Making Crosswalks Safer for Pedestrians

Application of a Multidisciplinary Approach to Improve Pedestrian Safety at Crosswalks in St. Petersburg, Florida

July 2000
Acknowledgements

The project team consisted of:
Patricia A. Turner, Center for Urban Transportation Research
Anthony J. Ferraro, Center for Urban Transportation Research
Bridget McGovern, Center for Urban Transportation Research
Louis Malenfont, Ph.D., Centre for Education and Research in Safety
Ronald Van Houten, Ph.D., Centre for Education and Research in Safety

The team would like to thank the following individuals for their assistance during the project:
David Ficher, Mayor, City of St. Petersburg
Assistant Chief Richard Stelljes, Deputy Police Chief, City of St. Petersburg Department of Transportation and Parking Services
Sgt. John Gardner, City of St. Petersburg Police Department
Lt. Randy Bratton, City of St. Petersburg Police Department
Lt. Ron Hartz, City of St. Petersburg Police Department
Angelo Rao, Director of Traffic Engineering, City of St. Petersburg Department of Transportation and Parking Services
Ray R. McKenzie, Neighborhood Transportation Manager, City of St. Petersburg Department of Transportation and Parking Services
Peter Shaw, Jon Stephenson, and Jan Thomas, City of St. Petersburg Department of Transportation and Parking Services
Linda Kinsey, City of St. Petersburg Department of Marketing/Public Information
Julie Hall, Channel 35, City of St. Petersburg Department of Marketing/Public Information
Peggy Johns, Supervisor, Health Education, School Board of Pinellas County
Brian Smith, Director, Pinellas County Metropolitan Planning Organization
Daniel Burden, Executive Director, Walkable Communities Inc.
Theo Petritsch, State Safety Office, Florida Department of Transportation
Pat Pieratte, State Safety Office, Florida Department of Transportation
John Royse, Local Pedestrian Safety Advocate

The team would also like to thank the following agencies and organizations for their assistance:
School Board of Pinellas County
City of St. Petersburg
City of St. Petersburg Police Department
City of St. Petersburg Department of Transportation and Parking Services
City of St. Petersburg Department of Marketing/Public Information
Channel 35
Pinellas County Metropolitan Planning Organization
Pinellas County Community Traffic Safety Team
Council of Neighborhood Associations (CONA)
Pinellas County Sheriff’s Office
WMNI 1380, Radio Disney

The following CUTR staff assisted with the completion of this report:
Martin Catala, GIS map design and production
Brandi Bartolomeo, GIS map design and production
Penny Booth, field data collection
Patricia Baptiste, cover design

Cover photograph by Jill Sagers. Used by permission courtesy of the St. Petersburg Times
Additional photographs by Anthony J. Ferraro and Louis Malenfont
The contents of this report reflect the views of the authors who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the official views or policies of the Florida Department of Transportation.

This report was prepared in cooperation with the State of Florida Department of Transportation Safety Office.


# Table of Contents

I. INTRODUCTION ................................................................................................................................. 1
   Research Background .................................................................................................................... 1
   Research Objectives ................................................................................................................... 3
   Research Approach ..................................................................................................................... 4
   Report Organization ..................................................................................................................... 4

II. COMMUNITY ASSESSMENT .......................................................................................................... 7
   Overview ........................................................................................................................................ 7
   Assessment Process ..................................................................................................................... 7
   Step 1. Analyze Pedestrian Crash Data .................................................................................... 8
   Step 2. Identify Community “Walkability” Issues ................................................................. 13
   Step 3. Document Crosswalk Conditions .............................................................................. 15
   Step 4. Select Intersections for Pedestrian Safety Interventions ......................................... 16
   Step 5. Collect Baseline Observational Data ........................................................................... 17

III. PROGRAM IMPLEMENTATION .................................................................................................... 21
   Introduction ................................................................................................................................. 21
   Engineering Components ......................................................................................................... 21
   Advance Stop Lines at Crosswalks ........................................................................................... 22
   Lead Pedestrian Intervals .......................................................................................................... 23
   Scanning Eyes on Pedestrian Signal Heads ........................................................................... 24
   Pedestrian Prompting Signs ...................................................................................................... 24
   Motorists Prompting Signs ......................................................................................................... 25
   Special Pedestrian Safety Improvements ................................................................................... 26
   Education Components .............................................................................................................. 27
   Electronic Message Boards ....................................................................................................... 28
   School Education Interventions ............................................................................................... 29
   Community Education Interventions ......................................................................................... 30
   Enforcement Interventions ......................................................................................................... 32
   Yielding to Pedestrians Warning Program 1: December 18, 1998 ...................................... 32
   Yielding to Pedestrians Warning Program 2: October 6, 1999 ............................................. 32

IV. PROGRAM EVALUATION ............................................................................................................. 33
   Introduction ................................................................................................................................. 33
   Methodology ............................................................................................................................... 33
   Findings ...................................................................................................................................... 34
   Motorists Yielding to Pedestrians at Crosswalks ................................................................. 34
   Pedestrian-Motor Vehicle Conflicts at Crosswalks ............................................................... 38
   Discussion of Intervention Efforts and Site Results ............................................................... 42
   Engineering Interventions ......................................................................................................... 42
   Education Interventions ........................................................................................................... 44
   Enforcement Interventions ........................................................................................................ 44
   Summary ..................................................................................................................................... 45

V. CONCLUSIONS ............................................................................................................................... 47
   Overview ...................................................................................................................................... 47
   Summary of Findings ................................................................................................................... 48
   Study Limitations ....................................................................................................................... 50
   Recommendations ....................................................................................................................... 51

REFERENCES ................................................................................................................................. 53
List of Tables

Table 2.1  Pedestrian-Related Crashes by Age, Jan to Nov, 1998 .......................................................... 12
Table 2.2  Distance of Pedestrian-Related Crashes from Intersections, Jan to Nov, 1998 .............. 12
Table 2.3  Condition of Crosswalk Markings: Signalized and Unsignalized Intersections .......... 16
Table 2.4  Signalized and Unsignalized Intersections Selected for Pedestrian Safety Interventions ................................................................................................................................1 8
Table 2.5  Baseline Conditions at Signalized Intersections, Nov, 1998 ................................................. 20
Table 2.6  Baseline Conditions at Unsignalized Intersections, Nov, 1998 ........................................... 20
Table 3.1  Engineering Interventions and Implementation Dates ......................................................... 22
Table 3.2  Location of Advance Stop Lines: Signalized and Unsignalized Intersections ............... 23
Table 3.3  Location of Lead Pedestrian Intervals ..................................................................................... 24
Table 3.4  Intersections with Pedestrian Prompting Signs Installed ..................................................... 25
Table 3.5  Intersections with Motorist Prompting Signs Installed ........................................................ 26
Table 3.6  Education Components Implementation Dates ................................................................. 28
Table 3.7  Electronic Message Board Safety Messages ............................................................................ 28
Table 3.8  Community Feedback Message and Reported Weekly Percentages .............................. 29
Table 4.1  Summary of Intervention Efforts at Signalized Intersections .............................................. 35
Table 4.2  Summary of Intervention Efforts at Unsignalized Intersections ...................................... 35
Table 4.3  Motorists Yielding to Pedestrians at Crosswalks Located at Signalized Intersections: Baseline v. Post-Intervention Period ................................................................. 37
Table 4.4  Motorists Yielding to Pedestrians at Crosswalks Located at Unsignalized Intersections: Baseline v. Post-Intervention Period ............................................................... 38
Table 4.5  Pedestrian–Motorist Conflicts at Crosswalks Located at Signalized Intersections: Baseline v. Post-Intervention Period .................................................................................. 40
Table 4.6  Pedestrian–Motorist Conflicts at Crosswalks Located at Unsignalized Intersections: Baseline v. Post-Intervention Period ............................................................................... 41
Table 4.7  Yielding and Conflicts at Intersections Receiving Pedestrian Prompting Signs .......... 43
List of Figures

Figure 1.1 Pedestrian Fatality Rate Per 100,000 Population: US, Florida, Pinellas County, Florida, 1991-1998 ............................................................ 1
Figure 2.1 Pedestrian Fatalities Per Year: St. Petersburg, Florida, 1994-1998 .......................................................... 8
Figure 2.2 Pedestrian Fatalities by Month: St. Petersburg, Florida, 1994-1998 ...................................................... 8
Figure 2.3 Pedestrian Fatalities by Age Group: St. Petersburg, Florida, 1994-1998 ........................................ 9
Figure 2.4 Location of Fatal Pedestrian Crashes in St. Petersburg, Florida, 1994-1998 ..................... 10
Figure 2.5 Most Dangerous Intersections for Pedestrians in St. Petersburg, Florida .................. 11
Figure 2.6 Pedestrian Comfort Levels at Signalized and Unsignalized Intersections ....... 13
Figure 2.7 Pedestrian Safety Features at Signalized and Unsignalized Intersections .......... 15
Figure 4.1 Percent of Motorists Yielding to Pedestrians at Signalized Intersections .......... 37
Figure 4.2 Percent of Motorists Yielding to Pedestrians at Unsignalized Intersections .... 37
Figure 4.3 Percent of Pedestrian-Motor Vehicle Conflicts at Signalized Intersections ......... 40
Figure 4.4 Percent of Pedestrian-Motor Vehicle Conflicts at Unsignalized Intersections .... 40