

1. Report No. FHWA-SA-04-003		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System				5. Report Date September 2004	
				6. Performing Organization Code	
7. Author(s) David L. Harkey and Charles V. Zegeer				8. Performing Organization Report No.	
9. Performing Organization Name and Address University of North Carolina Highway Safety Research Center 730 Airport Road, CB #3430 Chapel Hill, NC 27599				10. Work Unit No. (TRAIS)	
				11. Contract or Grant No. DTFH61-99-X-00003	
12. Sponsoring Agency Name and Address Federal Highway Administration Office of Safety Programs 400 7 <sup>th</sup> Street, SW Washington, DC 20590				13. Type of Report and Period Covered Final Report 2001 - 2004	
				14. Sponsoring Agency Code	
15. Supplementary Notes This report was produced under the FHWA contract "Bicycle and Pedestrian Technical Information Center," directed by John Fegan (AOTR). The task manager was Tamara Redmon (FHWA). The technical manager was Levenson Boodlal. Pedestrian Safety Consultant of KLS Engineering. Report layout and graphics support provided by Lisa Jusino of LEJ Graphics; case study solicitation and support provided by the Association of Pedestrian and Bicycle Professionals; web/CD application programming provided by Dwayne Tharpe of HSRC; and web/CD application design support provided by Zoe Gillenwater of HSRC.					
16. Abstract This report is the next generation of the <i>Pedestrian Facilities User Guide – Providing Safety and Mobility</i> . <sup>1</sup> It includes an update of 47 engineering countermeasures or treatments, along with education and enforcement programs, that may be implemented to improve pedestrian safety and mobility. Included in this version are 71 case studies that illustrate these concepts applied in practice in a number of communities throughout the United States. The most significant enhancement is the integration of the countermeasures and case studies into an expert system known as PEDSAFE. This system and the content of this guide are included on the enclosed CD and are available on-line at <a href="http://safety.fhwa.dot.gov/pedsafe">http://safety.fhwa.dot.gov/pedsafe</a> and at <a href="http://www.walkinginfo.org/pedsafe">www.walkinginfo.org/pedsafe</a> . The system allows the user to refine their selection of treatments on the basis of site characteristics, such as geometric features and operating conditions, and the type of safety problem or desired behavioral change. The purpose of the system is to provide the most applicable information for identifying safety and mobility needs and improving conditions for pedestrians within the public right-of-way. PEDSAFE is intended primarily for engineers, planners, safety professionals, and decisionmakers, but it may also be used by citizens for identifying problems and recommending solutions for their communities. <sup>1</sup> <i>Pedestrian Facilities User Guide – Providing Safety and Mobility</i> was authored by Charles V. Zegeer, Cara Seiderman, Peter Lagerwey, Mike Cyneki, Michael Ronkin, and Robert Schneider.					
17. Key Words: pedestrian safety, pedestrian facilities, crash typing, engineering treatments, education, enforcement			18. Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161.		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 336	22. Price

Form DOT F 1700.7 (8-72)  
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## SI\* (MODERN METRIC) CONVERSION FACTORS

### APPROXIMATE CONVERSIONS TO SI UNITS

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
<b>LENGTH</b>				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
<b>AREA</b>				
in <sup>2</sup>	square inches	645.2	square millimeters	mm <sup>2</sup>
ft <sup>2</sup>	square feet	0.093	square meters	m <sup>2</sup>
yd <sup>2</sup>	square yard	0.836	square meters	m <sup>2</sup>
ac	acres	0.405	hectares	ha
mi <sup>2</sup>	square miles	2.59	square kilometers	km <sup>2</sup>
<b>VOLUME</b>				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft <sup>3</sup>	cubic feet	0.028	cubic meters	m <sup>3</sup>
yd <sup>3</sup>	cubic yards	0.765	cubic meters	m <sup>3</sup>
NOTE: volumes greater than 1000 L shall be shown in m <sup>3</sup>				
<b>MASS</b>				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
<b>TEMPERATURE (exact degrees)</b>				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
<b>ILLUMINATION</b>				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m <sup>2</sup>	cd/m <sup>2</sup>
<b>FORCE and PRESSURE or STRESS</b>				
lbf	poundforce	4.45	newtons	N
lbf/in <sup>2</sup>	poundforce per square inch	6.89	kilopascals	kPa

### APPROXIMATE CONVERSIONS FROM SI UNITS

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
<b>LENGTH</b>				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
<b>AREA</b>				
mm <sup>2</sup>	square millimeters	0.0016	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	10.764	square feet	ft <sup>2</sup>
m <sup>2</sup>	square meters	1.195	square yards	yd <sup>2</sup>
ha	hectares	2.47	acres	ac
km <sup>2</sup>	square kilometers	0.386	square miles	mi <sup>2</sup>
<b>VOLUME</b>				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m <sup>3</sup>	cubic meters	35.314	cubic feet	ft <sup>3</sup>
m <sup>3</sup>	cubic meters	1.307	cubic yards	yd <sup>3</sup>
<b>MASS</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
<b>TEMPERATURE (exact degrees)</b>				
°C	Celsius	1.8C+32	Fahrenheit	°F
<b>ILLUMINATION</b>				
lx	lux	0.0929	foot-candles	fc
cd/m <sup>2</sup>	candela/m <sup>2</sup>	0.2919	foot-Lamberts	fl
<b>FORCE and PRESSURE or STRESS</b>				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in <sup>2</sup>

\*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)

# Acknowledgments



The authors of this report thank the many individuals who contributed to the production of the case studies included in Chapter 6. The specific persons are identified on the first page of each study. We also recognize the Association of Pedestrian and Bicycle Professionals for their efforts in soliciting many of these case studies.

We thank the panel of practitioners with whom we met at the outset of the project to define the goals and objectives for the PEDSAFE product, including:

Mike Cynecki, Traffic Engineering Supervisor  
City of Phoenix  
Street Transportation Department

Peter Lagerwey, Pedestrian and Bicycle  
Program Coordinator  
Seattle Department of Transportation

David Loughery, Senior Planning Specialist  
Montgomery County, Maryland  
Department of Public Works and Transportation

Theo Petritsch, Senior Transportation Engineer  
Sprinkle Consulting  
(formerly with Florida Department of Transportation)

Cara Seiderman  
City of Cambridge  
Community Development Department

Ritch Viola  
Arlington County, Virginia  
Department of Public Works

Mighk Wilson, Bicycle and Pedestrian Coordinator  
Metroplan Orlando

We also express our appreciation to Barbara McMillen (FHWA Office of Civil Rights) and Lois Thibault (U.S. Access Board) for their reviews of the product.

Finally we thank the following individuals, who participated in a focus group to discuss the beta version of the expert system and whose excellent feedback served to improve the final product for practitioners:

Tom Bertulis  
Seattle Bicycle Advisory Board

Keith Brown, Engineer  
King County Department of Transportation  
Neighborhood Traffic and Pedestrian Safety Unit

Robert Foxworthy, AICP  
King County Department of Transportation  
Strategic Planning and Non-motorized  
Transportation Program

Gordy Hyde, Traffic Investigations Supervisor  
Snohomish County, Washington  
Public Works Department

David Levinger, President and Executive Director  
Feet First

Louise McGrody, Program Manager  
Bicycle Alliance of Washington

Rich Meredith  
City of Shoreline, Washington  
Public Works Department

Mike Oriero  
City of Mukilteo, Washington  
Public Works Department

Paula Reeves, Bicycle and Pedestrian Program Manager  
Washington State Department of Transportation  
Highways and Local Programs

Peg Staeheli, Principal  
SvR Design Company  
(representing Seattle Pedestrian Advisory Board)

Pauh Wang, Assistant Planner  
Seattle Department of Transportation  
Bicycle and Pedestrian Program



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# How To Use This Guide

The recently published *Pedestrian Facilities User Guide—Providing Safety and Mobility* provided descriptions of 47 unique engineering countermeasures or treatments that may be implemented to improve pedestrian safety and mobility.<sup>1</sup> Included for each of the 47 treatments were a general description, purpose or objective, considerations for implementation, and estimated costs. While that level of information alone is useful to engineers, planners, and other safety professionals, the guide also included two matrices that related the 47 treatments (plus two additional countermeasures of education and enforcement) to specific performance objectives and specific types of collisions. These matrices provide the practitioner with the ability to select the most appropriate treatment(s) if they have a well-defined crash problem or are trying to achieve a specific change in behavior.

This report is the next generation of the information just described. It includes an update of the content of the first version along with case studies that illustrate these concepts applied in practice in a number of communities throughout the United States. The most significant enhancement is the integration of the countermeasures and case studies into an expert system known as PEDSAFE. This system and the content of this guide are included on the enclosed CD and are available online at <http://safety.fhwa.dot.gov/pedsafe> and at [www.walkinginfo.org/pedsafe](http://www.walkinginfo.org/pedsafe). The system allows the user to refine their selection of treatments on the basis of site characteristics, such as geometric features and operating conditions, and the type of safety problem or desired behavioral change. The purpose of the system is to provide the most applicable information for identifying safety and mobility needs and improving conditions for pedestrians within the public right-of-way. PEDSAFE is intended primarily for engineers, planners, safety professionals, and decisionmakers, but it may also be used by citizens for identifying problems and recommending solutions for their communities.

*Chapter 1: The Big Picture* gives an overview on how to create a safe, walkable environment. *Chapter 2: Pedestrian Crash Statistics* describes basic pedestrian crash trends

and statistics in the U.S. *Chapter 3: Selecting Improvements for Pedestrians* discusses the approaches to select the most appropriate countermeasures. One approach is based on the need to resolve a known safety problem, while the other is based on the desire to change behaviors of motorists and/or pedestrians.

*Chapter 4: The Expert System* describes the Web/CD application, including a description of the overall content and step-by-step instructions for use. *Chapter 5: The Countermeasures* contains the details of 49 engineering, education, and enforcement treatments for pedestrians. These improvements relate to pedestrian facility design, roadway design, intersection design, traffic calming, traffic management, signals and signs, and other measures. In *Chapter 6: Case Studies* are the 71 examples of implemented treatments in communities throughout the U.S.

Further resources are provided in *Chapter 7: Implementation and Resources*, including sections on community involvement in developing priorities, devising strategies for construction, and raising funds for pedestrian improvements. A list of useful web sites, guides, handbooks, and other references is also provided.

There are also several appendices with supporting materials. *Appendix A* includes an assessment form that can be used in the field to collect the information needed to effectively use the expert system. *Appendix B* provides a detailed matrix showing the specific countermeasures that are associated with each of the 71 case studies. The last two appendices provide recommended guidelines for the installation of sidewalks/ walkways (*Appendix C*) and crosswalks (*Appendix D*).

