



# National Heavy Vehicle Regulator

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## **Electronic Work Diary (EWD)**

Standards

November 2021

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## Part 1 – General

### 1. Scope

- (1) The Electronic Work Diary (EWD) Policy Framework establishes the National Heavy Vehicle Regulator (the NHVR) approach to administering the EWD provisions in the Heavy Vehicle National Law (the HVNL). The framework consists of the following documents which are designed to be read in conjunction with each other:
  - (a) EWD Policy Framework.
  - (b) EWD Privacy Policy.
  - (c) EWD Compliance Policy.
  - (d) EWD Standards.
  - (e) EWD Standards – Schedule A.
  - (f) EWD Policy Framework and Standards Addendum (Device agnostic approvals).
- (2) The EWD Standards (this document) specifies the requirements for EWDs as a tool for use in the management of fatigue-related heavy vehicles in accordance with the *Heavy Vehicle National Law Act 2012*.
- (3) Work diaries are a regulatory requirement introduced to assist the transport sector in combatting the adverse impacts of fatigue in the heavy vehicle industry. Only EWDs approved by the NHVR shall be accepted as an alternative work diary format to the Written Work Diary (WWD) as the primary method for keeping records under the HVNL.
- (4) The use of an EWD approved to these Standards shall not change the legal obligations of any parties in the Chain of Responsibility (CoR). The Heavy Vehicle National Law Act 2012 will take precedence in all matters.

### 2. Application

- (1) An EWD is a system that meets all requirements of this Standard and has been accepted by the NHVR. The use of non-approved electronic recording devices must be accompanied by a WWD meeting obligations in accordance with the *Heavy Vehicle National Law Act 2012*.

### 3. Reference documents

- (1) The NHVR acknowledges that the development of the EWD Standard was influenced by the Austroads Research Report: Performance-based Specification for Electronic Work Diary and Heavy Speed Monitoring (AP-R386/11, July 2011), specifically Appendix A – Specified EWD. Parts were adapted for use throughout the EWD standards.

- (2) *Heavy Vehicle National Law Act 2012*.
- (3) *Heavy Vehicle Fatigue Management National Regulation (HV(FM)NR)*.
- (4) NHVR Setting the Agenda: 2016 – 2022.
- (5) EWD Policy Framework.
- (6) EWD Privacy Policy
- (7) EWD Compliance Policy
- (8) EWD Standards – Schedule A.
  - (a) EWD Policy Framework and Standards Addendum (Device agnostic approvals).

The following references or the most recent iteration of:

- (9) The Australian Road Rules.
- (10) Standards Australia 2021, Data elements and interchange formats -Information interchange - AS ISO 8601.
- (11) Standards Australia 2017, Document Management – Portable Document Format, AS ISO 32000.1:2017.
- (12) Standards Australia 2016, Quality Management Systems – Requirements, AS/NZS ISO 9001.
- (13) Standards Australia 2015, Security Techniques – Information Security Management Systems – Requirements, AS/NZS ISO 27001.
- (14) Standards Australia 2000, Electromagnetic compatibility (EMC) General - Application and interpretation of fundamental definitions and terms, AS/NZS 61000.1.1:2000 (R2016).
- (15) International Electrotechnical Commission, Electromagnetic compatibility (EMC) – Part 1: General – Section 1: Application and interpretation of fundamental definitions and terms, IEC/TR EN 61000-1-1.
- (16) International Organization for Standardization 2015, Information Technology – Document Container File, ISO/IEC 21320-1:2015.
- (17) Rivest, R., The MD5 Message-Digest Algorithm, RFC 1321, DOI 10.17487/RFC1321, April 1992, <https://www.rfc-editor.org/info/rfc1321>.

## Part 2 – Design and operation

### 4. Overview

- (1) The EWD is an end-to-end system of that delivers all the local and remote requirements of the EWD Standards. These are:
  - (a) equipment and interface,
  - (b) technology provider back office and data collection,
  - (c) technology provider interoperation,
  - (d) fatigue management and compliance support, and
  - (e) software and language used to code the software.
- (2) EWD systems may be independent systems or integrated into other vehicle systems provided the system is approved to the requirements of the EWD Standards.

### Division 1 – Equipment

### 5. Environmental

- (1) The EWD equipment shall be designed to be suitable for continuous and reliable use in a heavy vehicle in compliance with the Australian Road Rules.
  - (a) Display interfaces must be:
    - (i) mountable in an acceptable location for drivers to view alerts while moving, and
    - (ii) viewable by Authorised Officers outside of the vehicle.
  - (b) EWD equipment shall be securely attached to the vehicle.
  - (c) Power shall be managed to all equipment.
  - (d) Connectors shall be robust and appropriate for vehicle use.
  - (e) Equipment shall comply with AS/NZS 61000 or equivalent international standards for electromagnetic compatibility.
  - (f) A method shall be provided to control the brightness of the display for viewing in direct sunlight and at night-time.

### 6. Real-time clock and time counting

- (1) The EWD equipment shall maintain a real-time clock for logging entries and managing time.
  - (a) The EWD shall re-establish the current time following power loss.
  - (b) Time keeping and calculations shall use the time zone of the base location of the driver.

- (c) All entries shall be counted in one (1) minute time periods to the last full minute.

### 7. Global Navigation Satellite System (GNSS)

- (1) The EWD equipment shall use GNSS to log the location of the vehicle. A geolocation service shall be used to present the driver with a human readable location description of the current position.
  - (a) On work and rest change, the EWD must present the driver with a location description that may be modified by the driver if clarity of location can be improved.
  - (b) The EWD shall automatically record the GNSS longitude and latitude, an automatically generated geolocation description and/or the location description if modified by the driver.

### 8. Odometer

- (1) The EWD equipment shall have a means of recording the odometer reading against work and rest changes.
  - (a) The odometer shall be entered with one (1) kilometre precision.
  - (b) The odometer readings may be either:
    - (i) automatically filled based on a measurement from the vehicle, or
    - (ii) allow for manual entry by the driver.

### 9. Failures, malfunction and tamper

- (1) The EWD equipment shall monitor the operation and use of the EWD.
  - (a) Failures shall include:
    - (i) EWD equipment failure – detected immediately on occurrence of removal of critical equipment,
    - (ii) tampering – detected immediately on occurrence,
    - (iii) memory failure/error – detected within one (1) minute of occurrence where driver work diary data cannot be maintained on the EWD equipment, and
    - (iv) communications failure – when an attempt to connect to technology provider fails subject to three (3) retries of 15-minute separation after the first attempt.

- (b) Failures that may not be able to be automatically monitored, which must be manually reported, include:
  - (i) power supply failure, and
  - (ii) communication and display equipment failure.
- (c) When a communication failure occurs, the EWD must:
  - (i) if less than 24 hours' continual failure, warn the driver of the communication failure,
  - (ii) if greater than 24 hours' continual failure, warn the driver of a critical communication failure, and
  - (iii) allow the driver to continue to make entries to the EWD.

- (2) In the event of a failure that still allows power and communications, the valid entries shall be automatically sent to the record keeper.
- (3) Failures that allow the driver and record keeper to maintain a compliant work diary shall be viewed as warnings and require repair as soon as practicable.
- (4) Failures that stop the work diary record keeping process shall be considered malfunctions, as defined in section 221 of the HVNL. Instructions on driver procedures in the event of malfunction are required to be provided in training material in accordance with legal obligations.

## 10. System updates

- (1) Remote or local updates to the equipment shall be allowed subject to the approval of the update. See section 53 in this document.
- (2) System versions shall be updated once the new release has been loaded and verified.

## Division 2 – Interfaces

### 11. Driver interface

- (1) A local interface shall be provided for drivers to manage their work diary and the overall system operation.

### 12. Driver authentication

- (1) The EWD shall provide a method to uniquely identify all drivers defined in the technology provider's system.
- (2) The EWD shall provide for a secure method for authentication into the EWD.

- (3) The EWD must only allow drivers to complete entries when logged into the EWD, to enforce the EWDs automatic calculation of information relating to the driver work diary and to work diary information.
- (4) The EWD shall display the name of the logged on and active driver and their driver licence number whenever driver details are being accessed and recorded.

## 13. Operational functionality

- (1) The interface shall provide drivers with a user-friendly method for managing and entering work diary information. This shall include methods for updating all information relevant to a work diary. When logged in, the EWD shall provide the driver with options to:
  - (a) Register a change of work diary from WWD to EWD.
  - (b) Confirm or change driver and vehicle details including:
    - (i) driver base,
    - (ii) time zone of driver base,
    - (iii) record keeper location, and
    - (iv) vehicle registration.
  - (c) Confirm or change the work and rest hours option in use including accreditation number if applicable.
  - (d) Enter two-up or solo driving.
  - (e) Enter rest or work periods that have occurred and not been recorded.
  - (f) Commence a new work or rest period.

If the EWD equipment is being operated in two-up recording, the EWD shall:

- (g) Allow the driver to enter the second driver's details.
- (h) Allow the transfer and management of both drivers' work diaries for a 28-day period.
- (i) Provide a secure method for changing between drivers for updating driver records and details if both using the same EWD.
- (j) Clearly identify the appropriate driver's name when:
  - (i) recording work and rest periods,
  - (ii) accessing records, and
  - (iii) viewing and changing details.
- (k) Not allow one driver to make an entry against the other driver.
- (2) The EWD shall provide a method for recording a work and rest change entry including confirming or correcting:

- (a) whether the change is to commence work or rest,
  - (b) the location,
  - (c) the odometer,
  - (d) the registration,
  - (e) two-up details (if applicable), and/or
  - (f) driver comments.
- (3) On log off, the EWD shall:
- (a) Provide the driver with options to:
    - (i) complete a work and rest change entry
    - (ii) maintain the current work or rest status
    - (iii) complete the work diary confirmation process.
  - (b) Send all data to the record keeper.
- (4) The EWD shall present the two-up driver a statement of declaration, using the two-up driver declaration specified in the EWD Standards – Schedule A. The driver name is to be automatically filled by the EWD or entered by the driver. The driver must re-authenticate for this declaration to be submitted.
- (5) The EWD shall use the work and rest option associated to the driver's fatigue management scheme and the driver's work and rest change entries to monitor compliance and calculations of potential non-compliance. The calculations shall:
- (a) be checked at change of activity,
  - (b) be checked at intervals required to provide driver with appropriate alerts during a work period,
  - (c) be checked against the past 28-days entries including all work and rest options used by the driver during this period, and
  - (d) alert the driver on time remaining until the soonest calculation of potential non-compliance.

## 14.Additions, corrections and confirmation

- (1) The EWD shall allow the driver to manually add self-declared work and rest changes. The EWD must deny the driver the ability to make records in more than one work diary for the same period. If the driver has missed an entry, the EWD must allow the driver to manually correct the omission prior to confirmation.

Once satisfied, the driver shall be prompted to confirm the data as accurate and digitally sign off on the record. Once confirmed the record must not be allowed to be modified or amended. Self-declared entries shall:

- (a) not allow overlapping entries, or

- (b) form part of the work and rest change entries and therefore form part of the calculations of potential non-compliance.
- (2) The EWD shall allow the driver to correct unconfirmed work and rest change entries. Corrections are subject to the EWD requiring:
- (a) a comment must be made against each correction,
  - (b) that these shall only be made by the driver whose details appear on the record, and
  - (c) that corrections shall not be allowed on entries retrieved from historical data.
- (3) The EWD must require confirmation by the relevant driver under the following conditions:
- (a) at the end of each day, and
  - (b) prior to the start of a new period if the driver has entries greater than 24 hours old.
- (4) The EWD shall notify the driver to confirm the records, using the driver confirmation declaration specified in the EWD Standards – Schedule A. The driver must re-authenticate for this declaration to be submitted.

## 15.Driver alerts and warnings

- (1) Alerts and warnings from EWD monitoring shall be presented on the driver interface with distinguishable messages to give the driver sufficient feedback to maintain the work diary records. The EWD shall alert or warn the driver when:
- (a) A calculation of potential non-compliance occurs when monitoring the work and rest changes against the work and rest option.
  - (b) A malfunction or tamper event occurs in accordance with section 9.
  - (c) Technology specific warnings that the technology provider identifies as critical to the EWD meeting the work diary requirements.

## 16.Compliance interface

- (1) An EWD must be configured with a 'Compliance View' for Authorised Officers to access the information contained at Part 4 for viewing outside the vehicle. See section 26.

## Division 3 – Equipment data management

## 17.Data collection and record generation



- (1) The EWD shall collect data and generate appropriate records for fatigue management, system validation and compliance checking. This shall take the form of the EWD automatically recording data and the driver making manual entries to satisfy their work diary legal obligations.
- (2) The EWD shall maintain the following for a 28-day period and be available on request by an Authorised Officer either directly on roadside without requiring a current cellular connection, or through the drivers record keeper:
  - (a) driver details as defined in section 27,
  - (b) EWD system details as defined in section 28,
  - (c) work and rest changes as defined in section 30,
  - (d) potential non-compliances as defined in section 31, and
  - (e) Authorised Officer annotations as defined in section 32.
- (b) Cache common data where appropriate including previous driver login credentials, work and rest change options, driver details and system details.
- (c) Allow Compliance View to be presented to an Authorised Officer with all appropriate information available.
- (d) Synchronise to the technology provider system upon regaining connectivity including:
  - (i) retrieving updated information from the technology provider system,
  - (ii) retrieving information from other technology providers,
  - (iii) sending new recorded information to the technology provider, and
  - (iv) sending compliance report transfer requests.

## 18.Storage capability

- (1) The EWD shall have sufficient capacity to store driver information for 28-days, for all drivers who have used the EWD in the 28-day period. Data stored on equipment shall not be viewable by unauthorised users through the EWD interface. Data stored in files shall be sufficiently encrypted to support security requirements of the data.

## 19.Data transfer

- (1) Records from an EWD shall be transferred at least once per day to the record keeper. Data shall be inclusive of all information required by the record keeper to fulfil legal obligations, maintenance of work diaries, EWD monitoring and audit purposes.
- (2) The method and protocol for data transfer from EWD equipment to the record keeper shall be secure and reliable.
- (3) The EWD shall alert the driver if the data has not been transferred, and retry every 15 minutes until successful.
- (4) The EWD may provide options for information to be stored or copied for driver work diary management.
- (5) EWD equipment shall maintain the driver's 28-day work diary, including retrieval of data from the technology provider in use and other technology providers for driver entries logged within the last 28-days. When the EWD is without connectivity, the EWD shall:
  - (a) Provide all functionality that does not require connectivity.

## 20.Communications

- (1) The EWD equipment shall provide a cellular or accepted equivalent communications method to allow data transfer in accordance with the requirements of the EWD Standards. The EWD shall allow data to be stored and automatically sent when connectivity is achieved.

## Part 3 – Technology provider

### 21. General

- (1) The technology provider shall maintain a centralised back office system for EWD data storage and transfer to meet the record keeper obligations for storage and access to records.
- (2) Data shall be stored in Australia.
- (3) The data stored shall maintain independence between record keepers.
- (4) The storage system shall provide a data back-up method.
- (5) The product must ensure that each driver shall be limited to only one secure access login to the EWD per instance of an approved EWD system installation. The technology provider must have the capability to uniquely identify the driver across all technology providers.

### 22. Quality system

- (1) The technology provider shall have an appropriate quality management system in place for compliance with the requirements of the EWD Standards. This may be in alignment with ISO 9001 or similar recognised quality standard.
- (2) The technology provider shall have an appropriate information security management system (ISMS) in place. Certification to ISO 27001 will be recognised as meeting this requirement; however, this is not mandatory.
- (3) A technology provider back office shall as a minimum include the following:
  - (a) Where physical server equipment is used, provide:
    - (i) measures to secure physical access to the system,
    - (ii) measures to maintain constant power such as uninterruptible power supplies, and
    - (iii) an environment within the normal operating conditions of the equipment.
  - (b) Adequate controls to prevent unauthorised attempts to access data in accordance with the API defined in the EWD Standards.
  - (c) Adequate controls to prevent attempts to access data outside of the API defined in the EWD Standards including prevention of malicious attacks.
  - (d) API access request logs that monitor and allow auditing of appropriate intersystem use in accordance with the EWD Standards.

- (e) A process for data validation including data stored and data transferred.
  - (i) Monitor and maintain the performance of the system including capacity planning.

### 23. Business continuity and disaster recovery

- (1) The technology provider back office shall operate continuously with defined processes for maintenance and disaster recovery.
  - (a) The technology provider back office shall:
    - (i) be configured to ensure an API availability percentage, as defined in section 53 in this document of 99.5% 24 hours a day, 7 days a week excluding scheduled outages that may affect operations,
    - (ii) limit scheduled outages to 3am – 4am AEDT on the first Sunday of each month, and
    - (iii) monitor and record outage and availability statistics for audit purposes.
  - (b) The EWD shall:
    - (i) have an API response time for data requests of less than 2 seconds,
    - (ii) support simultaneous requests from up to 50 other technology providers, and
    - (iii) support up to 5000 requests in aggregate per day from other technology providers.
  - (c) The technology provider system shall:
    - (i) ensure data losses do not exceed more than a 15-minute window,
    - (ii) perform complete operating system and application backup on a monthly basis,
    - (iii) have a documented process for using backed up systems and data in event of disaster recovery including resynchronising data with EWD equipment, and
    - (iv) log all outages and recovery events for audit purposes.
  - (d) The technology provider system may return an error response if invalid activities are detected such as excessive data requests.
- (2) In the event of an ongoing or permanent shutdown of a technology provider system, the technology provider shall present the drivers and record keepers with all information to maintain their legal obligations.

## 24. System access requirements and data governance

- (1) Driver access shall be provided. The EWD shall provide each driver with:
  - (a) access to all work diary entries made in all technology provider systems the driver has used within the past 28-day period. The access to this data shall be possible when logged into an approved EWD from any technology provider.
  - (b) Restricted access to not be able to view another driver's records except for when two-up driving requires simultaneous or dynamic viewing of work status. A driver must not be able to modify another driver's work diary information.
- (2) Record keeper access shall be provided. The record keeper shall:
  - (a) be provided a method for retrieving and storing the driver's work records in accordance with their obligations. The record keeper must have access to the previous 3 years of a driver records at any moment in time, and
  - (b) not be provided access to driver's work records for which the record keeper has no regulatory responsibility.
- (3) Transport operator access shall be provided. The transport operator shall:
  - (a) be provided access to the EWD system information for EWDs within its regulatory responsibility,
  - (b) be provided access to a driver's records where required to meet their obligations in the chain of responsibility, and
  - (c) not be provided access to EWD systems or drivers' records for which the transport operator has no regulatory responsibility.
- (4) Technology provider access shall be provided.
  - (a) The technology providers may access data from within the system when required:
    - (i) to facilitate a driver in meeting their obligations to provide a 28-day work diary,
    - (ii) to facilitate a record keeper in meeting their obligations to provide up to 3 years of work diary information, and
    - (iii) for a proper purpose, such as system validation, auditing or technical support.
  - (b) A technology provider shall not attempt to access driver data from other technology

providers system without the express permission of the driver.

- (5) Authorised officer requests shall be allowed. Authorised Officers shall:
  - (a) be able to view EWD interfaces in the Compliance View. The compliance view shall provide an Authorised Officer with all required information to assess a driver work diary,
  - (b) be able to transfer a compliance report from the EWD for use in legal matters,
  - (c) be able to view both driver work diaries in a two-up arrangement subject for both drivers actively using the EWD, and
  - (d) not be able to view the work diary of other drivers previously logged into the EWD that are no longer logged in.
- (6) NHVR access and auditing shall be allowed. The NHVR:
  - (a) may request audits be performed on approved technology provider systems at any time.

## 25. System documentation







- (1) System Design Manual.
  - (a) The manual shall outline the function of each part and how each requirement of the EWD Standards is managed.
- (2) Installation Manual.
  - (a) An installation manual shall outline the steps required to ensure each EWD complies with the EWD Standards.
- (3) Operation Manual. An operation or user manual shall:
  - (a) outline how the driver is required to operate the EWD to maintain a valid and compliant work diary,
  - (b) outline how the record keeper will access the EWD to meet regulatory obligations in respect of the driver, and
  - (c) reference the steps required to access the Compliance View to review all relevant information and methods for transfer of information.
- (4) Training Manual. Training material shall:
  - (a) outline how the driver and record keeper will be trained to perform the functions outlined in the operation manual, and
  - (b) reference the steps required in the event of failures and malfunctions.

## Part 4 – Enforcement requirements

### Division 1 – Compliance view

#### 26. Access requirements

- (1) The EWD shall be capable of being presented for view outside of the vehicle in daylight and in night-time or indoor environments. The following items shall be available in compliance view:
  - (a) driver details,
  - (b) EWD system details,
  - (c) a graphical summary view of the work diary,
  - (d) a tabular view of the driver work and rest change entries,
  - (e) a tabular view of calculated potential non-compliance,
  - (f) a tabular view of Authorised Officer annotations and ability for entry of annotations,
  - (g) report transfer option,
  - (h) Compliance View help,
  - (i) the make and model of the device being used, and
  - (j) the operating system (including version number) of the device being used.
- (2) Standard icons shall be used for navigation to the compliance view and for navigation to specific items.

Item	Symbol
Navigation to Compliance View	
Report Transfer	
Help	
Investigation Aid (Potential non-compliances)	
Annotations	
Standard Scroll functionality	

- (3) The interface shall be presented in a compliance view that allows an Authorised Officer to view, assess and make annotations in accordance with the EWD Standards. The compliance view shall only present information for drivers logged into the EWD.

- (4) In the case of multiple drivers logged into a two-up arrangement, the driver information in two-up arrangements shall not be interleaved in Compliance View but allow the information to be assessed separately.
- (5) Compliance View shall be a read only view except for an Authorised Officers' annotations.
- (6) The EWD may require a driver password to exit Compliance View. The driver may be in a work or rest period during the compliance assessment dependant on the activity the driver is undertaking.

Refer to [s221](#) of the HVNL for the definition of what is work in relation to a fatigue-related heavy vehicle.

#### 27. Driver details

- (1) The driver details shall be available in Compliance View. The driver details shall include:
  - (a) driver name,
  - (b) driver licence number,
  - (c) vehicle registration,
  - (d) driver base,
  - (e) base time zone,
  - (f) record location,
  - (g) work and rest hours option and accreditation number (if applicable), and
  - (h) two-up driver details including:
    - (i) driver name,
    - (ii) driver licence number,
    - (iii) state/territory of licence issue, and
    - (iv) work and rest hours option.

#### 28. EWD system details

- (1) The EWD system details shall be available in compliance view. The EWD details shall include:
  - (a) name of EWD system approval holder, as registered with the NHVR,
  - (b) EWD system name, and
  - (c) EWD system version number.

## 29. Graphical summary

- (1) The driver work diary shall be presented for Authorised Officers in graphical form as defined below, accessed via the standard icon for compliance view specified in section 26:

[illegible]

- (2) The graphical view shall include a details section at the top including and labelled as follows:

- (a) Driver Name - driver's name.
- (b) Licence - driver's licence number.
- (c) Registration - vehicle registration.
- (d) Work Option - work and rest option.
- (e) Date of sheet - date of currently viewed period.
- (f) Time Zone - time zone of the driver's base.
- (g) the make and model of the device being used.
- (h) the operating system (including version number) of the device being used.

The graph portion shall present the following information:

- (i) Annotations – as a row of flags where an Authorised Officer annotation has been made. Presented on the graph referencing the time of annotation flag.
- (j) Comments – as a row of flags where additional activity data exists in the work and rest activity tabular view. The flag shall be present if one of the following exists for the activity:
  - (i) the driver entered a comment,
  - (ii) the driver has corrected the time of activity commencement after the initial creation,
  - (iii) the driver has changed the location name, and
  - (iv) the driver has corrected the work and rest option.
- (k) Location – as a row of location names as confirmed by the driver.
- (l) 2-up – presented as a horizontal line for any time that the driver is under two-up operation.
- (m) Work and Rest – activities presented as a horizontal line in the appropriate row during the activity with a vertical line between rows when an activity change occurs.
- (n) A dashed line through the work and rest activities where a potential non-compliance has occurred.
- (o) A summary of Total Work and Total Rest for the displayed 24-hour period. The total shall show the sum of all time logged for each activity.

The graphic shall be able to be interpreted with a 24-hour period (from midnight to midnight) displayed in one view. Interface features such as sub 24-hour zoom and multi-day view may be included as an addition. The graphical view shall provide the ability to:

- (p) scroll through the past 28-days of graphs (if information is unavailable, each day shall be viewed with blanks where data is missing),
- (q) for an Authorised Officer to make an annotation at any point through the 28-day graphical views,
- (r) select an activity and view the detailed work and rest tabular view information for that activity, and
- (s) select an Authorised Officer annotation and view the detailed annotation tabular view information.

## 30. Work and rest changes

- (1) A tabular option of each work and rest change entry and each driver comment shall be available. The tabular view should represent the following information:

Activity	Time of Activity	Location	Odometer	Work and Rest Option	Comments	Origin	Entry Timestamp

- (2) The work and rest events table shall include the following:

- (a) Activity – commenced as either:
  - (i) Work, or
  - (ii) Rest.
- (b) Time of Activity – commencement, as the date and time.
- (c) Location – name as confirmed by the driver.
- (d) Odometer – in kilometres.
- (e) Work and Rest Option – in use from either:
  - (i) Standard,
  - (ii) BFM,
  - (iii) AFM (accreditation number display if AFM in use), or
  - (iv) Exemption.
- (f) Comments – entered by the driver.
- (g) Origin – origin of the data from either:
  - (i) EWD (if generated in current EWD).
  - (ii) Historic (if manually created historic data).
  - (iii) External (if retrieved from a different technology provider).
- (h) Entry Timestamp – as the timestamp of additional activity data entries flagged on the graphical view

- (3) The tabular view shall:

- (a) allow an Authorised Officer to clearly view all information of each activity in one view,
- (b) display multiple rows of activities with scrolling function as required by the number of activities present,
- (c) be ordered in reverse chronological order by the time of activity commencement, and
- (d) maintain record created and modified timestamps, managed in accordance with the data specifications in the EWD Standards.

## 31. Investigation aid

- (1) A tabular summary of calculations of potential non-compliance shall be made available to the Authorised Officer, accessed via the standard icon for Investigative Aid, provided in section 26. The tabular view shall include all calculated potential non-compliances in the last 28-day period and be assessed against each option in each rule set applied through this period. The calculations shall apply the constraints defined in each work and rest hours option. The tabular view should represent the following information:

Time	Work and Rest Option	Period of Time	Work or Rest	Potential Non-Compliance Level

- (2) The tabular view shall include the following:

- (a) Time – potential non-compliance event was last present, as the date and time.
- (b) Work and Rest Option – applied for potential non-compliance.



- (c) Period of Time – applied for potential non-compliance.
- (d) Work or Rest – period applied for potential non-compliance from either:
  - (i) Work, or
  - (ii) Rest.
- (e) Potential Non-Compliance Level – level of severity reached from either:
  - (i) Minor,
  - (ii) Substantial,
  - (iii) Severe, or
  - (iv) Critical.

(3) The tabular view shall:

- (a) use the terminology as described in each work and rest hours option,
- (b) allow an Authorised Officer to clearly view all information of each potential non-compliance in one view,
- (c) display multiple rows with scrolling function as required by the number present, and
- (d) be ordered in reverse chronological order by time.

## 32. Authorised officer annotations

- (1) Annotations shall be capable of being created by Authorised Officers from the graphical view, accessed via the standard icon for annotations specified in section 26.
  - (a) Annotations may be applied against any time in the past 28-day period.
  - (b) Where presented, Authorised Officer annotations shall be clearly distinguishable.
  - (c) The creation of a new annotation shall provide the ability to enter all information required by the annotation tabular view as defined in the EWD Standards. Once an annotation has been committed, the data shall be non-editable.
- (2) A tabular option of each Authorised Officer annotation within the past 28-day period shall be available. The tabular view should represent the following information:

Annotation Flag	Time of Intercept	Location	Annotation

(3) The annotation tabular view shall include the following columns:

- (a) Annotation Flag – as a time reference defined by the Authorised Officer as appropriate to the comments in the annotation.
- (b) Time of Intercept – as a date and time reference defined by the Authorised Officer for the beginning of the intercept.
- (c) Location – name of the intercept place as entered by the Authorised Officer.
- (d) Annotation – made by the Authorised Officer.

(4) The tabular view shall:

- (a) allow an Authorised Officer to clearly view all information of each annotation in one view,
- (b) display multiple rows of annotations with scrolling function as required by the number of annotations present,
- (c) be ordered in reverse chronological order by time of annotation flag, and
- (d) maintain a record created timestamp, managed in accordance with the data specifications in the EWD Standards.

## Division 2 – Data transfer

### 33. Compliance report transfer

- (1) The compliance view shall provide options for the Authorised Officer to transfer a report of relevant information available in compliance view at the time of inspection. The report shall not include the investigation aid.
- (2) The EWD shall, as a minimum requirement, have the capability to email an automatically generated report file to the manually entered email address of the Authorised Officer. The EWD shall provide fields for the Authorised Officer to enter the email subject and body. When an email request has been sent by the Authorised Officer the EWD shall:
  - (a) not display the entered email address in compliance view or to the driver or record keeper in another part of the EWD,
  - (b) attempt to send the email immediately with a resend mechanism every 15 minutes until acceptance from mail server is received, and
  - (c) store the contents of the email for 28 days allowing retrieval.
- (3) The report shall be a single Portable Document Format (PDF) file as defined in ISO 32000-2. The report shall include:
  - (a) a summary of driver details showing the same information present in compliance view,
  - (b) a summary of EWD system details showing the same information present in compliance view, including the make, model and the operating system (including version number) of the device being used,
  - (c) 28 individual 24-hour views of work graphs as present in compliance view,
  - (d) a tabular view of driver work and rest changes for the past 28 days showing the same information present in compliance view, and
  - (e) a tabular view of Authorised Officer annotations made on the driver's record for the past 28 days showing the same information present in compliance view.
- (4) The report shall:
  - (a) be clear and able to be interpreted in accordance with the *Heavy Vehicle National Law Act 2012* when printed on standard A4 paper,
  - (b) if no information is available for a given graph or tabular view, retain the view in the

report to show that no information exists, and

- (c) in two-up arrangements, only include information relating to the driver selected by the Authorised Officer.

### 34. Format of data transferred

- (1) The EWD shall create a zip formatted container file (as defined in ISO/IEC 21320-1) that contains the compliance report prior to sending.
  - (a) The EWD shall generate a MD5 checksum from the container file.
  - (b) The MD5 checksum of the container file shall be capable of being reproduced by others using standard MD5 checksum verification of RFC1321.
  - (c) The size of the file shall be less than 5MB.

### 35. Transaction acknowledgement

- (1) On the request for compliance report transfer (see section 33), the EWD shall provide the Authorised Officer with an acknowledgement of the request. The information presented on a transaction acknowledgement shall be:
  - (a) container file MD5 checksum (presented as transaction ID),
  - (b) driver name,
  - (c) driver licence,
  - (d) EWD system name,
  - (e) EWD system version number,
  - (f) name of EWD system approval holder, as registered with the NHVR, and
  - (g) the make, model and operating system (including version number) of the device being used.
- (2) If the MD5 checksum is unable to be generated at the time of roadside transfer due to communications failure, the transaction ID shall display as 'pending'.
- (3) The EWD shall present the information to allow the Authorised Officer to take a photograph of the information or to write down the information.

### 36. Access from record keepers

- (1) Authorised Officers shall be able to request work diary information from record keepers for the past three (3) year period. The information shall be in a format that is human readable and allows the information to be assessed in full. Information may be requested in PDF or CSV format. If requested in PDF format, the information shall include:
  - (a) work graphics of each day in the form displayed in section 29,



- (b) work and rest entries in tabular form as defined in section 30,
- (c) Authorised Officer annotations in tabular form as defined in section 32, and
- (d) other information as requested by an Authorised Officer and available to the record keeper.

## Part 5 – Data interoperability

### 37. General

- (1) The EWD shall comply with a standardised method and format for data transfer between technology providers. The data transferred shall be sufficient for the driver to maintain the last 28 days of work and rest information. The EWD system shall:
  - (a) transmit data to other technology providers in accordance with the data and security methods outlined in the EWD Standards, and
  - (b) request, receive and interpret data in accordance with the data and security methods outlined in this document.
- (2) The EWD shall only request driver data from other technology providers when the driver logs into an EWD.
- (3) 'Request' as referred to above is by means of a valid electronic data transfer request and shall not require a written or verbal application be made to initiate the transfer.
- (4) In the event of connectivity failures, the request shall be retried until a response is received.
- (5) The EWD shall allow two-up drivers to individually access the EWD and transfer data from other technology providers in accordance with the data transmission requirements.

### 38. Unique Driver Identification (UDI)

- (1) Drivers shall be uniquely identified across all technology provider systems.
- (2) The UDI shall be created one time in each technology provider system using the unique method provided in the EWD Standards. The technology provider shall validate or create all drivers in their EWD system. On creation, the technology provider shall alert the record keeper if a conflict is found.
- (3) The responsibility remains with the driver to advise of changes to the details provided to establish the same UDI across all EWD systems, ensuring the driver can maintain their work diary obligations.
- (4) The technology provider shall perform a search of the driver's records under a previous UDI if there has been a change of driver's UDI within the last 28-days and the technology provider has been advised of this change.

- (5) The method of login security access details for each EWD system may be different for each technology provider system. The driver's UDI is required to be used during technology provider to technology provider transfer.

- (6) The UDI shall be constructed as:

**SOI-XXXXXX-YYYYMMDD**

- (7) Where:

<b>SOI</b>	Driver's licence state or territory of issue as defined in section 433.
<b>XXXXXX</b>	Last five (5) characters in the driver's licence number excluding spaces and special characters.
<b>YYYYMMDD</b>	Driver's date of birth in year/month/day format as defined in ISO 8601.

### 39. Data required for transmission of driver records between systems

- (1) The data transferred between technology providers shall be the minimum required to provide 28 days of records and assess potential non-compliance.
- (2) The data transferred between technology providers shall contain all information relating to the creation of each entry to maintain a chain of evidence.
- (3) The data received from another technology provider shall be read only and marked with an origin of 'external'.
- (4) The data to be transferred is defined in Part 6 of this document.

### 40. Technology provider identification and key

- (1) On EWD approval and registration, technology provider identifier information shall be distributed to all other approval holders. Technology providers shall use the register of identifiers to form an inbound firewall.
- (2) All technology providers shall provide an open HTTPS port to allow other technology providers to access driver entries.
- (3) Upon approval and registration, technology providers shall provide a list of IP addresses that API requests will be made from. These IPs will be distributed to other technology providers for the purposes of whitelisting.

- (4) Upon approval and registration, technology providers shall provide a public key on which other providers can verify the origin of the request.

## 41. Data transfer Application Protocol Interface (API)

- (1) This API enables a technology provider to download the data of a driver.
  - (a) HTTPS must be used. Only encrypted data shall be transferred via the internet.
  - (b) After the top-level domain, the URL must start with /ewdapi/ e.g.  
<https://www.provider.com.au/ewdapi/>
  - (c) The work diary for a driver must be downloaded using a GET request to  
/ewdapi/driver/:UDI

**Where:** UDI is the UDI of the driver

**Example:** GET

<https://www.techprov.com.au/ewdapi/driver/VIC-12345-19700715>

Where:

**Technology Provider:** [www.techprov.com.au](http://www.techprov.com.au)

**driver-id:** VIC-12345-19700715

- (2) Standard HTTP response codes shall be used. Responses shall include:
  - (a) **200 – OK**
    - (i) Returns JSON object as defined in section **Error! Reference source not found.** when driver data is available for the previous 28-days.
    - (ii) Returns empty JSON object when driver data is not available for the previous 28-days.
  - (b) **403 – Forbidden**
    - (i) If the technology provider making the request fails to authenticate their credentials against the approved list.
  - (c) **404 – Not Found**
    - (i) If the UDI does not exist or the request path is invalid.
  - (d) **429 – Too Many Requests**
    - (i) If the technology provider detects invalid activities such as excessive data requests.

## Part 6 – Data specification

### 42. General

- (1) The format of data to be transferred shall meet the information required for the WWD.

### 43. Summary of foundation objects

- (1) Timestamps shall be used where data is created at a specific time such as an annotation. The timestamp shall take the form of:

**YYYY-MM-DDThh:mm:ss[+/-]Hh:Mm**

Where:

YYYY	year
MM	month
T	
DD	day
hh	hours
mm	minutes
ss	seconds
[+/-]	positive or negative time zone offset
Hh	time zone offset hours
Mm	time zone offset minutes

- (2) Unless otherwise specified, the original creation timestamp shall be kept with the data through transfer and presentation on an EWD.
- (3) The time zone of the timestamp shall be the driver's base time zone relevant to the data being recorded.
- (4) Where state and territory references are required, the following enumerators shall be used:
  - (a) ACT
  - (b) NSW
  - (c) NT
  - (d) QLD
  - (e) SA
  - (f) TAS
  - (g) VIC
  - (h) WA

Additionally, for driver licence state/territory of issue only:

- (i) OTH
- (5) Where location references are required, the following information shall be stored:

- (a) GNSS latitude (in signed decimal degree format with up to six (6) decimal places, e.g. -27.941582, or null if value is determined to be invalid).
- (b) GNSS longitude (in signed decimal degree format with up to six (6) decimal places, e.g. 153.43311, or null if value is determined to be invalid).
- (c) Human readable name.

### 44. Summary of work diary objects

- (1) The data transfer format is based on a set of defined JSON objects. These objects are defined in the EWD Standards – Schedule A.

### 45. Schema for data transfer

- (1) Technology providers shall transfer data using the format specified in the *EWD Standards – Schedule A*.

## Part 7 – Work and rest options

### 46. General

- (1) A rule set is a machine-readable version of a work and rest option.
- (2) A rule set defines periods of time to be used as markers for determining potential non-compliance. Rule sets are defined in four (4) categories:
  - (a) Standard hours.
  - (b) Basic Fatigue Management (BFM).
  - (c) Advanced Fatigue Management (AFM).
  - (d) Exemption hours.
- (3) The NHVR shall issue rule sets to technology providers in accordance with the EWD Policy Framework. Advanced Fatigue Management (AFM) rule sets developed by the NHVR on behalf of transport operators shall not be shared with other transport operators by technology providers.
- (4) The EWD shall use potential non-compliance descriptions provided in the rule sets for standardised information display in the compliance view.

### 47. Assessing work and rest change data against the rule sets

- (1) Time periods are defined within the rule sets.
- (2) Work potential non-compliance occurs when the minor work timeout is reached. This level is active until the next potential non-compliance level timeout occurs or a rest period begins.
- (3) Rest time is only added to the rest total when the rest period is passed.
- (4) Rest potential non-compliance occurs based on the minimum minutes per period defined and therefore during a rest period will reduce in level of potential non-compliance until no potential non-compliance is present.
- (5) Reset rest periods shall cease checking of that potential non-compliance type/work and rest period in reverse chronological order.

### 48. Maintaining and updating EWDs with rule sets

- (1) Technology providers shall monitor the rule sets and update their systems with new rule sets and upgrade or delete expired rule sets.
- (2) The NHVR may apply a human readable name, version number and expiry to each rule set.
- (3) Technology providers and transport operators shall manage the EWD installation to ensure that the relevant rule sets are applied.
- (4) Technology providers shall import rule sets into their system in accordance with the format provided by the NHVR.

determined by the NHVR based on the significance of the change declared by the technology provider.

## Part 8 – Approvals

### 49. General

- (1) Approval shall demonstrate that the requirements of the EWD Standards are met.
- (2) The NHVR must be satisfied that any proposed EWD will not impede Authorised Officer operational activities.
- (3) The NHVR may issue additional guidelines, procedures and policies for assessing EWDs to the EWD Standards. Technology providers shall adopt these in accordance with their purpose.
- (4) Approval of a proposed EWD to the EWD Standards shall be either granted or refused. Conditions may be applied at the discretion of the NHVR.
- (5) EWDs approvals, conditions of approval and use may be subject to audits and reassessment at the discretion of the NHVR. This may include third party review of a proposed or approved EWD.

### 50. Authority to approve

- (1) The NHVR, in accordance with the *Heavy Vehicle National Law Act 2012*, is the approving authority for EWD systems. The NHVR reserves the right to delegate whole or part of the assessment process to a third party. On approval of an EWD, the NHVR shall register the EWD system details.

### 51. Provision of test units and documentation for approval process

- (1) The technology provider shall provide a system and supporting documentation capable of demonstrating all requirements of the EWD Standards. Documentation and test procedures shall clearly outline where any variation to real-world application has occurred on the test EWD.

### 52. Requirement for post approval retesting following material system change

- (1) Any significant changes to an EWD system such as hardware, firmware or software updates that affect the requirements of the EWD Standards or change the approval conditions shall require notification to the NHVR.
- (2) The requirement for full or partial retesting to the requirements of the EWD Standards will be

## Part 9 – Definitions

### 53. Definitions

(1) For the purpose of this Standard, the definitions in the HVNL and the following definitions apply:

Term	Acronym	Comment
Advanced Fatigue Management (AFM)	AFM	See section 457 of the HVNL.
Application Programming Interface	API	A protocol and method for data transfer between software systems.
Approval holder		A technology provider who holds an approval granted by the NHVR, for an electronic recording system to be used as an electronic work diary (EWD), having met the requirements of the EWD Standards.
Authorised Officer		See section 5 Definitions of the HVNL.
Availability Percentage		$A\% = (S - D) / S \times 100$ Where: A% = Availability Percentage S = Standard Usage Hours (not including scheduled maintenance) D = Downtime Aggregate Hours
Basic Fatigue Management	BFM	See section 457 of the HVNL.
Comma Separated Values	CSV	A delimited text file that uses commas to separate the values.
Driver		See section 5 Definitions of the HVNL.
Driver base		See section 5 Definitions of the HVNL.
Driver licence		See section 5 Definitions of the HVNL.
Electromagnetic Compatibility	EMC	The ability of equipment to function satisfactorily, within its electromagnetic environment, without introducing intolerable electromagnetic disturbances to anything in that environment.
Electronic Work Diary	EWD	See section 221 of the HVNL.
Electronic Work Diary information		See section 727(1) of the HVNL.
Electronic Work Diary protected information		See section 727(1) of the HVNL.
Entry		See section 727(1) of the HVNL.
Equipment		See section 5 Definitions of the HVNL.
Geolocation		A human readable name generated based on geographic coordinates. The geolocation may be created from the Geocoded National Address File (G-NAF) dataset or similar equivalent dataset.
Global Navigation Satellite System	GNSS	The use of satellite constellation and augmentation systems to position devices using geographic coordinates.
Historic data		Historic data refers to work and rest entries created by the record keeper manually and marked as historic data, to create a continuous electronic record.

Term	Acronym	Comment
Hyper Text Transfer Protocol Secure	HTTPS	For secure communication over a computer network.
Internet Protocol	IP	Standard set of rules for sending and receiving data over the Internet.
JavaScript Object Notation	JSON	Data-interchange format for use in transfer of EWD driver information and provision of rule sets.
Legal obligations		Duties imposed on a party in the HVNL.
Malfunction		See section 221 of the HVNL.
Party in the Chain of Responsibility	CoR	See section 227 of the HVNL.
Record keeper		See section 317 of the HVNL.
Registration		See section 5 Definitions of the HVNL.
the Regulator	NHVR	National Heavy Vehicle Regulator.
Real-time Clock	RTC	A pulse generator which operates at precise time intervals to determine time intervals between events and initiate specific elements of processing.
Rest		See section 221 of the HVNL.
Rule Set		An electronic machine-readable version of the work and rest option.
Tamper		See section 334 of the HVNL.
Technology provider		A provider of candidate or EWD systems and services inclusive of equipment and data management.
Transport operator		See section 5 of the HVNL: ‘operator’.
Two-up driving arrangement		See section 221 of the HVNL.
Unique Driver Identifier	UDI	A core set of information that is formatted in a standard method to create a unique and common Driver reference across technology providers.
Uniform Resource Locator	URL	Standard address for accessing data between technology providers.
Work		See section 221 of the HVNL.
Work and rest hours option		See section 243 of the HVNL.
Work diary		See section 221 of the HVNL.
Work Rest Change		See section 221 of the HVNL.
Written Work Diary	WWD	See section 221 of the HVNL.

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