even less data when these crashes involve bicyclists. (These data are analyzed in Appendix III.)

The FRA also keeps information on crashes between trespassers and trains. We were not able to access any detailed information about trespassers and trains and so our analysis of this issue is very limited. More detailed data might help us to discover clear evidence that the establishment of a trail adjacent to a rail line decreases the number of trespasser crashes thereby reducing the number of pedestrian deaths. Currently, we only have anecdotal evidence of this which will be discussed below.



The 95 mile Trail of the Coeur d'Alene crosses the active St. Maries Railroad near Plummer. Safety devices are limited to railroad advance warning signs, stops signs, and a curve in the road to slow bicyclists. (Photo courtesy of Brian Momberg, RTC.)

Previous Studies

The best data is from research that has been performed by the U.S. Department of Transportation (DOT) and Rails-to-Trails Conservancy (RTC). Beginning in 1996, on a recurrent basis, information has been gathered and, to date, two studies have been published on rails-with-trails. Based on surveys and phone conversations the studies reported that no crashes have taken place between trains and trail users on the trail.

In 1996 and again in 2000, RTC surveyed trail managers regarding crashes between trains and trail users on the trail. This information was published in a report in 1996 and in a revised edition in 2000 entitled “Rails-with-Trails: Design, Management, and Operating Characteristics of 61 Trails Along Active Rails Lines” (2000 RTC study). At that time, trails adjacent to active rail lines extended between 0.4 and 57 miles in length with the longest portion of a trail next to a rail line being 22 miles. On the Southwest Corridor Park Trail in Massachusetts the adjacent trains ran at a speed of 150 mph. The oldest rail-with-trail corridor was the Illinois Prairie Path built in 1966. The widest corridor was the Rose Canyon Bike Path in California at an average width of 1,500 feet. The narrowest corridor was the Seattle Waterfront Trail and Duwamish Trail, both in Washington, at 18 feet. The Railroad Trail in Michigan ran two feet from active tracks. The Illinois Prairie Path existed next to an active train line with a train frequency of nine trains per hour. The Southwest Corridor Park in Massachusetts had the most crossings at seventeen. And the Heritage Rail Trail County Park in Pennsylvania had the most at-grade crossings at 13. In both the surveys conducted in 1996 and 2000, there were no

crashes between trains and trail users on the trail¹ even though in 1996 there were approximately 38 trails next to active rail lines and by 2000 that number had increased to 60.

In 2002, the U.S. Department of Transportation and Alta Planning produced the publication “Rails-with-Trails: Lessons Learned” (2002 DOT study). The extensive study was based on an analysis of existing literature, case studies that included interviews with railroad officials, trail managers and law enforcement officials, and before-and-after conditions related to safety, trespassing, vandalism and conflicts. The research also included relevant laws and statutes, legal case studies and precedents, and railroad company policies toward rails-with-trails.

The DOT report included case studies on 21 rail-with-trail projects located throughout the United States. For these studies researchers queried trail managers, railroad officials and official railroad records for information about at-grade rail-trail crossings and reported that no crashes had taken place. Additionally, the study reported that in many cases the addition of a trail benefited the railroad. Their list of benefits included: a reduction in liability costs (occurs when a rail company enters into a liability agreement with a municipality or trail organization); financial compensation (for selling land, or easements, or as a tax credit for donated land or easements); a reduction of petty crime and nuisance problems, including trespassing, dumping and vandalism (which often decreases after the establishment of a trail); and a reduction of illegal track crossings through the channelization of users to grade-separated or well-designed, at-grade crossings.

¹ In proximity to the trails, there were two crashes, though one did not include a trail user and the other took place on an already existing at-grade road crossing. In the first case, a person was injured as they traveled from a nearby residential neighborhood to “hop” a slow-moving train (crossing the trail along the way). The second incident occurred when a bicyclist ignored warning bells, flashing lights and a lowered crossing gate, and collided with a train.

Grade Crossings Survey 2005

In addition to the existing body of research, this report contains a new study of trails that have grade crossings with active rail lines. This research provides a descriptive analysis of the type of crossings and the landscape features surrounding the crossings.

From an initial pool of approximately 60 trails, responses were received from 26 trails representing 40 unique grade crossings. Responses to the survey indicated that there were no crashes, injuries, fatalities, vandalism or adverse incidents related to any of these crossings.

Several types of trail crossings were represented. In 27 cases the trail itself crossed the tracks, in eight cases a public road crossed the tracks and in two cases a private road crossed the tracks. And in one case each, a road solely for trail access and a road with a marked bike lane crossed the tracks. These at-grade crossings existed in 14 states, with three in New York, three in Illinois, and six in Pennsylvania.

The average number of tracks crossed was one, with only four trails reporting crossing a double set of tracks. Three-quarters of crossings were of freight lines, while the remainder were split between passenger and both passenger and freight line.

The frequency of trains ranged from twice per hour to once per week. Five trails reported trains passing once or twice per hour, seven reported trains 1–5 times per day, and four reported trains 1–3 times per week. Approximately half of those surveyed did not answer this field.

A speed of 15 mph or less was most typical. Four indicated a speed in excess of 15 mph with one train traveling at a speed of 50 mph. Approximately half of the respondents did not supply a value for train speed. One trail reported trains parking on the crossing though the frequency and duration were not known.

The following groups install and maintain the crossing warning devices: railroad (58 percent); state, county, or local government (38 percent); and trail organization (10 percent). In five cases (17 percent) the railroad and the municipality jointly install and maintain the warning devices and in one case the railroad and the trail organization jointly install and maintain the warning devices.

Based on the survey the following groups assume liability for incidents that occur at the crossings: state, county or local government (28 percent); railroad (21 percent); trail organization (10 percent); other or unknown (45 percent). In 70 percent of the cases the entity assuming liability has insurance coverage. In 20 percent of the cases there is a liability or indemnification agreement in place for the crossing. In 55 percent of the cases the crossing is legally approved and recognized by the state DOT or the state Public Utility Commission.



Along this trail in Burlington, Vermont, safety devices include cross bucks, flashing lights, a gate as well as a fence to encourage pedestrians to traverse the tracks at the designated crossing point.

Liability

It is encouraging to find that as the number of rail-with-trail projects continues to grow there still has not been a crash between a bicyclist or pedestrian and a train. However, due to the lack of trail incidents questions of liability continue to arise. Railroad companies have a right to be concerned about liability. As private companies, it is in their interest to reduce their liability to the greatest extent possible. Although the lack of a crash between a train and a trail user should reduce concern regarding the danger of rail-trail crossings, on the other hand, the lack of crashes also means there is limited case law on the subject.

Various techniques can be used to shield railroads from liability. These include land transfers, insisting on trail insurance or indemnification agreements, and knowledge of state recreational use statutes, which exist in every state. In addition, Maine recently adopted an act that extends landowner liability protection laws to railroad properties and rights-of-way.

The effectiveness of these techniques is borne out by the lack of any claims against railroads. The 2000 RTC report states: “None of the 61 trail managers were aware of liability claims being filed against any railroads as a result of trails running along active rail lines.” In addition to the lack of claims, the 2000 RTC report found that 60 of 61 trails carried their own insurance, and 26 percent specifically indemnified the rail carriers.

The 2000 RTC report also found that no trails reported difficulty in obtaining insurance. This suggests that insurance carriers are comfortable with the safety of trails, including those that interact with active rail lines.

A legal review of the crossings included in the survey found that railroads could be liable for incidents at only 19 percent of crossings if any incidents were to occur. In only two cases would the railroad be considered solely liable. This is because the railroad had not established an indemnification agreement or because they did not share liability with a trail group or government entity.



The Simon Kenton Trail in Ohio uses only cross bucks as safety devices. However, the trail curves intersecting the tracks at a right angle, slowing users and providing for an increased sight line. (Photo courtesy of Peggy Holland.)

Trespassers

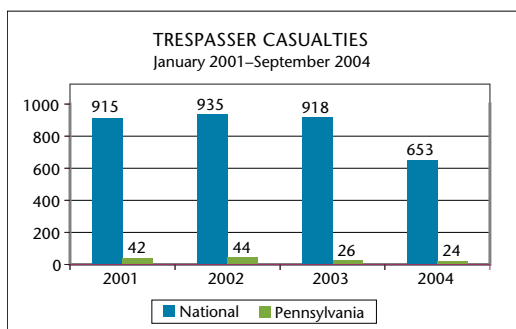
Another important issue is trespassing and rail-safety. Railroads experience numerous crashes and deaths among trespassers. According to the Institute of Transportation Engineers (ITE) Technical Committee in their “Rails-with-Trails: Best Practices Report”², by 1998, the United States railroad industry had already experienced more than 900 trespassing injuries and fatalities.

In the 2002 DOT study, it was reported that from 1995 to 2002 the number of trespass fatalities had reached approximately 500 per year, exceeding highway-rail crossing deaths. Per the report, “trespasser fatalities represent the greatest loss of life associated with railroad operations.” In Pennsylvania over the last 10 years almost 200 trespasser deaths have occurred, approximately 16 deaths per year.

There is no evidence that legitimate trail users will intentionally or unintentionally stray onto railroad property. Nor is there evidence that would-be trespassers will use trails to gain access to railroad property where no opportunities for access previously existed. In fact, established trails with designated access points will more likely

conduct people away from otherwise dangerous situations. Researchers as part of the DOT report observed fewer trespassers on railroad tracks located next to trails. In areas where trails were planned but not built, they noticed more frequent trespassing. They also observed four corridors before and after the inclusion of a trail and found “either no change or a significant drop in trespassing once the trail was built.”

Further, the establishment and use of trails has been found to deter illicit activity such as dumping and trespassing that previously occurred in the otherwise under-utilized corridor. A trail adjacent to a rail line may actually reduce the number of incidents by providing a safe pathway for people that currently travel on or in very close proximity to the tracks. The establishment of a maintained trail next to an active railroad may actually decrease the number of trespassers; therefore, decreasing the number of trespasser-related injuries and deaths.



Thun Trail, Pa.

² In 1997 the Federal Railroad Administration held the first of three forums to bring government agencies, trail proponents and engineers together to develop areas that needed to be studied for rails-to-trails. As a result, the U.S. Department of Transportation decided to develop a “Best Practices” report of rails-with-trails in the United States. The first section of the Rails-with-Trails Best Practices Study was completed in April 1999. The report was prepared by an Institute of Transportation Engineers (ITE) Technical Committee under the auspices of the Transportation Planning Council.

Warning Devices

The design of crossings is another important arm of safety concern. The 2002 DOT report provides considerable detail on the design of rail-with-trail and trail-related crossings. The report states:

“A variety of warning devices are available for trail-rail crossings. In addition to the Manual on Uniform Traffic Control Devices (MUTCD) standard devices, there are innovative treatments developed to encourage cautious bicyclist and pedestrian behavior. This report does not sanction one type of treatment as being appropriate for all trail-rail crossings, nor does the MUTCD provide a standard design for highway-track crossings.”

The report also does not specify safer or more effective warning devices or techniques based on actual performance. “Guide for the Development of Bicycle Facilities” (AASHTO, 1999) and “Trails for the Twenty-First Century” (RTC, 2001) touch briefly on railroad crossing design, but are also largely silent on warning devices.

Since RTC and DOT’s research shows a lack of crashes on trails near active rail lines by trail users, current statements about the efficacy of warning device technology can not be fully evaluated. However, it is important that safety measures play a significant part in overall trail design. Warning devices should be recommended for each specific situation by a qualified engineer based on various factors including train frequency and speed, trail usage and sight distances.



This crossing in Cambridge, Massachusetts includes cross bucks, flashing lights, a gate as well as a fence to encourage pedestrians to traverse the tracks at the designated crossing point. (Photo courtesy of Kelly Brown.)

Conclusion

Despite the limited availability of trail safety data, several conclusions about trail safety can be made. Tens of thousands of pedestrians are killed and hundreds of thousands are injured each year on our road system. The physical separation of trails makes them a safer option. The tables below provide details about pedestrians and cyclists on trails relative to other facilities and modes.

INJURIES AND DEATHS IN AUTO-RELATED VS. TRAIL-RELATED INCIDENTS IN YEAR 2000

	National	Pennsylvania
Bike/ped casualties at rail-with-trail crossings	0	0
Bike/ped injuries at rail-with-trail crossings	0	0
Bike/ped casualties at rail-highway crossings	15	2
All casualties at rail-highway crossing	63	8
Trespasser casualties on railroad lines	877	14
Pedestrians killed on roads	4,739	170
People killed in car crashes	41,821	1,520
Pedestrians injured on roads	78,000	N/A
People injured in car crashes	3,189,000	N/A

These statistics are from the Federal Railroad Administration (FRA) and the National Highway Traffic Safety Administration (NHTSA), both entities of the United States Department of Transportation (USDOT).

All parties recognize the attractiveness of trail systems; they reclaim lost spaces and provide a safe place for community members to ride. By placing them in proximity to active rail lines they also bring awareness to the historic transportation infrastructure that was revered by our forefathers and has been all but forgotten today.

Reports of rail-with-trail projects and trail crossings over the last 10 years indicate that the precautions that have been taken have made them safe; no crashes have occurred on these trails. As communities continue to demand more trails and look to incorporating trails into active rail corridors, we should acknowledge the relative safety of the 110 rail-with-trail projects currently in existence throughout the country.

In addition we should work toward ensuring these projects are safer. This can be accomplished by establishing specific guidelines for FRA pedestrian and bicycle incident reports, by gathering more FRA data on trespassers, and by continuing to require that FRA incidents are reported in detail. We are all dedicated to creating places that are safe, healthy, attractive and economically viable. If we work together, we can create these places for our communities.

The following terms and acronyms are used in this report.

Term	Definition
AASHTO	American Association of State Highway and Transportation Officials
Accident*	See Incident
Casualty*	A reportable death, injury, or illness arising from the operation of a railroad. Casualties may be classified as either fatal or nonfatal.
DOT	Department of Transportation
Fatality*	An event resulting in death of one or more persons. If death occurs subsequent to the filing of the monthly report, then the injury or illness must be reclassified as fatal. See § 225.13.
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
Highway-rail grade crossing*	A location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade.
Incident*	The term used to describe the entire list of reportable events. These include: fatalities, injuries, and illnesses; collisions, derailments, and similar accidents involving the operation of on-track equipment causing reportable damage above an established threshold; and impacts between railroad on-track equipment and highway users at crossings.
Injury*	Harm to a person resulting from a single event, activity, occurrence, or exposure of short duration.
MUTCD	Manual on Uniform Traffic Control Devices
NHTSA	National Highway Traffic Safety Administration
Rail-with-Trail	A trail that runs parallel and in close proximity to an active railroad.
RTC	Rails-to-Trails Conservancy
Trespasser*	Persons who are on that part of railroad property used in railroad operation and whose presence is prohibited, forbidden, or unlawful. Employees who are trespassing on railroad property are to be reported as “Trespassers” (Class E). Note: A person on a highway-rail crossing should not be classified as a trespasser unless the crossing is protected by gates, or other similar barriers that were closed when the person went on the crossing, or unless the person attempted to pass over, under, or between cars or locomotives of a consist occupying the crossing.

* These definitions are taken from “FRA Guide for Preparing Incident/Accident Reports” (DOT/FRA/RRS-22, 2003, <http://safetydata.fra.dot.gov/Objects/guidefinal050403.pdf>)

Resources and Acknowledgements

Many thanks to the trail managers and other knowledgeable persons who took their time to respond to our survey and to provide other valuable information for this report.

All highway safety statistics contained herein are from the National Highway Traffic Safety Administration and are freely available at www.nhtsa.dot.gov.

All railroad safety statistics contained herein are from the Federal Railroad Administration and are freely available at <http://safetydata.fra.dot.gov>.

Other data for this report came from (links provided where available):

"Rails-with-Trails: Design, Management, and Operating Characteristics of 61 Trails Along Active Rail Lines" (Rails-to-Trails Conservancy, 2000) www.trailsandgreenways.org/resources/highlights/online/tgc_rwt.pdf

"Rails-with-Trails: Lessons Learned" (Alta Planning, 2002) www.altaplanning.com/focus/rails_lessons.html

"The National Bicycling and Walking Study: Transportation Choices for a Changing America" (U.S. Department of Transportation, 1992)

"Bicycling and Walking in Pennsylvania: A Contract for the 21st Century" (Pennsylvania Department of Transportation, 1996)

"Pennsylvania Greenways: An Action Plan for Creating Connections" (Pennsylvania Greenways Partnership Commission, 2001)

"Guide for the Development of Bicycle Facilities" (American Association of State Highway and Transportation Officials, 1999)

"Manual on Uniform Traffic Control Devices" (U.S. Department of Transportation, 2003) <http://mutcd.fhwa.dot.gov/>

Additional Resources:

Trails and Greenways Clearinghouse: www.trailsandgreenways.org/resources/highlights/online/default.asp

American Trails: www.americantrails.org/resources/index.html

Operation Lifesaver: www.oli.org

Trail Contacts

Escondido Creek Bike Path (CA)
Stephan Vance
Senior Regional Planner
San Diego Association of Govern-
ments
401 B Street, Suite 800
San Diego, CA 92101
619.699.1924
sva@sandag.org

Jacksonville— Baldwin Rail Trail (FL)
Mary Anne Koos
District Bike/Ped Coordinator
Florida DOT
P.O. Box 607
Chipley, FL 32428
850-638-0250 x 547
maryanne.koos@dot.state.fl.us

Iowa Great Lakes Spine Trail (IA)
John Walters, Exec. Director
Dickinson County Conservation
Board
1924 240th Street
Milford, IA 51351
712 338-4786
jwalters@co.dickinson.ia.us

Great Western Trail (IL)
Deborah Jan Fagan
Chief Planner/County Trail System
Coordinitor
DuPage County
421 N. County Farm Road
Wheaton, IL 60187
630-407-6883
deborah.fagan@dupageco.org

Illinois Prairie Path (IL)
Deborah Jan Fagan
See contact above

Rock River Recreation Path (IL)
Judy Roby
Rockford Park District
1401 N. Second St.
Rockford, IL 61107
815-987-8695
judyroby@rockfordparkdistrict.org

Shining Sea Bikeway (MA)
Kevin K. Lynch, Chairman
Falmouth Bikeways Committee
PO Box 2372
Teaticket, MA 2536
508-548-0747
avnyd@aol.com

BWI Trail (MD)
David Dionne
Trails Superintendent
Anne Arundel CountyTrails
1003 Cecil Ave
Millersville, MD 21108
410-222-8820
rpdion96@aacounty.org

Eastern Prom Trail (ME)
Nan Cumming
Executive Director
Portland Trails
One India Street
Portland, ME 4101
207 775-2411
nan@trails.org

Huron River Trail (MI)
Amy Kuras
Landscape Architect
City of Ann Arbor
100 North Fifth Ave
Ann Arbor, MI 48104
734 994-1827

TART Trail (MI)
Missy Luyk
Trail Progam Spec.
TART Trails, Inc.
P.O. Box 252
Traverse City, MI 49685
231-941-4800
missy@traversetrails.org

Cedar Lake Trail (MN)
Donald Pflaum
Transportation Engineer
City of Minneapolis Public Works
350 South 5th Street - Room 233
City Hall
Minneapolis, MN 55415-1314
612-673-2129
donald.pflaum@ci.minneapolis.mn.us

Lakewalk Trail (MN)
Julene Boe
Public Information Coordinator
City of Duluth
12 East 4th St
Duluth, MN 55805
218-723-3231
jboe@ci.duluth.mn.us

Erie Canalway Trail (NY)
Steve Beauvais
Regional Transportation Enhance-
ments Coordinator
New York State Department of
Transportation
1530 Jefferson Road
Rochester, NY 14623
585-272-3466
sbeauvais@dot.state.ny.us

Genesee Valley Greenway (NY)
Steve Beauvais
See contact above

Lehigh Valley Trail (NY)
Steve Beauvais
See contact above

Arboretum Trail (PA)
John P. Wojtyna
Committee Member
Oakmont Boulevard Project
667 Fourth Street
Oakmont, PA 15139
412-860-2777
j.wojtyna@gaiconsultants.com

Gerard Hiking Trail (PA)
Dustin Drew
Acting Manager, Oil Creek State Park
305 State Park Road
Oil City, PA 16301-9733
814-676-5915
oilcreeksp@state.pa.us

Heritage Rail Trail County Park (PA)
Tammy Klunk, Assistant Director
York County Department of Parks
and Recreation
400 Mundis Race Road
York, PA 17402
717-840-7227
parks@york-county.org

Lehigh Gorge Trail
David Madl
Park Manager, Lehigh Gorge State
Park
RR#1 Box 81
White Haven, PA 18661
570-443-0400
dmadl@state.pa.us

Schuylkil River Trail - Thun Trail
Section (PA)
Wayne Bowen
Assistant Executive Director
Schuylkil River Greenway Association
140 College Drive
Pottstown, PA 19464
484-945-0200
wbowen@schuylkillriver.org

Three Rivers Heritage Trail (PA)
Thomas E. Baxter IV
Program Manager
Friends of the Riverfront
33 Terminal Way
Pittsburgh, PA 15219
412.488.0212 x3
thomas@friendsoftheriverfront.org

White Oak Bayou Trail (TX)
James Mackey, VP
White Oak Bayou Assoc
PO 920510
Houston, TX 77292
713-683-8075
bikin7@aol.com

Duwamish Trail (WA)
Pete Lagerwey
Ped and Bike Coordinator
Seattle DOT
700 5th Ave. Suite 3768
P.O. Box 34996
Seattle, WA 98134
206-684-5108
pete.lagerwey@seattle.gov

Interurban Trail (WA)
Chris Burke
9710 5th Ave NE
Seattle, WA 98115
206-371-6450
chris.burke@noaa.gov

Elk River Trail (WV)
Tom Raker, General Manager
Kanawha Co. Parks Commission
2000 Coonskin Dr
Charleston, WV 25311
304.341.8000
tom@kcprc.com

Appendix I: Grade Crossings Survey 2005 Analysis

For this report, RTC surveyed existing trail systems to gather information about grade crossings with active rail lines. Responses were received from 26 trails representing a total of at least 40 unique grade crossings in the following states:

- California (1)
- Florida (1)
- Illinois (3)
- Iowa (1)
- Maine (1)
- Maryland (1)
- Massachusetts (1)
- Michigan (2)
- Minnesota (2)
- New York (3)
- Pennsylvania (6)
- Texas (1)
- Washington (2)
- West Virginia (1)

The survey questions and answers generated the following results:

What crosses the active rail line?

The trail itself	27
A road solely for trail access	1
A road with a marked bike lane	1
Another public road	8
Another private road	2
Unidentified	1

The average number of tracks crossed was one, with only four trails reporting crossing a double set of tracks.

Three-quarters of crossings were of freight lines, while the remainder were split between passenger and both.

The frequency of trains ranged from twice per hour to once per week. Approximately half of respondents did not supply a value. Five trails reported trains once or twice per hour, seven reported 1-5 times per day, and four reported 1-3 times per week.

Approximately half of respondents also did not supply a value for train speed. The majority of those reporting indicated a speed of 15 mph or less. Only four indicated a speed in excess of 15mph.

Only one trail reported trains parking on the crossing. The frequency and duration were not known.

What type of safety devices is used?

Signs	97% (28 of 29)
Flashing lights	45% (13 of 29)
Gates	31% (9 of 29)
None	7%
Other	3%

Who installs and maintains the crossing warning devices?*

Railroad	58%
Trail Organization	10%
State, county, or local government	38%
Other	3%

Who assumes liability for any incidents that occur at the crossing?*

Railroad	21%
Trail Organization	10%
State, county, or local government	28%
Other or unknown	45%

Does the entity assuming liability have insurance coverage?

Yes	70%
No or unknown	30%

Is there a liability or indemnification agreement in place for this crossing?

Yes	20%
No or unknown	80%

Are you aware of any adverse incidents related to this crossing, including but not limited to injury, vandalism, and litigation?

Yes	0%
No	100%

Is the crossing legally approved and recognized by a state DOT or Public Utility Commission?

Yes	55%
No or unknown	45%

Have any attempts been made to close this crossing?

There was only one affirmative response to this question, with the following comment: "Norfolk Southern would like as many grade crossings closed as possible".

For multiple-choice questions, two or more responses were permitted, so percentages may not total 100% for these questions.

Appendix II: Grade Crossings Survey 2005 Data

TRAILS SURVEYED					
#	ST	Trail	County	Municipality	Location
1	CA	Escondido Creek Bike Path	San Diego	Escondido	Valley Pkwy at Escondido Transit Center
2	FL	Jacksonville - Baldwin Rail Trail	Duval	Baldwin	US 301 just north of US 90
3	IA	Iowa Great Lakes Spine Trail	Dickinson	Spirit Lake	15th St. & Lincoln Ave.
4	IL	Great Western Trail	DuPage	Lombard	Grace Street
5	IL	Illinois Prairie Path	DuPage	Elmhurst	Prospect Avenue
6	IL	Illinois Prairie Path Aurora Branch	DuPage	Aurora	Eola Road
7	IL	Illinois Prairie Path Batavia Spur	DuPage	Aurora	Eola Road
8	IL	Illinois Prairie Path Elgin Branch	DuPage	Wayne	Smith Road
9	IL	Rock River Recreation Path	Winnebago	Rockford	North Second Street
10	MA	Shining Sea Bikeway	Barnstable	Falmouth	Depot Ave
11	MD	BWI Trail	Anne Arundel	Linthicum	Andover Road and Camp Meade Road
12	ME	Eastern Prom Trail	Cumberland	Portland	Eastern Prom Trail, Eastern Prom Park
13	MI	Huron River Trail	Washtenaw	Ann Arbor	Geddes Road
14	MI	TART Trail	Grand Traverse	East Bay Twp.	TART Trail 5 mile point
15	MN	Cedar Lake Trail	Hennepin	Minneapolis	Near Penn/1394
16	MN	Lakewalk Trail	St. Louis	Duluth	There are two crossings of this same railroad track: The first crossing is at about 6th Ave East which involves the access road to the Lakewalk not the Lakewalk itself. The second crossing is at 26th Ave East and London Road.
17	NY	Erie Canalway Trail	Monroe	Town of Gates	Buell Rd. & Chili Ave.
18	NY	Genesee Valley Greenway	Monroe	Town of Chili	NY Route 383
19	NY	Lehigh Valley Trail - North Branch	Monroe	Town of Henrietta	Calkins Road
20	PA	Arboretum trail	Allegheny	Oakmont	Hulton Road at Allegheny River Blvd.
21	PA	Gerard Hiking Trail	Venango	Cherrytree Twp. Complanter Twp. Oil Creek Twp.	305 State Park Road Oil City
22	PA	Heritage Rail Trail County Park	York	11 different	
23	PA	Lehigh Gorge Trail	CARBON	Lehigh Twp	Penn Haven Junction
24	PA	Schuylkill River Trail— Thun Trail Section	Berks	Robeson Twp	Intersection State Rt. 724 and Gibraltar Road
25	PA	Three Rivers Heritage Trail	Allegheny	Pittsburgh	Fourth Street
26	TX	White Oak Bayou Trail	Harris	Houston	3500 block of W. TC Jester
27	WA	Duwamish Trail		Seattle	West Marginal Way between Spokane and Michigan Sts.
28	WA	Interurban Trail	King	Tukwila Kent	Several
29	WV	Elk River Trail	Kanawha	Charleston	Barlow Drive or Coonskin Drive

WHAT IS CROSSED?

#	Railroad	Trail	Trail access road	Road with bike path	Other public road	Other private road	Number of crossings	Number of tracks
1	North County Transit District	Yes	No	No	No	No	1	1
2	CSX	Yes	No	No	No	No	1	2
3	Northwest Iowa Railroad	Yes	No	No	No	No	1	1
4	Union Pacific - West Line	Yes	No	No	No	No	1	1
5	Chicago Central and Pacific RR	Yes	No	No	No	No	1	2
6	Elgin	Yes	No	No	No	No	1	1
7	Elgin	Yes	No	No	No	No	1	1
8	Elgin	Yes	No	No	No	No	1	1
9	Union Pacific	Yes	No	No	No	No	1	1
10	Massachusetts Bay Transportation Authority (MBTA)	Yes	No	No	Yes	No	1	1
11	Maryland Mass Transit Administration	Yes	No	No	No	No	1	1
12	Maine Narrow Gauge Railroad Museum	Yes	No	No	Yes	Yes	4	1
13	Norfolk Southern Corporation	Yes	No	No	No	No	1	1
14	MDOT/TSBY/TSBY	Yes	No	No	No	No	1	1
15	Twin Cities Western RR	Yes	No	No	No	No	1	1
16	St. Louis County & Lake County Regional Rail Authority	Yes	Yes	No	No	No	1	1
17	Rochester & Southern Railroad	Yes	No	No	Yes	No	1	1
18	CSXT	Yes	No	No	Yes	No	1	2
19	Livonia Avon & Lakeville Railroad	Yes	No	No	Yes	No	1	1
20	Allegheny Valley Railroad	No	No	No	Yes	No	1	1
21	Oil Creek and Titusville Rail Road	Yes	No	No	No	No	1	1
22	York Rail Company	Yes	No	No	No	No	1	1
23	Reading Blue Mountain & Northern Railroad	Yes	No	No	No	No	1	1
24	Norfolk Southern	No	No	No	Yes	No	1	1
25		Yes	No	Yes	No	No	1	2
26	BNSF	Yes	No	No	No	No	1	1
27	Burlington Northern Santa Fe	Yes	No	No	Yes	Yes	1	1
28	Union Pacific	Yes	No	No	No	No	9	
29	Norfolk Southern	Yes	No	No	No	No	1	1

TRAFFIC TYPE

#	Freight	Pass.	Both	Frequency	Speed	Parking
1	Yes	No	No	3 trains per week.	less than 15 mph.	No
2	Yes	No	No	At least every hour just north of a major yard	35?	No
3	Yes	Yes	No	2 x per day	10 mph	No
4	No	No	Yes	NA	NA	No
5	Yes	No	No	NA	NA	No
6	Yes	No	No	NA	NA	No
7	Yes	No	No	NA	NA	No
8	Yes	No	No	NA	NA	No
9	Yes	No	No	2–3 times per week	slow	No
10	Yes	No	No	The rail line was active but no trains operated on the line.	The last trains operating on the line would have been very slow since the crossing is 150 yards from the end of the line.	No
11	No	Yes	No	15–20	10 mph	No
12	No	Yes	No	Seasonal: 5–10 daily in summer	?	No
13	No	No	Yes	?	?	No
14	Yes	No	No	low	slow	No
15	Yes	No	No	Once to twice per day	10 mph	No
16	No	No	Yes	Excursion trains use this track twice daily which results in the crossings used four times daily. While freight trains have used these tracks it is very seldom.	15 mph for the excursion train	No
17	Yes	No	No	20	10 mph	No
18	Yes	No	No	15	50 mph	No
19	Yes	No	No	2	15 mph	No
20	Yes	No	No	Contact the owner	?	Yes
21	No	Yes	No	Normally 1 per day. Times vary from 11am to 6pm. Frequency is less in autumn and winter.	10 mph	No
22	Yes	No	No	infrequently—end of line spur	slow	No
23	No	No	Yes			No
24	Yes	No	No	?	?	No
25	Yes	No	No	Approx. every 1/2 hour	25 miles per hour est.	No
26	Yes	No	No	7–10, not really certain	25–35mph	No
27	Yes	No	No	3 per week	15mph	No
28	Yes	No	No	Unknown.	5–10 mph.	No
29	No	No	No	The rail is still considered active but has not been used since the early 1980's	N/A	No

WARNING DEVICE

#	Sign	Flashing Light	Automatic Gate	Other	None	Comments
1	Yes	Yes	No	No	No	
2	Yes	Yes	Yes	No	No	
3	Yes	No	No	No	No	
4	Yes	Yes	Yes	No	No	
5	Yes	No	No	No	No	stop sign along trail
6	Yes	No	No	No	No	stop sign along trail
7	Yes	No	No	No	No	stop sign along trail
8	Yes	No	No	No	No	stop sign along trail
9	Yes	No	No	No	No	
10	Yes	No	No	No	No	
11	Yes	Yes	Yes	No	No	
12	Yes	No	No	No	No	
13	Yes	Yes	No	Yes	No	
14	Yes	No	No	No	No	
15	Yes	No	No	No	No	
16	Yes	Yes	Yes	No	No	There is no gate or lights at 6th Ave East crossing.
17	Yes	Yes	Yes	No	No	
18	Yes	Yes	Yes	No	No	
19	Yes	Yes	Yes	No	No	
20	Yes	Yes	No	No	No	
21	Yes	No	No	No	Yes	Sign indicating hiking trail is present but there are no specific signs indicating the trail crosses the tracks.
22	Yes	No	No	No	No	
23	Yes	No	No	No	No	
24	Yes	Yes	Yes	No	No	
25	Yes	Yes	No	No	No	
26	Yes	Yes	Yes	No	No	
27	Yes	No	No	No	No	
28	Yes	No	No	No	No	
29	No	No	No	No	Yes	

RESPONSIBILITY

#	For Warning Devices				Comment	Liable for Crossing				Comment
	RR	Trail	Gov't	Other		RR	Trail	Gov't	Other	
1	No	No	Yes	No		No	No	Yes	No	
2	Yes	No	No	No		No	No	Yes	No	
3	Yes	No	No	No		Yes	No	No	No	
4	Yes	No	Yes	No		No	No	No	Yes	Don't know
5	Yes	No	Yes	No	County for trail stop signs	No	No	No	Yes	Don't know
6	Yes	No	Yes	No	County for trail stop signs	No	No	No	Yes	Don't know
7	Yes	No	Yes	No	County for trail stop signs	No	No	No	Yes	Don't know
8	Yes	No	Yes	No	County for trail stop signs	No	No	No	Yes	Don't know
9	Yes	No	No	No		Yes	Yes	No	No	
10	No	No	Yes	No		No	No	Yes	No	
11	No	No	Yes	No		No	No	Yes	No	
12	No	No	Yes	No		No	No	Yes	No	I don't know what kind of liability the railroad assumes
13	Yes	No	No	No		No	No	No	Yes	
14	No	No	Yes	No		No	No	No	Yes	
15	No	Yes	No	No		No	No	Yes	No	
16	No	No	No	Yes	North Shore Track Service	Yes	No	No	No	
17	Yes	No	No	No		No	No	No	Yes	
18	Yes	No	No	No		No	No	No	Yes	
19	Yes	No	No	No		No	No	No	No	
20	Yes	No	No	No		No	No	No	Yes	contact owner
21	Yes	Yes	No	No		Yes	Yes	No	No	Most likely it would be the trail organization but would depend on circumstances.
22	No	Yes	No	No		No	Yes	No	No	
23	Yes	No	No	No		No	No	No	Yes	The details are still being worked out-At the present time we do not have a written agreement with the railroad.
24	Yes	No	No	No		Yes	No	No	No	
25	Yes	No	No	No		Yes	No	No	No	
26	No	No	No	No		No	No	No	Yes	
27	No	No	Yes	No		No	No	Yes	No	
28	No	No	No	No		No	No	No	Yes	
29	No	No	No	No		No	No	Yes	No	

INSURANCE

#		Insurance Comment		Indemnification Comment	Incidents	DOT/PUC Designated Comment	Closing Yes/no
1	Yes	Check with City of Escondido.	Yes	Check with City of Escondido.	No	Yes	No
2	No		No	I think there is but not sure.	No	Yes	No
3	No		No		No	No	No
4	Yes	County self-insured for trail	No	Not that I am aware of at this time	No	No	Don't know
5	Yes	County self-insured for trail	No	Not that I am aware of at this time	No	No	Don't know
6	Yes	County self-insured for trail	No	Not that I am aware of at this time	No	No	Don't know
7	Yes	County self-insured for trail	No	Not that I am aware of at this time	No	No	Don't know
8	Yes	County self-insured for trail	No	Not that I am aware of at this time	No	No	Don't know
9	Yes	contact Risk Manager	Yes		No	No	No
10	Yes	Town Wide Insurance Policy	No		No	Yes	No
11	Yes	unknown	No		No	Yes	No
12	Yes	Portland Trails carries insurance but this is not Portland Trails' property, so it is covered by the City of Portland	No	I don't know	No	Yes	No
13	No		No		No	No	Yes
14	Yes	TART Trails has \$1million liability policy	Yes		No	Yes	No
15	Yes	City is self insured	Yes	RR Agreement	No	Yes	No
16	Yes	\$6 million policy	Yes		No	Yes	No
17	No		No		No	Yes	DOT 148 044M
18	No		No		No	Yes	DOT 521 146G
19	No		No		No	Yes	DOT 362 309V MP LV386.04
20	Yes	contact owner	No		No	Yes	contact owner
21	Yes	Trail organization is an entity of the Commonwealth of Pennsylvania. I cannot provide details as to the railroad company's insurance.	No	None that I am aware of at this time.	No	No	No
22	Yes		Yes		No	No	No
23	No		No	A crossing agreement is being sought between DCNR and the railroad.	No	No	As stated earlier
24	Yes	Assume railroad carries insurance	No		No	Yes	Unknown
25	Yes	State Law requires accident insurance	No		No	Yes	No
26	No		No		No	Yes	No
27	Yes		No		No	No	No
28	No		No		No	Yes	No
29	Yes	Liability coverage of the Park System	No		No	No	No

Appendix III: Highway-Rail Crossings Analysis and Data¹

Following is a description of the data from the Federal Railroad Administration's (FRA) highway-rail crossings in Pennsylvania from 1975 to 2004. Data was compiled from 58 incidents, representing approximately 2.2 percent of similar incidents nationwide for the same period. At the time, the FRA categorized bicyclists under the category of "other" rather than as a specific group. Only those incidents that were specifically identified in their narrative notes as involving bicycles (two) were included. They are considered separately from pedestrian incidents, unless otherwise indicated.

During almost 30 years, only 56 pedestrian and two bicycle incidents occurred. Of these, 33 were fatal. The majority of incidents took place during the day, when the weather was clear, where the view was not obstructed. Safety devices located at the crossings where the incidents took place included: standard flashing light signals (70 percent) (plus 11 percent cantilevered), gates (60 percent) and cross bucks (36 percent).

There did not appear to be any correlation between the types of safety devices and the number of pedestrians injured versus killed. Safety devices located at the crossings where pedestrians were killed included: standard flashing light signals (73 percent) (plus 3 percent cantilevered), gates (64 percent), and cross bucks (33 percent).

It must be noted that the focus of these reports is auto-related. For example, most data fields are referenced in terms of "motorists." To determine incidents to pedestrians, one must query "pedestrians" in the "highway user type of vehicle" field. Even though one may get a fairly accurate incident count, other incident-related information is more difficult to ascertain as the reporting form was not created for pedestrians. Even more difficult to determine is bicycle incidents. In the case of bicyclists, one must query out "other" in the "highway user type of vehicle" field and then read the "narrative" section to find out if a bicyclist was involved.

The railroad tracks where the 57 pedestrian incidents took place were owned by:

- 47% (27) by CR
- 11% (6) by CSX
- 7% (4) by BO
- 5% (3) by SEPA
- 3.5% (2) by NW
- 3.5% (2) by BLE
- 1.75% (1) each by ALY, CSRR, LVAL, NS, NSHR, PLE, WM, and WMYP

The two incidents involving bicyclists both occurred on tracks owned by NS.

Location by County

- 21% (12) – Allegheny County
- 9% (5) – Montgomery County
- 7% (4) – Delaware County (Cities/Towns: Glenolden, Darby, Holmes, unidentified)
- 7% (4) – Erie County
- 5% (3) – Beaver County
- 3.5% (2) – Berks County
- 3.5% (2) – Butler County
- 3.5% (2) – Crawford County
- 3.5% (2) – Dauphin County
- 3.5% (2) – Elk County
- 3.5% (2) – Northumberland County

The two incidents involving bicyclists occurred in Brackenridge (Allegheny County) and Sunbury (Northumberland County).

Of the 56 incidents involving pedestrians, at the time of the incident, the pedestrian was:

- 80% (45) moving over the tracks
- 9% (5) stopped at the crossing
- 11% (6) unidentified as to position

Both incidents involving bicyclists took place while the user was moving over the tracks.

Of the 56 incidents involving pedestrians, the pedestrian:

- 93% (52) was struck by the rail equipment
- 7% (4) struck the rail equipment

Of the 56 incidents involving pedestrians, pedestrians struck or were struck by:

- 73% (41) freight train
- 16% (9) passenger train
- 3% (2) work train
- (3) light locomotive
- (1) yard/switching

Of the 56 incidents involving pedestrians, the type of track was:

- 96% (54) main
- (1) yard
- (1) industry

Of the 55 incidents involving pedestrians where train speed was noted, the speed was:

- 9% (5) at less than 9 mph
- 14% (8) at 10-19 mph
- 16% (9) at 20-29 mph
- 36% (20) at 30-39 mph
- 18% (10) at 40-49 mph
- 7% (4) at 50-60 mph

Of the 33 total killed, where train speed was noted, the speed was:

- 3% (1) at less than 9 mph
- 6% (2) at 10-19 mph
- 12% (4) at 20-29 mph
- 45% (15) at 30-39 mph
- 21% (7) at 40-49 mph
- 12% (4) at 50-60 mph

Of the 56 incidents involving pedestrians, the location of the warning was:

- 89% (50) on both sides
- 21% (12) on side of pedestrian approach

Of the 33 pedestrians killed, the location of the warning was:

- 88% (29) on both sides of track
- 12% (4) on side of pedestrian approach

Of the 56 incidents involving pedestrians, crossing-warnings were interconnected with highway signals:

- 7% (4) yes
- 67% (38) no
- 25% (10) unknown + (4) undesignated in report

Of the 33 killed, crossing-warnings were interconnected with highway signals:

- 6% (2) yes
- 73% (24) no

Of the 56 incidents involving pedestrians, the crossing:

- 25% (14) had lights
- 38% (21) did not have lights
- 38% (11) unknown plus (10) undesignated in report

Of the 33 killed, the crossing:

- 18% (6) had lights
- 42% (14) did not have lights

Of the 56 incidents involving pedestrians, the view was obstructed by:

- 91% (51) not obstructed
- 3% (2) passing train
- 2% (1) vegetation
- 4% (2) undesignated in report

Of the 56 total incidents involving pedestrians, crossing safety devices included:

- 70% (39) standard flashing light signals (fls)
- 60% (34) gates
- 36% (20) cross bucks
- 27% (15) audible
- 11% (6) cantilever fls
- 2% (1) watchman

Of the 33 pedestrians killed, crossing safety devices included:

- 73% (24) standard fls
- 64% (21) gates
- 33% (11) cross bucks
- 30% (10) audible
- 3% (1) cantilever fls

¹ This data was downloaded from the Federal Railroad Administration site <http://safetydata.fra.dot.gov/officeofsafety/> on November 16, 2005.

Appendix IV: Railroad Warning Devices At Trail-Rail Crossings

Prepared by John Boyle for the Free Schuylkill River Park and The Bicycle Coalition of Greater Philadelphia April 29, 2005

Bicycle Pedestrian Railroad Crossings

Introduction

Because rail trails are multi-use paths built along abandoned rail corridor they often share and intersect active freight and passenger rail corridors. However the specific level of protection for each crossing varies. This may be due to the lack of guidance that is specific to trail-rail crossings.

Design Standards for Signals and Crossings

The Manual for Uniform Traffic Control Devices or MUTCD offers guidelines for the use of active and passive devices. The guidance for Non-motorist Signals and Crossings are found in section 10D of the MUTCD. This chapter focuses on light rail crossings, however other chapters in the manual on freight crossings reference this chapter for pedestrians therefore these safety measures can also applied to freight lines and commuter rail lines.

Examples of current pedestrian crossing treatments

- Swing Gates
- Warning Lights and Automatic Gates
- Warning Lights
- Non signalized Crossing

Automatic Roll Gates

Automatic roll gates are another possible crossing device, however they are not widely used at pedestrian-rail crossings in the United States.

Other Innovative Designs

Some interesting highway-rail grade warning devices in Europe include swing gates that normally block the railroad tracks when not in use and gates with skirts to stop unauthorized entry under the barrier arm



Commercial Roll Gate



Opening swing gate



Gates with skirts

Photos— Left: aegates.com, others: Ian Britton

Swing Gates



Perth Australia—City West Station. Automatic Swing Gate, which is normally open.



Gate closes automatically when a train approaches



Beaverton, Oregon—Manual Swing Gate



Disabled passengers and cyclists can use the push button control

Automatic swing gates close and lock as a train approaches. It is desirable to have a safe place or an emergency exit button in case a pedestrian is caught inside the gates. There is also a need for a button for an emergency exit and a safe haven in case someone is trapped inside the gates

Our research failed to yield any known examples of automatic swing gates used on multi-use paths in the United States. There are examples of automatic swing gates in Australia these photos was taken at in Perth on the Fremantle Rail Line.

Manual swing gates are designed to open away from the tracks, requiring users to pull the gate open to cross, but permitting a quick exit from the trackway, and to automatically close (MUTCD). Forcing the pedestrian to stop and pull the gate and is believed to discourage a dash across the tracks.

Photos—upper left and upper right: Michael Maher, lower left: Hugh Bynam Bicycle Transportation Alliance, lower right: Bob Vogel

Warning lights and Automatic Gates



Philadelphia, PA—Manayunk Canal Towpath



Princeton, NJ—Princeton Junction train station



Baldwin, FL—Jacksonville– Baldwin Trail



Cape May Courthouse, NJ—Middle Township Trail

The standard drop down railroad gates that are also known as boom gates offer the next level of protection. There are several pedestrian grade crossings in and around Philadelphia where this is used including the Manayunk Canal Towpath at SEPTA's former Shawmont Station, Princeton Junction, Princeton Branch (Dinky Line) Rail Station and the Middle Township Bike Path at the 4H Fairgrounds in Cape May County Park, NJ.

Photo—upper left and upper right: John Boyle, lower left: Craig P. Della Penna and Northeast Greenway Solutions, lower right: Bob Vogel

Warning Lights



Escondido CA—Escondido Creek Trail



Dixon CA—This rail line hosts freight and frequent Amtrak Service



Philadelphia, PA-Somerton Station multi - directional warning signals.



The audible device announces the approach of a train.

Warning lights – Some crossings have warning lights and audible signals to warn pedestrians. Some pedestrian crossings are also constrained by link fencing which works to channel pedestrians to the crossing points.

At some commuter and light rail crossings there are special signals that indicate the direction of approaching trains on multiple tracks. The Somerton Train Station on the SEPTA R3 West Trenton Line in Northeast Philadelphia contains multiple direction warnings, this signal is supplemented with an audible “Train Approaching” verbal warning.

Photos—upper left: Stephen Vance, upper right: TBD, lower left and lower right: John Boyle

Non-Signalized Crossings



York County, PA—York Heritage Trail



Pittsburgh—Three Rivers Heritage Trail



Ohio—Simon Kenton Trail



Madison WI—Trail Unknown

Non signalized crossings are the most common solution for multi-use paths when they cross low volume low speed freight railroads. Most have warning devices such as railroad crossbucks, pavement markings and signage. Some commuter rail stations simply have a “Look Both Ways” warning between inbound and outbound tracks.

Photos—upper left: York County Parks, upper right: Al Kovacik, City of Pittsburg Engineer, lower left: Peggy Holland, lower right: Michael Moule

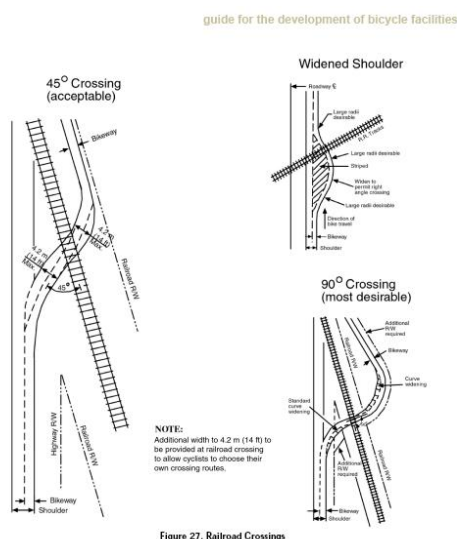
Crossing Surface

For bicycles and other wheeled devices a smooth crossing surface helps reduce the hazard of crossing rail tracks. Recommendations for grade crossing surface is published in the AASHTO *Guide for the Development of Bicycle Facilities*—Page 60:

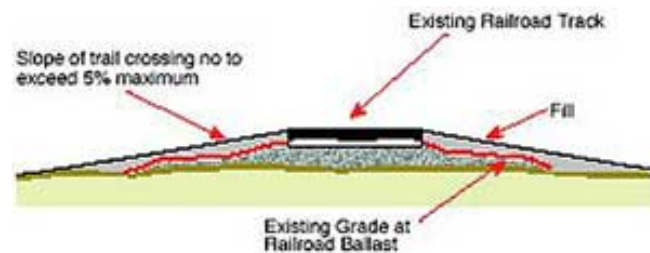
“Railroad tracks present special hazards for bicycles and other narrow tired vehicles...Railroad-highway grade crossings should ideally be at a right angle to the rails. It is also important that the roadway approach be at the same elevation as the rails. Consideration should be given to the crossing surface materials and to the flangeway depth and width. Rubber or concrete crossing materials are longer lasting than wood or asphalt and require less maintenance.”



Example of an improved crossing Princeton Junction NJ



61



Above: AASHTO smoothness guidelines

Left: AASHTO recommendations for paved paths at rail crossings.

Rail Crossing Safety Education



Operation Lifesaver office on the Jacksonville-Baldwin Trail

Operation Lifesaver is a national non-profit organization with chapters located in 49 of the 50 states. This program makes available to any transit property preprinted railroad safety related information and specially trained personnel that can be used to train other individuals to educate various groups and community organizations. The primary focus of the program is to elevate the importance of public awareness regarding the potential hazards at rail-highway grade crossings, and the dangers of trespassing on railroad right-of-way.

Operation Lifesaver publishes numerous rail safety brochures including pamphlets for pedestrians and bicyclists.

Operation Lifesaver Brochures



Tips For Bicyclists



Pedestrian Safety

Operation Lifesaver Railcar photo: from the collection of Craig P. Della Penna and Northeast Greenway Solutions.
Operation Lifesaver Website: <http://www.oli.org>