Pedestrian Safety Guide for Transit Agencies

FDOT/FTPA/CUTR
Professional Development Workshop
June 15, 2010
Presentation Overview

- Purpose
- Bus Stop Location and Design
- Process/Partnership
Purpose

• Every bus stop is a pedestrian crossing, whether designed accordingly...
Purpose

• Every bus stop is a pedestrian crossing, whether designed accordingly... or not.
### Purpose

<table>
<thead>
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- **Florida**: 2.94
- **National Average**: 1.57
Purpose

Danger Index:
Per Capita Pedestrian Fatalities

Percent of Pedestrians Walking to Work

Most Dangerous US Cities for Walking

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<thead>
<tr>
<th>Metro Area</th>
<th>Danger Index</th>
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<tr>
<td>1 Orlando-Kissimmee, FL</td>
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<td>2 Tampa-St. Petersburg-Clearwater, FL</td>
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<td>4 Jacksonville, FL</td>
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<td>5 Memphis, TN-MS-AR</td>
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<td>6 Raleigh-Cary, NC</td>
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<td>9 Birmingham-Hoover, AL</td>
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<td>10 Atlanta-Sandy Springs-Marietta, GA</td>
<td>108.3</td>
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</table>
Purpose

• Most pedestrian crashes...
  – Occur when pedestrians attempt to cross major roadways
Purpose

• Most pedestrian crashes...
  – Occur when pedestrians attempt to cross major roadways
  – Involve adult pedestrians
Purpose

• There is an over-representation of pedestrian crashes…
  – At night (about 40%)
  – In low income/auto-ownership areas
5% of major road mileage accounts for 40% of all pedestrian crashes
Most of these roadway corridors include transit service.
Conclusions

• Pedestrian safety and transit correlate:
  – Geographically
  – Demographically

• Providing safe access to transit
  – Benefits transit riders
  – Provides focal points for pedestrian safety infrastructure along corridors
  – Can improve route and roadway performance
Pedestrian Safety Guide for Transit Agencies

• Provides transit agency and partners with easy-to-use resource for pedestrian safety

• Emphasizes importance of partnerships to improve pedestrian safety
Guide Includes

• Common pedestrian safety issues near transit stations, bus stops, and other transit facilities.
• Descriptions of specific engineering, education, and enforcement programs that have been effectively applied by transit agencies.
• Background information about pedestrian safety and access to transit.
• References to publications, guides and other tools that can be used to identify pedestrian safety problems.
Presentation Overview

• Purpose

• **Bus Stop Location and Design**
  – Basic Site Issues
  – Signalized Intersections Considerations
  – Mid-block/un-signalized Intersection Considerations

• Process/Partnership
Bus Stop Location Considerations

Pedestrian Convenience and Safety Factors:
- Predominant pedestrian patterns
- Proximity to destinations in the surrounding area
- Ease of transfers to other bus routes
- Locations of traffic signals and other crossings
Moving, Eliminating, Consolidating Bus Stops

Existing Bus Stops

Big Box Store

Shopping Center

Closed Crosswalk

Existing Bus Stops
Moving, Eliminating, Consolidating Bus Stops

Pedestrians unlikely to “Detour” to use crosswalk
Moving, Eliminating, Consolidating Bus Stops

Relocate stop to far side of crosswalk

Install missing crosswalk
Moving, Eliminating, Consolidating Bus Stops

Relocate stops to mid-block location

Install mid-block island and signal if necessary
Signalized Intersection Considerations
Bus Driver Concern: Farside or Nearside Stops?

Farside generally preferred at intersections because:

• Driver can pull across intersection before light turns red (less delay for buses and other traffic)
• Nearside can mean waiting an extra signal cycle
• Farside ensures pedestrians cross behind bus
Large corner radii:
- Increase crossing distance and make signal timing more difficult
- Make crosswalk & ramp placement more difficult
- Allow high-speed turns by cars

Curb radius – small radii are safer for pedestrians
Islands at Intersections

Benefits:

- Separate conflicts and decision points
- Reduce crossing distance
- Improve signal timing
- Reduce crashes
Bus pullouts must work for peds, cyclists & drivers

A far side pullout can be used as an acceleration lane, endangering other users
Bus pullouts must work for peds, cyclists & drivers

With curb extension, drivers will turn cautiously. Pedestrians and bicyclists are better served
Pedestrian count-down signal tells pedestrians how much crossing time is left.
Set pedestrian signal to recall to “Walk” when major street is set to recall to green

Peds shouldn’t have to push a button to cross the minor street
LPI: WALK comes on 3 to 5 seconds prior to the vehicular green; pedestrians can enter crosswalk before turning vehicles arrive there.
Consider Protected-Only Left Turn Phasing Near Bus Stops

Protected-Only Left Turn Phasing Can Be Pushbutton-Activated
Permissive left turns

Pedestrians cross at same time as left-turning car;
Drivers turning left on a green ball don’t look for pedestrians.
Protected left turns

Pedestrians cross after left-turning car, with thru-traffic; Pedestrian and car **not** in conflict
Midblock or Un-signalized Intersection Considerations
Medians make random crossings safer
Continuous raised median – Basic Principle

*Breaks long complex crossing into two simpler crossings*
Islands improve safety at designated crosswalks
Crossing island at marked crosswalk - Same Principle

Breaks long complex crossing into two simpler crossings
In-street pedestrian crossing signs increase yield rates, on slow-speed streets

R1-6a MUTCD signs
Yield or Stop depends on state law
Advance Stop or Advance Yield line helps address “multiple threat” crashes

Both versions can be used in Florida – law passed in 2008 requires drivers to stop if signs with “STOP” are posted
Multiple Threat Crash Problem

1\textsuperscript{st} car stops to let pedestrian cross, blocking sight lines

2\textsuperscript{nd} car doesn’t stop, hits pedestrian at high speed
Multiple Threat Crash Solution

Advance stop/yield line

1\textsuperscript{st} car stops further back, opening up sight lines

2\textsuperscript{nd} car can be seen by pedestrian
Illumination – Essential For Any Crossing

Designated crosswalks at/near bus stops must be illuminated
Rectangular Rapid Flash LED Beacon

• Studies indicate motorist yield rates increased from about 20% to 80%
• Beacon is yellow, rectangular, and has a rapid “wig-wag” flash
• Beacon located between the sign and plaque
• Must be pedestrian activated
Pedestrian Hybrid Beacon aka “HAWK” (High Intensity Activated Crosswalk)

Included in the 2009 MUTCD

2009 MUTCD Chapter 4F Pedestrian Hybrid Beacons
1. Ped pushes button, waits, crosses to island
2. Ped crosses to island, proceeds to 2\textsuperscript{nd} button
3. Ped on island – pushes button to finish crossing
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<tr>
<th>Lanes</th>
<th>Low Volume Roads</th>
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<th>Medium-Volume Roads</th>
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<th>High-Volume Roads</th>
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<td>Roadway Volume &gt; 6,700 ADT (650 vph) and ≤ 12,000 ADT (1,150 vph)</td>
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<td>Roadway Volume &gt; 12,000 ADT (1,150 vph)</td>
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*Choose Treatment Only*
Presentation Overview

• Purpose

• Bus Stop Location and Design

• Process/Partnership
Process/Partnership

- Transit Projects
- Roadway Projects
- Developer Projects
Process/Partnership

• Transit Projects
  – Stop upgrade (i.e. shelter construction)
  – Bus stop calibration
  – New Route
Process/Partnership

- Transit Projects
- Roadway Projects
  - Minor traffic operational improvements
    - Median revision
    - Turn lanes
    - Etc…
  - 3R Project (Rehab, Restore, Resurface)
  - Add lanes and reconstruct
Process/Partnership

• Transit Projects
• Roadway Projects
• Developer Projects
  – New or redevelopment site
  – Developer-initiated roadway construction
    • Concurrency-required capacity projects
    • Turn lanes, median revisions
Process/Partnership

• Is current process effectively implementing the practices discussed earlier this morning?
  – Optimizing stop locations as part of roadway projects…
  – Incorporating transit/pedestrian safety needs in development review…
  – Coordinating stop upgrades and minor roadway projects to optimize pedestrian safety…
Process/Partnership

• Follow the Money…
• Typical Approach

Roadway Scoping

Preliminary Plans

Stakeholder Reviews

Construction Contracting
Process/Partnership

• Preferred Approach
  (Road Safety Audit Model)
  – Safety Office reviews FDOT 5-Year Work Program
  – RSA(s) conducted prior to design scoping
  – RSA included in design scope
Process/Partnership

• Proposed
  – Review roadway agency 5-Year Plans
  – Schedule route alignment studies in advance of design scoping
  – Incorporate route study and RSA in design scope
Thank you

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