NATIONAL
TELEMATICS
FRAMEWORK

TELEMATICS
DATA
DICTIONARY

A common lexicon that gives power to the platform

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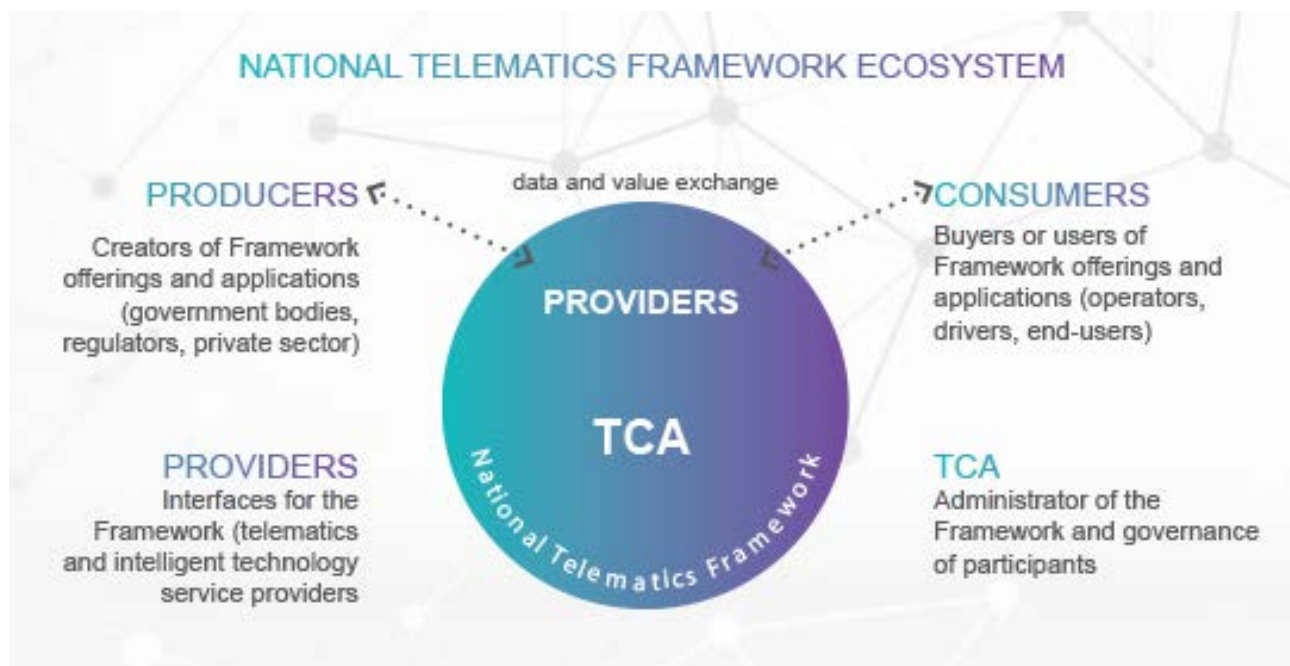| Version	Date	Description
1.0	April 2014	First version
2.0	May 2018	Updated version including additional data elements

NATIONAL TELEMATICS FRAMEWORK

The National Telematics Framework is a digital business platform with infrastructure and rules that aims to ensure an open marketplace of telematics and related intelligent technology providers.

The National Telematics Framework:

- Provides a national platform for the use of telematics and related intelligent technologies

- Supports an infinite number of applications across regulatory, contractual and commercial needs

- Supports different levels of assurance

- Is outcome-focussed and encourages innovation.

    The adoption of the National Telematics Framework for the delivery of offerings and applications both for public policy and private decision making is a world first. It has positioned Australia as the leader in the delivery of such services through the advent of the digital economy.

The National Telematics Framework was established following a series of decisions made by Responsible Ministers between 2003 and 2008, and was globally recognised as an International Standard (ISO 15638) in 2012.

NATIONAL TELEMATICS FRAMEWORK ECOSYSTEM

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

data and value exchange

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

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

PROVIDERS
TCA
National Telematics Framework

TCA
Administrator of the Framework and governance of participants

Contents

1 INTRODUCTION

1.1 Purpose

The Telematics Data Dictionary describes the data elements used within the National Telematics Framework by setting a common understanding of their data types, formats and definitions.

Information supplied in this document informs and supports other documents within the National Telematics Framework library.

2   TELEMATICS DATA DICTIONARY

The following table describes the data elements used within the National Telematics Framework.

Note: Where a data element is a value, the number of decimals or significant figures is implied in the Minimum and Maximum table columns.

Table 1: Telematics Data Dictionary

Data Element	Description	Data Type	Value or Length		Units	Remarks
			Minimum	Maximum		
Alarm Code	Numeric code assigned to a class of status change or event of interest	Integer	0	99		Alarm Code allocation is specific to the National Telematics Framework
Application Usage	Consumer operating under a specific application that requires the consumer to declare if the consumer is using the application	Enumerated	—	—		
Authorised Officer ID	Unique identification of an officer authorised to perform an authorised activity	String	0	30		Example: badge number
Axle Count	Total number of axles present within an axle group or vehicle (as per context)	Integer	0	99		0 = Count is unknown or not applicable
Axle Group Count	Total number of axle groups present within a vehicle	Integer	0	99		0 = Count is unknown or not applicable
Axle Group Mass	Mass of an axle group	Integer	0	99999	kilograms	Resolution: 10 kilograms or better
Breath Alcohol Concentration	Mass concentration of ethanol in a breath sample	Decimal	0.000	9.999	grams of alcohol per 210 litres of exhaled breath	Blood Alcohol Concentration (BAC) is derived from Breath Alcohol Concentration (BrAC). Using a blood-breath ratio of 2100:1, BrAC in g/210 L is equivalent to %BAC.

Data Element	Description	Data Type	Value or Length		Units	Remarks
			Minimum	Maximum		
Breath Sample Flow Rate	Flow rate of a breath sample	Decimal	0.00	9.99	litres per second of exhaled breath	Decimals: 2
Breath Sample Flow Volume	Flow volume of a breath sample	Decimal	0.00	9.99	litres of exhaled breath	Decimals: 2
Breath Sample Duration	Duration of a breath sample in seconds	Decimal	0.0	99.9		Decimals: 1
Breath Test Result	Result of a breath test	Enumerated	—	—		Values: 0 = Pass; 1 = Fail
Breath Test Type	Designation of whether a breath test is an initial or random test	Enumerated	—	—		Values: 0 = Initial; 2 = Random; 3 = Subsequent Random
Comment Code	Numeric code to identify a predefined Comment Name	Integer	0	9999		Comment Code allocation is specific to the National Telematics Framework
Comment Name	Human-readable representation of a predefined Comment Code	String	0	100		Comment Name content is specific to the National Telematics Framework
Comment Text	Manually entered, free-form text recording a comment	String	0	256		
Days Driver Data Records Requested	Number of days of driver data requested by an authorised officer when viewing telematics data	Integer	0	999		
Device Count	Total number of devices connected to a single device	Integer	0	99		
Device Hardware Version	Version of the device hardware	String	1	6		Format is manufacturer defined

Data Element	Description	Data Type	Value or Length		Units	Remarks
			Minimum	Maximum		
Device ID	Unique identifier of a device, that identifies it and the records generated by it	String	10	20		
Device Sequence Number	Relative position of a device on a vehicle, sequentially incrementing from the front to the back of the vehicle, starting at 1	Integer	1	99		
Device Software Version	Version of the telematics device software	String	1	6		Format is manufacturer defined
Direction of Travel	Course or heading of a device that moves expressed in two dimensions as the angle between true north and an imaginary line through the main fore-and-aft axis of the device	Decimal	0.0	359.9	degrees	Decimals: 1
Distance Travelled	Total traversed distance between a start and end point established by change in odometer or from multiple GNSS measurements	Decimal	0.0	999999.9	kilometres	Decimals: 1
Driver ID	Unique identifier assigned to a driver	Integer	0	18		
Driver Licence Number	Formal identification of a driver issued by the relevant authority for a Jurisdiction	String	6	13		Combination of Driver Licence Number and Jurisdiction is a unique identifier for a licensed individual
Event Code	Unique code describing an event	String	1	99		Event Code allocation is specific to the National Telematics Framework
Event Description	Description of a specific event	String	1	999		Event Description is specific to the National Telematics Framework
Event Name	Short name describing an event	String	1	99		Example: Road Closure

Data Element	Description	Data Type	Value or Length Minimum	Value or Length Maximum	Units	Remarks
Event Severity	Severity of an event	Enumerated	—	—		Values: Advisory; Low; Routine; High; Emergency
Fit for Work Status	Declaration by a driver of whether they are fit for work or not	Enumerated	—	—		Values: 0 = Unfit for work; 1 = Fit for work
Gross Vehicle Mass	Total vehicle mass	Integer	0	999999	kilograms	Resolution: 10 kilograms or better
Hire Status	Status of whether a vehicle is hired, not hired or paused	Enumerated	—	—		Values: 1 = Hire off; 2 = Hire on; 3 = Hire pause
Horizontal Dilution of Precision	Measure quantifying the quality of the determination of horizontal position (latitude and longitude) based on the number and geometric distribution of the satellites used in the determination	Decimal	0.0	99.9		Unknown or undetermined HDOP reading (e.g. no satellites) should use a value of 99.9 rather than zero to avoid confusion with ideal HDOP measurements Decimals: 1
Ignition Switch Status	Status of a vehicle ignition switch	Enumerated	—	—		Values: 0 = Disconnected; 1 = Off; 2 = On
Issuing Authority	Entity that has operational responsibility by the relevant authority	String	1	255		
Jurisdiction	Geographical area containing a road network (i.e. typically an Australian state or territory)	Enumerated	—	—		Values: VIC; NSW; QLD; SA; WA; NT; TAS; ACT
Latitude	Angular distance on a meridian north or south of the equator	Decimal	–90.00000	+90.00000	degrees	Relative to the datum GDA94 Decimals: 5

Data Element	Description	Data Type	Value or Length		Units	Remarks
			Minimum	Maximum		
Lift Axle Status	Position of a lift axle as part of an axle group	Enumerated	—	—		Values: • 0 = Axle Group does not include a lift axle, or is not capable of determining lift axle position; • 1 = Axle Group includes a lift axle, but the position is currently unknown; • 2 = Axle Group includes a lift axle, and the lift axle is detected as raised; • 3 = Axle Group includes a lift axle, and the lift axle is detected as lowered
Load Status	Indication of whether a vehicle is loaded or not	Enumerated	—	—		Values: N = No load; L = Load
Locality	Name of an Australian suburb (in a city or larger town) or locality (outside a city or larger town)	String	1	255		Name must be officially recognised by the Committee for Geographical Names in Australasia (CGNA), under the Intergovernmental Committee on Surveying and Mapping (ICSM)
Log On Method	Method by which a consumer logs on	Enumerated	—	—		Values: 0 = Automatically entered; 1 = Manually entered
Longitude	Angular distance east or west from Greenwich meridian	Decimal	−180.00000	+180.00000	degrees	Relative to the datum GDA94 Decimals: 5
Movement Sensor Status	Status of a sensor which detects movement of a vehicle independent of GNSS signal and ignition status	Enumerated	—	—		Values: 0 = Disconnected; 1 = No movement; 2 = Movement
Name	Name of a person, organisation or other entity	String	1	255		

Data Element	Description	Data Type	Value or Length		Units	Remarks
			Minimum	Maximum		
Non-Application Usage	Consumer operating under a specific application that requires the consumer to declare if the consumer is not using the application	Integer	0	1		
Object Description	Description of an Object	String	1	999		
Object ID	Unique identifier of a named Object	String	1	999		Specific identifiers must be used where an authority has defined identifiers for specific Objects.
Object Name	Name of an Object	String	1	255		
Odometer Reading	Odometer reading of a vehicle	Decimal	0.0	9999999.9	kilometres	Decimals: 1
Postcode	Australian postcode	String	4	4		Pattern: [0-9]{4}
Price Component	Component value that forms part of a price	Decimal	00000.00	99999.99	Australian dollars and cents	Examples: Metered fare; Fixed fare Decimals: 2
Price ID	Unique identifier of a price	String	1	5		
Price Total	Total value of a price	Decimal	00000.00	99999.99	Australian dollars and cents	Example: Schedule of taxi fares Decimals: 2
Radius	Location of an Object or Event, described as a circle centred at a given latitude and longitude	Integer	1	999999	metres	

Data Element	Description	Data Type	Value or Length		Units	Remarks
			Minimum	Maximum		
Record Number	Value assigned to data records in order of generation	Integer	0	9999999999		At a minimum, Record Numbers should be generated from the same sequence for the same Record Type, noting that the preference is for a single sequence for all Record Types. Additionally, different applications within the National Telematics Framework may require specific functionality.
Record Type	Code identifying the type of data record	Integer	0	99		Record Type allocation is specific to a telematics application
Satellite Count	Number of satellites used to establish a measurement made by a GNSS receiver	Integer	0	99		
Self-Declared Mass	Self-declared gross vehicle mass	Decimal	0.0	999.9	metric tonnes	Decimals: 1
Specification Reference	Version of the application specification	String	0	10		Format derived from application
Speed	Speed at which a vehicle is travelling	Decimal	0.0	999.9	kilometres per hour	Decimals: 1
State or Territory	Australian state or territory	Enumerated	—	—		Values: VIC; NSW; QLD; SA; WA; NT; TAS; ACT
Street Address	Street address describing the registered location of an organisation or individual	String	1	255		Formed in accordance with Australia Post address presentation standards (AS4212-1994)

Data Element	Description	Data Type	Value or Length		Units	Remarks
			Minimum	Maximum		
Telephone	Telephone number of an organisation or an individual	String	1	20		
Two-up Driver Status	Indication of whether the driver is performing solo work or partnering with another driver	Enumerated	—	—		Values: 0 = Solo driver; 1 = Two-up driver
Vehicle Category Code	Numeric code to identify a predefined Vehicle Category	Integer	0	99		Vehicle Category Code allocation is specific to the National Telematics Framework
Vehicle Category Name	Human-readable representation of a predefined Vehicle Category	String	1	100		Vehicle Category Name is specific to the National Telematics Framework
Vehicle Engagement	For a hire vehicle, status of customer engagement with the vehicle	Enumerated	—	—		Values: 1 = Rank; 2 = Hail; 3 = Booking
Vehicle Identification Number	Unique code, including a serial number, used by the automotive industry to identify a vehicle	String	17	17		Often abbreviated as VIN Pattern: [A-HJ-NPR-Z0-9]{17}
Vehicle Interlock Status	Status of a vehicle interlock function where the ignition of an engine is either prevented from starting or not	Enumerated	—	—		Values: 1 = Blocked; 2 = Unblocked
Vehicle Registration Jurisdiction	Unique identifier for the Jurisdiction where a Vehicle Registration was issued by the relevant authority	Enumerated	—	—		Values: VIC; NSW; QLD; SA; WA; NT; TAS; ACT; FIRS
Vehicle Registration Number	Formal identification of a Vehicle Registration issued by the relevant authority for a Jurisdiction to a distinct vehicle	String	6	10		Combination of Vehicle Registration Number and Vehicle Registration Jurisdiction is a unique identifier for a registered vehicle

Data Element	Description	Data Type	Value or Length		Units	Remarks
			Minimum	Maximum		
Web Address	A URL, specified in standard format, that locates a specific resource on the Internet or an intranet	String	1	255		Consists of an Internet protocol name; a domain name; and optionally other elements such as a port, directory, and file name
Work Hours Option	Work hours option under which a driver is operating, defining associated rules and limits on work and rest periods	String	1	10		Populated with a code representing the work hours option, including Standard Hours, Advanced Fatigue Management (AFM), Basic Fatigue Management (BFM) and other fatigue management schemes (including exemptions)
Work Rest Status	Indication of whether a driver is beginning a work or rest period	Enumerated	—	—		Values: 0 = Rest; 1 = Work

3 REFERENCES TO THE DICTIONARY

3.1 Data Types

The following table shows the format and examples of each data type used in the *Telematics Data Dictionary*.

Table 2: Data Types, Formats and Examples

Data Type	Format	Examples	Remarks
Array	<data type> [number of items]	<Integer> [4]	A data structure consisting of a collection of elements, each element having the same data type. The Remarks column will include a description of the population of the array and its dimensions.
Boolean	True/False	True/False 1/0 Y/N Yes/No	The encoding of a Boolean field may vary, depending upon the field. For example: • A field may output 1 or 0, where 1 = True, and 0 = False • A field may output Y or N, where Y = True, and N = False • A field may output Yes or No, where Yes = True and No = False Interpretations of Boolean outputs are noted in the Remarks column where relevant.
Date	yyyy-mm-dd	2018-04-30	The first example does not include the time zone offset. The time zone is implied and is typically expressed in Coordinated Universal Time (UTC) or the local time zone of a static location.
	yyyy-mm-dd+hh:mm	2018-04-30+10:00	The second example includes the time zone offset, which is an amount of time subtracted from or added to UTC time to derive the current local time, whether it is standard time or daylight saving time. Australian time zone offsets are always positive—this example shows Australian Eastern Standard Time.

Data Type	Format	Examples	Remarks
DateTime	yyyy-mm-ddThh:mm:ss	2018-04-30T23:59:45	The first example does not include the time zone offset. The time zone is implied and is typically expressed in UTC or the local time zone of a static location. T is included as a delimiter between date and 24-hour time.
	yyyy-mm-ddThh:mm:ss+hh:mm	2018-04-30T23:59:45+10:00	The second example includes the time zone offset, which is an amount of time subtracted from or added to UTC time to derive the current local time, whether it is standard time or daylight saving time. Australian time zone offsets are always positive—this example shows Australian Eastern Standard Time.
Decimal	nnnn.n	9999.99 −3922.23	Length depends on the minimum and maximum defined value for the data element. The number of decimal digits used is defined in the Remarks column. A leading minus sign is used for negative numbers.
Duration	PnYnMnDTnHnMnS	P3Y6M4DT12H30M5S	The first example shows a duration of three years, six months, four days, twelve hours, thirty minutes, and five seconds, where the following designators are defined: P (period) = duration designator, Y = number of years, M = number of months, W = number of weeks, D = number of days, T = time designator, H = number of hours, M = number of minutes, S = number of seconds. *Note: Each of the duration fields is optional. P must always be used, and T is only used if a time duration is present.*
		−P3D	The second example shows minus three days.
Enumeration		VIC, NSW, QLD, SA, WA, NT, TAS, ACT	A set of named values where each member of the set is different from the others. One of the named values must be used as the value for that data element.
Integer	nnnn	9999 −3922	Length depends on the minimum and maximum defined values for the data element. A leading minus sign is used for negative numbers.
String		6 axles, and 4 trailers	The minimum and maximum length of a string are defined for each data element. A pattern may be specified for a string using regular expressions.

Data Type	Format	Examples	Remarks
Time	hh:mm:ss	23:59:45	24-hour time. The first example does not include the time zone offset. The time zone is implied and is typically expressed in UTC or the local time zone of a static location.
	hh:mm:ss+hh:mm	23:59:45+10:00	The second example includes the time zone offset, which is an amount of time subtracted from or added to UTC time to derive the current local time, whether it is standard time or daylight saving time. Australian time zone offsets are always positive—this example shows Australian Eastern Standard Time.

3.2   Notes on Data Modelling and Encoding

The *Telematics Data Dictionary* specifies the modelling of each element. Modelling refers to the set of distinct values that each field can have (the 'value space') and is independent of how those values are transcribed in human-readable or computer-readable form.

The *Telematics Data Dictionary* is not intended to provide the encoding for specific data elements or messages.

Encoding refers to the transcription of a data element in human-readable or computer-readable form. This might include aspects such as:

- Character set—for example, ASCII; UTF-8; UTF-16

- Record structure—for example, flat files; XML; JSON

- Date and time formats—for example, ISO-8601 format versus YYYYMMDDHHMMSS, etc.

- Boolean data element representation—for example, Y or N; T of F; 0 or 1

- Enumerated data element representation—for example, names such as LOAD, NO_LOAD; numbers such as 0, 1, 2.

Note: For any data interface where interoperability is required, the encoding should be negotiated between each party. For telematics applications, this is typically defined in the relevant Specification(s) within the National Telematics Framework.

3.3 Date, Time and DateTime Data Elements

Date, Time and DateTime data types are modelled in accordance with ISO 8601:2004, *Data elements and interchange formats – Information interchange – Representation of dates and times* (available from www.iso.org/standard/40874.html).

It is recommended that each field of a Date, Time, or DateTime data type should have a defined time zone (not time zone offset). For example:

- UTC;
- 'Local time zone of the head office of the Issuing Authority'; or
- 'Local time zone of the driver'.

It is recommended that each field of a Date, Time, or DateTime data type should define whether:

- Time zone offset must appear;
- Time zone offset must not appear; or
- Time zone offset may appear.

It is recommended that a time zone offset is used if the time zone is ambiguous.

Irrespective of the points indicated above, each field of a Date, Time, or DateTime data type should be interpreted with respect to:

- Time zone within the field data if it appears; or
- Time zone associated with the field's defined time zone.

4 EXAMPLE: POSITION RECORD

The following table illustrates how a record can be generated from data elements provided by the Data Dictionary. A Position Record has been selected for this use case.

Table 3: Record Format of a Position Record

Data Element	Field Name	Use	Data Type	Length	Decimals
Date	Date	Mandatory	Date	8*	
Time	Time	Mandatory	Time	6*	
Record Number	Record Number	Mandatory	Integer	10	
Latitude	Position Latitude	Optional	Decimal	9	5
Longitude	Position Longitude	Optional	Decimal	10	5
Direction of Travel	Direction of Travel	Mandatory	Decimal	5	1
Satellite Count	Satellite Count	Mandatory	Integer	2	
Horizontal Dilution of Precision	HDOP	Mandatory	Decimal	4	1
Ignition Switch Status	Ignition Switch Status	Mandatory	Enumerated	—**	—
Movement Sensor Status	Other Independent Movement Sensor Status	Mandatory	Enumerated	—**	—
Device ID	Trailer Identifier #1	Optional	String	20	
Device ID	Trailer Identifier #2	Optional	String	20	
Device ID	Trailer Identifier #3	Optional	String	20	
Device ID	Trailer Identifier #4	Optional	String	20	
Device ID	Trailer Identifier #5	Optional	String	20	
Device ID	Trailer Identifier #6	Optional	String	20	
Device ID	Trailer Identifier #7	Optional	String	20	
Device ID	Trailer Identifier #8	Optional	String	20	
Device ID	Trailer Identifier #9	Optional	String	20	
Device ID	Trailer Identifier #10	Optional	String	20	
Date	Receipt Date	Mandatory	Date	8*	
Time	Receipt Time	Mandatory	Time	6*	

* In this use case, Date is encoded as YYYYMMDD, and Time is encoded as HHMMSS.

** In this use case, integer codes of 1, 2, 3 will be defined for corresponding values.

Appendix A ACRONYMS AND DEFINITIONS

A.1   Acronyms

Acronym	Definition
AFM	Advanced Fatigue Management
ASCII	American Standard Code for Information Interchange
BAC	Blood Alcohol Concentration
BFM	Basic Fatigue Management
BrAC	Breath Alcohol Concentration
CGNA	Committee for Geographical Names in Australasia
EWD	Electronic Work Diary
FIRS	Federal Interstate Registration Scheme
GDA94	Geocentric Datum of Australia 1994
GNSS	Global Navigation Satellite System
HDOP	Horizontal Dilution of Precision
ICSM	Intergovernmental Committee on Surveying and Mapping
JSON	JavaScript Object Notation
UTC	Coordinated Universal Time
UTF	Unicode Transformation Format
VIN	Vehicle Identification Number
WWD	Written Work Diary
XML	Extensible Markup Language

A.2   Definitions

Term	Definition
Axle Group	A single axle group, tandem axle group, twin-steer axle group, tri-axle group or a quad-axle group.
Jurisdiction	A geographical area containing a road network (i.e., typically an Australian state or territory).
Object	A person, place or thing (i.e. a noun). Examples include producer, provider, system, traffic light, event and message.
Time Zone Offset	An amount of time subtracted from or added to UTC time to derive the current local time, whether it is standard time or daylight saving time.