

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



26



Marc Panneton, Urban Planner  
Simon Trépanier, Eng.  
Ministère des Transports du Québec

Pro Walk – Pro Bike 2008  
Seattle, WA

# Summary of presentation

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

# 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

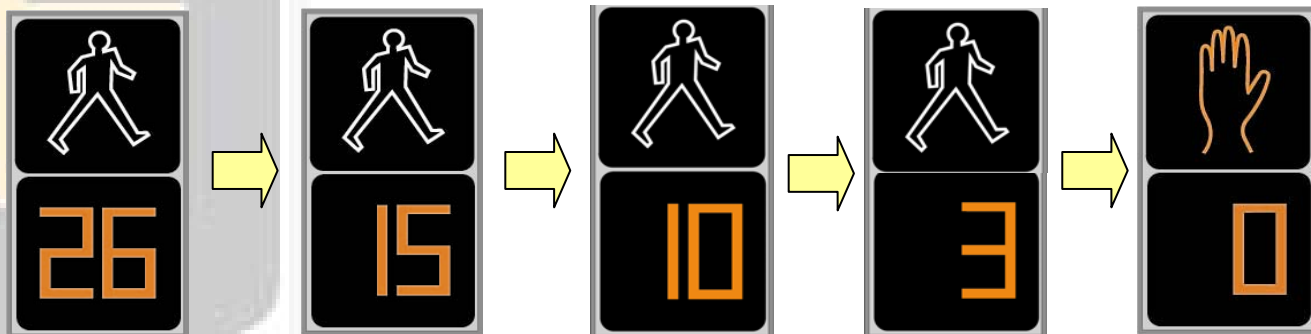
- Two methods of data collection:
  1. Electronic survey (Internet)
    - Group 1: age 5 to 8 (125 persons per city)
    - Group 2: age 9 to 13 (125 persons per city)
    - Group 3: age 14 to 65 (125 persons per city)
  2. Random encounter survey in shopping centres
    - Group 4: age 66 and over (125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

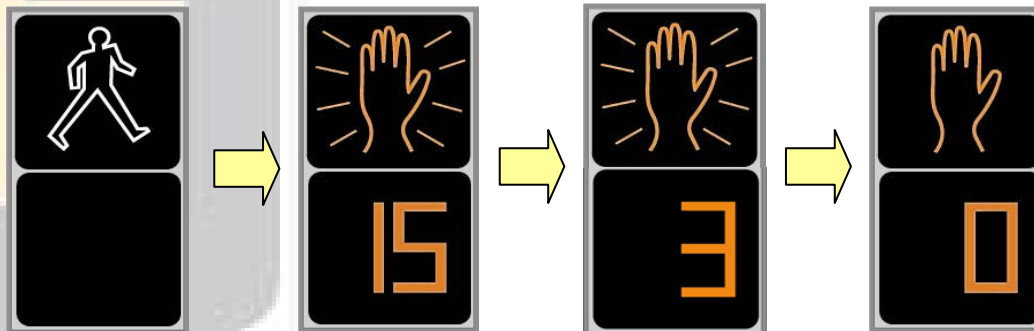
- Entrance (WALK) and clearance (DON'T WALK) combined into a single interval
- Silhouette and countdown throughout the WALK and DON'T WALK intervals
- WAIT interval indicated by a steady hand and the number "0"



# Operating Mode 2: Canada and USA Standard

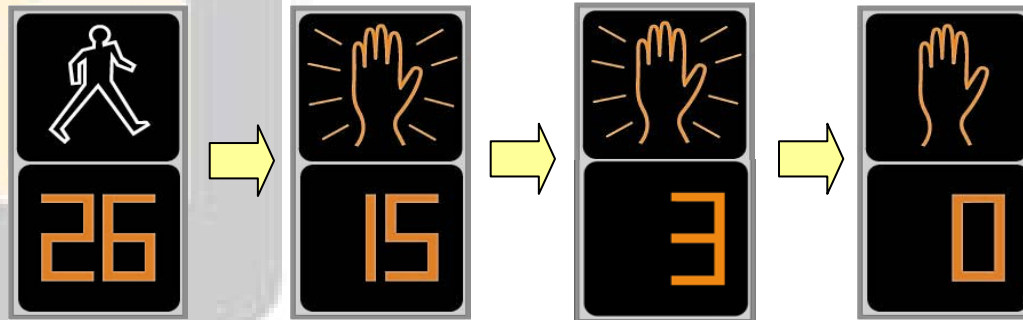


- Entrance (WALK) = steady silhouette
- Clearance (DON'T WALK) = flashing hand
- Countdown begins at DON'T WALK interval
- WAIT interval indicated by a steady hand and the number "0"



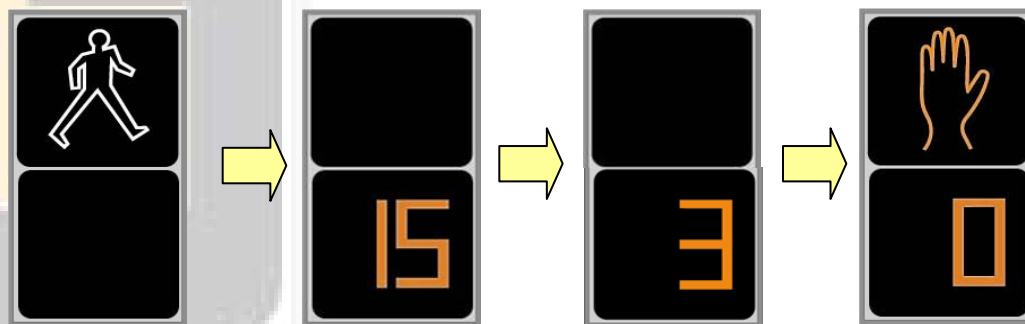
# Operating Mode 3: Pedestrian Signal with Countdown

- 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"



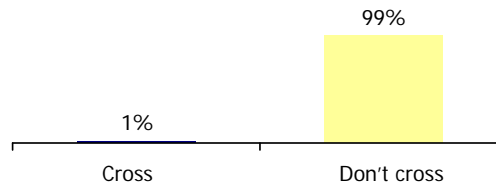
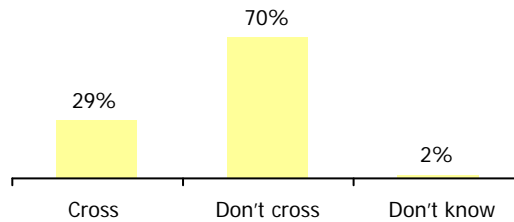
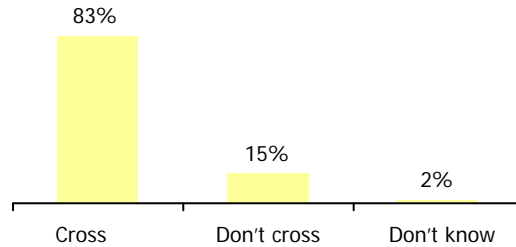
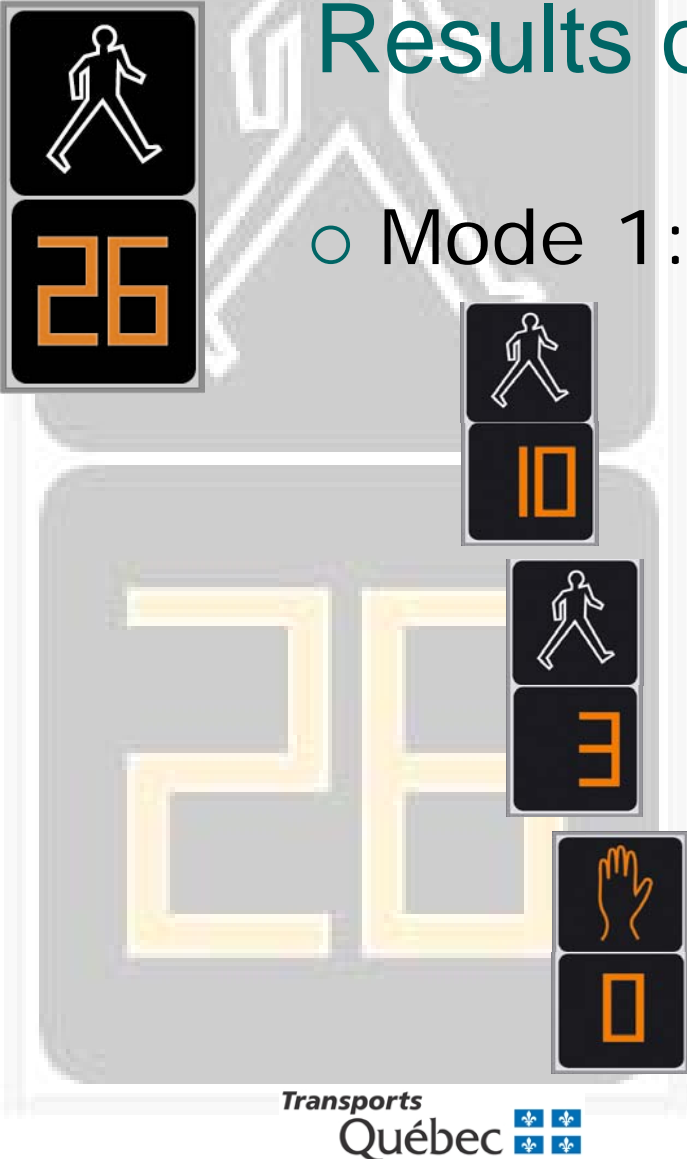
# Operating Mode 4: Mode suggested by some municipalities and manufacturers

- 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"



# Results of Survey

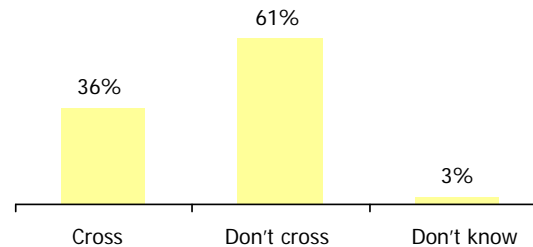
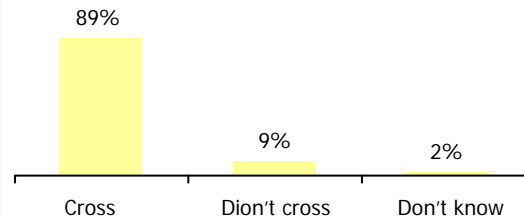
## Mode 1: Quebec Standard



Comprehension of Pedestrian Signals

# Results of Survey

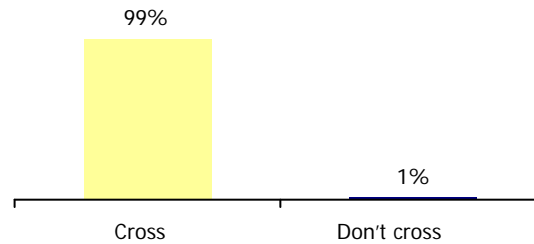
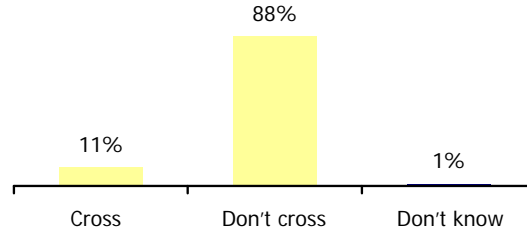
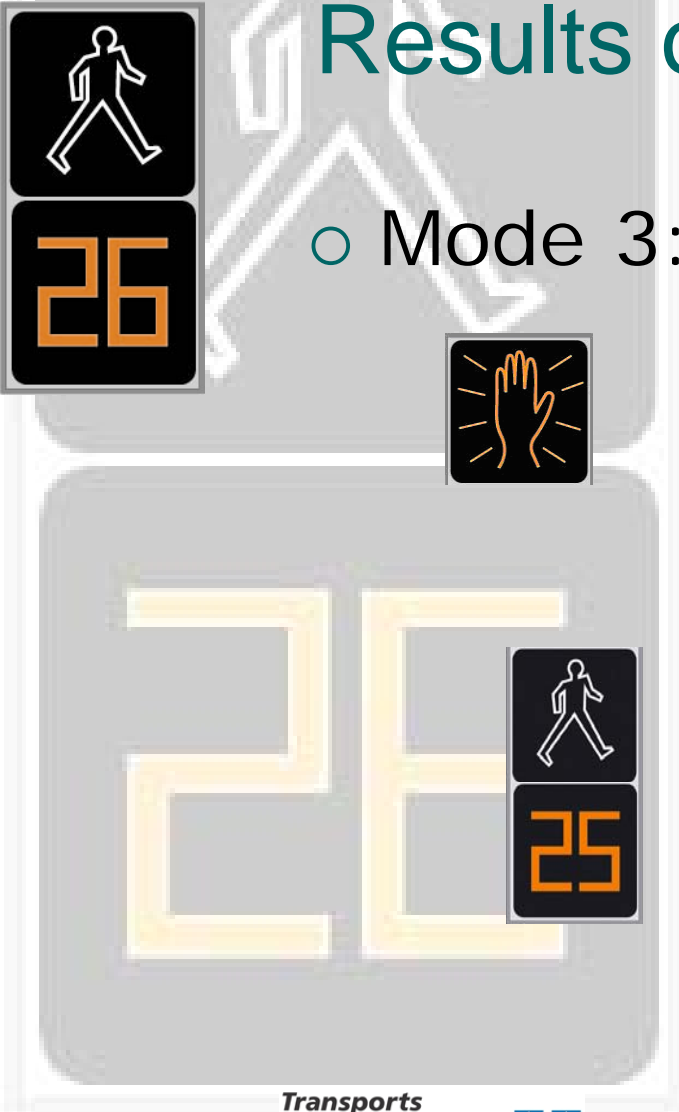
- Mode 2: Canada and USA Standard



Comprehension of Pedestrian Signals

# Results of Survey

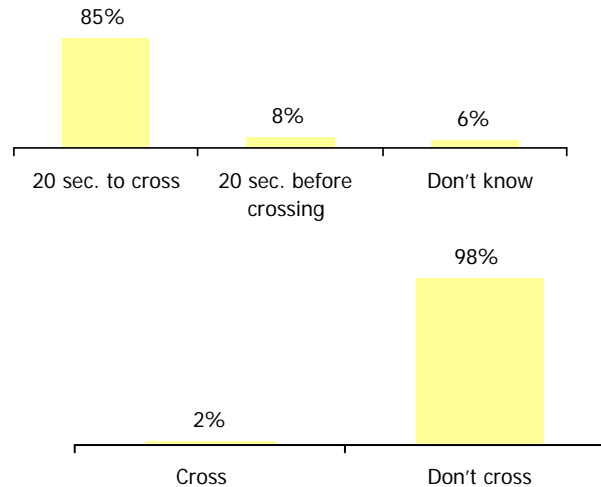
- Mode 3: Ped Signal with Countdown



Comprehension of Pedestrian Signals

# Results of Survey

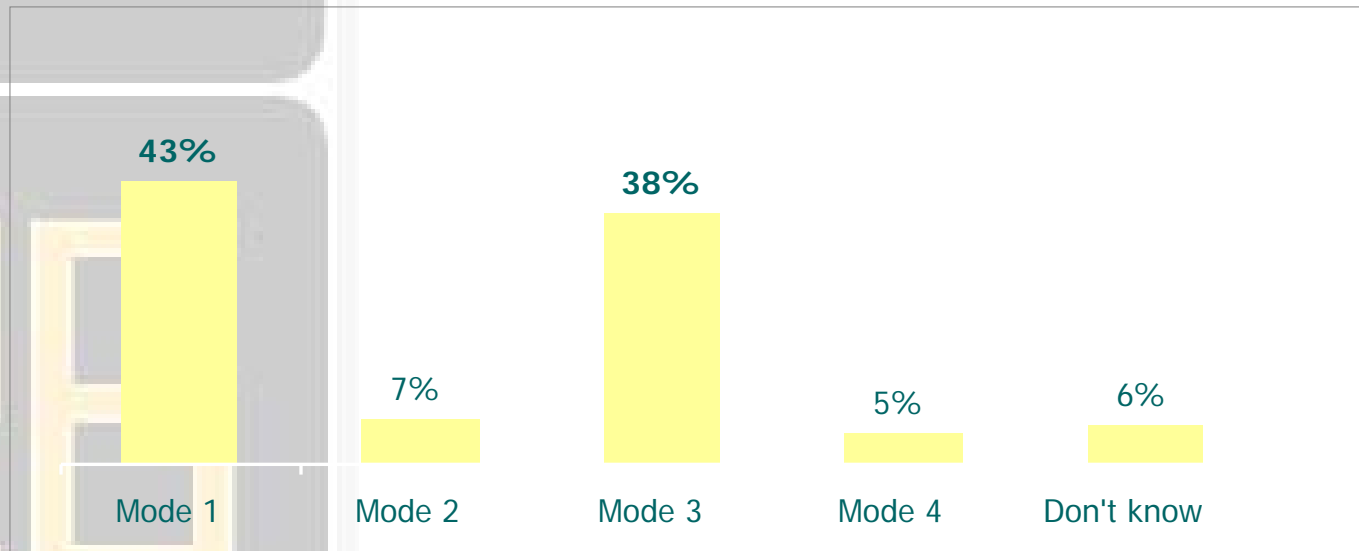
- Mode 4: Suggested by municipalities and manufacturers



Comprehension of Pedestrian Signals

# Results of Survey

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

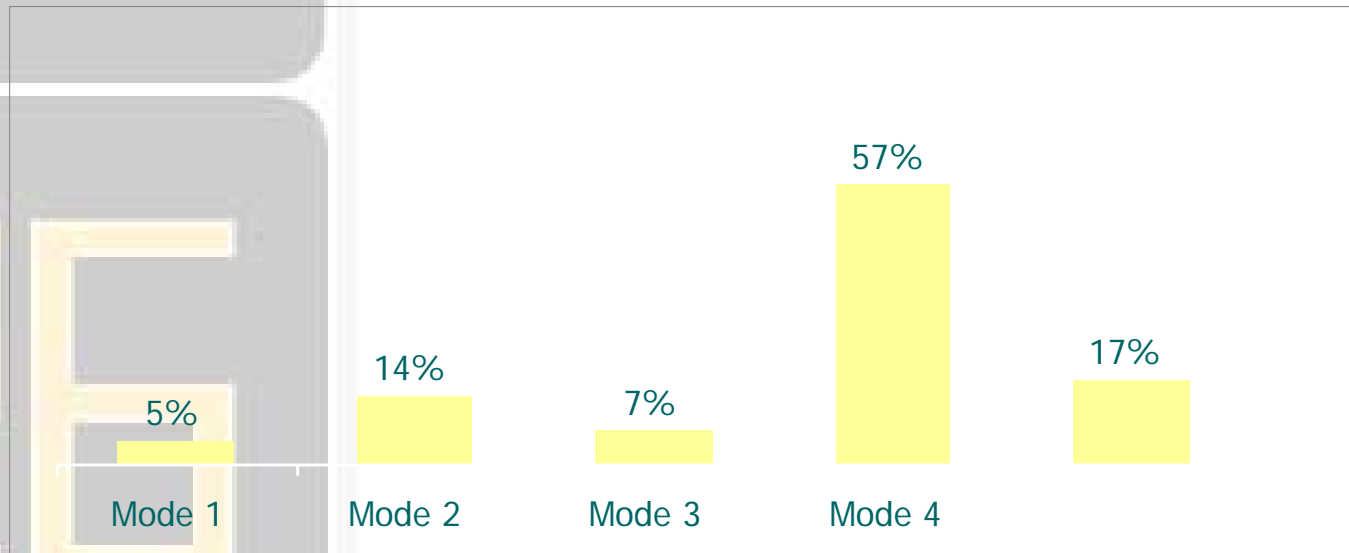


**Ped Signal with Countdown**

**Suggested by municipalities and manuf.**

# Results of Survey

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



**Ped Signal with Countdown**

**Suggested by municipalities and manuf.**

# Conclusions

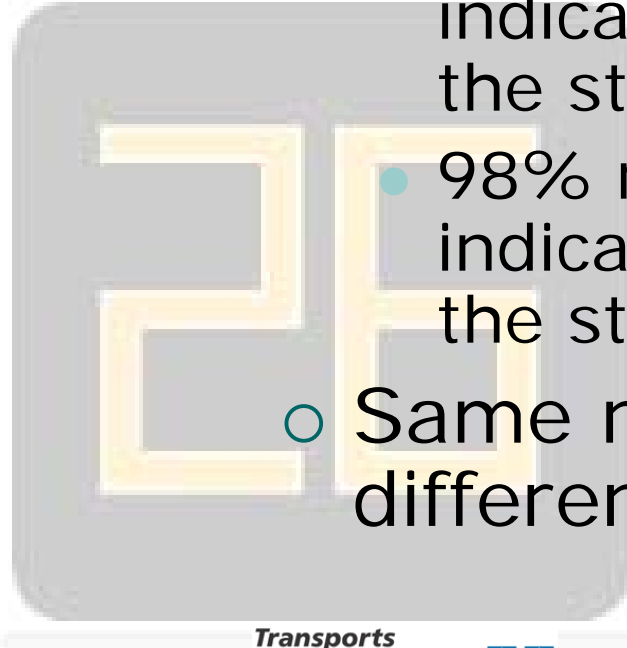
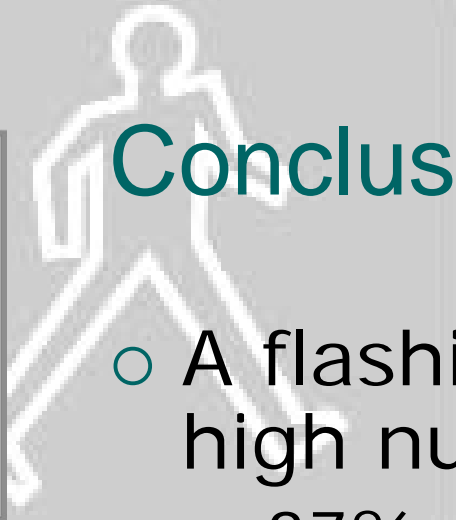
- Mode 1 (Quebec) is the easiest to understand
  - Selected by 43% of respondents
  - Especially popular in Trois-Rivieres and Quebec City, where it has been in use for three years
- Mode 3 ranks second with 38%

# 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

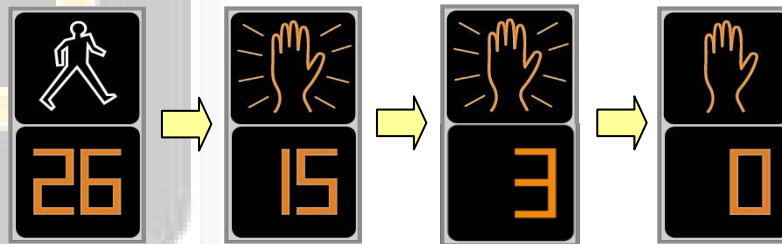


# Conclusions

- 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

# Recommendations and actions

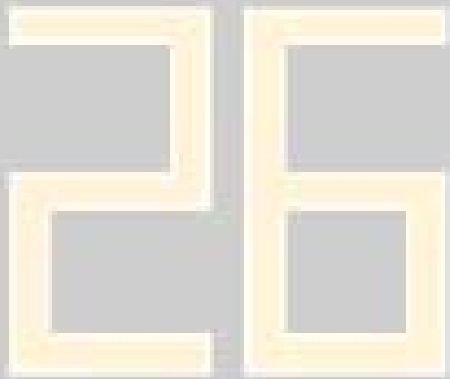
- Given the level of comprehension, the report recommended that mode 1 (Quebec) be retained for standardization
- Meeting in July 2007
  - 9 municipalities, including Montreal and Quebec City, MTQ and consulting firm
  - All agreed to adopt mode 3, bringing back the flashing hand for the DON'T WALK interval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



# 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!