

Vehicle Standard (Australian Design Rule 106/00 – Side Underrun Protection) 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 106/00 – Side Underrun Protection) 2023, which may also be cited as the Australian Design Rule 106/00 – Side Underrun Protection or ADR 106/00, is made under 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 106/00 is exempt from the sunseting provisions of the *Legislation Act 2003*.

Source of the Exemption

A standard made under section 12 of the RVSA is not subject to the sunseting 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 106/00, 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 over 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 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 106/00, 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 Australian Design Rules 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

The purpose of ADR 106/00 is to specify requirements for side underrun protection on medium and heavy goods vehicles, to reduce the risk of pedestrians and cyclists falling under the sides and being caught under the wheels of these vehicles. This mostly occurs during heavy vehicle turning manoeuvres in urban areas.

Side underrun protection is provided through Lateral Protection Devices (LPDs), which provide a practically continuous physical barrier in the form of a continuous flat surface, or one or more horizontal rails, or a combination of surfaces and rails. The LPDs are fitted in front of the rear wheels to prevent vulnerable road users, in particular pedestrians and cyclists, from getting killed or seriously injured if they get too close to the vehicle. Components permanently fixed to the vehicle, e.g. spare wheels, battery box, air tanks, fuel tanks, lamps, reflectors and tool boxes may be incorporated in an LPD, provided that they meet the dimensional requirements. LPDs may also be designed to have several adjustment positions at the side of the vehicle, including for example to include elements that can be moved to provide access to storage space under the vehicle (e.g. for trailer gates, a spare wheel carrier etc.).

Clause 3.1 requires goods vehicles over 4.5 tonnes Gross Vehicle Mass (GVM) (ADR sub-category NB2 and category NC vehicles) with an Overall Width exceeding 2,500 mm to comply with ADR 106/00 from 1 October 2023. This is the same date from which the Overall Width limit for goods vehicles meeting a package of ADRs (including this ADR 106/00), increases from 2,500 mm to 2,550 mm, through the commencement of the Vehicle Standard (Australian Design Rule) Safer Freight Vehicles Amendment No. 2 2023. For further detail, including on the package of ADRs, refer to the Safer Freight Vehicles Impact Analysis published as supporting material for this ADR. The objective of the Safer Freight Vehicles package is to allow wider heavy goods vehicles (up to 2,550 mm overall width) if fitted with additional safety systems or features, one of which is side underrun protection.

Clause 3.2 exempts prime movers (vehicles built to tow a semi-trailer) and partially completed vehicles from having to comply with ADR 106/00. In the case of prime movers there is usually limited space between the rear of the cab and the rear wheels in which to fit side underrun and this space usually includes fuel tanks and other components that perform a similar function. In the case of partially completed vehicles the original manufacturer may or may not fit side underrun protection to a vehicle before the vehicle was entered on the Register of Approved Vehicles as required by the RVS legislation. However, the policy intent is that cab-chassis and other partially completed vehicles supplied without side underrun protection will still be required to be fitted with these during the completion of the vehicle, e.g. by a vehicle bodybuilder, to be allowed to exceed 2,500 mm in width. It is expected that jurisdictions and the National Heavy Vehicle Regulator will be able to use existing legislation to require compliance for completed vehicles over 2,500 mm in width.

Clause 3.3 clarifies that ADR 106/00 is optional for goods vehicles over 4.5 tonnes GVM (ADR sub-category NB2 and category NC vehicles), which have an overall width not exceeding 2,500 mm and/or are partially completed vehicles. This gives manufacturers of these vehicles the option to meet the ADR, but does not require compliance, including if fitted with side underrun protection. As per the explanation for clause 3.2 above, compliance in service would be required for completed vehicles over 2,500 mm in width.

Clause 5 sets out different paths that a vehicle manufacturer may choose between to demonstrate compliance with the requirements of ADR 106/00. This is recognising that heavy vehicles are not always completed in one stage.

Clause 5.1(a) provides that vehicles meeting the requirements of Part I of Appendix A, as varied by clause 6 (Exemptions and Alternative Procedures), satisfy the requirements of ADR 106/00. Part I of Appendix A is the United Nations (UN) Regulation No. 73 (R73) – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO THEIR LATERAL PROTECTION DEVICES (LPD), incorporating the 01 series of amendments. Part I sets out the requirements to be met by the LPD (side underrun protection) and its installation under vehicle type approval arrangements.

Clause 5.1(b) provides that vehicles meeting the requirements of Part II and III of Appendix A, as varied by clause 6 (Exemptions and Alternative Procedures), satisfy the requirements of ADR 106/00. Part II of Appendix A is the UN Regulation No. 73 (R73) – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF LATERAL PROTECTION DEVICES, incorporating the 01 series of amendments. Part III of Appendix A is the UN Regulation No. 73 (R73) – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO THE INSTALLATION OF LPD OF AN APPROVED TYPE ACCORDING TO PART II OF THIS REGULATION, incorporating the 01 series of amendments. Part II sets out the requirements to be met by LPDs (side underrun protection) for component type approval, and Part III sets out the requirements for the installation of LPDs approved under Part II to vehicles.

Clause 5.1(c) provides that vehicles that meet the technical requirements to Part I of UN R73, incorporating the 01 series of amendments, satisfy the requirements of ADR 106/00. Compliance with the technical requirements of Part I could be demonstrated by a UN approval, or by a test report from an approved testing facility, covering all the technical requirements of Part I of UN R73 incorporating the 01 series of amendments, for the vehicle model/type.

Clause 5.1(d) provides that vehicles fitted with LPDs in accordance with the technical requirements of Parts II and Part III of UN R73 incorporating the 01 series of amendments, satisfy the requirements of ADR 106/00. Compliance with the technical requirements of these parts could be demonstrated by UN approval(s), and/or by a test report from an approved testing facility, covering all the technical requirements of Part I and/or Part II (as applicable) of UN R73 incorporating the 01 series of amendments, for the vehicle model/type.

The objective of the requirements of clause 5.1 (parts (a) to (d)) is to ensure that the barrier fitted to prevent vulnerable road users from falling under the vehicle performs that task without creating other unintended safety problems by protruding too far, having sharp parts or interfering with the functioning of the vehicle.

Clause 6.1 provides exemptions from the requirements of Appendix A which relate to gaining a UN R73 Approval. These exemptions are allowed because it is not a requirement to gain a UN Approval for vehicle supply to the market in Australia, where the Commonwealth administers approvals through the RVSA and the ADRs.

Clause 6.2 clarifies that “maximum mass” in Appendix A, paragraph 2.1.2 must be read as the ‘*Gross Vehicle Mass*’. This is because ‘*Gross Vehicle Mass*’ is the defined term to describe the maximum laden mass of a motor vehicle in the ADRs.

Clauses 6.3, 6.6, and 6.7 correct paragraph cross-referencing errors in Appendix A (UN R73 incorporating up to supplement 3 to the 01 series of amendments).

Clauses 6.4 and 6.5 set out how the validity of any calculation methods used to demonstrate the LPDs (side underrun) meet the minimum strength and maximum deflection requirements is to be established, where compliance with ADR 106/00 is demonstrated through clause 5.1(a) or 5.1(b).

Clauses 6.9 to 6.11 allow for access steps with an outer face of at least 42 mm in height to be used as horizontal rails in an LPD. UN R73 (as per Appendix A) would otherwise require horizontal rails used in an LPD to be at least 50 mm high for sub-category NB2 vehicles and 100 mm high for category NC vehicles. This derogation from UN R73 is to balance the need for heavy vehicle operators to have safe access to truck cabs, sleeper berths and load/cargo carrying areas, while also providing an effective barrier to reduce the risk of pedestrians and cyclists falling under the sides and being caught under the wheels of these vehicles. The policy intent of these clauses is to ensure that the derogation (i.e. lower minimum rail height) relative to UN R73 will only be applied for access steps which are genuinely designed and positioned to allow an operator to maintain three points of contact, to safely climb and descend the vehicle. Maintaining three points of contact is widely recommended for workplace health and safety reasons, and means keeping at least three of four limbs in contact with the vehicle at all times.

Clause 6.12 allows for additional gaps to be provided in LPD where this is necessary for specified vehicle uses/functions (e.g. for connecting hoses to a closed tank permanently fitted to a vehicle designed solely for the carriage of gases or liquids). Where additional gaps in the LPD(s) are necessary, the vehicle must be fitted with LPDs that comply so far as is practicable.

Clause 6.13 allows for an LPD not to be fitted on the right-hand side (i.e. driver's side or offside) of a vehicle with a side tipping function for the unloading of stored material on that side of the vehicle, where this would be incompatible with the unloading or tipping function. Fitment is still required on the left-hand side (i.e. passenger's side or nearside) of such vehicles. This is because a side tipping function may be somewhat blocked by and/or increase the risk of damage to LPDs on the unloading side, while the benefits of side underrun protection will be greatest on the nearside (side closest to the kerb).

Clause 7.1 specifies the technical requirements of UN Regulation No. 73 –
UNIFORM PROVISIONS CONCERNING THE APPROVAL OF:

- I. VEHICLES WITH REGARD TO THEIR LATERAL PROTECTION DEVICES (LPD)
- II. LATERAL PROTECTION DEVICES (LPD)
- III. VEHICLES WITH REGARD TO THE INSTALLATION OF LPD OF AN APPROVED TYPE ACCORDING TO PART II OF THIS REGULATION

incorporating the 01 series of amendments, as an acceptable alternative standard to ADR 106/00. UN R73 is the recognised international standard for LPDs (side underrun protection).

To meet UN R73 as incorporated in Appendix A, LPDs must not increase the overall width of the vehicle, or be any more than 150 mm inboard (at the main part of the outer surface) of the outermost planes between which the maximum vehicle width is measured. Further, the rear end (rearmost 250 mm) of an LPD must not be any more than 30 mm inboard of the outermost edge of the rear tyres (excluding any bulging of the tyres near the ground). Combinations of surfaces and rails must form a practically continuous LPD member from front to rear, with no more than a 25 mm gap permitted between adjacent components. Where horizontal rails are used in LPDs, these must be at least 50 mm high for UN category N₂ and O₃ vehicles, and at least 100 mm high for UN category N₃ and O₄ vehicles. The vertical gap between rails must not be any more than 300 mm. LPDs must be capable of withstanding a horizontal static force of 1 kN applied perpendicularly to any part of their external surface by the centre of a ram, the face of which is circular and flat, with a diameter of 220 mm ± 10 mm. The deflection of the LPD under load (measured at the centre of the ram) must not be more than 30 mm over the rearmost 250 mm of the LPD, and not more than 150 mm over the remainder of the LPD. This level of force has been set to ensure LPDs are sufficiently strong to be effective in collisions with vulnerable road users (in particular, pedestrians and bicyclists). LPDs are not required to have sufficient structural strength to prevent the underrun of a passenger car in a side (i.e. lateral) impact crash.

Figure 1 is an example illustration of the fitment of LPDs for a rigid truck, including key UN R73 dimensional and position requirements. For all vehicles, the lower edge of the LPD must not be any more than 550 mm from the ground. The permissible gaps at the front, rear and upper edge of the LPD vary by vehicle category and design/purpose. In the case of a vehicle having two steered axles, an LPD is not required between these axles if the longitudinal distance between the centrelines of the axles is no greater than 2.1 m.

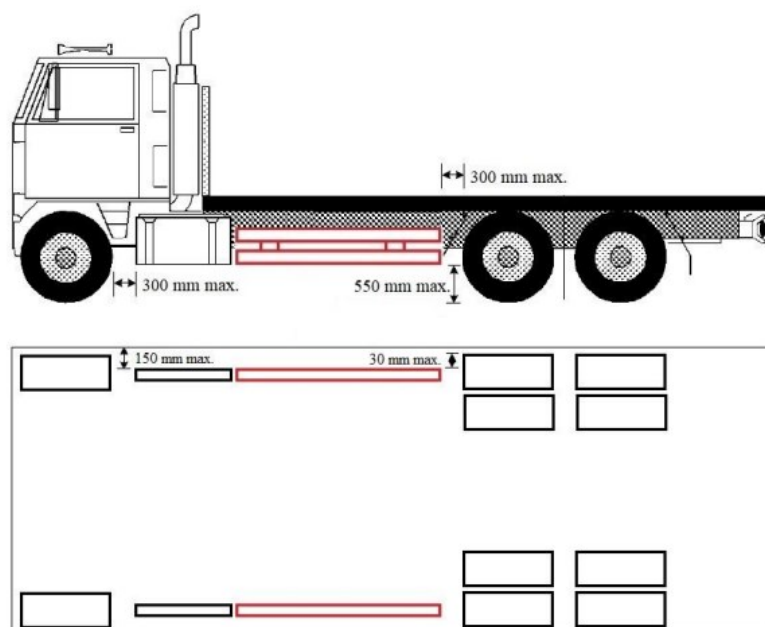


Figure 1: Illustration (side view and overhead/plan view) of a rigid truck utilising fuel tanks and horizontal rails/members on each side as LPDs for side underrun protection, including key UN R73 dimensional limits

3. MATTERS INCORPORATED BY REFERENCE

3.1. Legislative Instruments

Clause 4.1.1 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.

In accordance with paragraph 12(2)(b) of the RVSA, this ADR is incorporated as in force or existing from time to time.

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

3.2. Other Documents

International Organization for Standardization

Clause 6.12, and paragraphs 13.1.4 and 16.1.4 of Appendix A, include references to ISO 9367-1:1989 and ISO 9367-2:1994. These standards specify minimum requirements to allow efficient lashing and securing of goods vehicles and semi-trailers on board roll-on/roll-off ships.

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.

United Nations

Clause 7.1 includes a reference to the United Nations Regulation No. 73 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF:

- I. VEHICLES WITH REGARD TO THEIR LATERAL PROTECTION DEVICES (LPD)
- II. LATERAL PROTECTION DEVICES (LPD)
- III. VEHICLES WITH REGARD TO THE INSTALLATION OF LPD OF AN APPROVED TYPE ACCORDING TO PART II OF THIS REGULATION

incorporating the 01 series of amendments. This is an international standard for LPDs, which are smooth, longitudinal barriers over gaps between wheels and other body fixtures, designed to reduce the risk of pedestrians or cyclists falling under the side body and wheels of the vehicle (side underrun protection).

Paragraphs 1.1.1 to 1.1.3 of Appendix A include a footnote reference to the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6. This includes definitions for the UN vehicle category classifications used in Appendix A and the alternative standard under clause 7 of ADR 106/00.

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

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 and 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 Side Underrun Protection forms an integral part, from 27 April 2021 to 30 June 2021.

A draft ADR 106/00 – Side Underrun Protection based on the UN Regulation No. 73 was released together with a discussion paper, other draft ADRs proposed for the Safer Freight Vehicles package, and a feedback form on the the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (the department) 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 Side Underrun Protection on trucks 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 106/00 on Side Underrun Protection. The OIA reference number for the IA is 21-01048.

5.2. Benefits and Costs

There are both benefits and costs associated with mandating Side Underrun Protection 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 Side Underrun Protection reduces the risk of a heavy vehicle having a fatal crash by 1.4 per cent, reduces the risk of a heavy vehicle having a serious injury crash by 0.1 per cent, and costs \$1,000 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 106/00 specifies requirements for lateral protection devices, which are smooth, longitudinal barriers over gaps between wheels and other body fixtures, designed to reduce the risk of pedestrians, or cyclists falling under the side body and wheels of the vehicle, particularly during turning manoeuvres in urban areas.

6.2. Human Rights Implications

ADR 106/00 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 106/00 is compatible with human rights, as it does not raise any human rights issues.