



GLOBAL NCAP
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GLOBAL NCAP FLEET SAFETY GUIDE AND SAFER CAR PURCHASING POLICY

2014 — 2015



ABOUT GLOBAL NCAP



The Global New Car Assessment Programme (Global NCAP) was established in 2011 to serve as a platform for cooperation among new car assessment programmes (NCAPs) around the world and to share best practice in the use of consumer information promoting motor vehicle safety.

Over the next 10 years the number of passenger cars in use worldwide is forecast to almost double. Most of that growth is taking place in emerging markets where the road safety challenge is greatest. NCAPs have

proved highly effective in encouraging car purchasers to choose safer products and in improving outcomes for the victims of road crashes.

Global NCAP supports the development of NCAPs in emerging markets and promotes the widest application of United Nations vehicle safety standards.

Global NCAP strongly supports the UN Decade of Action for Road Safety 2011-2020 which aims to cut in half the predicted increase in road fatalities by 2020 and is a member of the UN Road Safety Collaboration.

Global NCAP is a charity registered in the United Kingdom (No. 1141798) governed by a Board of Trustees and an Annual General Meeting.

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KENSINGTON PALACE,
LONDON, W. 8.

Fleet safety can make a major contribution to the United Nations Decade of Action for Road Safety 2011-2020. Careful management of the way fleets are driven, maintained and purchased will save lives and reduce the costs of road crashes. To assist fleet managers when buying new vehicles, the Global New Car Assessment Programme (Global NCAP) has developed this important guide. It provides recommendations on vehicle selection using NCAP 'five star' ratings and identifies the most important UN safety standards for passenger cars.

Fleet safety has been given a prominent role in the Global Plan for the UN Decade, and increasingly major fleets in both the public and private sector are establishing policies to buy only 'five star' cars. The new road safety management standard released by the International Standards Organization also recommends careful selection of vehicles by fleet managers. These welcome developments will raise demand for safer vehicles and further encourage the motor industry's impressive innovation in safety technologies.

This practical guide shows how managers can apply 'five star' ratings and the most important regulations to their vehicle fleets. By adopting Global NCAPs recommendations organizations will ensure that their purchase decisions meet best practice in safety management and make an important contribution to the UN Decade of Action.



HRH PRINCE MICHAEL OF KENT GCMG

INTRODUCTION

Each year 1.3 million people are killed and up to 50 million injured in road crashes worldwide. By 2030 the World Health Organization (WHO) forecasts that road crashes will become the fifth leading cause of death rising to 2.4 million fatalities per year. Road crashes are already the number one killer of young people in all world regions aged between 10 and 25.

The world's vehicle fleet reached 1 billion in 2010 and is forecast to double in a decade. This unprecedented increase is

occurring in developing countries which account for 90% of global road deaths. About 48% of all road fatalities are vehicle occupants. So unless action is taken now to improve vehicle safety, the newly motorizing countries will suffer a growing road injury burden. Today passenger cars in USA, Europe, and Japan have become much safer than ever before. This progress is the result of both regulatory "push" and market "pull". Government regulation, combined with demand from consumers, has led to sustained innovation by the

automobile industry to produce safer vehicles. The challenge now is to promote similar progress in the safety of the growing automotive markets in the emerging economies.

1. See http://who.int/violence_injury_prevention/road_safety_status/2013/report/en/w



THE UN DECADE OF ACTION FOR GLOBAL ROAD SAFETY 2011-2020



To try to avoid an inexorable rise in road injury the United Nations General Assembly has proclaimed a Decade of Action for Road Safety 2011-2020¹. The Decade's goal is to 'stabilize and then reduce the level of road fatalities'. If achieved this will reduce the forecast level of fatalities in 2020 by 50% and avoid five million deaths, 50 million injuries and \$3 trillion in social costs. To support this aim the UN Road Safety Collaboration (UNRSC)² has prepared a Global Plan

for the Decade based on the "safe system" approach; an integrated and holistic strategy that simultaneously promotes safer vehicles, safer roads and safer road users³.

The safer vehicles section of the Global Plan includes vehicle fleet management and recommends that "managers of governments and private sector fleets to purchase, operate and maintain vehicles that offer advanced safety technologies and high levels of occupant protection".

1. UN General Assembly Resolution 64/255 2nd March 2010
2. UNRSC is a consultative body led by the WHO, UN Regional Commissions, development banks, governments and civil society to promote best practice in road injury prevention and monitor progress of the Decade.
3. See http://www.who.int/roadsafety/decade_of_action/plan/global_plan_decade.pdf

THE UN'S ROLE IN MOTOR VEHICLE SAFETY STANDARDS

The motor vehicle has been one of the most heavily regulated products in human history. This dates back to the adoption of the first International Traffic Convention in 1909 which introduced the concept of 'type approval' for motor vehicles requiring that automobiles meet certain safety standards. Today, through the UN World Forum for Harmonization of Vehicle Regulations¹ (Forum), motor vehicles can now be internationally approved without further tests provided they meet the relevant UN standards.

The Forum uses two Agreements, adopted in 1958 and 1998², to provide a legal framework that allows any UN Member State to apply voluntarily a wide range of motor vehicle standards. This unique UN regulatory system facilitates international trade and promotes the safety of motor vehicles whilst reducing regulatory compliance costs to industry and to approval authorities. All of the Forum's regulations are subject to a constant process of updating in order to adapt to technological progress and levels of stringency. The Forum's most important safety regulations applied

to light duty vehicles are:

- ▶ Seat belt anchorages - UN Reg. 14
- ▶ Safety belts and restraint systems - UN Reg. 16
- ▶ Occupant protection in frontal collision - UN Reg. 94
- ▶ Occupant protection in lateral collision - UN Reg. 95
- ▶ Electronic stability control – UN Reg. 13-H/GTR 8³
- ▶ Pedestrian protection – UN Reg. 127/GTR 9

The UN tests for front and side impact are the most significant assessment tools for crashworthiness. The frontal test (UN Reg. 94) simulates a car to car crash at 56 kilometers per hour (kph) in which the vehicle hits a barrier that replicates the soft front end of the other vehicle. The impact is 'offset' with a 40% overlap as most frontal crashes occur in this configuration. The side impact test (UN Reg. 95) uses a trolley that hits the vehicle just above the door sill area at 50 kph. They are performance tests in which stipulated loadings on an instrumented dummy must not be exceeded. They do not specify the fitment of a particular technology

such as an airbag. In practice, however, it is very unusual for a car to pass without the fitment of at least a driver's side airbag.

An area of growing importance is crash avoidance. The benefits of improved crash worthiness and occupant protection are obvious but it is even better to avoid the collision in the first place. To achieve this highly desirable outcome the automotive industry has invested heavily in technologies that will assist the driver from having a crash at all. The earliest such system was anti-lock brakes (ABS) and this has been followed more recently by electronic stability control (ESC) which has proved to be a highly effective crash avoidance system shown to reduce life-threatening crashes by up to 25%⁴.

ESC prevents loss of control (under-steer or over-steer) skidding incidents. It is widely acknowledged to be the most important safety device since the seat belt. It works by detecting if the steering inputs of the driver are inconsistent with the vehicle's direction of travel. If this happens ESC applies the brake to one of the wheels using the ABS

to correct the slide. Since 2012 ESC has become mandatory in all new cars in Australasia, Europe, and the USA. It is estimated that it will avoid 10,000 deaths annually in the USA and at least 4,000 in the EU. The UN adopted a global standard for ESC in 2008 which will encourage worldwide application of the system.

The UN is also promoting measures to reduce the risk of injury to pedestrians in a collision with a passenger car. Every year 270,000 pedestrians are killed on the roads or 22% of all road traffic deaths. Most pedestrian fatalities occur in low income countries but they are a major issue in all regions. In high income countries they are taking an increasing share of road deaths as other at risk groups such as vehicle occupants become safer. UN GTR No.9 encourages the design of more forgiving car fronts. Softer bumpers, combined with better bonnet area clearance and removal of unnecessarily stiff structures, are required to reduce the severity of a pedestrian impact.

The development of emerging crash avoidance systems such as

autonomous emergency braking (AEB) has also opened up significant further potential to avoid and mitigate pedestrian injuries. AEB uses laser/radar systems to automatically apply the brakes if the driver does not react in time and seems effective at reducing low speed collisions by 20%⁵. With sensors used to detect pedestrians AEB can reduce impact speeds by as much as 15 kph so reducing the severity of injury. This will maximise the benefit of softer and 'forgiving' car fronts. So the combined effect of improved pedestrian crashworthiness and crash avoidance promises further gains in safety for pedestrians.

Unfortunately, however, not all of the regulations listed above are universally applied by UN Member States. Entire world regions such as Latin America, the Middle East and most of Africa are not participating in the World Forum. As a result there are many new cars being produced today in emerging economies that are sub-standard in comparison with the UN's minimum safety requirements. For example of the record level of 65 million new passenger cars built last

year as many as one third would fail to pass the front and side crash tests, and do not have ABS and ESC systems fitted. This is why the Global Plan of the Decade strongly recommends participation by all UN member States in the work of the Forum and the application of its minimum vehicle safety standards.

1. For further information visit: <http://www.unecce.org/trans/main/welcwp29.html>
2. The 1958 Agreement now has 58 countries that are Contracting Parties and it has established 128 UN Regulations. This means that all other Contracting Parties who have signed the same regulation will recognize this approval. The 1998 Agreement now has 33 countries that are Contracting Parties and it has established 12 UN Global Technical Regulations (GTRs). It was developed as a global agreement on the initiative of the United States of America, Japan and the European Union. Unlike the 1958 agreement, the 1998 agreement does not require mutual recognition of approvals or certification. This was done particularly to assist the USA and Canada as both countries use systems of self-certification rather than type approval.
3. Both ESC and Pedestrian Protection are included in regulations available under both the 1959 and 1998 agreements.
4. See: <http://www.thatcham.org/what-we-do/safety/electronic-stability-control>
5. See: <http://www.thatcham.org/aeb>

NEW CAR ASSESSMENT PROGRAMMES AND CONSUMER INFORMATION

In parallel to regulatory action over the last thirty years a major effort has been made to increase the public demand for safer motor vehicles. This has mainly involved consumer information to stimulate car buyer's awareness of safety through New Car Assessment Programmes (NCAPs).

The first NCAP was created in 1978 by the US National Highway Traffic Safety Administration (NHTSA). This was followed by the creation of Australasian NCAP in 1993, Japan NCAP in 1995, and Euro NCAP in 1997. There are now nine NCAPs or similar bodies active in Asia, Australasia, Europe, Latin America and the USA¹. In 2011 the Global New Car Assessment Programme (Global NCAP) was launched to provide a platform for cooperation for NCAPs around the world to share best practice, and to support new testing programmes in rapidly motorizing regions².

NCAPs help to create a 'market for safety' by simultaneously raising awareness of the car-buyers and providing an incentive to manufacturers to build safer cars. They work as a 'demand pull'

mechanism that works alongside and supplements the 'regulatory push' of vehicle standards. Some NCAPs are run by governments, and others involve automobile clubs, consumer groups and insurance groups.

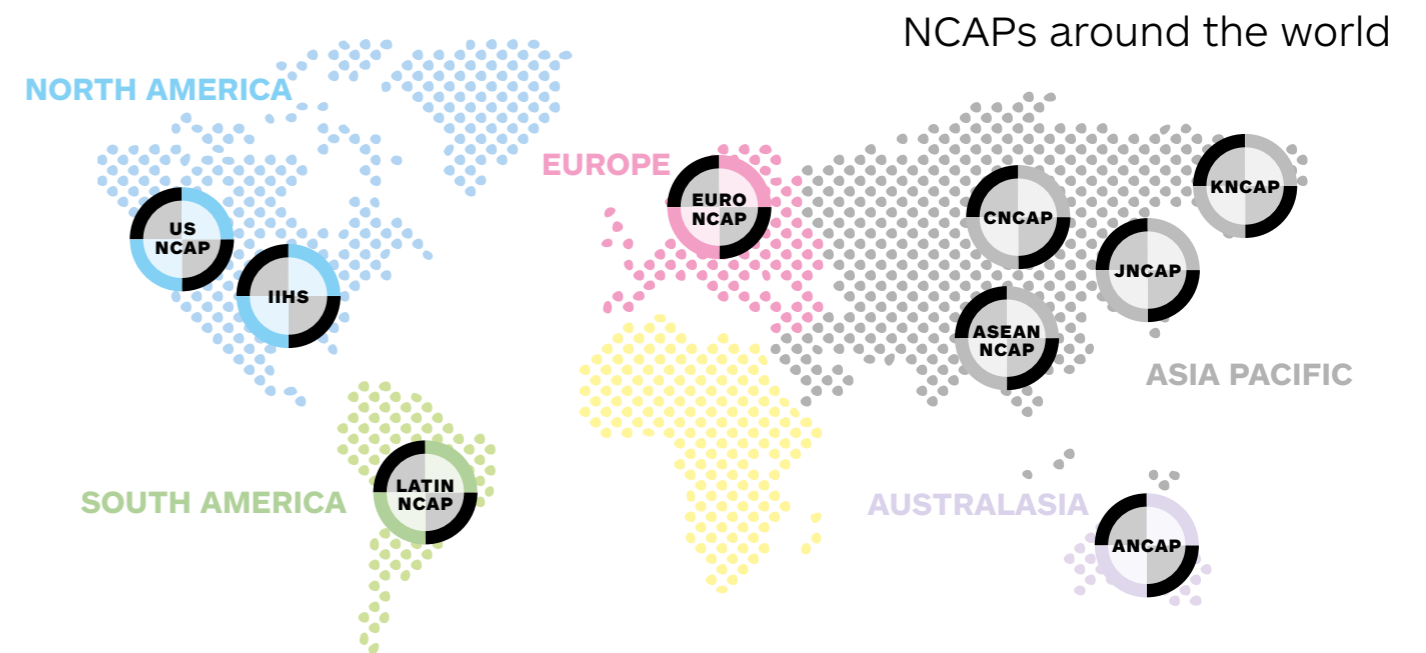
NCAPs have proven to be highly successful in promoting demand for safer vehicles. For example, in 1998 the European Union (EU) introduced mandatory crash tests for front and side impact (which were subsequently adopted by the World Forum as Reg. 94 & 95). In 1997, the European New Car Assessment Programme (Euro NCAP) released its first tests for front impact at the higher speed of 64kph compared with 56kph required in the legislative test. Despite the increased stringency of the tests, manufacturers rapidly saw the benefits of achieving high scores in Euro NCAP.

As a result today most new cars in the EU now achieve five stars; a safety level that far exceeds the original 1998 regulations. Indeed it has been estimated that a five star Euro NCAP car has a 36% lower fatality risk than a car that meets the UN's minimum crash test regulations. Over the last ten years over 100,000 deaths have

been avoided and probably 40% of this progress is attributable to safer vehicles. This shows clearly that the combination of minimum standards and consumer information can substantially reduce road fatalities.

The UN has recognised the beneficial role played by NCAPs. In September 2011 the UN Secretary General Mr Ban-ki Moon submitted a note 'Improving Global Road Safety' to the 66th Session of the UN General Assembly (A/66/389) which stated that NCAP's "have proved to be very effective in creating a market that encourages consumers to choose vehicles based on their safety ratings". The Secretary General's report concluded with a recommendation to Member States to "participate in the new car assessment programmes in order to foster availability of consumer information about the safety performance of motor vehicles". This recommendation was endorsed by UN General Assembly in subsequent resolutions adopted in April 2012 and again in 2014.

NCAPs typically award stars based on a car's performance in a variety of crash test assessments



with 'five stars' representing a high score. Rather than award stars the Insurance Institute for Highway Safety's highest accolade is its 'Top Safety Pick' rating. NCAP test scores are derived from the measurement of the loadings and decelerations that occur to the instrumented dummies during the crash. Most NCAPs use the same front and side impact crash tests as the UN regulations. However, in the frontal impact usually a higher test speed of 64 kph is applied. This is the speed at which fatalities are

most common. Some NCAPs also include additional pole, whiplash, and pedestrian impact ratings and also increasingly include crash avoidance technologies such as ESC.

Due to the different test protocols used by NCAPs not all five star cars are equivalent around the world (see table). In some NCAPs, for example, to obtain five stars requires that the model has ESC whereas in others this is not yet applied. These differences reflect the different market conditions around the world. Penetration of a

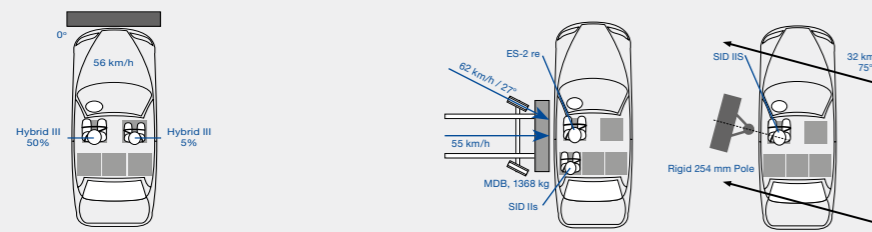
technology like ESC (which works in conjunction with ABS) is gradually increasing in the rapidly motorizing regions but is still very low, for example, in Latin America or India. Nevertheless, a five star car rated by any of the nine NCAPs represents a safer vehicle than one which simply meets the minimum UN front and side impact crash tests.

1. ASEAN NCAP, Australasian NCAP, China NCAP, Euro NCAP, Japan NCAP, Korean NCAP, Latin NCAP, US NCAP and the Insurance Institute for Highway Safety. See back cover for websites
2. For further information visit: www.globalncap.org

NCAP TESTS COMPARED

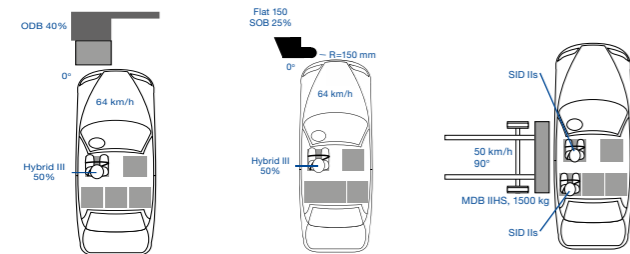
2014 2015

U.S. NCAP



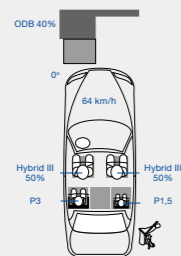
- ▶ **Rollover resistance tests:** SSF

IIHS



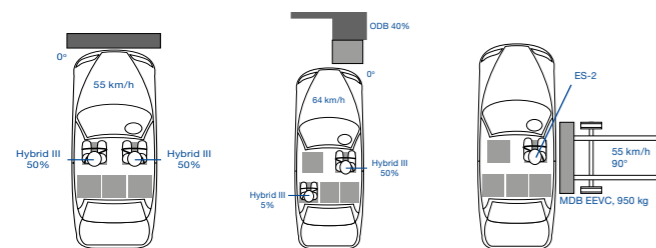
- ▶ **Rollover resistance tests:** Roof Crush
- ▶ **Whiplash mitigation tests:** static, dynamic (1 pulse)

LATIN NCAP



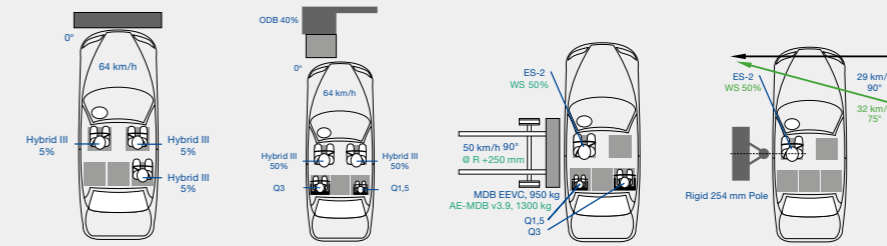
- ▶ **Child safety:** Frontal, CRS-based assessment, Vehicle based assessment

JNCAP



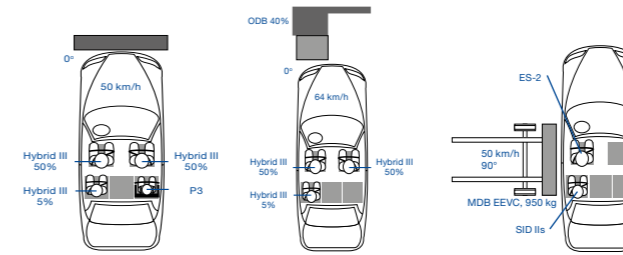
- ▶ **Pedestrian test:** Flex PLI, Headforms
- ▶ **Whiplash mitigation tests:** dynamic (1 pulse)
- ▶ **Others:** Brakes, Usability rear belts, SBR

EURO NCAP



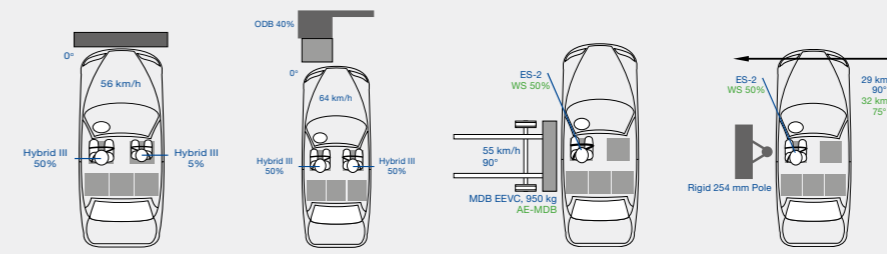
- ▶ **Pedestrian test:** EEVC Legform, Flex PLI, Upper Legform, Headforms
- ▶ **Child safety:** Frontal ODB, Side MDB, CRS- Installation, Vehicle based assessment
- ▶ **Whiplash mitigation tests:** static front / rear, dynamic (3 pulses), AEB City
- ▶ **Assistance systems:** SBR, SAS, ESC ...

C-NCAP



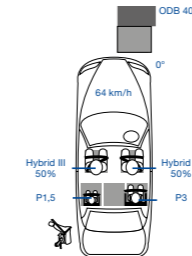
- ▶ **Rollover resistance tests:** Curtain Airbag
- ▶ **Whiplash mitigation tests:** dynamic (1 pulse)
- ▶ **Others:** SBR, ESC

KNCAP



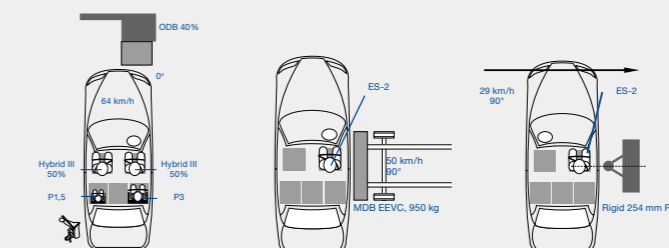
- ▶ **Rollover resistance tests:** SSF
- ▶ **Pedestrian test:** EEVC Legform, Flex PLI, Upper Legform, Headforms
- ▶ **Whiplash mitigation tests:** static, dynamic (1 pulse)
- ▶ **Others:** Brakes, FCWS, ACC, LDWS, SBR, eCall, SLD

ASEAN NCAP



- ▶ **Child safety:** Frontal, CRS-based assessment, Vehicle based assessment

ANCAP



- ▶ **Rollover resistance tests:** Roof crush
- ▶ **Pedestrian test:** EEVC Legform, Upper Legform, Headforms
- ▶ **Child safety:** Frontal
- ▶ **Whiplash mitigation tests:** static, dynamic (1 pulse)
- ▶ **Others:** Assistance systems

SAFE VEHICLE FLEET MANAGEMENT AND PURCHASING

Motivated by a combination of duty of care for their employees, cost control, and corporate social responsibility, many major vehicle fleets are now being systematically managed to avoid road crashes. This, of course, is consistent with the Global Plan for the Decade which includes fleet safety management among its main vehicle safety recommendations.

Supporting this approach is a new management system standard for road traffic safety (ISO 39001)¹ recently adopted by the International Standards Organization (ISO). The new standard is a practical tool for governments and vehicle fleet operators worldwide who want to reduce death and serious injury in road crashes.

ISO 39001 provides fleet operators with 'Road Traffic Safety Performance Factors' which, inter alia, includes "safety of vehicles, especially considering occupant protection, protection of other road users (vulnerable as well as other vehicle occupants), road traffic crash avoidance and mitigation, roadworthiness, vehicle load capacity



and securing of loads in and on the vehicle"². The ISO standard's guidance emphasizes that "Improvements in vehicle safety design and safety equipment, including the development and application of new safety technologies (e.g. electronic stability control), play an important role in efforts to reduce road traffic deaths and serious injuries".

Regarding vehicle purchasing policy ISO 39001 states that, "Any organization can improve safety by careful selection of the vehicles it uses. The safety differences of vehicle types and models are significant,

whether for people inside or outside of the vehicle, or for light or heavy vehicles. Generally, vehicle safety is legislated and most new vehicles deliver safety beyond legislation. Consumer programs test and publish safety ratings for many vehicle types and models which can be used by organizations to assist them in making informed decisions about the level of safety they seek in vehicle fleets"³.

ISO 39001's recognition of the role of consumer safety rating provides a further strong mandate for NCAPs to serve as an independent benchmark to assist organizations

wishing to buy safer vehicles. Five star ratings by NCAPs are a reliable independent guide to levels of vehicle safety and are being increasingly used by fleet managers to guide their vehicle purchase choices. For example, both the Australian and Swedish Governments have adopted purchasing policies that stipulate a five star rating requirement. In 2012, the world's largest resource extraction company BHP Billiton included in its Fatal Risk Control policy a transition to a five star commitment for all its light duty vehicles by 2016. Similar application of NCAP four and five star ratings are also being applied by global companies such as Shell and Johnson & Johnson.

To assist similar commitments by other major fleets in both the public and private sector, Global NCAP has developed a model 'Safer Car Purchasing Policy' (SCPP). The policy provides a template for organizations to assist their compliance with the recommendations of Global Plan for the Decade and ISO 39001.

The SCPP starting point is to choose five star cars wherever possible. A commitment to five stars

represents a robust demonstration of an organization's commitment to fleet safety. While acknowledging that NCAP ratings differ somewhat across world regions a five star commitment will ensure a level of occupant protection that significantly exceeds the UN minimum regulations.

Global NCAP also recognizes that NCAP ratings are not available in all world regions. To supplement a five star requirement it is, therefore, recommended that fleet managers seek confirmation from the vehicle manufacturers that the car they wish to purchase meets the most important UN safety regulations. These six recommended regulations listed above are divided into 'mandatory' and preferred' categories.

The first category (relating to seat belts and front & side impact tests⁴) are mandatory requirements as they represent an absolute minimum level of safety. The second are preferred requirements (relating to electronic stability control and pedestrian protection⁵). This acknowledges that in some markets the availability of vehicles that meet these standards is currently limited. Fleet managers

are, therefore, encouraged to favour selection of vehicles that meet these regulations where they are available and to commit to make them mandatory requirements by 2020 the latest. Finally the highly recommended category recognizes important new safety systems that are emerging technologies and which are already showing impressive effectiveness in promoting safety. The highly recommended system for Global NCAP's 2014 SCPP is autonomous emergency braking which as described earlier is proving effective in reducing collisions speeds and has potential to avoid and mitigate pedestrian injury.

Global NCAP's SCPP will be reviewed annually and periodically updated. Revised editions will adapt to changes in NCAP test programmes, to UN regulations and to developments in safety technology and systems.

1. See http://www.iso.org/iso/home/news_index/news_archive/news.htm?refid=Ref1661
2. ISO 39001:2012, Road traffic safety (RTS) management systems – Requirements with guidance for use – page 10
3. Op.cit. Page 23, Section 7
4. UN Regs 16, 14, 94 & 95
5. GTRs 8 & 9

CONCLUSIONS

Improved motor vehicle safety is a key component of the UN Decade and its Global Plan. Motor vehicle related road casualties can be significantly reduced by 2020.

What is needed is the twin track approach of regulatory push and demand pull. This will be the winning formula for automotive safety in the Decade of Action.

Global NCAP's model Safer Car Purchasing Policy includes five star rating with minimum regulatory standards that combines best known performance in both crash worthiness and crash avoidance. It can serve as a methodology for those organizations that wish to adopt 'best practice' in vehicle purchasing policy as part of their overall fleet safety management systems.

Global NCAP encourages all fleet managers both public and private to make 'five star' safety their goal in the UN Decade of Action.



Five-star result: passenger cell stays intact and airbag protects head in the Volkswagen Up



Zero-star result: passenger cell collapses and head strikes steering wheel in the Nissan Tsuru

GLOBAL NCAP MODEL SAFER CAR PURCHASE POLICY

Sample fleet safety policy

[COMPANY NAME] is committed to providing a safe workplace for all employees and ensuring that a safety culture permeates the organization. Accordingly, Management undertakes to purchase and/or lease the safest available vehicles within reasonable bounds of affordability. This policy will apply to all cars leased by the **[COMPANY NAME]** including pool and company leased vehicles.

The basic requirements for the **[COMPANY NAME]** (purchased/leased or rented) are:

- ▶ Wherever possible choose a 'five star' car as rated by a recognized New Car Assessment Programme¹ and,
- ▶ Confirm from the manufacturer that the vehicle passes the latest version of the following United Nations vehicle safety regulations² (or equivalent United States Federal Motor Vehicle Safety Standards - FMVSS).

a) Mandatory Requirement

(For immediate application as minimum safety requirement)

- Seat belt anchorages - UN Reg. 14 (or FMVSS 210)
- Safety belts and restraint systems - UN Reg. 16 (or FMVSS 209)
- Occupant protection in frontal collision - UN Reg. 94 (or FMVSS 208)
- Occupant protection in lateral collision - UN Reg. 95 (or FMVSS 214)

b) Preferred Requirement

(Preferred for purchase if available becoming a mandatory requirement by 2020 at the latest):

- Electronic stability control - UN Reg. 13-H/GTR 8 (or FMVSS 126)
- Pedestrian protection - UN Reg. 127/GTR 9

c) Highly Recommended

(For emerging technologies showing effectiveness)

- Autonomous emergency braking

1. ASEAN NCAP, Australasian NCAP, China NCAP, Euro NCAP, Japan NCAP, Korean NCAP, Latin NCAP, US NCAP and the Insurance Institute for Highway Safety.

2. See <http://www.unece.org/trans/main/welcwp29.html>

