

Bicycle and Pedestrian Training



Pennsylvania Planning Association October 24, 2006





GOALS AND OBJECTIVES OF TODAY'S TRAINING

- Educate Planners & Stakeholders on PennDOT Bicycle/Pedestrian Checklists
- Provide Sound Bicycle and Pedestrian Planning and Design Methods
- Contact and Research Information and Suggestions



Note: Not to standard





WHY PLAN / DESIGN FOR BICYCLISTS AND PEDESTRIANS?

- Legislation / Policy
- Safety
- Community Health





PENNSYLVANIA'S BICYCLE AND PEDESTRIAN FACILITIES EVOLUTION

- Act 120 of 1970 established PennDOT as a *multi-modal* transportation agency
- Federal ISTEA (1992)
- Federal TEA-21 (1998 2003)
 - SAFETEA-LU (2005)
- Growing Greener \$650 million / 7 years
- Governor Ridge Executive Order 1999-1
- 1995 Pennsylvania Transportation Policy Plan
- 1996 Bicycle and Pedestrian Master Plan
- 2000 Pennsylvania Statewide Long Range
- Transportation Plan *PennPlan Moves*

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Legislation / Policy

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PEDESTRIAN ACCOMMODATIONS

- PennDOT Issued the policy letter "PennDOT Policy on Improved Pedestrian Mobility", December 10, 2001. This document reversed the Department's position on pedestrian accommodations by stating that sidewalks should be considered in <u>all</u> federally funded and state funded projects (both local roads and state roads).
- PennDOT does not have to own the Rightof-Way for sidewalk facilities.
- Pedestrian safety is a federal and state focus area.



FUNDING ELIGIBILITY

- Most federal funding and many state funded projects.
- STP, CMAQ, except where bicyclists and pedestrians are legally prohibited (Interstate highways, Pennsylvania Turnpike, etc.).
- Enhancements.



Legislation / Policy

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Title 75 of the Pennsylvania Consolidated Statutes contains the laws which govern the operation of vehicles on Pennsylvania roads.

In Pennsylvania, a bicycle is a vehicle and, as such, is governed by a general set of rules (common to all vehicles) and a specific set of rules (designed for bicycles).



PennDOT Publication 380 is the Bicycle Driver's Manual



Legislation / Policy Pedestrians are defined under PA law as "traffic" and must be included in any transportation project plan.









PENNSYLVANIA STATISTICS

- Pedestrian-related crashes represent 3.6% of the total reported traffic crashes; however, they account for 10.1% of all traffic crash deaths.
- Bicycle crashes represent 1.2% of the total reported crashes and 0.9% of all traffic deaths.
- Elderly pedestrians (age 75 and over), although involved in fewer pedestrian crashes, are more likely to be killed if struck by a moving vehicle; they account for the highest number of pedestrian deaths (23.2%).

SOURCE: Pennsylvania Department of Transportation's 2004 Pennsylvania Crash Facts and Statistics data.



Safety

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PENNSYLVANIA STATISTICS, cont.

- Younger pedestrians (age 19 and under) account for 41.1% of the pedestrian injuries.
- Children and Teenagers age 10-19 are the most vulnerable to death and injury while riding a bicycle. This age group has suffered about a third of the deaths and half the injuries involving bicycles.
- A majority of bicyclists are killed at mid-block locations, but a majority are injured at intersections.

SOURCE: Pennsylvania Department of Transportation's 2004 Pennsylvania Crash Facts and Statistics data. 11



Community Health

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HOW DOES A MORE WALKABLE WORLD IMPROVE COMMUNITY HEALTH?

- Improve public health conditions
- Decrease automobile crashes and injuries
- Reduce traffic congestion, more resilient transportation systems
- Strengthen local economies, self-reliance
- Provide for social integrity and networks
- Enhance public safety
- Improve air quality

















Bicycle and Pedestrian Checklists



IF NOT, WHY NOT?

Every project must consider the need to incorporate pedestrian and bicycle elements in order to accommodate these modes of transportation.

It is no longer enough to just say that there is no pedestrian or bicycling activity or element to a project.



Introduction

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PLANNING AND PROGRAMMING KEY POINTS

- During Planning and Programming determine the need for bicycle and pedestrian facilities.
- If it is determined that a project would benefit from these facilities, project funding can be programmed accordingly.
- Coordination with PennDOT & MPO/RPO is necessary to determine the need for bicycle and pedestrian facilities in the project area.
- Planning concepts can apply to all planning efforts.



Bicycle & Pedestrian Plans

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Is the transportation facility included in or related to bicycle and pedestrian facilities identified in a master plan?

•Metropolitan Planning Organization (MPO) / Rural Planning Organization (RPO) bike/ped plan.

- All MPOs and RPOs have a some type of long range transportation plan. Each of these plans should have a bicycle and pedestrian element.
- If an MPO has a bicycle and pedestrian plan, find out how it relates to the proposed project.
- MPOs and RPOs are a good resource for determining latent demands in a particular area.

Bicycle & Pedestrian Planning





> Bicycle & Pedestrian Plans

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Is the transportation facility included in or related to bicycle and pedestrian facilities identified in a master plan?

• Local planning documents.

- The <u>www.newpa.com</u> website is a useful tool for tracking information relative to local governments in Pennsylvania.
- This website provides links to both county and municipal websites.



Bicycle & **Pedestrian** Plans

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Is the transportation facility included in or related to bicycle and pedestrian facilities identified in a master plan?

•Bicycle PA Routes.

•http://www.dot.state.pa.us/BIKE/WEB/tour_routes.htm

• Planned and current bicycle routes in PA can be viewed by using the website link shown near the top of the page.





> Bicycle & Pedestrian Plans

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Is the transportation facility included in or related to bicycle and pedestrian facilities identified in a master plan? •Statewide Bicycle and Pedestrian Master Plan.

- Discusses the vision, goals, issues, actions & implementation strategies necessary to integrate bicycles & pedestrians into the transportation system.
- Includes:
 - Executive Summary
 - Statewide Bicycle &
 - Pedestrian Master Plan
 - Bicycle Planning &
 - Design Guidelines
 - Pedestrian Planning &
 - Design Guidelines
 - Community Design Systems
- A new master plan is currently being prepared. The expected release date is 2006.







> Bicycle & Pedestrian Plans

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Is the transportation facility included in or related to a regional / local recreational plan?

•Greenways

•http://www.dcnr.state.pa.us/brc/greenways/actionplan.aspx



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> Bicycle & Pedestrian Plans

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Is the transportation facility included in or related to a regional / local recreational plan?

•Local, State, National Parks

•http://www.dcnr.state.pa.us/stateparks/parks/index.aspx







Connections / Linkages



Will the transportation facility provide continuity and linkages with existing or proposed **BICYCLE**/pedestrian facilities?



Planned Roadway Improvement Project



Connections / Linkages



Will the transportation facility provide continuity and linkages with existing or proposed bicycle/PEDESTRIAN facilities?



- Pedestrian attractions, such as schools, parks, commercial and business establishments, and residential areas must be considered and accommodated.
- Just because the existing roadway does not have a pedestrian facility does not mean that it shouldn't have one.
 IF NOT WHY NOT? There may be latent demand for a pedestrian facility.



Connections / Linkages Does the existing transportation facility provide the only convenient transportation connection / linkage between land uses in the local area or region?





Land use data should be obtained by a field view.
Assistance can also be provided by reviewing deeds or plat plans.









Area Land Use



Is the transportation facility in a city, town, borough, or village? Is the transportation facility within / near a community or neighborhood?



• The needs associated with bicycle and pedestrian facilities will vary depending on the location of the project.

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Area Land Use

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Is the transportation facility the "main street" in a community or town?



- A "main street" of a town would indicate a high use area with the potential to attract pedestrian and cycling activities.
- There may be more than one "main street" in a community or town.


> *Facility* Usage

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Do bicycle/pedestrian groups regularly use the transportation facility?

- Hiking, walking, or running clubs
- Skateboarding or rollerblading groups
- Bicycle touring groups
- General tourism / sightseeing groups
- These organizations should be contacted to discuss:
 - How their activities relate to the planned project study area?
 - How often that organization uses or would use the planned project facility---How many trips / group members?
 - What paths/routes do they utilize?
 - Do they have any comments on how to improve the facility?
 - Is the facility used to link to other routes of interest?
- If these groups <u>do not</u> use the facility, is there a reason?
- IF NOT, WHY NOT? Just because these groups do not currently use the facility, does not mean that they should not be accommodated. 37



> Facility Usage

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Do bicycle/pedestrian groups regularly use the transportation facility?

- Bike Clubs
- PennDOT Publication 316 Bicycling Directory of Pennsylvania

ftp://ftp.dot.state.pa.us/public/pdf/Pub%20316new.pdf





Facility Usage



Is the transportation facility in close proximity to hospitals, elderly care facilities, or the residences or businesses of persons with disabilities?



District H.S.





The presence of hospitals, elderly care facilities, and • persons with disabilities is important for several reasons. ADA is a key issue in these areas. 39



Facility Usage

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Is the transportation facility within or near educational institutions?

District H.S.

- Children may ride bicycles to or around a school.
- These facilities are often utilized to support other functions such as public recreation after hours or on weekends, community meetings, and continuing education.
- Colleges and Universities will have a high percentage of pedestrian and bicycle traffic.







Facility Usage

Baker URS Proximity to bike/ped generators:Athletic fieldsRecreational facilities



- Athletic fields experience event level volumes during games/special activities as well as a smaller amount of daily use.
- Recreational facilities could include a gym, park, walking/jogging path, shared use paths, etc.



Pedestrian & Bicyclist Activities

Are sidewalks needed in the area?
Presence of worn paths along the facility.
Connectivity with other pedestrian facilities.
Adjacent land uses generate pedestrian traffic.







Safety



Have bicycle / pedestrian crashes occurred in the area?



- Crash data summaries should be obtained from the PennDOT database as well as from either state or local police.
- Data should be reviewed to determine if *any* crashes involved pedestrians or bicyclists.
- Occurrence of crashes may provide clues to any existing problems which should be addressed.



DESIGN: KEY POINTS

- Do the Pedestrian and Bicycle elements included in the Construction Plan fulfill the requirements identified in the Planning and Programming process and the environmental document?
- Do the Pedestrian and Bicycle elements included in the Construction Plan meet PennDOT, AASHTO and other project design criteria and construction standards?



IF NOT, WHY NOT?

Every project must consider the need to incorporate pedestrian and bicycle elements in order to accommodate these modes of transportation.

It is no longer enough to just say that there is no pedestrian or cycling activity or element to a project.



Design

Introduction



DESIGN MANUAL PART 2 (IGHWAY DESIGN

JBLICATION 13M







- 2002 PennDOT Design Manual Part 2 Highway Design, Publication 13M.
- 2001 AASTHO A Policy on Geometric Design of Highways and Streets (the Green Book).
- 1999 AASHTO Guide for the Development of Bicycle Facilities.
- MUTCD Manual on Uniform Traffic Control Devices, 2003 Edition.
- AASHTO Guide for the Planning,
 Design, and Operation of
 Pedestrian Facilities.

Guide for the Planning, Design, and Operation of Pedestrian Facilities





DESIGN:

PEDESTRIAN FACILITIES





Sidewalks

Appropriate sidewalk width relative to its location. Appropriate barrier height.





Standard sidewalk width for residential, commercial, and industrial

Standard sidewalk width minimum for high use areas / Central Business District (CBD)



Standard width of sidewalk for bridges, Standard height for vertical barrier separating traffic from pedestrians, Standard shy distance for vertical barriers.





Sidewalks



- The maximum continuous grade may not exceed 5% for a sidewalk on an accessible route, or 8.33% for a sidewalk ramp on an accessible route.
- Between 5.00% and 8.33%, a 5' wide landing must be provided for each 2'6" of rise in the ramp.
- Where a sidewalk is adjacent to a roadway that exceeds a grade of 8.33%, an ADA compliant sidewalk may not be feasible, and the sidewalk may match the adjacent roadway grade.



2% cross-slope on sidewalks. 5% max cross-slope on crosswalks.







Pedestrian Crossings

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Applicability of planter or buffer strips.



- Planters and buffer strips have the ability to enhance the aesthetic component of the transportation facility as well as improve safety by providing a barrier to separate pedestrians and vehicular traffic.
- The functional classification of the roadway can help determine the applicability of planter or buffer strips.
- IF NOT, WHY NOT?



Pedestrian Crossings



Crosswalks are desirably at least 10' wide; 6' minimum.



- The PennDOT criteria for minimum crosswalk width is 6 feet. (TC-7800, Sheet 3 of 8).
- Local municipalities may have their own criteria for crosswalk widths.
- The actual crosswalk width shall be based on pedestrian volumes.

Crosswalks are provided and prominently marked using at least 6" line (continental style markings)?



 Continental style markings emphasize the presence of the crosswalk. This is beneficial when crosswalks are widely spaced or when there is a high level of distraction, as in urban areas.



Pedestrian Crossings



- Minimizing the crossing distance at intersections can improve pedestrian safety by reducing crossing time, improving visibility for motorists as well as pedestrians, and enhancing a driver's awareness of the crosswalk.
- At an existing intersection or mid-block crosswalk, the actual crossing distance may be reduced by the use of curb extensions/bulb-outs or median/refuge islands.
- For new construction, provide the corner radii needed for design vehicle turn movements. Bigger isn't better in this instance. A larger than necessary radius increases the pedestrian crossing distance and promotes higher vehicular speeds.



Pedestrian Crossings

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Yield to Pedestrian Channelizing Devices.





- "When traffic-controls are not in place or not in operation, the driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection." (Title 75)
- Signs are placed to remind motorists of the existing law.
- These signs are more noticeable than the traditional postmounted signs located curbside.
- Contact PennDOT District Bicycle/Pedestrian Coordinator for additional information or to obtain signs for your community.



Pedestrian Crossings

Longer signal cycles. Is there a dedicated pedestrian phase? Is there a concurrent pedestrian phase?



 The pedestrian crossing phase shall be based on the crossing width and pedestrian walking speed. In areas where higher usage by senior citizens or persons with disabilities is expected, consideration shall be given to lengthening the pedestrian crossing phase to accommodate a slower walking speed.

Coordination of turn phases with walk / don't walk signs.

 The appropriate combination of phase and actuation type is influenced by many factors.
 These factors include pedestrian volumes, crossing distances, and posted speed limits.







Pedestrian Crossings

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Proper lighting type and placement.





- Consider pedestrian usage, particularly nighttime usage, to determine if lighting is warranted.
- Those responsible for maintenance should be considered in the process of selecting a particular lighting element.





Pedestrian Signals & Pushbuttons

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Pedestrian signals are provided.



- Traffic Signal Plans shall indicate pedestrian signalization to meet standard criteria.
- There are multiple types of lighted pedestrian walk and don't walk signage (ie. Walking person and WALK)
- Manual on Uniform Traffic Control Devices standards for ped head signage shall be referenced.



Pedestrian Signals & Pushbuttons

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Pushbuttons are provided and accessible (recommended height of 3.5'). Large pushbuttons used.



- Pushbuttons shall be provided at an intersection with an actuated pedestrian phase.
- Both dedicated and concurrent pedestrian phases can be either actuated (pushbuttons required) or non-actuated (no pushbuttons required – phase always appears).
- Pushbutton accessibility shall meet ADA requirements.
- Pushbuttons shall meet ADA requirements for accessibility relative to the type of pushbutton, the location of the pushbutton, and the mounting height of the pushbutton. 57



ADA

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ADA Resources

U.S. Department of Justice, Americans with Disabilities Act

- http://www.ada.gov
- U.S. Department of Transportation
- http://www.dot.gov/citizen_services /disability/disability.html



Designing Sidewalks and Trails for Access, Part I of II: Review of Existing Guidelines and Practices (July 1999) – available online at:

http://www.fhwa.dot.gov/environment/bikeped/access-1.htm

Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide (September 2001) – available online at:

http://www.fhwa.dot.gov/environment/sidewalk2/pdf.htm

Revised Draft Guidelines for Accessible Public Rights-of-Way (November 23, 2005) available online at:

http://www.access-board.gov/prowac/draft.htm

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ADA



- ADA requires a continuous, minimum clear width of 4', and passing spaces that are 5'X5' at intervals not to exceed 200' to allow for passage of two wheelchairs.
- The ADA requirement of 4' is a minimum needed to accommodate a 28'' wide manual wheelchair and is not intended as a design standard for sidewalk width.

Note: The minimum clear width of 4' is based on Revised Draft Guidelines for 59 Accessible Public Rights-of-Way dated November 23, 2005.





ADA





Curb cuts flush with street surface.







ADA





- The ADA Board is expected to require the use of truncated domes for all curb ramps in the near future. It is expected that the standard will require a rectilinear pattern of truncated domes adjacent to the flush portion of the ramp, behind the curb.
- Local municipalities may have their own criteria for curb ramp finishes or materials, such as in a business, historical, or residential district.
- FHWA has issued the standard requirements.



ADA

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Running slope of new curb cuts 1 in 12 max.

- The maximum slope for a curb ramp is 1:12, or 8.33%.
- Where the sidewalk width is limited, other types of curb ramps may be used.



Note: The 48" minimum width is based on Revised Draft Guidelines for Accessible Public Rights-of-Way dated November 23, 2005.



ADA

Proper head / shoulder clearance for visually impaired.





• Provide the required vertical clearance to any projections such as signs and vegetation.







ADA



Coordinate utilities with ADA requirements.







- The location of the curb ramp shall take precedence over the location of any drainage structures, such as inlets and manholes.
- Utilities structures, such as junction boxes and valve covers, shall be outside the curb ramp wherever possible.



ADA

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Analyze landscaping growth potential for future obstructions.





- Where landscaping is included in a construction project, visibility for pedestrians as well as motorists shall be considered as part of the plant selection process and planting location design.
- Maintenance forces should consider visibility for pedestrians as well as motorists when clearing or pruning vegetation within the right of way.



DESIGN:

BICYCLE FACILITIES





Bicycle Lanes / Paved Shoulders Appropriate width of bike lane:

•5' adjacent to curb

•13' – 15' (including parking lane)





 While it may not be possible to provide bike lanes in many situations, an adequate paved shoulder is a reasonable alternative.

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Source: AASHTO Bicycle Guide.



Bicycle Operations









- The use of bike detection technology is relatively new and still under development.
- PennDOT conducted a study titled "PennDOT Bicycle / Motorcycle Detection Study" (September 2002).



Bicyclist Impediments

Bicycle safe grates.







- A bicycle safe grate is one that has openings that will not allow a bicycle wheel to drop between the bars of the grate.
- Bicycle grates shall be used wherever bicycle traffic may be present. Their use shall not be limited to bike lanes and bikeways.



Bicyclist Impediments



Inlets flush with roadway surface.



- Existing grates shall be adjusted to eliminate excessive depressions and cross slope in the vicinity of inlets.
- In the case that depressed inlets are the result of drainage design to maximize water flow, incorporate beveled edges around the inlet to reduce abrupt changes in the pavement surface for cyclists.



Bicyclist Impediments Manhole covers flush with roadway surface.



 Manhole covers and utility covers can be a hazard to bicyclists when they aren't flush with the roadway surface.






Design: Bicycle Facilities

Bicyclist Impediments

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- Parallel parking along a street side should accommodate for the extra space required to open a car door.
- Angled parking may also cause a hazard.
- Pottstown, PA and numerous other Middle Atlantic cities outside PA already have back-in angle parking. Other PA towns are considering it.







Design: Bicycle Facilities

Signs & Pavement Markings



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Source: PennDOT Publication 236M, W15-3.

ON BRIDGE ROADWA • This type of signage may be appropriate on roads that do not have dedicated bike lanes, but are regularly used by bicyclists.



Design: Bicycle Facilities

Signs & Pavement Markings



Bike lane and bike route designation signs.

Lane stenciling.

 There are standard signs available to designate a bike route. In addition to guiding bicyclists, they serve to advise motorists that the roadway is designated as a bike route.





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Other

Design: Bicycle Facilities

Other







• Be aware of bicycle and pedestrian accommodations during construction which could impact design alternatives and traffic control options.

PennDOT Questions or Comments :

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Bicycle and Pedestrian Training

THANK YOU FOR YOUR PARTICIPATION!



