



Safer Cars for ASEAN Region

ASEAN NCAP 2021 – 2030 DRAFT ROADMAP

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ASEAN NCAP 2021-2020 WORKHSOP
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FIA Foundation
for the Automobile and Society

Bloomberg
Philanthropies



GLOBAL NCAP



The Fourth Industrial Revolution

- UBER, the world's largest taxi company
 - Owns no vehicle
- FACEBOOK, the world's most popular media owner
 - Creates no content
- ALIBABA, the world's most valuable retailer
 - Has no inventory
- AIRBNB, the world's largest accommodation provider
 - Has no real estate
- ASEAN NCAP, the world's most
 - Owns no proving ground

Current Test & Assessments

50%

ADULT OCCUPANT PROTECTION

Starting from 2017 until 2020, instead of a separate rating for AOP and COP, a single rating system is introduced in which AOP contributes 50% of the overall rating with a maximum 36 points from three main assessments; offset frontal, side impact and HPT evaluation.

The test protocol for offset frontal test remains the same except for the inclusion of Q dummies replacing the existing P dummies. On the other hand, the requirement for side impact test has improved considerably from a legislation test (UN R95) to a more comprehensive test.

In addition, realizing the need to further improve the safety of occupants from side impacts, ASEAN NCAP has introduced additional requirement on the fitment of HPT in which the score is based on Fitment Rating System (FRS). HPT can be other than an airbag, as long as it protects the head. However, for technologies other than the conventional curtain or head airbags, manufacturer is requested to provide evidence that the system is effective, at least in principle, before a test can be allowed.

2012 – 2016 (AOP Single Rating)

Offset Frontal Test
• Maximum score of 16

Side Impact Test
• Compliance with UN R95
• 4-Star & above (September 2013–2014)
• 3-Star & above (2015–2016)

2017 – 2020 (50% of the Overall Rating)

Offset Frontal Test
• Maximum score of 16

Side Impact Test
• Maximum score of 16

HPT Evaluation
• The calculation is based on FRS with a maximum of 4 points

MAXIMUM OF 36 POINTS

25%

CHILD OCCUPANT PROTECTION

Protection for children in a vehicle is as important as adult protection. Currently ASEAN NCAP is separately rating adult and child.

Instead of a separate rating in 2012–2016 requirement, the new requirement for COP comprising 25% of the overall safety rating. This step is taken to ensure a vehicle receives the highest star award and also provides the best protection for the child.

Child Occupant Protection							
2012–2016 (COP Single Rating)			2017–2020 (25% of the Overall Rating)				
Dynamic Assessment		(24 Points)	Dynamic Assessment		(24 Points)		
Frontal Impact		P series dummy			Q series dummy		
		PL5	P3		Q1.5	Q3	
	Head	3	6	Frontal Impact	Head	4	4
	Chest	3	6		Chest	2	2
	Neck	3	N/A		Neck	2	2
				Side Impact	Head	4	4
CRS Based Assessment (12 Points)			CRS Installation Assessment (12 Points)				
CRS Marking	8 points per CRS		References List Assessment	10 points			
CRS to Vehicle Interface	4 points per CRS		OEM Assessment	2 points			
Vehicle Based Assessment (13 Points)			Vehicle Based Assessment (13 Points)				
Use of CRS on the Front Seats	5 points		Provision of Three-point Seatbelts	1 point			
Provision of Three-Points Seatbelts	1 point		Gabari Installation	2 points			
Gabari Assessment	2 points		2 Simultaneous Use Seating Positions	2 points			
ISOFIX	3 points		ISOFIX Usability	2 points			
Integrated CRS	2 points		Two or more Largest ISOFIX Positions	1 points			
			Passenger Airbag Warning Marking and Disabling	5 points			

Furthermore, assessment method has been improved in the new protocol for dynamic assessment by introducing Q dummies replacing P dummies. Q dummy provides better biofidelic response compared to P dummy. In addition, side impact test assessment has been added to the dynamic assessment criteria. CRS based assessment section has been replaced by CRS installation assessment. As for Vehicle Based Assessment, there will be apparent changes which includes additional requirement on passenger airbag warning, marking and disabling. The list of the CRS required for the assessment is as follows.

CRS Installation Assessment			
Reference Use	Group 0+	Maxi Cosi CabrioFix	8
	Group 0+/II	Combi Malgot	8
	Group II/III	Combi Buon Junior Air	8
	Group 0+	Britax Baby Safe Plus ISOFIX Base	1
	Group 0+/I	Maxi Cosi Milofix	1
	Group I	Britax Duo Plus	1
	Group II/III	Britax Parkway SGL	8
Q25	Q1.5	Manufacturer Selection	
	Q3	Manufacturer Selection	

25%

SAFETY ASSIST

Promotion of Safety Assist Technologies (SATs) has become of the main pillars in the new road map 2017–2020.

It contributes 25% of the overall rating with a maximum of 18 points focusing on Effective Braking and Avoidance (EBA), SBR, BST and Advanced SATs. This differs significantly from previous requirement in which only ESC and frontal SBR systems are considered as prerequisite for 5-Star AOP rating. Furthermore, the score calculation for all four elements is based on Fitment Rating System (FRS) except for advanced SATs.

Instead of only ESC, ABS is also considered in the new road map under EBA. Based on ASEAN NCAP's observation, ABS fitment rate in certain ASEAN countries is still lacking and it is still being offered as optional rather than standard equipment. As an encouragement for vehicle manufacturers, incentive is given to those vehicles fitted with rear SBRs in addition to frontal SBR. This is also part of ASEAN NCAP's mission to increase wearing rates among rear passengers beyond legislation approach.

Apart from that, in vision to reduce the number of lane-changing/merging crashes especially involving motorcycles, ASEAN NCAP introduces additional incentive for vehicle equipped with BST. This is part of ASEAN NCAP's strategic approaches in curbing the number of accidents and injuries involving motorcycles in the region. Furthermore, as a way forward for autonomous vehicle initiative around the world and harmonization with other NCAPs, advanced SATs such as AEB and several others are also included.

2012 – 2016 (Prerequisite for 5-Star AOP)

Electronic Stability Control

Seatbelt Reminder

• Driver
• Front Passenger

2017 – 2020 (25% of the Overall Rating)

Effective Braking & Avoidance

Seatbelt Reminders

Blind Spot Technology

Advanced Safety Assist Technologies*

• Anti-lock Braking System
• Electronic Stability Control

• Driver
• Front Passenger
• Rear Passengers

• Near-side
• Off-side

• 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

*Manufacturers are encouraged to propose any Advanced SATs subject to ASEAN NCAP approval.

Current Test & Assessments

WORLD FIRST??

FITMENT RATING SYSTEM

It is recognized that ASEAN NCAP has changed the landscape of automotive safety in the region. Apart from the increasing number of vehicles with higher ASEAN NCAP ratings, the demand for those vehicles among the consumers is gaining as well. Nevertheless, the positive impact is still imbalance as the safety features of specific models sold are not necessarily similar among the countries in the region and sometimes can be adversely different. Thus, ASEAN NCAP has formulated a Fitment Rating System (FRS) in order to minimize the substandard treatment.

The system applies for technologies i.e., HPT, EBA, SBR and BST. For Fitment Rating System, ASEAN NCAP has developed a formula for car technology fitment score (CTFS) summarized as follows.

$$CTFS = \frac{\sum_{i=1}^n \frac{CS_i}{CS_i}}{\sum_{i=1}^n CS_i} \times TFS$$

CTFS – Car Technology Fitment Score
CS – Country Score

TFS – Technology Fitment Score
CS – Fitment Rating Score

Each CS is determined based on the criteria and CS as listed in the respective FRS tables. It is to be noted that the value of TFS has been set forth for HPT (4 points), EBA (8 points), SBR (6 points), and BST (2 points). As for the CS, the value is based on the sectors the countries represent. The philosophy behind the country score is the 3-6-2 concept that was introduced by ASEAN NCAP in 2013. Generally, the 10 countries in the region are divided into three tiers (3 [Laos, Cambodia, Myanmar] - 6 [Malaysia, Thailand, Indonesia, the Philippines, Vietnam] - 2 [Brunei, Singapore]) based on their similarities in terms of road safety situation and automotive industry. The concept is further refined and categorized into four sectors; Sector 0, Sector 1, Sector 2, and Sector 3. Each country in the same sector represents similar CS. For example, in Sector 0, both Brunei and Singapore carry similar CS of 2 points each.

Sector 0
• Brunei
• Singapore
CS 2 points per country
Sector 1
• Malaysia
• Thailand
• Indonesia
CS 3 points per country
Sector 2
• The Philippines
• Vietnam
CS 6 points per country
Sector 3
• Laos
• Cambodia
• Myanmar
CS 1 point per country

Fitment Type	Details	Calculation Criteria
Fitment Rating System for Head Protection Technology		
Option A	Vehicle model is equipped with HPT as standard equipment	1
Option B	Vehicle model is equipped with HPT as optional equipment	0.5
Option C	Vehicle model is not equipped with HPT	0
Fitment Rating System for Effective Braking and Avoidance		
Option A	Vehicle model is equipped with ESC as standard equipment	1
Option B	Vehicle model is equipped with ESC as optional equipment but ABS as standard equipment	0.5
Option C	Vehicle model is not equipped with ESC but equipped with ABS as standard equipment	0.375
Option D	Vehicle model is equipped with ESC and ABS as optional equipment	0.25
Option E	Vehicle model is not equipped with ESC but equipped with ABS as optional equipment	0.375
Option F	Vehicle model is not equipped with either ESC or ABS	0
Fitment Rating System for Seatbelt Reminders		
Option A	Vehicle model is equipped with SBR for driver, front passenger and rear passengers as standard equipment	1
Option B	Vehicle model is equipped with SBR for driver and front passenger as standard equipment but rear passengers as optional equipment	0.75
Option C	Vehicle model is equipped with SBR for driver and front passenger only as standard equipment	0.5
Option D	Vehicle model is equipped with SBR for driver only as standard equipment	0.25
Option E	Vehicle model is not equipped with SBR	0
Fitment Rating System for Blind Spot Technology		
Option A	Vehicle model is equipped with BST for both nearside and offside as standard equipment	1
Option B	Vehicle model is equipped with BST for both nearside and offside as optional equipment	0.5
Option C	Vehicle model is equipped with BST for one side only as standard equipment	0.5
Option D	Vehicle model is equipped with BST for one side only as optional equipment	0.25
Option E	Vehicle model is not equipped with BST	0

FROM DUAL RATING TO SINGLE STAR RATING

From 2012, the dual rating system has able to increase the availability of safer cars in the market. ASEAN NCAP recorded almost 90% cars with 4-Star and above in its evaluation until August 2015. The result shows that the current system has benefited the market.

However, the weakness of the system was detected particularly in the promotion of safety. Most of the cars were promoted as a country based not on regional based. Hence, manufacturers intend to promote higher ratings compared to the lower ones.

The road map presented in this document was created based on extensive consultation with all stakeholders, especially manufacturers. The first vision draft was released in January 2014 for public comments. In February 2015, the visible structure of the ratings was announced. ASEAN NCAP received massive feedbacks from various organizations related to this road map.

The new rating system will emphasize on current and future. The ADP (current) will be given the most allocation to strengthen the crashworthiness of the cars. The future COP and Safety Assist is resilient to produce and promote better ASEAN car specifications in the future. The basis of the division is equally important to current and future. As collision avoidance is essential, protecting the child in cars is an obligation. Both are equally important subject to future safer cars and require similar attention.

Although it is almost impossible to prioritize safety issues, ASEAN NCAP pledges to solve prominent issues i.e. pedestrian, crash compatibility and autonomous driving in different forms. In line with ASEAN NCAP strategic approach, ASEAN NCAP will continue to improve the road safety situation in the region.

	ADP	COP	Safety Assist*	
ODB	16	Dynamic Assessment Frontal	16	Effective Braking & Avoidance
SIDE	16	Dynamic Assessment Side	8	Seatbelt Reminders
HPT Evaluation*	4	Installation of CHS	12	Blind Spot Technology
		Vehicle Based Assessment	13	Advance SATs
Max. Score (2)	36	ADP	18	
Normalized Score (2)	actual score / (2)	actual score / (2)	actual score / (2)	
Weighting (2)	50%	25%	25%	
Weighted Score	(2) x (3)	(2) x (3)	(2) x (3)	
Rating	calculated: normalized (2) / actual score by base for the respective star rating			
5-Star	75%	77.0	75%	36.75
4-Star	65%	23.4	60%	29.40
3-Star	45%	16.2	30%	16.70
2-Star	30%	10.8	25%	12.25
1-Star	20%	7.20	15%	7.35
				10.80
				9.00
				7.20
				3.60
				1.80
				75%
				65%
				50%
				40%
				30%

* Apply FRS

2017-2020
**ASEAN
NCAP
RATING**

Current Test & Assessments

	2011 - 2016	2017 - 2020
AOP	ODB 64	ODB 64
	UN R95*	SI 50 (ES2)
		HPT assesement
COP	Dummy : P1.5 & P3	Dummy : Q1.5 & Q3
	Dynamic Test Result from ODB only	Dynamic Test Result from ODB & SI
	CRS Based Assesment	Replaced with CRS Installation Assesment based on Reference List
	Vehicle Based Assessment	Vehicle Based Assessment
	+Integrated CRS	-Integrated CRS
SA	ESC*	ESC Standard = 8 points
	Driver & Front Passenger SBR*	All seats SBR = 6 points
		Blind Spot Technology = 2 points
		<i>Advanced SATs = 2 points</i>
Rating	Dual Rating allowed	Single Rating Only

*Pre-Requisite



Latest Result

TESTED BY	ANCAP	ASEAN NCAP
Test Year	2013	2017
Test Lab	Crashlab, Australia	JARI, Japan
Kerb Mass	1610 kg	1674 kg
INJURY		
Head/Neck	4.00 / 4.00	4.00 / 4.00
Chest	4.00 / 4.00	4.00 / 4.00
Upper Legs	4.00 / 4.00	4.00 / 4.00
Lower Legs	2.91 / 4.00	2.76 / 4.00
Total Score	14.91 / 16.00	14.76 / 16.00

Identical total score for both 2.4L variant



Market Coverage

➤ Using 2014 Sales Database (passenger car only)

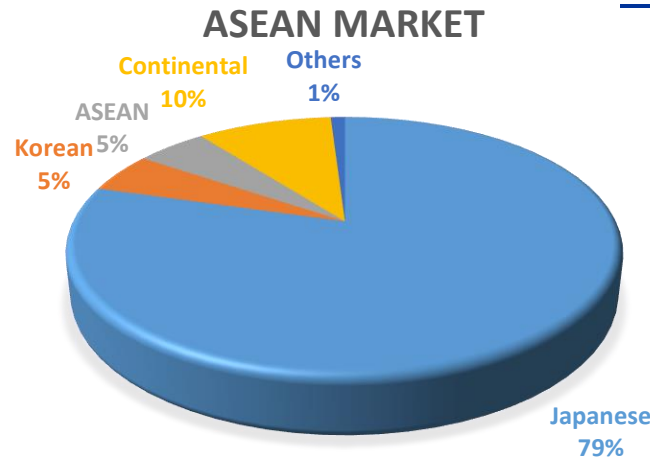
➤ By End of 2016

- **Complete Top 30 models**
- **46** models from Top 60
- **80%** market share
 - 8 out of 10 car sold in ASEAN Region rated with ASEAN NCAP.
- **95%** is 4-star & above

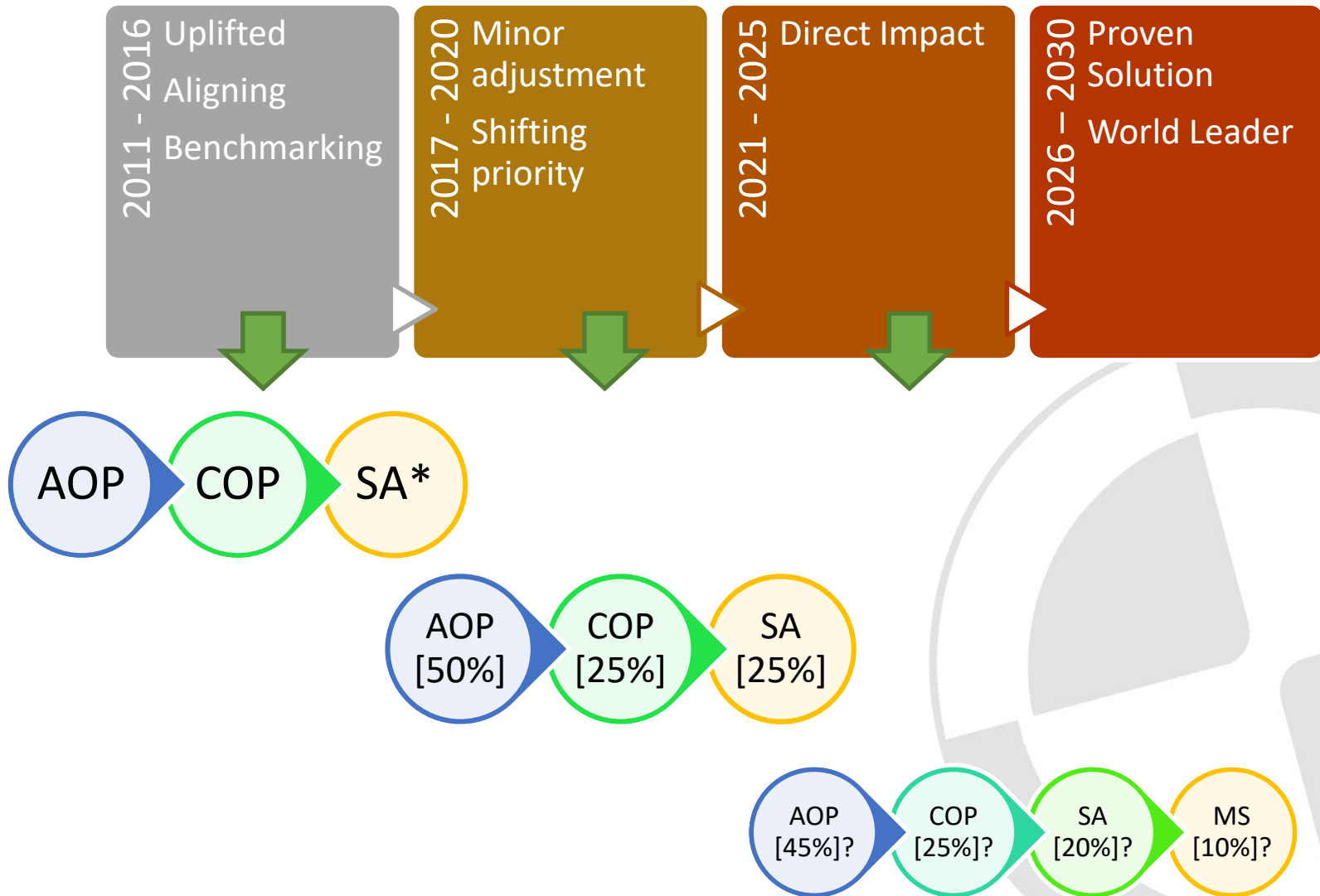
➤ Using 2015 Sales Database (passenger car only)

➤ By End of 2016

- **Complete Top 30 models**
- **46** models from Top 60
- **90%** market share
 - 9 out of 10 car sold in ASEAN Region rated with ASEAN NCAP.
- **96%** is 4-star & above



Roadmap 2021 - 2030



New Concept

DRAFT				
	2011 - 2016	2017 - 2020	2021 - 2025	2026 - 2030
AOP	ODB 64	ODB 64	ODB 64	TBD
	UN R95*	SI 50 (ES2)	SI 50 (ES2)	TBD
		HPT assesement	HPT assesement	
			SBR	
			AEB City	
COP	Dummy : P1.5 & P3	Dummy : Q1.5 & Q3	Dummy : Q1.5 & Q3	TBD
	Dynamic Test Result from ODB only	Dynamic Test Result from ODB & SI	Dynamic Test Result from ODB & SI	TBD
	CRS Based Assesment	Replaced with CRS Installation	Replaced with CRS Installation	
	Vehicle Based Assessment	Assesment based on Reference List	Assesment based on Reference List	
		Vehicle Based Assessment	Vehicle Based Assessment	
	+Integrated CRS	-Integrated CRS	-Integrated CRS	
SA	ESC*	ESC Standard = 8 points	AEB**	Automatic Emergency Steering
	Driver & Front Passenger SBR*	All seats SBR = 6 points	LDW	
		Blind Spot Technology = 2 points	LKA	
		Advanced SATs = 2 points	Driver Attention Monitor	
			AEB Pedestrian	AEB Pedestrian Nighttime
			Speed Assistance System	
MS	-	-	Blind Spot Detection	
			AEB Junction Assist	
			Auto Beam	Motorcycle Detection V2X
Rating	Dual Rating allowed	Single Rating Only	Single Rating Only	TBD

*Pre-Requirement

**Main SA Technology

OUR VIEWS : ACTIVE SAFETY

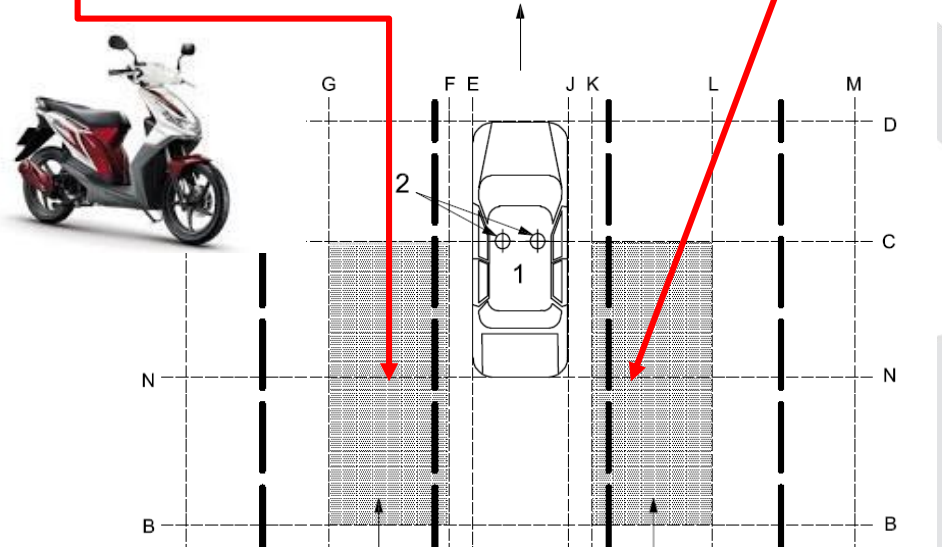
Road User	2010	2011	2012	2013	2014	2015
Motorcycle	4,036	4,169	4,178	4,294	4,179	4,203
Car	1,421	1,389	1,435	1,399	1,258	1,358
Pedestrian	626	530	530	455	515	482
Bicycle	192	172	156	159	124	107
Van	97	93	86	80	73	71
Bus	77	29	32	60	29	20
Lorry	202	247	194	210	221	223
4WD	154	151	159	158	129	130
Other	67	97	147	100	146	75
Total	6,872	6,877	6,917	6,915	6,674	6,706

- Motorcyclist dominating the road casualty list (reference Malaysia)
- Improve crashworthiness of motorcycle?
- Airbag jacket?

OUR VIEWS : ACTIVE SAFETY

- Environmental conditions
 - Flat, dry asphalt or concrete surface
 - $10^{\circ}\text{C} \pm 30^{\circ}\text{C}$
 - Horizontal visibility range greater than 1km
- Subject vehicle
 - Speed: min steady speed 20m/s
- Test target vehicle
 - Honda ICON from Indonesia: height (1053mm), length (1859mm) & width (667mm) >> most selling
 - Closing speed: 1m/s to 3 m/s
- Road geometry: straight road only
- Time of test: day only
- Frequency – 3 trials (left) + 3 trials (right)

- Left side – detectable within the defined area
- Right side – detectable within the defined area
- Optional blind spot warning suppression



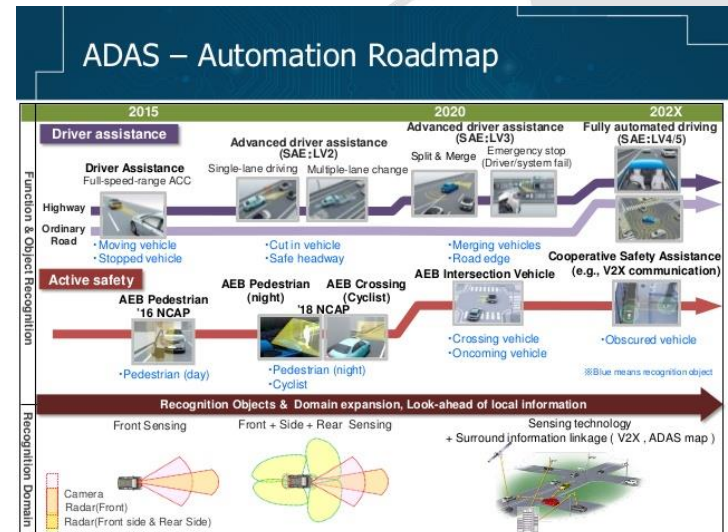
2017 - 2020

OUR VIEWS : ACTIVE SAFETY

- Considering a better headlight system benchmarking IIHS headlight rating.
- Motorcycle could be seen in advance.



- AEB for motorcycle?
- or AEB intersection for motorcycle
- Cooperation Safety Assistance i.e. V2X communication.



2021 - 2025

2026 - 2030

Making AEB more important ?

- 1st June 2018 – All passenger car in Malaysia is mandatory to install ESC.
- One of the push : ASEAN NCAP 2017 – 2020 protocols
- Future 2021 – 2025 will given more weightage to AEB, should be able to conduct AEB test (city, inter urban & pedestrian), hence pushing for regulatory?
- By 2026, we should be able to demonstrate AEB for motorcycle?

Why not focusing on Pedestrian?

Road Map for Safer Cars 2020

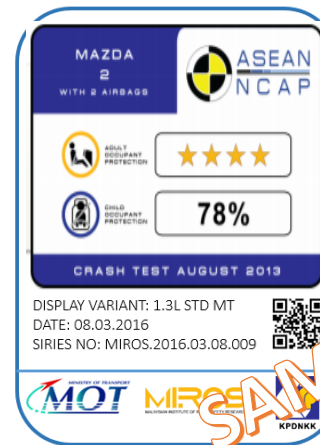
Only 10% of pedestrian occurred in the city, most in urban area. ASEAN NCAP plan to work with associates to improve pedestrian i.e. reflective clothing.

Road Map for Safer Vehicles 2020 UN Regulations* for:		All New Vehicles Produced or Imported	All Vehicles Produced or Imported
	Frontal Impact (No.94) Side Impact (No.95)	2016	2018
	Seat Belt & Anchorages (No.14 & 16)	2016	2018
	Electronic Stability Control (No. 13H / GTR. 9)	2018	2020
	Pedestrian Protection (No.127 / GTR. 9)	2018	2020
	Motorcycle Anti-Lock Brakes (No. 78 / GTR. 7)	2016	2018
	Autonomous Emergency Braking System	Highly Recommended	Highly Recommended

*or equivalent national standards such as US FMVSSs

ASEAN NCAP Initiatives

- ASEAN NCAP label soon to be displayed together with price tag in Malaysia.
- Target date:
 - 1st January 2018 as voluntary
 - 1st January 2020 as compulsory



- ASEAN NCAP is working with insurance industry in Malaysia to lower the premium for Safer Car.

ASEAN NCAP Initiatives

- Requirement for e-hailing (i.e. UBER, GRAB) vehicle in Malaysia is minimum ASEAN NCAP 3 star.



Ringkasan Dasar Kenderaan bagi Industri Teksi

	Teksi	Kereta Sewa	Limosin
Usia melesen	• Tidak lebih 3 tahun dari tarikh didaftarkan di JPJ	• Tidak lebih 10 tahun dari tarikh didaftarkan di JPJ	• Tidak lebih 3 tahun dari tarikh didaftarkan di JPJ
Had usia	• 7 tahun	• Tertakluk kepada kelulusan Puspakom	• 7 tahun
ASEAN NCAP	• Mesti memenuhi taraf tiga (3) bintang tahap piawaian Program Penilaian Kereta Baharu Rantau Asia Tenggara (ASEAN NCAP) atau yang setara dengannya.		
Pemeriksaan Puspakom	• Kenderaan mesti menjalani pemeriksaan Puspakom sekali setahun apabila melebihi usia 3 tahun dari tarikh didaftarkan di JPJ ataupun telah mencapai jarak perjalanan lebih daripada 150,000 km (yang mana terdahulu). • Meter teksi (hanya bagi teksi) mesti menjalani pemeriksaan Puspakom setiap 6 bulan		
Insurans	• Perlu mempunyai insurans yang melindungi pemandu, penumpang, kenderaan dan pihak ketiga.		
Model kenderaan	• Tidak terhad kepada mana-mana jenama dan model kereta bagaimanapun tertakluk kepada kelulusan JPJ • Segmen D kereta besar (executive compact cars dan large family cars) • Segmen E kereta eksekutif (full size cars dan mid-size luxury cars) • Segmen F kereta mewah • Segmen M kereta pelbagai guna		
Pelekat tambang	• Pelekat kadar tambang pada kedua-dua cermin penumpang belakang		• Tiada
Struktur panel	• Boleh mempamerkan 2 tanda - TEKS1M dan Hired	• Mempamerkan tanda Kereta Sewa	• Tiada
Warna badan	• Badan: Merah • Hud hadapan, bonet & bumbung kenderaan: Putih	• Badan: Merah • Bumbung kenderaan: Kuning	• Warna bebas
Tempat duduk	• 3 - 11 orang (termasuk pemandu)		

- Official Road Map 2021 – 2030 document to be released by November 2018 in Jakarta, Indonesia.
 - Revised Concept – 20 October 2017 @ Singapore
 - Cut off discussion ~ August 2018
 - ASEAN NCAP to identify possible test ground and equipment require to conduct Safety Assist / Motorcyclist Safety by November 2018
 - OEMs, researchers is encourage to work together with ASEAN NCAP to provide related research especially on effectiveness of the technology which will be introduced.
 - Let's make it OUR Roadmap.

Thank You

