

## ASEAN NCAP'S SUCCESS AND CHALLENGES IN PROMOTING SAFER VEHICLES IN THE ESCAP REGION

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### Abstract

*Starting from 2011, ASEAN NCAP has been mandated to carry out crash tests on new cars in the ESCAP region, particularly Southeast Asia. With a total population of over 630 million, the 10 countries comprising ASEAN have seen passenger vehicle sales reach over three million units. To date, 90 percent of the vehicles sold in ASEAN market have been tested by ASEAN NCAP. Their safety aspects have been greatly improved over time. But aside from the safety of car occupants, ASEAN NCAP is also concerned with the safety of vulnerable road users. In November 2018, ASEAN NCAP announced its latest road map which focuses on the safety of motorcyclists in the region. ASEAN NCAP's efforts have also been recognized by the Malaysian government, as of next year, all car dealers are to showcase the star rating issued by ASEAN NCAP on the car's front windshield and side mirror in all showroom and sales centres in Malaysia. This is to educate buyers to choose the models that give priority to the best rating. The current paper shall provide an overview of the results produced by ASEAN NCAP, including its success and challenges to elevate the safety standards of passenger vehicles in the Southeast Asian market. In addition, the last section will describe ASEAN NCAP road map which guides its journey toward achieving SDG targets 3.6 and 11.2.*

**Keywords:** ASEAN NCAP, Safety Star Rating, MIROS PC3, UN Decade of Action, SDG targets

### 1. INTRODUCTION

The New Car Assessment programme for Southeast Asian Countries or ASEAN NCAP was established in December 2011 through a joint effort by Global NCAP and Malaysia's Institute of Road Safety Research (MIROS). Similar to other NCAPs operating in different parts of the world, namely the United States, Latin America, Europe and Australia/New Zealand, ASEAN NCAP's primary motivations are to improve motor vehicle safety standards, build a market for safer vehicles and raise consumer awareness (GNCAP, 2011). Such objectives are in line with the UN Decade of Action for Road Safety 2011–2020, Pillar 3 Safer Vehicle.

Since its launch, ASEAN NCAP has performed a series of crash tests on new cars entering the ESCAP region particularly Southeast Asia to ensure safe design standards in crashworthiness and crash compatibility for various brands and models before awarding them with the safety star rating. Over a span of 8 years, ASEAN NCAP has tested almost 90 percent of the passenger cars sold in the Southeast Asian market. More than 100 ratings have been produced, and 3 road maps have been introduced since ASEAN NCAP was first unveiled (ASEAN NCAP, 2019)

Due to ASEAN NCAP's efforts, the safety aspects of passenger vehicles in the ESCAP region particularly in Southeast Asia have clearly witnessed tremendous improvements as opposed to in the past. For instance, in 2008, a certain passenger car model was merely fitted with a single airbag. Today, however, the same model is sold in ASEAN countries with 7 airbags and Electronic Stability Control (Khairil Anwar, 2018). Aside from passenger car occupants, ASEAN NCAP is also concerned with the safety of vulnerable road users (VRUs) especially motorcyclists. Hence, most new models offered to potential buyers in Southeast Asia are now equipped with the blind spot technology to reduce the risk of collision with motorcyclists (ASEAN NCAP, 2018).

The current paper aims to provide an overview of the results produced by ASEAN NCAP, including its success and challenges to elevate the safety standards of passenger vehicles in the Southeast Asian market. In addition, the last section will describe ASEAN NCAP road map which guides its journey toward achieving SDG target 3.6 on halving the number of global deaths and injuries from road traffic accidents;

and SDG target 11.2 on providing access to safe, affordable, accessible and sustainable transport systems as well as improve road safety for all.

## **2. BACKGROUND INFORMATION OF THE NEW CAR ASSESSMENT PROGRAMMES**

In 1979, the National Highway Traffic Safety Administration (NHTSA) started the New Car Assessment Programme (NCAP) to encourage buyers to demand safer vehicles and auto makers to supply them. NHTSA's first standardised frontal crash test was performed on 21 May 1979, and the results were made public five months later. The agency established a frontal impact test protocol based on Federal Motor Vehicle Safety Standard 208 ("Occupant Crash Protection") or FMVSS No. 208 (NHTSA, 2015).

Aside from NHTSA, an independent non-profit organization, the IIHS, was also formed. Headquartered in Arlington, Virginia, IIHS strives to reduce the number of motor vehicle traffic collisions, and the rate of injuries and amount of property damage in such crashes. In addition, the institute carries out research and gives ratings for top-selling passenger vehicles as well as for certain consumer products such as the child restraint systems (Lam, 2014).

IIHS's frontal crash test, which began in 1995, differs from that of the NHTSA programme in that the former performs offset test. In the offset test, 40 percent of the front of the vehicle is exposed to an impact with a deformable barrier at approximately 65 km/h. Further, IIHS evaluates six individual categories, awarding each a "Good", "Acceptable", "Marginal", or "Poor" rating before providing the vehicle's overall frontal impact rating (Lam, 2014).

Across the Atlantic, the European New Car Assessment Programme (Euro NCAP) was founded in 1997 and was based in Leuven, Belgium. With its slogan "For Safer Cars", the programme gained the recognition of several European governments, in addition to the support by the European Union.

Euro NCAP's frontal tests are performed at 64 km/h into an offset deformable barrier. Additionally, Euro NCAP's side impact tests are conducted at 50 km/h, while the side impact pole test is performed at 32 km/h. The pedestrian safety tests, on the other hand, are carried out at 40 km/h (Euro NCAP, 2015).

Meanwhile, the Australasian New Car Assessment Programme (ANCAP) was launched in 1993 to carry out the crash testing of passenger vehicles sold in Australia and New Zealand and disseminating results to consumers. To date, ANCAP has published crash test results for thousands of passenger and light commercial vehicles. The tested vehicles are awarded ANCAP safety rating between 1- and 5-Star. To achieve the maximum 5-Star safety rating, a vehicle must reach the highest standards in all tests and include advanced safety assist technologies (GNCAP, 2017).

Established in 2010, the Latin American & Caribbean New Car Assessment Programme (Latin NCAP), on the other hand, is backed by the Inter-American Development Bank (IADB) following the Euro NCAP and other similar programmes around the world. Latin NCAP, however, focuses on the active and passive safety features of new cars sold in Latin America and the Caribbean (GNCAP, 2017).

Finally, the latest addition to the NCAP family is the New Car Assessment Programme for Southeast Asia or ASEAN NCAP. Unveiled in December 2011, the automobile safety rating programme was jointly established by Malaysia Institute of Road Safety Research (MIROS) and Global NCAP. With the existence of a new car assessment programme which exclusively focuses on the Southeast Asian market (see Figure 1), safety aspects of new passenger cars in the region immediately experienced positive changes (Khairil Anwar, 2018).

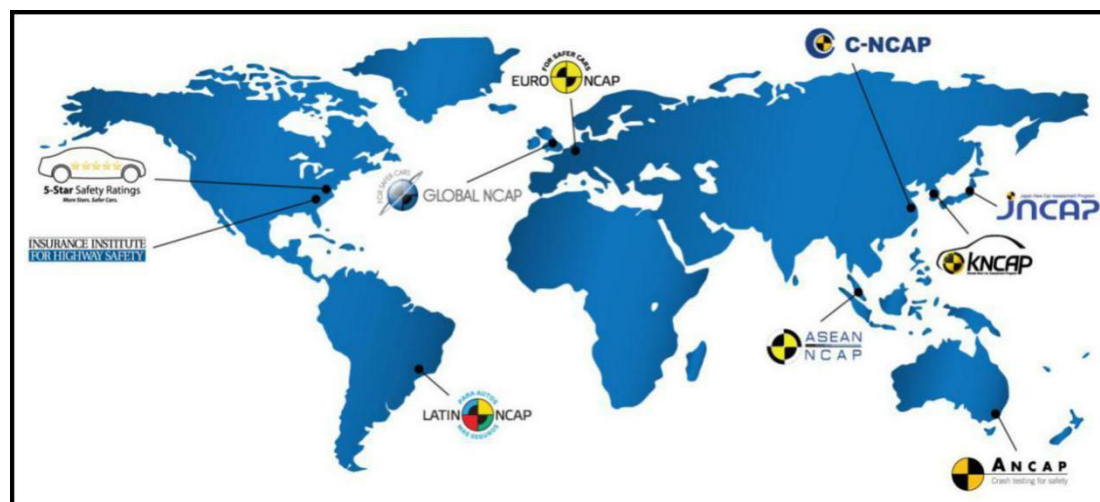


Figure 1.  
New Car

Assessment Programmes (NCAPs) in different parts of the world

### 3. SAFER VEHICLES AS THE KEY TO SAFER ASEAN ROADS

The Association of South East Asian Nations or ASEAN comprises Brunei, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam. With a combined total population of over 630 million, the 10 ASEAN countries have seen passenger vehicle sales soar to over three million units since 2012 (Yamakawa, 2018). Among the member nations, Thailand, Malaysia and Indonesia have emerged as the largest car manufacturers with 90 percent Total Industry Production (TIP) as well as 86 percent Total Industry Volume (TIV) (Deutsche Bank Research, 2011).

Unfortunately, road traffic fatalities involving car occupants, motorcyclists, pedestrians, and cyclists have remained a cause of major concern around the world, including in Southeast Asia. In its Global Status Report on Road Safety 2018, the World Health Organization (WHO) estimates that 1.35 million people perish each year due to road traffic accidents. In another report for 2013, Thailand was placed at the top of the most dangerous roads list with a death rate of 36.2 per 100,000 population whereas Malaysia registered a death rate of nearly 23 per 100,000 population. Indonesia and the Philippines have also made the list by registering 15 and 11 death rates respectively (WHO, 2013).

Recent reports also suggest that more than 50 percent of all road traffic fatalities involve VRUs, with motorcyclists accounting for more than half of the number in four ASEAN countries, namely Cambodia, Lao People's Democratic Republic, Malaysia and Thailand. The economic consequences of motor vehicle crashes have also been estimated to cost most countries around 3 percent of their gross domestic product (WHO, 2018).

To improve road safety and curb traffic fatalities, the Global Plan for the Decade of Action for Road Safety 2011-2020 was formulated by giving due attention to five "pillars", namely (a) building road safety management capacity, (b) improving the safety of road infrastructure, (c) further developing the safety of vehicles, (d) enhancing the behaviour of road users, and (e) improving emergency and other post-crash services (WHO, 2013).

Among its activities, the Decade of Action clearly calls for improved vehicle safety technologies for both passive and active safety through a combination of harmonization of relevant global standards, consumer information schemes and incentives to accelerate the use of new technologies.

Hence, safer vehicles play a vital role in alleviating the risk of crashes and reducing the likelihood of serious injury. There are several UN regulations on vehicle safety that, if applied to countries' manufacturing and

production standards, would potentially reduce road deaths. These include demanding vehicle manufacturers to meet front and side impact regulations, to install electronic stability control to prevent over-steering and to ensure fitment of airbags and seat-belts in all vehicles (WHO, 2018).

Regardless, before the emergence of ASEAN NCAP, the safety of passenger vehicles which populated ASEAN roads have not been duly emphasized. For example, fitment of the airbag was not mandatory whereby the ratio of the vehicles installed with airbag compared to the vehicles without was 20:80. The inception of ASEAN NCAP was therefore regarded by many as a step in the right direction to create a paradigm shift in the region's automotive ecosystem (Zulhaidi et al., 2013).

#### **4. ASEAN NCAP TEST RESULTS**

In January 2013, ASEAN NCAP announced the programme's First Phase results involving eight cars from seven different crash-test models. All these models are sold in the Southeast Asia region, and they include Ford Fiesta, Honda City, Toyota Vios, Perodua Myvi, Hyundai i10, Proton Saga (no longer in production since January 2013) and Proton Saga FLX+ (currently known as Saga SV).

At this point, the rating scheme was separated into two assessments encompassing the star-rating for Adult Occupant Protection (AOP) and the percentage-based rating for Child Occupant Protection (COP). Ford Fiesta managed to reach the highest standard (5-Star) among the tested models with overall AOP score of 15.73. Honda City came in second with 15.44 points (5-Star range, which was valid for the variant with ESC).

In the First Phase, the lowest AOP score was obtained by the Proton Saga with 4.3 points, enabling it to be awarded 1-Star rating. Such a low score was mainly attributed to excessive head injury level sustained by the Front Passenger. Due to absence of frontal airbag and seatbelt pre-tensioner aside from excessive seat movement, the Front Passenger's head impacted the instrument panel. ASEAN NCAP, nevertheless, was notified that the model would no longer be in production effective from January 2013 and was soon to be replaced. A reconciliation test was conducted on the new Proton Saga FLX+ model at the end of Phase I and it managed to attain 3-Star (Khairil Anwar, 2018).

Results of Phase I tests showed a significant gap between the best and the worst; with Ford Fiesta obtaining 5-Star rating with the highest overall AOP score (15.73) while Proton Saga FLX reached 1-Star rating with the lowest AOP score of 4.3. As for COP, Honda City achieved the highest percentage (81.2 percent), followed by Ford Fiesta (66 percent) while the remaining cars obtained about 50 percent each (Khairil Anwar, 2018).

In summary, seven popular models had been successfully crash tested and assessed in ASEAN NCAP's First Phase. The official results were then posted on ASEAN NCAP website ([www.aseancap.org](http://www.aseancap.org)) to be retrieved by the general public. Such an announcement has been the prime objective of NCAP as these test results are hoped to raise awareness about the safety ratings of car models available in the ASEAN market. ASEAN NCAP believes this would lead to consumers being able to make an informed choice in regard to purchasing a brand new car.

The ASEAN NCAP Star Rating results for Phase I crash tests are as follows:

<b>Vehicle tested</b>	<b>Star rating</b>
Ford Fiesta	★★★★★
Honda City	★★★★★
Toyota Vios	★★★★★
Nissan March	★★★★★
Perodua Myvi	★★★★★
Hyundai i10	★★★★★
Proton Saga	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)

While Phase I of ASEAN NCAP's assessment comprised eight test models, Phases II and III each featured 11 test vehicles. Phase II results were announced on 29 August 2013 at MIROS in Kajang, Selangor, in the presence of all ASEAN NCAP steering and technical committee members.

The ASEAN NCAP Star Rating results for Phase II crash tests are as follows:

<b>Vehicle tested</b>	<b>Star rating</b>
Toyota Prius	★★★★★
Honda Civic	★★★★★
Subaru XV	★★★★★
Suzuki Swift	★★★★★
Mazda 2	★★★★★
Mitsubishi Mirage	★★★★★
Toyota Avanza	★★★★★
Perodua Alza	★★★★★
Nissan Almera	★★★★★
Daihatsu Xenia	★★★★★
Misubishi Pajero Sport	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)

At the launch of the Phase II results, Australasian NCAP (ANCAP) noted that "Since the release of Phase I results earlier this year, ASEAN NCAP have not only conducted another round of successful tests, they have also developed strong relationships with manufacturers, approved another lab for testing within the region, and expanded the scope of their test programme to include larger people movers and SUVs. The benefits we have seen across Australia and New Zealand as a result of ANCAP testing are sure to be seen across the ASEAN as a result of their growing test programme," (Automotive World, 2013).

Following this, ASEAN NCAP Phase III test results were announced during two parallel sessions on 5 May 2014, namely the Results Launching with Consumers' Viewing at Philea Resort & Spa in Malaysia and the 2014 Global NCAP Forum in Australia. A total of 11 popular car models had been tested in Phase III.

The ASEAN NCAP Star Rating results for Phase III crash tests are as follows:

Vehicle tested	Star rating
Honda CR-V	★★★★★
Proton Prevé	★★★★★
Toyota Corolla Altis 2.0	★★★★★
Chevrolet Colorado	★★★★★
Toyota Corolla Altis	★★★★★
Volkswagen Polo	★★★★★
Kia Picanto (6 airbags)	★★★★★
Peugeot 208	★★★★★
Chevrolet Sonic	★★★★★
Isuzu D-Max	★★★★★
Kia Picanto Non- Airbag	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)

- ASEAN NCAP's first 0-Star was awarded to the Kia Picanto brought from Thailand. The car did not come with any airbag.

In 2014, ASEAN NCAP assessed another 12 models with 14 variants. The summary of the achievements are as indicated as follows. The Q3 and Q4 2014 tests involved the Tata Vista, Honda City (2014), Perodua Axia, Honda Jazz (2014), Proton Iriz and Nissan Teana. Results of Q3 and Q4 2014 are highlighted in the following table:

Vehicle tested	AOP	COP
Tata Vista	★★★★★	★★★★★
Honda City (2014)	★★★★★ ★★★★★	★★★★★
Perodua Axia	★★★★★	★★★★★
Honda Jazz (2014)	★★★★★ ★★★★★	★★★★★
Proton Iriz	★★★★★	★★★★★
Nissan Teana	★★★★★	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)

Six new manufacturers were involved in ASEAN NCAP in Phases 3 and 3+, with the Nissan Teana recording the highest achievement in ASEAN NCAP's tests by scoring 16/16 for frontal test. Its COP also reached 5-Star for the first time in history.

In addition, the Perodua Axia, the compact car from Malaysia reached 4-Star and was the most affordable 4-Star car in ASEAN with the price of USD 8,000 whereas the Proton Iriz with standard ESC fitment was the most affordable 5-Star car in ASEAN.

Further, the first left-hand drive (LHD) vehicle tested in ASEAN NCAP was Honda CR-V, produced in Thailand for the Philippines and Viet Nam market. Aside from the results launching of Phase III held in Melbourne and Melaka, ASEAN NCAP also launched several results during ASEAN NCAP Grand Prix 2014 and the final result for Nissan Teana during ASEAN Automobile Safety Forum 002 in Bangkok, Thailand (Khairil Anwar, 2018).

As for 2015, the Q1 and Q2 tests involved the Perodua Myvi (2015) and Suzuki S-Cross. It should also be noted that starting from January of the year, ASEAN NCAP had introduced the side impact test (UN R95) as a new pre-requisite for 3-Star and above. Also, COP was presented in star-rating form. Results of Q1 and Q2 2015 are highlighted in the table below:

Vehicle tested	AOP	COP
Perodua Myvi (2015)	★★★★★	★★★★★
Suzuki S-Cross	★★★★★	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)

Additionally, the Q3 and Q4 tests in 2015 included Mitsubishi Triton, Honda HR-V, Toyota Rush, Great Wall Haval M4, Mitsubishi Triton (High Variant), Datsun GO, Daihatsu Ayla (non-airbag), Daihatsu Ayla, Toyota Agya, Toyota Hilux and Ford Ranger. Results of ASEAN NCAP's Q3 and Q4 2015 tests are indicated in the following table:

Vehicle tested	AOP	COP
Mitsubishi Triton	★★★★★	★★★★★
Honda HR-V	★★★★★ ★★★★★	★★★★★
Toyota Rush	★★★★★	★★★★★
Great Wall Haval M4	★★★★★	★★★★★
Mitsubishi Triton (High Variant)	★★★★★	★★★★★
Datsun GO	★★★★★	★★★★★
Daihatsu Ayla (Non-Airbag)	★★★★★	★★★★★
Daihatsu Ayla	★★★★★	★★★★★
Toyota Agya	★★★★★	★★★★★
Toyota Hilux	★★★★★ ★★★★★	★★★★★
Ford Ranger	★★★★★ ★★★★★	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)

Afterwards in 2016, ASEAN NCAP's Q1 and Q2 tests featured Ford Everest, Hyundai i10 (2015), Nissan Grand Livina, Toyota Innova, Toyota BR-V, Volkswagen Vento, Nissan X-Trail, Suzuki Ertiga, Suzuki Ciaz and Kia Morning. Our Q1 and Q2 2016 results are as shown below:

Vehicle tested	AOP	COP
Ford Everest	★★★★★	★★★★★
Hyundai i10 (2015)	★★★★★	★★★★★
Nissan Grand Livina	★★★★★	★★★★★
Toyota Innova	★★★★★ ★★★★★	★★★★★
Toyota BR-V	★★★★★ ★★★★★	★★★★★
Volkswagen Vento	★★★★★ ★★★★★	★★★★★
Nissan X-Trail	★★★★★	★★★★★
Suzuki Ertiga	★★★★★	★★★★★
Suzuki Ciaz	★★★★★	★★★★★
Kia Morning	★★★★★	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)

The crash test videos can be accessed on ASEAN NCAP Youtube channel. Additionally, ASEAN NCAP has also published “Safer Cars for ASEAN Region: A Compilation of ASEAN NCAP Test Results 2016 Update”. The publication encompasses the test results from Phase I in 2012 to Q1 & Q2 tests in 2016.

Later, on 19 December 2017, ASEAN NCAP announced four new crash test results for the fourth quarter of 2017 which included:

Vehicle tested	Star rating
Perodua Myvi	★★★★★
Toyota Vios	★★★★★
Chery Transcab	★★★★★
Suzuki Carry	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)

- The All-New Perodua Myvi moved up one level by obtaining 5-Stars with an overall score of 88.27 points. From this score the Myvi obtained 45.43 points for AOP, 22.01 points for COP and 20.83 points for SATs.
- The Toyota Vios overall score was 81.63 points thus falling into the 5-Star category. The overall score can be broken down according to each domain with 44.70 points for AOP, 21.66 points for the COP and 15.28 points for SATs category.
- The Chery Transcab was awarded 0-Star with an overall score of 17.04 points. This light commercial vehicle’s points were based on its AOP domain, specifically from its side impact score.
- The Suzuki Carry, a light commercial vehicle with a single cab, scored low under the ASEAN NCAP new protocol. The model received an overall score of 17.14 points, which was based on its frontal offset assessment. This score placed the Carry with 0-Star rating.

ASEAN NCAP Q2 2018 crash tests, in addition, featured three models, namely Hyundai IONIQ Hybrid, Toyota Rush and Toyota C-HR. The overview of the results are as follows:

Vehicle tested	Star rating
Hyundai IONIQ Hybrid	★★★★★
Toyota Rush	★★★★★
Toyota C-HR	★★★★★

Source: [www.aseancap.org](http://www.aseancap.org)



- The Hyundai IONIQ Hybrid was awarded with 5-Star rating by reaching a total score of 91.98 points. The hatchback's score was accumulated from the three assessed domains with 46.34 points for AOP, 21.48 points for COP and 24.17 points for SATs.
- The new Toyota Rush was eligible for 5-Star ASEAN NCAP rating with an overall score of 84.03 points. The SUV obtained this accumulated score from 43.25 points for AOP, 21.33 points for COP and 19.44 points for SATs categories
- The Toyota C-HR reached an overall score of 91.31 points with 5-Star rating. The model's result was accumulated from AOP at 49.72 points, COP at 20.86 points and SATs with 20.73 points

Finally, the latest ASEAN NCAP result features the new Toyota Majesty/Granvia, which reached 5-Star rating with an accumulated score of 89.51 points. The score for each of the category the MPV was assessed included 46.31 points for AOP, 22.93 points for COP and 20.27 points for SATs (ASEAN NCAP, 2019).

## 5. ASEAN NCAP'S SUCCESS

In line with SDG targets 3.6 and 11.2, the introduction of ASEAN NCAP has made the issue of motor vehicle safety more prominent in the Southeast Asian automotive sphere. More automobile manufacturers have, as a result, displayed interest to include ASEAN NCAP ratings in their product brochures. Among the successes of the ASEAN NCAP to be elaborated here include introducing the Affordable Safety concept, gaining recognition and support from the government in promoting safer cars, enhancing cooperation among ASEAN automotive fraternity, emphasizing the use of advanced technologies to reduce road crashes, and promoting ESC as a standard in Malaysia and ASEAN.

### 5.1 Introducing the Affordable Safety Concept

To date, ASEAN NCAP has assessed more than 80 new passenger vehicles comprising 25 brands, therefore covering 90 percent of the market share. In the context of the Southeast Asia region, 'safer cars' are those which have obtained ASEAN NCAP score of at least 4 Stars compared with the ones registered on the road upon successfully obtaining VTA from the road transport department in their respective countries (Zulhaidi et al., 2013).

In 2014, ASEAN NCAP presented the Affordable Safety concept in a bid to ensure even the most economical cars could meet ASEAN NCAP basic standards. As a consequence, two models from Malaysia's national car makers, namely Proton and Perodua gained the advantage from such a concept.

The Proton Iriz which was awarded 5-Star for AOP (14.07/16.00 points) and 4-Star for COP (82 percent) is priced as low as RM 41,520 (USD 10,278). On the other hand, the Perodua Axia which obtained 4-Star for AOP (12.91/16.00 points) and 4-Star for COP (71 percent) is sold from as low as RM 24,437 (USD 6,054). These models embody ASEAN NCAP's slogan that 'Safety is Affordable' (Khairil Anwar, 2018).

Additionally, through both Vehicle Type Approval (VTA) obtained from the Road Transport Department and the assessments performed by ASEAN NCAP, the latter has been able to raise the safety specifications particularly for the base model which include:

- All cars in the new car market are now fitted with airbag. Some even boast dual airbags (DAB & PAB).
- Electronic Stability Control (ESC) is fitted in affordable cars such as Proton Iriz. This also has made Anti-Lock Braking System (ABS) seem out-dated.
- More child safety features, namely ISOFIX and top tether are installed by OEMs.
- Safety package as a whole is no longer a luxury and is within majority of users' reach.
- Proton and Perodua have not significantly increased their price although their cars come with reinforced body structure and safety equipment.
- Perodua Axia is acknowledged as the most affordable car in Malaysia with 4-Star for AOP.

- Proton Iriz is the most affordable 5-Star for AOP car in Malaysia with ESC being a standard across all variants.

## **5.2 Gaining Government Recognition and Support in Promoting Safer Cars**

With the support of the Ministry of Domestic Trade and Consumer Affairs Malaysia, ASEAN NCAP has introduced the ASEAN NCAP Labelling Compliance Guideline in order to reduce potential confusion on the information provided by the new car assessment programme and encourage the dissemination of safety information to consumers. This guideline shall apply to all cars assessed by ASEAN NCAP and those which have yet to be tested. At the same time, the Malaysia Consumerism Standard Division has agreed to organize awareness campaigns to educate the public about the labeling system and safety rating based on the safety features of the vehicles they own (Paultan.org, 2019).

Further, beginning 1 March 2020, passenger vehicles being displayed in all sales and showroom centres, hypermarkets, etc are compelled to present their respective safety rating as endorsed by ASEAN NCAP. The label will definitely add value to a certain model and attract interest of buyers for its recognized safety standards, aside from the information on vehicle specifications and QR codes. In addition, KPDNHEP will use the Trade Descriptions Act (APD) 2011 to enforce the guideline (KPDNHEP, 2019).

Although the collaboration is between the Ministry of Domestic Trade and Consumer Affairs Malaysia and ASEAN NCAP, the guideline can also be applied to other ASEAN countries.

## **5.3 Enhancing Cooperation Among ASEAN Automotive Fraternity**

Various collaborators, governmental institutions, contributors and manufacturers have come together in aid of the new car assessment programme in Southeast Asia. To date, ASEAN NCAP has received strong support from Automobile Associations of Malaysia (AAM), the Philippines (AAP), Singapore (AAS), Cambodia, and Thailand (RAAT), whereby they are involved in the ASEAN NCAP Steering Committee. ASEAN NCAP has also collaborated with such associations in the dissemination of information regarding safer cars as well as educating consumers in their respective countries (Zulhaidi, et al., 2015).

In addition, a Technical Committee to lend assistance in crash test – comprising The Sirindhorn International Thai-German Graduate School of Engineering, University of the Philippines National Centre for Transportation Studies, Institut Teknologi Bandung, Australasian NCAP, Euro NCAP, and Japan NCAP – has also been formed.

More recently, ASEAN NCAP has launched the ASEAN NCAP Collaborative Holistic Research (ANCHOR) Project as part of its effort to elevate vehicle safety in the Southeast Asia. ANCHOR shall feature a collaborative research project between ASEAN NCAP, Universiti Teknologi PETRONAS (UTP), Haluoleo University, Indonesia, Universiti Teknologi Malaysia (UTM) and International Islamic University Malaysia (IIUM), with the aim of gathering information to build a database for safer riding experiences among motorcyclists in the region, particularly for Malaysia and Indonesia (ASEAN NCAP, 2019).

## **5.4 Emphasizing The Use of Advanced Technologies to Reduce Road Crashes**

Since the establishment of ASEAN NCAP nearly 8 years ago, more technologies that could help reduce road accidents have been offered by car manufacturers to consumers in Southeast Asia. In previous time, the airbag was considered a safety feature only available to expensive car owners. Today it has become a standard fitment where most cars are equipped with at least 2 airbags. ESC and ABS have also become a necessity for drivers in the ASEAN region.

Looking ahead, ASEAN NCAP aims to promote various technologies that can assist drivers such as advanced rear-view mirror, blind spot technology, and auto high beam. In addition, ASEAN NCAP shall give greater attention on the safety of two-wheeler riders in Southeast Asia and shall encourage implementation of autonomous emergency braking system (AEB) as well as anti-lock brakes (ABS) for

motorcycles. In the foreseeable future, ASEAN NCAP also plans to cover other prominent safety issues such as pedestrian crash compatibility and also autonomous driving (ASEAN NCAP, 2019).

### **5.5 Promoting ESC as A Standard In Malaysia and ASEAN**

Aside from performing crash tests in accordance with the United Nation Regulations 94 and 95, ASEAN NCAP has constantly stressed on the use of safety assist technologies that can reduce the number of road traffic collisions.

Hence, given the substantiated benefits of ESC in preventing single-vehicle, run-off-road crashes, especially those with more serious outcomes, the implementation of ESC has been accelerated to cover the full range of passenger vehicles in the Malaysian automobile market through the efforts carried out by both Malaysia's Institute of Road Safety Research (MIROS) and ASEAN NCAP.

Subsequently, MIROS took the initiative to recommend and propose the use of ESC in passenger vehicles to the Malaysian government, through the Ministry of Transport, to reduce road traffic fatalities in the country. The recommendations were also made in line with the objectives of the UN Decade of Action for Road Safety 2011-2020.

Following such a recommendation, Malaysia's Minister of Transport made the timely announcement that all new models of passenger cars marketed in the country must be equipped with the safety system by June 2018 (Paultan.org, 2016).

Describing ESC as the most cost-effective life-saving device at present, the Minister of Transport also stated that the use of ESC in Malaysia, with its tropical climate and heavy rain, will be able to curb road accidents involving passenger vehicles on slippery roads (Todayonline, 2016). This is in line with the findings by the Royal Malaysia Police that more than 45 percent of fatal accidents in Malaysia are caused by loss of vehicle control.

In terms of the potential increase in the cost of vehicles as a result of such a ruling, the Malaysian government believes the increase to be small enough for carmakers to absorb. While ESC has been standard safety equipment in premium cars, the system is being passed on to the masses and can be found in more affordable medium and small vehicles (Carlist.my, 2016).

Although at present only Malaysia has made ESC mandatory by law in the region, ASEAN NCAP has updated its test protocol in 2017 whereby vehicles that do not offer ESC as standard across its range in all ASEAN countries will only be granted a maximum rating of 2 Stars, regardless of their performance in the crash test (Khairil Anwar, 2018).

## **6. CHALLENGES**

Success in elevating the safety standards of passenger vehicles in Southeast Asia does not come by easily. As such, ASEAN NCAP has been faced with numerous challenges in its quest to build a market for safer vehicles and raise consumer awareness. The key challenges to ASEAN NCAP shall be discussed below.

### **6.1 Test Spectrum and Adoption of Domestic Values**

Subject to funding and availability of resources, ASEAN NCAP plans to introduce more comprehensive crash procedures in the near future. Currently, frameworks are being put in place to include other configurations including pole crash tests in the upcoming stages. Furthermore, there have been suggestions for ASEAN NCAP to adopt domestic road safety issues in its safety pillars such as to include motorcycle- and pedestrian-related assessments in order to represent the most vulnerable road user groups in the Southeast Asia region (Zulhaidi et al., 2015).

## 6.2 Language Barrier

ASEAN NCAP programme has been set up to spread the message that vehicle safety in Southeast Asia is affordable. Regardless, its assessment results as well as the ASEAN NCAP star rating are presented in the English language and therefore, may not be easily understood by the whole ASEAN population due to language differences (Zulhaidi et al., 2015). It is therefore hoped that various parties, whether responsible agencies or non-governmental organizations, will be able to share the information provided by ASEAN NCAP in their respective languages through the use of traditional and new media technologies.

## 6.3 Budgetary Constraint

ASEAN NCAP is currently funded by both MIROS and Global NCAP. In addition, the programme has also received non-monetary support from various agencies, technical partners and road safety initiatives from around the world. In ensuring the sustainability and expansion of progressive tests in addition to effective dissemination of information, ASEAN NCAP is seeking more assistance be it in monetary or non-monetary form (Zulhaidi et al., 2015).

## 7. ASEAN NCAP ROAD MAP 2021 - 2025

Starting in September 2017, ASEAN NCAP has organized several brainstorming sessions with industry players in ASEAN, its steering and technical committee members, academics as well as non-governmental organizations in a bid to understand the most recent road safety issues as well as the readiness of passenger vehicle safety latest technology in the region. In addition, the ASEAN NCAP Collaborative Holistic Research (ANCHOR) has also been initiated to support the latest rating road map, ASEAN NCAP Road Map 2021 - 2025.

Upon deliberation of all the proposals, ASEAN NCAP has decided that its Road Map 2021 - 2025 shall feature 4 pillars. Aside from adult occupant protection (AOP), child occupant protection (COP) and safety assist (SA), motorcycle safety will also be included in ASEAN NCAP's upcoming assessment. Further, for each of the pillars, there shall be additional statements and improvements to the previous rating systems. For example, under COP, ASEAN NCAP Road Map 2021 - 2025 shall include tertiary safety for a child passenger, namely child presence detection in an effort to reduce the cases of a child being left unaccompanied in the car.

The new road map shall also be emphasizing auto emergency braking (AEB) which is a feature to alert drivers to an imminent crash. ASEAN NCAP believes that such technology is important and has been well-received by most car manufacturers. ASEAN NCAP shall also place greater attention to AEB City and Inter-Urban. Nevertheless, ASEAN NCAP has decided to delay the introduction to AEB Pedestrian, albeit having the potential to reduce pedestrian fatalities, until sufficient data is obtained from various studies.

Rear occupant protection shall also be given a close attention in the road map, whereby a total of 50 percent will be rewarded for seat-belt reminder (SBR) rear occupant detection. Such a decision provides evidence that ASEAN NCAP will be focusing on the use of seat-belts as the primary protection for car occupants. Finally, ASEAN NCAP shall also be rewarding points under SA for advanced SAT with OEMs being able to select any technology that is suitable to reduce road traffic casualties. As such, car manufacturers are encouraged to introduce any technology that can benefit road users and help prevent crashes.

To underline ASEAN NCAP's unwavering commitment to the safety of motorcyclists in Southeast Asia, the road map shall also include a new pillar, namely motorcyclist safety. The main technology under this pillar is blind spot technology comprising blind spot detection (for 5-Star level), and blind spot visualization (for 5-Star level). Other technologies such as advanced rear view mirror, auto high beam, and pedestrian protection have also been included in an attempt to further improve the safety of two-wheeler riders in the ASEAN region.

Finally, it is hoped that the development of the new road map will produce more encouraging results for the betterment of road safety in the ESCAP region in general.

## **8. CONCLUSION**

ASEAN NCAP has assessed more than 80 passenger vehicles comprising 25 brands in order to meet its primary objective to provide consumers in the Southeast Asia region with information pertaining to new car safety ratings in a systematic and comprehensible manner and acknowledge efforts of manufacturers in producing safer cars beyond the current legislation. At the same time, more than 100 ratings have been produced with 3 road maps being introduced.

Since ASEAN NCAP's inaugural crash test was conducted in MIROS crash test facility the PC3 in May 2012, several original equipment manufacturers (OEMs) including Proton, Perodua, Volvo, Toyota, Honda, Ford, Nissan, Hyundai, Mitsubishi as well as other renowned brands have stepped forward in a show of support for this new car assessment programme. In addition, the Malaysia Consumerism Standard Division has also agreed to organize awareness campaigns to educate the public about ASEAN NCAP's labeling system and rating based on the safety features of the vehicles they own.

As a consequence, the market for safer cars and consumer awareness in the ASEAN region can now be seen clearly. For example, in 2008, a certain car model was only equipped with a single airbag option. But since ASEAN NCAP came into play, the same model is now sold throughout ASEAN with 7 airbags and ESC. As such, laws and programmes including NCAPs are an important means to ensure improved levels of passenger vehicle safety in certain regions. Although there are still some stubborn car manufacturers in Southeast Asia, their number is quite small with only 1 percent.

In November 2018, ASEAN NCAP announced its Road Map 2021-2025 which aims to better protect motorcyclists in the region, as 70 percent of road fatalities in Southeast Asia revolves around two-wheelers. To this end, most cars sold in ASEAN shall be equipped with blind spot technology. Additionally, ASEAN NCAP's latest road map will also place greater emphasis on the safety assist technologies pillar.

Over a period of less than a decade, ASEAN NCAP has covered 90 percent of the market share for new cars in Southeast Asia. From this, 90 percent of the assessed vehicles have reached 4-Stars and above. With such noteworthy results, ASEAN NCAP has proved its unyielding commitment toward meeting SDG targets 3.6 and 11.2.

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