

# User Guide – Heavy Vehicle Asset Registers and Infrastructure Ratings

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## Overview

This first edition of the asset registers and heavy vehicle infrastructure rating assessments detail the services provided to heavy vehicle operators across the [national key freight routes](#). The information is available in spreadsheet and map formats. This document provides an overview of the information and instructions on how to access and interpret it.

## System requirements

Google Earth (or similar) is required in order to open the .kml map files.

Microsoft Excel 2007 (or later) is recommended for viewing the .xlsm data files. To produce reports, macros must be enabled.

## Data quality and comparability

It should be noted that the heavy vehicle infrastructure ratings (HVIR) reflect a point in time assessment and states and territories collected the data for input into the asset register at different times. The ratings also do not take account of the stage of the asset lifecycle that any particular stretch of road infrastructure might be in nor do they reflect any changes that may have occurred since the data was collected.

The methodology for calculating heavy vehicle infrastructure ratings has necessarily been kept relatively simple for this first edition, which is primarily a proof of concept. For example, there are a number of other infrastructure characteristics besides lane and shoulder widths that may impact considerations about the potential safety of roads. The methodology for calculating HVIR is designed to evolve over time to include other factors as data collection and interpretation methods improve.

While every effort has been made to ensure data is accurate and up to date, the variations in the methodologies employed by states and territories to record road infrastructure ratings means that caution must be exercised in comparing data between jurisdictions. Governments are working together to harmonise road data reporting across jurisdictions and the outcomes of this work will inform future refinements of the asset registers and HVIR.

## Maps

### Road categorisation

As a first step, the roads included in the asset register are categorised based on their functional characteristics (for rationale see Annex 1).

**R1 roads are freeways, motorways, and tollways that have divided carriageways** with two or more lanes in each direction and sealed shoulders on both sides of each carriageway. These roads form major urban and interurban traffic movement routes.

**R2 roads are urban highways** or major roads that are not a freeway but may have divided carriageways and two or more lanes in each direction. These roads always have sealed shoulders.

**R3 roads are urban arterials and rural highways** that have single carriageway with one lane in each direction. These roads may have sealed or unsealed shoulders.

**R4 roads are collector or distributor roads.** These are roads with no requirements for shoulders.

**R5 roads are local or access roads** which provide property access.



**Figure 1 – HVIR for Queensland key freight routes.**

At this higher level, the ratings for the longer sections are represented.

Source: Google Earth, data provided by Queensland Government with analysis by Australian Roads Research Board through Austroads.



**Figure 2 – HVIR by 100 metre segment along Dawson Highway, near Rolleston, Queensland.**

Source: Google Earth, data provided by Queensland Government with analysis by Australian Roads Research Board through Austroads.

### Heavy Vehicle Infrastructure Rating

Each 100 metre road section is given a HVIR based on three components important to heavy vehicle operators:

The **access** component is based on heavy vehicle permitted access rather than capacity of the asset (it has a 40% weighting).

The **ride quality** component is based on the International Roughness Index, a quantitative measure of ride quality (it has a 40% weighting).

The **safety** component is based on measurements of lane and shoulder width and as well as road markings (it has a 20% weighting).

The ratings for each component are then aggregated into a single HVIR score based on the above ratings.

Each road category is assigned an **expected HVIR**, based on a combination of statistical analysis and interpretation of previous research into heavy vehicle operators' road use experience and expectations (see Table 1).

**Table 1: Expected HVIR**

Road category	Maximum	Minimum
R1	89%	68%
R2	79%	50%
R3	73%	45%
R4	67%	32%
R5	58%	22%

An HVIR score that is between the minimum and maximum rating for each road category is considered to meet heavy vehicle operators' expectations for the level of service they receive while using that section of road.

Research that informs and outlines the calculation of these three elements of HVIR can be found in the Austroads publication: [Ai, U. \(2015\), Development of Road Categories, Heavy Vehicle Level of Service and an Asset Register for the National Key Freight Route Network, Austroads Limited, Sydney.](#)

The **colour of routes on the maps** illustrates the heavy vehicle infrastructure assessment against the expected HVIR for the identified road category:

**High** is where the HVIR is above the maximum expected rating for that road category and is shown as blue on the map.

**Medium** is where the HVIR is between the minimum and maximum expected ratings for that road category and is shown as green on the map.

**Low** is where the HVIR is below the minimum expected rating for that road category and is shown as red on the map.

Roads without a data overlay appear yellow.

## Annex 1: Road categorisation

The road categorisation used in the asset registers and HVIR relate to the form and function of roads as seen by road users. Table 2 includes a full definition of each category of road.

**Table 2: Categorisation of roads**

Category	Definition
<b>R1</b> – Freeways (motorways, tollways)	<ul style="list-style-type: none"> <li>Divided carriageway, sealed multilane roads with sealed shoulders on both sides of carriageway.</li> </ul>
<b>R2</b> – Urban highways	<ul style="list-style-type: none"> <li>A major sealed road that is not a freeway, but may have divided carriageways and 2+ lanes in each direction and sealed shoulders.</li> </ul>
<b>R3</b> – Urban arterials and rural highways	<ul style="list-style-type: none"> <li>Single carriageway with one sealed lane in each direction and may have sealed or unsealed shoulders.</li> <li>Unmarked roads with a seal width of 7 to 15 metres.</li> <li>Unsealed roads with a width of 8 to 16 metres.</li> </ul>
<b>R4</b> – Collector/distributor roads	<ul style="list-style-type: none"> <li>Other sealed roads that are not access roads with no requirements for shoulders.</li> <li>Unmarked roads with a seal width less than 7 metres.</li> <li>Unsealed roads with a width less than 8 metres.</li> </ul>
<b>R5</b> – Access roads	<ul style="list-style-type: none"> <li>Roads of all types that provide property access.</li> </ul>

The simplified categorisation ensures clarity and consistency across the national road network when undertaking data analysis. An example of how each state and territory's own road categorisation translates into the Heavy Vehicle Infrastructure Rating road category is in Table 3.

**Table 3: Association of some road classifications in states and territories with the categorisation of roads**

Jurisdiction	R1	R2	R3	R4	R5
<b>Australian Capital Territory</b>	Major roads connecting to NSW network (M23, A23, B23, B52)	Arterial roads	Major collector roads	Minor collector roads	Access roads
<b>New South Wales</b>	M and A roads	A, B roads	B roads		
<b>Northern Territory</b>	National highways (rural) and primary arterials (urban)	Sub-arterial (urban)	State highways (rural) and state arterials (rural)	Secondary roads (rural) and collector roads (urban)	Local roads
<b>Queensland</b>	Freeways	Highways	Secondary roads	Local connector roads	Street / local
<b>South Australia</b>		Urban Arterial	Rural arterial	Rural local	Urban local
<b>Tasmania</b>	Trunk roads	Regional freight roads	Regional access roads	Feeder road	Other roads
<b>Victoria</b>	M	A	B	C	
<b>Western Australia</b>	Primary distributor	District distributor A	District distributor B and regional distributor	Local distributor	Access road

## Annex 2: Spreadseets and detailed report creation

The original data for the maps is presented in spreadsheets, which are divided by states and territories.

The **survey data tab** contains a list of the infrastructure data in 100 metre segments

The **HVIR tab** contains HVIR calculations listed for every 100 metre segment.

The **summary tab** contains a summary of the dataset, which lists each road section and broader network level information.

Reports can be generated by road section by selecting the Create Report button which produces a .pdf containing information about the distances and average HVIR. An example of a report produced is in Figure 3 below:

**Figure 3 – Asset register report for Bruce Highway, Section 10E, Benaraby to Rockhampton, Reverse.**

