Vehicle Standard (Australian Design Rule 14/03 – Devices for Indirect Vision) 2023

Made under section 12 of the *Road Vehicle Standards Act 2018*

Explanatory Statement

Approved by the Hon Catherine King MP, Minister for Infrastructure, Transport, Regional Development and Local Government

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1. LEGISLATIVE AUTHORITY

1.1. National Road Vehicle Standards

The Vehicle Standard (Australian Design Rule 14/03 – Devices for Indirect Vision) 2023, which may also be cited as the Australian Design Rule 14/03 – Devices for Indirect Vision or ADR 14/03, is made under section 12 of the *Road Vehicle Standards Act 2018* (RVSA). The RVSA enables the Australian Government to establish nationally uniform standards that apply to new road vehicles or road vehicle components when they are provided to the market in Australia. The RVSA applies to vehicles or components whether they are manufactured in Australia or imported.

The making of the vehicle standards necessary for the RVSA's effective operation is provided for in section 12, which empowers the Minister to "determine standards for road vehicles or road vehicle components".

1.2. Exemption from Sunsetting

ADR 14/03 is exempt from the sunsetting provisions of the *Legislation Act 2003*.

Source of the Exemption

A standard made under section 12 of the RVSA is not subject to the sunsetting provisions of section 50 of the *Legislation (Exemptions and Other Matters) Act 2003* through section 12 of the Legislation (Exemptions and Other Matters) Regulation 2015 (table item 56C). A similar exemption was previously granted in respect of national road vehicle standards made under section 7 of the *Motor Vehicle Standards Act 1989* (MVSA) (item 40, section 12 of the Legislation (Exemptions and Other Matters) Regulation 2015). This exemption is important to ensure that Australian Design Rules (ADRs), including ADR 14/03, continue to remain in force and available to regulators and industry.

Intergovernmental Dependencies

The exemption concerns ADRs which facilitate the establishment and operation of the intergovernmental vehicle standard regime that Commonwealth, state and territory governments rely on to regulate the safety of vehicles on public roads.

The Commonwealth uses the ADRs as the basis on which approvals to supply types of road vehicles to the market are granted under the Road Vehicle Standards Rules 2019. States and territories and the National Heavy Vehicle Regulator use the ADRs as the primary criteria on which vehicles are assessed for road worthiness. This 'in-service' aspect is dependent on the date of manufacture, which determines the applicable version of the ADRs against which the vehicle can be assessed. The ability to rely on national standards is particularly relevant given the long service life of vehicles – the average age of vehicles in Australia is greater than 10 years.

While the ADRs are regularly updated to reflect changes in technology, it is not possible to apply these new standards retrospectively to vehicles that are already in use. With former ADRs kept on the Federal Register of Legislation, state and territory governments can use them to ensure vehicles continue to comply with the ADRs that were in force when they were first supplied to the market.

In the event that the Commonwealth could not justify the maintenance of the ADRs, state and territory governments would be compelled to create their own vehicle standards. Whilst this could mean adopting the substance of the lapsed ADRs as an interim measure, the differing needs and agendas of each state and territory government may result in variations to in-service regulations. Having different vehicle standards across the states and territories would make the scheme operate contrary to the underlying policy intent of the RVSA which is to set nationally consistent performance-based standards.

Commercial Dependencies

The effect on vehicle manufacturers to redesign existing models to comply with new ADRs would present a burden and be a costly and onerous exercise. Manufacturers should not be expected to continually go back to redesign existing vehicles. Furthermore, ongoing product recalls to update vehicles to comply with new ADRs would undermine consumer confidence with significant financial impact to manufacturers. This exemption allows vehicle manufacturers to focus their efforts to ensure new models supplied to the market continue to comply.

Reviews of Australian Design Rules

ADRs are subject to regular reviews, as resources permit, and when developments in vehicle technology necessitates updates to requirements. Reviews of the ADRs ensure the ongoing effectiveness of a nationally consistent system of technical regulations for vehicle design, which are closely aligned, wherever appropriate with leading international standards such as United Nations (UN) regulations. This method facilitates the rapid introduction of the latest safety devices and technological advances into the Australian market, while also contributing to the industry's cost competitiveness in the domestic market. Where a review results in a new or amended ADR, these changes are subject to full parliamentary scrutiny.

1.3. International Harmonisation

A majority of Australian road vehicle standards, including ADR 14/03, are closely harmonised with internationally based UN regulations, which are developed by the UN World Forum for Harmonization of Vehicle Regulations. Harmonisation ensures that vehicles built to the most recent safety, environmental and anti-theft standards are supplied to the Australian market at the least cost and that Australia has access to the latest vehicle technologies. In contrast, more Australian specific standards would require vehicles to be designed, developed and produced specifically for the relatively small Australian market. Unless needed to achieve legitimate policy objectives, a market specific standard would generally result in a significantly lower net benefit and benefit-cost ratio, than if costs were amortised over a number of markets, such as occurs with UN regulations.

2. PURPOSE AND OPERATION

2.1. Overview of the Regulatory Framework

The RVSA establishes a regulatory framework to regulate the importation and first supply of road vehicles to the market in Australia. The core principle of this framework is that vehicles which comply with appropriate standards are suitable for provision to the market in Australia. The ADRs have set out those standards since the early 1970s. At that time, they were applied cooperatively by the Australian Motor Vehicle Certification Board representing the Commonwealth and state and territory governments. In 1989, this arrangement was replaced by the MVSA and the ADRs were determined as national standards. The RVSA commenced in full and replaced the MVSA on 1 July 2021. A two-year transition period was provided between 1 July 2021 and 30 June 2023.

Under the RVSA, the ADRs are National Road Vehicle Standards intended to make vehicles safe to use, control the emission of gas, particles or noise, secure vehicles against theft, provide for the security marking of vehicles and promote the saving of energy. The ADRs are applied to vehicles as criteria for approval under various regulatory pathways set out in the Road Vehicle Standards legislation. Vehicles approved under these regulatory pathways can be provided to the market in Australia for use in transport.

2.2. Overview of the ADR

A new standard to support the Safer Freight Vehicles reforms

Vehicle Standard (Australian Design Rule 14/03 – Devices for Indirect Vision) 2023, also referred to here as ADR 14/03, is a new road vehicle standard in the ADR 14 series (the most recent prior version of which is ADR 14/02 – Rear Vision Mirrors). It contains significant updates that increase the overall stringency as well as the effectiveness of the standard, in particular for devices for indirect vision other than mirrors (typically camera-monitor systems). For motor vehicles, the purpose of ADR 14/03 is to specify requirements for devices to be fitted to vehicles to provide: drivers with a clear and reasonably unobstructed view to the rear, side, or front of the vehicle. ADR 14/03 has been developed for inclusion within the Safer Freight Vehicles regulatory reform package for mandatory safety features on wider vehicles.

Medium and heavy goods vehicles are able to comply with the existing ADR 14/02 through meeting the requirements of either its Appendix A or Appendix C, with either compliance pathway equally valid in all applicable cases. Section 2.2.3.1. of this document covers various reasons why compliance to Appendix A will not provide appropriate outcomes for the Safer Freight Vehicle regulatory reforms. Another key reason that existing ADR 14/02 is insufficient for the Safer Freight Vehicle reforms, is that its Appendix C contains outdated legacy requirements for rear visions mirrors on motor vehicles.

In the case of medium and heavy goods vehicles, the Appendix C of ADR 14/02 only requires a single mirror on each side of the vehicle, of a size (reflective surface area) that is far smaller than appropriate for modern mirrors on such vehicles, and without any prescriptive field of vision requirements to ensure the driver is able to see objects in defined regions adjacent to the vehicle. It is well understood by both the department and industry, that best practice design of indirect vision capability for safer heavy vehicles includes the fitting of not only larger mirrors than required by Appendix C of ADR 14/02, but also additional mirrors (or other devices providing the same function) at various locations on the vehicle. This increases the overall fields of vision available to the driver, and thereby conversely reduces the overall blind spots.

Applicability and general requirements

ADR 14/03 is mandatory for vehicles of ADR sub-category NB2 and ADR category NC (medium goods vehicles and heavy goods vehicles) with an 'Overall Width' exceeding 2,500 mm, from a date that coincides with the commencement of the ADR instruments that allow for relaxation of the 'Overall Width' limit for these vehicles. The ADR is optional for all other classes of motor vehicle (all ADR vehicle categories other than trailers) including sub-category NB2 and category NC vehicles, with an 'Overall Width' not exceeding 2,500 mm. This optional applicability aligns with the mandatory applicability of ADR 14/02, as vehicles for which this standard is optional may comply with ADR 14/03 instead of complying with ADR 14/02.

Clause 5 of the ADR is titled Requirements, and sets the compliance requirements for vehicles based on ADR category code. Vehicles must meet the requirements of either Appendix A or Appendix B as applicable to the category code. Appendix B is for mopeds, motor cycles and motor tricycles without bodywork that partially or wholly encloses the rider or driver, and aligns with the requirements for these vehicles in Appendix B of ADR 14/02. Appendix A is for all other vehicle types.

Appendix A is United Nations Regulation No. 46 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF DEVICES FOR INDIRECT VISION AND OF MOTOR VEHICLES WITH REGARD TO THE INSTALLATION OF THESE DEVICES (UN R46), incorporating the 04 series of amendments, including supplements 1 to 9 to the 04 series of amendments.

Appendix B is United Nations Regulation No. 81 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF REAR-VIEW MIRRORS AND OF TWO-WHEELED POWER-DRIVEN VEHICLES WITH OR WITHOUT SIDE CAR, WITH REGARD TO THE INSTALLATION OF REAR-VIEW MIRRORS ON HANDLEBARS (UN R81), incorporating the 00 series of amendments, including supplements 1 to 2 to the 00 series of amendments.

Where Appendix A sets the applicable technical requirements, these are varied by clause 6 Exemptions, Alternative Procedures and Supplementary Requirements to Appendix A. As an alternative, these vehicles may comply with the standard under clause 8.1.2, which is the same version of UN R46 as Appendix A, although a later version is also acceptable under clause 8.1.1.

Where Appendix B sets the applicable technical requirements, these are varied by clause 7 Exemptions and Alternative Procedures to Appendix B. As an alternative, these vehicles may comply with the standard under clause 8.2.1, which is UN R81 incorporating the 00 series of amendments at least its supplement 1.

Updated version of UN Regulation for newer technologies

UN R46 operates by mandating particular fields of vision that must be provided to the driver of a vehicle, depending on the category (refer UN category code) of the vehicle type. The fields of vision are defined geometric zones or regions to the sides, front and rear of the vehicle. In general, each zone is provided by a single device. Devices for indirect vision can be classified by the particular field of vision they are designed to provide, and in the case of ADR 14/02 this classification only applies to mirrors. ADR 14/02 includes UN R46 incorporating all valid text up to the 04 series of amendments.

Where a particular field of vision must be provided to the driver for the vehicle type, Appendix A of ADR 14/02 maintains compulsory fitment of mirrors to achieve this field of vision, with the exception of close-proximity view (Class V) and front-view (Class VI) mirrors which are able to be substituted by a camera-monitor system where applicable. For other classes of mirror, there may be camera-monitor systems fitted additional to (not in place of) these mirrors, and providing the same field of vision.

For the version of UN R46 in ADR 14/03, all devices for indirect vision that are mandatory on the vehicle type may be other than mirrors; i.e. mirrors become optional, and all devices can be camera-monitor systems for example. This version of UN R46 gained approximately 20 additional pages of technical requirements in comparison to the version in ADR 14/02, as a result of much more substantial performance and installation requirements for camera-monitor systems. This is to be expected, to ensure appropriate safety for the driver and other road users where camera-monitor systems may be the only devices for indirect vision fitted to the vehicle.

ADR 14/03 includes a version of UN R46 as its Appendix A that contains the technical requirements of the 04 series of amendments up to supplement 9 to this series of amendments as at 30 September 2021. Importantly, the significant changes in UN R46 for camera-monitor systems that were introduced at supplement 2 to the 04 series of amendments are contained within the Appendix A, and this is one of the main changes in UN R46 that was necessary in the new ADR to appropriately cater for vehicle types where mirrors are not used to provide indirect vision.

New definitions to support device exclusions from vehicle dimensions

In allowing for wider vehicles, it is also critical to establish new exclusions from vehicle body width measurements for certain safety devices and sensors. Without these additional exclusions, the increased supply of the latest vehicle models with wider bodies sourced from overseas markets would in many cases still require modifications to fit certain safety systems within the width envelope.

Aside from the specific need to complement the Safer Freight Vehicles reforms, there remains a general need to provide additional exclusions for devices for indirect vision from the dimensional measurements (of both width and length) of all vehicles, to increase alignment with exclusions given to vehicles in other larger markets including in particular the European union (EU) [1], and ensure vehicles manufactured to the current 'Overall Width' limit of 2.50 m are able to fit additional safety devices within this width envelope. These reforms will benefit many types of heavy omnibus, along with some goods vehicles such as those from the Japanese market where the width limit is 2.50 m.

In relation to this reform are two particular important definitions in the updated version of UN R46 included as Appendix A of ADR 14/03. The importance of these definitions is that they provide the means, through their use in new ADR definitions, of describing any device for indirect vision as one that meets the performance and installation requirements (including field of vision) of the updated UN R46. This provides an appropriate technical basis for exempting these devices from the vehicle width and length measurements.

The first updated UN R46 definition is 'Devices for indirect vision' at its paragraph 2.1. This definition requires that a device for indirect vision, which may be a mirror, camera-monitor or other device, must provide the prescribed field of vision as set within the regulation for the 'Class of device for indirect vision' that is defined separately. This change means that all 'Devices for indirect vision' are a 'Class of device for indirect vision'. The definition of 'Class of device for indirect vision' is the second important definition change, and appears at paragraph 2.4. of the regulation where each class is linked to the prescribed field of vision it must meet.

In contrast, within ADR 14/02 Appendix A, 'Devices for indirect vision' are not limited to providing the fields of vision prescribed in the installation (Part II) section of the regulation; only 'Class of mirror' (not 'Class of device for indirect vision') is defined, whereby each class of mirror is required to provide the corresponding prescribed field of vision. As such, a camera-monitor system that provides a field of vision prescribed by the regulation does not have a corresponding definition as a classified device. This means that where a vehicle complies with ADR 14/02, it is not possible to refer to a camera-monitor system (or other device that is not a mirror) fitted to it and that provides a specific field of vision, in a simple and internationally recognised manner. This remains the case regardless of the fact that Australia recognises approvals issued to UN R46 as a means of demonstrating compliance to ADR 14/02, as it is not possible to enforce that a vehicle must meet this version or a later version of UN R46 through ADR 14/02.

[1] COMMISSION IMPLEMENTING REGULATION (EU) 2021/535 of 31 March 2021, laying down rules for the application of Regulation (EU) 2019/2144 of the European Parliament and of the Council as regards uniform procedures and technical specifications for the type-approval of vehicles, and of systems, components and separate technical units intended for such vehicles, as regards their general construction characteristics and safety.

In summary, introduction of a new ADR 14/03 was primarily necessary for some of the concurrent updates[2] to Vehicle Standard (Australian Design Rule Definitions and Vehicle Categories) 2005, whereby new and amended definitions complement relaxation of the maximum vehicle width for Safer Freight Vehicles by specifying the types of devices eligible for exclusion from the vehicle width measurement; refer to new ADR definitions 'Class of Device for Indirect Vision' and 'Prescribed Device for Indirect Vision', and amended definition "Overall Width', noting that ADR 14/03 is required for referring to devices for indirect vision that are not mirrors. An amended definition 'Front End' allows for these exclusions from vehicle length measurements.

Alternative methods for meeting specific design requirements

The Appendix C of ADR 14/02 is based largely on requirements that existed in United States (US) vehicle standards at the time the ADR was written. As such it includes reference to US origin standards for the purposes of measuring a mirror's reflectance (SAE[3] J964a) and radius of curvature (FMVSS[4] No. 111). Although the Appendix C itself is outdated, Australia continues to import heavy goods vehicles from the US, as well as manufacture heavy goods vehicles locally based on designs from the US. As such, the ability to use US origin standards to meet some design requirements for mirrors remains important for the reduction of regulatory burden.

The new ADR 14/03 continues to allow the use of SAE J964 for the purposes of measuring the reflectance (referred to in UN R46 as 'normal coefficient of reflection) of a mirror, as an alternative procedure to the method required by the corresponding UN Regulations of Appendix A and Appendix B. These allowances are made at clauses 6.6 and 7.4. of the ADR respectively, which set the alternative use of the standard SAE J964 – 2016-11-08 version (Recommended Practice for Measuring Haze and Reflectance of Mirrors). While Appendix C of ADR 14/02 sets mandatory requirements for measured reflectance only for category MA, MB, MC and MD1 vehicles, ADR 14/03 sets requirements for all vehicles through use of Appendix A and Appendix B and therefore provides this alternative method in all cases.

The new ADR 14/03 continues to allow the use of FMVSS No. 111 derived method for measuring the radius of curvature of a mirror, as an alternative procedure to the method required by the corresponding UN Regulations of Appendix A and Appendix B. These allowances are made at clauses 6.4 to 6.5 and clauses 7.2 to 7.3. of the ADR respectively, which set the alternative use of the method described in Appendix C of the ADR, with that method adapted from FMVSS No. 111.

Clause 6.8 of the ADR provides an exemption from the pendulum impact test requirements in Appendix A, for mirrors projecting no more than 150 mm beyond the 'Overall Width'; as well as for folding mirrors projecting no more than 1490 mm beyond the longitudinal median plane of the vehicle and no more than 240 mm beyond the 'Overall Width'. Such mirrors could only project 10 mm more on either side than is allowed by ADR 14/02 Appendix C for 2,500 mm wide vehicles. This means there should not be any significant change in impact injury risk (relative to the status quo), including when fitted to 2,550 mm wide vehicles. The dimensions in this

[2] The updates to ADR – Definitions and Vehicle Categories for the Safer Freight Vehicle reforms are effected by separate legislative instrument Vehicle Standard (Australian Design Rule) Safer Freight Vehicles Amendment No. 1 2023.
[3] SAE International, formerly known as Society of Automotive Engineers.
[4] Federal Motor Vehicle Safety Standard.

clause are taken from the current requirements applied in New Zealand, together with ADR 14/02 Appendix C for collapsible mirrors. These dimensions are also suitable to allow for the same mirror package to be fitted to 2,500 mm and 2,550 mm wide vehicles, including for both markets.

Exemptions and alternative requirements for the Australian context

The following definitions of different 'Class of device for indirect vision' taken from paragraph 2.4. of Appendix A (UN R46) of ADR 14/03, covering different fields of vision that are nominally mandatory for provision to the driver of a 'Safer Freight Vehicle', are helpful for following discussion in this explanatory statement:

Class II: "Main rear-view device" (traditionally the conventional 'side mirrors'), giving the respective prescribed fields of vision that apply on both the drivers and passengers side.

Class IV: "Wide-angle view device", giving the prescribed field of vision that applies on both the drivers and passengers side.

Class V: "Close-proximity view device", giving the prescribed field of vision that applies on the passenger's side only.

Class VI: "Front-view device", giving the prescribed field of vision that applies to the front of the vehicle only (extending past the passenger's side).

During consultation on the Safer Freight Vehicle regulatory reforms, local industry representatives strongly conveyed their preference to retain the ability to fit flat glass main mirrors on all heavy trucks. Although the original intention for a new ADR 14/03 was for full alignment with UN R46 concerning main rear-view (Class II) mirrors (or camera-monitor systems), the final ADR is inclusive of exemptions and supplementary requirements for Class II mirrors as a compromise between ADR 14/02 Appendix C and the new ADR based on UN R46.

Simple flat glass main rear-view mirror

Clause 6.17 allows a flat glass main rear-view mirror which primarily meets a simple requirement for a minimum area of the reflecting surface, to be fitted to a sub-category NB2 or category NC vehicle instead of a Class II device for indirect vision in accordance with Appendix A. The minimum area of the reflecting surface aligns with requirements from FMVSS No. 111. This type of mirror is allowed to be fitted on the passenger's side of the vehicle, only where it is also fitted on the driver's side. Paragraph 15.1.1. of Appendix A requires that all compulsory and optional devices for indirect vision fitted to a vehicle are of a type classified by the regulation (UN R46), which generates the need for the exemption provided by clause 6.17.

Clause 6.17.1 sets additional requirements for the optional type of mirror/s that are allowed by Clause 6.16. The lateral projection limit of 250 mm aligns with the requirement in Appendix A for mirrors mounted less than 2 m above ground level. In addition, the mirrors are required to meet select requirements from Appendix A Part I for a Class II device, except as otherwise varied by preceding clauses of the ADR clause 6. Appendix A Part I contains technical requirements relating to the design and performance of mirrors, where the relevant paragraphs of Appendix A for this ADR clause 6.17.1. are 6.1.1.2 to 6.1.1.7, 6.1.2.2.5 to 6.1.2.2.6, 6.3 to 6.3.2.2.7.2 (except 6.3.2.2.7.1), and 6.3.3. The general purpose of these requirements is to ensure design features of the mirror assembly to; reduce the possibility of injury through contact with sharp edges or parts, reduce the lateral protrusion of rigid attachment parts that

are not intended to rotate under an impact force, provide a durable reflecting surface with a minimum value of reflectance so that images remain sufficiently bright, and reduce the possibility of injury as a result of an impact event.

Combined camera-monitor and simple flat glass main rear-view mirror

Clause 6.18 allows a flat glass main rear-view mirror which primarily meets a simple requirement for a minimum area of the reflecting surface, to be fitted to a sub-category NB2 or category NC vehicle, where the vehicle is also fitted on the same side with both a Class II camera-monitor system and Class IV camera-monitor system in accordance with Appendix A. This particular set of exemptions and supplementary requirements is intended to encourage fitment of devices for indirect vision that comply with UN R46, even where a manufacturer has identified a need to fit a device that is not compliant with UN R46 and which would otherwise replace a compliant device during use of the vehicle. This approach has been taken because devices for indirect vision meeting UN R46 requirements offer certain vehicle safety advantages, and that having these devices fitted to the vehicle is therefore preferable even where they may not be used under all conditions for which the class of device is designed to be suitable.

Further, camera-monitor systems can offer a number of advantages in comparison to mirrors, and therefore the design configuration allowed by clause 6.18 enables these advantages to be paired with the familiarity and convenience of a rear-view mirror. The arrangement of devices for indirect vision that is allowed by clause 6.18 is in general alignment with an approach already adopted for the US market. Paragraph 15.1.1 of Appendix A requires that all compulsory and optional devices for indirect vision fitted to a vehicle are of a type classified by the regulation (UN R46), which generates the need for the exemption provided by clause 6.18. This clause 6.18 allows for the combined camera-monitor systems and flat glass mirror arrangement to be used on both the driver's side and passenger's side, or on only one of either of these sides.

The reflecting surface minimum area requirement is aligned with that of clause 6.17, as are the additional technical requirements relating to design and performance of the mirror assembly. The requirements relating to the installation of the mirror are also aligned, other than mandating that the mirror must be visible by the driver through either the front side door window on the side of the vehicle to which it is fitted, or the portion of the windscreen that is swept by the windscreen wiper(s). This requirement is more stringent in this application, by mandating that the mirror be visible through the side door window, principally to require that the driver must look at an angle that sweeps past the monitor of the camera-monitor systems on the same side of the vehicle in order to view the mirror (based on the practical and typical mounting position of these types of monitors being adjacent to the vehicle A-pillars). This mirror installation requirement not only keeps the three devices for indirect vision relatively close together for ergonomic reasons, but it also provides ease of accessibility to the wide-angle image of the Class IV camera-monitor system, to supplement the image with a narrower field of view that is produced by the flat glass mirror.

Exemptions and alternative requirements to suit bonneted cab trucks

New definitions of 'Bonneted Cab' and 'Cab-Over Engine Vehicle' are being introduced[2] concurrently to ADR 14/03 to allow for a clear distinction between the medium and heavy goods vehicle types that are mostly manufactured and used in EU markets ('Cab-Over Engine Vehicle') and those that are more commonly manufactured and used in US markets (vehicles with a 'Bonneted Cab'). 'Bonneted Cab' vehicles are relatively common in the Australian market, however UN R46 (Appendix A of ADR 14/03) is written to more comprehensively account for 'Cab-Over Engine Vehicle' configurations, when considering the significant differences in physical construction between the two types of truck cab. The new definitions allow for versatility, relative to the UN Regulation, in setting some ADR 14/03 design and installation requirements for mirrors fitted to vehicles with a 'Bonneted Cab'.

Class V mirrors mounted on the fender/s or bonnet

Clause 6.19 provides an exemption against the Appendix A requirement on minimum mounting height for a Class V mirror, where the mirror is typically fitted on a fender or bonnet of a goods vehicle with a 'Bonneted Cab', and the vehicle is either sub-category NB2 with a 'Gross Vehicle Mass' exceeding 7.5 tonnes or category NC. This clause accounts for commonly used mounting positions for mirrors which may provide a field of vision in accordance with the requirements for a Class V device for indirect vision in Appendix A, on a vehicle with a 'Bonneted Cab'.

Although the mirror mounting position is not directly specified in Clause 6.19, it is indicated through the requirement that the mirror "is visible by the driver through the portion of the windscreen that is swept by the windscreen wiper(s)", which is taken from the requirements of Appendix A paragraph 15.2.2.2, and means any Class V mirror visible through the side window on a vehicle with a 'Bonneted Cab' must still be fitted at least 2 m above the ground.

The applicability to a sub-category NB2 vehicle with a 'Gross Vehicle Mass' exceeding 7.5 tonnes is taken to align with the separation of this vehicle class used in the paragraph 15.2.1.1.1 table of Appendix A, while also considering the typical 'Gross Vehicle Mass' of vehicles for which clause 6.18 is intended.

The Appendix A requirements that would otherwise apply regarding mounting height of the Class V mirror are prescribed at paragraph 15.2.2.7 and in the table of paragraph 15.2.1.1.1, whereby all parts of the mirror assembly would need to be at least 2 m above the ground when the vehicle was loaded to its 'Gross Vehicle Mass', regardless of the mirror adjustment position. This is not a practical requirement for all fender/bonnet mounted mirrors on vehicles with a 'Bonneted Cab', and is clearly intended to cater for the typical mounting position of a Class V mirror on a 'Cab-Over Engine Vehicle'.

Additional mirrors mounted on the fender/s or bonnet

Clause 6.23 provides an exemption against the Appendix A paragraph 15.1.1 requirement regarding number and type of mirrors that may be fitted, in the case of a mirror typically fitted on a fender or bonnet of a goods vehicle with a 'Bonneted Cab', where the vehicle is either sub-category NB2 with a 'Gross Vehicle Mass' exceeding 7.5 tonnes or category NC. As per the requirements of clause 6.18 explained above, the mirrors covered by clause 6.23 must be visible by the driver through the portion of the windscreen that is swept by the windscreen wiper(s), which limits (but does not prescribe) the available mounting positions. Such mirrors are convenient for the driver, as they may be viewed while looking largely in the forward direction of travel.

Paragraph 15.1.1. of Appendix A requires that all compulsory and optional devices for indirect vision fitted to a vehicle are of a type classified by the regulation (UN R46), where those devices are set by the table of paragraph 15.2.1.1.1 of the Appendix. For both sub-category NB2 vehicles with a 'Gross Vehicle Mass' exceeding 7.5 tonnes, and category NC vehicles, the Appendix A paragraph 15.2.1.1.1 table requirements on devices for indirect vision include one compulsory Class IV device on both the driver's side and the passenger's side, a compulsory Class V device on the passenger's side, and an optional Class V device on the driver's side. No other Class IV or Class V devices, or any unclassified devices, are listed for mandatory or optional fitment. Clause 6.23 allows one additional mirror to be fitted on both the driver's side and the passenger's side of applicable vehicle types.

Clause 6.23.2 covers the case where an additional mirror optionally fitted is either a Class IV or Class V mirror. In this case, each additional mirror fitted must meet the design and installation requirements that apply to the class of device for indirect vision (Class IV or Class V) as specified in Appendix A, except for paragraph 15.2.3.2, and as otherwise varied by preceding clauses of the ADR clause 6. Paragraph 15.2.3.2 of Appendix A sets requirements for a Class IV mirror fitted on the driver's side of the vehicle to be able to be adjusted from inside the vehicle with the driver's door closed, and this is not a practical requirement for the configuration of fender or bonnet mounted mirror for which clause 6.23 accounts for.

Where clause 6.23.2 applies, clause 6.23.3 ensures that Appendix A paragraph 15.2.4.5.13 is not interpreted in such a way that, where a mandatory Class V mirror assembly is fitted on the passenger's side with a mounting height that results in all parts being no less than 2.4 m above the ground (for example, where mounted to the cab above the passenger's side door) regardless of position after adjustment, the additional field of vision requirements set by paragraphs 15.2.4.5.6 to 15.2.4.5.9 are deemed to not apply to this higher mounted mirror when an additional Class V mirror assembly is mounted on either side of the vehicle according to clause 6.23.2 such that any part of that mirror or its holder is less than 2.4 m above the ground, regardless of its position after adjustment.

Clause 6.23.4 covers the case where an additional mirror optionally fitted is neither a Class IV or Class V mirror. The ability to fit additional mirrors under this clause recognises the fact that while the mounting location is commonly used on vehicles with a 'Bonneted Cab' and results in easily viewed additional fields of indirect vision for the driver, the fields of vision will not necessarily meet what is prescribed by Appendix A of the ADR (including because vehicles with a 'Bonneted Cab' are more commonly manufactured and used in US markets where prescriptive fields of vision do not apply to these goods vehicles).

Under sub-clause (b) of clause 6.23.4, each additional mirror fitted must meet the design and installation requirements that apply to a Class IV mirror under Appendix A, except for; paragraph 15.1.1 (which limits the types of devices able to be fitted under the Appendix A), paragraph 15.2.2.5 (which limits the lateral projection of the mirror to what is necessary to achieve a prescribed field of vision, which does not apply to a mirror fitted under this clause), paragraph 15.2.3.2 (which sets requirements for a Class IV mirror fitted on the driver's side of the vehicle to be able to be adjusted from inside the vehicle with the driver's door closed, and this is not a practical requirement for a typical fender or bonnet mounted mirror), paragraph 15.2.4.4 (which prescribes the field of vision for a Class IV device for indirect vision, however the mirror is not a classified device for indirect vision under Appendix A).

In relation to the lateral projection of the mirror, sub-clause (a) of clause 6.23.4 limits this to 150 mm beyond the point from which 'Overall Width' is measured on the respective side of the vehicle. Based on the typical design and mounting position of these mirrors, this limit is deemed to be sufficient for cases where the mirror does not meet a prescribed field of vision. If the lateral projection was to be increased beyond this limit of 150 mm, the mirror should be capable of providing a prescribed field of vision from Appendix A such that clause 6.23.2 would then apply.

Cross-view mirrors

Clause 6.20 provides an exemption against the Appendix A paragraph 15.1.1 requirement regarding number and type of mirrors that may be fitted, in the case of a mirror fitted to a goods vehicle with a 'Bonneted Cab' as an alternative to a UN R46 Class VI front-view mirror, where the vehicle is either sub-category NB2 with a 'Gross Vehicle Mass' exceeding 7.5 tonnes or category NC. The alternative mirror type is a 'Cross-View Mirror', described by a new definition[2] that includes the field of vision requirements that characterise this mirror and its function, analogous to the definitions for various 'class of device for indirect vision' in Appendix A of the ADR. A 'Cross-View Mirror' is designed to achieve the same function as the Class VI front-view mirror, but necessitates performance and installation requirements suitable for a 'Bonneted Cab' vehicle[5], in particular an allowance for a lower mounting height.

Clause 6.20.1 sets that the method used to determine that the field of vision from an installed 'Cross-View Mirror', which aligns with the method required by Appendix A of the ADR for other mirrors with a prescribed field of vision. Field of vision requirements were determined with reference firstly to the New York City requirements for truck Cross Over Mirrors, as legislated to come into effect in that jurisdiction 13 January 2012 for select goods vehicles with a 'Bonneted Cab'. In addition, the requirements of ADR 14/03 Appendix A paragraph 15.2.4.6.2 were used, as they represented an alternate approach[5] in UN R46 for defining the field of vision for a front-view device, and this approach aligned closely to the Cross Over Mirror requirements. The key differences between the two references are related to the minimum object height that must be visible (where the object can be modelled as a point on a transverse horizontal line 300 mm in front of the vehicle), and the distance across the width of the vehicle for which the object must be visible (the length of the

[5] Paragraph 15.2.4.6.1 of UN R46 (Appendix A to ADR 14/03) describes Class VI field of vision requirements suitable to be achieved on a 'Cab-Over Engine' goods vehicle, with this vehicle type clearly depicted in the Figure 9. On this type of vehicle, the front-view device is advantageously mounted high on the cab, close to the driver, approximately in line with the extreme front of vehicle.

transverse horizontal line). For object height, the requirements for the Cross Over Mirror compared to UN R46 are approximately 915 mm versus 1,200 mm respectively. As such, a figure of 1,000 mm was used, biased towards the US based requirements as this was the reference raised by local industry representatives in Australia, and the US are a dominant market for 'Bonneted Cab' vehicles. Further, a lower height means more objects will be detected under otherwise equal conditions. For the distance across the width of the vehicle for which the object must be visible, while the Cross Over Mirror requirements only set this as the full width of the vehicle, the UN R46 requirements extend this by a further 900 mm on the passenger's side. The decision was made to utilise the UN R46 requirements owing to the clear safety advantages in being able to see further on the side of the vehicle where vulnerable road users (e.g. pedestrians, cyclists) are typically located or approach from.

Clause 6.20.2 requires that where a 'Cross-View Mirror' is fitted it must meet the design and installation requirements that apply to a Class VI device as specified in Appendix A, except for paragraph 15.1.1 (which limits the types of devices able to be fitted under the Appendix A), paragraph 15.2.2.5 (which limits the lateral projection of the mirror to what is necessary to achieve a prescribed field of vision, which does not apply to a 'Cross-View Mirror' under the regulation[6]), the paragraphs that prescribe field of vision for a Class VI device, the paragraphs that apply regarding mounting height of a Class VI mirror (15.2.2.7 and the table of paragraph 15.2.1.1.1), and as otherwise varied by preceding clauses of the ADR clause 6.

Clauses 6.21 to 6.22.1 set alternative procedures to integrate the 'Cross-View Mirror' into select paragraphs of Appendix A relating to the enlarged field of vision that may apply to a Class V device for indirect vision. The Appendix A paragraphs specify optional approaches for achieving this field of vision through combining the view of multiple devices and direct view where applicable. In each of the ADR clauses the 'Cross-View Mirror' substitutes what would otherwise be a reference to a Class VI device for indirect vision. Clause 6.21 does this in relation to paragraph 15.2.4.5.10. Clause 6.22 does this in relation to paragraph 15.2.4.5.11. Clause 6.22.1 does this in relation to paragraph 15.2.4.5.11.3, to specify mirror adjustment requirements where clause 6.22 applies.

Clause 6.2 of the ADR provides an exemption for a 'Cross-View Mirror' from the requirements of paragraph 2.1.1.9 of Appendix A regarding marking of the transition between the convex and aspherical regions of the reflecting surface. The exemption is in part provided because the typical installation position of a compliant 'Cross-View Mirror' will be at a distance from the driver such that this marking is unlikely to be readily distinguishable or otherwise serve an important function. This would not be the case for a Class VI front-view mirror (on a 'Cab-Over Engine vehicle), owing to the much closer positioning of the mirror relative to the driver[5]. Also, it is understood that mirror designs currently available for installation as a 'Cross-View Mirror' on a vehicle with a 'Bonneted Cab' are mostly manufactured for the US market, whereby this requirement of UN R46 will not have been applicable to those designs.

[6] Lateral projection limits for a 'Cross-View Mirror' are specified separately within the revised definition of 'Overall Width' under updates to ADR – Definitions and Vehicle Categories for the Safer Freight Vehicle reforms as effected by separate legislative instrument Vehicle Standard (Australian Design Rule) Safer Freight Vehicles Amendment No. 1 2023.

Exemptions and alternative requirements for compatibility with the RVSA

Clause 6.1 provides exemptions from the requirements of Appendix A which relate to gaining a UN R46 Approval. This is because it is not a requirement to gain a UN Approval for vehicle supply to market in Australia, where the Commonwealth administers its own approvals through the RVSA and the ADRs.

3. MATTERS INCORPORATED BY REFERENCE

3.1. Legislative Instruments

Clause 3.2.1 of the ADR includes a reference to the Australian Design Rule 14/02 – Rear Vision Mirrors (ADR 14/02). The purpose of ADR 14/02 is to specify requirements for mirrors and other devices that provide the driver with a clear and reasonably unobstructed view to (primarily) the rear.

Clause 4.1.1 of the ADR includes a reference to the Vehicle Standard (Australian Design Rule – Definitions and Vehicle Categories) 2005 (which may also be cited as the Australian Design Rule – Definitions and Vehicle Categories). This sets out definitions for many terms used in the ADRs, including the vehicle categories used in ADR applicability tables.

Clause 6.11 of the ADR includes a reference to the Australian Design Rule 8/… – Safety Glazing Material (ADR 8/…). The purpose of ADR 8/… is to is to specify the performance requirements of material used for external or internal glazing in motor vehicles which will ensure adequate visibility under normal operating conditions, will minimise obscuration when shattered, and will minimise the likelihood of serious injury if a person comes in contact with the broken glazing material.

In accordance with paragraph 12(2)(b) of the RVSA, each of these ADRs are incorporated as in force or existing from time to time. The ellipsis (…) indicates the version(s) of the ADR in force at the Date of Manufacture.

The ADRs may be freely accessed online through the Federal Register of Legislation. The website is www.legislation.gov.au.

3.2. Other Documents

United Nations

Clauses 6.24, 6.25, 8.1.1 and 8.1.2 of the ADR include references to the United Nations Regulation No. 46 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF DEVICES FOR INDIRECT VISION AND OF MOTOR VEHICLES WITH REGARD TO THE INSTALLATION OF THESE DEVICES (UN R46). This is an international standard for devices for indirect vision fitted to passenger cars, goods vehicles, omnibuses, and motor tricycles with bodywork that either partly or wholly encloses the driver.

Clause 8.2.1 of the ADR includes a reference to United Nations Regulation No. 81 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF REAR-VIEW MIRRORS AND OF TWO-WHEELED POWER-DRIVEN VEHICLES WITH OR WITHOUT SIDE CAR, WITH REGARD TO THE INSTALLATION OF REAR-VIEW MIRRORS ON HANDLEBARS (UN R81). This is an international standard for rear view mirrors fitted to mopeds (with either 2 or 3 wheels), motorcycles (including with sidecar), and motor tricycles without bodywork that either partly or wholly encloses the driver.

Paragraph 6.2.1.3 of Appendix A includes a reference to UN Regulation No. 10. This is an international standard for electromagnetic compatibility for vehicles and vehicle components.

Both Appendix A and Appendix B include references to the Consolidated Resolution on the Construction of Vehicles (R.E.3.). This includes definitions and UN vehicle category classifications used in Appendix A, Appendix B and the alternative standards under clause 7 of ADR 14/03.

In accordance with paragraph 14(1)(b) and subsection 14(2) of the *Legislation Act 2003*, each of these UN documents are incorporated as in force on the date this national road vehicle standard is made.

UN Regulations (including UN R46 and UN R81) and Resolutions, may be freely accessed online through the UN World Forum for the Harmonization of Vehicle Regulations (WP.29). The website is www.unece.org/trans/main/welcwp29.html.

International Organization for Standardization

Paragraph 2.1.5 of Appendix A includes a reference to ISO 9241-302:2008. This document provides terminology for electronic visual displays and explains the terms and definitions used in the other parts of ISO 9241.

Paragraph 6.2.2.2.2 of Appendix A includes a reference to ISO 15008:2003 and paragraph 6.2.2.2.4 of Appendix A includes a reference to ISO 15008:2009. These standards specify minimum requirements for the image quality and legibility of displays containing dynamic visual information presented to the driver of a road vehicle by an on-board transport information and control system (TICS) used while the vehicle is in motion.

Paragraphs 6.2.2.3 and 16.1 of Appendix A, and Annexes 3 and 12 to Appendix A, include multiple references to ISO 16505:2015. This standard gives minimum safety, ergonomic, and performance requirements for Camera Monitor Systems to replace mandatory inside and outside rearview mirrors for road vehicles.

Paragraphs 6.2.2.3.4.2 of Appendix A includes a reference to ISO 9241-305:2008. Annex 12 to Appendix A includes references to ISO13406-2: 2001. These standards specify ergonomic requirements for flat panel displays.

Annex 12 also includes multiple references to ISO 14524:2009. This standard pecifies methods for the measurement of opto-electronic conversion functions (OECFs) of electronic still-picture cameras whose output is encoded as a digital image file.

In accordance with paragraph 14(1)(b) and subsection 14(2) of the Legislation Act 2003, each of these documents are incorporated as in force on the date this national road vehicle standard is made.

ISO standards are all available for purchase only from the ISO and various associated national standards bodies. While not freely available, these ISO standards are all readily accessible and widely used by vehicle manufacturers.

Section 12 of the RVSA allows the Minister to incorporate a broad range of documents, including as in force or existing at a particular time or as in force from time to time, when making national road vehicle standards. This ensures that Australia's legislative framework is well-prepared for future developments in the international road vehicle space.

SAE International

Clauses 6.6 and 7.4 of the ADR include a reference to SAE J964 – 2016-11-08 version (Recommended Practice for Measuring Haze and Reflectance of Mirrors). This is an international standard that describes methods for determining total and specular reflectance for mirrors with flat and curved surfaces and a method for determining diffuse reflectance and haze for mirrors with flat surfaces. As discussed above, ADR 14/03 allows the use of this standard for the purposes of measuring the reflectance (referred to in UN R46 as 'normal coefficient of reflection) of a mirror, as an alternative procedure to the method required by the corresponding UN Regulations of Appendix A and Appendix B.

In accordance with paragraph 14(1)(b) and subsection 14(2) of the *Legislation Act 2003*, this standard is incorporated as in force on the date this national road vehicle standard is made.

This standard is only available for purchase through SAE International. Vehicle manufacturers, component suppliers and test facilities routinely access standards through SAE International as part of their professional library.

Section 12 of the RVSA allows the Minister to incorporate a broad range of documents, including as in force or existing at a particular time or as in force from time to time, when making national road vehicle standards. This ensures that Australia's legislative framework is well-prepared for future developments in the international road vehicle space.

4. CONSULTATION

4.1. General Consultation Arrangements

It has been longstanding practice to consult widely on proposed new or amended vehicle standards. For many years, there has been active collaboration between the Commonwealth and the state/territory governments, as well as consultation with industry and consumer groups. Much of the consultation takes place within institutional arrangements established for this purpose. The analysis and documentation prepared in a particular case, and the bodies consulted, depend on the degree of impact the new or amended standard is expected to have on industry or road users.

Proposals that are regarded as significant need to be supported by an Impact Analysis (IA) meeting the requirements of the Office of Impact Analysis (OIA) as published in the *Australian Government Guide to Policy Impact Analysis* or the *Regulatory Impact Analysis Guide for Ministers' Meetings and National Standard Setting Bodies*.

4.2. Specific Consultation Arrangements

Public comment was sought on the Safer Freight Vehicles package, of which enhanced requirements for devices for indirect vision forms an integral part, from 27 April 2021 to 30 June 2021.

A draft ADR 14/03 – Devices for Indirect Vision based on the UN Regulation No. 46 was released together with a discussion paper, other draft ADRs proposed for the Safer Freight Vehicles package, and a feedback form on the department's website.

The department provided two ways to comment: 1) Emailing the feedback form to the Vehicle Standards Section email address; or 2) Mailing the provided feedback form to the Vehicle Standards Section postal address.

An email was also sent on 27 April 2021 to inform senior representatives of state and territory governments, and representative bodies for heavy vehicle manufacturer's, operators, and road users. In addition, a notice was published in the Office of Road Safety newsletter in May 2021. The department also held two targeted consultation meetings in June 2021, to explain the proposed regulatory changes contained within the discussion paper and the draft ADRs to other government and industry stakeholders.

Formal feedback was received from members of the public, state government agencies, industry, road user groups and road safety advocates. There was broad support for the implementation of a new ADR mandating an enhanced set of requirements for devices for indirect vision to be included in the Safer Freight Vehicles reforms.

Following the public consultation, the feedback and agreed outcomes from a series of ADR consultative forum meetings between July 2021 and November 2022 were used by the department to improve and refine the proposed Safer Freight Vehicles package of ADRs, including implementation related aspects. These consultative meetings involved nominated senior and technical representatives of government (Australian and state/territory), the manufacturing and operational arms of the industry and of representative organisations of consumers and road users.

5. REGULATORY IMPACT

5.1. Impact Analysis

An IA (refer Volume 2) was completed on options to increase the overall width limit for Safer Freight Vehicles meeting a package of additional ADRs harmonised with UN vehicle regulations, including a new ADR 14/03 on Devices for Indirect Vision. The OIA reference number for the IA is 21-01048.

5.2. Benefits and Costs

There are both benefits and costs associated with mandating enhanced requirements for devices for indirect vision for goods vehicles that are over 4.5 tonnes GVM and have an overall width exceeding 2,500 mm. In the benefit-cost analysis for the IA, the Australian Road Research Board estimated that enhanced devices for indirect vision reduce the risk of a heavy vehicle having a fatal crash by 0.6 per cent, reduce the risk of a heavy vehicle having a serious injury crash by 0.6 per cent, and cost $1,300 per vehicle to fit.

6. STATEMENT OF COMPATIBILITY WITH HUMAN RIGHTS

The following Statement is prepared in accordance with Part 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011.*

6.1. Overview

ADR 14/03 specifies requirements for devices to be fitted to vehicles to provide drivers with a clear and reasonably unobstructed view to the rear, side, or front of the vehicle; and riders with a clear and reasonably unobstructed view to the rear.

6.2. Human Rights Implications

ADR 14/03 does not engage any of the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

6.3. Conclusion

ADR 14/03 is compatible with human rights, as it does not raise any human rights issues.