A Review of Blind Spot Technology Compatibility in ASEAN Region

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Global Road Safety Status

- 1.25 million road fatalities in 2013
- Growth Domestic Product (GDP) lost of 3%
- Rank no. 7 in 2030, exceeds other serious health problems

Source: WHO, 2015
# Road Safety Status in ASEAN Region

<table>
<thead>
<tr>
<th>Country</th>
<th>WHO estimated road traffic fatalities (N)</th>
<th>Deaths per 100,000 population</th>
<th>4-wheeled cars and light vehicles</th>
<th>Motorized 2- or 3-wheelers</th>
<th>Buses and heavy trucks</th>
<th>Pedestrians and cyclists</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cambodia***</td>
<td>1,950</td>
<td>17.4</td>
<td>8</td>
<td>71</td>
<td>3</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Indonesia**</td>
<td>38,279</td>
<td>15.3</td>
<td>6</td>
<td>36</td>
<td>35</td>
<td>23</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Laos**</td>
<td>971</td>
<td>14.3</td>
<td>18</td>
<td>67</td>
<td>-</td>
<td>13</td>
<td>2</td>
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<tr>
<td>Malaysia**</td>
<td>7,129</td>
<td>24</td>
<td>24</td>
<td>62</td>
<td>4</td>
<td>9</td>
<td>1</td>
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<tr>
<td>Myanmar***</td>
<td>10,809</td>
<td>20.3</td>
<td>26</td>
<td>23</td>
<td>7</td>
<td>35</td>
<td>9</td>
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<tr>
<td>Philippines**</td>
<td>10,379</td>
<td>10.5</td>
<td>25</td>
<td>53</td>
<td>-</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>Singapore*</td>
<td>197</td>
<td>3.6</td>
<td>17</td>
<td>46</td>
<td>1</td>
<td>36</td>
<td>-</td>
</tr>
<tr>
<td>Thailand**</td>
<td>24,237</td>
<td>36.2</td>
<td>13</td>
<td>73</td>
<td>2</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Vietnam**</td>
<td>22,419</td>
<td>24.5</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

* High-income status  
** Middle-income status  
*** Low-income status  

Source: WHO, 2015
ASEAN NCAP Strategic Approaches

1. Develop reliable database on road fatalities and accidents in ASEAN
2. Establish effective communications towards consumers and stakeholders
3. Encourage Crash Avoidance Technology fitment, especially for saving motorcyclists
4. Promote safer cars and child restraint system
5. Reduce the number of non-safe cars in the transportation system
6. Improve safety beyond rating approaches
Preliminary Analysis
Car vs. Motorcycle Crashes
[Malaysia Situation]

Data from M-ROADS (2012)
Main Findings from Established Studies on Motorcycle-Car Collisions

• Most prevalence >> motorcycle against car (ACEM, 2009)
• The most common type of car-motorcycle collision >> car driver violates the right-of-way of motorcyclists
  • Occurred at junction and roundabout (Clark et al., 2007)
  • During lane changing (Clark et al., 2007)
  • During U-turn (Sexton et al., 2004)
• Motorcycle Accidents In-Depth Study [MAIDS] (ACEM, 2009)
  • Lack of conspicuity
  • Error in speed and distance judgement
Improvement of Motorcycle Conspicuity

Daytime Running Light (DRL)

Reflective vest & sticker

Distance and speed judgement?

Color contrast
Blind Spot Technology

Blind Spot Technology (BST) is designed to provide assistance for driver in detecting other vehicles in the blind spot zone especially during lane changing.

_May reduce human error & “limitation” in detecting motorcyclists_
EURO NCAP advanced
2014 Reward for Opel Side Blind Spot Alert
BST Classification

- **Active Detection**
- **Passive Detection** +
  - Monitoring (blind spot zone) +
    - warning (visual, sound or haptic)
  - Visual aid only
- **Non-Detection**
  - Passive Detection +
    - autonomous evasive maneuver & braking intervention
Car Models with Various BSTs

Active Detection
• Active Blind Spot Assist | Mercedes Benz

Passive Detection
• Blind Spot Information System | Volvo/Ford
• Side Assist | Audi
• Rear Vehicle Monitoring System | Mazda
• Side Blind Spot Alert | Opel
• Lane Change Assist | Hyundai
• Blind Spot Monitor | Toyota

Non-Detection
• Lane Watch | Honda
BST in ASEAN NCAP new rating

2012 – 2016 (Prerequisite for 5-Star AOP)
- Electronic Stability Control

2017 – 2020 (25% of the Overall Rating)
- Effective Braking & Avoidance
  - Anti-lock Braking System
  - Electronic Stability Control
- Seatbelt Reminders
  - Driver
  - Front Passenger
  - Rear Passengers
- Blind Spot Technology
  - Nearside
  - Offside
- Advanced Safety Assist Technologies*
  - Integrated CRS
  - AEB Inter-Urban
  - AEB City
  - AEB VRU
  - Lane Departure Warning System
  - Forward Collision Warning System

The calculation is based on FRS with a maximum of 8 points
The calculation is based on FRS with a maximum of 6 points
The calculation is based on FRS with a maximum of 2 points
A score of 1 point is awarded for each SAT available in any variant (minimum 1 country for each sector) with a maximum of 2 points

Maximum of 18 Points
Assessment on BST (pg. 17-18)

• Eligible for further FRS calculation if meeting the “Functional Definitions”
  • Detection BST – warn the driver of the subject vehicle against potential collisions with vehicles to the side and/or rear of the subject vehicle, and moving in the same direction as the subject vehicle during lane change maneuvers
  • Non-Detection BST – provide a live visual of the vehicles moving in the same direction, and on the side and/or rear of the subject vehicle which can be activated manually or via turn signal action

• Performance testing
  • Will not affect the FRS score
  • Public consumption (in the test report)
  • Path the way for future ASEAN NCAP unique protocol
## Fitment Rating System for Blind Spot Technology

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>FITMENT TYPE</th>
<th>$\alpha \times CS$</th>
<th>CS</th>
<th>CTFS</th>
</tr>
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<tbody>
<tr>
<td>Brunei</td>
<td>Option A</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>Option B</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>Option C</td>
<td>1.5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>Option D</td>
<td>0.75</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>Option E</td>
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<td>3</td>
<td>0.81</td>
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<tr>
<td>The Philippines</td>
<td></td>
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<tr>
<td>Vietnam</td>
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<td></td>
</tr>
<tr>
<td>Laos</td>
<td></td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td></td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Myanmar</td>
<td></td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fitment Type</th>
<th>Details</th>
<th>Fitment Rating Score, $\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>Vehicle model is equipped with BST for both nearside and offside as standard equipment</td>
<td>1</td>
</tr>
<tr>
<td>Option B</td>
<td>Vehicle model is equipped with BST for both nearside and offside as optional equipment</td>
<td>0.5</td>
</tr>
<tr>
<td>Option C</td>
<td>Vehicle model is equipped with BST for one side only as standard equipment</td>
<td>0.5</td>
</tr>
<tr>
<td>Option D</td>
<td>Vehicle model is equipped with BST for one side only as optional equipment</td>
<td>0.25</td>
</tr>
<tr>
<td>Option E</td>
<td>Vehicle model is not equipped with BST</td>
<td>0</td>
</tr>
</tbody>
</table>
Performance Testing

Detection BST
- ISO 17387

Non-Detection BST
- Guideline on Assessment of Non-Detection BST
Slight Refinement on ISO 17387

- Target vehicle >> representing the most common motorcycle type in the ASEAN region
  - Underbone
  - e.g. Honda Wave >> 1937mm (L) x 703mm (W) x 1086mm (H)

5.1 Test target vehicle

For each of the following tests, the test target vehicle shall be a motorcycle with a rider. The test target vehicle shall have the following dimensions. The length of the motorcycle shall be between 2,0 m and 2,5 m. The width of the motorcycle at its widest point (not including the side mirrors) shall be between 0,7 m and 0,9 m. The height of the motorcycle (not including the windscreen) shall be between 1,1 m and 1,5 m.
Conclusion

• Avoiding collisions with motorcyclists may potentially improve the road safety situation in the region >> Prevention is always better than cure!
• ASEAN NCAP confident that both detection and non-detection BSTs can help drivers to detect motorcyclists
• This can help to reduce human “error” and “limitation in information processing”
• Although the passing criteria for further FRS assessment on BST is based on “Functional Definition” only, additional performance testing will be conducted as to check the compatibility with motorcycle detection
• ASEAN NCAP will consider underbone as the target vehicle for ISO 17387 testing in order to represent ASEAN region
THANK YOU FOR YOUR ATTENTION!

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