EFFECTIVENESS OF THE PEDESTRIAN DETECTION STRATEGIES AND PAVEMENT MARKINGS: A DRIVING SIMULATOR STUDY

Qinaat Hussain, Wael K. M. Alhajyaseen, Ali Pirdavani, Kris Brijs, Khaled Shaaban, Tom Brijs

Introduction
- Pedestrians are the most vulnerable group in the traffic and accounts for 40,000 deaths each year
- One of the reasons of these crashes is that drivers do not usually yield for pedestrians
- Pedestrians’ illegal mid-block crossing behavior is usually observed in the state of Qatar
- In case of high-speed uncontrolled crosswalks, this problem becomes more serious

Objectives
- To investigate the effectiveness of detection based strategies at midblock marked crosswalks

Apparatus
- Driving simulator at QTTSC was used

Participants
- 67 participants with a valid Qatari driving license
  - 51 Male vs 16 Female
  - 32 Arab vs 35 non-Arab
  - Mean age: 28.93 (SD: 7.3)
  - Mean experience: 8.61 (SD: 6.3)

STUDY DESIGN

1 Control
  - Typical stop/yield controlled crosswalk in Doha City
  - Untreated – only with the default static signs

2 Pavement markings
  - Pedestrian encircled pavement markings
  - Three times on each lane with 30 m of spacing

3 LED lights
  - Flashing yellow LED lights in case of no pedestrian
  - Flashing red LED lights upon the pedestrian detection

4 Variable message sign
  - LOW DOWN message in case of no pedestrian
  - Change to STOP message with animations upon the pedestrian detection

RESULTS

4 scenarios

Participants
- 67 participants with a valid Qatari driving license
  - 51 Male vs 16 Female
  - 32 Arab vs 35 non-Arab
  - Mean age: 28.93 (SD: 7.3)
  - Mean experience: 8.61 (SD: 6.3)

Yielding rates
- Significantly lower yielding rates of 88.7% and 91%
- 98.4% drivers yielded in LED and VMS conditions

Vehicle-pedestrian conflicts
- LED and VMS were helpful in eliminating all serious conflicts while reducing the number of slight conflicts

Mean speed
- LED and VMS conditions
- Higher speed reduction
- Early speed reduction

Main findings

<table>
<thead>
<tr>
<th>Measure</th>
<th>Control</th>
<th>Markings</th>
<th>VMS</th>
<th>LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yielding rates</td>
<td>88.7%</td>
<td>91%</td>
<td>98.4%</td>
<td>98.4%</td>
</tr>
<tr>
<td>2. Conflicts</td>
<td>Higher number of serious/slight conflicts</td>
<td>Serious/slight conflicts reduced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Speed</td>
<td>Higher speed</td>
<td>Early speed reduction</td>
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</tbody>
</table>

Mean experience: 8.61 (SD: 6.3)

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