TMA Hill Descent Monitoring Schemes

Schemes using the Telematics Monitoring Application (TMA)

February 2024

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About Us

Transport Certification Australia (TCA) is a national organisation that provides assurance services relating to transport technologies and data to enable improved public purpose outcomes from road transport.

Priority outcome areas enabled by TCA services include improved road safety, transport efficiency, freight productivity, asset management and sustainability.

Key aspects of TCA include:

- An independent not-for-profit entity, with government oversight

- Administration of the National Telematics Framework, including its rules, specifications, agreements, digital infrastructure and other supporting services

- Assurance services that support but are appropriately separated from regulators, policy makers and enforcement activities, and underpin telematics applications and associated information and data services

- Advice that is based on evidence and a deep subject matter knowledge

- Trusted partner to both government and industry stakeholders, enabling a nationally consistent open market, with services covering all road vehicle types and associated digital infrastructure.

Contents

1   Introduction

1.1   Purpose

This document describes TMA Hill Descent Monitoring (HDM) schemes associated with the Telematics Monitoring Application (TMA). A TMA HDM scheme is made available by an appropriate road authority or regulator ('Authority').

1.2   Scope

This document describes TMA HDM schemes and how they are used with the TMA application

The following information is included:

- Parameters of TMA HDM schemes

- Key processes of TMA HDM schemes

- Roles and responsibilities of TMA HDM scheme participants

- Scheme descriptions in appendices, organised by Authority.

1.3   Background

TMA HDM schemes provide Authorities with a way to manage sections of road with hazardous grades and road alignments. Using TMA HDM schemes, Authorities can use TCA-approved telematics devices to provide data on vehicle compliance with restrictions placed on access to specific hills.

A TMA HDM scheme is a specific use of the TMA application linked to delivering a policy objective. To participate in a TMA HDM scheme, an Operator (e.g. a transport operator) must conform with the requirements specified within an instrument of access approval (i.e. a permit or Notice). Enrolment in the TMA application is one of the requirements that must be met by the Operator. Enrolment in the TMA application is performed by the certified Application Service Provider (ASP) selected by the Operator.

Data is collected from vehicles fitted with TCA-approved telematics devices, and if applicable to a TMA HDM scheme, a Smart OBM system (i.e. an OBM system approved by TCA to Category B or Category C)[1].

The ASP is responsible for the installation of a TCA-approved telematics device in the vehicle being utilised in accordance with the instrument of access approval.

Where a Smart OBM system is required by a TMA HDM scheme, the Smart OBM system supplier (or Operator-nominated personnel that the supplier authorises as suitably trained) is responsible for the installation of a TCA-approved Smart OBM system in the vehicle being utilised in accordance with the instrument of access approval.

ASPs provide data records to TCA. TCA analyses the data and makes reports available to the Authority via the Telematics Analytics Platform (TAP) and other reporting mechanisms as applicable to the scheme and as agreed with the Authority. The TMA application is offered at Level 2 Assurance appropriate to these vehicles (see Appendix A for a definition of Level 2 Assurance).

The use of the TMA application[2] for a TMA HDM scheme:

- Provides vehicle data of enrolled vehicles on the nominated route

- Allows an ASP to offer any scheme associated with the TMA application that the ASP is certified to provide services for.

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[1] TCA approval of a telematics device or Smart OBM system may be in the form of type-approval or an equivalent approval mechanism acceptable to TCA. The ASP must meet applicable requirements in the functional and technical specification, irrespective of the approval mechanism.

[2] *The TMA application can be used for a variety of purposes. In this document, TMA is described in the context of the scheme.*

2   TMA Hill Descent Monitoring Schemes

2.1   Participants

Figure 1 outlines the key interactions between participants for the use of the TMA application for a TMA HDM scheme:

- The Authority requires the monitoring, with reporting, of the Operator's vehicle(s) as a condition of the Authority allowing the Operator and its vehicle(s) to participate in the scheme. The Authority may conduct compliance activities as necessary and as applicable to the scheme.

    Note: The functions associated with an Authority may involve a road authority or regulator, or both, as applicable to the scheme.

- Operators are vehicle operators that agree to enrol vehicles in the scheme, and consent to their data collected through the TMA application to be used for the intended purpose (as defined by the Authority and agreed to by the Operator in the ASP–Operator Agreement).

- ASPs, certified by TCA, offer telematics services (hardware, software and associated processes) to enable enrolment of eligible vehicles in the TMA application (as well as other applications available within the National Telematics Framework [NTF]), collection of data from installed telematics devices, and reporting of data to TCA.

- TCA administers the TMA application and its schemes within the NTF, ensuring that data security and privacy concerns are managed. TCA receives vehicle enrolment details from Operators via ASPs, and makes ASP–Operator Agreements available to participants. TCA also receives telematics data from ASPs, performs data analysis, and makes standard and specialised reports available to the Authority via TAP as agreed between the Authority and TCA.

Figure 1: Scheme Participants and Key Interactions
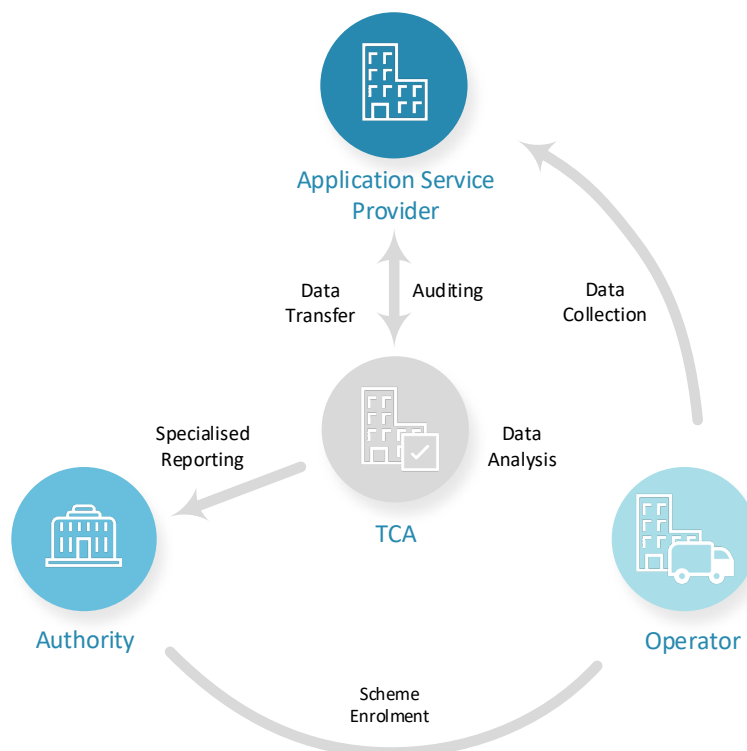
Note: Interactions between scheme participants are consistent with interactions between TMA application participants, and are not specific to the scheme.

2.2 Common Scheme Features

This section describes the common features of a TMA HDM scheme. It includes optional features of the TMA application that may be utilised by a TMA HDM scheme. For information on features that are specific to a TMA HDM scheme, refer to scheme descriptions in the appendices of this document.

a. ASP Certification

TCA will certify ASPs to provide services for the TMA application.

Note: In the ASP–TCA Certification Agreement, TCA will note any supported optional features of the TMA application that the ASP may provide services for. Not all ASPs will necessarily support all optional features.

b. Enrolment

ASPs will enrol vehicles in the TMA application and TMA HDM scheme at the request of the Operator.

The ASP will manage key steps of enrolment including approval, and as necessary, cancellation and replacement.

Note: Operators are expected to be more inclined to have their vehicles monitored through the TMA application based on the Authority transparently communicating the intended use of the TMA application, and obtaining assurance and safeguards from TCA that data collected through the TMA application will not be used for other, undisclosed purposes (such as compliance and enforcement).

Figure 2 shows the pre-enrolment steps for a TMA HDM scheme.

Figure 3 shows the reporting processes for a TMA HDM scheme

Figure 4 shows the enrolment cancellation and reporting processes for a TMA HDM scheme.

c. Devices and Data Collection

The primary device used in the TMA application is a telematics device, approved by TCA for use at Level 2 Assurance or higher.

The telematics device will collect:

- Position data at 30-second intervals, and

- Date and time data.

Note: The TMA application relies on changes in vehicle position records over a 30-second period to derive vehicle speed. Average and maximum vehicle speed results are estimates only, and may be influenced by factors such as road geometry and GNSS quality. Authorities should exercise caution when interpreting vehicle speed derived from the TMA application.

The following apply **only** if required by a scheme:

- If vehicle configuration and mass data is required, the data will be collected from vehicles with a Smart OBM system (i.e. an OBM system approved by TCA to Category B or C) installed. The Smart OBM system shall collect the mass data at 5-minute intervals.

- If self-declared data is required, self-declared data is manually collected via a user interface provided by the ASP.

  Note:

  i) *Refer to the scheme descriptions in the appendices of this document to determine whether the scheme requires these optional features.*

  ii) *Refer to the note under 2.2a regarding ASP support of optional features in the context of certification.*

d. Data Reporting

The ASP shall transfer data records collected through TMA to TCA no less frequently than each week or each month (as specified by the scheme), and as described in *Telematics Monitoring Application Functional and Technical Specification.*

e. Data Analysis and Reports

TCA will make data analysis and reporting for the scheme available to the Authority through TAP.

Through TAP, the Authority will have access to:

*   Interactive maps, which represent data collected as part of the scheme; and

*   If required by the Authority, specific reports required for scheme management (refer to the scheme description for examples).

    Note: The type, number and frequency of specific reports will be subject to agreed terms reached between TCA and the Authority.

The use of TMA for a TMA HDM scheme is intended to provide a basic representation of vehicle movements based on the data collected and the use of data for the intended purpose of the scheme (as agreed by the Operator in the ASP–Operator Agreement).

The Authority will manually review the operation of vehicles (through TAP) against the approved road network. TCA does not offer automated exception reporting to assess whether a vehicle has not met access conditions granted by the Authority.

A Scheme Participation Report will be made available to the Authority on a monthly basis via TAP. This report may include the following standard measures and dimensions as shown in Table 1.

Table 1: Scheme Participation Report

Example Measures
- Count of all vehicles enrolled in the scheme   - Count of vehicles enrolled in the scheme that TCA received data from   - Vehicles enrolled in the scheme that TCA did not receive data from for at least 30 consecutive days *Note: Reporting of this measure will include vehicle identities. An enrolled vehicle will only be included in this measure if, without a satisfactory explanation, it has not provided data for at least 30 consecutive days.*   - Count of Operators with vehicles enrolled in the scheme   - Count of ASPs reporting data for vehicles enrolled in the scheme

2.3   Key Scheme Processes

Figure 2 outlines the key actions taken by each participant during the pre-enrolment stage of the operation of a TMA HDM scheme.

Note: This process assumes that TCA has already certified the ASP to provide TMA application services.

Figure 2: Pre-Enrolment Process
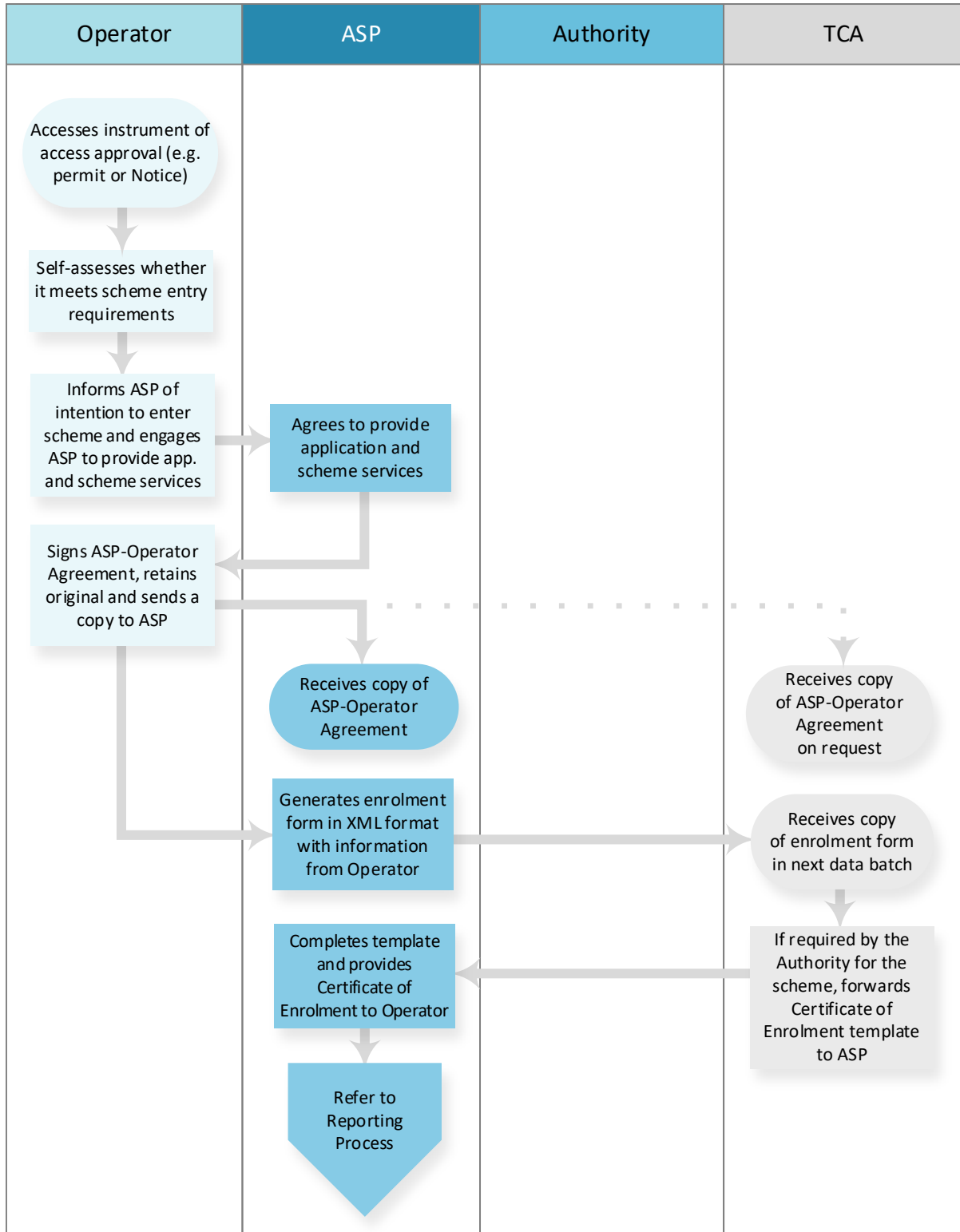
Figure 3 outlines the key actions related to data collection, record generation and reporting.

Figure 3: Reporting Processes
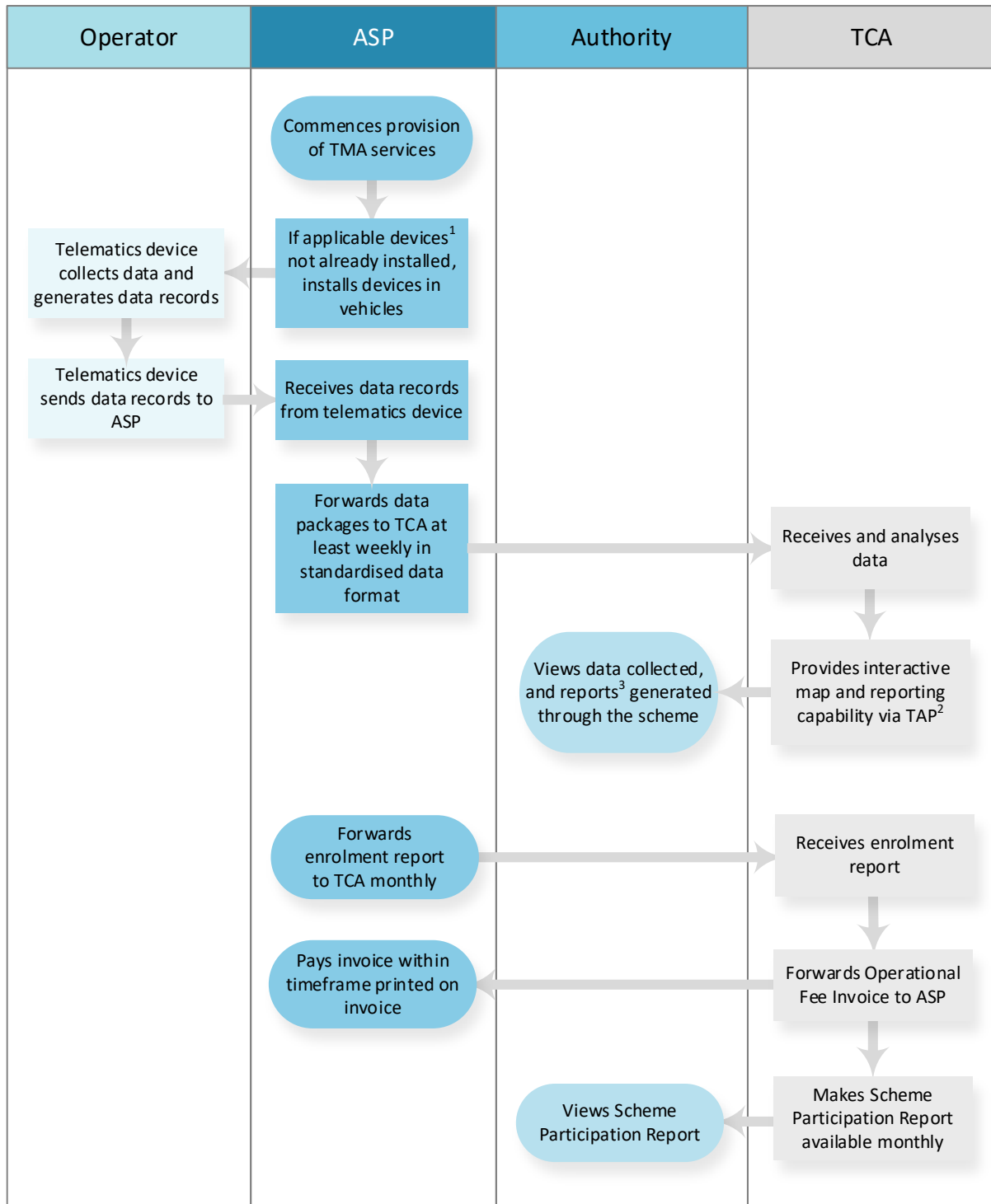
1. Applicable devices include a type-approved telematics device, and:
   - If mass and vehicle configuration will be collected, a type-approved OBM system at Category B or C; and/or
   - If comments are self-declared, a user interface connected to the type-approved telematics device.

2. Data will be updated at least weekly.

3. The Authority will nominate the locations that will be subject to location-based reports (subject to agreed terms).

Cancellation of enrolment may be initiated by the Operator, the Authority or the ASP.

Figure 4 outlines the key actions to discontinue enrolment of a vehicle in the scheme.

Figure 4: Enrolment Cancellation and Reporting Processes
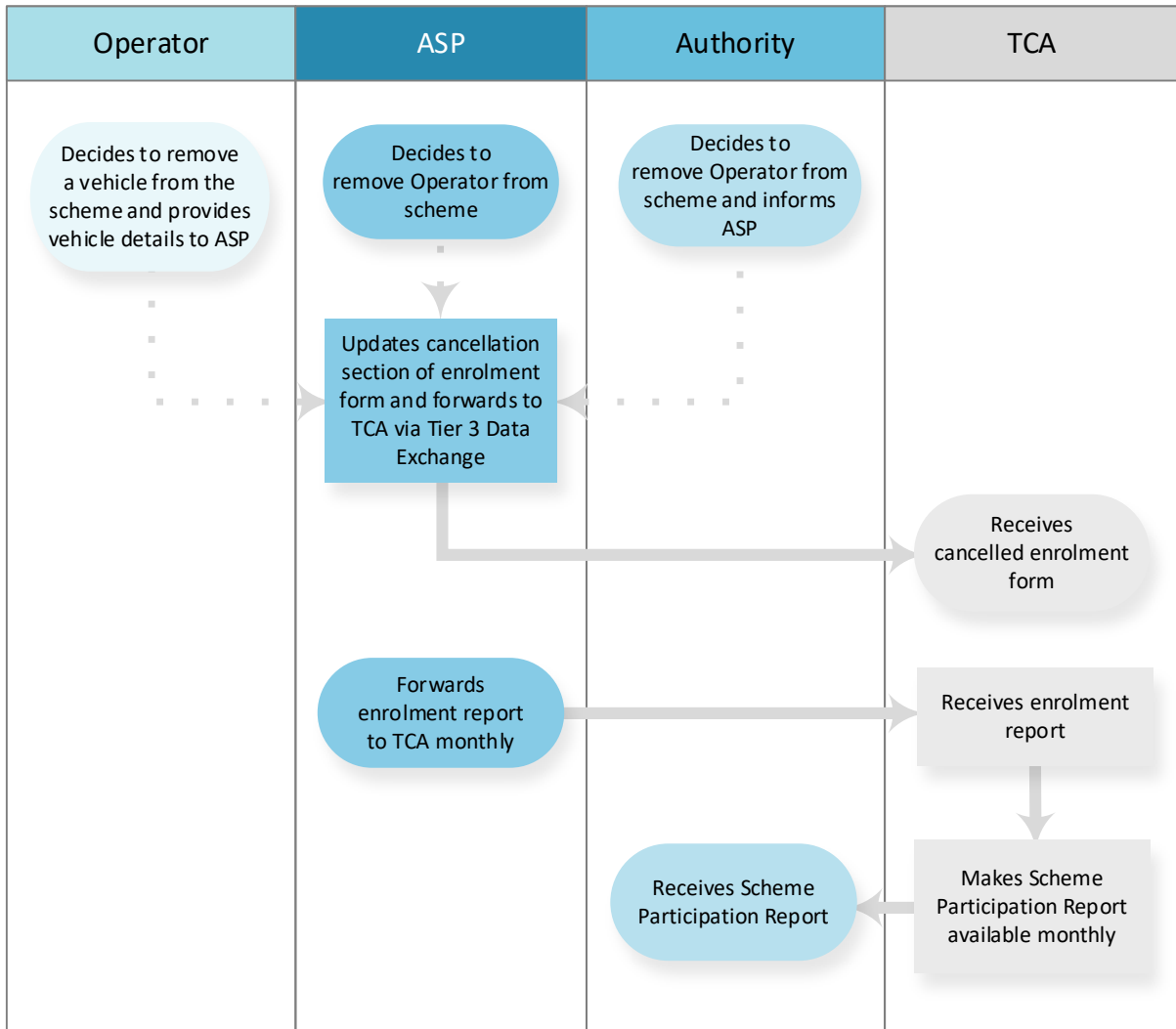
2.4   Roles and Responsibilities

In delivering the objectives of a TMA HDM scheme, **TCA** will:

- Provide a document (this document) describing the use of the scheme as part of the TMA application

- Produce or maintain collateral, as necessary, to support the scheme. Examples include the provision of current versions of:

   o *Telematics Monitoring Application Functional and Technical Specification;*

   o *Telematics Business-to-Business Data Transfer Functional and Technical Specification*;

   o *Telematics Device Functional and Technical Specification;*

   o (as required by a scheme) *On-Board Mass System Functional and Technical Specification;*

   o (as required by a scheme) *Interconnectivity of Telematics Device with Other Systems Functional and Technical Specification*

- Support the reporting of data records via Tier 3 Data Exchange using a RESTful application programming interface (API), with these records formatted using a JSON format

- Support the reporting of enrolment forms and enrolment reports using a RESTful API, with these documents formatted using an XML format

- Inform ASPs of the scheme details and entry conditions

- Produce an ASP–Operator Agreement for use with the scheme and make it available from the TCA website

- Ensure that TAP is set up to enable the Authority to access reporting generated by the scheme (in accordance with the intended purpose as agreed by the Operator in the ASP–Operator Agreement), and any malfunctions associated with vehicles enrolled in the scheme

- Maintain the cloud environment and databases, etc. for receipt of data records from the TMA application

- Produce and execute an ASP–TCA Certification Agreement, which formalises the relationship between TCA and the ASP with regard to ASP certification, or update the current Agreement

- Assess and certify whether an ASP meets requirements to provide TMA services (with the Smart OBM feature if applicable to the scheme)

- Approve applicable devices used in the scheme

- Ensure the intellectual property rights of ASPs are protected when assessing whether an ASP can meet operational requirements of the scheme

- If required by the Authority, provide certified ASPs with the Certificate of Enrolment template

- At the end of each month, forward Operational Fee Invoices to ASPs upon receipt of enrolment reports

- With the ASP, monitor via TAP whether a device malfunction has been resolved within agreed timeframes

- Notify the ASP when data from an enrolled vehicle has not been received for one month, followed by notification of the Authority if unresolved

- Provide the Authority with reports outlined in 2.2e via TAP

- Ensure the confidentiality of ASP data is maintained

- Unless directed by the Authority and consented to by the Operator, de-identify the TMA telematics data it has received relating to the Operator's nominated vehicle(s) 12 months from its receipt of the data.

The Authority will:

- Maintain policy documentation required by the Authority for the scheme

- Undertake program coordination activities related to the scheme with TCA

- Access reporting outlined in 2.2e via TAP, and review data trends and numbers of enrolled vehicles

- Conduct compliance activities as necessary and as applicable to the scheme.

Note: The functions associated with an Authority may involve a road authority or regulator, or both, as applicable to the scheme.

ASPs will:

- Interact with TCA to establish the delivery mechanism for provision of data packages to TCA (noting that a data package includes data records, enrolment forms and enrolment reports)

- Receive notification from Operators regarding the enrolment status of vehicles in the scheme, and forward this information to TCA using an agreed mechanism on a monthly basis

- Provide the ASP–Operator Agreement to an Operator once an agreement to provide services for the scheme has been made

- Be responsible for the installation, operation and maintenance of telematics devices (and any connected devices) and the reporting of data received from those devices, and as described in the *Telematics Monitoring Application Functional and Technical Specification*

- Upon request from TCA, and as applicable to a TMA HDM scheme, obtain from the Smart OBM system supplier (or Operator-nominated personnel that the supplier authorises as suitably trained) records of installation, operation, calibration, programmed maintenance and remediation-of-malfunction activity of individual Smart OBM systems and forward them to TCA

- If required by the Authority, provide Certificates of Enrolment to enrolled Operators, using the template received from TCA, and coordinate their removal from vehicles no longer enrolled in the scheme

- Pay Operational Fee Invoices received from TCA, generated upon receipt of enrolment reports, within the timeframe shown on the invoice

- In the event of a device malfunction: liaise with the Operator and/or device supplier to resolve the issue; report the malfunction (unidentifiable) to TCA within the required time period; monitor via TAP whether the device malfunction has been resolved within agreed timeframes, and notify TCA when the malfunction has been resolved

- Provide back office capability to process collected data records as required by the scheme

- Deliver data records to TCA, using agreed data delivery mechanism, required data formats and meeting data reporting requirements.

Operators will:

- Access scheme rules and entry conditions on the Authority's website (or other website as applicable, such as the National Heavy Vehicle Regulator) and determine whether they meet those conditions

- Access the permit or Notice and ensure compliance with the permit or Notice requirements for the scheme

- Upon self-assessment that scheme entry conditions are met, notify the ASP of its intention to enrol in the scheme

- Agree to share data collected by its ASP with TCA for the scheme using a signed ASP–Operator Agreement

- Follow rules for enrolment in the scheme

- If authorised by the Smart OBM system supplier to do so, maintain records of installation, operation, calibration, programmed maintenance and remediation-of-malfunction activity for individual Smart OBM systems

- Store original signed ASP–Operator Agreement and forward copies to the ASP and TCA (on request)

- Engage an ASP to provide services for the scheme

- Notify the ASP of the date that a vehicle or the Operator will no longer participate in the scheme.

A Acronyms and Definitions

Acronyms

Acronym	Definition
ASP	Application Service Provider
FTPS	File Transfer Protocol Secure
GNSS	Global Navigation Satellite System
GVM	gross vehicle mass
HDM	Hill Descent Monitoring
NTF	National Telematics Framework
OBM	on-board mass
TAP	Telematics Analytics Platform
TO	transport operator

Definitions

Term	Definition
application	A capability of the NTF that provides business value to stakeholders, delivered as an assembly of policy, business components and technical components, within in the context of an identified level of assurance.
Application Service Provider (ASP)	A service provider that has been certified by TCA as meeting the requirements of one of more telematics applications.
approval mechanism	The mechanism by which TCA approves a device, such as a telematics device or connected device, for use in a telematics application. The approval mechanism used may be type-approval, or an equivalent approval mechanism acceptable to TCA.
ASP–TCA Certification Agreement	The written agreement made between TCA and an ASP that recognises the fact that the ASP, having satisfied TCA's requirements for appointment as an ASP, is appointed in that capacity, and sets out the legal obligations of each party with respect to the ongoing role of the ASP.
ASP–Operator Agreement	A written agreement between an ASP, an Operator and TCA which sets out the terms on which the ASP will provide application services to the Operator, and the intended purpose for collecting data from the Operator's vehicle(s) enrolled in the scheme.
Authority	An entity, associated with a jurisdiction, responsible for the administration of one or more NTF applications. An Authority may appoint an administrator to perform its functions. *See also jurisdiction.* *Note: The functions associated with an Authority may involve a road authority or regulator, or both, as applicable to the scheme.*
connected device	Any device or technology connected to a telematics device.
data package	A package of information sent via Tier 3 Data Exchange for a data collection period
data record	A discrete and defined set of data elements generated by a device.
enrolment	Both the process and outcome by which an Operator enters an Authority's scheme. Each vehicle must be enrolled for each scheme it participates in. Enrolment also confirms the application and conditions (if applicable) that the vehicle is monitored under.
enrolment form	An electronic document that formally and simultaneously records the enrolment of a vehicle within a scheme, and within the application required by that scheme.
enrolment report	A summary of enrolments relevant to a given Authority for a specified reporting period, including any aggregated data required by specific applications.
jurisdiction	A geographical area containing a road network (i.e. typically an Australian state or territory).
level of assurance	An assurance level that supports telematics applications, structured around the intended use of a telematics application, risks being managed, and the needs and expectations of consumers and other stakeholders.
Level 2 Assurance	Independent assessment of specific elements of a telematics application. Telematics data is combined with other data sources.

Term	Definition
OBM system	A device which determines the mass of axle groups of a vehicle. TCA categorises OBM systems as follows: • Category A – OBM systems in this category electronically display collected data to drivers and/or loaders. • Category B – OBM systems in this category also collect data and transfer the collected data to a telematics device using a mechanism agreed and implemented by the manufacturer of the telematics device and the OBM system. • Category C – OBM systems in this category collect data and transfer data records in a standardised way to a telematics device (in accordance with *Interconnectivity of Telematics Device with Other Systems Functional and Technical Specification*).
Operator	An entity that operates one or more vehicles eligible to enter a scheme.
Regulator	In the context of a scheme, an entity that provides regulatory and/or legislative context for the scheme, and may conduct compliance activities as applicable to the scheme.
scheme	The generic term for a specific use of an application linked to delivering a policy objective.
self-declaration	The self-declaration of data by an Operator and/or its nominated representative to the ASP.
Smart OBM system	An OBM system approved by TCA to Category B or C. *See also: OBM system.*
telematics device	The primary telematics unit which monitors vehicle parameters.
Tier 1 Data Exchange	A web services solution where structured information is exchanged that complies with requirements such as authentication, security, privacy and certainty of delivery. It includes exchanges of information related to a vehicle's enrolment in telematics applications, conditions and adherence to those conditions.
Tier 2 Data Exchange	The human-initiated (rather than automated) exchange of business-related information and advice. Typical exchanges via this tier include reporting of issues and resolutions, correspondence regarding certification and re-certification, advice regarding information and communications technology (ICT), data assurance and other reporting.
Tier 3 Data Exchange	The packaging and delivery of data packages, comprising data records and enrolment-related artefacts. Data packages have several uses which include data analysis by the recipient, data assurance, and for research purposes.
vehicle category	A named business-level description of a prime mover/rigid truck and any trailers as defined by a vehicle category dataset approved for use by TCA. Example: 'Semi Trailer 6 Axle'.
vehicle configuration	A technical representation of the on-road footprint of the vehicle (that is, the number and configuration of trailers and axle groups), and is determined using data from the OBM system and data supplied by the ASP. It is typically captured with axle group pattern notation, for example '2-44/S444' for the vehicle category of Semi Trailer 6 Axle.

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B   TMA HDM Schemes for Main Roads Western Australia

B.1   TMA Hill Descent Monitoring – Roelands Hill Scheme (WA)

Purpose

The TMA Hill Descent Monitoring – Roelands Hill Scheme (WA) is a scheme administered by Main Roads Western Australia (MRWA) to monitor:

- Estimated speed of Category 7 (A) AB Triples operating under permit on part of the MRWA road network, namely Roelands Hill (noting the permit to operate will be related to this section of road only, and any other permits that vehicles operate under are considered separately)

- Whether enrolled vehicles stop for a sufficient period prior to descending Roelands Hill.

- Whether enrolled vehicles exceed the 40 km/h speed limit when descending Roelands Hill.

Background

The Coalfields Highway is a major route that travels from Collie to Roelands (near Bunbury, south of Perth).

The scheme will include the monitoring of Category 7 (A) AB Triples with tri-axle group trailers travelling on the Coalfields Highway and descending the 2.2 km length of Roelands Hill under a permit arrangement, where a 40 km/h speed limit applies.

Vehicles are required to stop prior to descending Roelands Hill, to enable checking of loads, brakes and the selection of low gear.

To participate in the scheme, Operators must conform with the requirements specified within the permit described on the MRWA website.

Scheme Features

The following features are specific to the scheme:

a.   Devices and Data Collection

The collection of mass or self-declared data is not required.

b.   Data Analysis and Reports

MRWA will have access to reporting required for scheme management, which includes:

- Through TAP, MRWA will have access to interactive maps, which represent de-identified and aggregated data collected as part of the scheme.

- To MRWA personnel with access to data for compliance purposes to fulfill MRWA's regulatory function, TCA will forward specialised reports specific to Roelands Hill of individual and identifiable vehicles that include the following measures:

  o   Estimated average vehicle speed between each consecutive vehicle position record along Roelands Hill

  o   Estimated average vehicle speed along the length of Roelands Hill

  o   Period of time that each vehicle is stopped just prior to travelling down Roelands Hill

  o   Estimated average speed and estimated maximum speed of enrolled vehicles that exceed 40 km/h down Roelands Hill.

  Note: In relation to this scheme, MRWA compliance personnel will have access to identifiable data which relates to the derived speed of each vehicle along the length of Roelands Hill, and the period of time that the vehicle stopped prior to descending the hill.

c. <u>Data Reporting</u>

The ASP shall transfer data records collected through TMA to TCA no less frequently than each week, and as described in *Telematics Monitoring Application Functional and Technical Specification.*

Other aspects of this scheme operate in accordance with generic TMA HDM processes, such as ASP Certification, Enrolment, Data Reporting, and Data Analysis and Reports. For more information, see 2.2.

Data Element Reference Values

Refer to the following when entering scheme name or Authority code values to an enrolment report or enrolment form:

Table B.1: Scheme Name and Authority Code

Scheme Name (full)	Abbreviated Scheme Name (for enrolment report and form)	Authority Code
TMA Hill Descent Monitoring – Roelands Hill Scheme (WA)	HDMROE	WA

B.2   TMA Hill Descent Monitoring – Lesmurdie Hill Scheme (WA)

Purpose

The TMA Hill Descent Monitoring – Lesmurdie Hill Scheme (WA) is a scheme administered by Main Roads Western Australia (MRWA) to monitor:

- Estimated speed of vehicles on the National PBS Level 2B Scheme operating under permit on part of the MRWA road network, namely Lesmurdie Hill (noting the permit to operate will be related to this section of road only, and any other permits that vehicles operate under are considered separately)

- Whether enrolled vehicles stop for a sufficient period prior to descending Lesmurdie Hill

- Whether enrolled vehicles exceed the 40 km/h speed limit when descending Lesmurdie Hill.

Eligible vehicles will be enrolled in the scheme on a case-by-case basis.

Background

Welshpool Road East is a major route that travels from Carmel to the Roe Highway (south of Perth).

The scheme will include the monitoring of vehicles on the National PBS Level 2B Scheme (up to 30.0 m long) travelling on Welshpool Road East and descending the 4 km length of Lesmurdie Hill under a permit arrangement, where a 40 km/h speed limit applies.

Vehicles are required to stop prior to descending Lesmurdie Hill, to enable checking of loads, brakes and the selection of low gear.

To participate in the scheme, Operators must conform with the requirements specified within the permit described on the MRWA website.

Scheme Features

The following features are specific to the scheme:

a.   Devices and Data Collection

   The collection of mass or self-declared data is not required.

b.   Data Analysis and Reports

   MRWA will have access to reporting required for scheme management, which includes:

   - Through TAP, MRWA will have access to interactive maps, which represent de-identified and aggregated data collected as part of the scheme.

   - To MRWA personnel with access to data for compliance purposes to fulfill MRWA's regulatory function, TCA will forward specialised reports specific to Lesmurdie Hill of individual and identifiable vehicles that include the following measures:
     - o   Estimated average vehicle speed between each consecutive vehicle position record along Lesmurdie Hill
     - o   Estimated average vehicle speed along the length of Lesmurdie Hill
     - o   Period of time that each vehicle is stopped just prior to travelling down Lesmurdie Hill
     - o   Estimated average speed and estimated maximum speed of enrolled vehicles that exceed 40 km/h down Lesmurdie Hill.

   Note: In relation to this scheme, MRWA compliance personnel will have access to identifiable data which relates to the derived speed of each vehicle along the length of Lesmurdie Hill, and the period of time that the vehicle stopped prior to descending the hill.

c.   Data Reporting

The ASP shall transfer data records collected through TMA to TCA no less frequently than each week, and as described in *Telematics Monitoring Application Functional and Technical Specification.*

Other aspects of this scheme operate in accordance with generic TMA HDM processes, such as ASP Certification, Enrolment, Data Reporting, and Data Analysis and Reports. For more information, see 2.2.

Data Element Reference Values

Refer to the following when entering scheme name or Authority code values to an enrolment report or enrolment form:

Table B.2: Scheme Name and Authority Code

Scheme Name (full)	Abbreviated Scheme Name (for enrolment report and form)	Authority Code
TMA Hill Descent Monitoring – Lesmurdie Hill Scheme (WA)	HDMLES	WA

B.3   TMA Hill Descent Monitoring – Greenmount Hill Scheme (WA)

Purpose

The TMA Hill Descent Monitoring – Greenmount Hill Scheme (WA) is a scheme administered by Main Roads Western Australia (MRWA) to monitor:

- Estimated speed of vehicles on the National PBS Level 2B Scheme operating under permit on part of the MRWA road network, namely Greenmount Hill (noting the permit to operate will be related to this section of road only, and any other permits that vehicles operate under are considered separately)

- Whether enrolled vehicles stop for a sufficient period prior to descending Greenmount Hill

- Whether enrolled vehicles exceed the 40 km/h speed limit when descending Greenmount Hill.

Eligible vehicles will be enrolled in the scheme on a case-by-case basis.

Background

The scheme will include the monitoring of vehicles on the National PBS Level 2B Scheme (up to 30.0 m long) travelling on the Great Eastern Highway and descending the length of Greenmount Hill under a permit arrangement, where a 40 km/h speed limit applies.

Vehicles are required to stop prior to descending Greenmount Hill, to enable checking of loads, brakes and the selection of low gear.

Signposts mark the beginning and end of the monitored section of road.

To participate in the scheme, Operators must conform with the requirements specified within the permit described on the MRWA website.

Scheme Features

The following features are specific to the scheme:

a.   Devices and Data Collection

   The collection of mass or self-declared data is not required.

b.   Data Analysis and Reports

   MRWA will have access to reporting required for scheme management, which includes:

- Through TAP, interactive maps, which represent de-identified and aggregated data collected as part of the scheme.

- To MRWA personnel with access to data for compliance purposes to fulfill MRWA's regulatory function, TCA will forward specialised reports specific to Greenmount Hill of individual and identifiable vehicles that include the following measures:
    - o   Estimated average vehicle speed between each consecutive vehicle position record along Greenmount Hill
    - o   Estimated average vehicle speed along the length of Greenmount Hill
    - o   Period of time that each vehicle is stopped just prior to travelling down Greenmount Hill
    - o   Estimated average speed and estimated maximum speed of enrolled vehicles that exceed 40 km/h down Greenmount Hill.

   Note: In relation to this scheme, MRWA compliance personnel will have access to identifiable data which relates to the derived speed of each vehicle along the length of Greenmount Hill, and the period of time that the vehicle stopped prior to descending the hill.

c. Data Reporting

The ASP shall transfer data records collected through TMA to TCA no less frequently than each week, and as described in *Telematics Monitoring Application Functional and Technical Specification.*

Other aspects of this scheme operate in accordance with generic TMA HDM processes, such as ASP Certification, Enrolment, Data Reporting, and Data Analysis and Reports. For more information, see 2.2.

Data Element Reference Values

Refer to the following when entering scheme name or Authority code values to an enrolment report or enrolment form:

Table B.3: Scheme Name and Authority Code

Scheme Name (full)	Abbreviated Scheme Name (for enrolment report and form)	Authority Code
TMA Hill Descent Monitoring – Greenmount Hill Scheme (WA)	HDMGRN	WA

C   TMA HDM Schemes for Transport for NSW

C.1   TMA Hill Descent Monitoring – Mount Ousley Scheme (NSW)

Purpose

The TMA Hill Descent Monitoring – Mount Ousley Scheme (NSW) is a scheme administered by Transport for NSW to monitor:

- Movement, mass and estimated speed of enrolled vehicles operating under an appropriate instrument of access approval on part of the NSW road network, namely Mount Ousley (noting the instrument of access approval will be related to this section of road only, and any other permits or Notices that these vehicles operate under are not monitored by this scheme)

- Estimated speed that exceeds the 40 km/h speed limit when descending Mount Ousley

- Mass that exceeds the mass limits stated in the applicable instrument of access approval when descending Mount Ousley.

The scheme will provide Transport for NSW with visibility over the safe operation of enrolled vehicles on this high-risk part of the NSW road network.

Background

Heavy vehicle combinations, conformant with the appropriate instrument of access approval, travel the steep descent at Mount Ousley on Princes Motorway for a variety of reasons, which may include:

- carrying coal from a colliery on Appin Road and travelling down Mt Ousley to Port Kembla

- carrying essential goods from Sydney to destinations further south.

The scheme will include the monitoring of eligible vehicles at a gross vehicle mass (GVM) of over 68.5 tonnes travelling on Princes Motorway and descending the length of Mount Ousley under an applicable instrument of access approval, where a 40 km/h speed limit and applicable mass limit applies. Speed limit signposts mark the beginning and end of the section of the Princes Motorway at Mount Ousley where the speed and mass limit will be monitored through the scheme.

Table C.1.1 lists vehicle categories that can be enrolled in the scheme.

Table C.1.1 TMA HDM–Mount Ousley Scheme (NSW) – Applicable Vehicle Categories

Vehicle Categories	GVM	Defined In	Available From
Eligible PBS Level 2B combinations at Tier 1 mass[1], travelling under GML, CML or HML	> 68.5 t	National Class 2 Performance Based Standards (Tier 1) Authorisation Notice	NHVR website
Eligible PBS Level 2B A-Double combinations at Tier 3 mass[2], travelling under GML, CML or HML		National Class 2 Performance Based Standards (High Productivity) Authorisation Notice	NHVR website
Eligible heavy vehicles at Tier 3 mass[2]		Permit	NHVR website

1   Tier 1 mass means the PBS vehicle meets bridge formulae for the level of access requested.

2   Tier 3 mass means the PBS vehicle does not meet bridge formulae for the level of access requested – it must be individually assessed for route suitability.

To participate in the scheme, Operators must conform with the requirements specified within the appropriate instrument of access approval.

Scheme Features

The following features are specific to the scheme:

a.   Devices and Data Collection

In addition to fitment of a telematics device, eligible vehicles must also be fitted with a Smart OBM system. The Smart OBM system must collect mass and vehicle configuration as described in 2.2c.

> *Important: Until 1 June 2024, Operators of eligible A-Double combinations operating under the 'Interim OBM' arrangement may continue operating whilst in the process of arranging fitment of TCA-approved Smart OBM systems to those vehicles. Fitment of a Smart OBM system in an eligible vehicle is mandatory after 1 June 2024.*

b.   Data Analysis and Reports

Transport for NSW will have access to the following data analysis and reporting for the scheme:

- Through TAP, interactive maps, which represent de-identified and aggregated data collected as part of the scheme.

- Graphical representations that include statistical analyses of gross vehicle mass and estimated vehicle speed at Mount Ousley.

  Note:

  o   *Measures reported are as agreed between Transport for NSW and TCA from time to time.*

  o   *TCA will provide the reports to Transport for NSW no less frequently than each month.*

Data Reporting

The ASP shall transfer data records collected through TMA to TCA no less frequently than each week, and as described in *Telematics Monitoring Application Functional and Technical Specification.*

Other aspects of this scheme operate in accordance with generic TMA HDM processes, such as ASP Certification, Enrolment, Data Reporting, and Data Analysis and Reports. For more information, see 2.2.

Data Element Reference Values

Refer to the following when entering scheme name or Authority code values to an enrolment report or enrolment form:

Table C.1.2: Scheme Name and Authority Code

Scheme Name (full)	Abbreviated Scheme Name (for enrolment report and form)	Authority Code
TMA Hill Descent Monitoring – Mount Ousley Scheme (NSW)	HDMOUS	NSW

C.2 TMA Hill Descent Monitoring – Beacon Hill Scheme (NSW)

Purpose

The TMA Hill Descent Monitoring – Beacon Hill Scheme (NSW) is a scheme administered by Transport for NSW to monitor:

- Movement, mass and estimated speed of PBS Truck and Dog vehicles operating under permit on part of the NSW road network, namely Beacon Hill (noting the permit to operate will be related to this section of road only, and any other permits or Notices that these vehicles operate under are not monitored by this scheme)
- Estimated speed that exceeds the 20 km/h speed limit when descending Beacon Hill
- Mass that exceeds 57.5 tonnes when descending Beacon Hill.

The scheme will provide Transport for NSW with visibility over the safe operation of enrolled vehicles on this high-risk part of the NSW road network.

Background

Warringah Road is a major route that travels between Roseville Chase and Pittwater Road in Brookvale, in Sydney's northern suburbs. The section of this road that will be monitored descends from Alfred Street to Pittwater Road, and is referred to in this scheme as 'Beacon Hill'. Crashes at the signalled intersection at the bottom of the hill have been reported due to heavy vehicles not being able to brake in time.

The scheme will include the monitoring of PBS Truck and Dog vehicles travelling on Warringah Road and descending the length of Beacon Hill under a permit arrangement, where a 20 km/h speed limit and 57.5 tonne mass limit applies. Speed limit signposts mark the beginning and end of the section of the Warringah Road at Beacon Hill where the speed and mass limit will be monitored through the scheme.

To participate in the scheme, Operators must conform with the requirements specified within the appropriate instrument of access approval.

Scheme Features

The following features are specific to the scheme:

a. Devices and Data Collection

In addition to fitment of a telematics device, eligible vehicles must also be fitted with a Smart OBM system. The Smart OBM system must collect mass and vehicle configuration as described in 2.2c.

b. Data Analysis and Reports

Transport for NSW will have access to the following data analysis and reporting for the scheme:

- Through TAP, interactive maps, which represent de-identified and aggregated data collected as part of the scheme
- Graphical representations that include statistical analyses of gross vehicle mass and estimated vehicle speed at Beacon Hill.

    Note:

    o   *Measures reported are as agreed between Transport for NSW and TCA from time to time.*

    o   *TCA will provide the reports to Transport for NSW no less frequently than each month.*

c. Data Reporting

The ASP shall transfer data records collected through TMA to TCA no less frequently than each week, and as described in *Telematics Monitoring Application Functional and Technical Specification.*

Other aspects of this scheme operate in accordance with generic TMA HDM processes, such as ASP Certification, Enrolment, Data Reporting, and Data Analysis and Reports. For more information, see 2.2.

Data Element Reference Values

Refer to the following when entering scheme name or Authority code values to an enrolment report or enrolment form:

Table C.2: Scheme Name and Authority Code

Scheme Name (full)	Abbreviated Scheme Name (for enrolment report and form)	Authority Code
TMA Hill Descent Monitoring – Beacon Hill Scheme (NSW)	HDMBEA	NSW