Pedestrian Signal Safety for Older Persons

AAA Foundation for Traffic Safety

- Established in 1947
- 501 (c)(3) Not-For-Profit
- Research affiliate of AAA
- Identify traffic safety problems
- Foster research that seeks solutions
- Disseminate information and educational materials

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Why the study?

- Older pedestrians are being struck and killed.

- **1-in-8 Americans is 65+**
- **1-in-5 Americans will be 65+ by 2030**

- **Need to make system safer for older pedestrians**

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The Problem

National (2005)

- **4,881 pedestrians were killed in motor vehicle crashes**
- **20% age 65 and older**

The Problem

Philadelphia 5-county region (2006)

- **65 pedestrians killed**
- **30% age 60 and older**

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The Problem

Pennsylvania (2006)

- **170 pedestrians killed**
- **30% age 60 and older**

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The Problem

New Jersey (2006)

- **166 pedestrians killed**
- **27% age 65 and older**

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The Problem

We will likely see an increase in highway injuries and fatalities for older pedestrians if we do not lower the risks.

Important Note

In this study...

"older" = 65 years or older

"younger" = younger than 65 years

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The Problem

The walking speed set for signal operations is one of the most important design and operational parameters – affecting

- Pedestrian-vehicular conflicts
- Pedestrian safety
- Crashes at signalized intersections

Small design and engineering improvement can make a big difference.

Study Goals

- Measure older and younger pedestrian walking speeds
- Understand pedestrian behavior at traditional signals and countdown signals
- Does existing signal timing allow enough time for older pedestrians to cross?
- Can signal timing be modified to accommodate older pedestrians without causing excessive vehicle delay?

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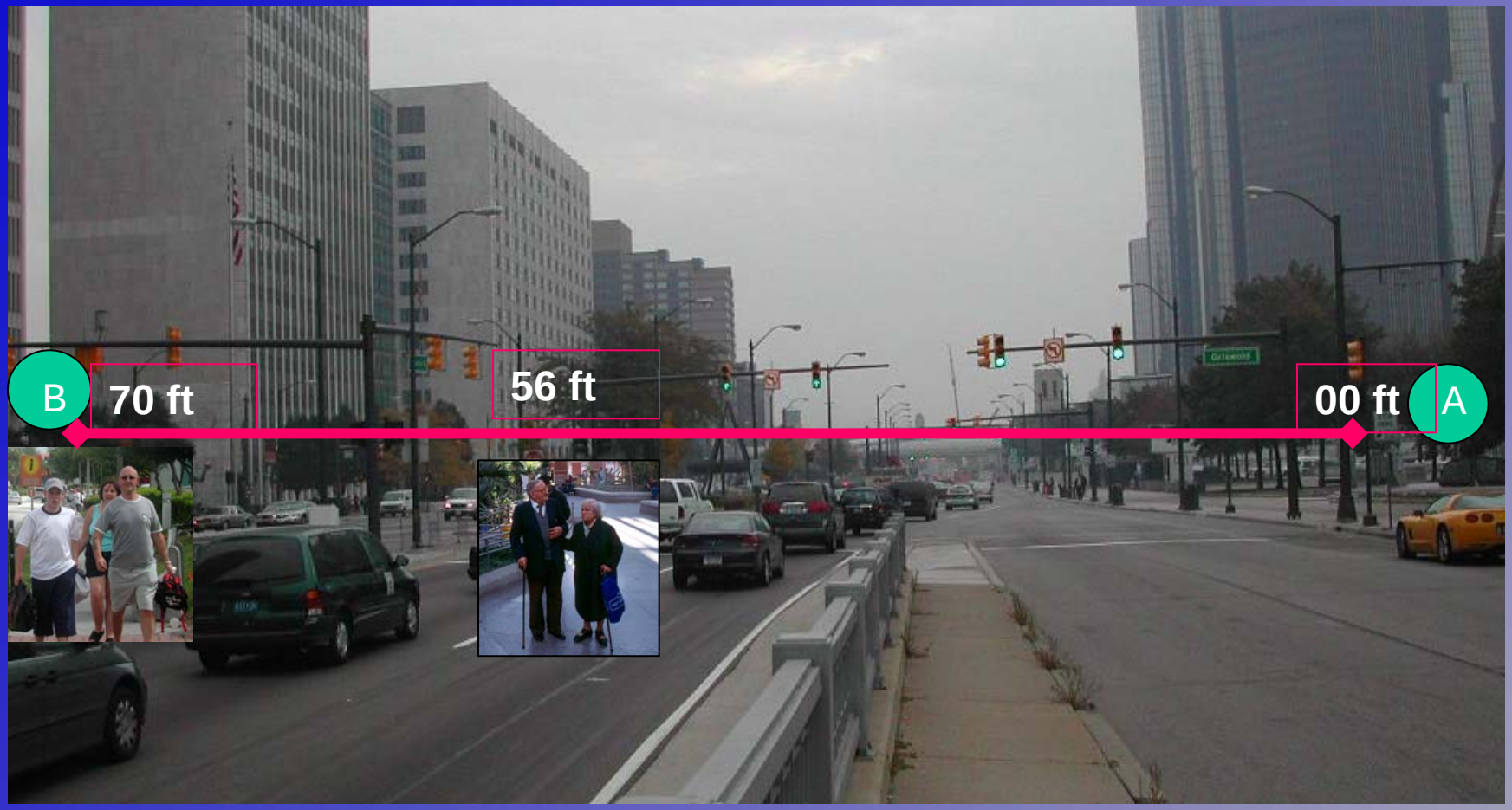

Photo source: Kimberly Lariviere, *Senior Showcase Driver Roadway, Presentation to NACEM, 9/12/04 NOT TO SCALE*

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Methodology

1. Literature Review
2. Web-Based Agency Survey
3. Observational Study of Pedestrians at Study sites
4. CORSIM (traffic simulation software)/Traffic Operations Analysis
5. Researchers at Institute of Transportation Engineers & Vanasse Hangen Brustlin

Literature Review

Countdown pedestrian signals do not appear to have an obvious **practical** impact on pedestrian walking speed.

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Observational Study

- 4 intersections each in 6 jurisdictions (24 intersections were analyzed using video)
  - Broward County, Florida
  - Minneapolis-St. Paul, MN
  - Montgomery County, MD
  - Salt Lake City, UT
  - Orange County, CA
- 1 of 4 intersections in each jurisdiction used as a case study for the traffic operations analysis
- Comparison group of traditional and countdown pedestrian signals

Observational Study

	Younger Pedestrians	Older Pedestrians
Traditional Pedestrian Signals	1,949	658
Pedestrian Countdown Signals	2,203	779
Total, all areas	4,152	1,437

Current Signal Timing

- Young pedestrian walking at 4.1 ft/s
- Older pedestrian walking at 3.4 ft/s
- When younger pedestrian finishes crossing 70 ft of street, older pedestrian still has ***more than another whole lane to cross.***

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Major Finding

Traffic signals do not allow enough time for many older adults to safely cross the street.

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What happens to vehicle delay when pedestrians have more time?

	Existing Level of Service (with signal timed for 4 ft/s walking speed)					
New Walking Speed	A	B	C	D	E	F
3.5 ft/s						
3.0 ft/s						

Green = insignificant delay

Yellow = minor delay

Orange = Moderate Delay

Red = Major Delay

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Technical Findings

- Traffic engineers can modify pedestrian signal timing to accommodate a 7-second WALK interval and a pedestrian clearance interval based on a walking speed of 3.5 ft./sec. with little or no congestion and minimal impacts to vehicle flow (Level of Service A, B or C).

- At intersections with moderate to significant congestion (Level of Service D, E, or F), moderate to major impacts to vehicle flow would be expected to occur. In this case, prudent traffic engineering judgment will need to be used in achieving a balance between efficient traffic movement and pedestrian accessibility within any given intersection.

Policy Implications

- The U.S. Department of Transportation will take these findings under consideration in the development of the new Section 4.e 10 (pedestrian walking speeds) of the 2009 MUTCD (*Manual on Uniform Traffic Control Devices*).

- The U.S. Access Board in their *Draft Guidelines for Accessibility within the Public Rights-of-Way* [11/23/05] and the National Committee on Uniform Traffic Control Devices (**http://www.ncutcd.org**) supports the findings and conclusions developed as part of this research.

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Next Steps

- This study's scope didn't specifically investigate the impact of signal timing on blind, low-vision, or otherwise disabled pedestrians and their use of pedestrian-accessible signals.

- Future studies should convene focus groups to develop parameters of future efforts that would consider the start-up time and walking speed differences of these pedestrian subgroups.

For more information,
please go to:

www.aaafoundation.org

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