



TCRP D-08/NCHRP 3-71

Improved Pedestrian Safety at Unsignalized Roadway Crossings

**TexITE Winter Meeting
February 2007**

Research conducted by:
Texas Transportation Institute



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TCRP/NCHRP Project Research Objectives

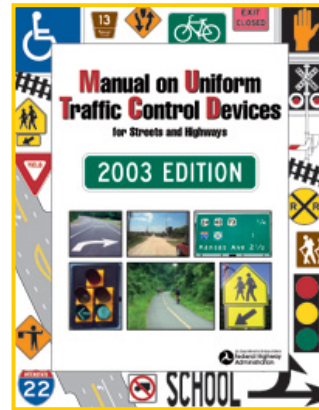
- Recommend selected engineering treatments to improve safety for pedestrians
- Recommend modifications to the MUTCD pedestrian traffic signal warrant



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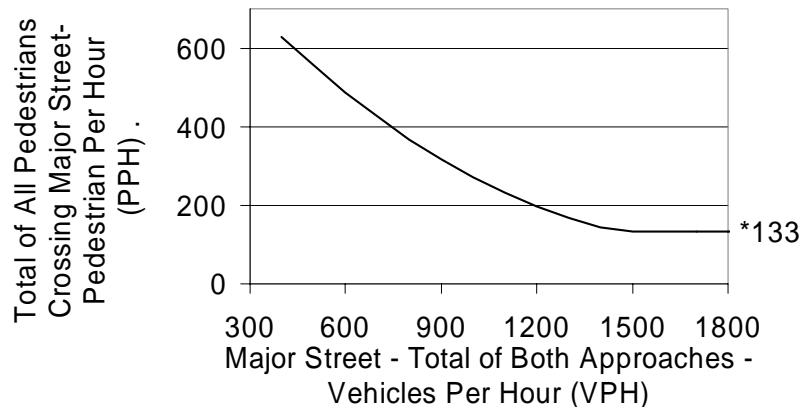
Signal Warrant

- Does the current pedestrian signal warrant need updating?
- YES
 - Rarely used
 - "Too hard to meet"
- Issues
 - Equity with vehicles
 - Other factors need to be considered



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New Criteria Endorsed by NCUTCD In June 2006



*Note: 133 pph applies as the lower threshold

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Field Studies

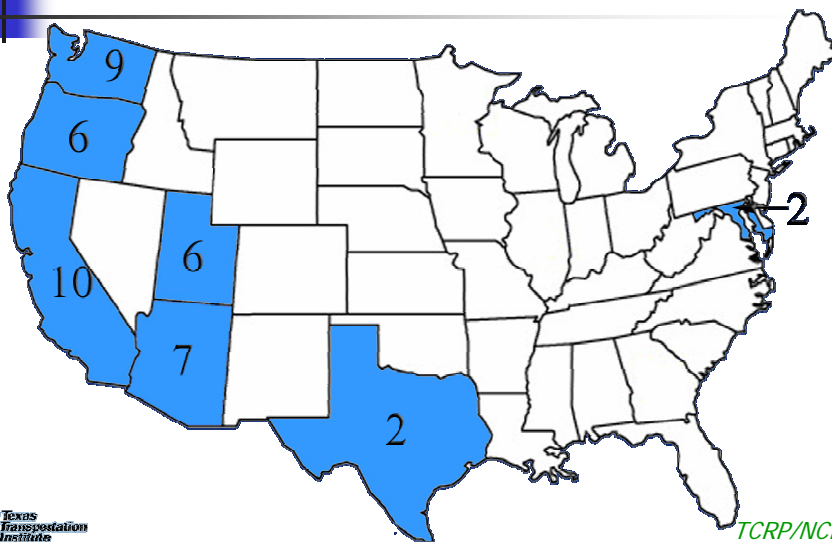
- Intent: Examine crossing behavior of pedestrians (general public)

- Process

- Set up camera
- Record data
- Site characteristics
- Reduce data in office



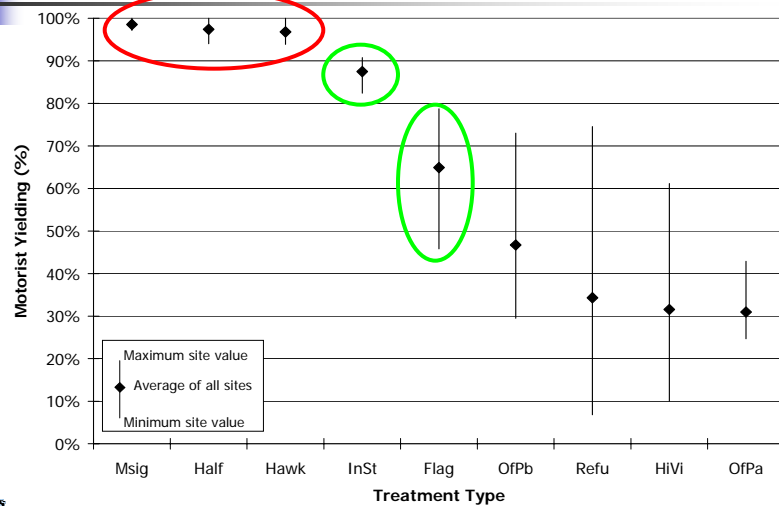
Data Collection: 42 Locations in Seven States



Examples of Study Sites



Key Finding: Motorist Yielding



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Key Finding: Walking Speed

- 1993 Knoblauch et al. for signal design
 - 4.0 ft/s younger pedestrians
 - 3.0 ft/s older pedestrians
- U.S. Access Board
 - 3.0 ft/s (2002)
 - 3.5 ft/s (2005)
- 2005 LaPlante & Koeser
 - 3.5 ft/s minimum for clearance
- **TCRP/NCHRP**
 - **3.5 ft/s general population**
 - **3.0 ft/s older pedestrians**



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Guidelines

- User's objective: Select pedestrian crossing treatments
- Document includes:
 - Supporting information - treatment categories
 - Examples
 - Worksheets
 - High speed vs low speed
 - 5 steps



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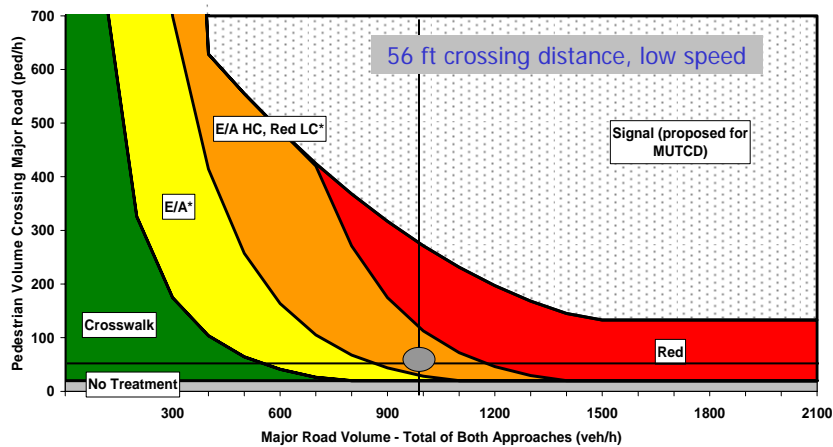
Final Step to Worksheet

| Total Pedestrian Delay, D_p and Motorist Compliance, Comp | Treatment Category |
|--|-----------------------------------|
| $D_p \geq 21.3 \text{ h}$ (Comp = high or low) OR $5.3 \text{ h} \leq D_p < 21.3 \text{ h}$ (Comp = low) | RED |
| $1.3 \text{ h} \leq D_p < 5.3 \text{ h}$ (Comp = high or low) OR $5.3 \text{ h} \leq D_p < 21.3 \text{ h}$ (Comp = high) | ACTIVE OR ENHANCED |
| $D_p < 1.3 \text{ h}$ (Comp = high or low) | CROSSWALK |



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Figure Alternative



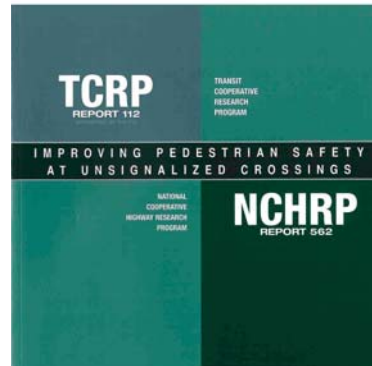
*E/A = Enhanced/Active, HC = High Compliance, LC = Low Compliance



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Guidelines Availability

- Appendix A, TCRP Report 112/NCHRP Report 562
- Can be purchased or downloaded from TRB website:
<http://www.trb.org/bookstore/>
- ITE Journal article, anticipated April 2007



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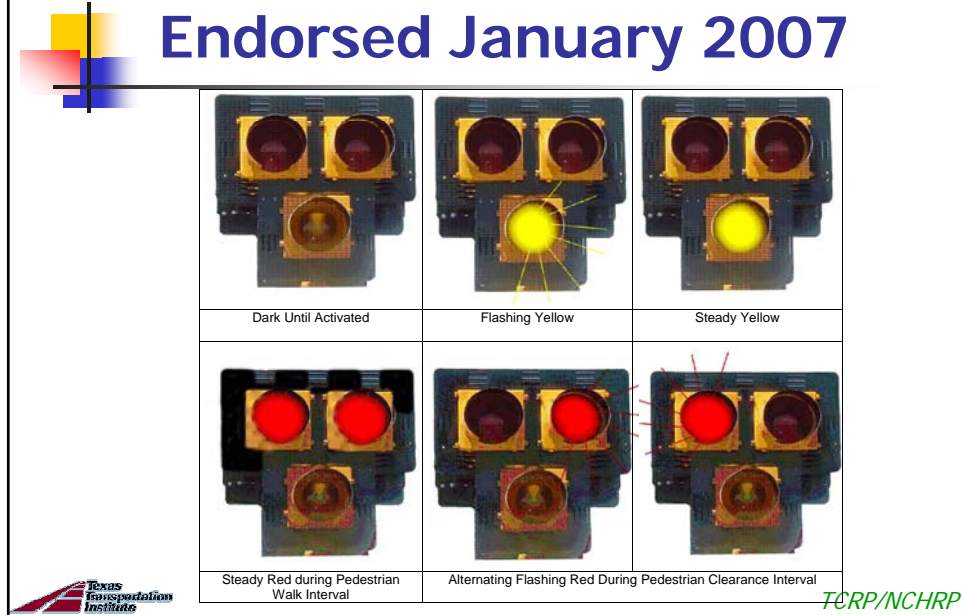
Additional Efforts...

- Suggestions to National Committee
 - Modify "Alternatives to Traffic Control Signals"
 - Revise geometrics at intersection to add a pedestrian median refuge island and/or curb extension
 - Add Pedestrian Beacon
- Next MUTCD edition anticipated in 2009



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Pedestrian Beacon Endorsed January 2007

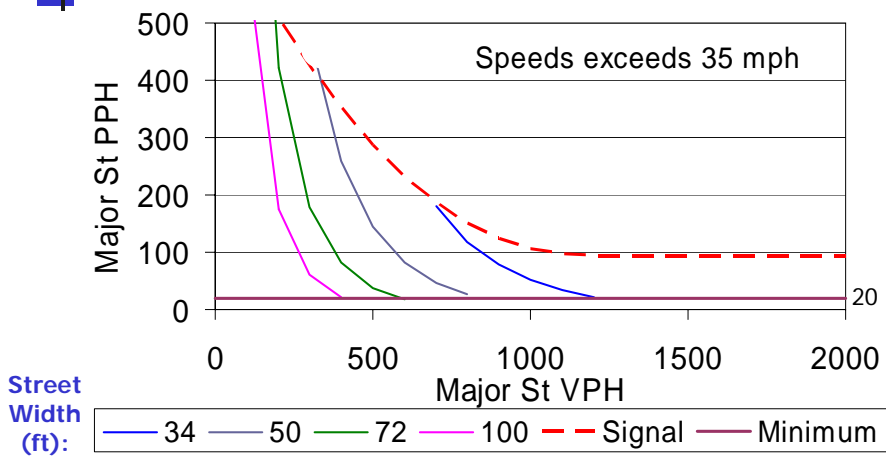


Sign with Pedestrian Beacon

- Sign is to accompany pedestrian beacon
- Exact sign design may change



Warrants for Pedestrian Beacon



Discussion/Questions

TCRP Report 112
NCHRP Report 562
Available on TRB
website