

---

---

# THE AUTOMOBILE AND TECHNICAL REGULATIONS

---

---

## 1 Introduction

This article presents recent trends in automotive regulations particularly those involving the planning, design, and development of vehicles, in conjunction with shifts in social conditions and government policies.

Automotive regulations are accompanied by certification systems that guarantee vehicles on the market comply with the regulations. There are two main types of certification systems.

(a) Official certification: An official body certifies compliance with the regulations when products are sold or used. The mainstream type approval system involves the official body testing and inspecting representative vehicles and granting approval for that type, with the manufacturer guaranteeing conformity of production (CoP) for the approved type.

(b) Self-certification: The manufacturer itself verifies and guarantee compliance with regulation for each individual product. The U.S., Canada, and other countries have a system empowering an official body to test randomly selected vehicles on the market for regulatory compliance, and impose measures such as injunctions on sales or recall orders in the event of non-compliance.

## 2 Overall Trends

### 2.1. Automobile Safety and Regulations

As automobiles became widespread following advances in motorization, fatalities caused by accidents started to rise dramatically around 1950, and the decade from 1960 to 1970 became known as the first traffic war. These circumstances led to moving from researching safe structures for automobiles to establishing regulations on structural requirements. Regulations on requirements to reinforce the cabin, including static strength requirements for seat belts, seat belt anchorages, and seats, as well as requirements for energy-absorbing steering wheels, were gradually implemented. Crash test dummies

simulating the human body were developed from 1970 to 1980, leading to the establishment of regulations imposing injury criteria thresholds on various parts of the human bodies in crash tests conducted with dummies in the vehicle.

**(1) Passive Safety:** Airbags were developed in the latter half of the 1980s and rapidly gained widespread adoption. Federal Motor Vehicle Safety Standard (FMVSS) No. 208 required injury criteria to be satisfied by the airbag alone, without relying on the seat belt. Some automakers increased the airbag output to comply with that regulatory requirement, but the side-effects of that approach resulted in the loss of many lives. Regulations established from the 1990s to the 2000s centered primarily on side impacts, offset deformable barrier (ODB) frontal impacts, pedestrian protection and other aspects of passive safety, resulting in a gradual decrease in fatalities and injuries.

**(2) Active Safety:** The 2000s emphasized the importance of a preemptive and active approach to complement passive safety. Electronic stability control (ESC) and the pre-collision seat belt (PSB) using millimeter wave-based detection to wind the seat belt just before the impact were developed. In the latter half of the 2000s, advanced emergency brake systems (AEBS) relying on camera-based detection to activate the brakes became available and quickly gained widespread adoption. Camera-based detection technology was applied to other functionality, such as lane keeping devices and advanced headlamps that, in conjunction with high definition pixels and increased sensitivity, resulted in systems also capable of detecting pedestrians and cyclists at night.

**(3) Automated Driving:** The sensors and actuators developed for active safety, along with advances in the computerization and digitalization of vehicles, significantly advanced the possibility of achieving automated driving. A legislative framework is essential to realizing automated driving as AI will change how legal liability for an

accident is assigned.

**(4) Communication:** Accident emergency call systems (AECS) that automatically transmit the location of a traffic accident in the event of a collision are being introduced and put in operation all over the world. With the establishment of an international standard for AECS by WP.29, new models equipped with an AECS in Japan after 2020 will be required to comply with that standard.

**(5) Cybersecurity and Software Updates:** Technologies that control the vehicle and update installed software over a network will make the commercialization of automated vehicles possible. This is achieved by a wireless data transmission technology known as over the air (OTA). However, the very presence of a communication device makes cybersecurity measures and the software updating process critical. Consequently, a management system certification that inspects the management system of the manufacturer has been added to regulations covering this field.

## 2. 2. Emissions, Fuel Economy (CO<sub>2</sub>), Noise

**(1) Emissions Regulations:** Environmental standards governing pollutants harmful to human health have been established, and the governments of various countries have adopted emissions regulations for the sources of those pollutants.

Automotive emissions regulations have spread to various countries and been strengthened since they were first established by the U.S. State of California in 1960. The level of regulation and timing of adoption varies according to circumstances in the individual countries.

Regulated pollutants typically consist of hydrocarbons, nitrogen oxides, and carbon monoxide, which are precursors of the ozone causing photochemical smog, and of particulate matter and other substances that contribute to respiratory diseases.

Emissions testing regulations initially covered gases emitted from the exhaust pipe (tailpipe emissions), and subsequently expanded to gases that evaporate from the fuel system (evaporative emissions), gases emitted during refueling (refueling emissions), and on-board diagnostics (OBD) devices.

Similarly, the test procedures for tailpipe emissions originally consisted of basic driving cycle tests by individual countries according to their own standards. This was followed by the addition testing under low-temperature, high-altitude conditions, and then the Worldwide harmonized Light vehicles Test Cycles (WLTC) by the

UN. Finally, regulations reached the point of making it mandatory for manufacturers to test real driving emissions (RDE) using portable devices to measure actual emissions on the road.

**(2) Fuel Economy and Greenhouse Gas Regulations:** In the wake of the first oil shock in the 1970s, the U.S. established corporate average fuel economy (CAFE) regulations for passenger cars and light-duty trucks in 1978. They assign fuel economy standards by vehicle and size, and required the weighted average fuel economy of new vehicles to meet the regulatory values.

The CAFE regulations were originally made stricter every year, but concerns that making vehicles smaller and lighter to improve fuel economy would potentially compromise their safety led to a freeze on the tightening of the regulations, which did not spread to other countries.

However, with global warming becoming a worldwide social issue starting in the 1990s, various countries followed in the footsteps of Japan and Europe in establishing automotive fuel economy and CO<sub>2</sub> emissions regulations as part of measures to address emissions of the CO<sub>2</sub> greenhouse gas. In addition, emerging nations also started introducing fuel economy regulations after 2010, and 90% of the global market is currently subject to such regulations. Since CO<sub>2</sub> emissions are proportional to the fuel consumed, CO<sub>2</sub> emissions and fuel economy have the same significance, and CAFE regulations are the mainstream.

**(3) ZEV Regulations:** In the U.S., in addition to regulations on emissions and on fuel economy and greenhouse gases, the state of California also has zero emission vehicle (ZEV) regulations. Those regulations make it mandatory for manufacturers with a certain volume of sales in California to sell a specified proportion of ZEVs.

Sales of ZEVs that exceed the specified proportion are eligible for credits, but selling less than that proportion requires either paying a fine to the State or buying credits from another manufacturer with many credits.

**(4) Noise Regulations:** In Japan, regulating automobile noise began with the introduction of steady running noise regulations in 1951, which was followed up with the addition of acceleration noise and close proximity exhaust noise regulations in 1971. In 1982, the UN WP.29 established UN R51.01, harmonizing the standards for noise testing methods.

However, changes in contemporary driving patterns,

vehicle performance, and usage no longer matching those at the time the regulation was established were cited as one reason lack of progress in reducing road traffic noise, and discussions to amend UN R51 began in 1996. The UN R51.02 Annex 10 (new acceleration noise test method) was then issued in 2007, and followed by the current UN R51.03.

### **2. 3. Substances of Concern and Recycling**

**(1) Vehicle Regulations:** Harmful substances released from abandoned or dismantled vehicles and the issue of resource recycling led to concerns about the burden on the environment. In response, the End-of-Life Vehicles (ELV) Directive was passed in 2000. In addition to stipulating recyclability thresholds requirements for certification, it mandated the use of labels to identify plastic and rubber materials, and prohibited the use of four substances of concern (lead, mercury, cadmium, and hexavalent chromium). Exemptions made due to the lack of substitute technologies have been revoked as new technology was developed, and the possibility of substitutes for the lead in copper alloys or batteries is currently being debated.

Outside of Europe, Turkey, Israel, Korea, China and India have also established ELV regulations. Among those, China has added brominated flame retardant to the above mentioned four prohibited substances, and is currently considering the further addition of polycyclic aromatic hydrocarbons (PAH) and asbestos. In Japan and Taiwan, the automotive industry is voluntarily reducing the use of substances of concern.

### **(2) General Chemical Substances Regulations:**

The concept of managing chemical substances was defined at the 1992 Rio de Janeiro United Nations Conference on Environment and Development, and the Strategic Approach to International Chemicals Management (SAICM) adopted in 2006 established the goal of “ensuring that, by the year 2020, chemicals will be produced and used in ways that minimize significant adverse impacts on the environment and human health”. Various countries then became more proactive in regulating chemical substances.

In a similar vein, the Stockholm Convention on Persistent Organic Pollutants was signed. This international treaty designated specified pesticides, as well as brominated flame retardant and fluorine compounds, as substances for elimination on an international level, initiating a global movement in that direction.

Regulations on chemical substances in various countries had primarily focused on new substances, but the introduction of the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) regulation in Europe expanded their scope to also cover existing chemicals. The REACH regulation includes a candidate list of substances of very high concern, and already imposes restrictions on phthalic ester and other substances used as plasticizers.

## **3 United Nations**

### **3. 1. International Harmonization of Automotive Technical Standards by the UN**

The United Nations World Forum for Harmonization of Vehicle Regulations (WP.29) discusses the international harmonization of automotive technical standards based on the Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts (1958 Agreement) and the 1998 Agreement on UN Global Technical Regulations (1998 Agreement).

The aim of the 1958 agreement is to establish uniform standards (UN regulations (UN R)) concerning the safety and environmental performance of automotive structures and equipment and obtain reciprocal recognition of those regulations. It has been ratified by the EU and 53 countries, and 161 UN regulations have been established as of June 2021.

The 1998 Agreement aims to harmonize global technical standards, and has been ratified by the EU and 37 countries. There are 21 established Global Technical Regulations (GTRs) as of June 2021. The GTRs are enforced through the integration of their technical standards in the domestic regulations of each of the contracting parties. While they offer hope for the promotion of international standards harmonization, there are also issues such as contracting parties incurring no obligation whatsoever for the applicable GTR if they abstain from voting when it is established, and the fact that countries are only required to make an effort to incorporate the GTRs into their domestic legislation.

### **3. 2. WP.29 Overview and Participation by Japan**

The WP.29 is a global forum for standard harmonization encompassing six working parties, which are the Working Party on Automated/Autonomous and Con-

**Table 1** New and Revised UN Regulations Issued in 2020 or Later

Number*	Name of regulation	Date of issue	Committee
0/02	International Whole Vehicle Type Approval (IWVTA)	2020/5/29	WP.29
0/03	IWVTA	2021/6/10	WP.29
17/10	Strength of Seats, Anchorages, and Head Restraints	2021/6/9	GRSP
22/06	Helmets and Visors	2021/1/3	GRSP
26/04	External Projections of Vehicles	2020/9/25	GRSG
35/01	Arrangement of Foot Controls	2021/6/9	GRSG
48/07	Installation of Lighting and Light-signalling Equipment	2020/9/25	GRE
53/03	Installation of Motorcycle Lighting (Category L3 Vehicles)	2020/5/29	GRE
55/02	Mechanical Coupling Components	2020/9/25	GRSG
59/03	Replacement Silencing Systems	2020/9/25	GRBP
62/01	Protection Against Unauthorized Use of Vehicles with Handlebars	2020/9/25	GRSG
67/03	Liquefied Petroleum Gas Equipment	2020/5/29	GRSG
74/02	Moped Lighting	2020/5/29	GRE
78/05	Motorcycle and Moped Braking (L Category Vehicles)	2021/1/3	GRVA
80/04	Seat Strength and Seat Anchorages for Large Passenger Vehicles	2020/5/29	GRSP
94/04	Occupant Protection in Frontal Collisions (Frontal Offset Oblique Impacts)	2021/6/9	GRSP
95/04	Occupant Protection in Lateral Collisions	2021/1/3	GRSP
95/05	Occupant Protection in Lateral Collisions	2021/6/9	GRSP
100/03	Construction and Safety of Electric Powertrains	2021/6/9	GRSP
137/02	Restraint System in Frontal Impact (Full-Lap Frontal Impact)	2021/6/9	GRSP
152/00	Automatic Emergency Braking for M1 /N1 Vehicles	2020/1/22	GRVA
153/00	Fuel System Integrity and Electric Power Train in a Rear-End Collision	2021/1/22	GRSP
154/00	Light Vehicle Emissions Type Approval Test Procedure (WLTP)	2021/1/22	GRPE
154/01	Light Vehicle Emissions Type Approval Test Procedure (WLTP)	2021/8/5	GRPE
155/00	Cyber Security and Cyber Security Management	2021/1/22	GRVA
156/00	Software Update Processes and Management Systems	2021/1/22	GRVA
157/00	Automated Lane-Keeping Systems (ALKS)	2021/1/22	GRVA
158/00	Reversing Motion Detection	2021/6/10	GRSG
159/00	UN Regulation on Moving-Off Information Systems (MOIS)	2021/6/10	GRSG

\*: The number after the slash indicates the series of the amendment, and /00 is a new UN regulation.

nected Vehicles (GRVA), the Working Party on Pollution and Energy (GRPE), the Working Party on Passive Safety (GRSP), the Working Party on Noise and Tyres (GRPB), the Working Party on General Safety Provisions (GRSG), and the Working Party on Lighting and Light-Signalling (GRE).

To establish new regulations or make large-scale amendments, informal groups are organized under the working parties. Countries and organizations with an interest in the applicable case then gather to make a proposal following extensive specialized discussions.

The Japanese government procedure for participating in WP.29 and its subsidiary bodies involves holding discussions between representatives of the government, related institutions, the Japan Automobile Manufacturers Association and other industry associations in a working party of the Japan Automobile Standards International-

**Table 2** New and Revised GTRs Established in 2020 or Later

Number	Name of regulation	Date of issue	Committee
GTR No. 3, Amendment 3	Motorcycle brakes	2020/6/24	GRVA
GTR No. 7, Amendment 1	Head restraints	2020/11/11	GRSP
GTR No. 15, Amendment 6	Worldwide harmonized Light vehicles Test Procedure (WLTP)	2020/11/11	GRPE
GTR No. 21	Determination of Electrified Vehicle Power (DEVPP)	2020/11/11	GRPE

ization Center (JASIC) to determine the policy to follow, and then forming a JASIC delegation that includes experts from the private sector.

### 3.3. Progress of UN R and GTR Formulation Since 2020

Table 1 lists newly established UN regulations (including those planned as of March 2021) and amendments to existing UN regulation series (amendments stemming from a tightening of requirements) since January 2020,

**Table 3** Types of Automotive Legislation in Japan

Type	Established	Example	Remarks
Law	National Diet	<ul style="list-style-type: none"> <li>• Road Transport Vehicle Act</li> <li>• Air Pollution Control Act</li> <li>• High Pressure Gas Safety Act, and so on</li> </ul>	<ul style="list-style-type: none"> <li>• Published in the Official Gazette</li> <li>• Established upon National Diet approval, with the highest precedence after the Constitution</li> </ul>
Cabinet Order	Cabinet Office	<ul style="list-style-type: none"> <li>• Order for the Enforcement of the Road Transport Vehicle Act</li> <li>• Order for the Enforcement of the Air Pollution Control Act, and so on</li> </ul>	<ul style="list-style-type: none"> <li>• Published in the Official Gazette</li> <li>• Orders established by the Cabinet Office to implement the constitution or a law.</li> </ul>
Ministerial ordinance	Minister	<ul style="list-style-type: none"> <li>• Safety Regulations for Road Vehicles, and so on</li> </ul>	<ul style="list-style-type: none"> <li>• Published in the Official Gazette</li> <li>• Order issues by Ministers of the various Ministries concerning the administrative procedures under their charge</li> </ul>
Ministerial announcement	Minister	<ul style="list-style-type: none"> <li>• Announcement that prescribes details of safety regulations for road vehicles</li> <li>• Permissible limit for automobile exhaust emissions</li> <li>• Permissible limit of automobile noise</li> </ul>	<ul style="list-style-type: none"> <li>• Published in the Official Gazette</li> <li>• Format used by national or local public organizations to indicate the detailed content of ordinances or conditions</li> </ul>
Circular	Director-General Deputy Commissioner Director	<ul style="list-style-type: none"> <li>• Test methods</li> <li>• Inspection criteria, and so on.</li> </ul>	<ul style="list-style-type: none"> <li>• Format used by government offices to inform the various authorities and employees of instructions, legal interpretations, or guidelines</li> </ul>

while Table 2 presents GTRs newly established or amended in that same period (as of March 2021).

## 4 Japan

### 4.1. General Trends

Table 3 shows the types of automotive legislation (laws and orders) in Japan.

Compliance with the safety regulations, as well as the notifications and directives defining their details must be certified by the Ministry of Land, Infrastructure Transport and Tourism (MLIT) and mass production vehicles are primarily certified through a type approval system (“type designation” in the rest of this article). Japan has adopted over 90 UN regulations in its domestic standards, and allows mutual recognition of type approval with other countries that have signed the 1958 Agreement.

The high pressure gas containers and attendant accessories used in fuel cell, LPG, and CNG vehicles are subject to the High Pressure Gas Safety Act under the jurisdiction of the Ministry of Economy, Trade and Industry (METI), and require approval separate from the type designation.

### 4.2. Vehicle Safety

**(1) Progress of Safety Measures:** The MLIT is assessing the regulation of the items to focus on among the four pillars of vehicle safety measures, namely (a) addressing accidents involving children or the elderly, (b) measures for the safety of pedestrians and automobile occupants, (c) measures to address grievous accidents in-

volving heavy-duty vehicles, and (d) addressing new technologies such as automated driving, raised in its June 2016 compilation on the course of future automobile safety measures. The Eleventh Fundamental Traffic Safety Program (2021 to 2025) has also been drawn up, and is currently serving as the basis for discussions on matters such as the direction of vehicle safety measures and new reduction targets for fatalities and other metrics.

**(2) Strengthening of Safety Regulations and Harmonization of Criteria:** The MLIT is working to incorporate newly established UN regulations in Japanese standards. In 2020, the new UN R151 (blind spot information monitors), UN R153 (rear-end collisions), UN R155 (cybersecurity), UN R156 (software updates), and UN R157 (ALKS) regulations were integrated in domestic standards. In addition to harmonizing standards, regulations for ultra-compact mobility were amended to reflect actual driving and accident conditions (e.g., relaxing the impact test speed).

**(3) Automated Driving:** In May 2019, the Road Transport Vehicle Act was amended to add automated driving systems to the devices covered by the safety regulations. The amendment stipulates that automated driving systems must be equipped with an operating state recorder to monitor that state, and vested the authority to determine the driving conditions under which such systems are used in the Minister. The Road Traffic Act was also amended around the same time, adding a definition of automated driving systems, as well as estab-

lishing stipulations concerning recording by the operating state recorder and obligations of the driver with respect to automated driving. The amendment came into effect in April 2020, making the world's first revised vehicle law to address automated vehicles.

#### 4.3. Environmental Protection

**(1) Emissions:** The 14th Future Policy for Vehicle Emission Reduction submitted to the Minister of the Environment in August 2020 introduced particle number regulations (PN regulations:  $6 \times 10^{11}/\text{km}$ ) as a complement to existing regulations on the mass of particulate matter, and determined that they would come into effect at the end of 2024 for gasoline vehicles and at the end of 2023 for diesel vehicles.

Decreasing the detection lower limit through refined PN measurement methods, formulating a suitable test method to evaluate dust from brake wear, and the strengthening of regulations on particulate matter for special vehicles are some of the topics being examined in preparation for the next report.

Guidelines on the prohibition of illegal control in diesel vehicles have also been formulated, and RDE testing will be introduced in October 2022 for new models, and in October 2024 for existing vehicles.

**(2) Fuel Economy:** The passenger car fuel economy standards for 2030 were determined in June 2019. The WLTC will replace the current JC08 test cycle. The regulations were extended to cover EVs and PHEVs, and it was made mandatory for catalogs to show not only the overall WLTC AC power consumption rate, but also the values for the urban, suburban and highway driving environments, as well as the overall WLTC cruising range (distance that can be travelled on electric power on a single charge). The regulatory level anticipates a 20% spread for EVs and PHEVs, and makes the standard 44.3% stricter (WLTC converted fuel economy) than the 2020 standard.

In May 2019, a new heavy-duty vehicle fuel economy standard intended for 2025 was formulated. Compared to the current 2015 fuel economy standard, it strengthens the standards by 13.4% for trucks and 14.3% for buses.

Following the October 2020 declaration of a policy aiming to achieve carbon neutrality by 2050 made by Prime Minister Suga, the METI set a target of having 100% of new passenger vehicle sales consist of electric powered vehicles (including HEVs) by the mid-2030s in as part of the *Green Growth Strategy* announced in December 2020.

This, in turn, will lead to assessing how to apply fuel economy standards as well as to examining new policies.

**(3) Noise:** According to the third *Future Policy for Motor Vehicle Noise Reduction* released by the Central Environmental Council of Japan, the UN R51.03 test method and regulatory values up to Phase 2 were introduced in 2016. They became mandatory for new models in September 2020 (postponed to September 2022 for the N2 category), and will become mandatory for existing vehicles in September 2022 (September 2023 for the N2 category). The timing for the introduction of Phase 3 is under assessment based on considerations such as surveys of technological forecasts, the progress of international standard examinations, and other regulations.

## 5 The U.S. and Canada

### 5.1. General Trends

**(1) U.S.:** Regulations covering automotive structure include (a) vehicle safety regulations, (b) automobile emissions regulations, (c) regulations on automobile fuel economy, (d) federal noise regulations, and (e) regulations on hazardous substances.

**(a) Vehicle safety regulations::** The FMVSS were instituted based on the National Traffic and Motor Vehicle Safety Act of 1966 ("Safety Act"), with the National Highway Traffic Safety Administration (NHTSA) was established as their administrative organ with the Department of Transportation.

**(b) Automobile emissions regulations::** The passing of the Clean Air Act of 1970 and its amendments provided the basis for various regulations, with the EPA established as their administrative organ. Faced with a severe smog problem, the California Air Resources Board (CARB) had already established its own emissions regulations ahead of the federal government, and the State of California has since maintained the right to implement regulations differing from the federal ones.

**(c) Regulations concerning automobile fuel economy:** The Energy Policy and Conservation Act of 1975 forms the legal foundation, with the NHTSA serving as the administrative organ and fuel economy calculations performed by the EPA. Manufacturers failing to meet the regulations are fined based on the extent to which they are below the requirements.

**(2) Canada:** Regulations covering automotive structure are similar to those of the U.S., and include (a) vehicle safety regulations, (b) automobile emissions regula-

tions, (c) regulations on automobile fuel economy, (d) federal noise regulations, and (e) recycling & SOC regulations. The contents of each regulation is essentially the same as its U.S. equivalent. The Canada Motor Vehicle Safety Standards (CMVSS) were instituted based on the Motor Vehicle Safety Act passed in 1970.

**(3) Certification Systems:** Both the U.S. and Canada have a self-certification system for safety regulations, but an official certification system for emissions regulations. Certification must be obtained annually, even if models are not redesigned.

**(4) U.S. Socioeconomic Factors that Affect Automobile Regulations:** In 2017, then-President Trump issued an executive order mandating the abolishment of two existing regulations when a new regulation was introduced. Consequently, rulemaking was carried out cautiously.

## 5.2. Vehicle Safety

The main trends are as follows.

- (a) Advance notice of proposed rulemaking for amendments to tire standards: December 2019.
- (b) Notice of proposed rulemaking for test dummies (Part 572 "Dummy Standards": December 2019.
- (c) Notice of proposed rulemaking to add occupant protection requirements for vehicles equipped with an automated driving system: March 2020.

## 5.3. Environmental Protection

**(1) California:** A carbon neutrality policy to ban the sale of new vehicles equipped with internal combustion engines by 2035, and achieve net zero carbon emissions for society as a whole by 2045 has been announced, and regulations based on that policy are under consideration.

**(a) Emissions regulations::** The LEV III regulations are currently in effect, and require compliance with the corporate average fuel economy regulations (NMOG + NO<sub>x</sub>), which become stricter every year. The PM regulatory value will also be raised to 1 mg/mile as of 2025. Even tighter corporate average emissions regulations, stricter restrictions on evaporative emissions generated while driving (running loss), and measures to further decrease real world emissions are being discussed for the 2026 and subsequent model years. The OBD II regulations are also expected to be amended to include devices such as control monitors under engine cold condition.

**(b) Greenhouse gas regulations::** Starting with the 2021 model year, compliance with the California regulations, which are more stringent than the federal ones,

will be required.

**(c) ZEV regulations::** Compliance has been required for PHEVs, EVs, and fuel cell vehicles since the 2018 model year, and the mandated proportion of such models is rises every year. Regulations for the 2026 and subsequent model years have been set in motion by gubernatorial policy.

**(2) U.S. Federal Government:** President Biden is emphasizing policies to address climate change, and a revision and tightening of the relevant regulations is foreseen.

**(a) Emissions regulations::** The EPA has implemented Tier 3 regulations that are largely harmonized with the California LEV III regulations. In addition, the OBD regulations have also been brought in lines with those of California. If the regulations for the 2026 and subsequent model years are passed in California, federal regulations might follow a few years behind.

**(b) Fuel economy and greenhouse gas regulations::** During the Trump administration, the EPA and NHTSA revised the regulations for the 2021 to 2026 model years and determined to relax the tightening rate to approximately 1.5% annually. A second, upward, revision is likely under the Biden administration.

**(3) Canada:** The Canadian government has passed a law setting a target of zero greenhouse gas emissions by 2050. The law stipulates first setting targets for 2030 within six months of its enactment, and revising those targets every five years.

**(a) Emissions regulations::** The Canadian federal government has adopted regulations equivalent to those of the U.S. Tier 3. AT present, vehicles with a U.S. Tier 3 certification sold in Canada are not required to obtain the Canadian certification.

**(b) Greenhouse gas regulations::** As in the U.S., GHG regulations have been strengthened starting with the 2017 model year, but a higher multiplier has been set for advanced technology vehicles. The revision of U.S. federal regulations is expected to result in a similar tightening of their Canadian equivalent.

**(c) ZEV regulations::** The province of Quebec has applied ZEV regulations similar to those of California since the 2018 model year, and is considering even tighter regulations to achieve the goal of 100% ZEVs in 2035. Similarly, the province of British Columbia has decided to introduce ZEV regulations stating with the 2020 model year in preparation to achieve 100% ZEVs in 2040.

## 6 Europe

### 6.1. General Trends

#### (1) EU Whole Vehicle Type Approval (WVTA):

Obtaining Whole Vehicle Type Approval (WVTA) is mandatory in EU member countries (27 nations). The WVTA requires satisfying over 100 regulations on automobile structure and performance, including safety, emissions, noise, and fuel economy regulations. In addition, a new framework regulation (Regulation (EU) 2018/858) was published in July 2018 and came into effect for new models in September 2020. The new regulation is not limited to requirements for vehicle structure. A wide range of provisions also cover stronger market surveillance, stricter certification inspections, defining the termination of validity of type approval, and mandatory access to OBD information and other maintenance information.

**(2) UK:** The UK government officially withdrew from the EU on February 1, 2020. The period of transition for the EU WVTA continues until December 31, 2021, and the UK will issue its own type approval scheme which will apply to new models starting in January 2022. The scheme will mandate essentially the same technical requirements as those of the EU WVTA.

**(3) Russia:** In the Eurasian Customs Union (EACU), the Technical Regulation of the Customs Union (TR CU), a common approval system based on Russian regulations, is in effect.

### 6.2. Vehicle Safety

The European Commission has set a long term goal of zero fatalities and injuries by 2050 (Vision Zero), and is preparing more stringent safety regulations as a step toward its midpoint goal (2030). The publication of the revised General Safety Regulation (GSR), (EU) 2019/2144 in December 2019, will make the installation of advanced emergency brake systems, lane departure prevention systems, and other advanced safety systems mandatory. This is expected to reduce cases of fatalities by 25,000 and of injuries by 140,000 by 2038.

### 6.3. Environmental Protection

Identifying climate change as its highest priority issue upon taking office in 2019, the current European Commission administration announced the Green Deal set of policies aimed at achieving carbon neutrality by 2050, and has been actively bringing the timetable of the previous administration's policies forward. In September

2020, the Commission announced a policy raising the CO<sub>2</sub> reduction target for 2030 from the original 40% compared to 1990 to at least 55%.

A CO<sub>2</sub> emissions (fuel economy) regulation for light-duty vehicles imposing reductions of 15% in 2025, and 37.5% (passenger vehicles) or 31% (commercial vehicles) in 2030 compared to 2021 values was published in 2019. Furthermore, the European Commission brought the revision of 2030 reduction targets for 2030 in that regulation forward to June 2021, and is assessing the possibility of raising the 37.5% for passenger vehicles to between 40 and 60%. Based on the premise that CO<sub>2</sub> emissions from new vehicles will have to reach zero by 2035 to 2040 to ensure carbon neutrality is achieved for all vehicle traffic, including aged vehicles, by 2050, a policy to ban the introduction of internal combustion engines is also under consideration.

The tightening of Euro 6 regulations forecast to apply around 2026 is being examined concurrently with the strengthening of the Euro VI heavy-duty vehicle regulations. The European Commission view the post Euro 6/ Euro VI as the final emissions regulations for internal combustion engines, and CLOVE, the consortium charged with studying the contents of the regulations by the Commission, has announced plans to define regulations requiring the best available technology for reducing emissions.

## 7 China

### 7.1. General Trends

Regulations concerning automobile structure are stipulated in the Chinese national standards (GB) established under the Standardization Law of the People's Republic of China, and product certification and registration (acquisition of a license plate) can also require compliance with recommended national standards (GB/T), industry standards (e.g., GA, QC/T) and local standards (DB).

Product certification is based on the China Compulsory Certificate (CCC) system and involves inspections to verify compliance with the GB, GB/T and other standards, stipulated in the certification implementation rules established by the Certification and Accreditation Administration of the People's Republic of China (CNCA). Additionally, there is a two-tier certification system in place for completed vehicles produced in China. The second tier, based on the implementation rule for producers of motor vehicles and products and the implementation rule for



producers of new energy vehicles and products established by the Ministry of Industry and Information Technology, involves inspecting the corporate framework and products as a whole and granting a production license.

## 7.2. Vehicle Safety

**(1) Progress of Measures to Expand Advanced Safety Technologies:** Various policies and plans aimed at expanding connected cars (intelligent and connected vehicles (ICVs)) have been promoted over the years. According to the guidelines on building a standards framework for national ICV production formulated under the guidance of the Ministry of Industry and Information Technology, ICV standards covering over 100 items, including advanced automated driving, are slated to be established by 2025.

In 2020, new GB/Ts for lane keeping assist systems (LKAS) and blind spot detection (BSD) in passenger vehicles were issued, and a new GB on event data recorders (EDR) will come into effect in January 2022. New regulations covering more than 20 standards including ADAS technology, cybersecurity, and automated driving are currently being formulated.

The Ministry of Transport has issued its own JT/T vehicle safety standards for commercial vehicles in operation. The standards require the mandatory installation of electronic braking (EBS), advanced emergency braking (AEBS), vehicle stability control (ESC), lane departure warning (LDWS) and tire pressure monitoring (TPMS) in certain applicable models.

**(2) Other Standards:** Revised GBs for lamp mounting, seats and seat belt anchorages, head rest strength, and fuel tanks, as well as a new GB on bus interior material flammability, came into effect in July 2020. New GBs on safety requirements for electric vehicles, drive batteries for electric vehicles, and electric buses were applied in January 2021. The GBs governing steering, indirect field of view, and bus seats are currently being revised.

## 7.3. Environmental Protection

**(1) Policy Trends Concerning Energy-Saving and New Energy Vehicles:** In October 2020, the China Society of Automotive Engineers (China SAE) released the *Energy-saving and New Energy Vehicle Technology Roadmap 2.0*. The 2.0 roadmap outlines the development vision and goal of automotive technology in China from 2025 to 2035, and sets gradual targets such as new energy vehicles (NEVs) accounting for 50% of new vehicles and having hybrid vehicles (HVs) represent

100% of conventional energy vehicles by 2035.

In November 2020, the State Council officially announced the *New Energy Vehicle Industrial Development Plan for 2021 to 2035*. The plan includes concrete targets such as having NEVs account for around 20% of new vehicles in 2025 and an average electricity consumption of 12.0 kWh/100 km for electric vehicles (EVs).

**(2) Emissions Regulations:** The China 6 regulation was issued for light-duty vehicles in 2016, replacing the previous European NEDC with the WLTC and setting the same normal temperature emissions regulatory value for both gasoline and diesel vehicles. Another distinctive point is the adoption of partially modified versions of the European real driving emissions (RDE) regulations, as well as the U.S. evaporative emissions, on-board refueling vapor recovery (ORVR) regulations, and on-board diagnostics (OBD) regulations. Regulatory values are being strengthened in two phases, with China 6a scheduled to apply in July 2020 (postponed to January 2021 due to COVID-19), and China 6b coming into effect in July 2023. The latter, notably, imposes stricter regulatory values than Euro 6.

The sixth-stage GB regulations for heavy-duty vehicles were issued in 2018. In addition to the inclusion of new items such as PN regulations, off-cycle emissions regulations, and a term for emissions quality certification, the existing emissions compliance requirement for stand-alone engines was complemented with the addition of bench test emissions measurements for completed vehicles, on-road emissions measurement tests (PEMS), on-board devices for remote monitoring, and other vehicle requirements.

Stricter use environment requirements will be implemented in two phases, China VIa and China VIb. Enforcement dates based on usage have been set for gas-powered vehicles, city (public) vehicles, and ordinary vehicles, with China VIa coming into effect in July 2021.

**(3) Fuel Economy and NEV Regulations:** Fuel economy standards for light-duty passenger vehicles include both corporate average fuel consumption (CAFC) and individual vehicle fuel economy regulations, which are being implemented in five stages since January 2021. The fifth-stage CAFC regulations replace the current European NEDC with the WLTC, while effectively tightening the regulation by a little over 20% compared to the fourth stage (WLTC converted regulatory values). For individual vehicles, the fourth-stage simply switches to

converting to WLTC fuel economy values without further tightening of the regulation. In addition, off-cycle credits will be adopted in the fifth stage of the CAFC regulation.

Similarly, legislation on the concurrent management of CAFC and NEV fuel economy credits (valid from 2018 to 2020) was issued in 2017 and enacted in April 2018. In June 2020, a revised version incorporating rules for 2021 to 2023 was issued. Although the enforced ratio of NEV credits relative to the production and import of conventional energy vehicles becomes stricter every year, the rules also include a preferential scheme for the count of conventional energy vehicles that meet the definition of fuel-efficient vehicles. Taking the impact of the COVID-19 pandemic into account, special regulation easing measures limited to 2020 were issued separately in February 2021.

Fuel economy for heavy-duty vehicles used in commercial operations is subject to two different test methods and regulatory values, namely the Phase 4 Ministry of Transport regulations and the Phase 3 Ministry of Industry and Information Technology regulations.

A driving mode GB standard was recently released for the Ministry of Industry and Information Technology Phase 4 regulations, and revisions to the regulatory values and test methods will be examined.

**(4) Noise Regulations:** Acceleration noise regulations equivalent to UN R51.02 (phase 2) and stationary noise regulations are currently in effect. A draft law to integrate acceleration noise regulations (phases 3 and 4) and stationary noise regulations into a single GB standard for the next regulations is under examination.

## 8 Asia & Oceania

### 8.1. General Trends

In the ASEAN, establishing a Mutual Recognition Agreement (ASEAN MRA) in the automotive field has been discussed for many years since the ASEAN heads of state signed the mutual recognition framework agreement in 1998. In January 2021, approval by all member countries was completed, and some items will come into effect in January 2022 following the establishment of legislation in the individual nations. For the time being, applicability is limited to the products manufactured in the ASEAN region, allowing the use of test reports from any of the countries in that region by all member countries. This is projected to simplify approval procedures.

### 8.2. India

The Indian Standards (IS) and Automotive Industry Standards (AIS) technical standards under the Central Motor Vehicle Rules (CMVR) have been established, and are gradually being harmonized with UN regulations. The introduction of up to 2,500 European- or Japanese-approved vehicles per manufacturer per year.

Regulations equivalent to those of Europe have been established in preparation for the day the offset frontal impact, side impact, and pedestrian protection passive safety regulations are applied to all vehicles. Rules stipulating the requirements for brake composite electronic components came into force in April 2021. The safety conformity of production (CoP) rules for markings and simplified inspections are under consideration.

The Bharat Stage VI (BS VI) regulations equivalent to the European Euro 6 emissions regulations have been applied since April 2020. Real driving emissions regulations are planned for April 2023, and regulatory values are currently under discussion. The country has also decided to introduce regulations on fuel economy and fuel economy label for new vehicles. Stage 1 corporate average fuel economy regulations have applied to light-duty passenger vehicles since April 2017. A tightening of fuel economy regulations is planned for April 2022.

### 8.3. Indonesia

The Indonesian government is pushing for the spread of electric vehicles, and a new law on type approval for electric vehicles has been established independently by Presidential Order. The adoption of UN R100 (for electric vehicle safety) and UN R138 (for acoustic vehicle alerting systems (AVAS)) also tightens the requirements for EVs. There are also plans to build a large-scale testing facility capable of conducting tests for all items in the ASEAN MRA.

The application of Euro 4/IV regulations to gasoline vehicles in 2018 and diesel vehicles in 2021 was decided in 2017. However, the impact of the COVID-19 pandemic resulted in pushing enforcement for diesel vehicles back one year to 2022. In 2021, a tax based on fuel efficiency will be levied.

### 8.4. Thailand

Every year, new UN regulations are systematically adopted. However, even if the technical requirements are the same as in the UN regulation, adaptations such as instituting Thai-specific plant audit (CoP) requirements are made and the approval in the UN regulation is not taken

as is. In 2020, the Thai Industrial Standard Institute (TISI) announced that labeling using QR codes with license information would be mandatory for industrial products. This means that vehicles and parts approved by the TISI will require those labels.

Following the formulation of a national policy to address PM 2.5 and other air pollution issues, the Ministry of Industry is looking into moving Euro 5/6 adoption forward. Despite a push to enact Euro 5, in particular, for all vehicles in 2021, a proposal to postpone Euro 5 presented by the industry was accepted by the National Environment Board. A final decision will be made following discussions in the cabinet.

### **8.5. Malaysia**

A tightening of emissions regulations to Euro 4/IV is scheduled from 2020 for gasoline vehicles and 2022 for diesel vehicles. Vehicle exterior noise regulations are going to be strengthened to UN R51.02 for light-duty vehicles and UN R51.01 for heavy-duty vehicles on the same timeline as the emissions regulations. Since joining the 1958 Agreement in 2006, Malaysia has been actively adopting UN regulations, and is the ASEAN country with the highest number of such regulations. The application of all planned UN regulations to new models was completed in 2020.

### **8.6. Vietnam**

Based on the roadmap issued for emissions standards by the Prime Minister, regulations are set to be strengthened to Euro 5/V in January 2022. However, market fuel preparations are behind schedule, creating a discrepancy with the new emissions regulations.

Seizing upon the occasion provided by the enactment of the EU-Vietnam Free Trade Agreement (FTA) in August 2020, the Vietnamese has expressed interest in joining the 1958 Agreement, raising expectations that the mutual recognition type approval framework will eventually be used.

### **8.7. Taiwan**

Harmonization with UN regulations is underway, but rather than being unconditional, their introduction is based on a careful examination of the requirements and test by the nation's own testing institute. The procedure, starting with the examination of the application documents, is carried out extremely strictly.

The Euro VI emissions regulations have applied to new models since September 2019, and to existing vehicles since September 2020. With respect to fuel economy,

stronger CAFE regulations will apply in 2022. The sixth-stage noise regulation has been issued. As with the UN R51.03 on vehicle exterior noise serving as a model, the regulation will be applied in three stages.

### **8.8. Australia**

The Australian Design Rules (ADR), which include unique requirements, are being harmonized with UN regulations. It is currently possible to use compliance with UN regulations cited in the ADR or the latest subsequently issued version thereof to submit an application. A new certification system (RVSA) was scheduled to apply in December 2019, but the stagnation of the economy has led to postponing its application on hold until July 2021.

Government authorities is said to have proposed Euro 6d (WLTP mode) for light-duty vehicles and Euro VI for heavy-duty vehicles as the next emissions regulations, which would come into effect in July 2027 for new models and July 2028 for existing vehicles. The Federal Chamber of Automotive Industries (FCAI) has finalized voluntary CO<sub>2</sub> restrictions, and defined the years 2020 to 2023 as the discretionary compliance period and the years 2024 to 2030 as the mandatory compliance period.

## **9 Central and South America**

### **9.1. General Trends**

While several countries have started producing vehicles since the 1950s, many nations still have out-of-date regulations. The Brazil and Argentina-led Southern Common Market (MERCOSUR) is working on establishing regulations with an eye toward harmonizing them with those of the UN.

### **9.2. Mexico**

Although strongly influenced by the U.S., Mexico accepts regulations from the U.S., UN/EU, China, India, Brazil and Japan. Deliberations on adopting pole side impact, AEBS and other advance safety regulations for the 2023 model year for new vehicles and the 2024 model year for all vehicles have begun.

Emissions regulations equivalent to Euro 4 Tier 2-Bin 7 based on those of the U.S. and Europe have been introduced. The government proposed a gradual tightening of the regulations to Euro 5/Tier 2-Bin 5 and Euro 6/Tier 3, but a concrete timetable for this process has yet to be determined. In an effort to reduce greenhouse gas emissions, CO<sub>2</sub> regulations aligned with those of the U.S. are in effect. The government is reevaluating its 2018 pro-

posal to make those regulations stricter for the 2019 and subsequent model years.

### 9.3. Brazil

The introduction of Rota 2030 (an automotive policy meaning Route 2030), which aims to stimulate domestic production, and encourage technology transfers, and offers tax incentives for early compliance with regulations, is advancing efforts to harmonize its collection of regulations dating to the 1980s with UN regulations.

The next emissions regulations (L7 regulations: as of January 2022, L8 regulations: as of January 2025) were finalized at the end of 2018. These Brazil-specific regulations use those of the U.S. as a basis while also adding stipulations such as the real driving emissions (RDE) tests introduced in Europe. The government and industry have been debating the details of the various test items since 2019. Fuel economy standards intended to revitalize Brazilian automobile production and increase competitiveness are stipulated in the Rota 2030 government policy. Regulations for gasoline and flexible fuel vehicles came in effect in 2019, and will apply to diesel vehicles in 2022. Regulatory values are currently determined until 2026, and deliberations on values for 2027 and subsequent years are expected to begin in 2021.

### 9.4. Argentina

Regulations from the UN/Europe, as well as from the U.S. are all accepted, and no new regulations have been adopted in the last few years. One distinction, however, is the requirement to present a report in Spanish in certification submissions.

There has been little activity concerning emissions regulations since the application of Euro 5 in 2015. There has been some indication of starting discussions on Euro 6 as the next regulation, nothing concrete has been set in motion. With respect to fuel economy and CO<sub>2</sub>, the application of fuel economy labels became mandatory in June 2020 as a step toward the final goal of formulating fuel economy standards.

## 10 Middle East and Africa

### 10.1. Gulf Cooperation Council (GCC)

Given the lack of a concentrated automotive industry in its region and the influx of a large variety of vehicles from various parts of the world, the GCC Standardization Organization (GSO) vehicle structural regulations consist of stipulations to comply with UN regulations and the

FMVSS, with many cases involving choosing to comply with one or the other. The GSO regulations are also characterized by giving precedence to stipulating mandatory installation requirements, and by allowing compliance with either UN regulations/FMVSS or the regulations of the region of origin for technical requirements.

Work to revise the GSO regulations has slowed down in the last few years, but there are quiet behind-the-scenes discussions on the mandatory installation of back guide monitors, CMS, AEBS, LKA and other advanced active safety systems.

The GSO also issued a directive requiring the UAE to make Euro 6-equivalent exhaust emission regulations mandatory for gasoline and diesel vehicles starting from the 2025 model year.

### 10.2. South Africa

Regulations based on those of the UN have been adopted, but they have not been updated in many years and out-of-date requirements remain in effect. Discussions to update to the latest regulations and introduce new requirements in 2025 have finally begun under the impetus provided by the Safer Cars for Africa campaign launched by Global NCAP.

Tightening the current (Euro 2) emissions regulations to (Euro 4 or 5) is under consideration, but specific dates of enforcement and the contents of the regulations remain unclear.

## 11 Motorcycles

### 11.1. Japan

**(1) Vehicle Safety:** Lighting devices (UN R50) and Headlamps emitting a symmetrical passing beam (UN R113) were adopted in June 2015, and side marker lamps for new models and existing vehicles as of June 2020. The first two regulations came into effect for those same vehicles in September 2020. The Installation of Lighting and Light-signalling Devices (UN R53) regulation was adopted in September 2020 and will apply to vehicles other than class 1 motorized bicycles in September 2023, and to class 1 motorized bicycles in June 2025.

Reflecting amendments to Motorcycle and Moped Braking (UN R78) with respect to advanced brakes, the installation of ABS in vehicles with a displacement exceeding 125 cc and either ABS or a combined brake system (CBS) in vehicles with a displacement exceeding 50 cc but less than 125 cc has become mandatory starting in October 2018 for new models, and October 2021 for

existing or imported vehicles.

**(2) Emissions:** The fourth stage of emissions regulations, which are based on GTR 2, will apply to new models other than Class 1 motor-driven cycles, as of December 2020 and to existing vehicles as of November 2022. Catalyst monitors, which are part of the OBD II requirements will apply to new models starting in December 2024, and to existing vehicles as of November 2026. However, for Class 2 motor-driven cycles this will be delayed by one year, to December 2025 for new models and November 2027 for existing vehicles.

**(3) Noise:** Motorcycle noise emissions regulations (UN R41.04) are in effect, and amendments to the UN R41.04 next-stage noise regulations are under discussion.

### 11.2. U.S.

**(1) Vehicle Safety:** There were no significant changes in the laws or regulations.

**(2) Environmental Protection:** There were no significant changes in federal laws or regulations. Amendments to bring the emissions regulations up to the Euro 5 level are being considered by the state of California.

### 11.3. Canada

There were no significant changes in the laws or regulations.

### 11.4. Europe

A new uniform vehicle type certification (Whole Vehicle Type Approval [WVTA]) framework regulation ((EU) 168/2013) was issued in 2014, and came into effect in January 2016 for motorcycles.

Type approval consists of the framework regulation and the delegated regulations on environmental and propulsion unit performance ((EU) 134/2014, as amended by (EU) 2016/1824, (EU) 2018/295) and (EU) 2019/129, on functional safety ((EU) 3/2014, as amended by (EU) 2016/1824), and on vehicle construction ((EU) 44/2014, as amended by (EU) 2016/1824 and (EU) 2018/295), and the implementing regulation ((EU) 901/2014, as amended by (EU) 2016/1825 and (EU) 2020/239). An amended framework regulation ((EU) 2020/1694) was issued in November 2020 in the context of specific measures for end-of-series vehicles in response to the COVID-19 pandemic.

The withdrawal of the U.K. from the European Union will automatically make receiving European WVTA impossible as of January 2021 and will require following the U.K. type approval requirements, which are based on the European WVTA.

**(1) Vehicle Safety:** Motorcycles have been excluded

for some time, but progress was made on the examination of general safety criteria that also encompass cybersecurity.

**(2) Emissions:** In accordance with the delegated regulation ((EU) 2019/129), Euro 5 is set to apply to new models starting in January 2020 and to existing vehicles starting in January 2021. Some OBD Stage II functionality (catalyst monitors) will apply to new models as of January 2024 and to existing vehicles as of January 2025 as part of Euro 5+.

**(3) Noise:** The next-stage motorcycle noise regulations (amendments to UN R41.04) are being discussed.

### 11.5. China

The passenger handholds and foot rest safety regulations have been amended and will apply to new models from January 2022, and to existing vehicles from January 2023. Advanced braking systems have been enforced since July 2020.

The China IV (equivalent to Euro 4) emissions regulations are currently in effect, and the next-stage China V (equivalent to Euro 5) are under assessment. Fuel economy standards have also been revised, coming into effect in July 2020 for new models, and in July 2021 for existing vehicles. The amendment of noise regulations equivalent to UN R41.04 is also being examined.

### 11.6. Asia & Oceania

**(1) India:** The AIS regulations on stands, external projections, and foot rests have been revised and will apply in January 2022.

The Euro 5-equivalent Bharat Stage (BS) VI emissions regulations came into effect in April 2020, and OBD Stage I was applied at the same time.

In addition, the OBD stage II requirements will apply from April 2023. Since March 2019, applications for the IS 3028:1998 noise regulations (equivalent to UN R41.03) and IS 3028:2018 (equivalent to UN R41.04) can be submitted concurrently.

**(2) Indonesia:** Emissions regulations equivalent to Euro 3 are currently in effect, and the application of Euro 4-equivalent regulations starting in 2025 is being examined. The application of UN R41.04-equivalent noise regulations to new models in 2021 and existing vehicles in 2023 is also under consideration.

**(3) Thailand:** Horn safety regulations (equivalent to UN R28.00) came into effect for new models from January 2018 and for existing vehicles from January 2020. Tire regulations (equivalent to UN R75) have applied

since January 2019. Making advanced braking systems (ABS/CBS) mandatory is under consideration.

Seventh stage emissions regulations equivalent to Euro 4 (applying to all items except OBD) have been in effect since March 2020.

Noise regulations equivalent to UN R41.03 are in effect, and regulations equivalent to R41.04 are under consideration as the next stage.

**(4) Malaysia:** The latest UN safety-related regulations covering speedometers (UN R39.01), brakes (UN R70.04), electromagnetic compatibility (UN R10.05) and symmetrical passing beams (UN R113.01) came into effect in January 2020, and only the regulation on the installation of lighting devices is scheduled to apply in January 2022.

Emissions regulations equivalent to Euro 4 (Types 1 and 2 only) came into effect in January 2020 for new models and will apply to existing vehicles in January 2022. The UN R41.04 noise regulations were applied to new models in January 2020 and will apply to existing vehicles in January 2022.

**(5) Vietnam:** Harmonization with UN safety regulations is being examined. Making automatic daytime lights, daytime lights, and advanced braking systems (ABS) mandatory is also being studied. Euro 3-equivalent regulations are currently in effect, and strengthening them to Euro 4-equivalent regulations is being considered. The application of fuel economy labels became mandatory in January 2020. Noise regulations only cover close proximity exhaust noise.

**(6) The Philippines:** Safety regulations concerning horns (UN R28), tires (UN R75) and speedometers (UN R39), among others, are under assessment.

Euro 3-equivalent regulations are currently in effect, and the introduction of Euro 4-equivalent regulations is being considered. The incorporation of noise regulations equivalent to UN R41.03 is also being examined.

**(7) Singapore:** Euro 4-equivalent emissions regulations have applied to vehicles with a displacement exceeding 200 cm<sup>3</sup> since 2018, and to those with a displacement of 200 cm<sup>3</sup> or less since 2020. The introduction of noise regulations equivalent to UN R41.04 is also being examined.

**(8) Taiwan:** Safety regulations matching those of Europe have made the installation of ABS or CBS mandatory since January 2019 for new vehicles. The seventh stage emissions regulations (equivalent to Euro 5, with

local requirements) will apply to new models as of January 2020 and to existing vehicles as of January 2022.

The fuel economy regulations have also been revised and are scheduled to apply from January 2022. The sixth stage noise regulations (equivalent to UN R41.04, with local regulation values applied to close proximity exhaust noise) are in effect.

**(9) Hong Kong:** On the environmental front, the emissions regulations in effect since July 2020 are the Euro 4 or Japanese (2016) regulations. For noise, compliance with either the European regulation (97/24/EC) or Japanese regulation (2001 regulation) is required.

**(10) Australia:** The new Road Vehicle Standards Act (RVSA) was issued, and will come into effect in July 2021.

The mandatory installation of front and rear ABS for vehicles above 125 cm<sup>3</sup>, and of either ABS or CBS in the front and rear for smaller vehicles was finalized. It came into effect in November 2019 for new models and will apply to existing vehicles in November 2021 (however, there are provisions that exclude trial, enduro, and trail motorcycles).

There were no significant changes in laws and regulations concerning either emissions or noise.

#### **11. 7. Central and South America**

**(1) Brazil:** The mandatory installation of ABS or CBS for vehicles with a displacement below 300 cc (output below 22 kW), and for ABS for those with a displacement of 300 cc or higher (22 kW or more) has gradually been made mandatory, came into effect in 2019.

UN regulations on lighting devices and mirrors were used as a basis to amend domestic laws, which were applied to production vehicles and to vehicles clearing customs starting in January 2019.

The second-stage PROMOT M4 fuel emissions regulations are in effect, and the application of PROMOT M5 (e.g., stricter regulation values, extended durability distance, the addition of evaporative emissions diurnal testing, aldehydes, and the addition of OBD (M1) requirements) are scheduled to apply to new models in January 2023 and to existing vehicles in January 2025. The enforcement of OBD (M2) will begin in January 2025 for new models, and January 2027 for existing vehicles. Strengthening the current noise regulations, which are equivalent to UN R41.03, to make them equivalent to UN R41.04 is under consideration.

**(2) Argentina:** In terms of advanced brake safety

regulations, the installation of ABS for vehicles with a displacement exceeding 220 cc, and ABS or CBS for vehicles with a displacement exceeding 50 cc and less than 220 cc, will be made mandatory, with enforcement in January 2023 for new models and January 2025 for existing vehicles under consideration.

**(3) Peru:** The Euro 3 emissions regulations have been in effect since January 2017.

**(4) Chile:** Since March 2019, the Euro 3 have become the only emissions regulations in effect.

Noise regulations equivalent to UN R41.03 have applied since July 2019.

Safety regulations that make the installation of advanced brakes (ABS or CBS) mandatory are under con-

sideration.

**(5) Columbia:** Emissions regulations were issued in September 2019, and Euro 3-equivalent regulations will apply to domestically produced and imported motorcycles starting in January 2021.

Safety regulations that make the installation of advanced brakes (ABS or CBS) mandatory in stages are under consideration.

#### **11. 8. Middle-East**

**(1) Gulf Cooperation Council (GCC):** Environmental and safety regulations are currently in effect. Since January 2020, the vehicle categories in motorcycle vehicle certification system have complied with those of Europe.