



Regulation of Crash Avoidance Systems

Australia • Canada • China • European Union
France • Israel • Japan • Russian Federation
South Africa • Spain • Sweden • Turkey
United Arab Emirates • United Kingdom

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Comparative Summary

Jenny Gesley
Foreign Law Specialist

This report surveys the legal requirements for car crash avoidance systems aimed at detecting and classifying vulnerable road users, such as pedestrians and bicyclists, in 14 selected jurisdictions, namely **Australia, Canada, China, France, Israel, Japan, the Russian Federation, South Africa, Spain, Sweden, Turkey, the United Arab Emirates (UAE), the United Kingdom (UK), and the European Union (EU).**

Around 1.3 million people worldwide are killed in road accidents every year, and up to 50 million are injured. Vulnerable road users, such as pedestrians and cyclists, make up more than half of those killed and injured.¹ Globally, the total number of road deaths increased during the 1990s and early 2000s. After that, it plateaued and slightly decreased in recent years. In the **United States**, 36,560 people were killed in road accidents in 2018, and nearly 3 million adults and children were injured. However, in the past 50 years, the fatality rate per 100 million vehicle miles traveled has gone down by 76% in the United States.² In 2008, **Sweden's** car manufacturer Volvo Automobile AB was the first car manufacturer in the world to introduce an automatic car-crash avoidance system, and in 2010, it was the first manufacturer to “introduce pedestrian detection and avoidance technology.”

In February 2020, 1,700 representatives from 140 countries around the world, as well as people from international agencies, civil society organizations, foundations, and private companies met in Stockholm, **Sweden**, at the Third Global Ministerial Conference on Road Safety. Among other topics, the gathering addressed better ensuring the safety of pedestrians and cyclists and adopted the nonbinding “Stockholm Declaration,” which calls for a new global target to reduce road traffic deaths and injuries by 50% by 2030.³ The Stockholm Declaration was endorsed by the United Nations General Assembly in August 2020.⁴

The United Nations Economic Commission for Europe (UNECE) was set up in 1947. UNECE is one of five regional commissions of the United Nations (UN). It has 56 member states in Europe, North America, and Asia, among them the **United States** and the surveyed jurisdictions **Canada, France, Israel, the Russian Federation, Sweden, Turkey, and the UK.** The UNECE World Forum for Harmonization of Vehicle Regulations (WP.29) is a regulatory forum within the institutional framework of the UNECE Inland Transport Committee. It administers three agreements on motor vehicles and their equipment, adopted in 1958 (UN regulations related to safety and environmental aspects of vehicles), 1997 (UN rules on periodical technical inspections of vehicles

¹ *Road Traffic Injuries*, WHO, June 21, 2021, <https://perma.cc/MF2K-JK7Q>.

² U.S. Explanation of Position on the 2020 Stockholm Declaration, Third Global Ministerial Conference on Road Safety, Feb. 19–20, 2020, at 2, <https://perma.cc/NWP4-5E5P>.

³ Stockholm Declaration, Third Global Ministerial Conference on Road Safety: Achieving Global Goals 2030, Feb. 19–20, 2020, <https://perma.cc/7DR4-ZJY3>.

⁴ G.A. Res. 74/299, U.N. Doc. A/RES/74/299 (Sept. 2, 2020), at 5, <https://perma.cc/NQD5-RESQ>.

in use), and 1998 (UN global technical regulations), respectively. Any member of the UN and any regional organization set up by member countries of the UN may participate in the activities of WP.29 and become a contracting party to the agreements administered by WP.29.

The surveyed jurisdictions **Australia**, the **EU**, **France**, **Japan**, the **Russian Federation**, **South Africa**, **Spain**, **Sweden**, **Turkey**, and the **UK** are contracting parties to the 1958 UNECE Agreement. The UN regulations adopted under the agreement establish uniform standards for vehicles and their components relating to safety, environment, energy, and anti-theft requirements. Contracting parties are not obligated to adopt a specific UN regulation. Among others, two UN regulations adopted in June 2021 aim to increase the safety of pedestrians and cyclists (UN Regulations nos. 158 and 159). The **EU** acceded to these two new UN regulations, making them mandatory for all its Member States. The development of another UN regulation on advanced emergency braking systems (AEBS) for cars (no. 152) was spearheaded by **Japan** and the **EU**.

Furthermore, the surveyed jurisdictions **Australia**, **Canada**, **China**, the **EU**, **France**, **Japan**, the **Russian Federation**, **South Africa**, **Spain**, **Sweden**, **Turkey**, and the **UK**, as well as the **United States**, are contracting parties to the 1998 Agreement on UN Global Technical Regulations. The global technical regulations (GTRs) developed under the agreement cover the approval of vehicles' safety and environmental aspects. Among other safety requirements, the GTRs contain requirements for the protection of pedestrians and other vulnerable road users. Contracting parties may decide not to apply a specific UN GTR or transpose it with amendments.

On January 5, 2020, the new **EU** Regulation No. 2019/2144 on type-approval requirements for motor vehicles and their trailers entered into force. The regulation applies from July 6, 2022, in all **EU** Member States, including the surveyed jurisdictions **France**, **Spain**, and **Sweden**, without any implementing legislation needed. The **UK** has incorporated the regulation into a new body of domestic UK law, known as retained EU legislation. In line with the EU-Turkey Customs Union, **Turkey** has issued a regulation transposing the regulation into Turkish law, which will take effect simultaneously with the EU regulation. Among other things, Regulation (EU) 2019/2144 amends Regulation (EU) No. 2018/858 to update **EU** type-approval requirements to ensure the general safety of vehicles, in particular with regard to vulnerable road users. Vulnerable road users are defined as "non-motorised road users, including, in particular, cyclists and pedestrians, as well as users of powered two-wheelers." In **Japan**, AEBS standards will take effect for domestic new type cars on November 1, 2021, and they will be incorporated in the vehicle approval system. In **South Africa**, requirements for vehicles are in general aligned with the applicable standards, regulations, and directives of the UNECE.

Other countries may not have mandatory requirements to protect vulnerable road users, but have issued nonbinding recommendations or are in the process of revising the currently applicable standards, or their manufacturers are voluntarily adding additional safety features. **China**, for example, is currently revising its recommended standard titled *Protection of Motor Vehicle for Pedestrians in the Event of a Collision* and will upgrade it into a mandatory standard, with reference to the UNECE Regulation No. 127. Transport **Canada** has held open consultations on updating the Motor Vehicle Safety Regulations to require the installation of certain advanced driver assistance systems, other technologies, such as advanced braking systems, and sound emitters for electric and hybrid vehicles to assist in the detection of vulnerable road users. In **Australia**, a

regulation impact statement was published in October 2020 that recommended pedestrian-detecting AEBS be made mandatory for light vehicles; however, a proposed Australian Design Rule on this matter has not yet been published. In addition, even though there is no regulatory requirement, a majority of new passenger cars in **Australia** are being sold with AEBS or lane keeping assist. Crash avoidance and pedestrian recognition equipment used to be mandatory for vehicles used in mines in the **Russian Federation**; however, the regulations were repealed in December 2020. Media outlets have reported that the government is working on establishing requirements for collision avoidance systems for all types of vehicles.

Countries are also supporting the development of autonomous vehicles, in particular to increase the safety of road traffic. **Israel's** Ministry of Transportation and Road Safety reportedly sent a document to companies engaged in the development of autonomous vehicles that lists different scenarios to be tested, including one where autonomous vehicles will have to be aware of pedestrians and obstacles. In addition to the safety of non-autonomous vehicles, the **UAE's** 2030 vision focuses on operating autonomous vehicles. Among other things, its Autonomous Vehicles Infrastructure will include pedestrian crossings that warn pedestrians with a vehicle approach alert. **China's** autonomous vehicles rules require test vehicles to pass a closed-road test, which includes testing the function "pedestrian and non-motor vehicle detection and response."

European Union

*Jenny Gesley
Foreign Law Specialist*

SUMMARY European Union (EU) Regulation No. 2019/2144, which applies from July 6, 2022, updates EU type-approval requirements to ensure the general safety of vehicles, in particular with regard to vulnerable road users, such as pedestrians and cyclists. Manufacturers apply for type-approval or individual vehicle approval with the competent approval authorities of the EU Member States. They must ensure that the vehicle complies with all relevant requirements applicable at the time of production and issue a certificate of conformity to accompany each vehicle. Manufacturers are furthermore required to ensure that vehicles are “designed, constructed and assembled so as to minimise the risk of injury to vehicle occupants and vulnerable road users.”

In addition, EU Member States must establish market surveillance authorities that carry out regular checks, such as documentary checks, laboratory tests, and on-road tests, to verify that vehicles, systems, components, and separate technical units comply with the relevant requirements. The European Commission is authorized to perform market checks independent of the Member States’ authorities and perform corrective or restrictive measures.

The European Commission is required to submit an evaluation of the safety measures and systems to the European Parliament and to the Council of the European Union by July 7, 2027, and every five years thereafter. If necessary, the European Commission must make recommendations, including legislative proposals, to amend the requirements concerning general safety and the protection and safety of vehicle occupants and vulnerable road users.

I. Introduction

The European Union (EU) is a contracting party to the UNECE 1958 Agreement and the 1998 Agreement on UN Global Technical Regulations.¹ The UN Regulations on vehicle approval adopted under the 1958 agreement to which the EU has acceded are published in the Official Journal of the European Union (O.J.).² The global technical regulations (GTRs) developed under the 1998 agreement cover the approval of vehicles’ safety and environmental aspects.³ Among

¹ 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, Mar. 20, 1958, 335 U.N.T.S. 211, <https://perma.cc/NF26-GLKN>; Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/8CRR-6QTF>.

² *Translation of UN Regulations in the Area of Vehicle Approval*, European Commission (last updated June 21, 2021), <https://perma.cc/55BM-4QDW>.

³ *Global Technical Regulations (GTRs)*, UNECE, <https://perma.cc/9NNM-QSTC>.

other safety requirements, the GTRs contain requirements for the protection of pedestrians and other vulnerable road users.

On January 5, 2020, the new European Union (EU) Regulation No. 2019/2144 on type approval requirements for motor vehicles and their trailers entered into force.⁴ The regulation applies from July 6, 2022, in all EU Member States without any implementing legislation needed.⁵ Among other things, Regulation (EU) 2019/2144 amends Regulation (EU) No. 2018/858 to update EU type-approval requirements to ensure the general safety of vehicles, in particular with regard to vulnerable road users.⁶ Vulnerable road users are defined as “non-motorised road users, including, in particular, cyclists and pedestrians, as well as users of powered two-wheelers.”⁷ Recital 3 of Regulation (EU) 2019/2144 states that

[t]he Union should do its utmost to reduce or to eliminate accidents and injuries in road transport. In addition to safety measures to protect vehicle occupants, the implementation of specific measures to prevent fatalities and injuries of vulnerable road users, such as cyclists and pedestrians, is needed to protect road users outside of the vehicle. Without new initiatives on general road safety, the safety effects of the current approach will no longer be able to off-set the effects of increasing traffic volumes. Therefore, the safety performance of vehicles needs to be further improved as part of an integrated road safety approach and in order to protect vulnerable road users better.

The update of vehicle safety requirements is part of the “Europe on the Move” package of the European Commission to achieve a mobility system that is “safe, clean and efficient for all EU citizens.”⁸

II. Development and Installation of Car Crash Avoidance Systems

A. Approval and Oversight

Manufacturers apply for type-approval or individual vehicle approval with the competent approval authorities of the EU Member States.⁹ They must ensure that the vehicle complies with all relevant requirements applicable at the time of production and issue a certificate of conformity to accompany each vehicle.¹⁰ Type-approval is granted by the approval authority if the type of vehicle, system, component, or separate technical unit satisfies the relevant administrative

⁴ Regulation (EU) 2019/2144, 2019 O.J. (L 325) 1, <https://perma.cc/K5J7-9FRC>.

⁵ Id. art. 19; Consolidated Version of the Treaty on the Functioning of the European Union (TFEU), art. 288, para. 2, 2016 O.J. (C 202) 47, <https://perma.cc/4FWQ-996H>.

⁶ Regulation (EU) 2018/858, 2018 O.J. (L 151) 1, <https://perma.cc/72GL-6DAB>; Regulation (EU) 2019/2144, art. 1.

⁷ Regulation (EU) 2019/2144, art. 3(1).

⁸ COM(2018) 293 final, May 17, 2018, at 1, <https://perma.cc/C2BQ-TB5U>.

⁹ Regulation 2018/858, art. 6, para. 1, art. 7, art. 13.

¹⁰ Id. art. 13, para. 2, art. 36.

provisions and technical requirements under EU legislation.¹¹ The type approval can be either EU-wide, meaning the vehicle complies with all relevant EU administrative provisions and technical requirements, or restricted to the territory of an EU Member State, meaning all national requirements are fulfilled.¹²

In addition, EU Member States must establish market surveillance authorities that are independent from the approval authorities.¹³ They carry out regular checks, such as documentary checks, laboratory tests, and on-road tests, to verify that vehicles, systems, components, and separate technical units comply with the relevant requirements.¹⁴ A minimum of one test for every 40,000 new motor vehicles registered in that Member State in the preceding year must be conducted, but there must be not less than five tests.¹⁵ The results of periodic reviews and assessments and information on hazards stemming from vehicles are made publicly available.¹⁶

EU Member States must establish “effective, proportionate and dissuasive” penalties for non-compliance by “economic operators”¹⁷ and technical services with the regulation.¹⁸

The European Commission is authorized to perform market checks independent of the Member States’ authorities and perform corrective or restrictive measures.¹⁹ Furthermore, it can impose administrative penalties on economic operators of up to €30,000 (about US\$35,600) per non-compliant vehicle.²⁰

B. General Requirements for All Vehicles

Regulation (EU) No. 2019/2144 sets requirements for motor vehicles with at least four wheels used for the carriage of passengers (category M), motor vehicles with at least four wheels intended for the transportation of goods (category N), and trailers (category O).²¹ It also applies to the systems, components, and separate technical units designed and constructed for such vehicles.²² Manufacturers must equip all new vehicles with the following safety features:

¹¹ Id. art. 7.

¹² Id. arts. 3(2), 3(3), 22, 46.

¹³ Id. art. 6, para. 1.

¹⁴ Id. art. 8.

¹⁵ Id. art. 8, para. 2.

¹⁶ Id. art. 6, para. 8, art. 8, para 10.

¹⁷ The term “economic operator” includes the manufacturer, the manufacturer’s representative, the importer, and the distributor. See id. art. 3(44).

¹⁸ Id. art. 84.

¹⁹ Id. arts. 9, 53.

²⁰ Id. art. 85, para. 1.

²¹ Regulation (EU) 2019/2144, art. 2.

²² Id.

- intelligent speed assistance,
- alcohol interlock installation facilitation,
- driver drowsiness and attention warning systems,
- advanced driver distraction warning systems,
- emergency stop signals,
- reversing detection systems,
- event data recorders, and
- accurate tire pressure monitoring.²³

Intelligent speed assistance is defined as “a system to aid the driver in maintaining the appropriate speed for the road environment by providing dedicated and appropriate feedback.”²⁴ Such a system must meet the following requirements:

- it must make the driver aware that the applicable speed limit is exceeded,
- it must be possible to switch it off,
- information about the speed limit may still be provided, and intelligent speed assistance shall be in normal operation mode upon each activation of the vehicle master control switch,
- feedback must be based on speed limit information obtained through the observation of road signs and signals, based on infrastructure signals or electronic map data, or both,
- it must not affect the possibility, for the drivers, of exceeding the system’s prompted vehicle speed, and
- its performance targets must be set in order to avoid or minimize the error rate under real driving conditions.²⁵

“Alcohol interlock installation facilitation” means a “standardized interface that facilitates the fitting of aftermarket alcohol interlock devices in motor vehicles.”²⁶

A “driver drowsiness and attention warning” is defined as a “system that assesses the driver’s alertness through vehicle systems analysis and warns the driver if needed.”²⁷ An “advanced driver distraction warning” means “a system that helps the driver to continue to pay attention to the traffic situation and that warns the driver when he or she is distracted.”²⁸ Driver drowsiness and attention warning and advanced driver distraction warning systems must comply with the

²³ Id. art. 4, para. 1 in conjunction with art. 5, art. 6, para. 1.

²⁴ Id. art. 3(3).

²⁵ Id. art. 6, para. 2.

²⁶ Id. art. 3(4).

²⁷ Id. art. 3(5).

²⁸ Id. art. 3(6).

principle of data minimization.²⁹ In addition, where one action triggers both systems, they must not prompt the driver in a confusing manner.³⁰

An “emergency stop signal is defined as “a light-signaling function to indicate to other road users to the rear of the vehicle that a high retardation force is being applied to the vehicle relative to the prevailing road conditions.”³¹

“Reversing detection” means “a system to make the driver aware of people and objects at the rear of the vehicle with the primary aim of avoiding collisions when reversing.”³²

An “event data recorder” is “a system with the only purpose of recording and storing critical crash-related parameters and information shortly before, during and immediately after a collision.”³³

Lastly, “tire pressure monitoring system” means “a system fitted on a vehicle which can evaluate the pressure of the tires or the variation of pressure over time and transmit corresponding information to the user while the vehicle is running.”³⁴

The European Commission is authorized to adopt delegated acts to lay down detailed rules concerning the specific test procedures and technical requirements for the type-approval of vehicles with the above-mentioned safety features.³⁵

Furthermore, manufacturers are required to ensure that vehicles are “designed, constructed and assembled so as to minimise the risk of injury to vehicle occupants and vulnerable road users.”³⁶

C. Specific Requirements for Passenger Cars and Light Commercial Vehicles

There are additional safety requirements for passenger cars and light commercial vehicles. In addition to the general safety requirements outlined above, these vehicles must be equipped with

- advanced emergency braking systems capable of detecting obstacles and motor vehicles in front, as well as vulnerable road users, such as pedestrians and cyclists,
- emergency lane-keeping systems, and

²⁹ Id. art. 6, para. 3.

³⁰ Id.

³¹ Id. art. 3(7).

³² Id. art. 3(8).

³³ Id. art. 3(13).

³⁴ Id. art. 3(2).

³⁵ Id. art. 6, para. 6.

³⁶ Id. art. 4, para. 4.

- enlarged head impact protection zones capable of enhancing the protection of vulnerable road users and mitigating their injuries in collisions.³⁷

Advanced emergency braking systems and emergency lane-keeping systems must meet the following requirements:

- it must only be possible to switch off such systems one at a time by a sequence of actions to be carried out by the driver,
- the systems must be in normal operation mode upon each activation of the vehicle master control switch,
- it must be possible to easily suppress audible warnings, but such action shall not at the same time suppress system functions other than audible warnings, and
- it must be possible for the driver to override such systems.³⁸

The European Commission is authorized to adopt provisions concerning uniform procedures and technical specifications for the type-approval of vehicles with such additional safety features.³⁹

D. Buses and Trucks

Buses and trucks must also be equipped with additional safety features to protect vulnerable road users. In particular, they must have advanced systems that are capable of detecting pedestrians and cyclists located in close proximity to the front or nearside of the vehicle and of providing a warning or avoiding collision with such vulnerable road users. Furthermore, they must be designed and constructed to enhance the direct visibility of vulnerable road users from the driver seat, by reducing the blind spots in front of and to the side of the driver.⁴⁰

III. Evaluation of Car Crash Avoidance Systems

The European Commission is required to submit an evaluation report to the European Parliament and to the Council of the European Union (Council) by July 7, 2027, and every five years thereafter.⁴¹ The evaluation report must cover the achievements of the safety measures and systems and detail whether those safety measures and systems act as intended by Regulation 2019/2144. If necessary, the European Commission must make recommendations, including legislative proposals, to amend the requirements concerning general safety and the protection and safety of vehicle occupants and vulnerable road users.⁴²

³⁷ Id. art. 7.

³⁸ Id. art. 7, para. 4.

³⁹ Id. art. 7, para. 6.

⁴⁰ Id. art. 9, paras. 3, 5.

⁴¹ Id. art. 14, para. 1.

⁴² Id.

Furthermore, by January 31st of each year, the European Commission must report to the European Parliament and to the Council on the progress made by the WP.29 of the UNECE's World Forum for Harmonization of Vehicle Regulations with regard to the vehicle safety standards set out in Regulation 2019/2144.⁴³ In addition, the European Commission publishes an annual status report on EU accession to UN regulations in the area of vehicle approval.

⁴³ Id. art. 14, para. 2.

France

Nicolas Boring
Foreign Law Specialist

SUMMARY France is a party to international agreements on vehicle safety and, as a member state of the European Union (EU), is bound by EU regulations. Motor vehicles need to be received before they can be used on public roads in France, and there are four main types of reception: European reception by type, European reception by small series type, national type reception, and individual reception. European reception by type and European reception by small series type are done by the National Center for Vehicle Reception (*Centre National de Réception des Véhicules*), while a network of regional authorities are in charge of approving vehicles for national type reception or individual reception. A private firm called UTAC does technical testing of vehicles and their components for reception purposes.

New vehicles must include certain systems for the protection of pedestrians and other vulnerable road users, and these systems must be approved for a vehicle to be received in France. For European reception by type and European reception by small series type, this requirement comes from Regulation (EU) No. 2019/2144, which is directly applicable in France. National type reception and individual reception are governed by domestic regulations, but these texts refer to EU regulations. On the specific subject of protection of pedestrians, French domestic regulations simply require new vehicles to fulfill the conditions laid out in the EU's Regulation (EC) No. 78/2009, which in turn requires vehicles to include a brake assist system and frontal protection system. This EU regulation also states that, upon assessment by the European Commission, vehicles equipped with collision avoidance systems may not have to fulfill some of the otherwise mandated test requirements.

I. Introduction

France is a party to the 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations.¹ It is also a party to the 1998 Agreement on UN Global Technical Regulations.² Furthermore, as a member state of the

¹ 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, Mar. 20, 1958, 335 U.N.T.S. 211, <https://perma.cc/NF26-GLKN>.

² United Nations, Economic and Social Council, 1998 Agreement (Global), Status of the Agreement, Mar. 5, 2007, at 4, <https://perma.cc/3BE3-6SV4>; Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/8CRR-6QTF>.

European Union (EU), France is bound by EU regulations, including Regulation No. 2019/2144 on type approval requirements for motor vehicles and their trailers.³

Motor vehicles need to be certified, or “received” to use the technical term, before they can be used on public roads in France.⁴ This requirement applies to vehicles classified M (motor vehicles with at least four wheels, for the transportation of passengers), N (motor vehicles with at least four wheels for the transportation of goods), and O (trailers), T (wheeled agricultural vehicles), C (tracked agricultural vehicles), and L (motorcycles, motorized tricycles, quads and buggies).⁵

As in other member states of the European Union, there are four main types of reception in France.⁶ They are as follows:

- European reception by type, which corresponds to EU type-approval as defined in EU Regulation (EU) 2018/858 of 30 May 2018 on the approval and market surveillance of motor vehicles,⁷ and is automatically recognized by other EU member states,
- European reception by small series type, which is also automatically recognized by other EU member states but is limited to vehicles sold in small numbers,
- national type reception, by which vehicles may be approved to be used on French roads, but other EU member states are not obligated to recognize the approval, and
- individual reception, for single vehicles.

European reception by type, and European reception by small series type, are done by the National Center for Vehicle Reception (*Centre National de Réception des Véhicules*), while a network of regional authorities are in charge of approving vehicles for national type reception or individual reception.⁸ The minister in charge of transportation establishes technical criteria for vehicle reception.⁹ All the systems that make up a vehicle must be approved for that type of vehicle to be received.¹⁰ A private firm called UTAC does technical testing of vehicles and their

³ Regulation (EU) 2019/2144, 2019 O.J. (L 325) 1, <https://perma.cc/K5J7-9FRC>.

⁴ *Homologation des véhicules*, Ministère de la transition écologique (Feb. 1, 2021), <https://perma.cc/3RRD-3XXC>.

⁵ Id.

⁶ Id.

⁷ Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the Approval and Market Surveillance of Motor Vehicles and Their Trailers, and of Systems, Components and Separate Technical Units Intended for Such Vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC, 2018 O.J. (L 151), <https://perma.cc/XXR6-THWK>.

⁸ *Homologation des véhicules*, Ministère de la transition écologique, supra note 4.

⁹ Code de la route, arts. R321-6, R321-15, <https://perma.cc/DHN3-2SJJ>.

¹⁰ *La réception par type de systèmes*, Centre National de Réception des Véhicules, Direction régionale et interdépartementale de l’environnement, de l’aménagement et des transports, <https://perma.cc/E2GD-93VH>.

components for reception purposes at a laboratory and testing ground near the town of Montlhéry.¹¹

II. Car Crash Avoidance Systems

New vehicles classified as M, N, and O must include certain systems for the protection of pedestrians and other vulnerable road users, and these systems must be approved for a vehicle to be received in France. For European reception by type and European reception by small series type, this requirement comes from Regulation (EU) No. 2019/2144, which is directly applicable in France.¹² National type reception and individual reception are governed by domestic regulations, but these texts refer to EU regulations. On the subject of general safety, French regulations require new vehicles to fulfill the conditions set out in Regulation (EC) 661/2009.¹³ This EU regulation requires manufacturers to “ensure that vehicles are designed, constructed and assembled so as to minimize the risk of injury to vehicle occupants and other road users.”¹⁴ Systems and equipment that all M and N class vehicles must have include braking systems, speedometers, headlamps, fog lamps, reversing lamps, and safety glazing.¹⁵

On the specific subject of protection of pedestrians, French domestic regulations simply require new vehicles of the M1 class (motor vehicles with at least four wheels and built with no more than eight passenger seats in addition to the driver) and N1 class (motor vehicles intended for the transportation of goods and weighing no more than 3.5 tons) to fulfill the conditions laid out in European Regulation (EC) No. 78/2009.¹⁶ This regulation requires vehicles to include a brake assist system and frontal protection system, the latter of which may be fitted as original equipment to the vehicle or supplied as a separate technical unit.¹⁷ This EU regulation also states

¹¹ Id.; *Regulation & Homologation*, UTAC, <https://perma.cc/PC64-USZL>; *Individual Vehicle Approval (RTI)*, UTAC, <https://perma.cc/M9E6-GYUZ>.

¹² Regulation (EU) 2019/2144, arts. 4, 6.

¹³ Arrêté du 4 mai 2009 relatif à la réception des véhicules à moteur, de leurs remorques et des systèmes et équipements destinés à ces véhicules en application de la directive 2007/46/CE, (as amended), Annex 3 & Annex 3 bis, <https://perma.cc/ZAQ3-7K47>; Arrêté du 11 janvier 2021 relatif à la réception des véhicules à moteur, de leurs remorques et des systèmes et équipements destinés à ces véhicules en application du règlement UE/2018/858 (as amended), Annex 2 & Annex 2 bis, <https://perma.cc/K48W-NFWC>.

¹⁴ Regulation (EC) No 661/2009 of the European Parliament and of the Council of 13 July 2009 Concerning Type-Approval Requirements for the General Safety of Motor Vehicles, Their Trailers and Systems, Components and Separate Technical Units Intended Therefor (as amended), art. 5, 2009 O.J. (L 200) 1, <https://perma.cc/AP8A-JGKD>.

¹⁵ Id. annex I.

¹⁶ Arrêté du 4 mai 2009 relatif à la réception des véhicules à moteur, de leurs remorques et des systèmes et équipements destinés à ces véhicules en application de la directive 2007/46/CE, (as amended), Annex 3 & Annex 3 bis; Arrêté du 11 janvier 2021 relatif à la réception des véhicules à moteur, de leurs remorques et des systèmes et équipements destinés à ces véhicules en application du règlement UE/2018/858 (as amended), Annex 2 & Annex 2 bis.

¹⁷ Regulation (EC) No. 78/2009 of the European Parliament and of the Council of 14 January 2009 on the Type-Approval of Motor Vehicles with Regard to the Protection of Pedestrians and Other Vulnerable Road Users, Amending Directive 2007/46/EC and Repealing Directives 2003/102/EC and 2005/66/EC (as amended), art. 4, 2009 O.J. (L 35) 1, <https://perma.cc/E7CN-5SNT>.

that, upon assessment by the European Commission, vehicles equipped with collision avoidance systems may not have to fulfill some of the test requirements otherwise required.¹⁸

III. Current Discussion

There currently does not appear to be any public discussion about adopting additional requirements for systems to detect and protect vulnerable road users.

¹⁸ Id. art. 11.

Spain

Graciela Rodriguez-Ferrand
Senior Foreign Law Specialist

SUMMARY The Dirección General de Tráfico, within the Ministerio del Interior, regulates and enforces car safety technical standards in Spain. The car crash avoidance systems listed in Spain's Reglamento General de Vehículos are mandatory for all cars sold in Europe.

I. Introduction

In Spain, the Dirección General de Tráfico (DGT), through the Jefatura Central de Tráfico (JCT) within the Ministerio del Interior, is the authority in charge of regulating and enforcing car safety standards.¹ The JCT is the authority in charge of establishing the technical standards and equipment required for a vehicle to be on the road in Spain.²

Spain became a party to the 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations on January 3, 1962.³ It also became a party to the 1998 Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can be Fitted and/or be Used on Wheeled Vehicles on August 8, 2000.⁴

II. Car Crash Avoidance Systems

The Reglamento General de Vehículos implements the technical equipment requirements for all new passenger cars sold in Europe to be on the road.⁵ The DGT website lists all the mandatory passenger car crash-prevention equipment requirements.⁶

¹ Real Decreto 2822/1998, Dec. 23, 1998 (updated Apr. 14, 2021), Por el que se Aprueba el Reglamento General de Vehículos, Boletín Oficial del Estado (B.O.E., Official Gazette) Jan. 26, 1999, arts. 1-2, <https://perma.cc/Z86X-TDC9>.

² Id. arts. 2, 10, 11-20.

³ 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, B.O.E. Jan. 3, 1962, <https://perma.cc/D7S4-9NUJ>.

⁴ Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/8CRR-6QTF>.

⁵ Real Decreto 2822/1998 arts. 2, 10, 11-20.

⁶ *Sistemas de Seguridad de Vehículos, Antes del Accidente*, DGT, <https://perma.cc/ME83-LR53>.

1. Anti-Lock Braking System

An anti-lock braking system (ABS) prevents wheels from locking during emergency braking or on low-grip surfaces such as a wet road or ice. This prevents or minimizes loss of directional control and stability and can reduce the risk or severity of an accident under certain circumstances.

2. Emergency Braking Assistance System

An emergency braking assistance system detects emergencies requiring application of a vehicle's brakes. It ensures maximum braking force and deceleration of the vehicle.

3. Stability Control System

A stability control system compares the actual path of the vehicle with that desired by the driver. It works by avoiding or minimizing the loss of directional control of the vehicle during cornering and making turns and in emergency maneuvers.

4. Tire Pressure Monitoring System

The tire pressure monitoring or control system continuously measures tire inflation pressure and informs the driver when this pressure falls below a certain threshold. Correct tire pressure ensures that the dynamic behavior of the vehicle is adequate.

5. Daytime Running Lights or Driving Lights

These lights increase the visibility of the vehicle for other road users, by means of energy-saving lamps that come on automatically when the engine is started.

6. Speed Control System

This system prevents a vehicle from exceeding a maximum speed set by the driver. The speed limiter is usually installed in conjunction with other speed control systems, such as cruise control and adaptive cruise control. These systems assist the driver in maintaining a safe speed adapted to the conditions of the road and the environment.⁷

III. Current Discussion

Recently, research by automobile manufacturers has led to the progressive adoption of new safety systems in vehicle fleets to reduce the probability and severity of an accident in certain situations.⁸

⁷ Id.

⁸ Id.

Some of the most important crash avoidance systems under consideration are:

- Warning systems that inform a driver of involuntary lane changes. These systems can act autonomously to keep a vehicle from straying out of its lane.
- Autonomous or automatic braking systems, which detect obstacles in front of a vehicle and inform the driver of risky situations. Some of these systems can act autonomously and activate a vehicle's brakes.

The head of the DGT has advocated mandatory adoption in Spain of the Intelligent Speed Assistant (ISA), a driving assistance system that prevents the driver from exceeding speed limits.⁹

Although Spain has not enacted any legislation or regulations for autonomous vehicles, the General Directorate of Traffic has authorized the testing of autonomous vehicles since 2015.¹⁰

Directive 2010/40 / EU creates the framework for the implementation of *Sistemas Inteligentes de Transporte* (SITs) on the road. Royal Decree 662/2012 establishes the framework for incorporating SITs in road transport and for interfaces with other modes of transport to improve traffic management and allow safer and more coordinated use of transportation networks.¹¹

The DGT is working with Mobileye, a company specializing in driver assistance systems, on joint research to help reduce accidents through alerts, both visual and audio, in real time.¹² Although the alert systems target road safety, they will also enable the gathering of data for research on information collected from the streets, such as infrastructure deficiencies, areas with a high number of accidents, the volume of parking lot use, and environmental conditions, among other factors.¹³ This information will be analyzed by the DGT and other entities to adapt Spanish roads for the arrival of autonomous and semi-autonomous vehicles.¹⁴

⁹ *Sistemas ADAS: Qué Son, Cómo Funcionan y Por Qué la DGT los Considera Tan Importantes Para la Seguridad*, El Economista (Sept. 17, 2018), <https://perma.cc/R438-TX42>.

¹⁰ Nota de Prensa, Dirección General de Tráfico, Ministerio del Interior Tráfico Establece el Marco para la Realización de Pruebas con Vehículos de Conducción Automatizada en Vías Abiertas a la Circulación (Nov. 16, 2015), <https://perma.cc/LDH9-27QT>.

¹¹ Real Decreto 662/2012, por el que se Establece el Marco para la Implantación de los Sistemas Inteligentes de Transporte (SIT) en el Sector del Transporte por Carretera y para las Interfaces con Otros Modos de Transporte, B.O.E. Apr. 14, 2012, <https://perma.cc/PN3G-MQ72>.

¹² *Regulación en Movilidad Autónoma*, Centro de Estudios Regulatorios (Oct. 25, 2019), <https://perma.cc/8XJ2-VT8V>.

¹³ Id.

¹⁴ Id.

Sweden

*Elin Hofoerberg
Foreign Law Specialist*

SUMMARY Swedish car manufacturer Volvo Automobile Ab in 2008 became the first in the world to introduce an automatic car-crash avoidance system, an automatic breaking system at low speeds.

Sweden is a European Union member state and bound by the EU framework on vehicle manufacturing requirements. Currently, newly registered cars must be equipped with an emergency breaking system (EBS). The Swedish Transport Agency is the responsible authority for approval and granting exemptions from any rules, and for overseeing and enforcing EU vehicle manufacturing requirements in Sweden.

In 1997, Sweden introduced a “Vision Zero” (*nollvision*) campaign to reduce traffic fatalities. Vision Zero continues to be government policy and the overall traffic goal. The goal was updated in 2020 to cut deaths in half by 2030 by adopting road safety measures such as increasing the use of automatic breaking technology in new passenger cars by 2030.

The Swedish government actively favors innovation in autonomous safety technology and funds state and industry collaborations to develop advanced technology to reduce traffic fatalities.

I. Development and Installation of Car Crash Avoidance Systems

A. Background

In 2008, Swedish car manufacturer Volvo Automobile AB became the first car manufacturer in the world to introduce an automatic car-crash avoidance system, which automatically applied the passenger car brakes when the distance to the car in front became too small.¹ Two years later, it became the first manufacturer to introduce pedestrian detection and avoidance technology.² The introduction of the car-crash avoidance system has reportedly resulted in fewer accident insurance claims.³ The feature has become standard in Volvo cars,⁴ and the Swedish traffic safety organization NTF has described the technology as one of the most important safety features in

¹ *First Car with a Constant Crash Avoidance System*, Guinness World Records, <https://perma.cc/57K8-M6N5>.

² *Id.*

³ John O’Dell, *Swedish Crash Records Show Volvo’s City Safety System Cuts Collisions*, Edmunds (July 15, 2015), <https://perma.cc/TM8R-A5SA>.

⁴ *Säkerhetssystem i Volvobilar*, Volvia, <https://perma.cc/7G5J-JAXV>.

cars since the introduction of seatbelts.⁵ Older cars without the technology installed may still be driven in Sweden.

In 1997, Sweden introduced the concept of Vision Zero (Nollvision), meaning the goal of zero deaths from traffic accidents.⁶ In line with this aspiration, Swedish traffic agencies have also encouraged safe driving through other means, including promoting the installation of Intelligent Speed Adaptation Systems (ISAs), alcohol ignition interlock devices, and “black box” event data recorders in passenger cars and trucks.⁷

Statistics indicate Sweden has seen significant demand for new cars recently. There were 4,994,067 registered passenger cars in Sweden at the end of 2020.⁸ About 300,000 were registered for the first time in 2020.⁹ As of June 2021, a total of 5,142,452 passenger cars were registered in the country.¹⁰

B. Regulation of the Development and Installation of Car Crash Avoidance Systems

Sweden is party to the 1958 Agreement concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulation,¹¹ and the 1998 Agreement on UN Global Technical Regulations (UN GTRs).¹²

Sweden is a member of the European Union (EU), and thus bound by EU legislation on vehicle manufacturing requirements, including car crash avoidance systems.¹³ As discussed in the EU part of this report, the EU has adopted a framework for vehicle safety, which includes car crash avoidance systems; road vehicle standard requirements are thus regulated at the EU level. Regulation (EU) 2018/858 on the approval and market surveillance of motor vehicles entered into

⁵ *Automatiska Bromssystem*, NTF, <https://perma.cc/37UR-4TSB>.

⁶ Regeringens Proposition 1996/97:137 Nollvisionen och det Trafiksäkra Samhället, <https://perma.cc/ET2U-UL6U>; see also Trafikverket, *Det Här är Nollvisionen*, <https://perma.cc/MVV8-RVCG>.

⁷ *Mobility and Transport, Road Safety: Cars*, European Commission, <https://perma.cc/8YPU-VZYJ>

⁸ *Fordonsbestånd 2001–2020*, Statistics Sweden, <https://perma.cc/5WEB-P28W>.

⁹ *Vehicle Statistics: Vehicles 2020*, Transport Analysis, <https://perma.cc/RUQ8-3UFX>.

¹⁰ *Fordon Enligt Bilregistret efter Fordonsslag och Bestånd. Månad 1975M01 - 2021M06*, SCB, <https://perma.cc/VHZ9-PPPX>.

¹¹ Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, June 20, 1959, 335 U.N.T.S. 211, <https://perma.cc/US9G-H4S5>.

¹² Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles June 25, 1998, 2119 U.N.T.S. 129 (1998 Agreement) <https://perma.cc/T4C3-LFBP>.

¹³ Treaty on the Functioning of the European Union (TFEU), art. 288, 2012 O.J. C 326, 47 (Consolidated), <https://perma.cc/YDY9-Z2HL>.

force on July 4, 2018, and has applied in Sweden since September 1, 2020.¹⁴ Regulation (EU) 2019/2144 on type-approval requirements for motor vehicles will apply in Sweden as of July 6, 2022.¹⁵ Thus, passenger cars that enter the market after that date will be required to comply with the requirements listed therein, including being equipped with advanced emergency braking systems and lane-keeping systems.¹⁶

Reflecting EU law, the Swedish Vehicles Act (Fordonslagen) provides that any car brought into the Swedish market must comply with the technical requirements of both EU and UNECE regulations.¹⁷ Specifically, there are type requirements for manufacturers of passenger cars mandating proof that the car is manufactured in compliance with ECE, EU, or national requirements.¹⁸ The UNECE has adopted harmonizing technical regulations with the specific aim of protecting vulnerable road users.¹⁹

The Transportstyrelsen (Swedish Transport Agency) is the authority responsible for accepting applications and granting permissions for vehicle type requirements and for overseeing and enforcing EU vehicle manufacturing requirements in Sweden.²⁰ It may grant exemptions from the requirements for cars that are to be used in Sweden, following an application from the manufacturer or owner.²¹

In addition to requiring automatic braking systems, the EU has addressed the risks to vulnerable road users in connection with vehicles that operate more quietly, such as electric and hybrid cars. Regulation (EU) No. 540/2014 on the sound level of motor vehicles and of replacement silencing systems requires that such vehicles be equipped with an Acoustic Vehicle Alerting System

¹⁴ Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the Approval and Market Surveillance of Motor Vehicles and Their Trailers, and of Systems, Components and Separate Technical Units Intended for Such Vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC, 2018 O.J. (L151) 1, <https://perma.cc/9895-AC4C>. See also Regeringens Proposition 2019/20:139 Kompletterande bestämmelser till EU:s förordning om godkännande av och marknadskontroll över motorfordon, <https://perma.cc/DLV3-VRAU>, which amended the Vehicles Act.

¹⁵ Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 on Type-Approval Requirements for Motor Vehicles and Their Trailers, and Systems, Components and Separate Technical Units Intended for such Vehicles, as Regards their General Safety and the Protection of Vehicle Occupants and Vulnerable Road Users, 2019 O.J. (L325) 1, <https://perma.cc/RG8V-9M6X>; TFEU art. 288. For more on this regulation, see the EU survey in this report.

¹⁶ Regulation (EU) 2019/2144, art. 7.

¹⁷ 2 kap. 2 § Fordonslagen (SFS 2002:574), <https://perma.cc/V342-A36V>.

¹⁸ Id.

¹⁹ UNECE, UN GTR No. 9 - Pedestrian safety (ECE/TRANS/180/Add.9), <https://perma.cc/R69B-YCMT>.

²⁰ Lag (2011:791) om ackreditering och teknisk kontroll, <https://perma.cc/7UYD-YQAR>; 1, 4 §§ Förordning (2008:1300) med instruktion för Transportstyrelsen, <https://perma.cc/RE8P-CHY7>.

²¹ 4 kap. 6 § Fordonsförordning (2009:211), <https://perma.cc/LZ5V-WDKR>.

(AVAS) that will alert pedestrians, bicyclists, and others a car's presence. As of July 1, 2021, manufacturers must install AVAS in all new hybrid or electric vehicles.²²

II. Current Discussions

The Swedish government views the development of safety features in vehicles as an integral part in protecting vulnerable road users, complementing traffic safety planning.²³

A. Vehicle Strategic Research and Innovation

The Swedish government supports research in autonomous safety measures. The government funds a project named Vehicle Strategic Research and Innovation (Fordonsstrategisk Forskning och Innovation (FFI)), a collaboration between state actors and the vehicle industry in the development of new vehicle technology.²⁴ Among other projects, the FFI has supported a project of Chalmers University of Technology, Volvo, and others, known as the "Non-Hit Car" project, with the goal that by 2020 no one should be killed in a new Volvo car.²⁵ In addition, the government agency Vinnova, which provides funding for research and development, is currently planning to open an application process together with FFI, where it will accept applications in October to December 2021 for automated vehicle projects that would promote traffic safety and Sweden's Vision Zero goals.²⁶

B. Traffic Safety Goals 2030

The Swedish government, through a government decision on February 13, 2020, decided to amend its traffic safety goals for 2030 ("traffic safety 2030"), aiming to reduce the number of traffic fatalities by half by 2030, compared to 2015.²⁷ The decision followed a previous government report and a 2016 report from the Trafikverket that outlined a restart of the Vision Zero initiative, calling specifically for the implementation of automatic emergency braking at low speeds in all new passenger cars by 2020, and automatic braking at high speeds and in response to wildlife

²² Regulation (EU) No 540/2014 of the European Parliament and of the Council of 16 April 2014 on the Sound Level of Motor Vehicles and of Replacement Silencing Systems, and amending Directive 2007/46/EC and repealing Directive 70/157/EEC, 2014 O.J. (L 158) 131, art. 8, <https://perma.cc/C2U3-Z4VF>.

²³ Trafikutskottetsbetänkande 2019/20:TU14 Trafiksäkerhet, at 14, <https://perma.cc/3FBL-DW9W>.

²⁴ Press Release, Regeringskansliet, Fordonsstrategisk Forskning och Innovation – Staten och Fordonsindustrin Tillsammans för Framtidens Transportsystem (Mar. 26, 2021), <https://perma.cc/L69D-TW83>.

²⁵ Regeringens Proposition 2020/21:60 Forskning, Frihet, Framtid – Kunskap och Innovation för Sverige, at 169, <https://perma.cc/5FXB-TT5C>. For more about FFI see *FFI Fordonsstrategisk Forskning och Innovation*, available at <https://docplayer.se/30169012-Ffi-fordonsstrategisk-forskning-och-innovation.html>.

²⁶ *Trafiksäkerhet och Automatiserade Fordon - FFI - December 2021*, Vinnova, <https://perma.cc/2P9K-9V79>.

²⁷ Regeringsbeslut, *Nytt Transportpolitiskt Etappmål för Trafiksäkerhet* (Feb. 13, 2020), <https://perma.cc/TRY3-TZAS>.

in all new passenger cars by 2030.²⁸ It also called for automatic steering to be standard in all passenger cars by 2030.²⁹

C. Autonomous Vehicle Initiatives

The Swedish Transport Agency started to accept applications for autonomous vehicle testing in 2018.³⁰ That same year, the agency approved testing with autonomous passenger cars in Sweden's second largest city, Gothenburg.³¹ Testing activities are regulated in the regulation on testing activity of automated vehicles (Förordning (2017:309) om försöksverksamhet med automatiserade fordon)³² and the Swedish Transport Agency's regulations on permits for testing of automated vehicles (Transportstyrelsens föreskrifter om tillstånd att bedriva försök med automatiserade fordon (TSFS 2021:4)).³³ The Swedish parliament has proposed instructions to the Swedish government to establish large scale testing of autonomous vehicles in realistic environments.³⁴ In 2021, the Parliamentary Committee on Transports and Communications found that there was no need for any further instructions to the government on the topic autonomous vehicles, as projects were ongoing, and the government was working with both industry and the EU to promote the development and use of autonomous vehicles.³⁵

²⁸ Regeringskansliet, *Nystart av Nollvisionen* (2016), <https://perma.cc/TD3J-QNJB>; Trafikverket, *Analysrapport: Översyn av Etappmål för Säkerhet På Väg till 2020 och 2030, Med en Utblick mot 2050*, at 69 (2016:109), <https://perma.cc/NK2R-XM47>.

²⁹ Trafikverket, *supra* note 28, at 69.

³⁰ Transportstyrelsen, *Ansökan om Tillstånd för Självkörande Fordon*, <https://perma.cc/8LX2-LFUG>.

³¹ *Ja till Försök med Självkörande Personbilar i Göteborg*, Transportstyrelsen (Sept. 1, 2018), <https://perma.cc/6HVV-NXZ8>.

³² Förordning (SFS 2017:309) om försöksverksamhet med automatiserade fordon, <https://perma.cc/N9UD-3D54>.

³³ Transportstyrelsens föreskrifter om tillstånd att bedriva försök med automatiserade fordon (konsoliderad elektronisk utgåva)(TSFS 2021:4), <https://perma.cc/64SZ-2WD6>.

³⁴ Trafikutskottetsbetänkande 2019/20:TU11, at 7, 73-76, <https://perma.cc/6EVB-HJHB>.

³⁵ Trafikutskottets betänkande 2020/21:TU16 *Framtidens infrastruktur* 64-65, <https://perma.cc/HD7F-FQWH>.

Australia

Kelly Buchanan
Chief, Foreign, Comparative, and
International Law Division II*

SUMMARY Australia’s national road vehicle standards for new and imported vehicles, contained in the Australian Design Rules (ADRs), do not currently mandate specific systems for avoiding collisions with pedestrians and cyclists. The Australasian New Car Assessment Programme notes that passenger cars, SUVs, and light commercial vehicles are now being sold in Australia with autonomous emergency braking (AEB), and that lane keeping assist is also provided in new vehicle models, despite the absence of regulatory requirements.

The development of new ADRs on AEB, lane keeping assist, and fatigue and distraction monitoring/detection systems for light vehicles is a priority area in Australia’s draft National Road Safety Strategy 2021-30. In October 2020, a regulation impact statement was published that recommended pedestrian-detecting AEB be made mandatory for light vehicles; however, a proposed ADR on this matter has not yet been published. In addition, the government recently completed a consultation process related to a draft ADR incorporating automated steering systems, and it has stated that it intends to develop further ADRs related to automated vehicles. It is the government’s policy to harmonize the national vehicle safety standards with international regulations where possible.

I. Introduction

On July 1, 2021, the Road Vehicle Standards Act 2018 (Cth)¹ came fully into force in Australia, replacing the Motor Vehicle Standards Act 1989 (Cth).² The operational aspects of the new legislation are contained in the Road Vehicle Standards Rules 2019 (Cth).³ Under section 12 of the 2018 Act, the relevant government minister may determine “national road vehicle standards” for road vehicles or road vehicle components that, for example, make vehicles safe to use, control emissions from vehicles, secure vehicles against theft, and promote the saving of energy. These standards are contained in the Australian Design Rules (ADRs), including those that were previously determined under the 1989 legislation.⁴

* This report was prepared with the assistance of Law Library intern Damian Terbiler.

¹ Road Vehicle Standards Act 2018 (Cth), <https://perma.cc/D6EB-5U8M>.

² See *Road Vehicle Standards Laws*, Department of Infrastructure, Transport, Regional Development and Communications (DITRDC), <https://perma.cc/PLG7-CKD9>.

³ Road Vehicle Standards Rules 2019 (Cth), <https://perma.cc/LP32-UD92>. See also *Road Vehicle Standards Rules*, DITRDC, <https://perma.cc/2T6J-238R>.

⁴ See *Road Vehicle Standards (RVS) Legislation – Glossary of Terms*, DITRDC, <https://perma.cc/6YZA-3RND> (explaining the terms “Australian Design Rules (ADRs)” and “national road vehicle standards”).

The national legislation and ADRs apply to all imported vehicles (both new and used) and to new vehicles manufactured in Australia. Australian state and territory governments are responsible for regulating the safety requirements with respect to in-service vehicles. The Department of Infrastructure, Transport, Regional Development and Communications (the Department) (previously the Department of Infrastructure, Transport, Cities and Regional Development), and specifically the Vehicle Safety Standards branch, is responsible for the development of the ADRs and conducts a “normal program of review and revision.”⁵ This includes monitoring international developments and consulting key stakeholders and the public. Furthermore, “[t]he ADRs are also subject to a full review where possible every ten years to ensure they remain relevant, cost effective, and do not become a barrier to importation of safer vehicles and vehicle components.”⁶ It is also the Australian government’s policy to “harmonise the national vehicle safety standards with international regulations where possible and consideration is given to the adoption of the international regulations of the United Nations (UN). Australia is a signatory to the UN 1958 Agreement and the 1998 Agreement.”⁷

In terms of compliance with the legislation and ADRs, the Department is

responsible for supporting the safety, environmental and anti-theft performance of all road vehicles being provided to the Australian market for the first time. To achieve this outcome, the department’s Vehicle Safety Operations (VSO) branch takes a risk-based approach to the management of compliance with the Road Vehicle Standards Act 2018 (RVSA), the Road Vehicle Standards Rules 2019 (RVSR), and the Australian Design Rules (ADRs).⁸

The 2018 Act “introduced a Register of Approved Vehicles (RAV), an online publicly searchable database of vehicles that have met the requirements of the RVSA [i.e., the 2018 Act] and been approved for provision to the Australian market.”⁹ To be entered on the RAV, a vehicle “must first be granted either a vehicle type approval or a concessional RAV entry approval.”¹⁰ A vehicle type approval identifies the national road vehicle standards applicable to the vehicle type and specifies the documents submitted to confirm compliance with those standards.¹¹ In addition, the legislation provides the option for applicants to obtain component type approvals for

⁵ *Australian Design Rules*, DITRDC, <https://perma.cc/C2H6-CVVL>; *Australian Design Rule Development Program and Public Comment*, DITRDC, <https://perma.cc/WUU7-NX6G>.

⁶ *Australian Design Rules*, supra note 5.

⁷ Id. The “UN 1958 Agreement” refers to the Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, <https://perma.cc/U85X-23EY>; the “1998 Agreement” refers to the UN Global Technical Regulations, <https://perma.cc/T6KR-LCK4>.

⁸ *Compliance and Enforcement Under the RVSA*, DITRDC, <https://perma.cc/4HSN-75WC>.

⁹ *Register of Approved Vehicles*, DITRDC, <https://perma.cc/8ABW-DPJY>.

¹⁰ *Vehicle Type Approvals*, DITRDC, <https://perma.cc/W6F2-Z4WS>.

¹¹ Id.

components used in the manufacture of a road vehicle, including an assembly, that are capable of being assessed for compliance with the ADRs or an equivalent standard.¹²

Other entities in Australia involved in vehicle safety matters include the National Transport Commission (NTC), which leads “national transport reform in support of all Australian governments to improve safety, productivity, environmental outcomes and regulatory efficiency.”¹³ For example, the NTC has developed model rules, based on the ADRs, for the regulation of in-service vehicle standards for light vehicles that form the basis for each state and territory’s Vehicle Standards Rules.¹⁴

Also at the national level, the Transport and Infrastructure Council, under the Council of Australian Governments (COAG), brings together federal, state, and territory transport and infrastructure ministers to discuss and develop national reforms “that improve the safety and productivity of Australia’s transport and infrastructure systems.”¹⁵

In addition, in July 2019, the Australian government established the Office of Road Safety (ORS) “to provide national leadership and coordination to improve road safety outcomes.”¹⁶ In particular, the ORS is tasked with leading the development of a new National Road Safety Strategy 2021-30, which “sets out Australia’s road safety objectives, key priorities for action, and road trauma reduction targets for the decade to 2030. It will also lay the groundwork for the longer-term goal of zero deaths and serious injuries by 2050.”¹⁷ A draft strategy was published for public comment in February 2021.¹⁸ The ORS also administers the Road Safety Innovation Fund, a four-year, AU\$12 million (about US\$9 million) fund “to support road safety research and the development of new road safety technologies.”¹⁹

The federal, state, and territory governments in Australia support the Australasian New Car Assessment Program (ANCAP) and the Used Car Safety Ratings, “which both provide vehicle safety ratings aimed at assisting consumers to choose safer vehicles.”²⁰ These nongovernmental bodies provide safety ratings for vehicles through different safety performance assessment programs but do not have any regulatory authority.

¹² *Component Type Approvals*, DITRDC, <https://perma.cc/X9QE-U4BF>.

¹³ *About NTC*, National Transport Commission (NTC), <https://perma.cc/W395-AWDU>.

¹⁴ *Australian Light Vehicle Standards Rules*, NTC, <https://perma.cc/VX2P-VLAW>.

¹⁵ *Infrastructure and Transport Ministers’ Meetings*, DITRDC, <https://perma.cc/CBM5-UQ3D>.

¹⁶ *Taking the Lead on Road Safety*, Office of Road Safety (ORS), <https://perma.cc/C8QS-U6V7>.

¹⁷ *About the National Road Safety Strategy*, ORS, <https://perma.cc/H6XL-LD8F>.

¹⁸ *Id.*

¹⁹ *Programs*, ORS, <https://perma.cc/M2TN-ZZ58>.

²⁰ Transport and Infrastructure Council, *National Road Safety Action Plan 2018-2020*, at 23 (May 2018), <https://perma.cc/TL6Y-8RX3>.

II. Regulation of Crash Avoidance Systems

A. Current ADRs and Voluntary Mechanisms

The Third Edition ADRs, which are currently in effect, consist of more than 70 separate ADRs covering standards for both light and heavy vehicles.²¹ Most of the ADRs are aligned with UN Regulations.²² The Department provides a summary list of the ADRs applicable to different categories of passenger vehicles (M-Category Vehicles),²³ including, for example, ADR 42 on General Safety Requirements,²⁴ ADR 69 on Full Frontal Impact Occupant Protection,²⁵ ADR 89 on Brake Assist Systems,²⁶ ADR 90 on Steering System,²⁷ and ADR 94 on Audible Warning.²⁸

The current ADRs for light vehicles do not mandate specific systems for avoiding collisions with pedestrians and cyclists, such as autonomous emergency braking systems, lane keeping and lane departure warning systems, blind spot monitoring and warning systems, and forward collision warning and avoidance systems.²⁹

ANCAP notes that

[t]he ADRs do not prevent the introduction of new safety technology. For example, the majority of new passenger cars, SUVs and light commercial vehicles (LCVs) are now being sold in Australia with autonomous emergency braking (AEB) well ahead of the introduction of any ADR. Other new safety technology, such as lane keeping assist (LKA), is also provided in new vehicle models, again without any regulatory requirement.³⁰

Currently, ANCAP evaluates new vehicles against four key areas: Adult Occupant Protection, Child Occupant Protection, Vulnerable Road User Protection, and Safety Assist. The Vulnerable Road User Protection area assesses AEB systems with respect to their ability to actively avoid or

²¹ *Third Edition Australian Design Rules*, DITRDC, <https://perma.cc/9UYK-M7BN>.

²² *Fact Sheet: Vehicle Safety*, ORS, <https://perma.cc/B36W-QXST>.

²³ DITRDC, *Applicability Summary: Australian Design Rules – M-Category Passenger Vehicles* (Jan. 2020), <https://perma.cc/K4LX-M8MD>.

²⁴ Vehicle Standard (Australian Design Rule 42/05 – General Safety Requirements) 2018 (Cth), <https://perma.cc/QGU6-9MC4>.

²⁵ Vehicle Standard (Australian Design Rule 69/00 - Full Frontal Impact Occupant Protection) 2006 (Cth), <https://perma.cc/QNM9-D39H>.

²⁶ Vehicle Standard (Australian Design Rule 89/00 – Brake Assist Systems (BAS)) 2017 (Cth), <https://perma.cc/W37A-9VVT>.

²⁷ Vehicle Standard (Australian Design Rule 90/00 – Steering System) 2018 (Cth), <https://perma.cc/8Y2D-4YVA>.

²⁸ Vehicle Standard (Australian Design Rule 94/00 – Audible Warning) 2018 (Cth), <https://perma.cc/MVF4-69QN>.

²⁹ See *Understanding Safety Features*, ANCAP, <https://perma.cc/S4ER-WFJE>.

³⁰ *Frequently Asked Questions*, ANCAP, <https://perma.cc/ZX4L-Y2Z8>.

mitigate impacts with pedestrians and cyclists. The Safety Assist area includes assessments of lane departure warning, lane keeping assist, and lane support systems, among others.³¹

B. Priority Areas for New ADRs

The following are the priority areas for ADRs set out in the draft National Road Safety Strategy 2021-30:

- lane keep assist for light vehicles
- lane departure warning for heavy vehicles
- fatigue and distraction monitoring/detection systems
- blind spot information systems for heavy vehicles
- safe deployment of automated vehicles³²

The ORS notes that, “[t]hrough the National Road Safety Action Plan 2018-2020, ADRs for Autonomous Emergency Braking for both heavy and light vehicles have been progressed. Mandating this technology in new vehicles will result in improved safety for road users.”³³ Proposals related to mandating AEB systems are discussed below.

In terms of light vehicle safety, the draft strategy includes the following actions:

- Prioritise and adopt proven technological improvements for all vehicle types through new Australian Design Rules as quickly as possible (e.g. systems assisting drivers to stay in their lane, and systems that provide warnings when drivers are drowsy or distracted).
- Encourage and promote voluntary uptake of vehicle safety technologies ahead of regulation, including through ongoing support of the Australasian New Car Assessment Program (ANCAP) and through fleet purchasing policies.
- Implement new regulatory requirements for vehicles with automated driving systems, to facilitate the safe deployment of these vehicles.³⁴

Encouraging voluntary uptake of “emerging vehicle technologies with high safety benefits” was also previously a priority action under the National Road Safety Action Plan 2018-2020. One of the implementation areas for this action was to “[i]nfluence industry to apply, and if possible accelerate, new safety technologies, for example AEB, fatigue detection, distraction mitigation, vehicle control and aftermarket vehicle warning technologies.”³⁵

³¹ *ANCAP Safety Ratings Explained*, ANCAP, <https://perma.cc/YJN3-XL3N>.

³² *Fact Sheet: Vehicle Safety*, *supra* note 22.

³³ *Id.*

³⁴ Infrastructure and Transport Ministers, *National Road Safety Strategy 2021-30: Consultation Draft 16* (Feb. 2021), <https://perma.cc/DBG4-ES4H>.

³⁵ *National Road Safety Action Plan 2018-2020*, *supra* note 20, at 10.

C. Proposed ADRs on Autonomous Emergency Braking (AEB)

Under the National Road Safety Action Plan 2018-2020, Priority Action 4 was to “[i]ncrease deployment of Autonomous Emergency Braking (AEB) in both heavy and light vehicles,” with the stated outcome by 2020 being to “[a]chieve a majority of consumers purchasing vehicles fitted with AEB, through mandating AEB in heavy and light vehicles as well as increasing voluntary uptake.”³⁶ The related implementation matters were listed as follows:

- International standards for AEB exist for heavy vehicles and are under development for light vehicles.
- The Commonwealth will examine international standards for AEB for heavy vehicles for implementation in the Australian new vehicle fleet, and finalise a regulatory package through the Australian Design Rules (subject to Regulatory Impact Statement (RIS) outcomes).
- The Commonwealth will contribute to the development of international standards for AEB for light vehicles for implementation in the Australian new vehicle fleet, and finalise a regulatory package through the Australian Design Rules (subject to international development and RIS outcomes).
- The Commonwealth and the states and territories will work to increase voluntary uptake of AEB through government and private fleet purchasing policies and consumer information.³⁷

1. Actions Related to AEB Systems for Heavy Vehicles

In August 2019, the Department published a Regulation Impact Statement (RIS) titled *Reducing Heavy Vehicle Rear Impact Crashes: Autonomous Emergency Braking*.³⁸ The recommended option selected in the RIS was to mandate, through an ADR, the fitment of AEB systems to all new heavy vehicles, adopting the technical requirements in UN Regulation No. 131 and thereby harmonizing Australian requirements with internationally agreed standards.³⁹

As of July 2021, a draft ADR for heavy vehicles (ADR 97/00 – Advanced Emergency Braking) was listed by the Department as “forthcoming.”⁴⁰ It will form part of a regulatory package related to heavy freight vehicles that also includes draft ADRs on Devices for Indirect Vision (ADR 14), Lane Departure Warning Systems (ADR 99), Blind Spot Information Systems (ADR 105), and Side Underrun Protection (ADR 106).⁴¹ The public submission process for the overarching discussion paper on safer freight vehicles closed on June 30, 2021.⁴²

³⁶ Id. at 7.

³⁷ Id.

³⁸ DITRDC, *Regulation Impact Statement – Reducing Heavy Vehicle Rear Impact Crashes: Autonomous Emergency Braking* (Aug. 2019), <https://perma.cc/383G-2W2Y>.

³⁹ Id. at 8-9, 34-36, 53.

⁴⁰ *Australian Design Rule Development Program and Public Comment*, supra note 5.

⁴¹ DITRDC, *Discussion Paper: Safer Freight Vehicles 20* (Apr. 2021), <https://perma.cc/A6QK-6PE7>; *Australian Design Rule Development Program and Public Comment*, supra note 5.

⁴² *Discussion Paper: Safer Freight Vehicles*, supra note 41, at 1.

2. Actions Related to AEB Systems for Light Vehicles

In October 2020, a press release by the federal government ministers with responsibilities for road safety stated that a RIS on regulatory options for the use of AEB systems on new light vehicles had been published for consultation, with submissions due by December 10, 2020.⁴³ However, the RIS itself could not be located.

The press release stated that “Australia was playing a lead role in the international development of a United Nations regulation for AEB systems, which for the first time includes pedestrian protection measures” and that the consultation process would “allow industry and the community to express their views on the use of AEB across the new light vehicle fleet.”⁴⁴ The ministers further explained that “[t]o date, many systems have been unable to detect pedestrians. This draft new regulation would require light vehicle AEB systems to detect likely forward collisions with both vehicles and pedestrians to help keep some of our most vulnerable road users safe.”⁴⁵

According to news reports, the RIS recommended the introduction of new ADRs “specifying car-to-car and pedestrian-detecting AEB be standard on all new models launched from July 2022 and all new vehicles sold from July 2024”; the same time frame proposed by EU regulators.⁴⁶ One article notes that “[w]hile regulations will mandate the basic forms of the automatic braking technology, cyclist-detecting AEB and lane keeping assist have been left off the table for now.”⁴⁷

As of July 2021, no relevant draft ADRs on AEB systems for light vehicles were located.

D. Draft ADR 90/01 Incorporating Automated Steering Systems

A further consultation process, with submissions due by June 30, 2021, relates to a draft new version of ADR 90 (ADR 90/01) that incorporates automated steering systems, drawing on “internationally developing requirements for automated vehicles where available.”⁴⁸ The Department explains that

[i]n November 2017, the then Transport and Infrastructure Council (now Infrastructure and Transport Ministerial Meeting) agreed that, in the absence of established international standards, supply of vehicles equipped with Automated Driving Systems (ADSs) would

⁴³ Press Release, Michael McCormack et al., Consultation Kick-Starts on Crash-Reducing Brake Technology for Light Vehicles (Oct. 16, 2020), <https://perma.cc/A2B5-Y7FZ>.

⁴⁴ Id.

⁴⁵ Id.

⁴⁶ *Government Proposes Mandatory AEB, Motoring* (Oct. 16, 2020), <https://perma.cc/4AK6-RZB6>. See also *Australian AEB Mandate Closer to Reality*, *The Brake Report* (Oct. 20, 2020), <https://perma.cc/SLV3-VW9Q>; Susannah Guthrie, *Autonomous Safety Feature Could Soon Be Compulsory on all New Cars*, *CarAdvice* (Oct. 22, 2020), <https://perma.cc/GW7R-U558>.

⁴⁷ Tom Place, *Australia Set to Make Autonomous Emergency Braking Mandatory by July 2022*, *Chasing Cars* (Oct. 2020), <https://perma.cc/TM6R-ZP38>.

⁴⁸ *Australian Design Rule Development Program and Public Comment*, *supra* note 5.

be regulated within existing vehicle regulation frameworks through meeting a suite of Statement of Compliance (SoC) criteria. The SoC were developed through stakeholder consultations led by the National Transport Commission to support mandatory self-certification of ADSs. This decision enables a flexible approach while ADS technologies continue to evolve and international standards are developed.⁴⁹

A new Appendix B in the draft ADR 90/01 “gives effect to the set of SoC criteria that can be regulated within an ADR, including through self-certification.”⁵⁰

In addition to the minimum requirements for ADS technologies in ADR 90/01, the Department states that

it is the intention that new ADRs be made that respectively cover the requirements of UN R157 on Automated Lane Keep Systems, UN R155 on Cyber Security, UN R156 on Software Updates and UN draft regulation on Data Storage System for Automated Driving (DSSAD). This approach is consistent with usual practices for ADR development where separate UN regulations are paralleled as unique ADRs, as part of the harmonisation program. It is also consistent with Council decision to adopt international regulations for ADSs as they become available.⁵¹

⁴⁹ Id.

⁵⁰ Id.

⁵¹ Id.

Canada

Tariq Ahmad
Foreign Law Specialist

SUMMARY All vehicles manufactured for sale in Canada or imported into Canada must meet the Canada Motor Vehicle Safety Standards (CMVSS) found in Schedule III of the Motor Vehicle Safety Regulations. Transport Canada (TC) is the federal department responsible for developing and overseeing the Government of Canada’s transportation policies and programs and proposing and issuing policies, laws, and regulations. Although Canada regulates some advanced safety features, such as advanced lighting technologies, mandatory back-up cameras and electronic stability control systems, there are no standards at this time that deal specifically with automation features, such as automatic emergency braking, automated steering systems, and adaptive cruise control. TC does not appear to have issued uniform and clear standards for crash avoidance systems.

However, more recently, TC has held open consultations on updating the Motor Vehicle Safety Regulations to include regulatory proposals or standards for advanced driver assistance systems, automatic emergency braking systems, and standards to protect vulnerable road users by requiring sound emitters for electric and hybrid vehicles. Following the public consultations, TC plans to prepublish the proposed regulations in late 2022 with a follow-up 75-day comment period.

I. Introduction

In Canada, motor vehicle transportation is a “shared responsibility between federal, provincial and territorial governments.”¹ All vehicles made for sale in Canada and all vehicles imported into Canada must meet the Canada Motor Vehicle Safety Standards (CMVSS) issued under the Motor Vehicle Safety Act.² Manufacturers and importers must follow the CMVSS in Schedule III of the Motor Vehicle Safety Regulations.³ They must also comply with “related safety standards, technical standards documents and test methods.”⁴ CMVSS set out the “minimum performance levels vehicles and equipment must meet. Each standard includes, either directly or by reference to other documents, the performance requirements against which regulated vehicles and equipment are to be measured to determine compliance.”⁵

¹ *Testing Highly Automated Vehicles in Canada: Guidelines for Trial Organizations*, Transport Canada (TC) (May 16, 2018), <https://perma.cc/U6U6-ZV4Z>.

² Motor Vehicle Safety Act, S.C. 1993, c. 16, <https://perma.cc/NZ44-QC3A>.

³ Motor Vehicle Safety Regulations, C.R.C., c. 1038, <https://perma.cc/66N5-SAPR>; see also *Motor Vehicle Safety Regulations* (C.R.C., c. 1038), TC, <https://perma.cc/TPZ3-5N8D>.

⁴ *Safety Standards for Vehicles*, TC (Jan. 29, 2021), <https://perma.cc/WHM7-6MD2>.

⁵ TC, *Canada’s Safety Framework for Automated and Connected Vehicles* 13 (Feb. 2019), <https://perma.cc/BZ7Z-XCTT>.

Transport Canada (TC) is the federal department responsible for developing and overseeing the Government of Canada's transportation policies and programs and "[p]roposing and updating policies, laws and regulations."⁶ The Canadian Council of Motor Transport Administrators (CCMTA) is an "incorporated body that coordinates matters dealing with the administration, regulation and control of motor vehicle transportation and highway safety. Membership includes representation from provincial and territorial governments as well as the federal government of Canada."⁷

A 10-year national strategy, Road Safety Strategy (RSS) 2025,⁸ was created in 2015 and launched in January 2016 by the CCMTA with the approval of federal, provincial, and territorial transportation and highway safety ministers. This strategy was the fourth in a series of national strategies. The strategy provides "an inventory of proven and promising best practices to address key high risk groups and contributing factors. For each risk group and contributing factor, there may be more than one intervention for promoting safer road users, safer infrastructure and safer vehicles."⁹

Canada has taken a "definitive signature" whereby it has consented to be bound by the Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles. The date of notification was June 22, 1999, and the agreement went into effect on August 25, 2000.¹⁰

II. Regulation of Crash Avoidance Systems

Vehicles at SAE Level 2, which are allowed for sale and use in all of Canada, have features such as adaptive cruise control, park assist, and automatic emergency braking. Transport Canada does not appear to have issued uniform and clear standards for crash avoidance systems.¹¹ In September 2016, Minister of Transport Marc Garneau announced a new task force cochaired by Alberta Transportation and Transport Canada, with representatives from provincial and territorial authorities, to improve the safety of vulnerable road users.¹² In June 2018, the task force published a summary report that "addresses current and potential countermeasures that may

⁶ *About Transport Canada*, TC (Aug. 8, 2019), <https://perma.cc/LS4U-2VB9>.

⁷ *About CCMTA*, Canadian Council of Motor Transport Admins. (CCMTA), <https://perma.cc/7URF-ZCQD>.

⁸ CCMTA, *Road Safety Strategy (RSS) 2025: Towards Zero: The Safest Roads in the World* (Jan. 2016), <https://perma.cc/RTK2-QRUH>.

⁹ CCMTA, *Safety Measures for Cyclists and Pedestrians Around Heavy Vehicles Summary Report 15* (June 2018), <https://perma.cc/73BF-8SCW>.

¹⁰ Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/FQZ2-G9AJ>.

¹¹ David Burke, *Lack of Canadian Standards for Automated Systems in Cars Worries Advocates*, CBC News (Oct. 7, 2019) <https://perma.cc/72X9-QVL7>.

¹² *Transport Canada Explores Technology to Protect Vulnerable Road Users*, TC, <https://perma.cc/W9T7-N9LF>.

reduce conflicts and the resulting fatalities and injuries among vulnerable road users (VRUs) (i.e., pedestrians and bicyclists) struck by heavy vehicles, including buses in urban areas.”¹³

According to Canada’s *Safety Framework for Automated and Connected Vehicles* “[w]hile TC regulates some advanced safety features, such as advanced lighting technologies, mandatory back-up cameras and electronic stability control systems, there are no standards at this time that deal specifically with automation features, such as automatic emergency braking, automated steering systems and adaptive cruise control.”¹⁴

In September and October of 2020, Transport Canada held open consultations “on updating the Motor Vehicle Safety Regulations to include advanced driver assistance systems”¹⁵ and “require automatic emergency braking and pedestrian automatic emergency braking on all new vehicles in Canada, in particular school buses and commercial trucks, but also passenger cars, multi-purpose passenger vehicles, and buses.”¹⁶

TC plans to prepublish proposed regulations in late 2022 with a follow-up 75-day comment period. The following regulatory amendments are anticipated in line with TC’s Forward Regulatory Plan of August 2020.

A. Regulations Amending the Motor Vehicle Safety Regulations Regarding Advanced Driver Assistance Systems on Newly Manufactured Vehicles

As part of this consultation on advanced driver assistance systems, TC obtained input on: “(1) what unbiased metrics could be implemented to determine whether a technology has met a safety goal; (2) if there are no requirements from the United States or United Nations whether an outcome-based approach or prescriptive requirements should be implemented; (3) if there are requirements from the United States or United Nations, whether to adapt international prescriptive requirements or implement an outcome-based approach; and (4) what information should be provided to manufacturers to help determine compliance with outcome-based regulations.”¹⁷

Specifically, TC is looking at whether advanced driver assistance features should be “required by regulations or left unregulated” and “meet a minimum set of requirements if they’re on a vehicle.” According to TC:

New safety requirements would take the form of new Canada Motor Vehicle Safety Standards and could apply to school buses and commercial trucks in particular but also other vehicles such as motorcycles, cars, trucks and passenger buses. There may end up being different requirements for different types of vehicles. The technologies we’re looking

¹³ CCMTA, *Safety Measures for Cyclists and Pedestrians Around Heavy Vehicles Summary Report*, supra note 9.

¹⁴ TC, *Canada’s Safety Framework for Automated and Connected Vehicles*, supra note 5, at 13.

¹⁵ *Creating a Standard for Advanced Driver Assistance Systems*, TC (Dec. 1, 2020), <https://perma.cc/7GNS-RBDZ>.

¹⁶ *Should Automatic Emergency Braking Systems Be Required for New Vehicles?*, TC, <https://perma.cc/NPV5-V4YK>.

¹⁷ *Background: Advanced Driver Assistance Systems*, TC (July 5, 2021), <https://perma.cc/T22P-6RE3>.

at directly impact the safety of drivers, passengers and other road users. At this time, we're not looking at driver convenience systems or systems that don't affect safety. We plan on introducing new requirements using an outcome-based approach, when possible. Outcome-based regulations focus on the results we want from a regulation, instead of a specific process or action that must be followed. Using outcome-based regulations would give companies some flexibility to choose the best way for them to meet the requirement, and help them develop and introduce new systems.¹⁸

Additional questions were also considered on performance requirements for these technologies during the consultation.¹⁹ TC is considering "minimum safety requirements for SAE level 2 and SAE level 3 systems, which take control of both steering, throttle and braking, to reduce the possibility that drivers rely on technology too much. These requirements could include warning lights, driver monitoring, and minimum transition procedures."²⁰

These proposed regulatory amendments would mandate the installation of certain advanced driver assistance systems on newly manufactured vehicles while providing a set of minimum requirements for others. These advanced driver assistance systems can increase driver situational awareness or take control of steering, braking or throttle inputs, thereby affecting the safety of vehicle occupants and other road users including vehicles, pedestrians, and cyclists. TC is looking at potential regulatory cooperation efforts at both the domestic and international levels. TC plans to gather information on applicable international requirements.²¹

TC is considering other technologies based on results from American and international studies. These technologies include: advanced braking systems for motorcycles, emergency brake assist, electronic stability control for medium vehicles, emergency stop signal, regenerative braking signal, accident emergency call system, blind spot information system (heavy vehicles), blind spot detection/warning, lane departure warning, lane keep assist, SAE Level 2 and Level 3 systems, 360-degree cameras, camera monitoring systems, intelligent speed assist, rear-visibility systems (medium and heavy vehicles), and driver drowsiness and distraction monitoring. Some of these technologies can assist in the detection of vulnerable road users.²²

B. Regulations Amending the Motor Vehicle Safety Regulations Regarding Automatic Emergency Braking Systems

TC also held an informal consultation as part of a pre-regulatory process for automatic emergency braking systems. Automatic emergency braking monitors a vehicle's surroundings when in motion and automatically applies the brakes if an imminent crash is detected. The system does not replace the driver's reaction but acts as a last resort when the driver fails to react by slowing the vehicle before a collision. Some systems can also detect and intervene when they sense a

¹⁸ *Creating a Standard for Advanced Driver Assistance Systems*, Gov't of Can. (Oct. 7, 2020), <https://perma.cc/8UG6-WSV7>.

¹⁹ *Background: Advanced Driver Assistance Systems*, TC, *supra* note 17.

²⁰ *Id.*

²¹ *Id.*

²² *Id.*

pedestrian, cyclist, or other obstacles, but these extra capabilities are more complex and more costly. Automatic emergency braking is not required currently on new vehicles in Canada.²³ TC is asking the following consultation questions:

- Do you see any challenges with installing a pedestrian automatic emergency braking system on a vehicle? Can systems be as effective if the pedestrian is the size of a small child instead of an adult?
- Should automatic emergency braking systems be able to function even at very low speeds? Should it work when the vehicle is at a crawling speed?
- What is a metric (or set of metrics) that Transport Canada could use to see whether an automatic emergency braking system makes a vehicle safer? What would be the signs of an automatic emergency braking system that doesn't make a vehicle safer[?]
- In your opinion, what are the pros and cons of using outcome-based regulations instead of using traditional tests and minimum performance requirements? Do you have a preference? Why?
- What information would be beneficial to manufacturers to help them determine if they meet outcome-based regulations?²⁴

TC is posing an additional question:

- Are there any types of vehicles (like school buses, passenger cars or garbage trucks) that should or should not have automatic emergency braking and pedestrian automatic emergency braking fitted as standard equipment?²⁵

These proposed regulatory amendments would mandate the installation of automatic emergency braking systems on newly manufactured light and heavy vehicles intended for use on public roads. The automatic emergency braking system can function at high and low speeds to intervene in an impending collision with another vehicle or a pedestrian. TC is looking at potential regulatory cooperation efforts on both the domestic and international levels. TC plans to explore an outcome-based approach, which could facilitate international harmonization by avoiding Canadian-specific prescriptive requirements.²⁶

TC is also conducting “ongoing field operational tests that look at how advanced collision avoidance systems in heavy vehicles can help detect and possibly prevent collisions with vulnerable road users. These field operational tests are occurring at multiple cities across Canada to cover a wide range of weather and road conditions.”²⁷

²³ *Background: Automatic Emergency Braking Systems*, TC, <https://perma.cc/YN8A-QNET>.

²⁴ *Id.*

²⁵ *Should Automatic Emergency Braking Systems Be Required for New Vehicles?*, TC, *supra* note 16.

²⁶ *Road Safety Initiatives Planned for April 2021 – April 2023*, TC (July 5, 2021), <https://perma.cc/E2FV-YLU2>.

²⁷ TC, *Canada's Safety Framework for Automated and Connected Vehicles*, *supra* note 5, at 13.

C. Regulations Amending the Motor Vehicle Safety Regulations Regarding Minimum Noise Requirements for Hybrid and Electric Vehicles

The Government of Canada has also proposed regulations for standards to protect vulnerable road users by requiring sound emitters for electric and hybrid vehicles. According to a press release, the proposed regulations would “make it the law and would outline specific standards” and “all hybrid and electric vehicles would be equipped with an Acoustic Vehicle Alert System (sound emitters) which produce noise at low speeds. The volume and pitch from these sound emitters will vary depending on vehicle speed to allow road users to hear whether a vehicle is speeding up or slowing down. These regulations would make sure all hybrid and electric vehicles sold in Canada will be equipped with sound emitters by 2023.”²⁸

D. Regulations Amending the Motor Vehicle Safety Regulations Regarding School Bus Safety

The proposed regulatory amendments are based on recommendations made by a Task Force on School Bus Safety established on January 21, 2019, by the federal, provincial, and territorial Council of Ministers Responsible for Transportation and Highway Safety.²⁹

In February 2020, the Task Force published its report, which included recommendations that all jurisdictions explore the application of the following safety measures based on their assessed needs:

- infraction cameras: to help prevent dangerous incidents caused by passing motorists;
- extended stop arms: to further deter motorists from passing while children are entering or leaving the bus;
- exterior 360° cameras: to better detect and protect children and other vulnerable road users around the outside of the bus; and
- automatic emergency braking: to help reduce the severity of a collision or avoid it entirely.³⁰

The proposed amendments would introduce “voluntary requirements for infraction cameras and require extended stop arms and exterior 360° cameras on all newly manufactured school buses regulated under the Motor Vehicle Safety Act in Canada, while automatic emergency braking would be addressed under a separate regulatory initiative.”³¹

III. Regulation of Autonomous Vehicles

Vehicles with lower levels of automation—up to SAE Level 3—are currently available for purchase in all of Canada. SAE Level 2 “have features such as adaptive cruise control, park assist,

²⁸ News Release, TC, Minister of Transport Proposes Noise Requirements for Hybrid and Electric Vehicles to Protect Vulnerable Road Users, (Apr. 23, 2021), <https://perma.cc/CUJ7-TN22>; Gov’t of Can., *Canada Gazette, Part I, Volume 155, Number 17: Regulations Amending the Motor Vehicle Safety Regulations (Minimum Sound Requirements for Hybrid and Electric Vehicles)* (Apr. 24, 2021), <https://perma.cc/2S9E-WBHJ>.

²⁹ *Road Safety Initiatives Planned for April 2021 – April 2023*, TC, *supra* note 26.

³⁰ *Id.*

³¹ *Id.*

and automatic emergency braking. Fully automated vehicles are vehicles that can drive without human help in any situation and any location and likely won't be available for many years."³²

Ontario allows the use of SAE Level 3 automation on public roads.³³ Additionally, on January 1, 2016, Ontario's Ministry of Transportation launched a 10-year pilot program "to allow the testing of automated vehicles on Ontario's roads,"³⁴ through the promulgation of Ontario Regulation 306/15,³⁵ which was issued under Ontario's Highway Traffic Act.³⁶

Quebec also allows the use of SAE Level 3 automation on public roads.³⁷ Further, assent was granted to Bill No. 165, amending the Quebec Highway Safety Code,³⁸ on April 18, 2018, to allow a pilot program testing automated vehicles.³⁹

³² Policy and Planning Support Committee (PPSC) Working Group on Automated and Connected Vehicles, *Automated and Connected Vehicles Policy Framework for Canada 2* (Jan. 21, 2019), <https://perma.cc/FMK4-G6P3>.

³³ On January 1, 2019, the Ontario Ministry of Transportation updated its program "[i]n response to advances in [AV] technology," to allow "for the testing and sale of more innovative technologies," implementing the following changes:

1. Automated vehicles equipped with SAE Level 3 technology that are available for public purchase in Canada can be driven on Ontario roads. These vehicles will no longer be restricted to registered pilot participants. Vehicles with aftermarket SAE Level 3 technology (technology that has been added to a vehicle after sale, not by an Original Equipment Manufacturer) will remain restricted to the pilot program and will not be permitted for public use.

Ontario's Automated Vehicle Pilot Program, Ontario Ministry of Transp., <https://perma.cc/BMT5-7UV6>.

³⁴ *Id.*

³⁵ Pilot Project – Automated Vehicles, O. Reg. 306/15, <https://perma.cc/TT6F-UPLB>.

³⁶ Highway Traffic Act, R.S.O. 1990, c. H.8, <https://perma.cc/4UWH-TTC8>.

³⁷ Blake, Cassels & Graydon LLP, *Autonomous Vehicle Regulation in Canada 3* (2021), <https://perma.cc/CJ6T-N4DY>.

³⁸ Highway Safety Code, C-24.2, <https://perma.cc/URK3-NQ2Y>.

³⁹ Bill 165 (2018, chapter 7), An Act to Amend the Highway Safety Code and Other Provisions, <https://perma.cc/2FA2-A34F>; *In an Autonomous Vehicle*, Société de l'assurance automobile du Québec, <https://perma.cc/KCS8-K4UJ>.

China

Laney Zhang
Foreign Law Specialist

SUMMARY China does not appear to have enacted any mandatory standards requiring specific crash avoidance systems on passenger cars aimed at protecting pedestrians, bicyclists, and other vulnerable road users. A vehicle safety standard requires certain buses to install a lane keeping assist (LKA) system, an advanced emergency braking (AEB) system, and an electronic stability control system.

China has recently issued recommended standards covering advanced driver assistance systems (ADAS), which include various systems that use the sensing, communication, decision-making, and execution devices installed on the vehicle to assist the driver in performing driving tasks or actively avoid or mitigate collisions. The AEB standard might only require the system to be capable of detecting motor vehicles, but not vulnerable road users such as pedestrians and cyclists. The ADAS standards are overseen by the Ministry of Industry and Information Technology.

The autonomous vehicles rules require test vehicles to pass a closed-road test, which includes testing the function “pedestrian and non-motor vehicle detection and response.”

I. Introduction

Under the Road Traffic Safety Law of the People’s Republic of China (PRC or China), in order to drive on the roads in China, all motor vehicles must comply with the national technical standards for automobile safety.¹ Industrial products that may endanger human health or property, including motor vehicles, are also required by the PRC Product Quality Law to meet national safety standards.²

“Standards” under the PRC Standardization Law refer to unified technical requirements in agriculture, industry, services, and other fields. There are national standards, industrial standards, local standards, association standards, and enterprise standards.³ National standards are divided into two groups in terms of their binding force and effect: mandatory (compulsory)

¹ PRC Road Traffic Safety Law (adopted by the National People’s Congress Standing Committee (NPCSC) on Oct. 28, 2003, amended Dec. 29, 2007 and Apr. 22, 2011) arts. 8, 10, <https://perma.cc/L7ME-FT5X> (in Chinese), <https://perma.cc/5D4Y-YVSU> (English translation of the 2007 version).

² PRC Product Quality Law (adopted by the NPCSC on Feb. 22, 1993, as amended Dec. 29, 2018) art. 13, <https://perma.cc/8UVP-A48P> (in Chinese).

³ PRC Standardization Law (adopted by the NPCSC on Dec. 29, 1988, as revised Nov. 4, 2017) art. 2, <https://perma.cc/UJ7K-2ZZC> (in Chinese), <https://perma.cc/EX6B-D5UM> (English translation).

standards and recommended (voluntary) standards.⁴ The Standardization Law requires mandatory national standards to be formulated for technical requirements that safeguard human health and personal or property safety.⁵

China's vehicle mandatory standard system is established on the basis of researching and analyzing global typical vehicle technical regulation systems, with the United Nations (UN) regulations issued by the UN Economic Commission for Europe (UNECE) as the main reference.⁶ China is a contracting party to the 1998 Agreement on Global Technical Regulations, but does not appear to have joined the 1958 Agreement.⁷

II. Regulation of Crash Avoidance Systems

A. Mandatory Standards

As of January 2020, the Standardization Administration of China (SAC) had issued a total of 123 mandatory national standards for motor vehicles (including motorcycles), including 69 standards that are applicable to passenger cars.⁸

The basic standard for auto safety that applies to all types of motor vehicles travelling on the roads in China, the *Technical Specifications for Safety of Power-Driven Vehicles Operating on Roads* (GB 7258 – 2017), requires certain buses to install a lane keeping assist (LKA) system, an advanced emergency braking (AEB) system, and an electronic stability control system.⁹ This is a mandatory standard issued by the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) and the SAC.¹⁰

As an effort to protect vulnerable road users, in particular pedestrians, China is currently revising a recommended standard titled *Protection of Motor Vehicle for Pedestrians in the Event of a Collision* (GB/T 24550-2009), which will be upgraded into a mandatory standard. Formulation of the mandatory standard will refer to UNECE Regulation No. 127, *Uniform Provisions Concerning the Approval of Motor Vehicles with Regard to Their Pedestrian Safety Performance*. The competent authority of GB/T 24550-2009 is the Ministry of Industry and Information Technology (MIIT).¹¹

⁴ Id.

⁵ Id. art. 10.

⁶ UNECE, *World Forum For Harmonization of Vehicle Regulations (WP.29): How It Works, How to Join It* 85 (2019), <https://perma.cc/K4YZ-6L64>.

⁷ Id. at 9-11, 13.

⁸ *Authoritative Release: Here Comes the 2020 Version Auto Standard System Diagram!*, National Technical Committee of Auto Standardization (NTCAS) (Jan. 6, 2020), <https://perma.cc/M4DJ-6X6S> (in Chinese).

⁹ AQSIQ & SAC, *Technical Specifications for Safety of Power-Driven Vehicles Operating on Roads* (GB 7258 – 2017) (Sept. 29, 2017, effective Jan. 1, 2018) §§ 4.17.3 & 4.17.4, <https://perma.cc/C346-66H4> (in Chinese).

¹⁰ Id. § 1.

¹¹ *The Protection of Motor Vehicle for Pedestrians in the Event of a Collision* (under revision), National Public Service Platform for Standard Information, <https://perma.cc/5KG2-UTFR> (in Chinese; index only).

As of now, China does not appear to have enacted any mandatory standards requiring specific car crash avoidance systems on passenger cars aimed at protecting pedestrians, bicyclists, and other vulnerable road users.

B. Voluntary Standards

The State Administration of Market Regulation (SAMR) and the SAC have recently started publishing voluntary standards covering advanced driver assistance systems (ADAS). ADAS under these standards include various systems that use the sensing, communication, decision-making, and execution devices installed on the vehicle to monitor the driver, the vehicle, and its driving environment and assist the driver in performing driving tasks or actively avoid or mitigate collisions.¹²

References to the following ADAS standards have been located, including on LKA and AEB systems on passenger cars and a blind spot detection system:

- *Road Vehicles – Advanced Driver Assistance Systems – Terms and Definitions* (GB/T 39263-2020), November 19, 2020, effective June 1, 2021;¹³
- *Performance Requirement and Testing Method for Lane Keeping Assist (LKA) System of Passenger Cars* (GB/T 39323-2020), November 19, 2020, effective June 1, 2021;¹⁴
- *Road Vehicles – Performance Requirements and Testing Methods for Blind Spot Detection (BSD) System* (GB/T 39265-2020), November 19, 2020, effective June 1, 2021;¹⁵
- *Performance Requirements and Test Methods for Advanced Emergency Braking System (AEBS) of Passenger Cars* (GB/T 39901-2021), March 9, 2021, effective October 1, 2021.¹⁶

The competent authority of the ADAS standards is the MIIT. According to a draft of GB/T 39263-2020 released by the National Technical Committee of Auto Standardization (NTCAS), the standard specifies terms and definitions of a wide variety of ADAS systems, including driver attention monitoring, traffic sign recognition, forward collision warning, rear collision warning, lane departure warning, rear crossing traffic alert, BSD, AEB, automatic emergency steering, and LKA systems.¹⁷

The standard on the AEB system of passenger cars, GB/T 39901-2021, might only require the system to be capable of detecting motor vehicles, but not vulnerable road users such as

¹² *Road Vehicles – Advanced Driver Assistance Systems – Terms and Definitions (Draft for Soliciting Opinions)*, NTCAS (Sept. 29, 2018), <https://perma.cc/U7BY-3MZV> (in Chinese).

¹³ *Standard Number: GB/T 39263-2020*, <https://perma.cc/TH34-GZ26> (in Chinese; index only).

¹⁴ *Standard Number: GB/T 39323-2020*, <https://perma.cc/BNN6-CKCC> (in Chinese; index only).

¹⁵ *Standard Number: GB/T 39265-2020*, <https://perma.cc/5VHB-LQMB> (in Chinese; index only).

¹⁶ *Standard Number: GB/T 39901-2021*, <https://perma.cc/83A7-HGPA> (in Chinese; index only).

¹⁷ *Id.*

pedestrians and cyclists. According to a draft of the standard published by the NTCAS, when the AEB system detects a possible collision with a vehicle of category M, N, or O that is traveling at a lower speed, slowing down, or stationary in the same lane ahead, it shall issue a collision warning signal.¹⁸ The drafters of this standard appear to have explained that it would be too complex to detect pedestrians and two-wheel vehicles, which would be a longer-term goal for future development of the standard.¹⁹

III. Autonomous Vehicles Rules

On April 11, 2018, three Chinese central regulators—the MIIT, the Ministry of Public Security (MPS), and the Ministry of Transport (MOT)—jointly issued the road testing rules of autonomous vehicles, the Administrative Rules on Intelligent and Connected Vehicle Road Testing (for Trial Implementation).²⁰ The rules subject the intelligent and connected vehicle (ICV) testing to prior regulatory approval and various requirements concerning the applicants, drivers, vehicles, and testing process.²¹ The term ICV adopted by Chinese policy documents and regulations is defined broadly to include autonomous vehicles or driverless vehicles within its scope.²²

Under the ICV road testing rules, test vehicles must pass a closed-road test before being eligible for testing on public roads.²³ The self-driving function of test vehicles must be tested and verified by third-party testing institutes recognized by government authorities.²⁴ “Pedestrian and non-motor vehicle detection and response” is among the testing items specified by the rules. It is, however, an optional testing item under the 2018 rules.²⁵

The function of “pedestrian and non-motor vehicle detection and response” appears to be becoming a mandatory testing item under China’s new autonomous vehicles rules. The three regulators recently issued the Administrative Rules on Intelligent and Connected Vehicle Road Testing and Demonstration Application (for Trial Implementation), which will repeal the 2018

¹⁸ *Performance Requirements and Test Methods for Advanced Emergency Braking System (AEBS) of Passenger Cars (Draft for Soliciting Opinions)* § 4.2.1, NTCAS (Sept. 10, 2018), <https://perma.cc/2S32-NLWP> (in Chinese).

¹⁹ Standard Drafting Working Group, *Explanations of the Formulation of the Performance Requirements and Test Methods for Advanced Emergency Braking System (AEBS) of Passenger Cars* (Sept. 6, 2018), <https://perma.cc/92SX-JHD8> (in Chinese).

²⁰ MIIT, MPS & MOT, *Administrative Rules on Intelligent and Connected Vehicle Road Testing (for Trial Implementation) (Road Testing Rules)* (Apr. 11, 2018, effective May 1, 2018), <https://perma.cc/HQ3R-X79N> (in Chinese).

²¹ Hongbin Zhang, *China–National Administrative Rules of Road Testing of Self-driving Vehicles Promulgated*, *Conventus Law* (Aug. 3, 2018), <https://perma.cc/HX66-KY9W>.

²² *Latest Progress of China’s Formulation of Standards for Intelligent and Connected Vehicles*, Baker McKenzie (Feb. 1, 2018), <https://perma.cc/EG4M-W4KL>.

²³ Road Testing Rules art. 7(5).

²⁴ *Id.* art. 7(6).

²⁵ *Id.* Appendix 1.

rules when it takes effect on September 1, 2021.²⁶ Under the new rules, this function remains included in the items required for third-party testing, but is no longer marked optional, as it was under the 2018 rules.²⁷

²⁶ MIIT, MPS & MOT, Administrative Rules on Intelligent and Connected Vehicle Road Testing and Demonstration Application (for Trial Implementation) (July 27, 2021, effective Sept. 1, 2021), <https://perma.cc/MT95-F5QZ> (in Chinese).

²⁷ Id. Appendix 1, <https://perma.cc/S5EW-R6Z6> (in Chinese).

Israel

Ruth Levush
Senior Foreign Law Specialist

SUMMARY Israel's Ministry of Transportation and Road Safety (MOTRS) regulates the development and installation of car crash avoidance systems. Safety systems aimed at detecting and classifying pedestrians, bicyclists, and other vulnerable road users are among the features requiring registration by importers, dealers, and manufacturers. The availability of safety features constitutes a basis for determining vehicles' safety ratings.

MOTRS views the introduction of autonomous vehicles in Israel favorably and has approved trials of vehicles manufactured by both Israeli and foreign companies. A MOTRS document sent to companies engaged in the development of autonomous vehicles reportedly lists different scenarios including those where autonomous vehicles will have to be aware of pedestrians and obstacles.

I. Development and Installation of Car Crash Avoidance Systems

A. Regulation of the Development and Installation of Car Crash Avoidance Systems

The Ministry of Transportation and Road Safety (MOTRS) enforces registration and testing of vehicles in accordance with the Transportation Ordinance and regulations. Israel requires the installation of certain systems for car crash avoidance to operate motor vehicles. Dealers, importers, and manufacturers of private and commercial vehicles must register safety systems in the MOTRS automotive database.¹

B. Promoting Installation of Safety Systems

In accordance with the Transportation Regulations, a vehicle license must indicate the vehicle's level of safety equipment, which will be determined according to a safety rating procedure to be determined by MOTRS.²

MOTRS has issued a list of safety features that must be registered to determine a vehicle's safety rating, as discussed below in Section I.C. The list includes car crash avoidance systems aimed at detecting and classifying pedestrians, bicyclists, and other vulnerable road users.

According to MOTRS, a "safety level" for each vehicle model will be specified on the vehicle license to increase public awareness: "The more equipped the vehicle is with safety systems, the

¹ Safety Systems for Vehicles Types M1 [Passengers] & N1 [commercial] (Safety Systems for Vehicles), Administrative Rules 03/13, MOTRS (Aug. 21, 2019), <https://perma.cc/EU9U-ZVWE> (in Hebrew).

² Transportation Regulations 5761-1961, as amended, Nevo Legal Database (in Hebrew, by subscription), <https://perma.cc/ZL7U-K6TF>.

higher the level of safety equipment . . . The safety systems and [relevant tax] credits [provided] will be published on the MOTRD and the Tax Authority websites.”³

The installation of lane departure control and forward distance monitoring systems was specifically required for buses and trucks from production year 2012 onward as of November 1, 2016, and for every new vehicle imported into Israel as of January 2018.⁴ The installation of these systems, in compliance with specified Economic Commission for Europe standards,⁵ is a condition for the licensing of both commercial and noncommercial vehicles.⁶

To promote installation of lane departure control and forward distance monitoring systems in used cars, MOTRS offers a rebate of up to 1500 NIS (about US\$457) of a vehicle’s registration fee to vehicle owners who have installed the systems at authorized businesses.⁷

C. Registration of Safety Systems

Importers, dealers, and manufacturers of private and commercial vehicles weighing up to 3.5 tons must report the presence of safety systems, including systems for detecting vulnerable road users.⁸ As noted, the registration of safety systems constitutes a basis for determining the safety rating recorded on a vehicle’s license and must be included in sale advertisements.⁹

In addition to airbags, the following safety systems, with specific features for protection of pedestrians and bicycle and motorbike riders are included in the MOTRS list:

1. Lane Departure Warning System: A system that alerts the driver of drifting out of this driving lane through at least two warning means out of visual (mandatory), acoustic and haptic. Additionally, the existence of this system should be reported if the vehicle is fitted with an active lane departure system, which, when the vehicle drifts out of the lane, prevents or minimizes the undesirable drift.
2. AEBS – Advanced Emergency Braking System: A system capable of identifying a situation of a dangerous approach to obstacles and issuing a sonic alert. In the event of an imminent danger of an accident, if the driver fails to remedy the situation, the system will initiate braking of the vehicle.

³ Id. Safety Systems for Vehicles § 1.

⁴ Press Release, Following Minister Katz’s Regulation from Today: NIS 1,500 Discount on License Fee for Vehicles with Life-Saving Safety Systems, MOTRS (Sept. 25, 2017), <https://perma.cc/4PWR-7PYB> (in Hebrew).

⁵ Transportation Regulations 5761-1961, as amended, 2nd attachment part C § 31, Nevo Legal Database (in Hebrew, by subscription), <https://perma.cc/B5ZV-8FNW>.

⁶ Transportation Regulations 5761-1961, as amended, Reg. 364 H (a), <https://perma.cc/RAH9-UBZB> (in Hebrew).

⁷ *Install an Advanced Safety System in the Vehicle and Receive a Refund of up to NIS 1,500!*, MOTRS (updated Jan. 14, 2021), <https://perma.cc/D9A9-ZYNC> (in Hebrew).

⁸ Id.

⁹ Safety Systems for Vehicles § 5.

3. Forward Distance Monitoring System: A system that identifies an obstacle in front or a situation where the driver fails to maintain a proper distance to the vehicle in front and alerts the driver of the danger of collision through a sonic alarm (mandatory) and a visual alert. Additionally, the existence of this system should be reported if the vehicle is fitted with an active system, which initiates automatic braking when a danger of imminent collision has been identified.
4. Adaptive Cruise Control: A system designed to maintain a steady driving speed while maintaining a safe distance from the vehicle in front, through automatic control of the throttle and brakes.
5. Pedestrian Identification System: A system that identifies pedestrians crossing or standing on the road in front of the vehicle while the vehicle travels forward, and alerts the driver of the danger of hitting a pedestrian through a sonic alarm (mandatory) and a visual alert. This system (category) will also include an active system that brakes the vehicle in the event of an acute danger of hitting a pedestrian.
6. Bicycle Rider and Motorbike Identification System: A system that identifies a bicycle rider and motorbike crossing or moving on the road in front of the vehicle while the vehicle travels forward, and alerts the driver of the danger of hitting a bicycle rider and motorbike through a sonic alarm (mandatory) and a visual alert. This system (category) will also include an active system that brakes the vehicle in the event of an acute danger of hitting a bicycle rider and motorbike.
7. "Blind Spot" Detection System: A system that identifies the presence of vehicles in "blind spots" along the sides of the vehicle, using sensors located on the rear side walls of the vehicle, and generates a visual alert on the appropriate side mirror or close to it, within the vehicle driver's field of view.
8. Rear View Camera: A system of rear view (reverse) cameras installed in the rear part of the vehicle that enables panoramic viewing, from the driver's seat, of the area located behind the vehicle when it travels backwards.
9. Safety Belt Sensors: A system that identifies and gives an alert (through a sonic and/or visual alarm) of the presence of unbelted occupants in the front and rear seats whenever the vehicle is in motion (whether the belt was unfastened while driving or had not been fastened to begin with).
10. High Beam Control System: A system that enables identification of a vehicle approaching from the opposite direction in darkness when a vehicle's high beam headlights are on and switches the headlights from high beam to low beam automatically as the oncoming vehicle approaches. When the oncoming vehicle passes, the system switches the headlights back to high beam.
11. Traffic Sign Identification System: A system capable of identifying standard and electronic road speed limit signs, and issuing an alert when the speed limit has been exceeded.¹⁰

¹⁰ Id. at 7.

II. Evaluation of Safety Systems in Autonomous Vehicles

The State of Israel supports the development of autonomous vehicles and has approved trials for vehicles manufactured by both Israeli and foreign companies.¹¹ On August 19, 2020, MOTRS published the Memorandum of the Law for the Amendment of the Traffic Ordinance (Amendment No. 129) (Experiments in Autonomous Vehicles), 5742-2020. The memorandum proposes, among other things, a regulatory framework and a review of various aspects of the operation of autonomous vehicles in Israel.¹² The period for submission of comments on the memorandum ended on September 9, 2020.¹³

According to an internal MOTRS document, reportedly sent to companies engaged in the development of autonomous vehicles in March 2021, testing was designed to ensure compliance with the MOTRS regulations. The document

. . . deals with actual possible scenarios, i.e., all the situations in which the autonomous vehicle may encounter on a daily basis, conditions that may affect the performance of the autonomous vehicle and the specific challenges each such situation produces.

The list itself consists of 12 different scenarios that autonomous vehicles will encounter on the streets of Israel. In most of these scenarios, the autonomous vehicles will be near non-autonomous cars and will have to brake next to or behind them, drive alongside them in sharp turns and also beware of pedestrians and obstacles.¹⁴

¹¹ For a study of policy aspects of authorization for self-driving autonomous vehicles, see Roy Goldschmidt, *Autonomous Vehicles, Challenges and Opportunities*, Knesset Info. & Res. Ctr. (Dec. 8, 2019), <https://perma.cc/RV9W-49TZ> (in Hebrew).

¹² Memorandum of the Law for the Amendment of the Traffic Ordinance (Amendment No. 129) (Experiments in Autonomous Vehicles), 5742-2020, linked from MOTRS, <https://perma.cc/6585-WSZJ> (in Hebrew).

¹³ Memorandum of the Law for the Amendment of the Traffic Ordinance (Amendment No. 129) (Experiments in Autonomous Vehicles), 5742-2020, comments at <https://perma.cc/2U39-FQ5A> (in Hebrew).

¹⁴ Tomer Hadar, *This Is How Autonomous Vehicles Will Be Tested in Israel*, Calcalist (Mar. 3, 2021), <https://perma.cc/HA4R-AL4X> (in Hebrew).

Japan

Sayuri Umeda
Senior Foreign Law Specialist

SUMMARY Japan led the development of 2020 United Nations Regulation No. 152 regarding the Advanced Emergency Braking System (AEBS). As one of its measures to assist the elderly in driving and to reduce traffic accidents, the government has promoted the AEBS. Currently, the government tests the AEBS of passenger cars and publishes the results in order to let the elderly know about the AEBS and promote purchasing such cars. Starting from November 2021, new domestic type cars must be equipped with AEBS. The technical standards of AEBS follow Regulation No. 152.

I. Background

Japan is a signatory to the United Nations (UN) 1958 Harmonized Technical Regulations for Wheeled Vehicles Agreement.¹ It is also a signatory to the 1998 Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles.² Forty countries, led by Japan and the European Union, agreed on a draft regulation for advanced emergency braking systems (AEBS) for cars in February 2019.³ Based on the draft, the UN adopted Regulation No. 152, Uniform Provisions Concerning the Approval of Motor Vehicles with Regard to the Advanced Emergency Braking System (AEBS) for M1 and N1 vehicles [2020/1597] in October 2020. Regulation No. 152 entered into force on January 3, 2021.⁴ Under Regulation 152

[t]he system shall automatically detect a potential forward collision, provide the driver with an appropriate warning and activate the vehicle braking system to decelerate the vehicle with the purpose of avoiding or mitigating the severity of a collision in the event that the driver does not respond to the warning.⁵

Regulation 152 does not obligate contracting parties to adopt it.⁶

¹ 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, Mar. 20, 1958, 335 U.N.T.S. 211, <https://perma.cc/NF26-GLKN>.

² Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/8CRR-6QTF>.

³ *UN Regulation on Advanced Emergency Braking Systems for Cars to Significantly Reduce Crashes*, UN Econ. Comm'n for Eur. (Feb. 11, 2019), <https://perma.cc/5L85-PJ3F>.

⁴ UN Regulation No 152 – Uniform Provisions Concerning the Approval of Motor Vehicles with Regard to the Advanced Emergency Braking System (AEBS) for M1 and N1 Vehicles [2020/1597], 2020 O.J. (L 360) 66, <https://perma.cc/SVW2-USBZ>.

⁵ *Id.* at Introduction.

⁶ *Id.*

II. Passenger Car AEBS to Assist Elderly Drivers

Japan is one of the leading car-producing countries in the world and employs advanced technology. Japanese carmakers started marketing cars with the world's first AEBS, or collision-mitigation braking systems, in 2003.⁷ The Japanese government has already obligated makers of large trucks and buses to equip them with AEBS. The starting dates of the requirement depended on the vehicle's weight, at earliest November 1, 2014, for new types of heavy trucks.⁸

For the passenger cars, the Ministry of Economy, Trade and Industry (METI) considered AEBS as a means to assist elderly drivers and reduce traffic accidents around 2016.⁹ The installation rate of new domestic passenger cars with AEBS was 45.5% in 2015.¹⁰ In March 2017, the interim report of the relevant deputy ministers' council regarding the dissemination and enlightenment of "safe driving support cars (Sapo Car)" defined Sapo Car as a passenger car in which AEBS and an acceleration control system that responds to a driver's mistaken use of the acceleration pedal are installed.¹¹ The council decided that the government would publicize Sapo Cars to the elderly and provide opportunities to drive them.¹² According to a booklet by the Japan Automobile Manufacturers Association "84.6% of the totality of passenger cars produced in 2018 for the domestic market were equipped with forward collision-mitigation braking systems."¹³

After notable tragic accidents in which preschoolers were victims and an increase in traffic accidents caused by elderly drivers due to impaired vision and other age-related physical and cognitive disabilities, the council of the cabinet office and relevant ministries for traffic safety

⁷ 国交省の大きな勘違で「日本の安全技術は大きく出遅れた」!? 追突被害軽減自動ブレーキの歴史を振り返る [*Because of A Big Mistake by Ministry of Land, Infrastructure, Transport and Tourism, "Japanese Safety Technology Was Slowed Down"!? Looking Back at the History of Collision Damage Mitigation Break System*], CORISM (Dec. 28, 2014), <https://perma.cc/2GTR-672E>.

⁸ 衝突被害軽減ブレーキの装備義務拡大及び基準強化 [Expanded Obligation to Equip Collision Damage Mitigation Brakes and Strengthened Standards], Material 4-2 for Vehicle Safety Study Group Meeting on Nov. 27, 2013, Ministry of Land, Infrastructure, Transport and Tourism (MLIT), <https://perma.cc/MGJ5-PPBT>.

⁹ Reishi Taniguchi, 高齢運転者事故対策としての先進安全自動車の普及促進 [*Reduction of Traffic Accidents by Elderly Drivers Through Promotion of Advanced Safety Vehicles*], in 56(3) 安全工学 [*Safety Engineering*] 159 (2017), <https://perma.cc/L9TG-FUVQ>.

¹⁰ 「安全運転サポート車」の普及啓発に関する関係省庁副大臣等会議中間取りまとめ [Interim Report of the Relevant Deputy Ministers' Council Regarding the Dissemination and Enlightenment of "Safe Driving Support Cars"] 3, METI (Mar. 31, 2017), <https://perma.cc/FU9U-AXJC>.

¹¹ *Id.* at 5.

¹² *Id.* at 6.

¹³ Japan Automobile Manufacturers Ass'n, Inc., *Motor Industry of Japan 2020* (2020), <https://perma.cc/U5JD-7VED>.

decided to add traffic safety measures on June 18, 2019.¹⁴ Among relevant ministries, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has jurisdiction over road transport,¹⁵ and the Ministry of Economy, Trade and Industry (METI) has jurisdiction over industrial technology.¹⁶ One of the measures was enhancing promotion of passenger cars with functions to assist safe driving by elderly drivers. The council decision states:

Following the expected entry into force of the international standard for AEBS in January 2020, the government will establish the domestic standard for AEBS. By the end of 2019, the government will decide if new cars must have AEBSs. In addition, the government will decide if it will introduce performance certification systems of acceleration suppression devices that works when drivers mistakenly press pedals as well as AEBS, by the end of 2019.¹⁷

Near the end of 2019, the MLIT announced the schedule regarding AEBS and acceleration suppression devices, among other things, to follow up the council decision that states:

1. Following the entry into force of international standards for AEBS for passenger cars, domestic standards will be established in January 2020. Domestic standards will gradually require new domestic models to have such brakes after November 2021, the first in the world;
2. The MLIT will establish a performance certification system for devices to suppress sudden start by pedal missteps and AEBS by the end of March 2020. The applications for the certification will be accepted from April 2020; and
3. A performance certification system for retrofitted devices to suppress sudden start by pedal missteps will be established by the end of March 2020. The applications for the certification will be accepted from April 2020.¹⁸

As planned, the MLIT established the standards for AEBS for passenger cars on January 31, 2020. The standards will take effect for new domestic types of cars on November 1, 2021, new imported

¹⁴ 未就学児等及び高齢運転者の交通安全緊急対策 [Traffic Safety Emergency Measures Concerning Protection of Preschoolers and Prevention of Accidents by Elderly Drivers], Ministerial Council for Traffic Safety (June 18, 2019), <https://perma.cc/GK3X-MZAP>.

¹⁵ 国土交通省設置法 [MLIT Establishment Act], Act No. 100 of 1999, amended by Act No. 24 of 2019, art. 4, item 80, <https://perma.cc/8ZAF-ZKGG>.

¹⁶ Id. items 21-24, 32.

¹⁷ Id. at 4 (translation by author).

¹⁸ 報道発表資料: 交通安全緊急対策に係る車両安全対策の措置方針について、～高齢運転者による交通事故の削減に向けて～ [Press Release: About Measures and Policy of Vehicle Safety Measures Related to the Traffic Safety Emergency Measures – To Reduce Traffic Accidents Caused by Elderly Drivers], MLIT (Dec. 17, 2019), <https://perma.cc/2DUN-3YYG>.

types of cars on July 1, 2024, existing domestic types of cars on December 1, 2025, and existing imported types of cars on July 1, 2026.¹⁹

III. Sales Promotion of Passenger Cars with Advanced Technologies

As seen in the previous section, since 2017, the government has promoted Sapo Car sales for the elderly by publicity and events. Details of how the MLIT and METI have promoted Sapo Cars are described below.

A. Tests and Publications

The MLIT and the National Agency for Automotive Safety and Victims' Aid (NASVA) engage jointly in the Japan New Car Assessment Program (JNCAP), which tests the safety of new vehicles and publishes the results for consumers. One of the tests is to assess preventive safety technologies.²⁰

Regarding the AEBS, the NASVA tests vehicles in various conditions:

1. AEBS to avoid collisions with a car
A test vehicle approaches to a target at a speed of 10 to 60 km/h (6.2 to 37.3 mph) from behind. The test scenarios are carried out in two ways. One is to collide with a stationary unmoving target. The other is to collide with a moving target at 20 km/h.
2. Alarm and AEBS to avoid collisions with a pedestrian during daytime
A test vehicle approaches a pedestrian target crossing the road at a speed of 10 to 60 km/h. The tests are carried out in two scenarios: a pedestrian crosses the road in front in clear visibility, and a pedestrian crosses the road emerging from in front of another, parked, car.
3. Alarm and AEBS to avoid collisions with a pedestrian in the dark
A test vehicle approaches a pedestrian target crossing a road at a speed of 30–60 km/h (18.7 to 37.3 mph). The tests are carried out in two scenarios: a pedestrian crosses the road without obstacles to block the driver's view, and a pedestrian crosses the road from behind an oncoming vehicle. The tests are conducted in an environment with and without street lamps.²¹

Another test and publication system was introduced in 2018 in connection with the promotion of Sapo Cars.²² The MLIT certifies, if automobile manufacturers request, that the AEBS of a new car

¹⁹ 道路運送車両の保安基準の細目を定める告示等の一部改正について [Regarding Partial Amendment of Notification Stipulating the Details of Safety Standards for Road Transport Vehicles], MLIT (Jan. 31, 2020), <https://perma.cc/3SGQ-SZ99>.

²⁰ MLIT & NASVA, *Preventive Safety Performance Assessment: New Technologies to Avoid Crashes 2* (Mar. 2020), <https://perma.cc/568V-AXNE>.

²¹ Id. at 3–5.

²² Ken-ichi Suzuki, 安全を気にするなら知っておきたい「自動ブレーキ認定制度」とは？ JNCAPとの違いも解説！ [If We Care About Safety, We Want To Know the “Autonomous Break Certification System.” Also Explain the Difference from JNCAP!], GAZOO (Aug. 31, 2019), <https://perma.cc/94PF-KDZF>.

type has a certain level of performance in avoiding a collision with another car.²³ It is similar to the JNCAP, but the JNCAP conducts detailed tests as described above. In 2020, the certification process was expanded. Tests of the ability of an AEBS to avoid collisions with pedestrians and of equipment designed to curb acceleration in the event of car pedal misapplication were added.²⁴ The MLIT has published the results on its website.²⁵

B. Subsidies for Sapo Cars

To support elderly drivers aged 65 or older in purchasing Sapo Cars or a safety support device for aftermarket installation, the government started the subsidy program in 2020. The subsidy amounts for such elderly drivers are as follows:

1. Vehicles on which AEBS and an acceleration control system are installed: newly registered vehicles: 100,000 yen [about US\$915]; light motor vehicles: 70,000 yen [about US\$640]; and used vehicles: 40,000 yen [about US\$366].
2. Vehicles on which AEBS is installed: newly registered vehicles: 60,000 yen [about US\$550]; light motor vehicles: 30,000 yen [about US\$275]; and used vehicles: 20,000 yen [about US\$185].
3. Acceleration control systems for aftermarket installation with a function for detecting obstacles: 40,000 yen.
4. Acceleration control systems with no function for detecting obstacles: 20,000 yen.²⁶

IV. AEBS Requirement

As stated in Section II above, the AEBS standards will take effect for new type domestic cars on November 1, 2021. Testing a new type of car's AEBS will be incorporated in the vehicle approval system.

An automobile manufacturer makes an application for approval of a new type of vehicle to the MLIT.²⁷ The National Traffic Safety and Environment Laboratory inspects the vehicle for the MLIT and examines whether it conforms to safety standards.²⁸

²³ Id.

²⁴ 新車・後付装置の性能認定制度を拡充します [Press Release: The MLIT Expands the Certification System of New Car Retrofit Devices], MLIT (Mar. 31, 2020), <https://perma.cc/GJ9A-RZXH>.

²⁵ 衝突被害軽減ブレーキの性能評価認定結果 [Collision Damage Mitigation Brake Performance Evaluation Certification Result], MLIT, <https://perma.cc/5BCT-S7KR>.

²⁶ News Release, METI, Subsidies for Safety Support Cars Included in FY2019 Supplementary Budget Draft (Dec. 13, 2019), <https://perma.cc/H9R7-QX93>.

²⁷ 道路運送車両法 [Road Transport Vehicle Act], Act No. 185 of 1951, amended by Act No. 14 of 2019, arts. 8, 41, 75.

²⁸ 自動車認証審査部 [Automobile Approval Examination Department], Nat'l Traffic Safety & Env't Laboratory, <https://perma.cc/3EZF-T9Q3>.

The safety standards were amended on January 31, 2020.²⁹ The amendment states that passenger cars and small trucks must be equipped with an AEBS that meets the technical requirements of UN Regulation No. 152, except for rules 5 (“Specifications”) and 6 (“Test Procedure”).³⁰

²⁹ 道路運送車両の保安基準 [Safety Standards for Road Transport Vehicles], Ministry of Transport Ordinance No. 67 of 1951, amended by MLIT Ordinance No. 100 of 2020, art. 12, <https://perma.cc/UAL9-5J3C>; 道路運送車両の保安基準の細目を定める告示 [Notification of Details of the Safety Standards for Road Transport Vehicles], MLIT Notification No. 619 of 2002, amended by MLIT Notification No. 52 of 2020, <https://perma.cc/PRS9-MU66>.

³⁰ Notification of Details of the Safety Standards for Road Transport Vehicles, art. 15, para. 8; art. 9, para. 9.

Russian Federation

Iana Fremer
Legal Research Analyst

SUMMARY The Russian government does not mandate the installation of crash avoidance or pedestrian recognition systems to protect vulnerable traffic participants. No restrictions on their production, import, and installation in vehicles operated in Russia have been located. Media outlets have reported that the government is working on establishing requirements for collision avoidance systems, however, the road safety standards are not amended yet. Presently, government requirements obligate vehicle owners to install Russian-made collision monitoring, reporting, and recording equipment. The mandate for crash avoidance and pedestrian recognition equipment on vehicles used in mines has been repealed.

I. Introduction

Several laws regulate road and traffic safety in Russia. The work of federal executive authorities in the field of road safety is coordinated at the ministerial level by the State Commission for Road Safety.¹

The Federal Road Safety Program for 2013–2020 was implemented by the Ministry of Transport,² which is the federal agency that ensures transportation safety in all 85 constituent components of the Russian Federation.³ On January 8, 2018, the government of the Russian Federation adopted the Road Safety Strategy of the Russian Federation 2018-2024.⁴ These documents promote technological solutions for road safety problems and introduce the notion of an “intelligent transport system” consisting of integrated informational, digital, and remote technological capabilities. Except for antilock brake systems (ABS), however, crash and collision avoidance systems are not recognized as required elements yet, and their installation on new Russian and imported cars is not mandated.

¹ Resolution of the Government of the Russian Federation “On the Government Commission for Road Safety” (with amendments and additions, Apr. 14, 2007, May 22, 2008, June 24, 2008), No. 237, Apr. 25, 2006, <https://perma.cc/3D45-ZNCD> (in Russian).

² Government of the Russian Federation, Resolution on the Federal Target Program “Improving Road Safety in 2013-2020” (amended May 16, 2020), No. 864, Oct. 3, 2013, <https://perma.cc/B9AT-SAUf> (in Russian).

³ Resolution of the Government of the Russian Federation “On approval of the Regulation on the Ministry of Transport of the Russian Federation” (with amendments and additions), No. 395, July 30, 2004, <https://perma.cc/LWG4-4VJN> (in Russian).

⁴ *Road Safety Strategy in the Russian Federation for 2018-2024*, Rossiyskaya Gazeta [Russian newspaper] (Jan. 25, 2018), <https://perma.cc/8A6Q-T3W3> (in Russian).

II. Regulations on the Development and Installation of the Crash Avoidance System

No legal norms regulating the standards and other parameters for crash avoidance systems that are allowed for use in Russia have been located.

In 1986, the Russian Federation became a party to the 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations.⁵

In 2000, the Russian Federation became a signatory of the Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles.⁶

The only legal norm requiring the installation of crash avoidance and pedestrian recognition systems in Russia was for vehicles used in underground mines. It was in force between March 2019 and December 2020. The Federal Rules and Norms in the Field of Industrial Safety for Mining and Solid Fossils Exploration, which were approved by the Federal Service of Environmental, Technical, and Nuclear Monitoring on November 21, 2018, contained two requirements addressing the safety of vulnerable mining employees.⁷ The rules stated “transport vehicles used in mines must be equipped with collision avoidance systems. These systems shall inform the operator about the presence of people and other vehicles within the radius of the vehicle’s movement trajectory.”⁸ The rules also required the application of “software that would provide for timely informing the personnel about the danger of collisions, possible crashes with pedestrians, danger zone alerts, and other violations of safe use of mining equipment.”⁹

These rules were repealed by a federal government regulation and have not been in force since January 1, 2021.¹⁰ Some developers of crash avoidance equipment expect that a more extensive list of requirements for such systems will be issued in the future.¹¹ Presently, ABS appears to be the only type of crash avoidance system specifically required by the law and included in the state

⁵ 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, Mar. 20, 1958, 335 U.N.T.S. 211, <https://perma.cc/NF26-GLKN>.

⁶ Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/8CRR-6QTF>.

⁷ Russian Federal Service of Environmental, Technical, and Nuclear Monitoring, Order No. 599 of Dec. 11, 2013, amended Nov. 21, 2018, <https://perma.cc/T5P5-TCE3>.

⁸ Id. § 325.

⁹ Id. § 597.

¹⁰ Government of the Russian Federation, Regulation No 1192 of Aug. 6, 2020, attachment 2, § 83, <https://perma.cc/SR8T-5V4G>.

¹¹ *Crash Avoidance Systems: Legislation for Developers*, Habr.com (Oct. 16, 2019), <https://perma.cc/TCE4-GNDF>.

standard (GOST) 51709-2001.¹² On March 4, 2020, the Russian newspaper *Izvestia* reported that the State Commission for Regulation of Standards had issued new regulations requiring all vehicles produced or imported to the Russian Federation to be equipped with an Advanced Driver Assistance System, which includes a crash avoidance system.¹³ According to the report, the new regulations were to be introduced by October of 2020, but they are not yet in effect.

The Russian Federation's government implemented a specialized standard for motor vehicles within the Eurasian Economic Union (EEU) on April 1, 2017. It requires all vehicles produced or imported in the EEU to be equipped with an integrated communication device called GLONASS. This Russian satellite navigation system is similar to the Global Positioning System commonly known as GPS. The specialized standard also has other technical requirements aimed at crash avoidance.¹⁴ It mandates that all passenger and freight vehicles used for the first time within the EEU's borders be equipped with emergency call devices that promptly convey information about accidents on Russian roads, relay that information to the emergency response services, and give access to the information to the authorities, legal entities, and individuals.¹⁵ Additionally, the government created a subsidiary system, known as ERA-GLONASS, with the sole purpose of being a service provider for real-time detection of collisions.¹⁶

A number of special decrees further regulate the details of installing the GLONASS system. Several requirements were postponed because of the COVID-19 pandemic, and some will not go into effect until January 1, 2022.¹⁷

¹² State Standard of the Russian Federation. Motor Vehicles. Safety Requirements for the Technical Condition and Test Methods (Approved by the Decree of the State Standard Committee of Russia on Feb. 1, 2001, No. 47-st) (revised March 28, 2006), arts. 1, 3, <https://perma.cc/2NR4-WTV6> (in Russian).

¹³ Alexander Volobuev, *Refueled with Intelligence: Cars Will Warn About Traffic Violations*, *Izvestia* (Mar. 4, 2020), <https://perma.cc/23MJ-UEBW> (in Russian).

¹⁴ Interstate Standard, Single Road Vehicles. Test Methods for Compliance Assessment (entered into force Apr. 1, 2017), <https://perma.cc/4JHG-L4YU> (in Russian).

¹⁵ *Id.* art. 2.

¹⁶ Federal Law of the Russian Federation on the ERA-GLONASS State Automated Information System, No. 395-FZ, adopted on Dec. 20, 2013, last amended on July 15, 2013, <https://perma.cc/HW4E-N6G3> (in Russian), <https://perma.cc/84XP-68HP> (unofficial English translation).

¹⁷ *Mandatory Installation of GLONASS Systems on Cars in Russia Has Been Postponed*, RUSOFT (May 1, 2020), <https://perma.cc/7QDU-UNC6> (in Russian).

South Africa

*Hanibal Goitom
Chief, FCIL I*

SUMMARY In South Africa, the National Regulator for Compulsory Specifications (NRCS) administers and maintains compulsory specifications for the fitness of vehicles offered for sale for use on public roads, as well as off-road and specialized vehicles. The applicable compulsory specifications require certain category of N2, N3, M2 and M3 motor vehicles, homologated on or after January 1, 2016, and all vehicles in these categories manufactured or imported on or after January 1, 2017, must be fitted with braking equipment including anti-lock braking systems. No compulsory specification relating to other forms of car crash avoidance systems designed for the protection of pedestrians and other vulnerable road users was located.

I. Introduction

South Africa is a contracting party to both the UNECE 1958 Agreement and the 1998 Agreement on UN Global Technical Regulations.¹

Established in 2008 as an agency within the Department of Trade and Industry, the National Regulator for Compulsory Specifications (NRCS) has a mandate that includes “promoting public health and safety, environmental protection and ensuring fair trade.”² Among the stated objectives of the NRCS are administering and maintaining compulsory specifications,³ carrying out market surveillance through inspection in order to monitor compliance with compulsory specifications, and enforcing compliance with compulsory specifications.⁴ As part of its mandate, NRCS “administers compulsory specifications for the fitness of vehicles offered for sale for use on public roads, as well as off-road and specialized vehicles.”⁵ According to the NRCS, “[c]ertain safety-critical vehicle components and automotive products are also regulated by means of compulsory specifications. In general the standards are aligned with the UN ECE regulations.”⁶

¹ 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, Mar. 20, 1958, 335 U.N.T.S. 211, <https://perma.cc/NF26-GLKN>; Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/8CRR-6QTF>.

² *Background to the NRCS*, National Regulator for Compulsory Specifications (NRCS), <https://perma.cc/9ZTN-78D8>; National Regulator for Compulsory Specifications Act 5 of 2008 § 3 (July 1, 2008), <https://perma.cc/2HE4-XE9N>.

³ *Compulsory Specifications List*, NRCS (updated through Nov. 5, 2019), <https://perma.cc/ETK9-9Q4P/>.

⁴ National Regulator for Compulsory Specifications Act § 5.

⁵ *About Automotive*, NRCS, <https://perma.cc/KN5C-QUTZ>.

⁶ *Id.*

Anyone seeking to import a new or used vehicle, including importers and builders of vehicles, must first obtain what is known as a “letter of authority” from the NRCS.⁷ The NRCS provides that

All vehicles used on public roads whether locally manufactured or imported must conform to the requirements for vehicles as set out in the Road Traffic Act [National Road Traffic Act 93 of 1996]⁸ and relative compulsory specifications and importers must supply proof of conformity to the NRCS.

The required proof depends on the individual circumstances and is at the discretion of NRCS. A certificate of ECE compliance or local origin is usually sufficient for individual imports.

The requirements for vehicles are in general aligned with the applicable standards, regulations and directives of the EEC and ECE. Importers of foreign vehicles are strongly advised to consult NRCS to determine the specific requirements for their vehicle/s. This is essential for vehicles that originate in countries outside of Europe (e.g. Americas, Far East, Australasia).⁹

The NRCS further provides that “[n]ew vehicle models, built up vehicles and modifications of vehicles, whether locally manufactured or imported, must conform to the compulsory specifications for vehicles of the relevant class, and in particular the standards affecting **SAFETY CRITICAL CHARACTERISTICS** of the vehicle and its components.”¹⁰

II. Car Crash Avoidance Systems

South Africa requires car crash avoidance systems for certain vehicles. The compulsory specifications for motor vehicles of category N2 and N3 state that

Vehicles homologated on or after 1 January 2016 and all vehicles manufactured or imported on or after 1 January 2017 shall be fitted with braking equipment including anti-lock braking systems and shall comply with the relevant requirements given SABS ECE R13, Uniform provisions concerning the approval of vehicles of categories M, N and O with regard to braking, to the level of ECE R13/08, provided that;

- a) compliance of the anti-lock braking system is not required until 01 January 201 [sic];
- b) anti-lock braking systems are not required on all-wheel-drive vehicles or on vehicles with articulated steering, or on truck tractors with a GVM not exceeding 7000kg; and
- c) compliance to clause 4.4 of Annex 10 of SABS ECE R13 is not required to be demonstrated.¹¹

⁷ *Automotive – Import*, NRCS, <https://perma.cc/EB7E-NVDJ>.

⁸ National Road Traffic Act 93 of 1996 (Nov. 12, 1996), <https://perma.cc/CCU2-XEBP>.

⁹ *Id.*

¹⁰ *Automotive – Homologation of Vehicles*, NRCS, <https://perma.cc/RK2D-PMEN>.

¹¹ Compulsory Specification for Motor Vehicles of Category N2 and N3, § 3.3.2 & Sch. 1, GN 611 of Government Gazette [GG] 39220 (Sept. 18, 2015), <https://perma.cc/AU5X-PKT2>.

The same requirements apply to motor vehicles of category M2 and M3.¹²

No compulsory specification relating to other forms of car crash avoidance systems designed for the protection of pedestrians and other vulnerable road users was located.

III. Current Discussion

No information regarding current discussions relating to the adoption of additional requirements for systems to detect and protect vulnerable road users was located.

¹² Compulsory Specification for Motor Vehicles of Category M2 and M3, § 3.2.2 & Sch. 1, GN 613 of GG 39220 (Sept. 18, 2015), <https://perma.cc/DM44-AJJH>.

Turkey

Kayahan Cantekin
Foreign Law Specialist

SUMMARY Turkey is a major producer of motor vehicles. In order to ensure the free movement of motor vehicles and related products between the Turkish market and the European Union's internal market in accordance with the EU-Turkey Customs Union, Turkey has adopted in its entirety the EU's framework for the type approval of such automotive products, including its rules on protecting vulnerable road users. These EU rules are transposed into Turkish law by a series of regulations issued by the Ministry of Industry and Technology (MIT). The MIT, as Turkey's approval authority under EU rules, has delegated the evaluation and certification of type approvals to the Turkish Standards Institution (TSE). Currently, the Turkish type approval framework does not specifically require the installation of car crash avoidance systems in any categories of vehicles, reflecting the EU rules in force. However, installation of such systems will be required in vehicles carrying passengers and goods following the entry into force of Regulation (EU) 2019/2144, and the MIT regulation transposing the Regulation, on July 6, 2022.

I. Introduction

Turkey is a major motor vehicle producer. In 2020, Turkey was the 14th largest motor vehicle producer in the world by number of total vehicles manufactured, with approximately 855,000 passenger cars and 443,000 commercial vehicles produced.¹

In the same year, 150,275 traffic accidents causing injuries or death took place in the country, involving 4,866 fatalities and 226,266 injured.² Of the 177,867 traffic faults causing accidents involving death or injuries, 88.3% was ascribed to the driver and 7.0% to a pedestrian.³ Of the total fatalities, 80.1% were vehicle drivers or occupants, while 19.9% were pedestrians.⁴ Of the total injured, 89.9% were vehicle drivers or occupants, and 10.1% were pedestrians.⁵

Turkey acceded to the 1958 United Nations Economic Commission for Europe (UNECE) Agreement in 1997, and has also been a contracting party to the 1998 Agreement on Global Technical Regulations since 2000.⁶

¹ International Organization of Motor Vehicle Manufacturers, *2020 Production Statistics* (2021), <https://perma.cc/MM3K-YUYH>.

² Türkiye İstatistik Kurumu, *Karayolu Trafik Kaza İstatistikleri, 2020* (Turkish Statistical Institute News Bulletin, 2020), No. 37436 (June 1, 2021), <https://perma.cc/N776-K7NA> (in Turkish).

³ Id.

⁴ Id.

⁵ Id.

⁶ 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions

II. Regulation of the Development and Installation of Car Crash Avoidance Systems

A. General Framework Regarding Type Approval of Motor Vehicles, Systems, and Components

Since the establishment of the European Union-Turkey Customs Union in 1996, the Turkish legal framework regarding type approvals of land motor vehicles has been harmonized with the relevant European Union (EU) framework.⁷ The Law on Highway Traffic authorizes the Ministry of Industry and Technology (MIT) to issue regulations regarding the technical standards and type approval systems to ensure the roadworthiness of vehicles at the manufacturing stage.⁸ Accordingly, the MIT has issued numerous regulations harmonizing Turkish law with the EU framework concerning type approvals of land vehicles. The EU framework provides the technical specifications a manufacturer of motor vehicles must satisfy in its whole-vehicles, vehicle systems, components, or separate technical units that it manufactures in order to obtain an EU type approval for these products.⁹ An EU type approval allows the manufacturer to market these products, and an importer to import them, within the EU and within the EU-Turkey Customs Union without needing to recertify in each member state.¹⁰ The EU framework incorporates specific technical standards issued by the European Commission and certain technical regulations created by the UNECE; some series of UNECE regulations are considered equivalent and acceptable alternatives for compliance with EU standards for type approvals and free movement of approved products.¹¹

In Turkish law, the framework currently in force governing the type approval and market surveillance of motor vehicles and their trailers, systems, components, and separate technical units is set forth in MIT's framework regulation transposing Regulation (EU) 2018/858.¹² In addition to this, two other MIT framework regulations transpose Regulations (EU) 167/2013 and 168/2013, which concern type approvals and market surveillance of agricultural and forestry

for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations, Mar. 20, 1958, 335 U.N.T.S. 211, <https://perma.cc/U85X-23EY>, ratified by Council of Ministers Decision No. 96/8657 (Official Gazette [O.G.] No. 22868, Jan. 5, 1997), <https://perma.cc/VV82-9XM8>; Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can be Fitted and/or be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/8CRR-6QTF>, ratified by Council of Ministers Decision No. 2000/1318 (O.G. No. 24216, Oct. 31, 2000), <https://perma.cc/YPY9-4Y6W>.

⁷ Decision No 1/95 of the EC-Turkey Association Council of 22 December 1995 on implementing the final phase of the Customs Union, 1996 O.J. (L 35) 1, <https://perma.cc/VP6C-JMFA>.

⁸ Karayolları Trafik Kanunu, Law No. 2918, art. 29 (O.G. No. 18195, Oct. 13, 1983), <https://perma.cc/3ALT-VUYF>.

⁹ For details of the EU type approval framework, see Jenny Gesley, *European Union*, in this report.

¹⁰ See Regulation (EU) 2018/858, 2018 O.J. (L 151) 1, Recital 7, <https://perma.cc/72GL-6DAB>.

¹¹ See Gesley, *supra* note 9.

¹² Motorlu Araçlar ve Römorkları ile Bunların Aksam, Sistem ve Ayrı Teknik Ünitelerinin Tip Onayı ve Piyasa Gözetimi ve Denetimi Hakkında Yönetmelik (AB/2018/858) (O.G. No. 31104, Apr. 19, 2020), <https://perma.cc/SLB7-CXU6>.

vehicles, and two- or three- wheeled vehicles and quadricycles, respectively.¹³ These three MIT framework regulations are complemented by the Regulation on the Manufacturing, Repair, and Assembly of Vehicles, which governs the national type approval system for vehicles that are not required to be certified under the harmonized EU type approval rules.¹⁴

The three MIT framework regulations provide, inter alia, the definition of vehicle categories, responsibilities of vehicle manufacturers and importers in obtaining type approvals, procedures regarding the harmonized recognition of type approvals granted in accordance with EU law and incorporated UNECE regulations, and annexes listing the applicable specific EU and UNECE regulations with the technical standards specific vehicle products must meet. Specific EU regulations providing technical standards that are directly applicable in EU member states but not in Turkey are transposed into Turkish law through individual regulations issued by the MIT.

B. Type Approval of Motor Vehicles With Regard to General Safety Measures and Protection of Vulnerable Road Users

On November 27, 2019, the European Parliament and the Council of the EU passed Regulation (EU) 2019/2144, which amended Regulation (EU) 2018/858 and introduced in the type approval system for motor vehicles numerous new requirements concerning general safety and the protection of vehicle occupants and vulnerable road users.¹⁵ Regulation (EU) 2019/2144 will enter into force on July 6, 2022.¹⁶

Accordingly, the MIT issued a regulation transposing Regulation (EU) 2019/2144 into Turkish law, which was published in the Official Gazette on May 14, 2020.¹⁷ The relevant provisions of the MIT regulation will enter into force on July 6, 2022, simultaneously with Regulation (EU) 2019/2144.¹⁸

Among other things, Regulation (EU) 2019/2144, and the MIT regulation transposing it, mandates fitting “advanced emergency braking systems” capable of detecting obstacles, moving vehicles, pedestrians, and cyclists ahead of the motor vehicle into vehicles of categories M₁, M₂, M₃, and N₁, N₂, N₃.¹⁹ It authorizes the European Commission to issue implementing acts

¹³ Tarım ve Orman Araçlarının Tip Onayı ve Piyasa Gözetimi ve Denetimi Hakkında Yönetmelik (AB/167/2013) (O.G. No. 29088, Aug. 14, 2014), <https://perma.cc/7LEU-SKPN>; İki veya Üç Tekerlekli Motorlu Araçların ve Dört Tekerlekli Motosikletlerin Tip Onayı ve Piyasa Gözetimi ve Denetimi Hakkında Yönetmelik (AB/168/2013) (O.G. No. 29453, Aug. 22, 2015), <https://perma.cc/NAK6-NYM9>.

¹⁴ Araçların İmal, Tadil ve Montajı Hakkında Yönetmelik (O.G. No. 29869, Oct. 26, 2016), <https://perma.cc/ZU9Q-RVU2>.

¹⁵ Regulation (EU) 2019/2144, 2019 O.J. (L 325) 1, <https://perma.cc/K5J7-9FRC>.

¹⁶ Id. art. 19.

¹⁷ Motorlu Araçlar ve Römorkları ile Bunlar İçin Tasarlanan Aksam, Sistem ve Ayrı Teknik Ünitelerin Genel Güvenliği ve Korunmasız Karayolu Kullanıcılarının ve Yolcuların Korunması ile İlgili Tip Onayı Yönetmeliği (AB/2019/2144) (O.G. No. 31127, May 14, 2020), <https://perma.cc/8PKS-T5QM>.

¹⁸ Id. art. 18(b).

¹⁹ Id. arts. 7(2) and 9(3); Regulation (EU) 2019/2144, arts. 7(2) and 9(3). For detailed definitions of vehicle categories see Regulation (EU) 2019/2144, Annex I(A)(3) and I(B)(1); Categories M and N generally refer to

providing the technical specification for such breaking systems, but none appear to have been issued yet.²⁰ Accordingly, the MIT has not yet issued a regulation regarding the type approval of such systems.

III. Evaluation of Car Crash Avoidance Systems

Via a protocol signed between the MIT and the Turkish Standards Institution (TSE), the MIT delegated the administration of the EU type approval system to the Vehicle Type Approval Directorate of the TSE (TSE-ATOM).²¹ TSE-ATOM is responsible for evaluating and approving applications of vehicle manufacturers for EU type approvals for whole vehicles or their systems, components, or separate technical units in accordance with the relevant EU and UNECE rules and the MIT regulations transposing these.²² TSE-ATOM performs the technical evaluations of samples submitted by manufacturers, and according to the sample's compliance with EU rules or UNECE regulations will prepare a technical report approving or rejecting the application for a type approval.²³ Final certification of type approvals are done by the Certification Directorate of the TSE (TSE-ULMB) in accordance with the technical reports prepared by TSE-ATOM.²⁴ The TSE administers both EU type approvals in compliance with the relevant EU directives and UNECE type approvals in accordance with UNECE regulations.²⁵

The MIT regulation transposing Regulation (EU) 2019/2144 does not appear to change the role of the TSE in the type approval and certification processes under the joint framework of EU and UNECE rules. Thus, it appears that type evaluations and certification of car crash avoidance systems will be undertaken by TSE-ATOM and TSE-ULMB, respectively, once relevant technical standards are issued by the MIT in response to the eventual EU regulations or implementation acts and UNECE regulations relating to crash avoidance and mitigation systems.

IV. Existing Requirements for Detection of Vulnerable Road Users

Under the framework currently in force, safety features for the protection of vulnerable road users that must be installed in motor vehicles seeking EU type approvals are set forth in the MIT regulation (and its annexes) transposing Regulation (EU) 78/2009, which will be repealed by the

vehicles carrying passengers, and goods, respectively. See *Vehicle Categories*, European Commission (2021), <https://perma.cc/P3AM-EVJ9>.

²⁰ Regulation (EU) 2019/2144, art. 7(6).

²¹ T.C. Bilim, Sanayi ve Teknoloji Bakanlığı Tarafından Türk Standardları Entitüsünün Tip Onayı Belgelendirme İşlemleri Kapsamında Görevlendirilmesine Dair Protokol (Sept. 28, 2015), <https://perma.cc/6GDC-WVN7>; Türk Standardları Entitüsü, *Sık Sorulan Sorular* (TSE website, type approval FAQ), § 3, <https://perma.cc/CD2B-85VR>.

²² Türk Standardları Entitüsü, *Sık Sorulan Sorular*, supra note 21, § 2.

²³ Id. at § 4.

²⁴ Id. at § 13.

²⁵ Id. at § 11.

entry into force of the MIT regulation transposing Regulation (EU) 2019/2144.²⁶ Under the MIT regulation transposing Regulation (EU) 78/2009, there appears to be no requirement for vulnerable road user detection systems to be installed on motor vehicles. Nevertheless, the regulation allows the MIT to exempt vehicles with collision avoidance systems from satisfying certain collision impact tests if the avoidance system ensures levels of protection that are at least equivalent to the effectiveness required by the said impact tests.²⁷ Research in public sources has not yielded any documentation related to such an exemption actually having been granted by the MIT.

²⁶ Yayaların ve Diğer Korunmasız Karayolu Kullanıcılarının Korunması Hakkında Motorlu Araçların Tip Onayı Yönetmeliği ((AT) 78/2009), (O.G. No. 27687, Aug. 29, 2010), <https://perma.cc/7B9K-XUTJ>; Regulation (EU) 78/2009, 2009 O.J. (L 35), 1, <https://perma.cc/UCF7-PUDP>; Motorlu Araçlar ve Römorkları ile Bunlar İçin Tasarlanan Aksam, Sistem ve Ayır Teknik Ünitelerin Genel Güvenliği ve Korunmasız Karayolu Kullanıcılarının ve Yolcuların Korunması ile İlgili Tip Onayı Yönetmeliği (AB/2019/2144), supra note 17, art. 17(1)(a).

²⁷ Yayaların ve Diğer Korunmasız Karayolu Kullanıcılarının Korunması Hakkında Motorlu Araçların Tip Onayı Yönetmeliği ((AT) 78/2009), supra note 26, art. 11; also see Regulation (EU) 78/2009, supra note 26, art. 11.

United Arab Emirates

*George Sadek
Foreign Law Specialist*

SUMMARY The United Arab Emirates (UAE) continues to be one of the strongest automotive markets in the Gulf region. The government of UAE conducts tests to ensure the safety of both non-autonomous and autonomous (driverless) vehicles on the roads.

The UAE is not a signatory of the UNECE 1958 Agreement or the 1998 Agreement on UN Global Technical Regulations.

On the federal level, the Emirates Authority for Standardization and Metrology (ESMA) is the government entity responsible for issuing technical regulations concerning the safety requirements for all vehicles in the UAE.

To reduce traffic accidents on the roads, the emirates of Abu Dhabi and Dubai are creating a new traffic control system. Additionally, all non-autonomous vehicles must meet a number of safety requirements to be drivable on the roads. Concerning autonomous vehicles, according to a report issued in October 2019 by the Dubai World Congress for Autonomous Transport, building an appropriate road infrastructure for autonomous vehicles is essential for creating adequate safety measures for this type of vehicle.

In January 2017, ESMA issued Regulation No. 8 of 2017, which sets standards for all imported used vehicles operating in the UAE. Apparently, the UAE does not have a federal law regulating the safety of autonomous vehicles. However, on the local level, the Emirate of Dubai has issued two legal instruments regulating the safety of autonomous vehicles: Executive Council Resolution No. 3 of 2019 and Administrative Decree No. 501 of 2020.

According to news reports, the main concerns of the public in UAE regarding autonomous vehicles are vehicle safety and road infrastructure.

I. Introduction

The United Arab Emirates (UAE) continues to be one of the strongest automotive markets in the Gulf region. That strength is due to a number of factors, including low fuel costs, low import tariffs, high per capita disposable income, a favorable tax regime, and attractive insurance and finance options. The automotive market in the UAE includes electric cars as well as gas-powered cars.¹

¹ *Country Commercial Guide, United Arab Emirates: Automotive*, Int'l Trade Admin., US Dep't of Com., <https://perma.cc/WQ26-HB58>.

The UAE pays special attention to the safety of all imported vehicles. It does not permit the entry of vehicles that were in accidents such as submerging, fire, collision, rollover, etc. Additionally, vehicles previously used as taxicabs or by police are not allowed to be imported.²

The UAE is not a signatory of the UNECE 1958 Agreement or the 1998 Agreement on UN Global Technical Regulations.³

In addition to regulating the safety of non-autonomous vehicles, the UAE is focusing on the operation of autonomous (driverless) vehicles. His Highness Sheikh Mohamed bin Rashid Al Maktoum, the UAE's prime minister, has announced that 25% of all transportation trips in Dubai will be smart and driverless by 2030.⁴

II. Entities Responsible for Vehicle Safety Regulations and Tests

A. Federal Level

On the federal level, the Emirates Authority for Standardization and Metrology (ESMA) is the government entity responsible for issuing technical regulations concerning safety requirements for autonomous and non-autonomous vehicles in the UAE.⁵

B. Local Level

On the local level, each of the nine emirates has its own transport authority. For instance, in the Emirate of Dubai, the Roads and Transport Authority (RTA) is the entity in charge of creating safety regulations concerning all types of vehicles.⁶

C. Safety System Evaluation

Non-autonomous and autonomous vehicles are tested to ensure their safety on the roads.

² Id.

³ 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of These United Nations Regulations, Mar. 20, 1958, 335 U.N.T.S. 211, <https://perma.cc/NF26-GLKN>; Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129, <https://perma.cc/8CRR-6QTF>.

⁴ *Dubai Self-Driving Transport Strategy & Roadmap*, Dubai Road & Transp. Auth. (RTA), <https://perma.cc/6NKD-36YM>.

⁵ *ESMA Issues Safety Rules for Self-Driving Vehicles*, Gulf News (Aug. 12, 2017), <https://perma.cc/XJN2-8HFG>.

⁶ *Explore RTA*, Gov't of Dubai, <https://perma.cc/88CW-MY7J>.

1. *Non-Autonomous Vehicles*

The RTA has established many Vehicle Testing Centers around the emirate to provide different services related to non-autonomous vehicle safety inspections. These vehicles must undergo technical tests at frequencies that depend on a vehicle's categorization as a light or heavy vehicle.⁷

2. *Autonomous Vehicles*

The RTA has signed a Memorandum of Understanding (MoU) with the World Economic Forum (WEF) to evaluate the safety system of autonomous vehicles by providing the information necessary to operate safe roads as well as technical support and training for technicians operating an autonomous transport system.⁸ The RTA is also investing AED590 million (about US\$160 million) in developing and evaluating the best methods to establish a network and infrastructure grid for autonomous vehicles.⁹

III. Required Safety Measures

A. Non-Autonomous Vehicles

1. *Road Safety*

Both the Dubai and Abu Dhabi emirates prioritize the safety of drivers on the roads. They operate a new traffic control system called the Split Cycle Offset Optimization Technique (SCOOT). SCOOT is a central traffic control system installed with sensors counting the volume of vehicles at signals to improve traffic flow. The sensors will detect the flow, the number of cars on each approach, and the cruise speed or the average speed toward a traffic signal.

2. *Vehicle Safety*

For a vehicle to be safe to drive, it must meet a group of safety requirements set by the transportation authority. All vehicles must pass the following tests:

- exhaust emission test,
- braking system test, which examines the performance, efficiency, and condition of the system,
- steering wheel test, which examines condition, attachment, and coupling of the steering wheel,
- visibility test, which examines whether the windshield has any cracks and the condition of rear-view mirrors,

⁷ RTA, *Vehicle Testing Guide*, <https://perma.cc/JJK8-AFVB>.

⁸ *Dubai and WEF Sign MoU to Promote Autonomous Vehicle Technology*, Intelligent Transport (Apr. 7, 2021), <https://perma.cc/3NGT-6GZ5>.

⁹ *5 Disruptive Trends Shaping the Future of Transport in Dubai*, Dubai World Congress for Self-Driving Transport (Oct. 14, 2019), <https://perma.cc/9V99-GKLW>.

- lighting equipment test, which examines the condition, efficacy, and operation of the headlights and rear brake lights,
- axles, wheels, and suspension test, and
- test for the existence of an operational safety belt, audible warning devices, emergency lights, and battery.¹⁰

Safety belts and an Antilock Braking System (ABS) are required in all new vehicles. We were unable to find any requirement that systems in vehicles detect pedestrians or cyclists. Every vehicle must have an alarm to notify drivers that they are exceeding a speed limit of 120 kilometers per hour (about 75 miles per hour) in cars and 100 kilometers (about 62 miles per hour) in buses.¹¹

B. Autonomous Vehicles

According to a report published by the Dubai World Congress for Autonomous Transport, building an appropriate road infrastructure for autonomous vehicles is essential for creating adequate safety measures for this type of vehicle.¹²

The report states that the UAE must evaluate its road capacity to operate autonomous vehicles. It also recommends the examination of different scenarios of autonomous vehicles' paths (buses, taxis, and private cars) using micro-simulation (computerized analytical tools). Additionally, the report advocates creating mandatory infrastructure modifications such as autonomous-vehicle-compliant signs, road markings, and communication devices.¹³

Specifically, the report recommends that the following safety measures be incorporated into autonomous vehicles infrastructure:

- Installing traffic signs that are visually distinctive and immediately recognizable to autonomous vehicles.¹⁴
- Creating vehicle-to-vehicle (V2V) communication technology for autonomous vehicles to communicate with each other to avoid accidents on the road.¹⁵
- Installing machine-readable radar-reflective road markings.¹⁶

¹⁰ RTA, *Vehicle Testing Guide*, supra note 7.

¹¹ Int'l Trade Admin., supra note 1.

¹² Scott Fennelly, *Preparing Dubai and the UAE's Road Infrastructure for Autonomous and Self-Driving Transport*, Dubai World Congress for Self-Driving Transport (Oct. 2019) <https://perma.cc/4NLP-GTXX>.

¹³ Id. at 6.

¹⁴ Id. at 17.

¹⁵ Id. at 10.

¹⁶ Id. at 18.

- Programming autonomous vehicles to drive under a certain speed limit on the road.¹⁷
- Installing traffic signal systems that allow vehicle-to-infrastructure (V2I) communications. Such systems facilitate the communication between autonomous vehicles and traffic signal controllers to enable optimized signal timings for an intersection or group of intersections.¹⁸
- Installing roadside sensors on lanes, curbs, and sidewalks to allow vehicles to detect dangerous or unexpected situations far ahead.¹⁹
- Creating a traffic control system that relies primarily on a combination of optimized V2I and V2V communication. This would permit vehicles to share their positions, destinations, and intended routes.²⁰
- Creating a Traffic Management Center to communicate with onboard units in vehicles, Infrastructure Traffic System field equipment, and roadside units to monitor road conditions.²¹
- Installing pedestrian crossings that warn pedestrians by a vehicle approach alert.²²

IV. Domestic Legislation Regulating Safety of Vehicles

A. Non-Autonomous Vehicles

In January 2017, ESMA issued Regulation No. 8 of 2017 to regulate the standards for all imported used vehicles operating in the UAE.²³ The purpose of the regulation is to protect consumers from unsafe vehicles and reduce traffic accidents caused by unsafe vehicles.²⁴

The following vehicles cannot be registered or operated in the UAE:

- water/flood damaged vehicles,
- fire-damaged vehicles,
- junk-title vehicles that have been declared a total loss, e.g., the vehicle's parts have been salvaged for reuse and the rest of the vehicle has been destroyed or scrapped,
- vehicles with a crushed or completely damaged frame or chassis,

¹⁷ Id. at 19.

¹⁸ Id. at 20.

¹⁹ Id. at 22.

²⁰ Id. at 25.

²¹ Id. at 26.

²² Fennelly, *supra* note 12.

²³ Regulation No. 8 of 2017, issued on January 1, 2017, ESMA, <https://perma.cc/7LJW-Y3W7>.

²⁴ Id. art. 3.

- irreparable vehicles that have been reconstructed after they were destroyed or declared irreparable,
- vehicles with a safety defect reported by the manufacturer that remains unfixed, and
- dismantled vehicles that cannot be driven.²⁵

B. Autonomous Vehicles

The UAE does not appear to have a federal law regulating the safety of autonomous vehicles. However, on the local level, the Emirate of Dubai has issued two legal instruments regulating the safety of autonomous vehicles: Executive Council Resolution No. 3 of 2019 and Administrative Decree No. 501 of 2020.

1. Executive Council Resolution No. 3 of 2019

In April 2019, the Executive Council of the Emirate of Dubai issued Executive Council Resolution No. 3 of 2019 to regulate the testing of autonomous vehicles.²⁶ Its purpose is to ensure that autonomous vehicle technology is safe for use by individuals.²⁷

The resolution identifies the functions of the RTA in supervising autonomous vehicle testing.²⁸ It requires the presence of the Dubai Police Force and an ambulance during all road tests of autonomous vehicles.²⁹ It also requires a human to be in the driver's seat during the tests. The driver must be familiar with the autonomous vehicle's system and operations.³⁰

Companies contracted to conduct testing of autonomous vehicles must insure each vehicle and its driver against accidents and civil liability under a comprehensive insurance policy. This policy must be valid throughout the road test period and must be issued by an insurance company licensed to operate in the Emirate of Dubai.³¹ If a contracting company does not meet this requirement, the RTA has the power to revoke its authorization to test autonomous vehicles.³²

²⁵ Id. art. 5; see also *Vehicle Verification FAQs*, ESMA, <https://perma.cc/L3XJ-89VH>.

²⁶ Executive Council Resolution No. 3 of 2019, Dubai Official Gazette, vol. 449, Apr. 29, 2019, <https://perma.cc/6Z73-HWPP> (in Arabic).

²⁷ Id. art. 2.

²⁸ Id. art. 3.

²⁹ Id. art. 4.

³⁰ Id. art. 7.

³¹ Id. art. 9.

³² Id. art. 10.

2. *Administrative Decree No. 501 of 2020*

In August 2020, the RTA issued Administrative Decree No. 501 of 2020 on the conditions, procedures, and rules related to conducting autonomous vehicle tests in Dubai.³³ The decree requires that companies desiring to conduct such tests submit an application to RTA, including the technical specifications of the vehicle in question.³⁴ They must provide the resume of the driver who will be inside the vehicle during road tests to RTA.³⁵ Autonomous vehicle manufacturers must submit their vehicles for inspection by RTA personnel before tests.³⁶

If an autonomous vehicle manufacturer's application meets all RTA requirements, RTA issues an authorization to test the vehicle. The authorization includes the following information:

- the company's name,
- a description of the autonomous vehicle,
- the name of the driver, and
- the place, duration, and timing of the test.³⁷

Autonomous vehicle manufacturers must submit periodic reports containing all information related to the following:

- the test stages already completed,
- the performance outcomes of each stage,
- the number of trips made by the vehicle, and
- how far the vehicle has traveled.³⁸

The human in the driver's seat during the test of the autonomous vehicle must not be under 25 years of age.³⁹ This person also must have a current driver's license in the UAE.⁴⁰

V. Ongoing Discussion About Safety of Autonomous Vehicles

The UAE hosted the "Dubai World Congress for Self-Driving Transport" in October 2019. During the event, leading car companies, universities, and research centers discussed the current

³³ Administrative Decree No. 501 of 2020, Dubai Official Gazette, vol. 485, Sept. 10, 2020, <https://perma.cc/PD9Q-FMFU> (in Arabic).

³⁴ Id. 2(a).

³⁵ Id. 2(e).

³⁶ Id. 4(9).

³⁷ Id. 6(3).

³⁸ Id. 8(4).

³⁹ Id. 9(3).

⁴⁰ Id. 9(1).

autonomous vehicle technology. According to news reports, safety and infrastructure tied as attendees' main concern in an informal audience survey.

The *Khaleej Times* reported that participants said building an adequate infrastructure that accommodates autonomous vehicle technology is the right step toward creating a reliable and safe traffic system.⁴¹ According to the *Gulf News*, one of the main issues raised by the participants was how to change the public perception of autonomous vehicles to convince people they are safe to use on the road.⁴²

Additionally, during the International Conference on Future Mobility 2019, which took place in Dubai in November 2019, experts in the field of transport discussed the integration of new technology in infrastructure.⁴³

⁴¹ Angel Tesorero, *Self-Driving Cars in UAE: Safety, Infrastructure Main Concerns for Public*, *Khaleej Times* (Oct. 15, 2019), <https://perma.cc/T7J3-8GT3>.

⁴² Faisal Masudi, *Dubai "Not Far" from Being First City to Have Driverless Transport*, *Gulf News* (Oct. 15, 2019), <https://perma.cc/J6T6-FFN8>.

⁴³ *Dubai's Future Mobility Strategy Outlined at International Conference*, *Gulf News* (Nov. 27, 2019), <https://perma.cc/9HMY-QR8D>.

United Kingdom

Clare Feikert-Ahalt
Senior Foreign Law Specialist

SUMMARY The United Kingdom’s government has taken steps to encourage the development of automated vehicles. Much of the UK’s regulations for crash avoidance systems stem from European Union law incorporated into the domestic law of the UK as retained EU legislation. This includes Regulation (EU) 2019/2144, which requires the UK to improve the safety performance of vehicles in order to protect vulnerable road users.

The Vehicle Certification Agency (VCA) is responsible for operating the type approvals plan and works to ensure that automotive products, including sample parts of a vehicle, system, or component design, meet required standards. The VCA also evaluates measures the manufacturer has in place to ensure conformity of production. It will not issue type approval unless conformity of production testing has been conducted.

I. Introduction

The United Kingdom is actively encouraging the development of automated vehicles through investment grants and adopting regulatory guidance and insurance measures to provide clarity over their testing and development.¹ It is estimated that the UK’s market for automated vehicles will be £42 billion (approximately US\$58 billion) by the year 2035,² and that by 2040, 40% of new cars sold will have the ability to self-drive.³ The UK created a joint policy unit in 2015 known as the Centre for Connected and Autonomous Vehicles to coordinate government policy on driverless cars and related technologies, such as car crash avoidance systems.⁴ In 2019, the Department for Transport stated that its main action plans included “undertak[ing] activity to support the safe testing, sale and use of connected and automated vehicles.”⁵

¹ Automated and Electric Vehicles Act 2018, c. 18, <https://perma.cc/9WLN-MB73>.

² Department for Transport et al., *UK on the Cusp of a Transport Revolution, as Self-driving Vehicles Set to be Worth Nearly £42 Billion by 2035*, UK.Gov (Jan. 13, 2021), <https://perma.cc/82DJ-NNMS>.

³ Vehicle Certification Agency, *The Vehicle Certification Agency Business Plan: 2021-22*, ¶ 2.2.1 (2021), <https://perma.cc/R8HH-7AJN>.

⁴ Department for Business, Innovation and Skills et al., *UK to Lead the Way in Testing Driverless Cars*, UK.Gov (July 19, 2015), <https://perma.cc/TCY9-U8NQ>.

⁵ Department for Transport, *The Road Safety Statement 2019: A Lifetime of Road Safety* ¶ 3.29 (July 2019), <https://perma.cc/3KG9-Z8PT>.

II. Regulation of Car Crash Avoidance Systems

The United Nations Economic Commission for Europe (UNECE) has worked towards setting uniform standards across Europe for motor vehicles, including car crash avoidance systems.⁶ While the UK left the EU, the majority of EU legislation as it stood on December 31, 2020, was incorporated into a new body of domestic UK law, known as retained EU legislation. Among such retained EU legislation is Regulation (EU) 2019/2144, which requires the UK to improve the safety performance of vehicles in order to protect vulnerable road users⁷ through type approval of vehicles, systems, components, and technical units.⁸

In the UK, the Vehicle Certification Agency (VCA), an executive agency of the Department for Transport, has been “[d]esignated by the Secretary of State to discharge their statutory responsibility for operating national and UNECE type approval schemes.”⁹ The VCA is responsible for certifying that new vehicles conform to safety regulations.¹⁰ The VCA issues type approval for automotive products, that is, “confirmation that production samples of a type of vehicle, vehicle system, component or separate technical unit will meet specified performance standards.”¹¹

Manufacturers must issue certificates of conformity, which state that the vehicle has been produced under the same processes and systems as the example that received type approval.¹² Certificates are issued when the manufacturer provides evidence that they are capable of producing “a series of products that exactly match the specification, performance and marking

⁶ See, e.g., Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which can be Fitted and/or be used on Wheeled Vehicles, June 25, 1998, 2119 U.N.T.S. 129 (June 25, 1998), <https://perma.cc/EM96-WNT9>; 1958 Agreement Concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations, Mar. 20, 1958, 335 U.N.T.S. 211, <https://perma.cc/U85X-23EY>. The UK is a party to the 1998 agreement and a signatory to the 1958 agreement.

⁷ This Regulation defines vulnerable road users as “non-motorised road users, including, in particular, cyclists and pedestrians, as well as users of powered two-wheelers.” Regulation (EU) 2019/2144 of the European Parliament and of the Council, 2019 O.J. (L 325) 1, art. 1, <https://perma.cc/A6TC-D7D5>. The Department of Transport’s Highway Code states that the most vulnerable road users are pedestrians, cyclists, motorcyclists and horse riders, and that it is also particularly important to be aware of children, older and disabled people, and learner and inexperienced drivers and riders. Department of Transport, Highway Code ¶ 204 (2019), <https://perma.cc/3RBV-LEHQ>.

⁸ Regulation (EU) 2019/2144, art. 1. See also Regulation (EU) 2018/858 of the European Parliament and of the Council, 2018 O.J. (L 151) 1, <https://perma.cc/T6ZZ-CUCB>; Commission Implementing Regulation (EU) 2020/683, <https://perma.cc/3SAV-SSES>. Information on the requirements for crash avoidance systems in Regulation (EU) 2019/2144 is provided in the European Union survey in this report.

⁹ Road Vehicles (Approval) Regulations 2020, SI 2020/818, <https://perma.cc/N3B7-X3A8>. See also *About the Vehicle Certification Agency (VCA)*, Vehicle Certification Agency, <https://perma.cc/738D-X3A9>.

¹⁰ *What is Vehicle Type Approval?*, Vehicle Certification Agency, <https://perma.cc/N54V-3AJC>.

¹¹ *Id.*

¹² *Certificate of Conformity or CoP*, Vehicle Certification Agency, <https://perma.cc/5F8A-2R2F>.

requirements outlined in the type approval documentation.”¹³ The VCA evaluates measures the manufacturer has in place to ensure conformity of production, and type approval will not be issued unless the conformity of production testing has been conducted.¹⁴

The VCA established an Automated Vehicle Technology Group (AVT) that aims to safely and securely test automated systems to ensure that when they enter the mass production market they receive certification and approvals to ensure consumer confidence.¹⁵ The VCA aims to expand the AVT in 2021 to support the areas of:

- Cyber Security—to support the development of legislation and ensuring manufacturers provide safe and secure software
- Verification and validation—to ensure systems perform and react as intended in all conditions
- Functional Safety and ADAS—to lead and develop VCA knowledge of risk analysis in multifunctional autonomous systems
- Regulatory—to support the development of National and International legislation.¹⁶

Retained EU legislation includes Regulation (EU) 2018/858, which requires the UK to establish market surveillance authorities that are independent from approval authorities. In the UK, the Driver and Vehicle Standards Agency (DVSA) is responsible for ensuring vehicles entering the UK comply with regulations. The DVSA conducts this function on behalf of the Department for Transport and aims to “improve road safety and environmental performance whilst safeguarding and protecting consumer interests.”¹⁷ The DVSA conducts in-service market tests to assess whether vehicles meet type approval requirements and that aftermarket components are manufactured to the correct standards:

Enforcement priorities are determined by risks to consumers, the environment and industry. Information is shared with other member states using approved intelligence networks. Enforcement activity is carried out through reacting to complaints, testing of products at approved test facilities, monitoring of information and products at point of sale, and monitoring of advertisements. The form of enforcement action used will differ depending on the nature of the non-compliance, the harm caused and the history of the responsible person or business. DVSA are therefore not restricted to taking the least formal enforcement action in the first instance and will consider what immediate action is needed to protect consumer interests, including where necessary, prosecution.¹⁸

¹³ *About the Vehicle Certification Agency (VCA)*, Vehicle Certification Agency, *supra* note 9.

¹⁴ *What is Vehicle Type Approval?*, *supra* note 10.

¹⁵ Vehicle Certification Agency, *The Vehicle Certification Agency Business Plan: 2021-22*, *supra* note 3, ¶ 2.2.1.

¹⁶ *Id.*

¹⁷ Office for Product & Safety Standards, *National Market Surveillance Programme 2019-20*, at 13 (2019), <https://perma.cc/WZ6U-T64H>.

¹⁸ *Id.*

III. Evaluating Automated Vehicles

Generally, all vehicles in operation on the roads of the UK must comply with a series of acts and regulations, including the Road Vehicles (Construction and Use) Regulations 1986,¹⁹ the Road Vehicles Authorised Weight Regulations 1998,²⁰ the Road Vehicles Lighting Regulations 1989,²¹ and the Road Vehicles (Authorisation of Special Types) (General) Order 2003.²² In 2015, the government reviewed the UK's existing legislative framework and determined that it does not present a barrier to testing automated vehicles on public roads, provided a test driver is present and responsible for operating the vehicle.²³ In order to test automated vehicle technologies on public roads, the organization responsible for the vehicle must address the requirement that

the vehicle, through its sensors or through control by the safety driver or safety operator, will need to appropriately respond to all types of road users and hazards which may typically be encountered during a trial, such as more vulnerable road users and following instructions from those authorised to direct traffic.²⁴

Newly registered prototype vehicles, or vehicles that contain prototype equipment,²⁵ may be exempt from certain construction requirements and permitted on the roads if they are on the roads for testing or demonstration purposes.²⁶

The government published a non-statutory Code of Practice for testing driverless cars in 2015, with the aim of “promot[ing] responsible testing.”²⁷ The Code of Practice provides guidance and recommendations to manufacturers as to the “measures that should be taken to maintain safety during this testing phase” for automated or fully automated vehicles on public roads in the UK.²⁸ The Code of Practice was updated in 2019.²⁹ It notes that individuals who want to test new

¹⁹ Road Vehicles (Construction and Use) Regulations 1986, SI 1986/1078, <https://perma.cc/QP39-9RY9>.

²⁰ Road Vehicles Authorised Weight Regulations 1998, SI 1998/3111, <https://perma.cc/FK4R-8JUD>.

²¹ Road Vehicles Lighting Regulations 1989, SI 1989/1796, <https://perma.cc/Y29V-DT49>.

²² Road Vehicles (Authorisation of Special Types) (General) Order 2003, SI 2003/1998, <https://perma.cc/2CTN-XTRF>.

²³ Department for Transport, *The Pathway to Driverless Cars: Summary Report and Action Plan 5* (2015), <https://perma.cc/66EA-S2Z6>.

²⁴ Centre for Connected & Autonomous Vehicles, *Code of Practice: Automated Vehicle Trialling* ¶ 1.1 (2019), <https://perma.cc/8TKP-MLYY>.

²⁵ Id. ¶ 36. See also Department for Transport, *Information Sheet: Prototype Road Vehicles – Construction Requirements* (July 2015), <https://perma.cc/HY8F-X9UR>.

²⁶ Road Vehicles (Authorisation of Special Types) (General) Order 2003, SI 2003/1998, ¶ 36 & sched. 11 ¶ 2.

²⁷ Department for Transport, *The Pathway to Driverless Cars: A Code of Practice for Testing* ¶ 1.5 (2015), <https://perma.cc/YU2V-CGA3>. The Code states that “[i]t should be used by testing organisations in conjunction with detailed knowledge of the legal, regulatory and technological landscape. Failure to follow the Code may be relevant to liability in any legal proceedings. Similarly, compliance with the Code does not guarantee immunity from liability in such circumstances.”

²⁸ Id. ¶ 1.4.

²⁹ Centre for Connected & Autonomous Vehicles, *Code of Practice: Automated Vehicle Trialling*, *supra* note 2424.

automated vehicles on UK roads are not required to obtain any permits or surety bonds.³⁰ It also includes recommendations on contingency planning, such as providing a single point of contact in cases of emergencies, and notifying a number of public bodies, including highway, transport, and local authorities, as well as the police and the Centre for Connected and Autonomous Vehicles, prior to conducting any form of public trials.³¹

In order for vehicles to be tested on the public roads in the UK, the testers must have

- A driver or operator, in or out of the vehicle, who is ready, able, and willing to resume control of the vehicle;
- A roadworthy vehicle; and
- Appropriate insurance in place.³²

In particular, a longstanding requirement under the 1986 Construction and Use Regulations provides that “[n]o person shall drive or cause or permit any other person to drive, a motor vehicle on a road if he is in such a position that he cannot have proper control of the vehicle or have a full view of the road and traffic ahead.”³³

The Code of Practice states that the test driver should be a person who is appropriately licensed for the type of vehicle being tested, or in cases of prototype vehicles the closest equivalent vehicle, and trained as a safety driver or operator. The operator or driver is responsible for the operation of the vehicle at all times, must ensure that all traffic laws are followed, and must be capable of manually overriding any automated controls at any time.³⁴

Vehicles may lawfully be operated remotely, provided all legal requirements are met and the “remote-control system is able to deliver the same level of safety as having a driver inside of the vehicle.”³⁵ The remote operator must have the capability to resume control of the vehicle and “understand any risks associated with remote access. This includes handling any communication or control latency and mitigating and responding to any network problems.”³⁶

As part of the tester’s risk management practices, the Code notes that any vehicles, and software used in the vehicle, should be tested and simulated in-house, and then tested on a closed track or private road. If these tests are successful, the tester “should maintain an audit trail of such evidence and data.”³⁷ The vehicle should only be tested on public roads if the testers “have

³⁰ Id.

³¹ Id. ¶¶ 2.19 & 3.2.

³² Id. ¶ 2.2.

³³ Road Vehicles (Construction and Use) Regulations 1986, SI 1986/1078, ¶ 104.

³⁴ *Code of Practice: Automated Vehicle Trialling*, supra note 244, ¶¶ 4.2, 4.8 & 4.9.

³⁵ Id. ¶ 5.8.

³⁶ Id. ¶ 4.3.

³⁷ Id. ¶ 5.6.

confidence that public road trials are possible without creating undue additional risk to road users.”³⁸

The tester should ensure that any controllers and systems have security built into them to prevent against the threat of cyberattacks and other unauthorized access.³⁹ It advises those responsible for testing automated vehicles to consider adopting British Standards Institution cyber security specifications⁴⁰ and to follow the principles established by the government in its guidance on the key principles of vehicle cybersecurity for connected and automated vehicles.⁴¹

The Code of Practice further states that the transition from manual to automated mode should be simple and easily understandable. It should be clear as to the mode the vehicle is being operated in and when the vehicle switches modes.⁴² Any failure in the automated driving system should include both an audible and visual warning, and manual steering and braking should be made available quickly and easily in the case of such failure.⁴³

The Code of Practice notes that organizations wishing to undertake trials with automated vehicles should develop detailed safety cases prior to undertaking trials, which should be made available to the public. These should include

- Information on the specific trial activity, vehicles, and operational domain of the trial;
- Evidence that the trial activity can be performed safely, whether with a safety driver in the vehicle or with a remote safety operator;
- Safety driver or operator training;
- Processes for managing the trial activity, and organisational responsibilities for managing the trial;
- How the trial aligns with legislation and regulations;
- Evidence of engagement with relevant bodies, authorities, and other road users; and
- Updates on milestones and progress reports of specific trial activity.⁴⁴

In addition to these requirements, any vehicle tested on UK public roads must be roadworthy – that is, the vehicle must meet the standards contained within the Construction and Use Regulations.⁴⁵ If the vehicle is deemed unfit to be tested or driven on public roads, the group organizing the test may be subject to criminal or civil prosecution.⁴⁶

³⁸ Id. ¶¶ 2.13 & 5.6.

³⁹ Id. ¶ 2.17.

⁴⁰ Id.

⁴¹ Centre for Connected & Autonomous Vehicles et al., *Guidance: The Key Principles of Vehicle Cyber Security for Connected and Automated Vehicles* (Aug. 6 2017), <https://perma.cc/WR7T-LES9>.

⁴² *Code of Practice: Automated Vehicle Trialling*, supra note 244, ¶ 5.18.

⁴³ Id.

⁴⁴ Id. ¶ 2.7.

⁴⁵ Road Vehicles (Construction and Use) Regulations 1986, SI 1986/1078.

⁴⁶ Centre for Connected & Autonomous Vehicles, *Code of Practice: Automated Vehicle Trialling*, supra note 24, ¶ 5.3.

IV. Ongoing Review

The government is currently working to “develop[] a supportive regulatory framework to enable the safe development and deployment of [connected and automated vehicle] technology in the UK, and ... to shape regulation at an international level.”⁴⁷ The Law Commission and the Scottish Law Commission have undertaken a significant review of the laws relating to automated vehicles “to identify where in the UK motoring laws may need to be changed to support the safe use of automated vehicles and provide potential solutions.”⁴⁸ The review includes a wide range of issues, including accounting for the human factor in automated vehicles; considering how to include automation features on the driving test; driver licensing requirements; how, and whether, to fully automate all vehicles on the UK’s roads; setting standards for automated vehicles; setting and monitoring safety standards; accident investigations involving automated vehicles; civil and criminal liability for accidents involving automated vehicles; interfering with automated vehicles; and adapting current road rules for automated vehicles.⁴⁹ There are three key objectives of the review:

Our key objective is safety. Secondary objectives are to provide a clear allocation of responsibility and liability; and to reap the benefits of driving automation, through improvements in mobility and productivity. Driving automation technologies can enable new ways for those with visible and non-visible disabilities to get around.⁵⁰

The review began in 2018 and the Law Commission is expected to publish its final report and recommendations in the final quarter of 2021.⁵¹

⁴⁷ Centre for Connected & Autonomous Vehicles & the Department for Transport, *Innovation is Great: Connected and Autonomous Vehicles* 5, <https://perma.cc/S4TZ-SQV5>.

⁴⁸ Department for Transport, *The Road Safety Statement 2019: A Lifetime of Road Safety*, *supra* note 5, ¶ 3.28.

⁴⁹ Law Commission & Scottish Law Commission, *Automated Vehicles: A Joint Preliminary Consultation Paper* ¶ 1.45 (Nov. 8, 2018), <https://perma.cc/SQ7S-YV4U>.

⁵⁰ *Id.* ¶ 1.4.

⁵¹ *Rules on Safe Use of Automated Vehicles on GB Roads (Closed Consultation)*, Department for Transport (Apr. 28, 2021), <https://perma.cc/JK2C-3X6A>.