ASEAN NCAP
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Test Protocol – BLIND SPOT VISUALIZATION

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Preface

During the test preparation, vehicle manufacturers are encouraged to liaise with the laboratory and to check that they are satisfied with the way cars are set up for testing. Where a manufacturer feels that a particular item should be altered, they should ask the laboratory staff to make any necessary changes. Manufacturers are forbidden from making changes to any required parameter that will influence the test, such as dummy positioning, vehicle setting, test environment, etc.

It is the responsibility of the test laboratory to ensure that any requested changes satisfy the requirements of ASEAN NCAP. Where a disagreement exists between the laboratory and manufacturer, the ASEAN NCAP secretariat should be informed immediately to pass a final judgement. Where the laboratory staff suspects that a manufacturer has interfered with any of the setup, the manufacturer's representatives should be warned that they are not allowed to do so themselves. They should also be informed that if another incident occurs, they will be asked to leave the test site.

Where there is a recurrence of the problem, the manufacturer’s representatives will be told to leave the test site, and the Secretariat should be immediately informed. Any such incident may be reported by the Secretariat to the manufacturer and the persons concerned may not be allowed to attend further ASEAN NCAP tests.

DISCLAIMER: ASEAN NCAP has taken all the necessary steps to ensure that the information published in this protocol is accurate and reflects the technical decisions taken by the

organisation. In the unlikely event that this protocol contains a typographical error or any other inaccuracy, ASEAN NCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

In addition to the settings specified in this protocol, the following information will be required from the manufacturer of the car being tested in order to facilitate vehicle preparation. A vehicle handbook should be provided to the test laboratory prior to the assessment.

TEST PROTOCOL –
BLIND SPOT VISUALIZATION

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NEW CAR ASSESSMENT PROGRAM FOR SOUTHEAST ASIAN COUNTRIES (ASEAN NCAP)

TEST PROTOCOL – BLIND SPOT VISUALIZATION

1 INTRODUCTION

Each year, passenger vehicles are fitted with new innovative mechanical and electronic features to enhance drivability and safety. Blind Spot Technology (BST) systems are an example of such features. BST can be categorised into two types: detection and non-detection. The detection type refers to BSD (Blind Spot Detection System), whereas the non-detection type refers to BSV (Blind Spot Visualization System).

BSD uses sensors to detect one or more vehicles in adjacent lanes that may not be directly observable by the driver. The system warns the driver of the approaching vehicle to help facilitate safe lane changing.

Not all BSTs have the same detection capabilities or operating conditions. In the vehicle owner's manuals, many automotive manufacturers state that their systems are designed to detect only highway vehicles and not other objects, including bicycles, motorcycles, humans, or animals. Various systems have a threshold speed, and if the speed of the equipped vehicle is below the threshold speed, typically ranging from 5 to 20 km/h, the system is

inactive. BSV displays images according to the driver's operation from 0 km/h to the maximum speed.

2 DEFINITIONS

Throughout this protocol the following terms are used:

2.1 Subject vehicle (SV)

Vehicle equipped with the system in question and related to the topic of discussion.

2.2 Target vehicle (TV)

Motorcycle that is closing in on the subject vehicle from behind, or any vehicle that is located in one of the adjacent zones.

2.3 Coverage zone

The entire area to be monitored by a BST is a system's coverage zone, consisting of a specific subset of the following zones: left adjacent zone, right adjacent zone, left rear zone, and right rear zone.

2.4 Adjacent zones

Zones to the left and right of the subject vehicle.

2.5 Visualization function

As for the non-detection type, the system shall be able to 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.

NOTE: A target vehicle located within the coverage zone will thus be visualized by the system.

3 REFERENCE SYSTEM

The International Standard specifies the system requirements and test methods for Lane Change Decision Aid Systems (LCDAS) are fundamentally intended to 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. Hence, the detection and visualization technology will help in reducing motorcyclist injuries and deaths in Southeast Asia.

4 TEST CONDITIONS

The test location shall be on a flat, dry asphalt or concrete surface. The ambient temperature during testing shall be within the range of 5 °C to 40 °C. The test shall be conducted during the day and at night (without a streetlamp or any other lamp).

4.1 Test Track

4.1.1 Conduct tests on a dry (no visible moisture on the surface), uniform, solid-paved surface with a consistent slope between level and 1%.

4.1.2 The surface must be paved and may not contain any irregularities (e.g., large dips or cracks, manhole covers, or reflective studs).

5 TEST PROCEDURE

5.1 Conditioning

5.1.1 General
A car (test vehicle) is used as delivered to the laboratory. There is no restriction on car selection.

5.1.2 Vehicle Preparation
Set up the cameras inside and outside of the vehicle.

5.1.3 Test Target Vehicle
The main objective of BST testing is to check the functionality of BST with regard to the visibility of motorcycles, which is a prevalent issue in the ASEAN region.

Thus, the dimension of the target vehicle used in this protocol will be as follows:

Table 1: Target vehicle dimension

	Dimension (m)
Length	1.8 to 2.0
Width	0.6 to 0.8
Height	1.0 to 1.4

5.2 Test Conduct

5.2.1 Static Straight-lane Tests
The test SV is subjected to one type of performance test, namely static straight-lane tests.

In the static straight-lane test series, both SV and TV are placed on separate but parallel lanes, with the target vehicle positioned in the lane next to the SV either on the driver or passenger side, as depicted in Figure 3.

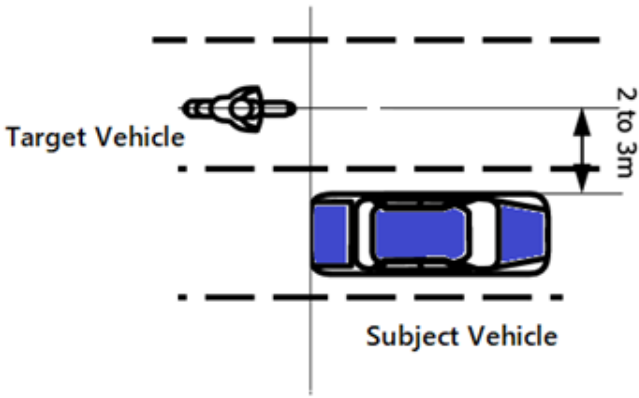

Figure 3: Target vehicle and subject vehicle's positions

The static straight-lane tests are performed on a controlled straightaway test facility containing equal or more than three parallel lanes of concrete surface roadway. All tests are performed during the day or/and at night.

Once these measurements are completed for the passenger side, the entire test is repeated for the driver-side sensor.

*In order to identify the system's interaction with the application of the SV's turn signals, the test series are repeated with the turn signal activated.

Note: Manufacturer is required to provide information for specific model.

5.2.2 Functionality Check and Scoring
Check the functionality of whether the BSV system provides adequate live visual of the static vehicle when a test is performed according to the test procedure with the target vehicle described in 5.2.2.1.

5.2.2.1 Static Test
In the static test, the target vehicle will be positioned at five different locations in the lane next to the subject vehicle, between 2 to 3 meters adjacent, as described in Figure 4. Confirm that the target vehicle is visible at each place and distance.

The locations of the target vehicle must be as follows (with respect to the subject vehicle's rear):

a) 30 m zone;
b) 20 m zone;
c) 10 m zone;
d) 3 m zone; and
e) blind spot zone.

For a BSV-type system, the system must be able to provide a live visual of the static vehicle in the same

direction and on the adjacent side of the subject vehicle. The result should be based on the following Table 2.

Table 2: BST visualization type requirements

Live visual video	Must be clearly visible
Distance	In the 30-meter zone from SV trailing edge to blind spot zone

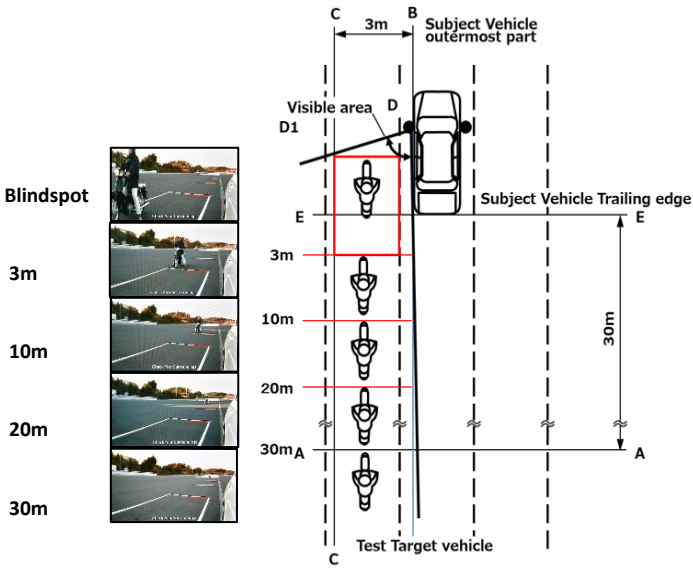

Figure 4: Functionality check and score

If the subject vehicle does not meet all the requirements as described in Table 2, no point will be rewarded.

The subject vehicle should be able to visualize other vehicles in the blind spot zones, especially smaller ones such as motorcycles (the target vehicle), and provide adequate visibility as described in Figure 5.

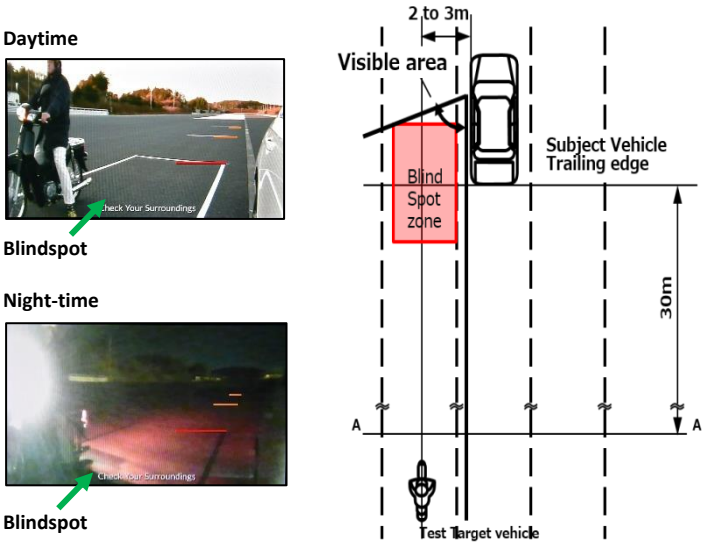

Figure 5: Zone requirements for BSV system live visual

*For assessment at night, the test needs to be conducted with a motorcycle with the headlight turned on.

Note: If required by ASEAN NCAP inspector.

ANNEX A

A.1

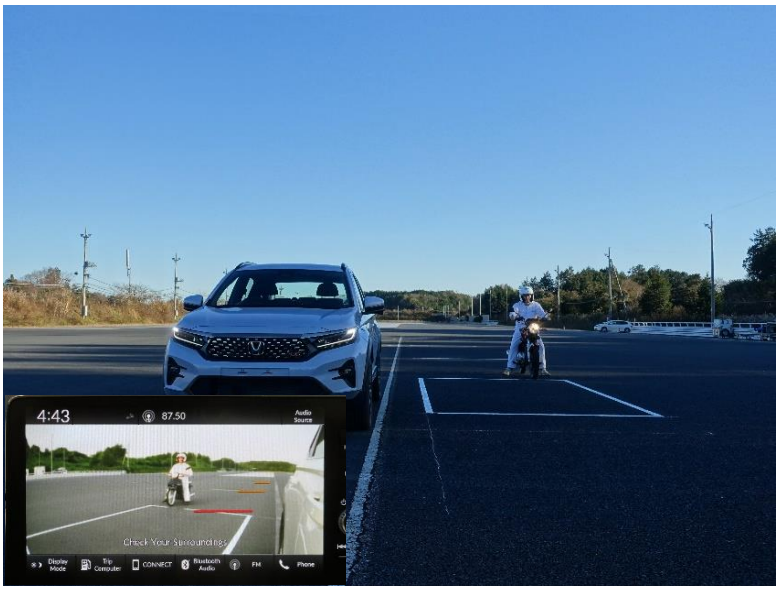

Figure A-1: Image log of BSV test

A.2

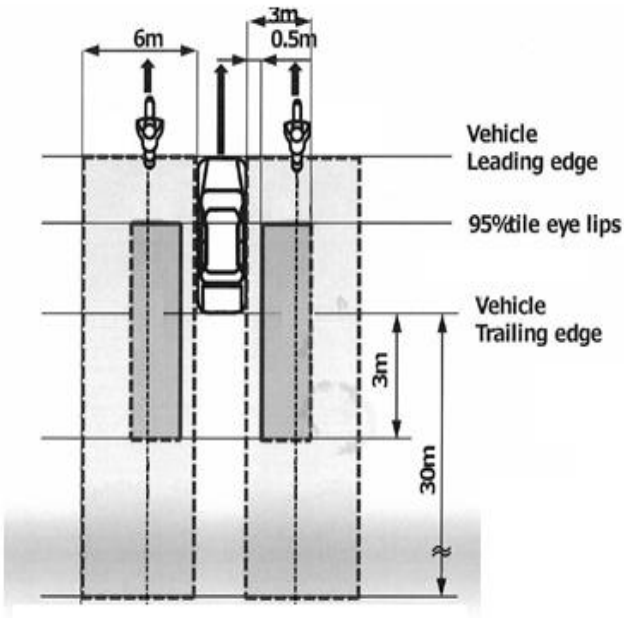

Figure A-2: Blind spot zone

ACKNOWLEDGEMENT

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