Data Standard Overview

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The Data Standard Essentials

What is the Data Standard?

The data standard is made up of three parts:

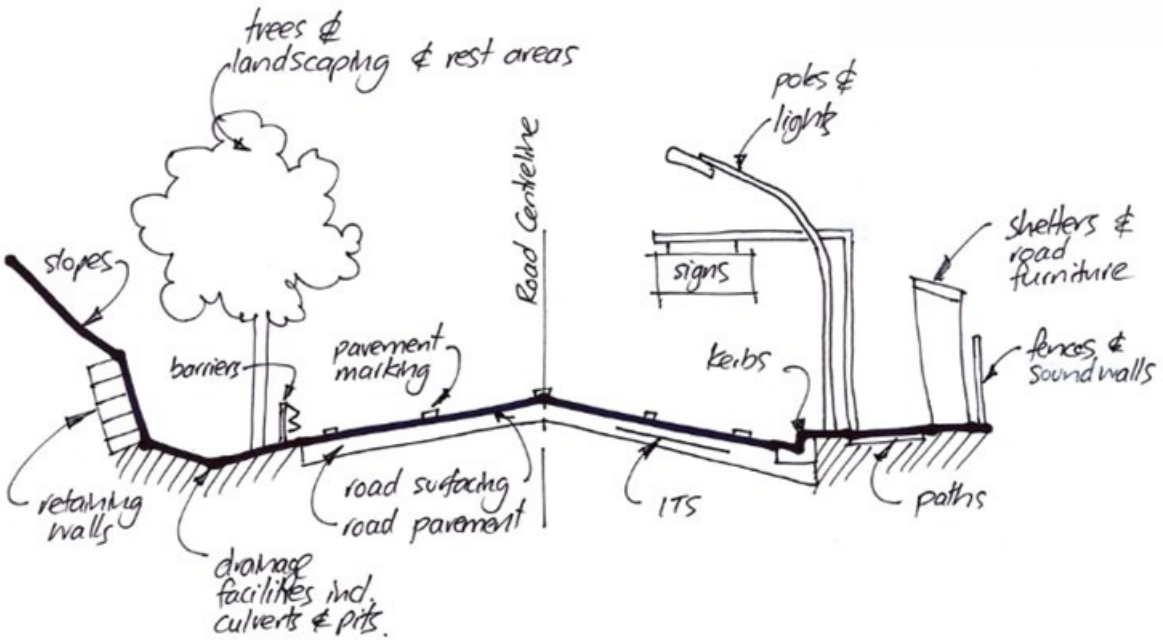
1. A spreadsheet that sets out and defines the data tables that will be used in AWM
2. A spreadsheet that sets out and defines the attributes in each of the data tables.
3. Articles in this KnowledgeBase (KnowledgeOwl) that provides supporting information that allow users to better understand and use the data standard consistently in a variety of scenarios.

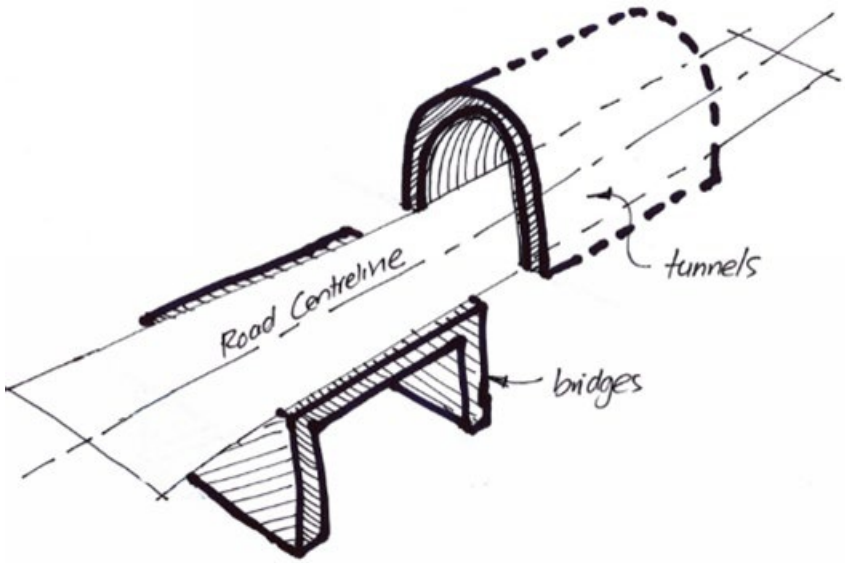
Asset Table Names

- You will notice asset table names with "(AMDS)'. This indicates that the table has come from the AMDS standard.
- If the name has "(AMDSX)" at the end it indicates that the data standard is a modified version from AMDS.
- If the name has "(PNG)" at the end it indicates that this is a new data design specifically for local RMS needs (e.g. Causeway)

The following provides deatil of each table currently being deployed as part of phase 1 of the Road Management System (RMS) implementation whihc Asset & Work Managment (AWM) forms part of.

Assets to be Managed in AWM





The following sets out the assets and asset components that are to be managed in RAMM.

Pavement & Surfacing

- Pavement Layer (AMDS)
- Subgrade Layer (AMDS)
- Surfacing Later (AMDS)

Road Structures

- Bridge (AMDS)
- Bridge Span (PNG)
- Mahor Culvert (PNG)
- Retaining Wall (AMDS)
- Sea Wall (AMDS)
- Causeway (PNG)
- Tunnel (AMDS)

Drainage System

- Chamber (AMDS)
- Channel (AMDS)
- Culvert (PNG)
- Headwall (AMDS)
- Water Area (AMDS)

Amenities

- Cultural Installation (AMDS)

Street Lights

- Luminaire (AMDS)

Intelligent Transport Systems (ITS)

- Camera (AMDS)
- Controller (AMDS)
- Electronic Sign (AMDS)

Traffic Signals

- Aspect (AMDS)
- Target Board (AMDS)
- Traffic Signal (AMDS)

Support Structure

- Pole Structure (AMDS)
- Outreach (AMDS)
- Gantry (AMDS)
- Mast (AMDS)

Pathway

- Pathway (AMDS)

Barrier

- Barrier (AMDS)
- Barrier Terminal (AMDS)
- Crash Cushion (AMDS)

Traffic Services

- Rail (AMDS)
- Sign (AMDS)
- Delineator (AMDS)

Geotech

- Ground Treatment (AMDS)

Assets that could be Managed in AWM in the Future

[WIP]

- Stopping Place (AMDS)

Network & Other Information to be Managed in AWM

The following sets out the network information that are to be managed in AWM.

Core Network Information

- Road Names
- Carriageway

Other Network Information

- Intersections
- Restrictions
- RiverCrossing

Other Infromation

- Points of Interest
- PNG Useful Areas
    - Provinces

Geometry Guidance

Introduction

Geospatial information is vital to PNG DoWH, as it underpins the management, analysis and reporting of land transport assets now and into the future.

Transport assets are often located close together and beside other physical objects. Having confidence in the recorded location of assets is important, as it can enable assets to be located and identified more efficiently, and for faults to be found and remedied promptly.

This guidance provides a framework for recording the location of transport assets with sufficient accuracy for future needs. It will help to ensure consistency and confidence in the positional information of assets to assist maintenance and support planning.

Unlike some other practice documents and standards, which provide clarification on how to determine positional measurements, the underlying focus of this guidance is on specifying a relatively simple and generic way of recording the position of transport assets.

Purpose of the guidance

This guidance establishes a specification for the positional accuracies for recording transport assets. It is intended to be used when collecting information on the location of assets, such as when preparing an ‘as built’ record. This will enable the surveyed spatial information to be recorded in RAMM accurately in three dimensions (X, Y, Z).

The guidance is not expected to be applied to existing records, as this could create a significant burden and expense for PNG DoWH. Instead, it provides a framework that can be used whenever there is physical interaction with the asset, such as during maintenance or fault repair.

The guidance is intended to enable the assets to be located and relocated at any time, using GNSS (Global Satellite Navigation System) technology such as GPS. The accuracy obtainable from various products using this technology

continues to increase and become more affordable.

It also provides for the recording of accurate invert levels. More accurate technologies may be required to determine these levels.

Target audience and users

The guidance is intended to be used by PNG DoWH, contractors, surveyors and engineers who undertake work on the assets.

PNG DoWH and asset managers will be able to specify (e.g. in contracts) that this guidance should be used when recording the location of new or maintained assets.

Scope

The guidance is limited to the position associated with an asset (i.e. the X, Y, Z coordinates).

Datums and Projections

This section of the document has not been populated and needs to be confirmed. Some resources from *The Association of Surveyors of Papua New Guinea* has been found that may be relevant to this topic: http://www.aspng.org/techinfovert.htm and http://www.aspng.org/techinfopng94.htm

This section outlines how the horizontal and vertical positions should be reported, suggested asset geometries, and the capture and use of the Z location.

Horizontal Position

All horizontal positions should be reported in TBC.

Vertical Position

All vertical positions should be reported in TBC.

Suggested Asset Geometries

Geometry Type	Lat/Long	Start Lat/Long	End Lat/Long	Z	Asset Information
Point	Yes			Yes	Yes
Polyline, Polygon and Voxel	Yes	Yes	Yes	Yes	Yes

Accuracy

Specifying the level of accuracy is important, and this is to be assessed based on the method of collection used for

both horizontal and vertical reference systems. Options include:

• draped

• LiDAR

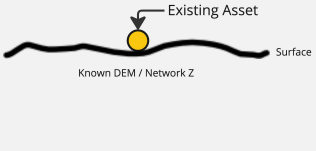
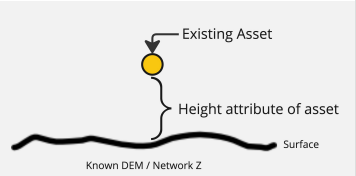
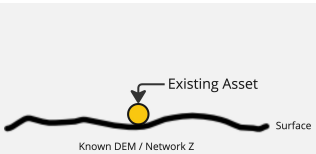
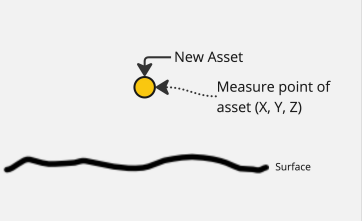
• survey

• nothing

The capture and use of the Z location

New assets should have their Z location collected with a high level of accuracy. Where this information is not available or feasible to collect, the Z location could be calculated using appropriate software applications that can leverage the Network Model as a base point / DEM.

The accuracy level for DEM calculated Z geometry will only be as good as the DEM and Network Model that is currently available. Some common scenarios are outlined below.

Asset Status	Does the asset sit flush on the surface?	Guidance	Guidance Diagram
Existing Asset	Yes	If the asset has no previous Z geometry information, then the Z value defaults to the surface level of the DEM/Network Model.	
	No	The Z value is calculated from the DEM/Network Model and the the asset height field.	 Where Asset Z = DEM or Network Model Z + Height of Asset
New Asset	Yes	Record the Z for the new asset with the data collection device placed on the ground.	
	No	Record the Z for the new asset with the measurement taken from the base of the asset at its start height from the surface.	

Reference / Attribution

This guidance document has been adapted under the Creative Commons Attribution 4.0 International license, from the Waka Kotahi NZ Transport Agency (www.nzta.govt.nz); Asset Management Data Standard Geometry Guidance v1.0 document.

Background to Development of the Standard

- This data standard has been created by Simon Gough (GHD), Scott McIntyre (Datastack - supporting GHD), Stuart Trounson (GHD) and Elliot McBride (GHD) as part of the PNG Transport Sector Support Programme.
- The following standards have been used as source information to provide some of the inputs for the creaton of the PNG RMS data standard:
    - The NZ Asset Management Data Standard (AMDS)
    - Auckland Transport Database Operations Manual (ATDOM) - partly written by Simon Gough and Scott McIntyre
    - Austroads Asset Data Standard

Data Standard Background Information

Data Standard Development

1. The AMDS (see below) has recently been developed in New Zealand as a current data standard and RAMM are progressively rolling out data tables that align to this standard.

2. As AMDS is a thorough standard for roading requirements AND RAMM is providing data tables already aligned to this standard, it was logical to use AMDS as the base data definition for assets that are going to be managed in the PNG RAMM database.

3. Modifications have been made to the AMDS requirements where it was felt that they did not suit PNG requirements

4. The PNG RMS Data Standard is aligned to the data structure (tables) in RAMM so that it is pratical and simple to use. It can therefore be considerd a data requirements and a data structure standard.

> The data requirements for networks follow the RAMM 'core' tables (standard tables that can't be changed) as opposed to any separate data standard.

External Data Standards

The NZ Asset Management Data Standard (AMDS)

The AMDS is currently being implemented into all road authorities in NZ. I will provide a few links below. I am not expecting you to read all of this, but just in case you want to know where this standard comes from.

- Overall information on the project: https://www.nzta.govt.nz/roads-and-rail/asset-management-data-

standard/

- Latest release of the standard: https://www.nzta.govt.nz/roads-and-rail/asset-management-data-standard/development/data-standard-releases/

Austroads Data Standard

Austroads also have a data standard for roading information. This is not so tightly aligned to RAMM, hence why AMDS was chosen as the base data standard.

- Information on their latest version 4 release can be found here: https://austroads.com.au/latest-news/fourth-edition-of-austroads-road-asset-data-standard

Austroads (represented by Sarah Jones (sarah@drivenstrategyandpolicy.com) as the Project Manager) has rovided approval that PNG DoWH can include portions of the Austroads standard in their standard.