FINDINGS OF A STUDY ON THE COMPREHENSION OF VARIOUS OPERATIONAL MODES FOR PEDESTRIAN SIGNALS

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Summary of presentation

- Overview of Standard
- Consequences of Standardization
- Methodology of Survey
- Operating Modes Evaluated
- Results
- Conclusions
- Recommendations and actions

Comprehension of Pedestrian Signals
Overview of 2003 Standard

- Interval display
  - Entrance (WALK) and clearance (DON’T WALK) combined into a single interval = no flashing hand
  - Simultaneous display of a silhouette and countdown
  - WAIT interval indicated by a steady hand and the number "0"
Overview of 2003 Standard

- Operating modes
  - Protected: all conflicting movements prohibited throughout the pedestrian phase (Right Turn On Red - RTOR prohibited)
  - Partially protected: conflicting movements prohibited during the first part of the pedestrian phase, then allowed afterwards (RTOR prohibited)
  - Non-protected: conflicting movements allowed during the pedestrian phase (RTOR allowed)
Consequences of Standardization

- After publication of 2003 standard, municipalities that were part of a working group had
  - Technical concerns
  - Safety Concerns
Consequences of Standardization

- Technical Concerns
  - Presence of preemption (emergency vehicles or trains)
  - Compatibility with audible signals
  - Conflict monitor
  - Coordination of Signals
  - Countdown Learning Mode
  - Rest in Walk mode
  - Capacity of Cabinets

- Viable and feasible solutions offered by Quebec manufacturers for a safe operation of newly standardized Pedestrian Countdown Signals (PCS)
Consequences of Standardization

- Safety Concerns
  - Level of comprehension of countdowns, especially among vulnerable users: young children and the elderly
  - Removal of the flashing hand = clearance (DON’T WALK) not displayed might not be understood by pedestrians

- Need to survey the population to evaluate the level of understanding
Methodology of Survey

- Study Population
  - French or English-speaking pedestrians
  - Aged 5 and over
  - Living in 4 major cities: Montreal, Laval, Quebec and Trois-Rivieres
  - Results weighted by sex, city, and age
Methodology of Survey

- Two methods of data collection:
  1. Electronic survey (Internet)
     - Group 1: age 5 to 8 (125 persons per city)
     - Group 2: age 9 to 13 (125 persons per city)
     - Group 3: age 14 to 65 (125 persons per city)
  2. Random encounter survey in shopping centres
     - Group 4: age 66 and over (125 persons per city)

- Average duration of interviews: 7 minutes
Methodology of Survey

- 4 different operating modes shown to participants
  - 1 video per mode
  - Same duration of pedestrian phase for each video (26 seconds)
  - After each video: 2 to 3 questions related to the video
  - Simple questions for younger people

- Extra questions
  - Favorite mode (easiest to understand)
  - Least favorite mode (hardest to understand)
  - Identify symbols or combination of symbols that mean you can cross the street
  - Identify symbols or combination of symbols that mean you can not cross the street
Operating Mode 1: Québec Standard

- Entrance (WALK) and clearance (DON’T WALK) combined into a single interval
- Silhouette and countdown throughout the WALK and DON’T WALK intervals
- WAIT interval indicated by a steady hand and the number "0"
Operating Mode 2: Canada and USA Standard

- Entrance (WALK) = steady silhouette
- Clearance (DON’T WALK) = flashing hand
- Countdown begins at DON’T WALK interval
- WAIT interval indicated by a steady hand and the number "0"

Comprehension of Pedestrian Signals
Operating Mode 3: Pedestrian Signal with Countdown

- Entrance (WALK) = steady silhouette
- Clearance (DON’T WALK) = flashing hand
- Countdown begins at WALK interval and continues during the DON’T WALK interval
- WAIT interval indicated by a steady hand and the number "0"

Comprehension of Pedestrian Signals
Operating Mode 4: Mode suggested by some municipalities and manufacturers

- Entrance (WALK) = steady silhouette
- Clearance (DON’T WALK) = countdown only (no flashing hand)
- Countdown begins at DON’T WALK interval
- WAIT interval indicated by a steady hand and the number "0"

Comprehension of Pedestrian Signals
Results of Survey

- Mode 1: Quebec Standard

<table>
<thead>
<tr>
<th></th>
<th>Cross</th>
<th>Don't cross</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quebec Standard</td>
<td>83%</td>
<td>15%</td>
<td>2%</td>
</tr>
<tr>
<td>Quebec Standard</td>
<td>29%</td>
<td>70%</td>
<td>2%</td>
</tr>
<tr>
<td>Quebec Standard</td>
<td>99%</td>
<td></td>
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</table>
Results of Survey

- Mode 2: Canada and USA Standard

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<thead>
<tr>
<th>Action</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Cross</td>
<td>89%</td>
</tr>
<tr>
<td>Don't cross</td>
<td>9%</td>
</tr>
<tr>
<td>Don't know</td>
<td>2%</td>
</tr>
</tbody>
</table>

- Mode 2: Canada and USA Standard

<table>
<thead>
<tr>
<th>Action</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross</td>
<td>36%</td>
</tr>
<tr>
<td>Don't cross</td>
<td>61%</td>
</tr>
<tr>
<td>Don't know</td>
<td>3%</td>
</tr>
</tbody>
</table>

Comprehension of Pedestrian Signals
Results of Survey

○ Mode 3: Ped Signal with Countdown

Comprehension of Pedestrian Signals
### Results of Survey

- **Mode 4:** Suggested by municipalities and manufacturers

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>20 sec. to cross</td>
<td>85%</td>
</tr>
<tr>
<td>20 sec. before crossing</td>
<td>8%</td>
</tr>
<tr>
<td>Don't know</td>
<td>6%</td>
</tr>
<tr>
<td>Cross</td>
<td>2%</td>
</tr>
<tr>
<td>Don't cross</td>
<td>98%</td>
</tr>
</tbody>
</table>

Comprehension of Pedestrian Signals
Results of Survey

- Question: Which operating mode is the easiest to understand?

<table>
<thead>
<tr>
<th>Operating Mode</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode 1</td>
<td>43%</td>
</tr>
<tr>
<td>Mode 2</td>
<td>7%</td>
</tr>
<tr>
<td>Mode 3</td>
<td>38%</td>
</tr>
<tr>
<td>Mode 4</td>
<td>5%</td>
</tr>
<tr>
<td>Don't know</td>
<td>6%</td>
</tr>
</tbody>
</table>
Results of Survey

- Question: Which operating mode is the hardest to understand?

- Mode 1: 5%
- Mode 2: 14%
- Mode 3: 7%
- Mode 4: 57%
- Don't Know: 17%

Comprehension of Pedestrian Signals
Conclusions

- Mode 1 (Quebec) is the easiest to understand
  - Selected by 43% of respondents
  - Especially popular in Trois-Rivieres and Quebec City, where it has been in use for three years

- Mode 3 ranks second with 38%
Conclusions

- Very important that the countdown be displayed for the entire duration of the pedestrian phase
  - Main reason why modes 1 and 3 were identified as the easiest to understand
Conclusions

- A flashing hand accompanied by a high number causes confusion
  - 37% responded that these symbols indicate that you can begin crossing the street
  - 98% responded that these symbols indicate that you can begin crossing the street
- Same number, different symbol = different interpretation
Conclusions

- Comprehension of countdown is very good among vulnerable users
  - 78% of group 1 (age 5 to 8) said that number 20 means “20 seconds left to cross the street”
  - 83% of group 4 (age 66 and over) said that number 20 means “20 seconds left to cross the street”
  - Only 13% of group 1 (age 5 to 8) reported that they sometimes cross the streets by themselves

Comprehension of Pedestrian Signals
Recommendations and actions

- Given the level of comprehension, the report recommended that mode 1 (Quebec) be retained for standardization.
- Meeting in July 2007:
  - 9 municipalities, including Montreal and Quebec City, MTQ and consulting firm.
  - All agreed to adopt mode 3, bringing back the flashing hand for the DON’T WALK interval (technical matter).

Comprehension of Pedestrian Signals
Recommendations and actions

- New standard was published in December 2007
- Deadline for compliance was extended to December 31st, 2010
- Manufacturers will be asked to find more viable solutions to technical concerns
- Campaign will take place for public education
QUESTIONS?

THANK YOU!

Comprehension of Pedestrian Signals