Promotion of Road Safety by NCAP in JAPAN

August 27th 2014

National Agency for Automotive Safety & Victims’ Aid (NASVA)
Contents

1. Status and Target of Road Accidents in Japan
2. Role of JNCAP
3. Feature of JNCAP
4. Effectiveness of NCAP
5. Introduction of Advanced Safety Technology Assessment
6. Conclusion
1. Status and Target on Road Accidents in Japan
1-1. Status of Road Accidents

- Although death toll from accidents are decreasing, there were 4,373 deaths and 781,494 injured in FY 2013.
- There are still severe condition as death toll caused or related with elderly people are increasing year by year.
1-2. Road Accidents Reduction Target

- We aim to realization of death toll should be less than 3,000 persons by 2015. (Governmental Plan)
- Set the target of death toll should be bellow 2,500 people by 2018 and realization of the safest road in the world (Minister’s commitment)

Killed per every 100k population in the world in 2009 (OECD data)
2. Role of JNCAP
2-1. Relationship between Ministry and NASVA

“We implement easy access environment for the public to chose safer car and enhance their mind for safety. This is one of the main pillars of vehicles safety measures, it will be necessary to enrich further more.” (Administrative Reform Promotion Meeting, December 20, 2013)
2-2. Outline of JNCAP

Carry out the Assessment by governmental organization.
Results will be announced officially.

User can access the information on HP, etc.

The manufacturer develops succeeding model based on the assessment results.

Flow

1. Making of test procedure
2. Determination of test model
3. Procurement of test vehicle
4. Collision tests
5. Analysis of the test results
6. Publication of the results·PR

Cooperation with related organizations

Offset Frontal Collision Test
Rear seat occupant safety evaluation

Assessment Steering Committee Meeting
Marking for test vehicle
Implementing collision tests

Presenting the result
Cooperation with other NCAPs
2-3. Role of NASVA

Determination by MLIT

MLIT

NASVA

Use of JARI test facility

Determination of an enforcement organization

Analysis/Implementation

Discussed in Steering Committee Meeting
- study of the test procedures
- determination of test model
- confirmation of test results

The evaluation results are finalized with 5 Working Groups (Collisions, Pedestrian, CRS, Media, Advanced Safety Technology) and Task Forces.

- Test vehicle procurement
- Implementation
- Analysis
- Public Relations
- Implementation of the surveillance
- The proposal of new test procedures
- Cooperation with other NCAPs
- Publication of results
### 2-4. History of JNCAP

<table>
<thead>
<tr>
<th>Test items</th>
<th>'95</th>
<th>'99</th>
<th>'00</th>
<th>'01</th>
<th>'03</th>
<th>'07</th>
<th>'09</th>
<th>'11</th>
<th>'12</th>
<th>'14</th>
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<tr>
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<td><strong>I. Crash Safety</strong></td>
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<td>Full-overlap Frontal Collision Test</td>
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<td>Side Collision Test</td>
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<td>Rear Impact Sled Test</td>
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<td><strong>II. Pedestrian Protection</strong></td>
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<td>Head Protection Performance Test</td>
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<td>Leg Protection Performance Test</td>
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<td><strong>III. Passenger Seat Belt Reminder Test</strong></td>
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<td><strong>IV. Seat Belt Usability Test</strong></td>
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<td><strong>VI. Advanced Safety Tech. Assessment</strong></td>
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<td><strong>Child Seat Assessment</strong></td>
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</table>

- **New overall evaluation (2011)**
- **Overall evaluation (2000)**
- **Occupant Protection Against Electrical Shock After Collision (2011)**
- **Side Curtain Airbag evaluation (2008)**
- **Evaluation of Rear Seat Passengers (2009)**
- **Crash speed increased (2012)**
(for reference: JNCAP tests)

**Passenger Protection Performance Evaluation**

- **Full-overlap Frontal Collision Test**
  - Test Speed: 55km/h
  - Driver Seat & Front Passenger Seat

- **Offset Frontal Collision Test**
  - Test Speed: 64km/h
  - Driver Seat & Rear Seat

- **Side Collision Test**
  - Test Speed: 55km/h
  - DMB: 950kg
  - Driver Seat

- **Neck Injury Test**
  - Test Speed ($\Delta v$): 20.0km/h
  - Driver / Passenger Seat

**Pedestrian Protection Performance Evaluation**

- **Pedestrian Head Protection Test**
  - Test Speed: 35m/h

- **Pedestrian Leg Protection Test**
  - Test Speed: 40km/h
  - Flex-PLI

**Seat Belt Reminder Evaluation**

- This mark shows that high-voltage battery electrolyte leakage performance and high-voltage battery fastening status has been met.
3. Feature of JNCAP
In offset frontal collision test, AF05 dummy is placed in the rear seat.

Occupant protection performances are evaluated to 5 levels based on the dummy received impact on head, neck, chest, abdomen and femur.
### 3-1. Offset frontal collision test-2

<table>
<thead>
<tr>
<th>Body region</th>
<th>Injury criteria</th>
<th>Score (a)</th>
<th>Modifier</th>
<th>Score (b)</th>
<th>Weight (c)</th>
<th>weighted score {(a)+(b)} × (c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>HIC15* (500/700)</td>
<td>4**</td>
<td>Hard contact with car interior</td>
<td>-1</td>
<td>×</td>
<td>0.8 = 3.2</td>
</tr>
<tr>
<td>Neck</td>
<td>Tension (1.70kN/2.62kN)</td>
<td>4</td>
<td></td>
<td></td>
<td>×</td>
<td>0.2 = 0.8</td>
</tr>
<tr>
<td></td>
<td>Shear* (1.20kN/1.95kN)</td>
<td></td>
<td></td>
<td></td>
<td>×</td>
<td>0.8 = 3.2</td>
</tr>
<tr>
<td></td>
<td>Extension moment* (36Nm/49Nm)</td>
<td></td>
<td></td>
<td></td>
<td>×</td>
<td>0.8 = 3.2</td>
</tr>
<tr>
<td>Chest</td>
<td>Chest deflection (23mm/48mm)</td>
<td>4</td>
<td></td>
<td></td>
<td>×</td>
<td>0.8 = 3.2</td>
</tr>
<tr>
<td>Abdomen</td>
<td>n/a</td>
<td>4***</td>
<td>Pelvis restraint condition</td>
<td></td>
<td>×</td>
<td>0.8 = 3.2</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>Femur force (4.8kN/6.8kN)</td>
<td>4</td>
<td></td>
<td></td>
<td>×</td>
<td>0.4 = 1.6</td>
</tr>
</tbody>
</table>

* : Calculation is done if secondary hard contact exists.  
** : Without secondary hard contact, 4 points are given by default.  
*** : 4 points are given by default.

**Total 12 points**
3-2. Pedestrian Protection and Seat Belt Reminder

With the consideration of the pedestrian protection measures, the new overall evaluation has been started since FY2011.

**Occupant Protection** (100 points)
- Full-wrap frontal
  - Offset frontal
    - 64 km/h
- Side impact
  - Rear impact sled test
  - 55 km/h

**Pedestrian Protection** (100 points)
- Head protection
- Leg protection

**Passenger Seat Belt Reminder** (8 points)
- Passenger seat belt reminder

Overall evaluation for vehicle safety
Total score: **208 points**
3-3. Safety for electric shock protection

Conformity display is to be made when all the requirements for the fixed situation of electric shock protective performance, high-voltage battery electrolysis solution leak performance, and a high-voltage battery fastening status are met.

If any of requirement is not met, a comment is to be released.
4. Effectiveness of JNCAP
### 4-1. Significance of NCAP

NCAP suggests the effect to death toll reduction

Transition of the evaluation index of a succeeding models (33 models)

<table>
<thead>
<tr>
<th>Year</th>
<th>Passenger protection performance</th>
<th>Pedestrian head protection performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>5.30</td>
<td>3.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td>2012</td>
<td>5.69</td>
<td>4.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.60</td>
</tr>
<tr>
<td>2013</td>
<td>5.63</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.00</td>
</tr>
</tbody>
</table>

NCAP reflecting the actual traffic accident data

**Succeeding model, improvement made based on the result JNCAP.**

Transition of the assessment highest evaluation (5★ prize) in recent years

<table>
<thead>
<tr>
<th>Year</th>
<th>Highest remarks by the model</th>
<th>No. of 5★star</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>179.6pt (Lexus: CT200h)</td>
<td>3 models</td>
</tr>
<tr>
<td>2012</td>
<td>184.8pt (Mitsubishi: Outlander)</td>
<td>6 models</td>
</tr>
<tr>
<td>2013</td>
<td>189.7pt (TOYOTA: CROWN)</td>
<td>7 models*</td>
</tr>
</tbody>
</table>

※including 1 mini-car model

<table>
<thead>
<tr>
<th>Year</th>
<th>Passenger vehicle</th>
<th>Mini-car</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>162.6pt</td>
<td>146.8pt</td>
</tr>
<tr>
<td>2012</td>
<td>174.2pt</td>
<td>156.0pt</td>
</tr>
<tr>
<td>2013</td>
<td>176.4pt</td>
<td>160.7pt</td>
</tr>
</tbody>
</table>
4-2. Results in 2013

- 5 Star Award: 7 models
- Top rating: TOYOTA CROWN (189.7pt)
- Top rating in Mini-sized car: HONDA N-WGN (178.8pt)

TOYOTA Crown Hybrid

- Pop-up bonnet system
- A backseat, a seat belt with a pretension system, force limiter system and seat belt reminder system

HONDA N-WGN

- A backseat, a seat belt with a force limiter system and seat belt reminder system
4-3. Cooperation with User and Traffic victims

The public presentation for Traffic victims are simultaneously held.

Survey at our booth on the Tokyo Motor Show 2013 shows NCAP recognition rate was 30%.

81% among all like to refer NCAP result in next time.
5. Introduction of Advanced Safety Technology Assessment
In order to prevent the damage of the elderly people, and the pedestrian and the bicycle driver, to prevent the accident itself is important.

The spread of advanced safety technology which avoids a collision is indispensable.

The number of accident what the elderly people are the party concerned

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of accident</th>
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<tbody>
<tr>
<td>1989</td>
<td>24,169</td>
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<tr>
<td>1994</td>
<td>42,249</td>
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<tr>
<td>1999</td>
<td>67,813</td>
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<td>2004</td>
<td>100,930</td>
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<tr>
<td>2010</td>
<td>111,215</td>
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</table>

Death toll ratio of the elderly people; pedestrian

- Over 65 age: 70% (2013)
The system which performs control of the alarm to a driver, and brake mechanism in order to detect a front obstacle and to reduce the damage caused by a collision.

The system which prevents lane deviation when the car is about to deviate from the lane or having deviated by alerting to a driver.

Availability of AEB and LDW is rapidly increasing.
5-3. Roadmap for Advanced Safety Technology Assessment

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<tr>
<td><strong>AEB</strong></td>
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<td>Development of evaluation method</td>
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<td>Car to Car</td>
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<td>Car to Pedestrian</td>
<td>Development of evaluation method</td>
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<td><strong>LDW</strong></td>
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<td>Development of evaluation method</td>
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<td><strong>Others</strong></td>
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<td>Development of evaluation method</td>
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<td>Introduction device for back &amp; surrounding view</td>
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<td>New test</td>
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<td>LKA</td>
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<td>New test</td>
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<tr>
<td>Night Vision</td>
<td>Development of evaluation method</td>
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<td>New test</td>
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</tbody>
</table>
5-4. Progress of Advanced Safety Technology Assessment

1. The outline of Advanced Safety Technology Assessment Steering committee decided in 2014
   (1) Autonomous Emergency Braking System (AEBS) [test protocol]
   (2) Lane Departure Warning System (LDWS) [test protocol]
   (3) Overall evaluation of Advanced Safety Technology [evaluation and publication method]

2. The official announcement schedule
   (1) MLIT and NASVA; Test result will be released periodically with a leaflet etc.
   (2) Use of a logo mark; Manufactures can release the result with the use of Logo.

(3) For start, all results are planning to release collectively by October in JF2014.
6. Conclusion
6-1 Cooperation with NCAPs in the world

Realization of safe road is indispensable to prosper a country and the area.

The global plan for the traffic safety of the United Nations (2011-2020)
“Encourage implementation of new car assessment programs in all regions of the world in order to increase the availability of consumer information about the safety performance of motor vehicles.”

In the United Nations General Assembly, "68/269. Improving global road safety“ were resolved

For the efficient and effective enforcement, collaboration works between NCAPs in the world are more important.

- harmonization of the Test Procedure, Test equipment, etc.
- Sharing of knowledge and experience.
- Mutual use of test result

[Map showing cooperation between NCAPs in the world]
6-2 Conclusion

1. The promotion of NCAP is important in order to reduce traffic accident.
2. JNCAP plays a significant role in past 20 years in Japan.
3. Assessment for Advanced safety technology will be implemented in Japan.
4. Collaboration with NCAPs in the world is increasingly important.
5. NCAP will raise the safety consciousness of car user all over the world in the future.
Thank you for your attention

View from NASVA new office
Highest Radio Tower in the world (634m)
『Tokyo Sky Tree』

2013 calligraphy design awarded Work by child-orphaned-in-a-traffic-accidents