PBIC Webinar

Toward Zero Deaths: Strategies for Pedestrian and Bicycle Professionals

Charlie Zegeer, PBIC

Carl Sundstrom, PBIC

Jan. 31, 2013, 2 pm

Today's Presentation

- **Introduction and housekeeping**
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PBIC Webinar

Toward Zero Deaths for Pedestrians and Bicyclists: A national Strategy

Charlie Zegeer, PBIC

Presentation Overview

- Introduction
- Focus On Pedestrians
  - Magnitude of the Problem
  - Pedestrians Most at Risk
- Major Issues
- Pedestrian Crash Factors
- Eight Safety Strategies
- Summary & Next Steps

Worldwide Motor Vehicle Crashes

- 1.2 Million deaths per year
- 20 to 50 million non-fatal injuries
- Crash fatalities are comparable to deaths from all communicable diseases

Source: http://drusilla.hsrc.unc.edu/imagelib/l

Source: World Health Organization. (2009). *Global Status Report on Road Safety: Time for Action*. Geneva, Switzerland: WHO Press.

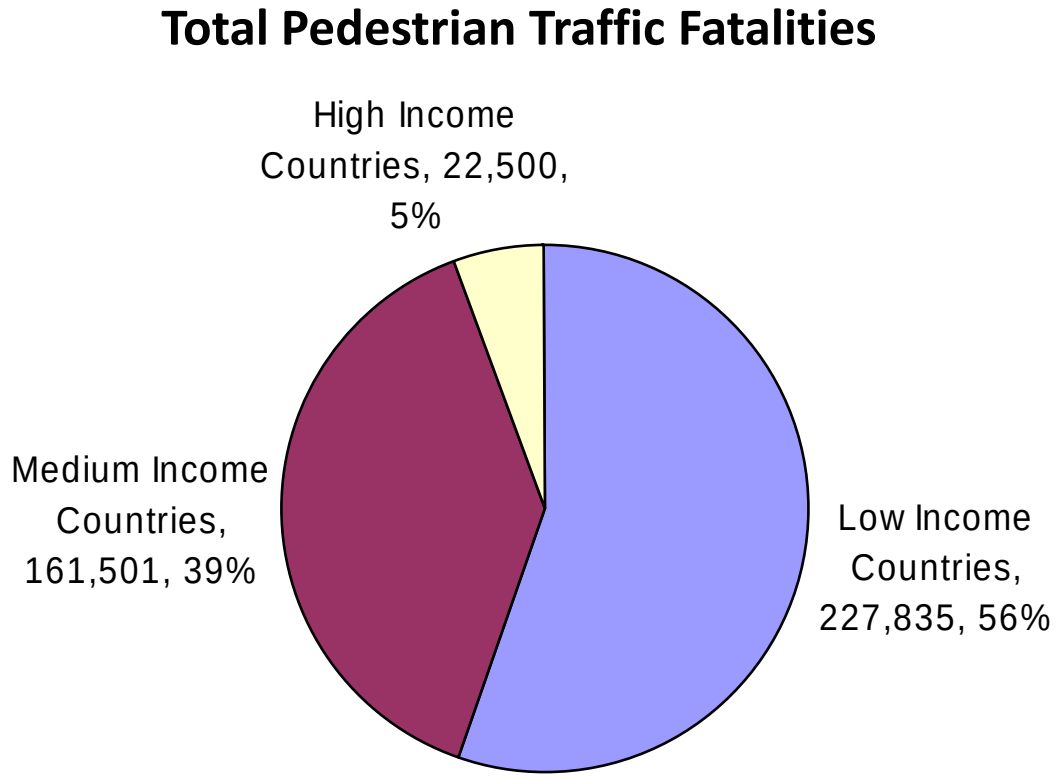
Worldwide Motor Vehicle Crashes

Source: http://drusilla.hsrc.unc.edu/imagelib/largeimages/

- Leading cause of death in the world for people 15 to 29 years old
- About half of the road fatalities are Vulnerable Road Users (pedestrians, cyclists, and users of motorized two-wheeled vehicles)

Source: World Health Organization. (2009). *Global Status Report on Road Safety: Time for Action*. Geneva, Switzerland: WHO Press.

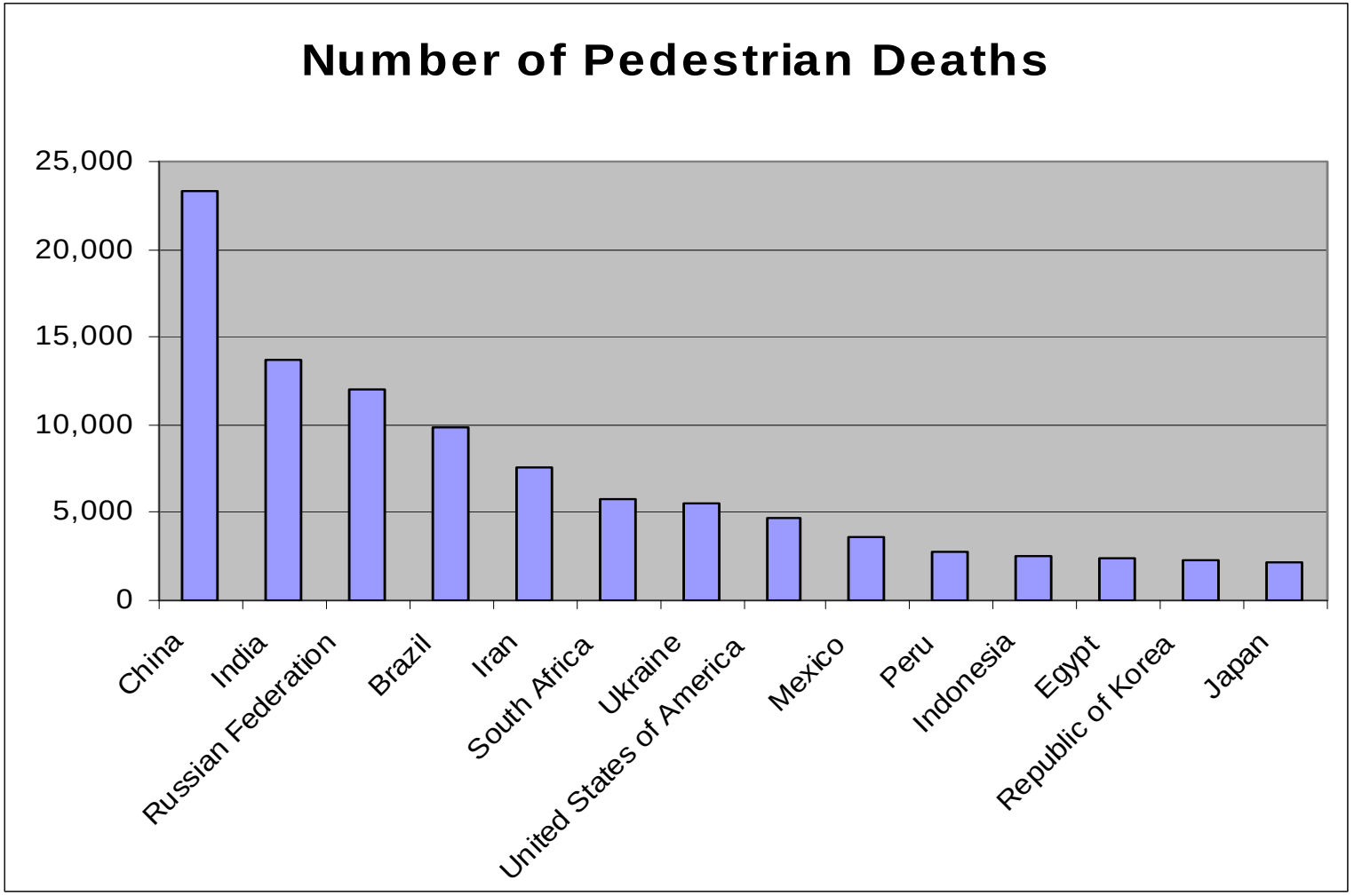
Worldwide Pedestrian Fatalities



- Over 400,000 pedestrians die each year with more than half of the pedestrian deaths occurring in poor countries
- This trend is also reflected among children

Source: Naci, H., Chisholm, D., and Baker, T. D. (2009). Distribution of Road Traffic Deaths by Road User Group: A Global Comparison. *Injury Prevention, 15*, 55-59. doi: 10.1136/ip.2008.018721.

Numbers of Pedestrian Fatalities by Country



Source: World Health Organization. (2009). *Global Status Report on Road Safety: Time for Action*. Geneva, Switzerland: WHO Press.

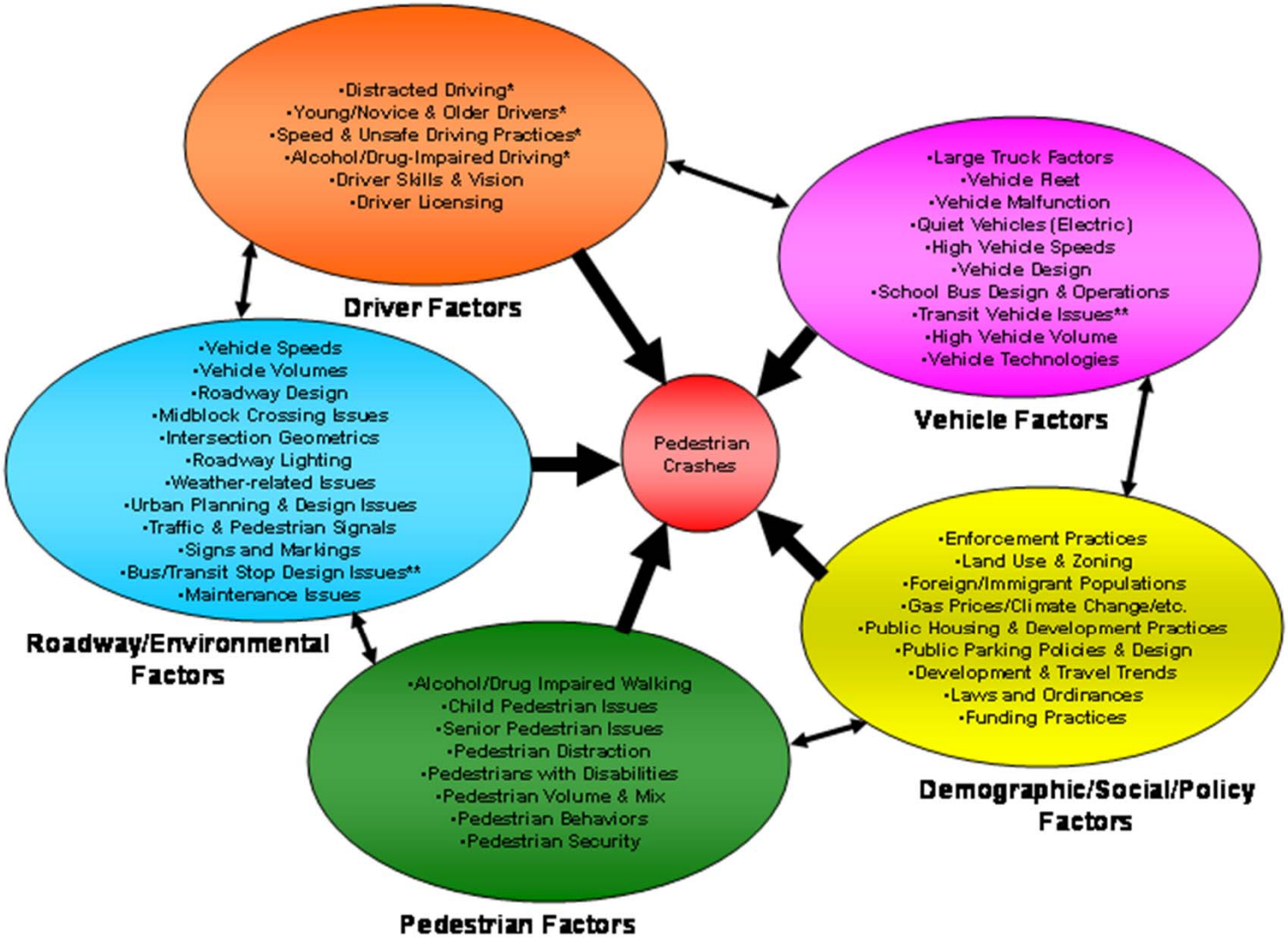
U.S. Pedestrian Crashes

- Approximately 4,000 pedestrians killed each year (13% of traffic deaths)
- 1.33 pedestrian fatality rate per 100,000*
- 60,000 to 70,000 pedestrians injured each year

* Fatality Analysis Reporting System (FARS). (2009). *National Rates: Fatalities*. Retrieved from http://www-fars.nhtsa.dot.gov/States/StatesPedestrians.aspx

Roads and streets should be designed to be reasonable safe for all types of road users, including pedestrians and bicyclists

Pedestrian Crash Factors



Pedestrians Most at Risk

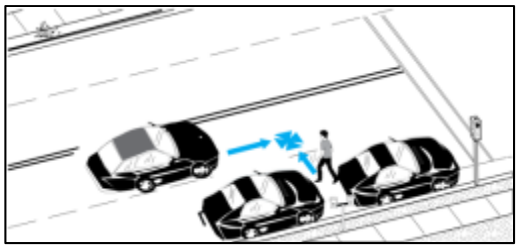
- Children
- Older Adults
- Pedestrians with Disabilities

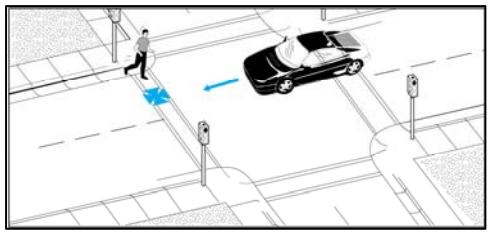
www.pedbikeimages.org / Laura Sandt

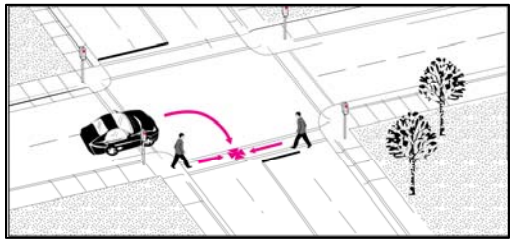
www.pedbikeimages.org / Dan Burden

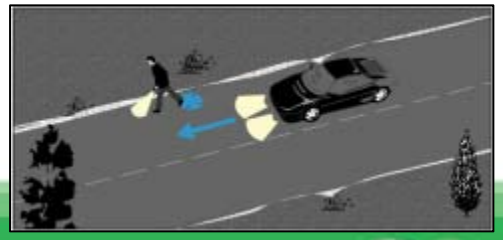
Pedestrian Crash Types and Behavior

- Some crash types occur more than others
  - Dart-Out
  - Dash
  - Midblock Crossing
  - Walking Along Roadway
  - Turning Vehicle
- Nighttime Crashes are also particularly severe



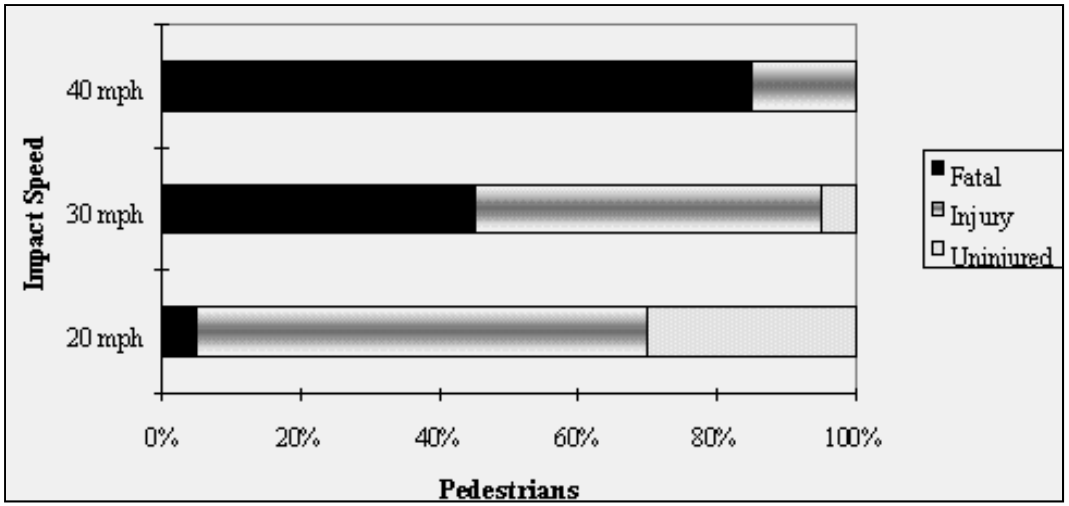






Major Issue: Vehicle Speeding

- Higher speeds increase the likelihood of fatal injuries



Pedestrian Injury Severity Based on Vehicle Speed.

Roadway Features

- Roadway factors that affect pedestrian safety
  - Lack of Sidewalk
  - High Traffic Volume
  - High Vehicle Speeds
  - More Traffic Lanes
  - Lack of a Median (on Multi-lane Roads)
  - Presence of Transit Stops

www.pedbikeimages.org / Janet Barlow

Key Trends

- Users Distracted & Impaired
- Lack of Adequate Enforcement & Education
- Needed Infrastructure
  - Signs and Signals
  - Traffic Calming
  - Geometric Designs

www.pedbikeimages.org / Mike Cynecki

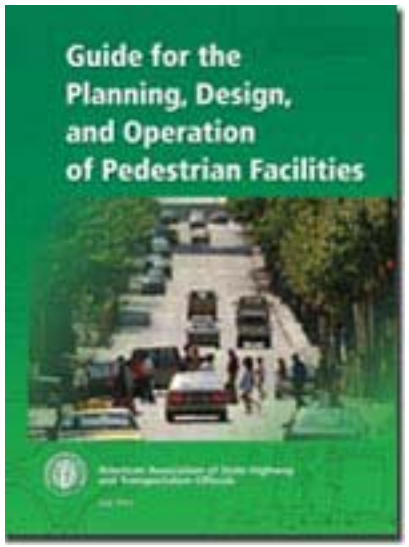
www.pedbikeimages.org / Dan Burden

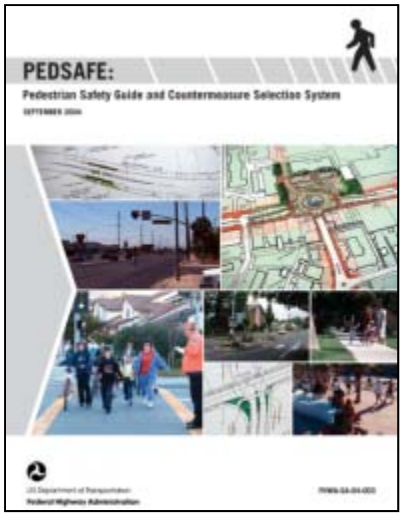
Eight Recommended TZD Pedestrian Safety Strategies

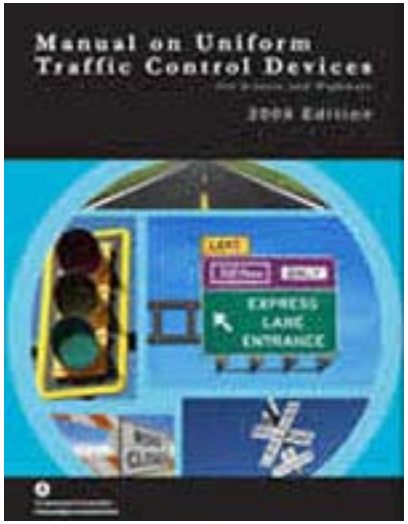
1. Provide pedestrian-friendly geometric guidelines
2. Implement effective traffic control treatments
3. Expand funding for SRTS & educational programs
4. Improve safety conditions for transit users
5. Promote enforcement programs
6. Improve pedestrian visibility
7. Develop & implement ITS vehicles & roadways
8. Develop a comprehensive pedestrian safety action plan

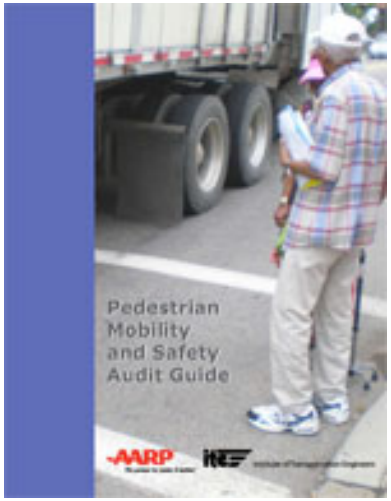
Pedestrian Strategy One

- Provide Pedestrian Friendly Geometric Guidelines







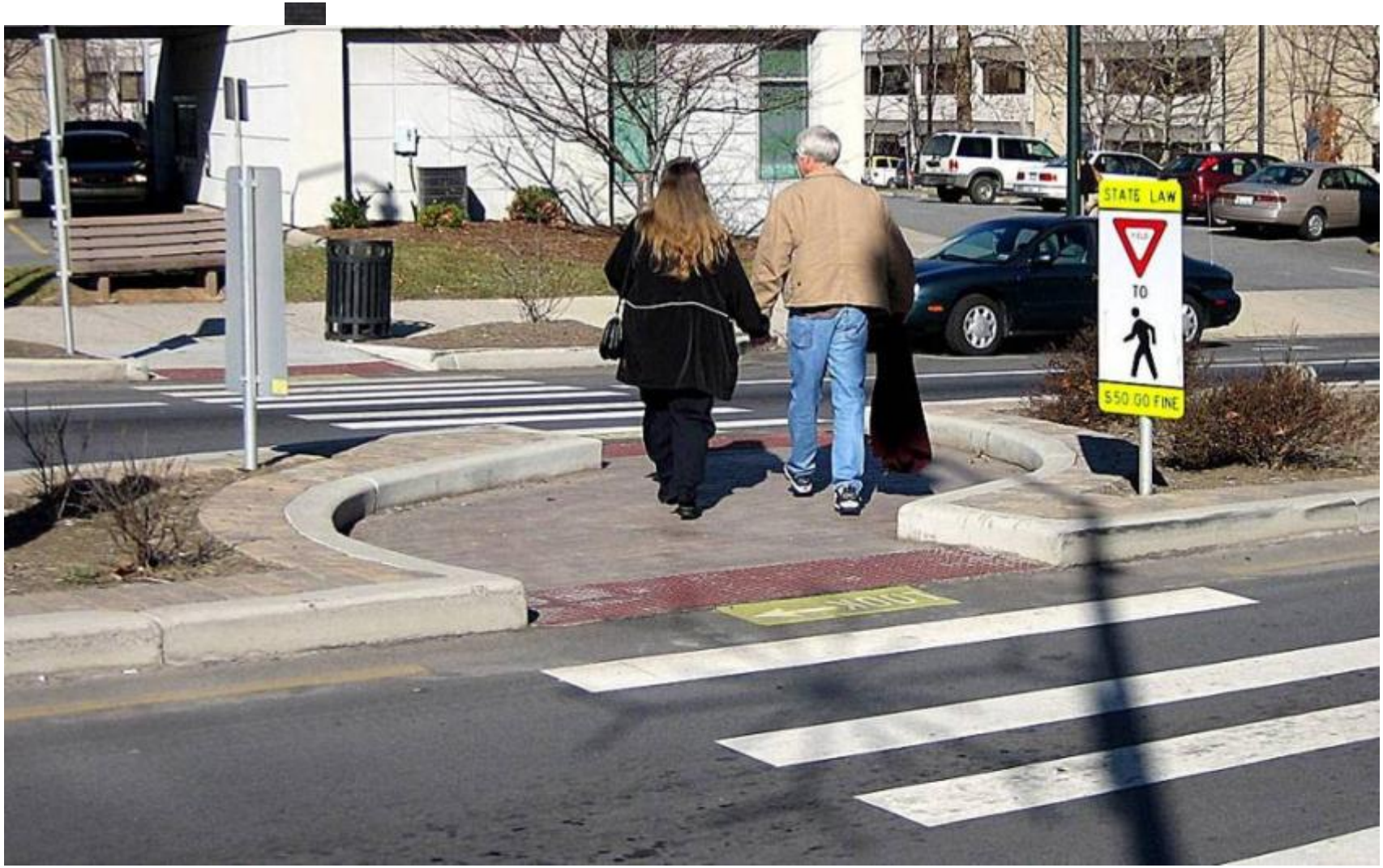


A well designed network of sidewalks and walkways is needed to provide for pedestrian travel

Rural Environments: Paved Shoulders

Reduction in walking along road ped crashes

Minimum of 6 ft shoulder width preferred



Islands improve safety at designated crosswalks

“Classic Road Diet”

4 to 3 lanes

Road diet with raised island at the crossing

Curb extensions reduce crossing distances and slow the speeds of right-turning vehicles

Design streets for people with disabilities

Pedestrian Strategy Two

- Implement Effective Traffic Control and Other Pedestrian Safety Treatments

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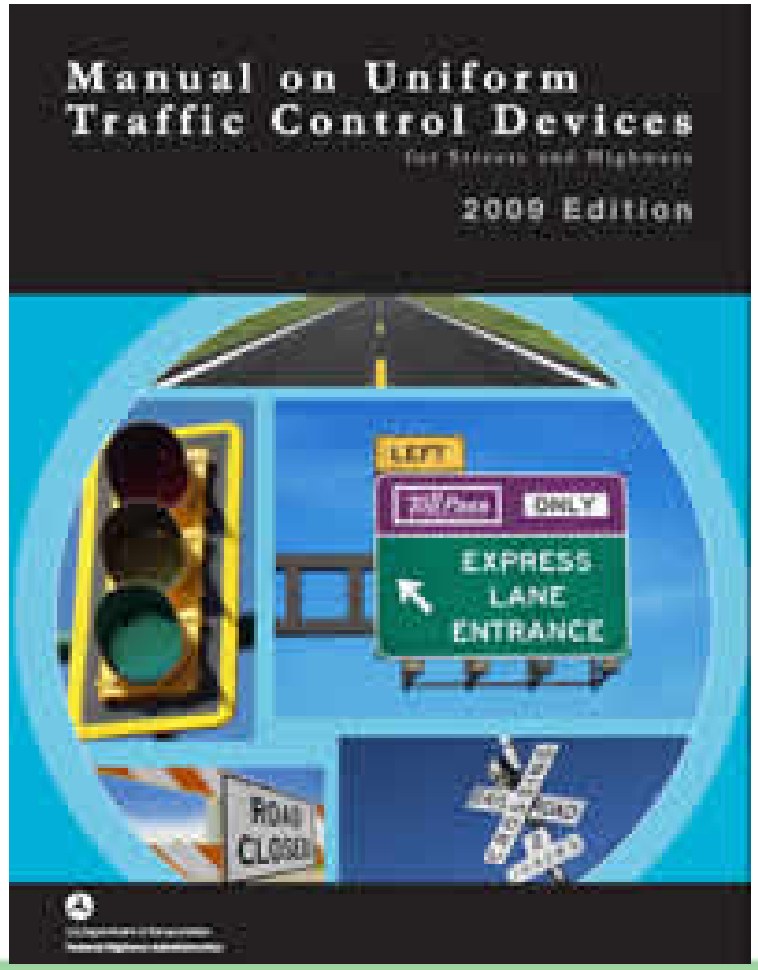
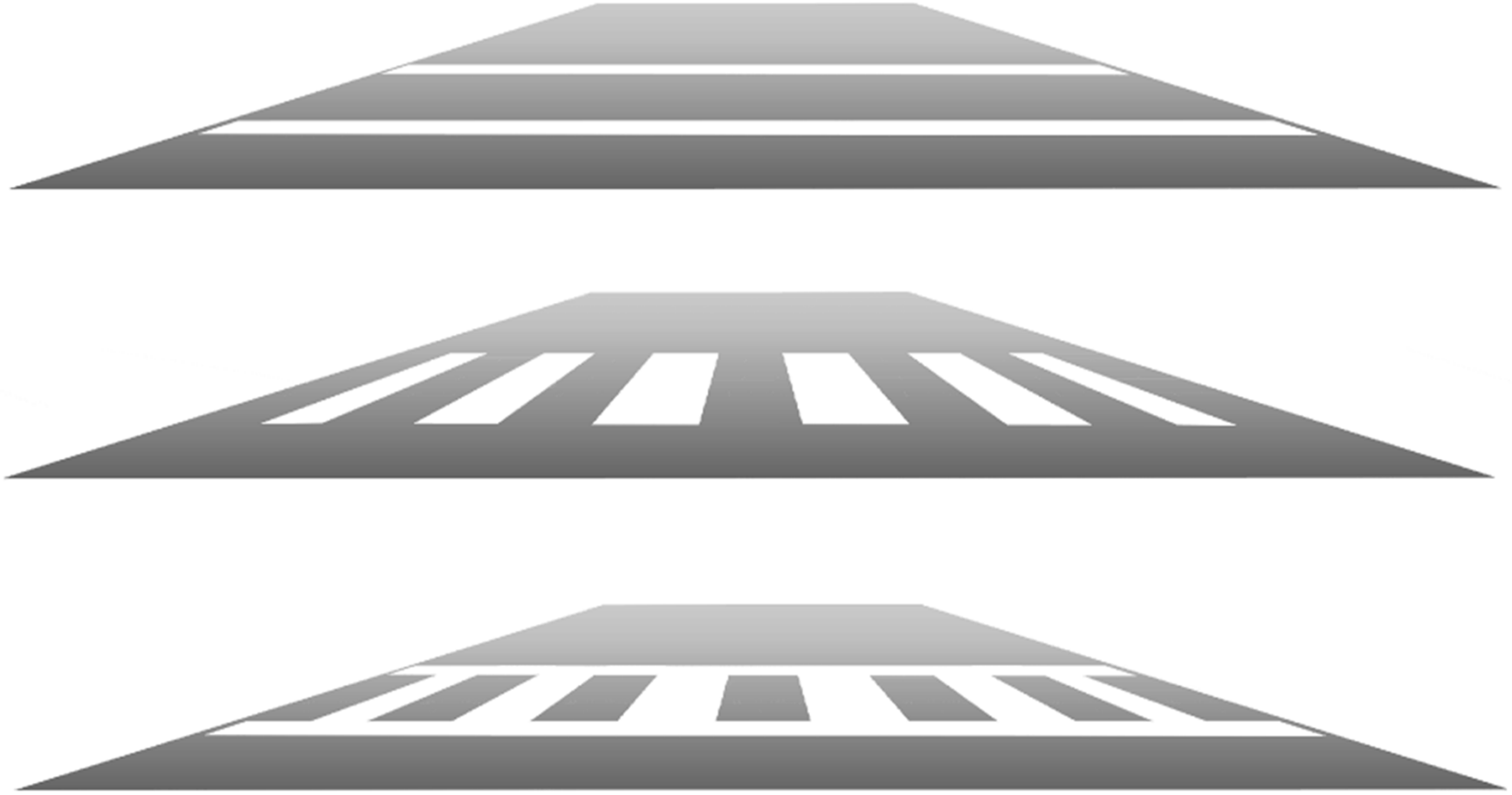
Continue to Refine the MUTCD to Address Pedestrian Safety Problems Based on New Research



Crosswalk Visibility



Crosswalk Marking Types

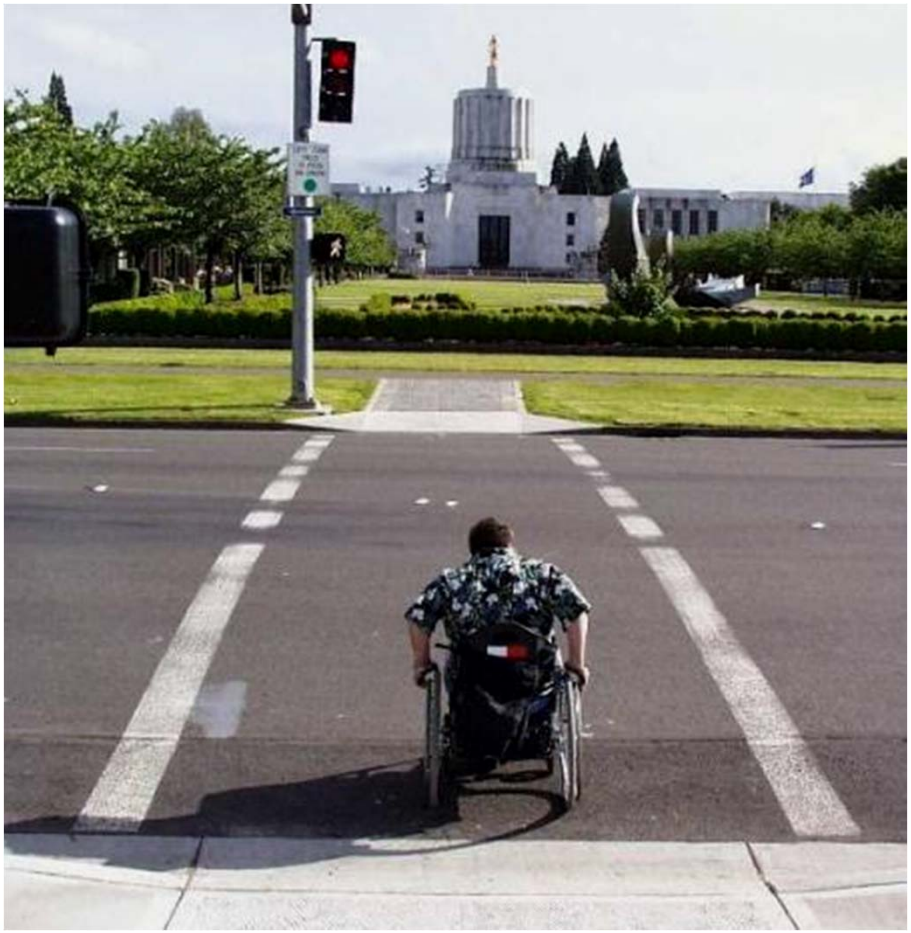
Pedestrian Hybrid Beacon aka “HAWK”
(High Intensity Activated Crosswalk)

Included in the 2009 MUTCD

Advanced yield line (shark's teeth) & sign

Protected left-turn phasing can dramatically reduce left-turn crashes with motorists and pedestrians

LPI : WALK comes on 3 seconds prior to the vehicular green; pedestrians can enter crosswalk before turning vehicles arrive there.



Pedestrian Strategy Three

- More Funding Needed to Implement Safe Routes to School Programs and Safety Education Programs

SafeRoutes
National Center for Safe Routes to School

www.pedbikeimages.org / Dan Burden

Other Needs for SRTS and safety education

- More education needed to drivers and pedestrians
- Enforcement is essential
- Implement needed engineering measures in school zones
- Coordinate with parents & local officials

Pedestrian Strategy Four

Improve safety conditions for transit users

www.pedbikeimages.org / Austin Brown

www.pedbikeimages.org / Dan Burden

Develop and Implement Specific National Guidelines for Safer Bus Stop Design and Placement

Shelters must be accessible (grass makes it inaccessible)

The same bus stop after improvement

Bus stop location should allow for pedestrians to cross the street safely. Closer cooperation needed between traffic engineers and transit agencies.

Crossing includes advanced yield lines with signs, marked crosswalk, raised median, lighting, and sidewalk.

Pedestrian Strategy Five

- Promote and Advance the Use of Enforcement

Police Enforcement

BARBARA P. FERNANDEZ/FOR THE HERALD

IN DANGER: As cars make their turns, a pedestrian navigates the crosswalk in the 7100 block of Collins Avenue in Miami Beach. Another pedestrian was killed nearby earlier this month.

Yield to pedestrians, police warn

Campaign will ticket violators

BY JOHNNY DIAZ
jdiaz@herald.com

MIAMI BEACH

Drivers, beware.

Ignoring or speeding by pedestrians in crosswalks may land you an $83 fine if you don't

pedestrians.

Collaborating on the program: Miami Beach police and

be a hotspot for pedestrian crashes," said Ron Von Houten, a researcher with the University of Florida who assisted the center with its study based on traffic accidents countywide. "It's the law to yield to the right of way of pedestrians. We want to reach out to the people to make this a walkable commu-

Sign for Crosswalks at Uncontrolled Sites

Sign for Crosswalks at Traffic Signals

Promote and Advance the Use of Photo Enforcement

- Promote as tool to enhance pedestrian safety
- Some pushback from communities may occur
- Task force of interested organizations?

Source: Google Images

Pedestrian Strategy Six

- Improve the Visibility of Pedestrians

www.Flickr.com / Sarah Sosiak

www.flickr.com / OregonDOT

Improve the Reflectorization/Conspicuity of Pedestrians

- Improve education about conspicuity
- Provide low cost reflective clothing through partnerships with sporting goods companies
- Enhance nighttime lighting

Source: Google Images

Adequate nighttime lighting is important for nighttime visibility

Pedestrian Strategy Seven

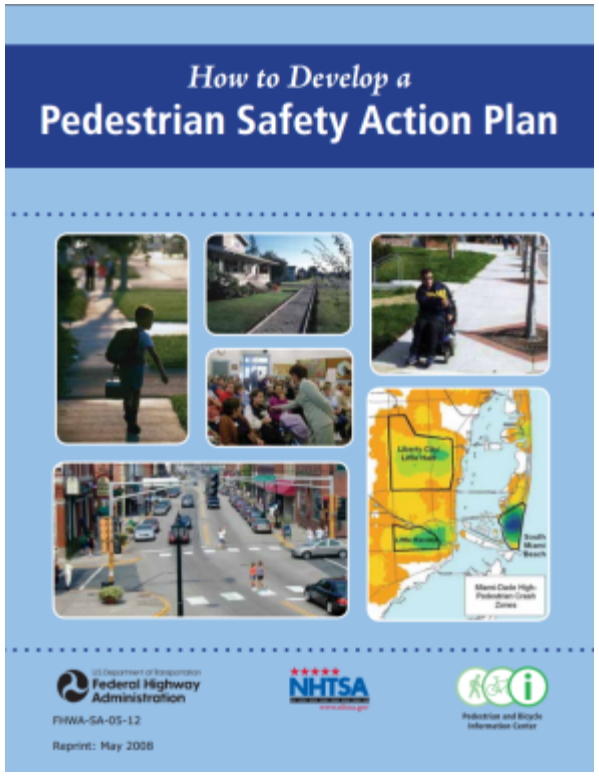
Develop and Implement Pedestrian- Friendly ITS Vehicle and Roadway Features

Developments in “Smart Vehicles”

- Equip electric (or silent) motor vehicles with noise-making devices
- Employ pedestrian/object detectors equipped on motor vehicles which can send a warning to the driver
- Implement more vehicles with crash-avoidance capabilities
- Further develop driverless motor vehicles with pedestrian & vehicle detection and avoidance

Pedestrian Strategy Eight

Develop a Comprehensive Pedestrian Safety Program



Obstacles

By Strategy

- 1. Revised AASHTO Guide: DOTs continue to face financial pressures
- 2. Refine/Implement New MUTCD: Additional costs for new traffic control devices; more research needed
- 3. Expand SRTS: Increased funding needed; strong partnerships necessary
- 4. Transit rider safety: Substantial coordination and funding needed

Obstacles

- 5. Photo Enforcement: Political and privacy issues; possible state legislative action needed
- 6. Reflectorization/Conspicuity: Funds for lighting needed, reaching right pedestrians
- 7. Ped-Friendly ITS: Developing and marketing ITS technology; increased vehicle costs
- 8. PSAP Pedestrian safety training needed, and not enough emphasis from some agencies

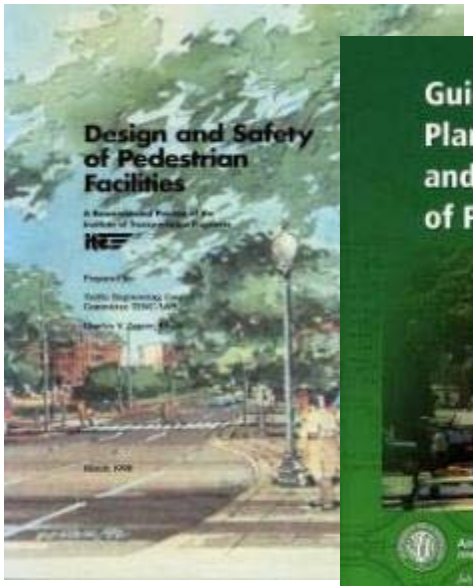
The Bottom Line

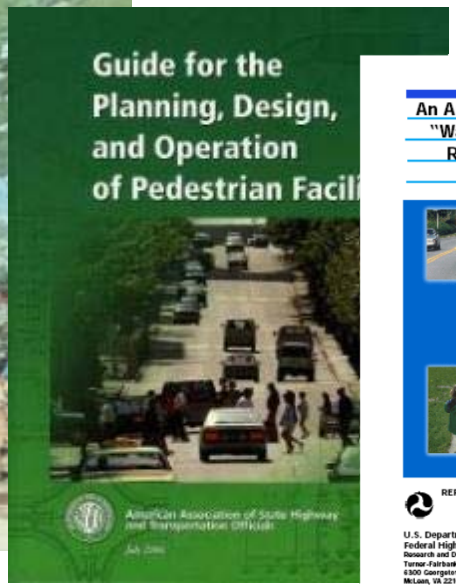
- Coordination between government and private organizations is important
- Crash analysis is an important and necessary step
- Professional training should be offered to government employees regularly
- Pedestrian safety research has an important role to play and is needed
- A comprehensive and cooperative program involving all stakeholders is necessary to achieve results

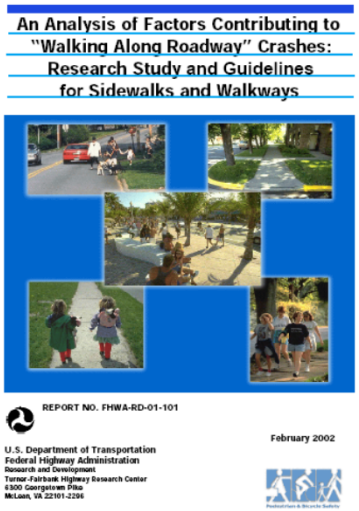
What can State & Local Agencies Do Now ?

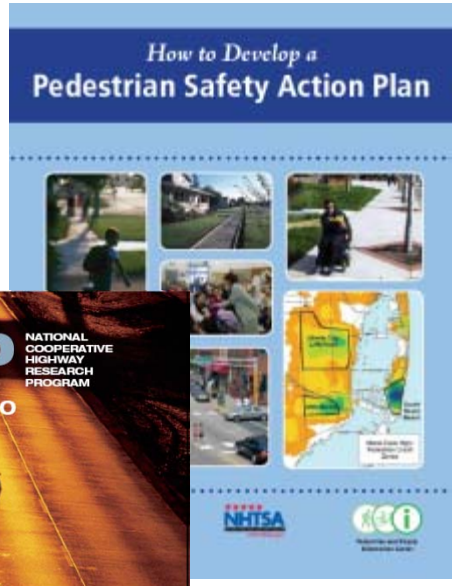
- Designate pedestrian safety and bike safety as a emphasis area (e.g., SHSP, Complete Streets Policy)
- Identify key stakeholders and champions
- Analyze pedestrian crash data
- Quantify crash characteristics & location clusters
- Identify crash problems and establish TZD goals
  - Reduce 10% of child crashes each year
  - Reduce nighttime ped./bike crashes by 25% by year 2018
  - Reduce senior pedestrian crashes by 5% per year
- List safety measures to accomplish TZD goals
- Develop a Pedestrian Safety Action Plan
- Secure funding and Implement 3 E's and policy changes to meet TZD goals

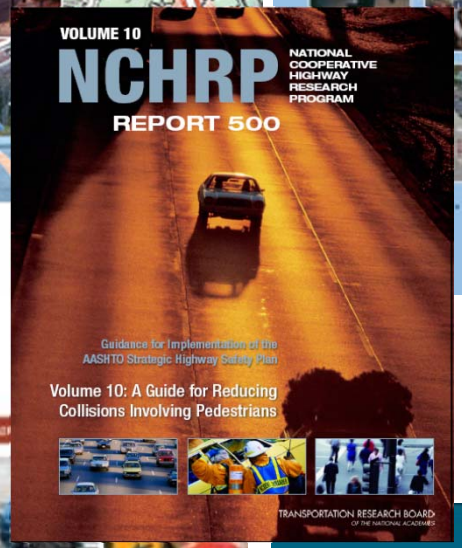
Resources

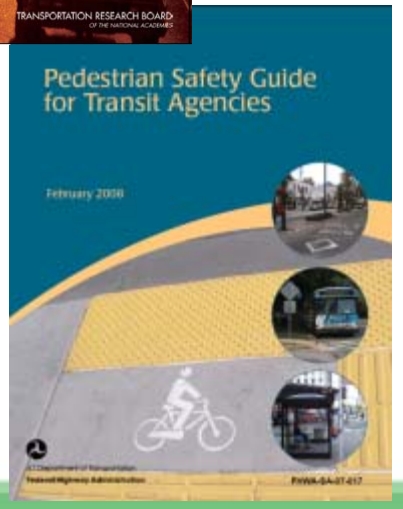












PBIC: www.walkinginfo.org

FHWA: safety.fhwa.dot.gov

NHTSA: nhtsa.dot.gov

ITE: www.ite.org

AASHTO/NCHRP: safety.transportation.org

PBIC Webinar

Toward Zero Deaths:
A National Strategy on Highway Safety

Presentation on Bicyclist Strategies

Carl Sundstrom, UNC Highway Safety Research Center

Table of Contents

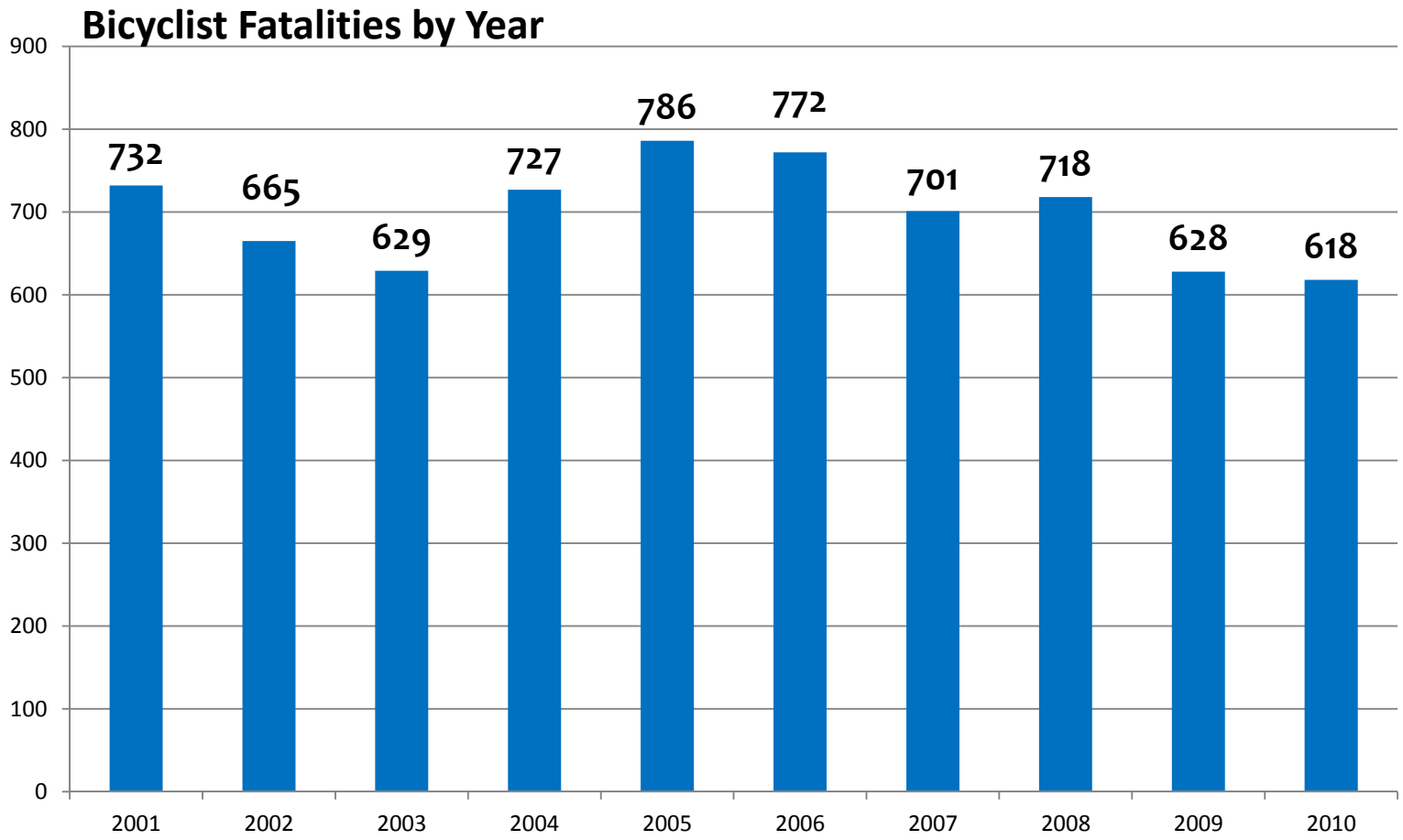
- Background
- Safety strategies
- Other activities
- Summary


www.pedbikeimages.org / Mike Cynecki

Background

- From White Papers for: *"Toward Zero Deaths: A National Strategy on Highway Safety"*
- White Paper No. 5: Safer Vulnerable Road Users: Pedestrians, Bicyclists, Motorcyclists, and Older Users (2010)
  - Bicyclist section author:
    William Hunter, UNC Highway Safety Research Center

Background



Source: Fatality Analysis Reporting System (FARS). (2010). *National Rates: Fatalities*.

Background

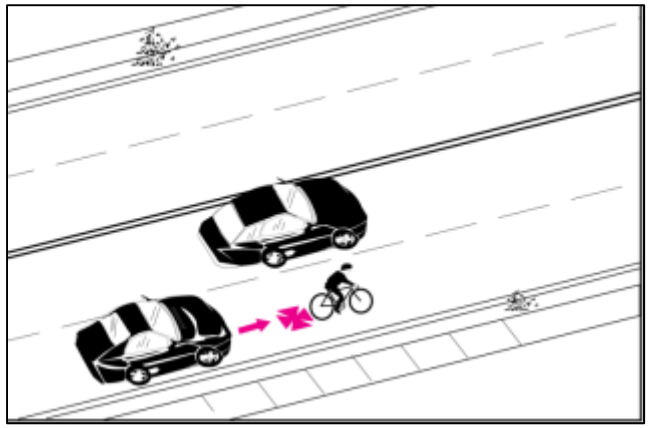
2010 bicyclist traffic fatalities:

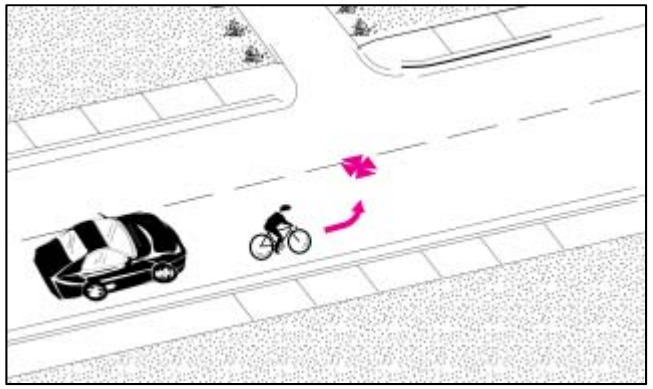
- 618 killed
- 21% under age 16
- 86% were male
- 21% had BAC level ≥ 0.08
- 72% in urban areas
- 33% at intersections
- 28% between 4 p.m. and 8 p.m.

Background

North Carolina crash types
(1997-2008)

Crash Type	% of total crashes
Motorist overtaking bicyclist	33%
Bicyclist left turn/merge	14%
Bicyclist failed to yield, midblock	10%
Head on	8%
Bicyclist failed to yield at a sign-controlled intersection	7%
Bicyclist right turn/merge	6%

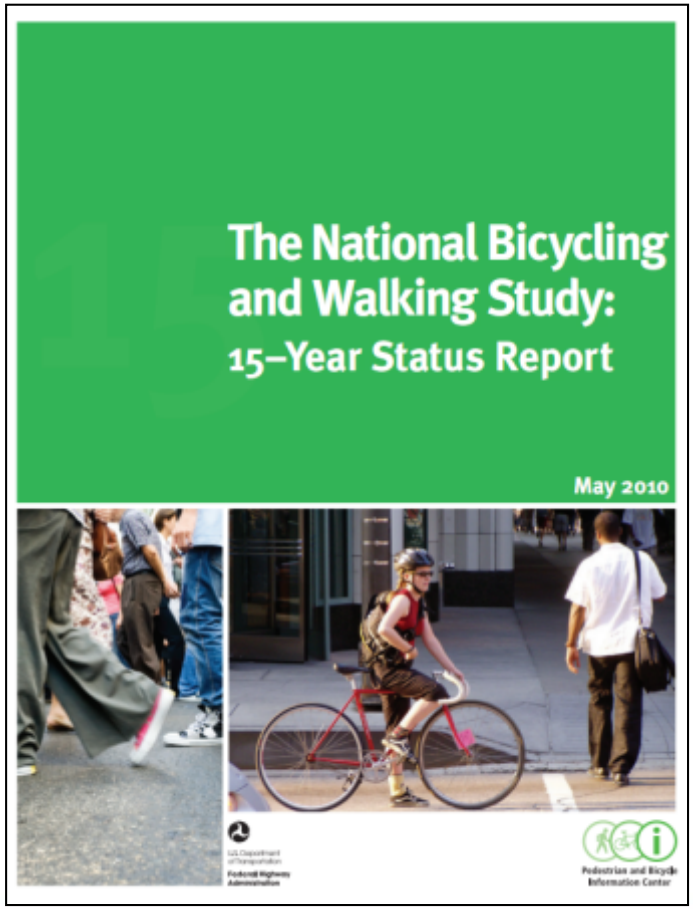




Background

1994 National Bicycling and Walking Study

- Goals:
  - Double percent of trips made
  - Reduce killed & injured by 10%
- 15-year status update:
  - Bicycling mode share
    0.7% (1990) – 1.0% (2009)
    - Trip increase from 1.7 to 4 billion
  - Bicyclist fatalities reduced by 12%
    - Injury estimate is a 14.7% reduction



Strategies for Reducing Bicycle Fatalities

Strategy 1:

Reduce Motor Vehicle Speed in Urban and Suburban Areas

- Problem:
  - Reduced reaction time
  - Increased severity
- Strategies:
  - Enforcement (including automated)
  - Geometric (lane diets, traffic calming)
- Costs:
  - Low
- Implementation issues:
  - Requires paradigm shift

www.pedbikeimages.org / Dan Burden

Strategy 2:

Reduce Distracted Driving by Motorists and Distracted Riding by Bicyclists

- Problem:
  - Distracted driving involved crashes are increasing
  - Involved in 16% of total fatalities (2008)
  - 27% of adults have sent or read a text message while driving
- Strategies:
  - Legislation
  - Public awareness
- Costs:
  - Low
- Implementation issues:
  - Personal freedom concerns

www.distraction.gov

Strategy 3:

Educate Motorists about How to Share the Road with Bicyclists

- Problem:
  - Not looking for/expecting cyclists
  - Unaware of laws
- Strategies:
  - Drivers ed & exams
  - PSAs
  - Fines
- Implementation issues:
  - Bureaucracy
  - Lack of support for increased fines

www.pedbikeimages.org / Carl Sundstrom

Strategy 4:

Educate Bicyclists about How to Ride in Traffic and the Use of Proper Equipment

- Problem:
  - Not aware of where in road to ride
  - Inadequate equipment (lights, helmet, clothing)
- Strategies:
  - Bicycle skills training
  - PSAs
- Costs:
  - Low
- Implementation issues:
  - Requires large outreach efforts to reach all groups

Strategy 5:
Reduce Intersection Conflicts

- Problem:
  - Inadequate facilities
  - Poor bicyclist visibility
- Strategies:
  - Widespread bicycle facilities
  - Intersection crossing markings
  - Bicycle signals/signal timing
  - Convex mirrors
  - Lighting
- Implementation issues:
  - Effectiveness evaluations
  - Costs
  - Staff training


www.pedbikeimages.org / Laura Sandt

Federal Highway Administration

Other Activities in Support of the Strategies

- Several other activities would supplement the five strategies:
  - Continue with the implementation of bicycle facilities
  - Maintain bicycle facilities and shared roadways
  - Increase enforcement for dangerous behaviors
  - Examine legislation
  - Embrace the Complete Streets concept
  - Continue funding of Safe Routes To School (SRTS) initiatives

Summary

- New policies are creating a paradigm shift in planning & implementation
- There is a “safety in numbers” effect
- Most of the strategies are low-cost
- Not just engineering strategies

Safer Vulnerable Users white paper available at http://www.walkinginfo.org/library

Thank You!

- **Archive at www.walkinginfo.org/webinars**
  - Downloadable and streaming recording, transcript, presentation slides
- **Questions?**
  - **Charlie Zegeer**
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  - **Carl Sundstrom**
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