

The background features a large, light blue watermark of the University of Delaware seal. The seal is circular and contains the text 'GRAMM PHILOL RHETOR ETHICA' and 'METAPHYSICA MATHEM PHYSICA' on two open books. Below the books is a banner with the word 'SOL'. At the bottom of the seal, the year '1743' is visible. The seal is surrounded by a circular border with the text 'UNIVERSITY OF DELAWARE' and '1743'.

# MUTCD Experimentation with Countdown Pedestrian Signals and Change Intervals

10<sup>th</sup> University Transportation Centers Spotlight  
Conference: Pedestrian and Bicycle Safety

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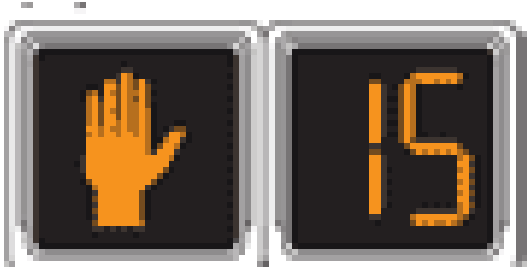


# Problem statement

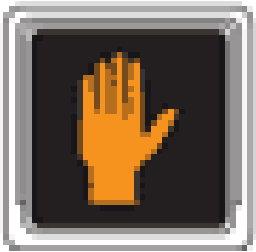
Would alternatives to the MUTCD Standards for Pedestrian Crossing Signals represent an increased hazard to pedestrians?

The 2003 MUTCD (in effect when the work was proposed) provides inconsistent guidance for countdown and non-countdown displays and their synchronization with the vehicle phases.

# 2003 MUTCD Guidance



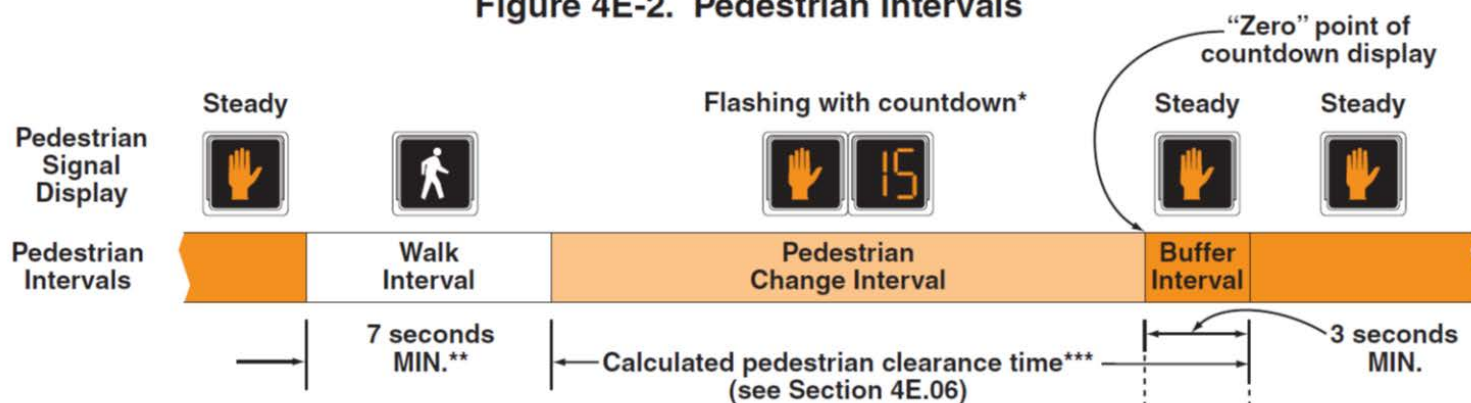
Countdown goes to zero at start of yellow phase;  
Coincides with Flashing Hand going Steady



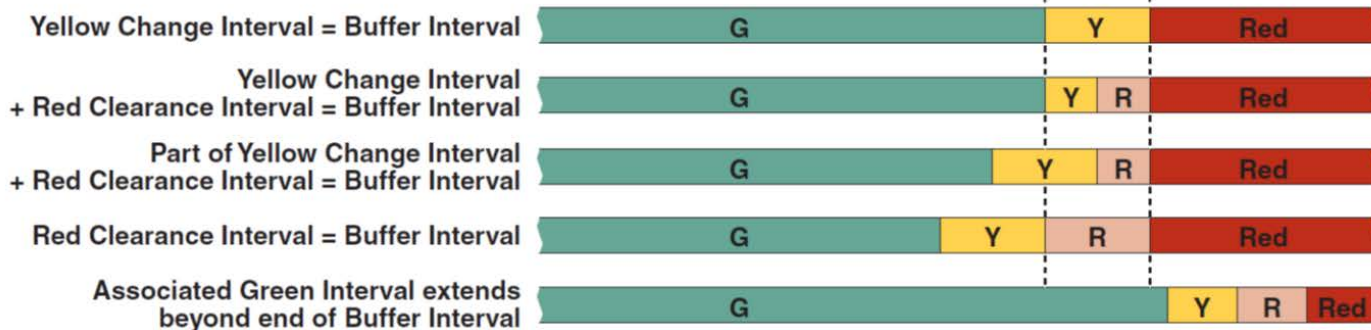
Flashing Hand goes to Steady at end of yellow phase

# 2009 MUTCD

Figure 4E-2. Pedestrian Intervals



Relationship to associated vehicular phase intervals:



# Project Timeline

- May 2009 – request to FHWA
- September 2009 – approved by FHWA
- December 2009 – DeIDOT funding and NTP
- September 2010 – All countdown signals installed at test sites and MUTCD compliant counts conducted.
- September 30, 2010 – Experimental phasing installed at all sites
- November 1, 2010 – Experimental counts complete
- May 2011 – Final report issued to DeIDOT (Phase 1)

# Description of Data Collection

- 20 Sites were nominated to FHWA and approved for the testing
- Two sets of data collected at each site – one with the MUTCD procedures and one with the experimental.
- Data was collected for total number crossing noting the number who crossed safely; late arrivals; late departures (arrive before zero and arrive after); jaywalking (crossing outside the pedestrian phase) and vehicle – pedestrian conflicts.
- At the 20 sites, over 10,000 pedestrians were observed during the 2 hour counts in the before and after study.

- A Wilcoxon Signed Rank Test was conducted on the paired observations.
- Hypothesis was that the pedestrians were at no greater risk with the experimental timing
- Hypothesis was accepted in all cases
- Also noted was a significant drop in jaywalking (27% with MUTCD to 18% with experimental)(requires further study)

# Accident Data

- Follow-on study conducted to look at long term effects
- Review of pedestrian crash reports from January 1, 2007 – February 29, 2012 – 3 phases – no countdown ped signal; countdown signal & MUTCD compliant; countdown and experimental
  - Some phase two durations were very short and not included in the study
- Results – Increase in pedestrian crash frequency phase 1 to 2; decrease from 2 to 3; decrease from 1 to 3 (95% confidence)
- Confirmed earlier finding of no additional risk.



# Future work

- Examination for the observed reduced jay walking
- Incorporation of 2 second buffer into next MUTCD

# Project Team

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