Telematics Industry Group (TIG)
14 February 2019

Welcome!
Overview of Today’s Session

Gavin Hill
General Manager
Strategic Development/Implementation
01. Remove barriers to innovation
02. Reduce duplication effort and cost
03. Avoid potential market failures
04. Avoid potential regulatory failures
The National Telematics Framework is a digital business platform consisting of infrastructure and rules that support an open marketplace of telematics and related intelligent technology providers.

Allows multiple applications to co-exist with different levels of assurance

Links producers, providers and consumers
National Telematics Framework

National Telematics Framework Ecosystem

PRODUCERS
Creators of Framework offerings and applications (government bodies, regulators, private sector)

CONSUMERS
Buyers or users of Framework offerings and applications (operators, drivers, end-users)

PROVIDERS
Interfaces for the Framework (telematics and intelligent technology service providers)

TCA
Administrator of the Framework and governance of participants

TCA
Transport Certification Australia

www.tca.gov.au
Update on TCA

Nick Koukoulas
Chief Executive Officer
Austroads Ltd
Austroads
Nick Koukoulas
Chief Executive

Improving the safety, productivity and sustainability of Australasian road networks through research and collaboration.
Austroads

Peak organisation of Australasian road transport and traffic agencies.

873,500 kilometres of roads

$250AU/$189US/€157 billion value

Activities:

- strategic research
- promote a consistency
- share knowledge
- conduct business activities
- foster international collaboration.
Structure

Programs

• Assets
• Safety
• Network
• Connected and Automated Vehicles

National Exchange of Vehicle and Driver Information System (NEVDIS)

• enables road authorities to interact across state borders
• supports transport and automotive industries
• owned by Austroads
Assets Program

Extending the life and performance of road infrastructure

- Materials development
- Strategic management of road infrastructure
- Managing loading impacts
- Pavement management
- Bridge management
- Managing for climate change
- Managing rural and remote roads
Network Program

Improving mobility on the road network

• Managing urban congestion
• Traffic management planning and infrastructure
• Freight transport/road productivity
• Road funding models
• Active travel and integration with public transport
Safety Program

Planning, designing and managing ‘Towards Zero’

• mapping crash risks
• targeting research to mitigate emerging crash risks and gaps in knowledge
• providing harmonised, concise, and simple guidance.
Realising the benefits of emerging technologies

- Infrastructure readiness
- Regulatory readiness
- Data readiness
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Road Infrastructure Management (RIM) application – NSW deployment

Scott Greenow
Senior Manager, Network Management
Roads & Maritime Services
Questions and comments

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Levels of assurance through the National Telematics Framework

Gavin Hill
General Manager
Strategic Development/Implementation
National Telematics Framework

NATIONAL TELEMATICS FRAMEWORK ECOSYSTEM

PRODUCERS
Creators of Framework offerings and applications (government bodies, regulators, private sector)

CONSUMERS
Buyers or users of Framework offerings and applications (operators, drivers, end-users)

PROVIDERS
Interfaces for the Framework (telematics and intelligent technology service providers)

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Administrator of the Framework and governance of participants
Different levels of assurance

The National Telematics Framework supports multiple applications, as well as different levels of assurance. This allows Producers to determine the level of assurance for applications, depending on:

- The **intended use** of a telematics application
- The **risks** being managed
- The **needs and expectations** of consumers (and other stakeholders)
Different levels of assurance

• Apply the appropriate level of **independent assessment** commensurate with intended outcomes

• **Allocate risk** to the party/ies best placed to manage those risks

• Obtain the **right balance** between costs and benefits
Different levels of assurance

Assurance levels can be “dialled-up” or “dialled-down”…

…without impacting the common business rules of the National Telematics Framework
Different levels of assurance

The National Telematics Framework does not prescribe or ‘hard-wire’ a specific level of assurance.

Instead, the level of assurance is determined by individual producers (or consumers).
# Different levels of assurance

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>DESCRIPTION</th>
<th>EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 Assurance</td>
<td>Self-assessment or advisory No independent oversight</td>
<td>Consumers need to self-assess the use of data in relation to its intended use</td>
</tr>
<tr>
<td>Level 2 Assurance</td>
<td>Independent assessment – periodic audit</td>
<td>The use of telematics data in combination with other data sources, to deliver an intended purpose</td>
</tr>
<tr>
<td>Level 3 Assurance</td>
<td>Independent assessment – oversight</td>
<td>The use of telematics data as the primary source of data to deliver an intended purpose</td>
</tr>
</tbody>
</table>

- **Certification of data**
  - Certificate based data and evidence
  - Independent assessment and oversight of telematics application and service provision.
Different levels of assurance

Level 1 relies on the self-assessment. Associated with ‘advisory’ applications, where data is not being depended upon for high levels of accuracy or integrity.

Level 2 provides greater rigour in the collection and reporting of information from a telematics application. Complemented with other data sources (i.e. data collected from other systems, administrative records).

Level 3 provides the necessary environment for collection and secure storage of high-integrity data which may provide (subject to underlying legislative provisions) certificate-based data and evidence.
Different levels of assurance

There is no perfect fit or alignment with any one of the levels of assurance.

Rather, there are numerous sub-options within each level of assurance, which will be influenced by any number of factors.
Determining the appropriate level of assurance (1/2)

- What is the problem that is sought to be solved?
- Why is producer (government or commercial entity) action needed?
- How much of the problem/action will be undertaken by the telematics application and how much can/should be undertaken outside the application?
- What benefits would an application of the National Telematics Framework enable?
- What is the net benefit of the desired behaviours that are being sought?
Determining the appropriate level of assurance (2/2)

• What incentives exist for consumer participants to game/cheat the application?

• What is the intended use of the information obtained from the application (i.e. could it be used against consumer participants)?

• How will the application interact with other interventions (i.e. is it stand alone, will it be used in conjunction with other information, could it be used to influence other government permissions)?

• How will participation in the application be facilitated?
Questions and comments

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Updated Telematics IVU Functional and Specification (Version 3)

Peter Clark
Specification Manager
Reasons for this update

1. Make requirements more functional and less prescriptive
   - Provide more options for meeting requirements
   - Reduce barriers to uptake
   - Reduce costs of meeting requirements where possible

2. Acknowledge that technology has advanced in certain areas, and that after analysis of TCA’s testing and auditing evidence base, some requirements can be less stringent or removed
   - Evidence-based changes include stakeholder feedback
3. Acknowledge that the IVU may support multiple NTF applications, including:
   • Applications and features described in the Business Case to the Transport and Infrastructure Council (TIC) approved by Ministers
   • Applications with different levels of assurance (Levels 1, 2 and 3)

This allows producers to offer multiple applications with differing levels of assurance without requiring investment in new IVUs, or needing multiple IVUs in the same vehicle to support applications at different levels of assurance.

4. Make implicit requirements more explicit, and acknowledge that the IVU may be more than just a ‘black box’
More functional, less prescriptive
More functional, less prescriptive

With greater focus on outcomes, reduced need to specify how something is expected to be done

• Removed internal power supply from list of core functions.
• Removed how a GNSS receiver is connected to GNSS antenna (and how communications device is connected to communications antenna).
• Removed requirement for an internal backup battery. Stated instead that the IVU must be able to be operated, within limits, when disconnected from the external power supply.
More functional, less prescriptive

- Combined several requirements into a single requirement for a feature that provides evidence of unauthorised removal or opening of IVU
- Merged Security Seals (Section A.3) with Section A.1 and removed requirements specific to security seals. Focus on expected functional outcomes instead
- Removed ‘Doppler’ as the prescribed method for measuring speed (e.g. ‘GNSS-derived method’, instead of ‘GNSS Doppler-derived method’)

More functional, less prescriptive

Environmental Characteristics

• Added introductory requirement that allows in-field performance evidence to be provided as evidence of compliance
  Replaced phrase ‘from an appropriate body with the following or equivalents’ with ‘compliance with the following standards or their equivalents’

• For radiated and conducted emissions added ACMA Regulatory Compliance Mark as another way of providing evidence of compliance

• Added that if an environmental characteristic requirement is not applicable or unnecessary as a result of IVU installation, that requirement shall not apply

IVU GNSS Capability

• Removed requirement in note that GNSS antenna should be mounted on outside of vehicle
Technology advance, less stringent requirements
Technology advance, less stringent requirements

Technology advance: GNSS

- Replaced GPS with GNSS throughout document. Changed ‘Vehicle Speed’ to ‘GNSS Speed’
- Added note clarifying type-approval in a multi-GNSS environment
- Added note that suitable GNSS must provide publicly available measures of health and historical performance; info on suitable GNSS available from TCA
- Removed note stating that desired speed measurement performance is possible where the IVU GNSS receiver is configured to only use line-of-sight satellites
Technology advance, less stringent requirements

From analysis of testing and auditing evidence bases, some parameters can be relaxed as appropriate to answer intent of requirement

- Removed physical characteristics requirement related to electrostatic discharge
- Allowed slightly wider fixed mask angle for the IVU GNSS receiver (5 to 20 degrees, instead of 10 to 20 degrees)
- Shortened time an IVU internal clock needs to operate or be accurate (7 days, from 28) if external power supply fails
- Softened resolution of direction of travel to 1 degree or better (from 0.1)
- Modified compliance percentage for measurement of vehicle speed from 99.9% to 99.5%
- Added requirement such that for any of four preceding alarm status data requirements, if a suitable protection feature exists to prevent disconnection or access (as applicable), that requirement shall not apply
Technology advance, less stringent requirements

From analysis of testing and auditing evidence bases, some parameters can be relaxed as appropriate to answer intent of requirement.

• Shortened the time an IVU internal clock needs to store data (7 days, from 28) if IVU fails or shuts down

• Shortened the time an IVU monitors ignition status and other independent movement sensor (1 day, from 7) if IVU fails or shuts down

Transfer of Data from IVU

• Removed mention of term ‘data blocks’, and merged requirements with ‘IVU Data Records and Data Blocks’ and ‘Integrity and Origin of Data Blocks and IVU Data Records’
IVU support for multiple NTF applications
IVU support for multiple NTF applications

Telematics IVU

• Added expectation that IVU should be able to support different applications

• Added note under examples of IVU data records as a reminder that data records are not necessarily expected to be standalone

  *In environments where multiple NTF applications are supported, data may be combined within the data stream as needed*

Record Numbering

• Harmonised with corresponding ‘core’ content in applications such as Intelligent Location Monitoring, Intelligent Mass Monitoring and Intelligent Mass Assessment

  An application may specify a separate numbering sequence for a specific type of data record
State previously implicit requirements
State previously implicit requirements

Background: Telematics IVU

• Added that IVU may not be a single device, but a collection of core functions, or a distributed system.
  Included schematic of this concept on cover.

Installation, Operation and Maintenance

• Added new section modelled on corresponding section in OBM System Spec.

IVU Alarm Records

• To event subclauses i) to l), added ‘(regardless of whether the vehicle is in operation or not in operation)’
Questions and comments

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On-Board Mass (OBM) System type-approval

Paul Corkill
General Manager
Operations
OBM System Functional and Technical Specification

• Valuable as a stand alone document
• Can be used to for self-assessment of available systems by purchasers
• Self-assessment by OBM suppliers
• Forms the basis for type-approval
• Available at:
  www.tca.gov.au
OBM System Functional and Technical Specification

- Physical Characteristics
- Environmental Characteristics
- Data Collection
- Record Generation
- Functionality
- Data Storage
- Data Security and Transfer
- Interconnection to a Telematics In-Vehicle Unit (IVU)
- Installation, Calibration, Operation and Maintenance
OBM System Functional and Technical Specification

Philosophy:

• ‘Performance-based’ focus on required outcomes

• Use of a conceptual description (e.g. ECU, MSUs) requiring equivalent, but not exact, physical match

• Innovation encouraged! For example:
  o OEM-fitted or an after-market product
  o ‘Shared components’ providing comparable functionality
  o Quality management system approach to calibration to maintain accuracy
Categories of OBM Systems

**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 and transfer the collected data

**Category C** – OBM Systems in this category collect data and transfer Data Records in a standardised way to a telematics in-vehicle unit (in accordance with Interconnectivity of Telematics In-Vehicle Unit With Other Systems Functional and Technical Specification)
Type-approval of OBM Systems

Type-approval is focused on meeting required outcomes

OBM System type-approvals are under way with TCA

Five different systems currently under assessment (with three already approved)
Benefits of type-approval

OBM Systems which are type-approved are recognised as having achieved an independent benchmark for quality, reliability and functionality.

Entitled to carry the TCA Type-Approved logo (for OBM):
TCA website – source of truth

![Image of TCA website](https://www.tca.gov.au)

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Model</th>
<th>OBM System Category (See Note 1)</th>
<th>ECU Model</th>
<th>MSU Model</th>
<th>Suitable for vehicles with...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loadtranx Pty Ltd (Pacific Australia)</td>
<td>LR300, LR300R</td>
<td>Category A</td>
<td></td>
<td></td>
<td>Air suspension</td>
</tr>
<tr>
<td>惭愧</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Transmate Pty Ltd</td>
<td>CVC-5000</td>
<td>Category A</td>
<td></td>
<td></td>
<td>Air suspension</td>
</tr>
<tr>
<td>惭愧</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The ONE-WAY Eliminator with Dual Input Reach AMP</td>
<td>CWS-5300</td>
<td>Category A</td>
<td></td>
<td></td>
<td>Air suspension</td>
</tr>
</tbody>
</table>
OBM Systems and Intelligent Mass functionality

The OBM System Functional and Technical Specification is a foundational document for Intelligent Mass functionality.

Category B and C type-approved systems provide the necessary information for Intelligent Mass.

More on Intelligent Mass later on the agenda.
Finding out more

Suppliers of OBM Systems encouraged to contact us for more information

Initial reviews (and gap analyses) can be arranged with my team

Discussions with TCA are confidential
Questions and comments

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New applications of the National Telematics Framework

Gavin Hill
General Manager
Strategic Development/Implementation
Let’s start at the beginning…

May 2018:
Transport and Infrastructure Council (TIC) assign TCA to lead a business case on improvements to the IAP

May to August 2018:
Consultation and engagement with producers, providers and consumers of the IAP
What stakeholders told us…

There are specific needs and demands about the use of telematics applications across:

• Road managers
• Regulators
• Telematics providers
• Transport operators and drivers
Two take-away messages…

1. The need for the IAP application was reaffirmed by all stakeholders (road managers and regulators need a high assurance application to manage high risk vehicles and operations)

2. There are opportunities to apply other telematics applications to improve road utilisation, infrastructure planning and access management
Road managers need new tools

More specifically, road managers want telematics applications that can:

• Change the way road networks are managed

• Improve route assessment decision making and approvals

• Enable a transition away from transactional, permit-based arrangements to manage restricted access vehicles

• Optimise the balance between productivity, safety and the use of infrastructure assets
Road managers need new tools

The needs of road managers in Australia are consistent with international developments/best practice

(Using telematics data to further advance road infrastructure management and life-cycle asset management)
Some suggested bedtime reading…

IMPROVEMENTS TO THE INTELLIGENT ACCESS PROGRAM (IAP)

STAKEHOLDER REPORT

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Website: www.tca.gov.au
So what happened next?

September 2018:
Transport and Infrastructure Senior Officials Committee (TISOC) endorse the Business Case

November 2018:
Transport and Infrastructure Council (TIC) endorse the Business Case
## The business case...

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Initiative</th>
</tr>
</thead>
</table>
| **Road managers**                              | 1. Introduce a new application to support road asset management and planning application specifically for road managers (including local governments), with lower levels of assurance  
2. Enhance the availability of IAP information for research purposes. |
| **Regulators**                                 | 3. Optimise electronic conditions to manage key risks  
4. Enable on-demand access to telematics data  
5. Improve the management of enrolments and cancellations  
6. Improve the management of self-declarations. |
| **Road managers and regulators (common needs)**| 7. Enable the use of real-time alerts  
8. Improve vehicle configuration identification  
9. Enable new access applications with lower levels of assurance (‘IAP lite’)  
10. Make the Telematics Analytics Platform (TAP) available for use across multiple producers. |
| **Telematics providers**                       | 11. Streamline processes for providers to offer applications with lower levels of assurance (through the National Telematics Framework)  
12. Improve the management of alarms and malfunctions  
13. Update hardware requirements. |
| **Transport operators and drivers**            | 14. Enable turn-by-turn navigation/route guidance for heavy vehicle drivers  
15. Allow transport operator systems to be used for access applications  
16. Share Non-Compliance Reports (NCRs) with transport operators and drivers. |
Where to from here?

**Seven** improvements which are already underway as part of TCA’s 2018-19 work program

**Nine** improvements can be progressed as part of future TCA work programs
Where to from here?

There are two key initiatives from the Ministerially-approved Business Case which are driving TCA’s focus and priorities:

• Road Infrastructure Management (RIM) application – Level 1 assurance

• IAP Lite application – Level 2 assurance
Where to from here?

TCA is working closely with road agencies in New South Wales, Queensland, Western Australia and Tasmania on new, innovative access management approaches which utilise RIM and IAP Lite.

While each deployment of RIM and IAP Lite will be tailored according to the policy settings of each agency…*the technical and operational deployments will be consistent*
Questions and comments

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Intelligent Mass

David Rowe
Senior Engineer
Intelligent Mass

New functionality of the National Telematics Framework

The Intelligent Mass Specification has the requirements for both:

• *Assessment applications* (Intelligent Mass Assessment)
• *Monitoring applications* (Intelligent Mass Monitoring)

This functionality can be used by different producers to offer applications for different use cases and different levels of assurance

Collect mass data from an OBM system and position data from an IVU to manage vehicle mass
On-Board Mass System
Structuring of requirements

Intelligent Mass

TDE B2B

Tele. IVU

OBM System

Inter-connectivity
Assessment & Monitoring Applications
Role of producers

Based on policy and program needs, the producer is able to set:

- Whether to use a monitoring or assessment application
- The process for enrolment of vehicles
- The level of assurance needed

These tools and options allow Intelligent Mass to cater for a range of producer needs, schemes and policy and commercial considerations
Progress to Date
Consultation

Public consultation on the draft of the Intelligent Mass specification opened in Early November 2018

Consultation period was extended and last comments were accepted to the end of January 2019

Feedback was generally positive with no significant changes required to the draft
Next Steps
Final Release
Expected by end Q1 2019
Go-to-market timeframes

TCA is discussing with producers the uses and near-term needs for intelligent mass functionality

Dependent on Category B or C type-approved OBM Systems becoming available
Questions and comments

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Interconnectivity protocol for fatigue monitoring devices

David Rowe
Senior Engineer
Background

Drowsiness monitoring device

Telematics device
About the initiative

TCA is working to support the interconnection between telematics devices and fatigue monitoring devices.

This work is complementary to the NTC / Alertness CRC heavy vehicle driver fatigue research project.
About the initiative

TCA is working with industry to minimise the barriers which may inhibit the adoption of these technologies, including:

• Lack of integration with other systems
• Proprietary connections and data formats
• Inability to leverage existing investments in telematics

It is not heavy vehicle specific, but is intended to provide interconnectivity between fatigue monitoring devices and telematics devices - irrespective of the needs of consumers, or what kind of vehicles they’re used in.
About the initiative

Objectives:

• Explore the viability of defining one or more standard digital interfaces for exchanging mutually-appropriate data

• Develop an open protocol that vendors of drowsiness monitoring devices and telematics devices can adopt to facilitate data exchange between those devices

• Consult widely with industry at all stages of analysis
<table>
<thead>
<tr>
<th>DATE</th>
<th>MILESTONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 2018</td>
<td>Host initiative kick-off meeting and confirm feasibility (completed)</td>
</tr>
<tr>
<td>September 2018</td>
<td>Agree on detailed scope of the protocol</td>
</tr>
<tr>
<td>October 2018</td>
<td>Agree on data payload</td>
</tr>
<tr>
<td>December 2018</td>
<td>Agree on data protocol message layer and lower layers</td>
</tr>
<tr>
<td>February 2019</td>
<td>Release Draft protocol for comment</td>
</tr>
<tr>
<td>April 2019</td>
<td>Publish a Drowsiness-Telematics Device Interconnectivity Protocol</td>
</tr>
</tbody>
</table>
Progress

- Two meetings held with interested stakeholders
- Strong participation and representation from industry (telematics and drowsiness device suppliers)
- Decided principles, scope and approach
- Draft protocol developed
- Consultation stage
Protocol features

Device-device protocol

JSON

Any

OSI Model

Application

Presentation

Session

Transport

Network

Data Link

Physical
Protocol features

Heartbeat message:

<table>
<thead>
<tr>
<th>Container type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positioning container</td>
<td>Used to communicate a device’s measure of current position</td>
</tr>
<tr>
<td>Vehicle container</td>
<td>Used to communicate the current vehicle in use and its attributes</td>
</tr>
<tr>
<td>Driver container</td>
<td>Used to communicate the driver and HoS status</td>
</tr>
<tr>
<td>Drowsiness container</td>
<td>Used to communicate a device’s measure of driver drowsiness</td>
</tr>
</tbody>
</table>
## Protocol features

### Event message:

<table>
<thead>
<tr>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HARSH_BRAKING</td>
<td>Vehicle deceleration exceeds threshold</td>
</tr>
<tr>
<td>HARSH_STEERING</td>
<td>Rate of change of steering angle exceeds threshold</td>
</tr>
<tr>
<td>LANE_DEPARTURE</td>
<td>Lane departure warning activated</td>
</tr>
<tr>
<td>DROWSINESS_EVENT</td>
<td>Driver drowsiness exceeds threshold or changes risk category</td>
</tr>
<tr>
<td>REST_BREAK_REQUIRED</td>
<td>A rest break is recommended based on hours of service / hours of driving</td>
</tr>
</tbody>
</table>
Next Steps

Currently out for comment with stakeholders

Free to request a copy for comment

Next meeting for late Feb / early March

• To resolve comments on the draft
• To discuss any follow-on work or initiatives

Publish by mid-2019
Questions and comments

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Traveller Information Exchange (TIX)

Janelle Shotton
Government Relations & Engagement Manager
Overview

Traveller Information Exchange (TIX)

- What is TIX all about
- Latest developments
- Rest area location and amenity information
What TIX does

TIX enables users of the transport network to connect with many producers of information through one common standardised information exchange.
Making Information Available

- Sends messages to your vehicle
- Customised to the consumer
  - Port slot openings
  - Traffic congestion or road closures
  - Rest area information
- En route journey planning
- Network use decisions
Traveller Information Exchange Ecosystem
Latest developments

The Port of Fremantle provides real-time information on:

• Road closures and congestion
• Availability of port access slots and
• Other relevant information in the port precinct
• Improves driver planning and scheduling on way to the Port
'Virtual truck marshalling area' for drivers and operators
Rest area location and amenities

• Formal heavy vehicle rest areas
• Informal heavy vehicle rest areas (green reflectors)
Consolidated rest areas
How to access

• Live information available for technology providers and transport operators through the TIX web API

• Heavy vehicle rest area data set is also available as a downloadable human-readable data file

• API access information and downloadable data file can be accessed by clicking the link on the TCA website

Questions and comments

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