



Safer Cars for ASEAN Region

ASEAN NCAP – Safety Assist and Motorcycle Safety Assessment Protocol and Roadmap

Malaysian Institute of Road Safety Research



FIA Foundation
for the Automobile and Society

Bloomberg
Philanthropies



Introduction to ASEAN NCAP



What is NCAP?

- NCAP stands for “**New Car Assessment Programme**”
- NCAP’s role is to provide consumer a **realistic** and **independent** assessment on the **safety performance** of vehicles **recently launched** in the markets.
- NCAP Family
 - IIHS
 - 5-Star Safety Ratings (NHTSA)
 - JNCAP
 - ANCAP
 - Euro NCAP
 - KNCAP
 - CNCAP
 - Latin NCAP
 - ASEAN NCAP
 - Bharat NCAP



Formation of ASEAN NCAP



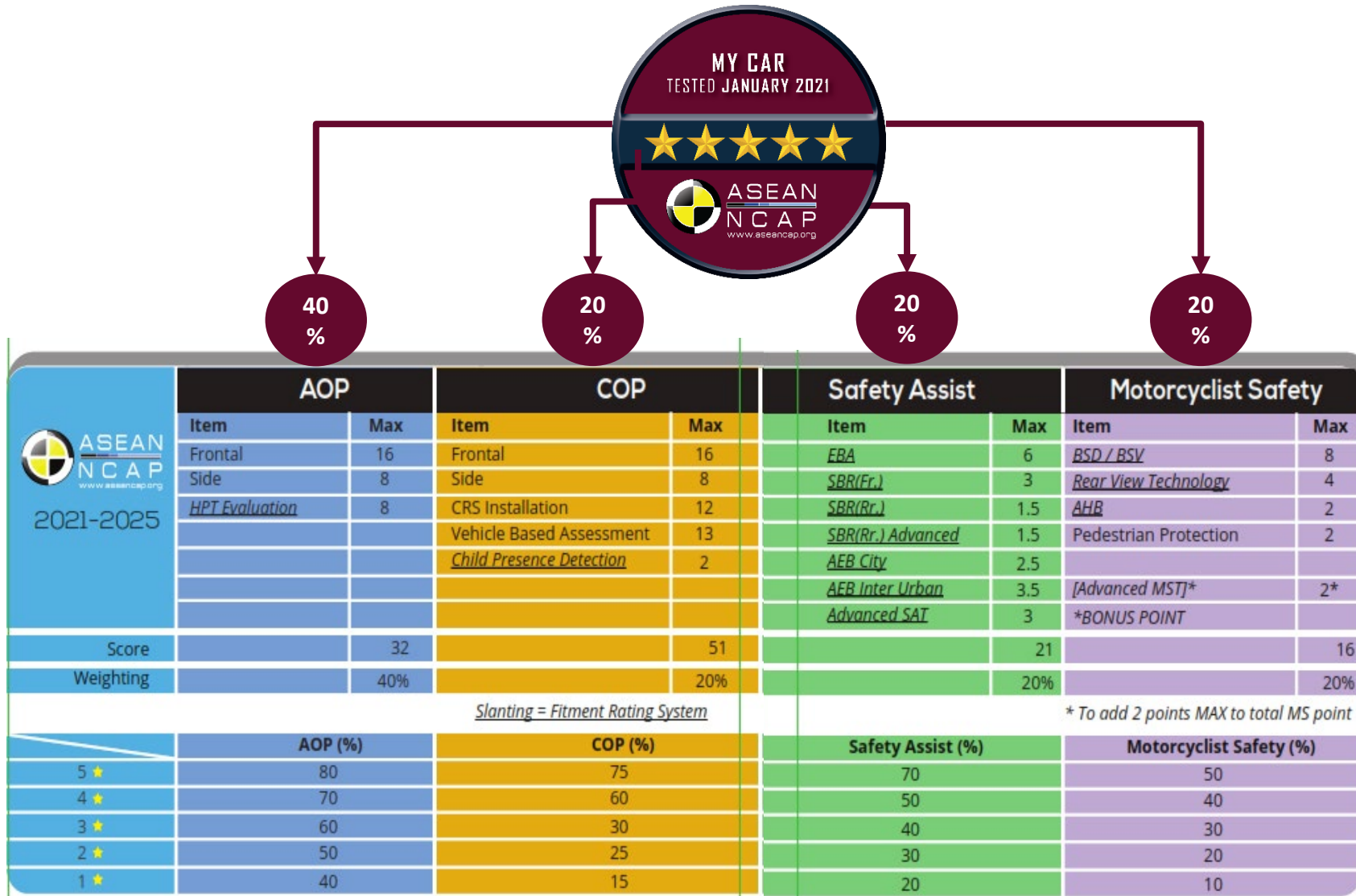
- 8 December 2011: MoU Signing between Global NCAP and MIROS in New Delhi.
- Objective: to promote a market for safety by raising awareness to the car buying public and encouraging manufacturers to build safer vehicles

NCAP Around the World



#	Est. Year	Countries	#	Est. Year	Countries
1	1999	USA	6	1999	South Korea
2	1978	USA	7	2006	China
3	1991	Japan	8	2010	South America
4	1992	Australia & New Zealand	9	2011	South East Asia Countries
5	1997	FRA, GER, ITA, ESP, SWE, NED, UK (EU)	10	2023	India

Weightage Assessment for 2021-2025



Where are we now?

- As of to date, ASEAN NCAP has assessed and rated 14 models under the 2021-2025 protocol.
- From this number, 10 models were awarded with 5-Star, 3 were rated as 4-Star and 1 model rated as 3-Star.
- The success was based on close collaboration with partners on the development of our 2021-2025 protocol.
- This year marks the mandatory application for e-hailing operators in Malaysia to have their vehicles rated with ASEAN NCAP rating of 3-Star and above in order for them to operate the vehicles as public transportation.

Evolution of ASEAN NCAP Protocol

2012
- 2016

ASSESSMENT

- Effective Braking Avoidance (EBA)
- Seatbelt Reminder (SBR)
- Blind Spot Technology (BST)

FITMENT

- AEB Inter-Urban
- AEB City
- AEB VRU
- Lane Departure Warning System
- Forward Collision Warning System

2017
- 2020

ASSESSMENT

- Effective Braking and Avoidance (EBA)
- Seatbelt Reminder (SBR)
- AEB City
- AEB Inter-Urban
- Blind Spot Detection System (BSD)/Blind Spot Visualization (BSV)
- Advanced Rear View Mirror (ARV)
- Auto High Beam (AHB)
- Pedestrian Protection

FITMENT



- RCTA
- RCTB
- LKA
- LDW
- FCW
- Driver Monitoring
- AEB Motorcycle

2021
- 2025

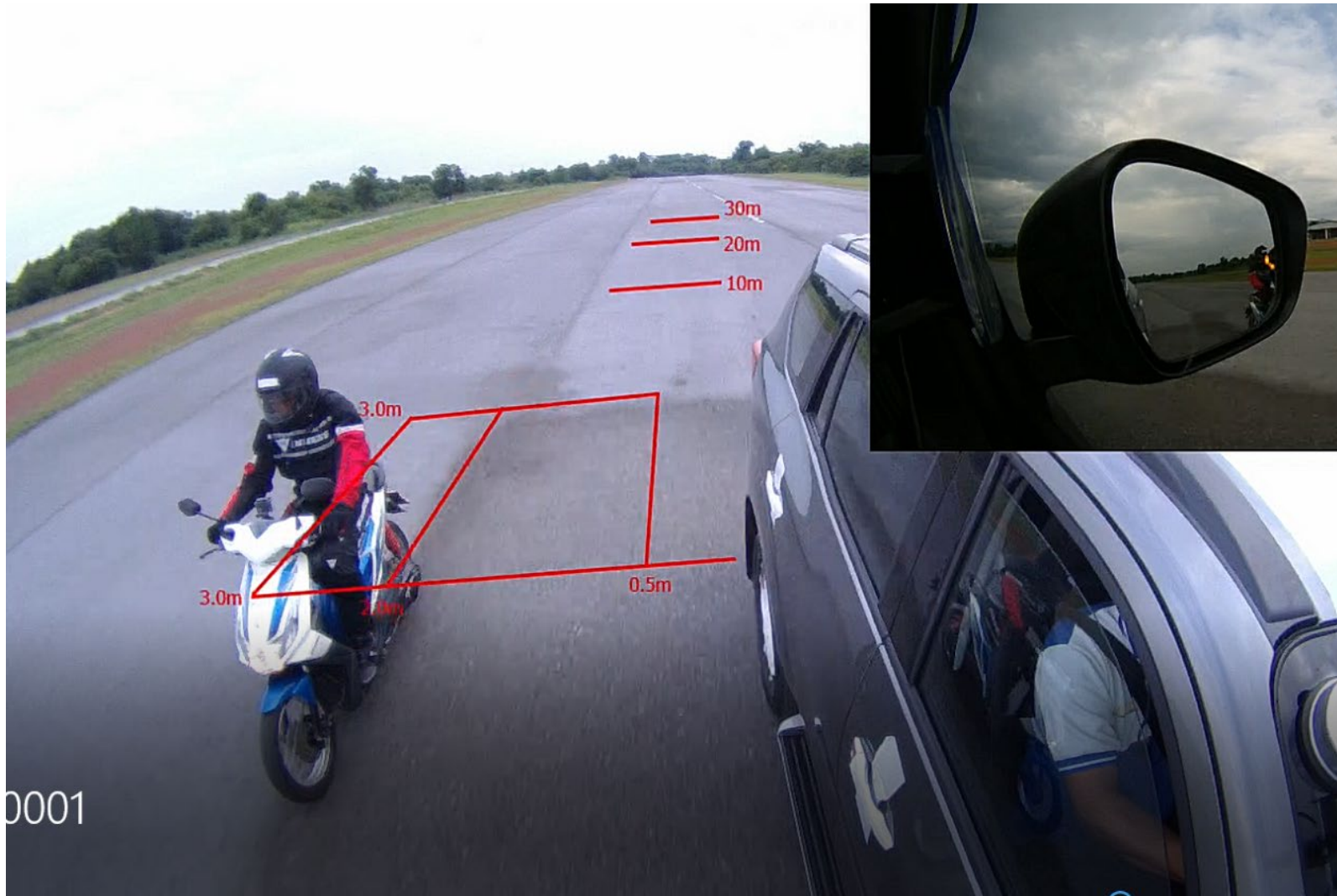
- Electronic Stability Control
- Seatbelt Reminder (SBR)

ASEAN NCAP Testing Protocol – 2021 - 2025

Autonomous Emergency Braking (AEB)

Test type	Illustration	Test description
<p>AEB City Stationary low speed</p>	<p>Car drives into stationary vehicle (low speed)</p>	 <p>Approaching a stopped vehicle at test speeds from 10 to 60km/h in 5km/h increments.</p>
<p>AEB Inter-Urban Slower moving</p>	<p>Car drives into slower moving vehicle</p>	 <p>Approaching a moving target at 20km/h. Test vehicle speed 30km/h up to 60km/h in 5km/h increments.</p>

Blind Spot Detection (BSD)

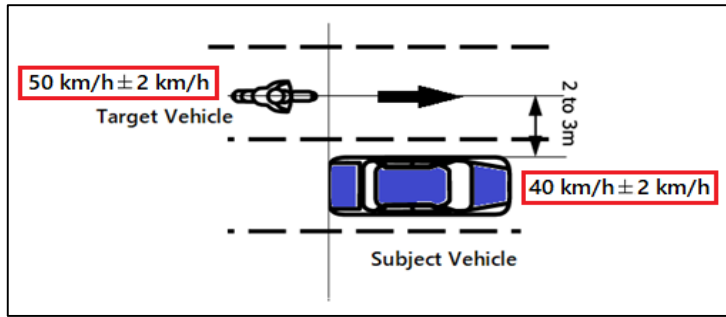


Motorcycle Size

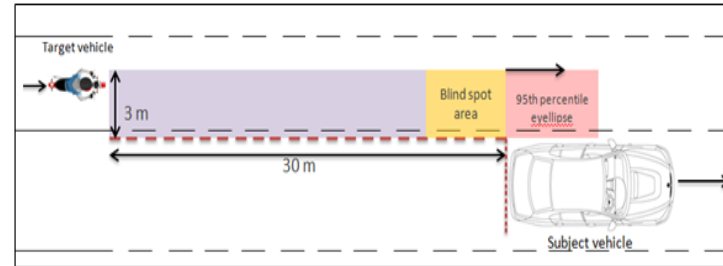
	Dimension (m)
Length	1.8 to 2.0
Width	0.6 to 0.8
Height	1.0 to 1.4

Blind Spot Detection (BSD)

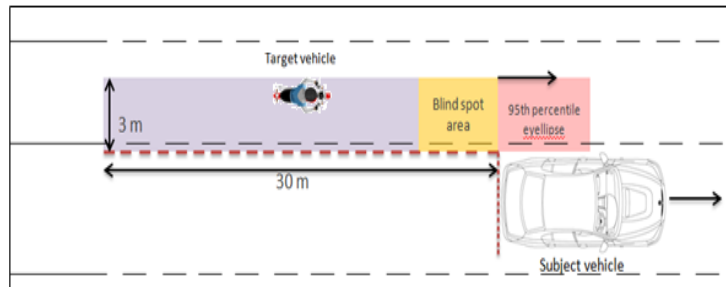
Test Condition



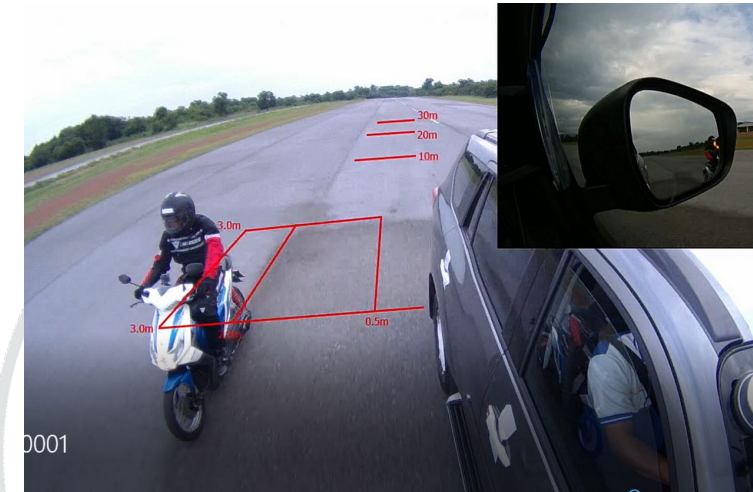
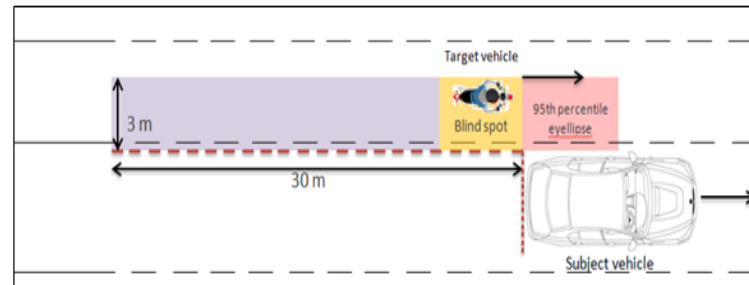
No Warning



May Give Warning

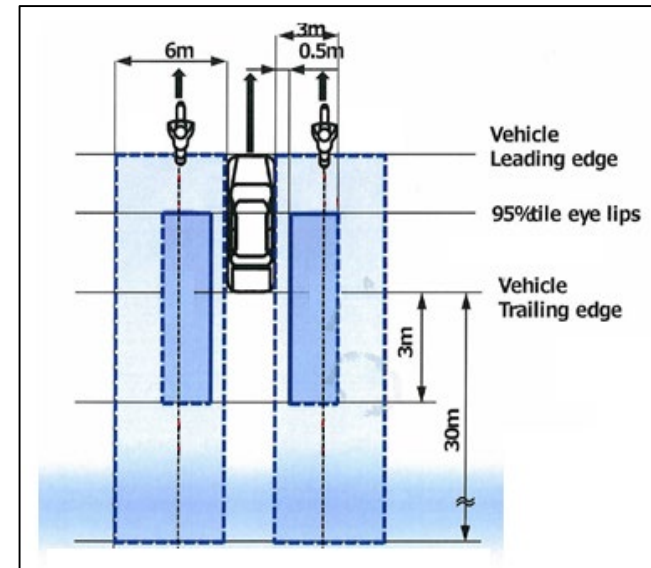
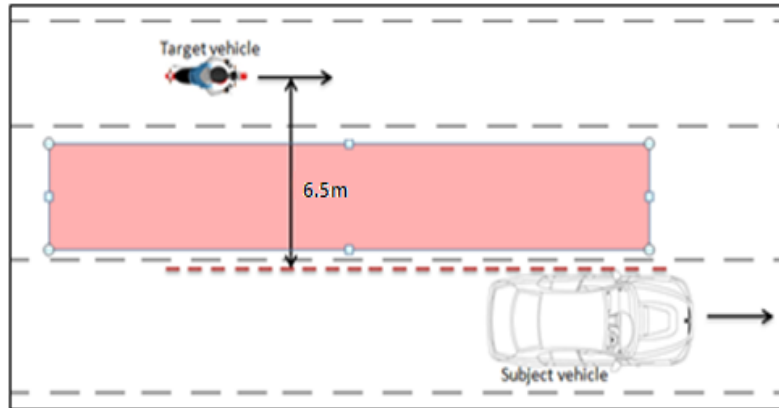


Must Give Warning



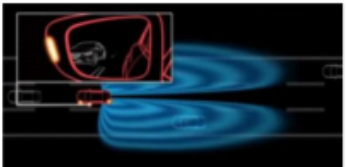







Blind Spot Detection (BSD)

False Signal – Must Not Give Warning

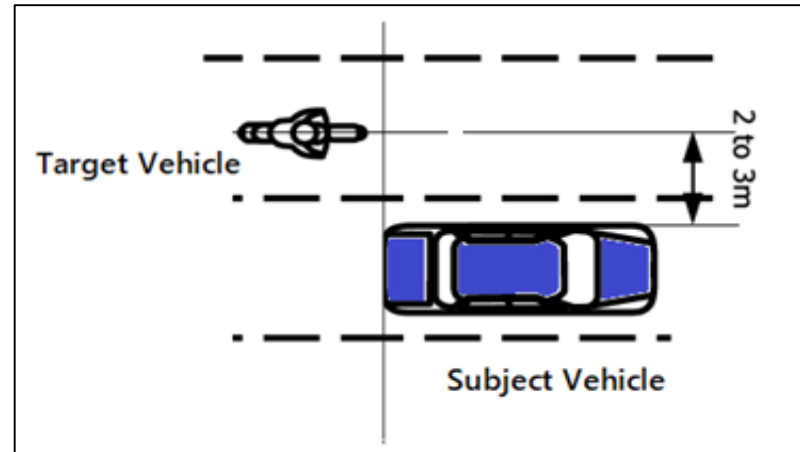


Example of BST

Vehicle	A	B	C	D
Model	Mercedes S400	Honda Odyssey EXV	Mazda CX-5 2017	Mazda 3
Body style	4-door sedan	5-door MPV	4-door SUV	4-door sedan
BSM Illustration				
Trade Name	Blind Spot Assist (BSA)	Blind Spot Illustration (BSI) System	Blind Spot Monitor (BSM)	Blind Spot Monitor (BSM)
Technology	radar	vision	radar	radar
Sensor Location (s)	Two sensor mounted one in each corner of the rear bumper	Two sensor mounted one in each corner of the rear bumper	Two sensor mounted one in each corner of the rear bumper	Two sensor mounted one in each corner of the rear bumper
BSM Icon				
Icon description	LED is a triangular area on end left of the side mirror	LED warning lamp icon integrated to the side mirror face	warning lamp icon integrated to the side mirror face	lighted lamp icon integrated to the side mirror face
Audible warning	none	none	has	has

Blind Spot Visualization (BSV)

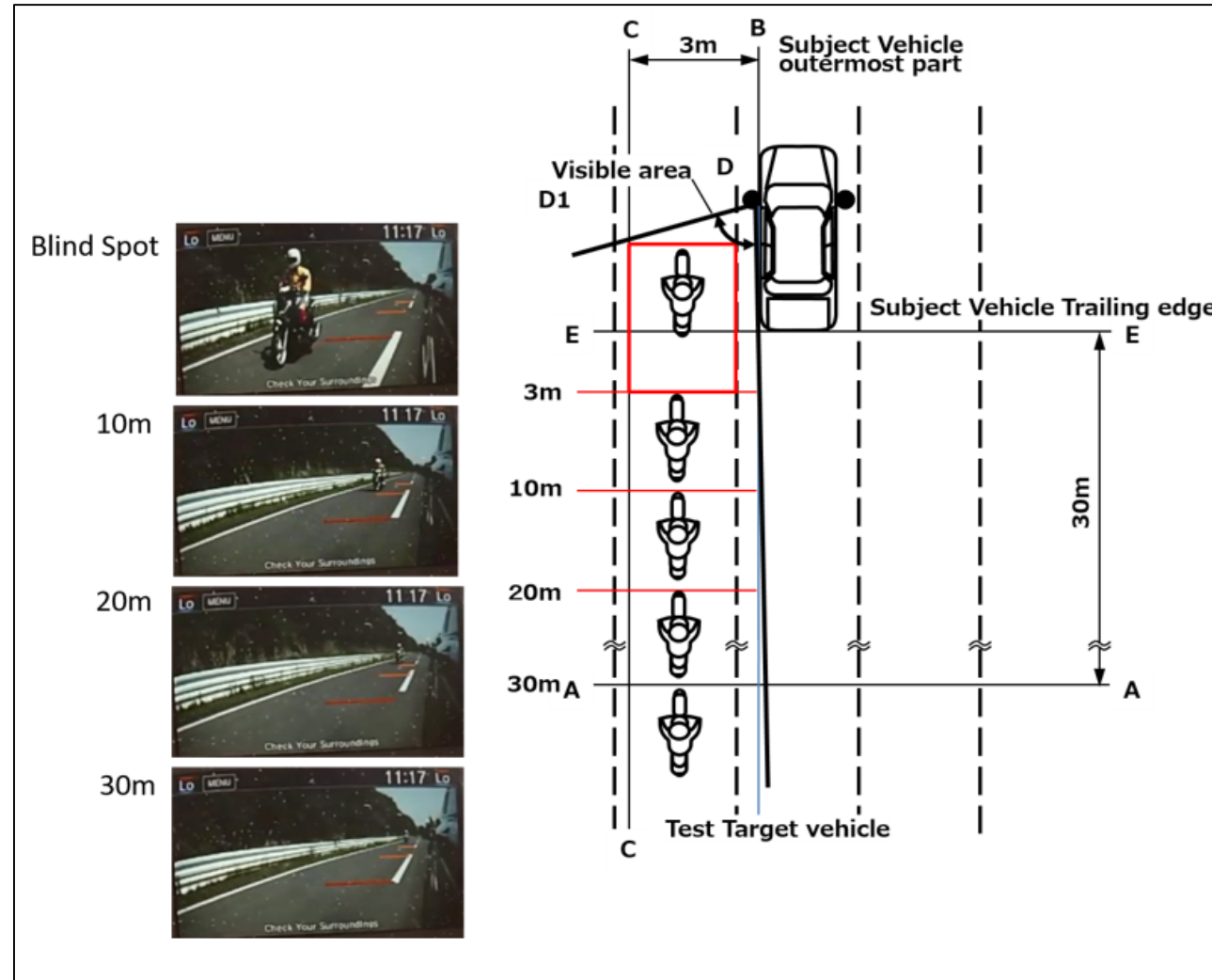
Static Position for both test vehicle and subject



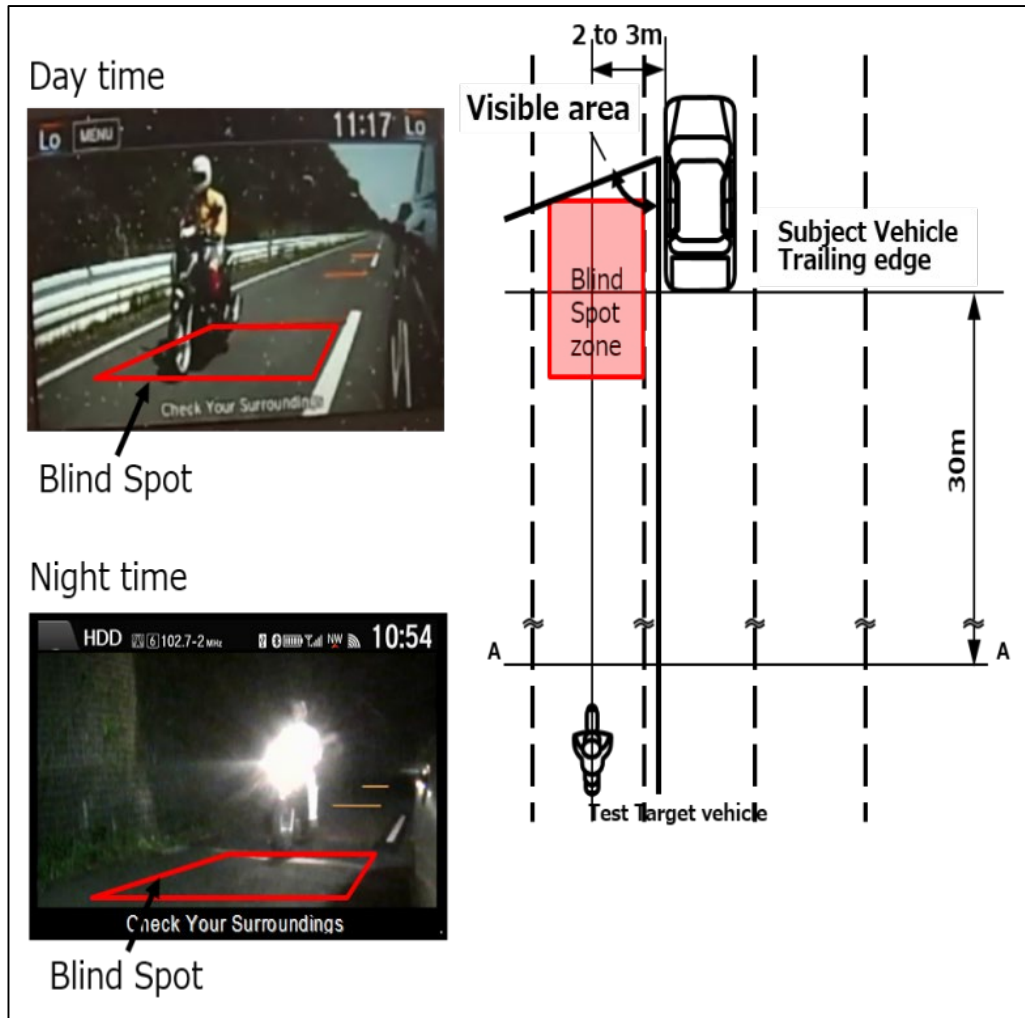
The locations of target vehicle must be as follows (in respect to subject vehicle rear);

- a) 30m zone
- b) 20m zone
- c) 10m zone
- d) 3m zone and
- e) Blind spot zone

Blind Spot Visualization (BSV)



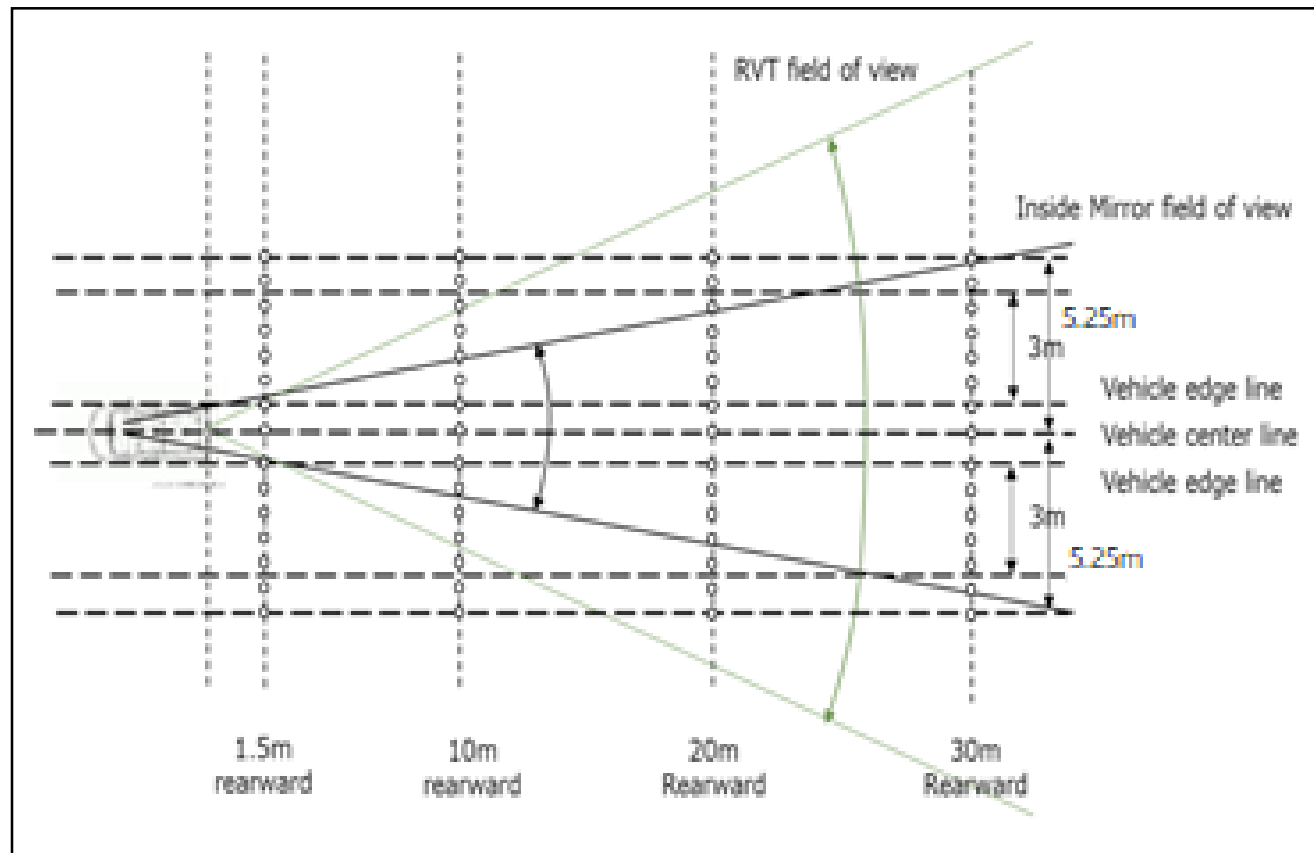
Blind Spot Visualization (BSV)



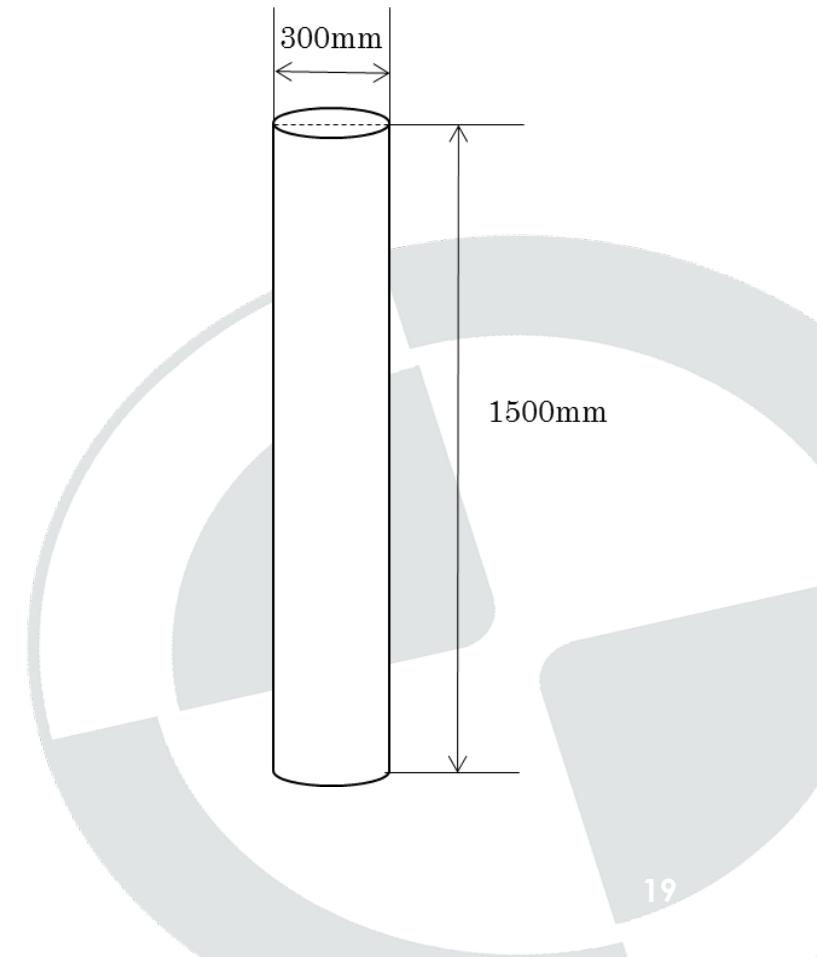
For assessment at night, the test needs to be conducted with a motorcycle with the head-light turned on.

Advanced Rear Visualization (ARV)

- 15 poles were placed in a straight line with the following adjustment

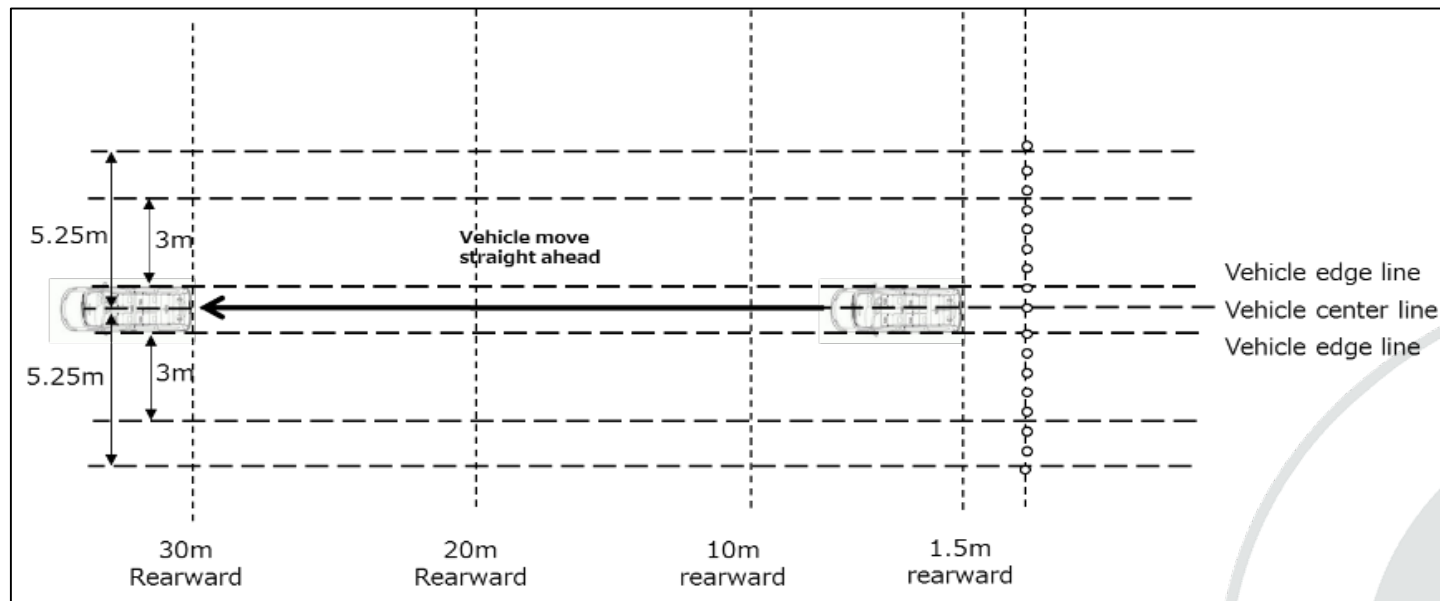


Test Object Location



Advanced Rear Visualization (ARV)

- Vehicle was placed in 1.5 meters from the pole at the start and will move forward in 10, 20 and 30 meters ahead in straight line.

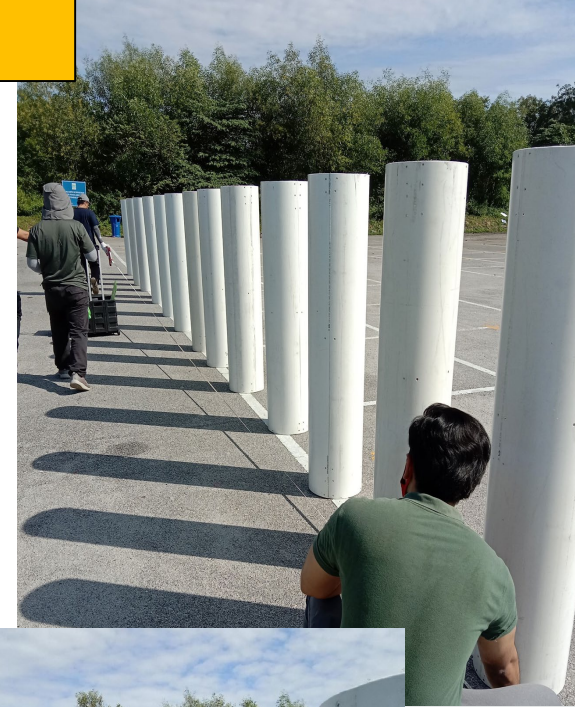


Test Methodology

- Subject was asked to identify the pole number within the rear-view mirror without moving his head.
- The same subject was used throughout this assessment

Advanced Rear Visualization (ARV)

ARV Assessment

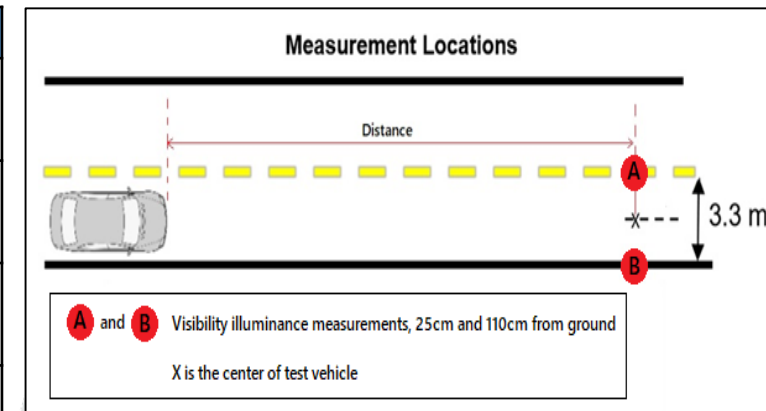


Auto High Beam (AHB)

Test	Headlight	Activated Start Speed	Requirement
Operational Speed	Low to High Beam	< 50 km/h	Must automatically switching
	High to Low Beam	< 50 km/h	Detect oncoming vehicle

AHB operation speed requirements

Test	Headlight	Lux meter	Distance (m)	Height (cm)	Requirements
Illuminance	High Beam	A	100	25 from ground	5 Lux (Min)
				110 from ground	5 Lux (Min)
		B	100	25 from ground	5 Lux (Min)
				110 from ground	5 Lux (Min)



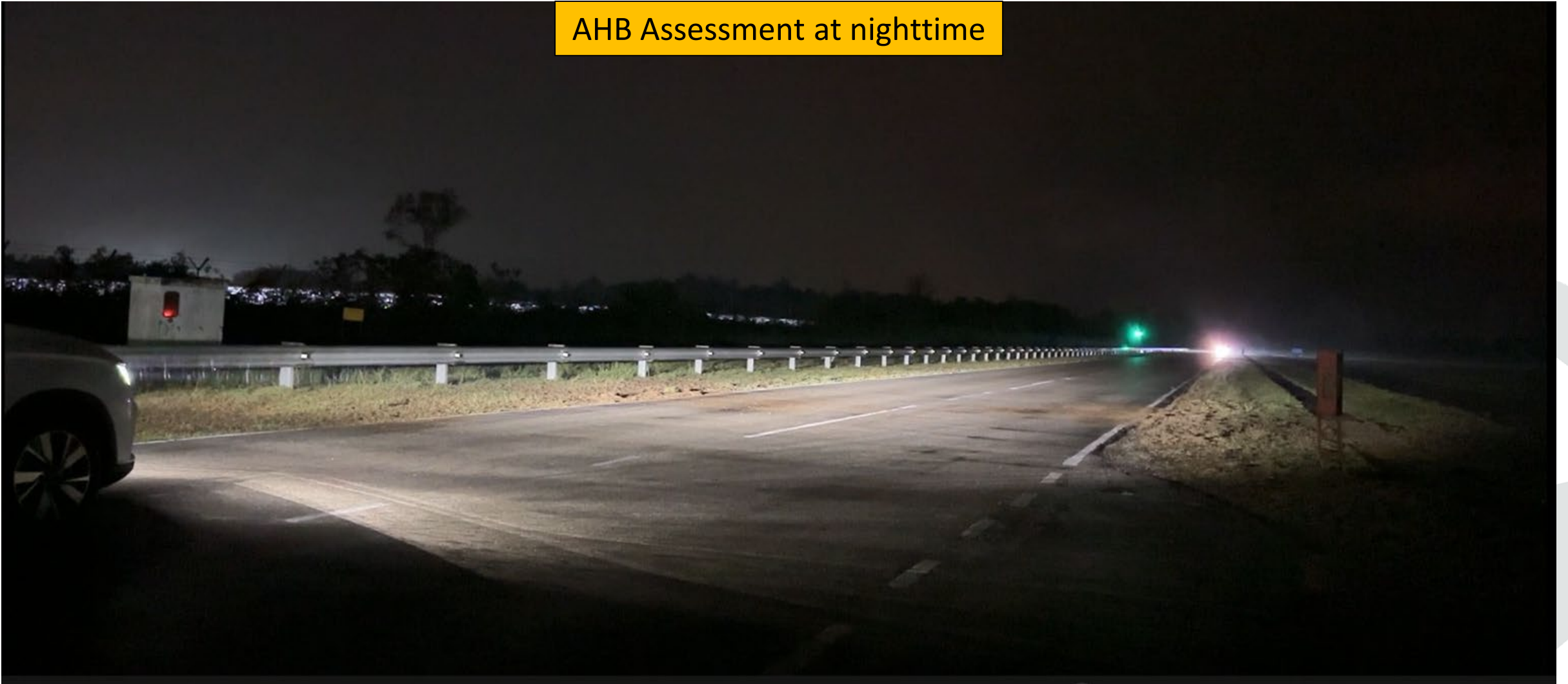
Illuminance measurements assessment

Equivalent Test Procedure

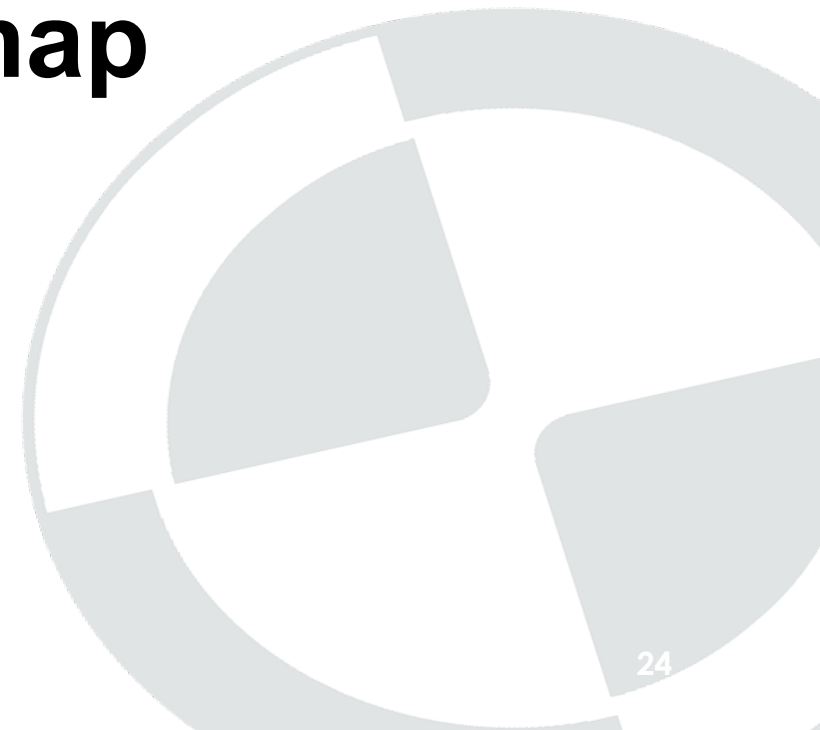
At the request of the manufacturer, the above test set procedure can be replaced by the test procedure described in UNECE Regulation No. 48-06 (or later), section 6.1.9.3.3.2 and UNECE Regulation No. 122-01(or later), section 6.3.3 class B and UNECE Regulation No. 123, section 6.3.2. or or UNECE Regulation No. 149

Auto High Beam (AHB)

AHB Assessment at nighttime



ASEAN NCAP Roadmap 2026-2030



ASEAN NCAP Upcoming Roadmap for 2026-2030

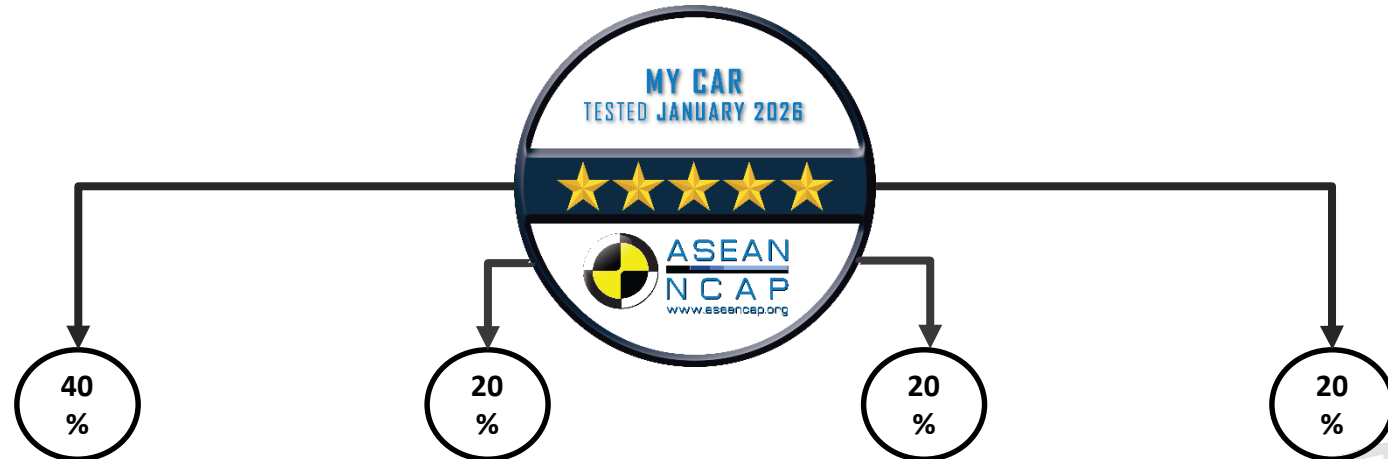
ASEAN NCAP recently launched our latest roadmap for 2026-2030 in Jakarta on 15 March 2023.

The roadmap will maintain its 4 assessment pillars (AOP, COP, SA and MS) from the current protocol.

Due to significant number of road fatalities involving motorcyclists in the ASEAN region, ASEAN NCAP is keen to further develop the assessment items under the Motorcyclist Safety category.

One aspect that will be considered in the new roadmap is the assessment on how effective is the vehicle in avoiding collision against a motorcyclist.

Scoring Assessment for 2026-2030 Roadmap



ASEAN NCAP	AOP		COP		Safety Assist		Motorcyclist Safety	
	Item	Max	Item	Max	Item	Max	Item	Max
	Frontal	16	Frontal	16	EBA	6	BSD / BSV	8
	Side	8	Side	8	SBR	6	Rear View Technology	3
	HPT Evaluation	8	CRS Installation	12	AEB City	2.5	AHB / ADB	3
			Vehicle Based Assessment	13	AEB Inter Urban	5	Pedestrian Protection	2
			Child Presence Detection	5	Lane Support	2	AEB MC	6
					Advanced SAT	2	Advanced MST	2
	Score	32		54		23.5		24
	Weighting	40%		20%		20%		20%

Slanting = Fitegment Rating System

	AOP (%)	COP (%)	Safety Assist (%)	Motorcyclist Safety (%)
5 ★	80	75	75	60
4 ★	70	60	60	50
3 ★	60	50	40	40
2 ★	50	40	30	30
1 ★	40	30	20	20

Active Safety

ASSESSMENT

- i. Effective Braking and Avoidance (EBA)
- ii. Seatbelt Reminder (SBR)
- iii. AEB City
- iv. AEB Inter-Urban
- v. Blind Spot Detection System (BSD)/Blind Spot Visualization (BSV)
- vi. Advanced Rear View Mirror (ARV)
- vii. Auto High Beam (AHB) / Adaptive Driving Beam (ADB)
- viii. Lane Support Assessment (LKA+ LDW)
- ix. Pedestrian Protection
- x. AEB Motorcycle

FITMENT

- i. RCTA
- ii. RCTB
- iii. LKA
- iv. LDW
- v. FCW
- vi. Driver Monitoring

Example of Assessment



Difference between 2021-2025 vs 2026-2030 Roadmaps

Pillar	Technology	2021-2025	2026-2030
SA	AEB Inter Urban (CCrm + CCrb)	3.5	5
	Lane Support	-	2 (new)
	Advanced SAT	3	2
MS	Rear View Technology	4	3
	AEB MC (Motorcycle)	-	6 (new)
	AHB / ADB	2	3
	Advanced MST	Bonus Point - 2	2

OASIM Project

(Overall ASEAN market Safety Improvement for Motorcycles)

One aspect that will be considered in the new roadmap is the assessment on how effective is the vehicle in avoiding collision against a motorcyclist.

To achieve this objective, the OASIM project was kicked-off by UTAC on 20th September 2020 in collaboration with MIROS and ASEAN NCAP.

The project used crash data from Thailand and Malaysia to study the feasibility in addressing crash situations with the ADAS systems.

The project was concluded on 9th March 2023 with several key proposals for ASEAN NCAP 2026-2030 test and assessment for motorcycle avoidance.

ASEAN NCAP Motorcycle Target for 2026

A newly developed motorcycle target for ASEAN NCAP assessment dedicated to the Motorcyclist Safety pillar.

- **Testing materials**

- Driving robot
- Test platform

- **Light condition**

- Day

- **Weather condition**

- Dry surface



Cases/Scenarios for Assessment

CMRm

- Car-to-Motorcycle Rear-end moving

CMFtap

- Car-to-Motorcycle Front Turn Across Path

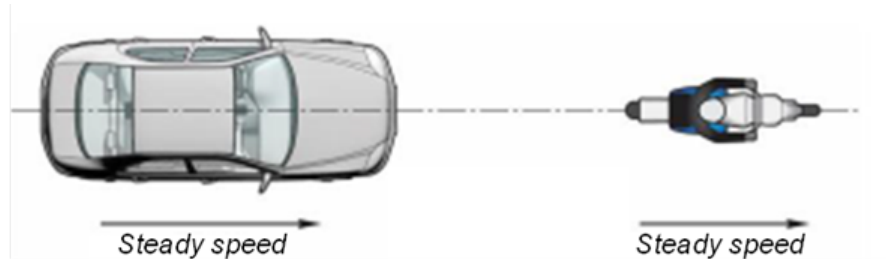
CMCrossing

- Car-to-Motorcycle Crossing

CMOncoming

- Car-to-Motorcycle Oncoming

Car-to-Motorcycle Rear-end moving



50% impact point				
Speed (km/h)	AMT			
	30	45	60	
VUT	40	AEB/FCW	-	-
	45	AEB/FCW	-	-
	50	AEB/FCW	-	-
	55	AEB/FCW	AEB/FCW	-
	60	AEB/FCW	AEB/FCW	-
	65	FCW	FCW	-
	70	FCW	FCW	FCW
	75	FCW	FCW	FCW
	80	FCW	FCW	FCW

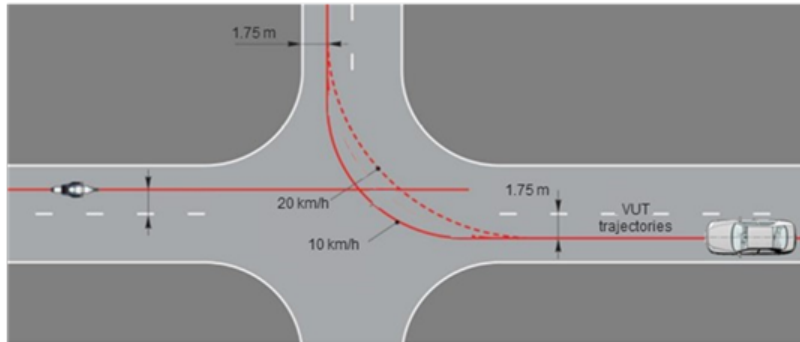
25% impact point				
Speed (km/h)	AMT			
	30	45	60	
VUT	40	FCW	-	-
	45	FCW	-	-
	50	FCW	-	-
	55	FCW	FCW	-
	60	FCW	FCW	-
	65	FCW	FCW	-
	70	FCW	FCW	FCW
	75	FCW	FCW	FCW
	80	FCW	FCW	FCW

	CMRm	
	Car to Motorcycle Rear-end moving	
Paragraph	8.3.1	
Type of test	AEB	FCW
VUT Speed [km/h]	40-60	40-80
VUT direction	Forward	
Target speed [km/h]	30,45,60	
Impact location [%VUT width]	50	50 and 25
Lighting condition	Day	
Number of test	36 speed combinations (best case: 22 tests)	

*Further work need to be developed to finalize the protocol for the assessment.

CMFtap

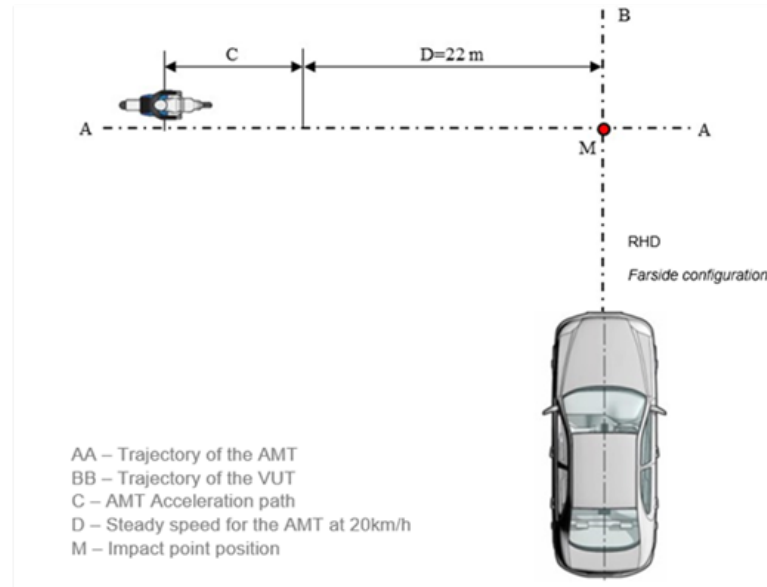
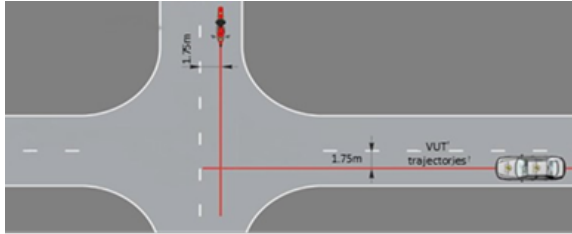
Car-to-Motorcycle Front Turn Across Path



Speed (km/h)		AMT		
		30	45	60
VUT	10	AEB	AEB	AEB
	20	AEB	AEB	AEB

	CMFtap Car to Motorcycle Front Turn Across Path
Paragraph	8.2.2
Type of test	AEB
VUT Speed [km/h]	(2026) 10,20
VUT direction	Farside turn
Target speed [km/h]	30,45,60
Impact location [%VUT width]	50
Lighting condition	Day
Number of test	6 tests

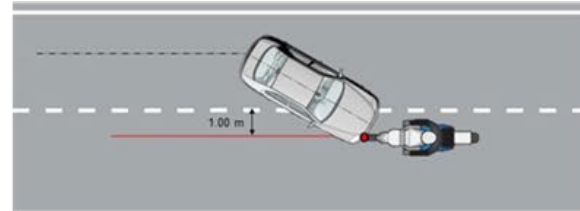
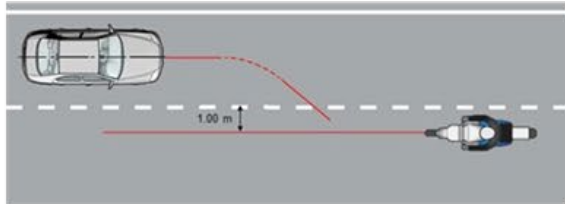
CMCrossing Car-to-Motorcycle Crossing



Speed Km/h	AMT	
	20	
VUT	20	AEB
	25	AEB
	30	AEB
	35	AEB
	40	AEB
	45	AEB
	50	AEB
	55	AEB
60	AEB	

	CMCrossing Car-to-Motorcycle Crossing
Paragraph	8.2.3
Type of test	AEB
VUT Speed [km/h]	20-60
VUT direction	Farside and nearside
Target speed [km/h]	20
Impact location [%VUT width]	50 -50% motorcycle length
Lighting condition	Day
Number of test	9 speed combinations (best case: 5 tests)

CMOncoming Car-to-Motorcycle Oncoming



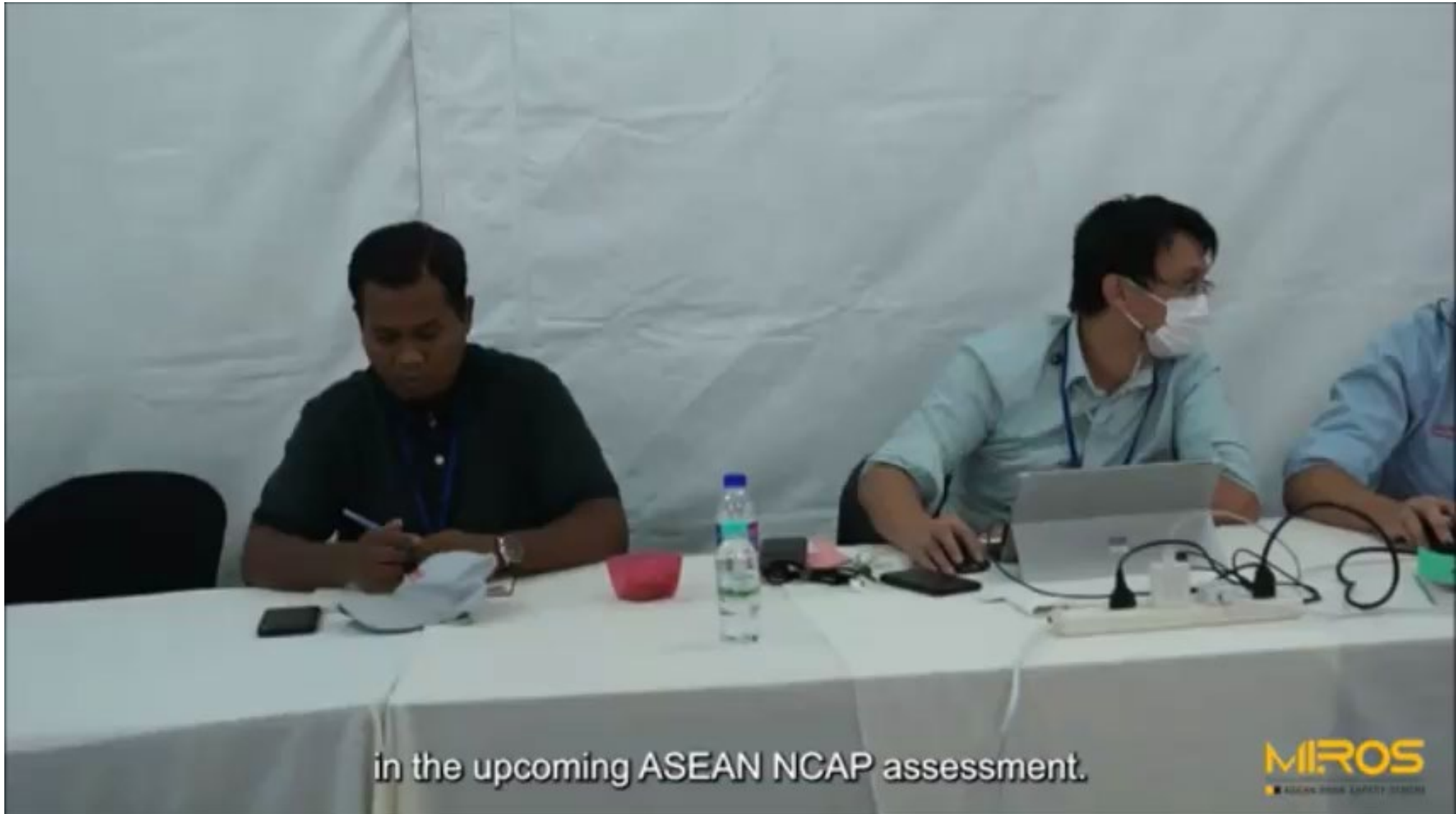
Assessment:

- Option 1: warning assessment, pass/fail with maximum intrusion point should be under 20 cm after the lane.
- Option 2 (if ELK realistic*): pass/fail criteria (fail = collision with target)

	CMOncoming Car-to-Motorcycle Oncoming
Paragraph	8.2.6
Type of test	LSS
VUT Speed [km/h]	72
VUT direction	Farside
Target speed [km/h]	60
Impact location [%VUT width]	10
Lighting condition	Day
Number of test	4 – 5 tests

*: *Emergency Lane Keeping (ELK) may raise issues due to road and traffic conditions and low Electronic Power Steering System (EPS) penetration rate.*

Video of the Crash Scenarios



Planning Schedule for New Protocol

- Protocol will be announced by April of 2024



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