Austroads

Technical Report
AP-T334-18

Data Standard for Road Management and Investment in Australia and New Zealand Version 2

Network | Classification | Inventory | Condition
Demand | Utilisation | Criticality | Risk | Resilience
Performance | Access | Work and Costs

Data Standard for Road Management and Investment in Australia and New Zealand Version 2

Prepared by

Opus International Consultants

Project Manager

Angus Draheim

Publisher

Austroads Ltd.
Level 9, 287 Elizabeth Street
Sydney NSW 2000 Australia
Phone: +61 2 8265 3300
austroads@austroads.com.au
www.austroads.com.au

Abstract

The Data Standard for Road Management and Investment provides road agencies and their suppliers, in Australia and New Zealand, with a specification for the data that supports common operational activities.

The Data Standard also provides road network funding agencies with a specification to inform structure of reports and submissions requested from road agencies, to enable more equitable evidence-based investment decision making. Specifically, the Standard establishes a common understanding of the meaning or semantics of the data, to ensure appropriate use and interpretation of the data by its stakeholders.

The Standard also recognises various levels of sophistication in inventory and asset planning practice and provides relevant data item details in this regard. Accordingly, the Standard will benefit any road industry stakeholder who utilises data for road research, policy development, expenditure comparisons, funding approvals, supporting national reforms, national reporting, innovation, shared services, and inter-organisation communications.

Keywords

Asset management, data schema, data sharing, data specification, data standard, road investment, road management

ISBN 978-1-925671-62-9

Austroads Project No. ASP2112

Austroads Publication No. AP-T334-18

Publication date June 2018

Pages 254

About Austroads

Austroads is the peak organisation of Australasian road transport and traffic agencies.

Austroads' purpose is to support our member organisations to deliver an improved Australasian road transport network. To succeed in this task, we undertake leading-edge road and transport research which underpins our input to policy development and published guidance on the design, construction and management of the road network and its associated infrastructure.

Austroads provides a collective approach that delivers value for money, encourages shared knowledge and drives consistency for road users.

Austroads is governed by a Board consisting of senior executive representatives from each of its eleven member organisations:

- Roads and Maritime Services New South Wales
- Roads Corporation Victoria
- Queensland Department of Transport and Main Roads
- Main Roads Western Australia
- Department of Planning, Transport and Infrastructure South Australia
- Department of State Growth Tasmania
- Department of Infrastructure, Planning and Logistics Northern Territory
- Transport Canberra and City Services Directorate, Australian Capital Territory
- The Department of Infrastructure, Regional Development and Cities
- Australian Local Government Association
- New Zealand Transport Agency.

Acknowledgements

Opus International Consultants (Opus) developed and produced this Standard, with the assistance of GISSA International (GISSA) and representative industry stakeholders, on behalf of Austroads.

The basis for the inventory 'as constructed' data standards has been adopted from R-Spec V3C, which has evolved from initial work undertaken in Australia and more recently in New Zealand by the Transport Analytics Governance Group (TAGG). Austroads acknowledges this contribution and the role that GISSA had in facilitating and producing these previous Standards.

The basis for the classification data standards has been adopted from the 'One Network Road Classification' system developed by The Road Efficiency Group in New Zealand.

Summary

Data Standard for Road Management and Investment

This Data Standard for Road Management and Investment in Australia and New Zealand (the Standard) has been developed in response to a need to standardise and harmonise data sets that support common road management and investment activities. Specifically, this Standard establishes a common understanding of the meaning or semantics of the data, to ensure correct and proper use and interpretation of the data by its stakeholders. The data specifications are specific to the data that is typically and routinely used for road management and investment purposes. It provides consistency in data definition and format. The Standard will assist with road management and investment activities including: asset and service performance assessment, performance benchmarking, road research, policy development, expenditure comparisons, funding approvals, supporting national reforms, national reporting, innovation, shared services, and inter-organisation communications.

This Standard has been developed to support asset information management systems for data collection, finance, risk, and information. It is the product of comprehensive consultation in Australia and New Zealand across the road industry.

This version (Version 2) of the Standard highlights an initial Priority Harmonisation Subset (PHS) of data, that will be the subject of further review and stakeholder consultation. The PHS and wider Standard will continue to develop and mature in consultation with stakeholders and in support of national reforms.

NOTE: Levels of Sophistication

The Standard allows organisations to determine their desired level of sophistication with respect to both asset inventory recording and asset management planning and provides the relevant data specification in this regard. This approach is consistent with the fundamental principles of ISO 55000:2014 Management System – Asset Management, particularly regarding maximising 'value' from assets.

NOTE: Functional Road Classification

In this Standard the New Zealand One Network Road Classification (ONRC) has been used as an example of a classification system. This classification has not been endorsed as the primary functional classification system in Australia. The outcomes of discussions on functional road classification in the context of national reforms will inform future versions of a Data Standard for Road Management and Investment.

Background to this Standard

An internal Strategic Business Case report was prepared for Austroads in early 2015, which drew the

conclusion that development of road asset data standards would support the following:

> *a platform to improve road agency practices and drive innovation; and*
>
> *the realisation of national reforms.*

In mid-2015, Austroads agreed to further work on road data harmonisation to:

a. Investigate and quantify Commonwealth and jurisdictional requirements regarding data scope;
b. Develop a 'straw man' as the proposed harmonised asset data standard;
c. Conduct a gap analysis and impact assessment for road agencies; and
d. Prepare a final business case to better quantify costs, benefits and risks.

The Standards presented in this document have been developed in response to item (b) outlined above.

Evaluation of the cost and benefits of establishing road data standards, suggests that benefits can be largely achieved by seeking harmonisation of key subsets of data as an embedded element of national reforms, while making a wider set of standards available as a practice guide to road managers and the industry sector that supports road asset management activities.

The potential benefits of this kind of targeted approach to harmonisation of road related data include:

- Efficiency of maintenance activities and spending
- Ability to deliver heavy vehicle road reform benefits
- Improved net benefit from capacity expansion activities
- Lower data collection costs
- Lower operational costs
- Improved ability to leverage new technologies

Contents

Tables

Figures

1. Overview

1.1 Purpose

This Standard has been developed to provide a common understanding and language for the management and investment in road and associated infrastructure in Australia and New Zealand. It is intended to be utilised by all road asset owners, managers, road network funding agencies, stakeholders and service providers in the planning, delivery, operation, maintenance, disposal and reporting of asset management functions across the road asset portfolio.

This Standard is specifically designed to provide:

- A common understanding of the meaning or semantics of the data;
- Consistency in data definition and format;
- A list of data items that support road management and investment activities;
- Guidance for appropriate levels of sophistication in asset location referencing, asset data, and asset planning practices; and
- Detail on common data items to ensure consistent application.

This Standard is also intended to be used or referenced by:

- Organisations involved in provision of funding and investment to road asset owners and organisations monitoring road network performance, in the context of structure and content of reports and submissions requested from road asset portfolio owners and managers;
- Contractors, service providers or project developers that perform asset management related services for road organisations including their suppliers involved in defining, designing, implementing, commissioning and integrating new or altered assets into the operating network; and
- Software vendors involved in developing, structuring and/or configuring asset management information systems/software solutions.

This Standard presents data specifications that are technology and software agnostic in that they are intended to be used by anything and anyone.

This Standard does not specify data collection or storage requirements, nor does it provide guidance on how to create an asset register.

1.2 Data Scope

The scope of the data items included in this Standard is confined to those required for effective road management and investment. The data items have been categorised against fourteen function groups, which has determined the structure of this Standard. Function groups include:

- Network (the road network and its links)
- Classification (the hierarchy and purpose for the links)
- Inventory (the asset register)
- Condition (the condition of the assets)

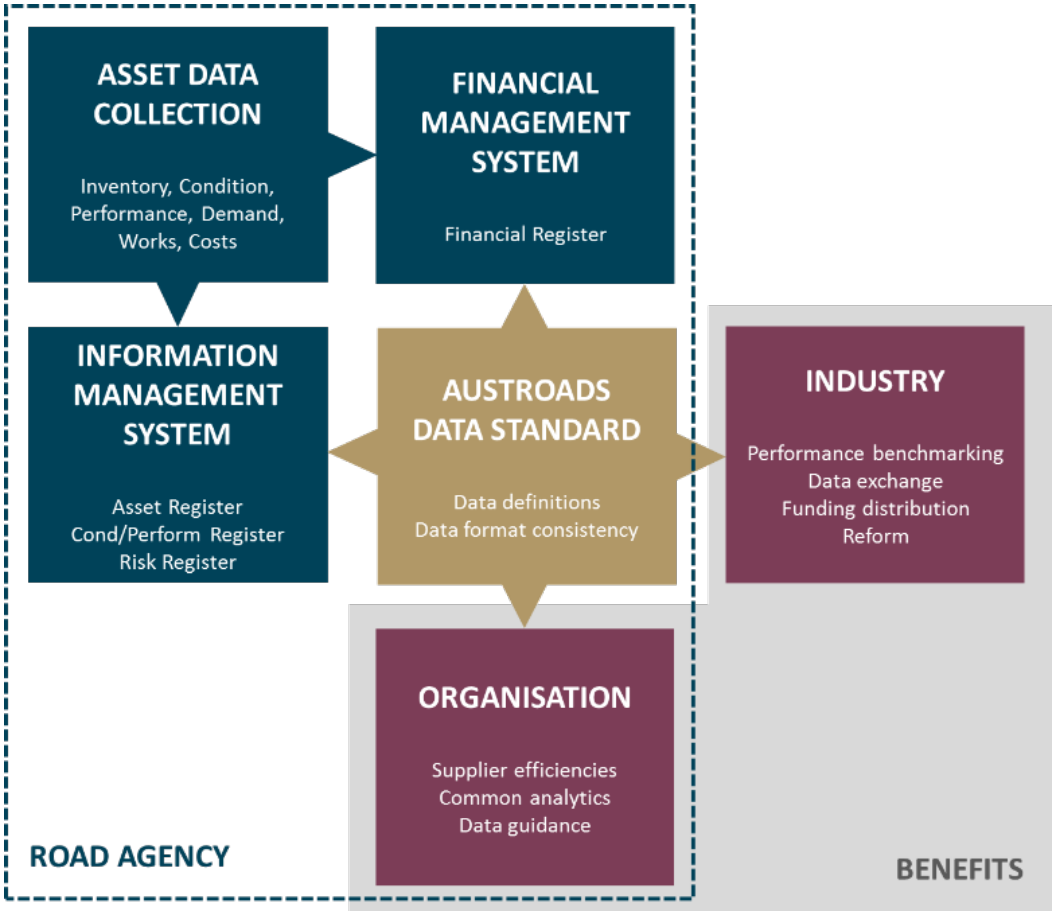
- Demand (the current road user profiles and vehicle volumes)
- Utilisation (the usage of the assets)
- Criticality (the importance of the assets)
- Risk (the risks associated with the assets)
- Resilience (the ability to restore asset service following an event)
- Performance - asset (the technical performance of the assets)
- Performance – finance (the costs of asset ownership)
- Performance – service (the customer service performance of the assets)
- Access (any road user access restrictions)
- Works and Costs (the physical works plan/achievements and related estimated/actual costs)

1.3 Data Standard Context

It is recognised that organisations use a variety of information systems to store asset related data. These systems can be broadly categorised into finance data and asset information data. This Standard specifically provides a common specification for data items that feature in financial and information management data systems, for the benefit of the organisation and across the industry. Refer Figure 1.1.

This Standard provides structure regarding common data sets to manage assets. It also includes a more extensive data set for organisations operating at higher levels of sophistication in asset management practice.

Figure 1.1: Data Standard Context



1.4 Benefits and Impacts

This Standard provides a common specification for road management and investment related data items to benefit road users and the industry.

These benefits have been determined though an Investment Logic Mapping (ILM) workshop and subsequent review sessions with the Austroads Asset Task Force (Austroads ATF):

- Improved reform outcomes for heavy vehicle and road pricing and investment;
- More productive design, construction, maintenance and operation of the roads network;
- Better justification and monitoring of investment in roads; and
- Wider benefits to the community resulting from road data being more accessible for the purposes of information technology, health, and the environment.

Achieving these benefits will generate the following road industry-wide impacts:

- Common basis for data Exchange between stakeholders;
- Common basis for data used in national data analytics;
- Common basis for software and data analytics; and
- Base data set to support International Standard ISO 55001: Management System – Asset Management.

1.5 Reporting Data in terms of this Standard

While this Standard does not define an Asset Information Management System (AIMS) or an Asset Register (AR), it is a reference document and does provide direction regarding road asset data specifications across a comprehensive set of road management and investment activities. More specifically this Standard provides a definition for asset data, which is utilised for data analytics and reporting that inform road management and investment decisions.

1.6 Prioritised Harmonised Set

A Prioritised Harmonised Set (PHS) of data items has been determined to promote the realisation of two key benefit areas identified by key industry stakeholders. These areas relate to comparative road network performance reporting and data items that are considered a priority for effective asset and maintenance management. The PHS, presented in this document version, is confined to roads (pavement and surfacing), bridges, major culverts, and tunnels as these asset classes combined represent a significant share of the whole road network portfolio.

The PHS categories are defined as:

- **Network [N]** – A list of example network reporting measures that provide the basis for comparing road networks in terms of scope, use, demand, condition, and financial performance. These network measures have been identified by the industry as priority measures that provide a consistent and accurate means for both comparative assessment and performance monitoring. Refer to Appendix A for the measure definitions, measure identification, the relevant data items from the Standard, and the algorithm for reporting.

  Condition profile reporting is dependent on the data collection method used, which is characterised by either visual assessment or machine measured data gathering (ie. High speed data collection). Road managers should report against the measure that corresponds to the data available.

  Data items that feature in the example network reporting measures have been identified in the relevant data definition tables with a ‘N’ notation in the PHS data class attribute.

- **Management [M]** – A list of data items that represent the minimum data set for effective asset and maintenance management. This Standard recommends that Road Agencies adopt this management set of data items as a priority for implementation.

  Data items that feature in the minimum management data set have been identified in the relevant data definition tables with a 'M' notation in the PHS data class attribute.

Additional categories of PHS will be developed in the future to further aid in the adoption and implementation of this Standard.

2. Road Management and Investment Practice

Asset management objectives are fundamental for organisations to clearly define the purpose and expectations of assets as they relate to the organisational objectives. This approach is described in International Standard ISO 55001: Management System – Asset Management. Accordingly, organisations are encouraged to define its asset management objectives and corresponding strategies, which can be broad in nature. Objectives that are directly related to assets are typically defined in the following two categories:

- Asset performance (asset preservation - technical levels of service); and
- Asset service performance (customer experience - service standards)

The asset management objectives are delivered by the organisations Asset Management System (AMS), which as defined in ISO 55000 is an integrated management system including people, processes, and technology. Data in the context of an AMS, sits under technology and is typically managed using computer software such as an Asset Information Management System (AIMS) or Computerised Maintenance Management System (CMMS). While the AMS focusses on a planned 'whole of life' approach to managing assets, there is a direct interface to asset development as shown in Figure 2.1. Asset development in this context is a form of asset acquisition, which provides opportunity to incorporate and benefit from asset management considerations.

The optimisation of the 'whole of life' asset management cycle is considered in four phases (planning, acquisition, operations, and disposal) as shown in Figure 2.1.

Figure 2.1: Asset Management System

This is the typical process for managing assets from 'conception to disposal', including all the asset management activities required to manage an asset portfolio to ensure the required level of service is delivered sustainably in terms of risk, cost, and performance.

Asset management requires effective integration of many key elements supported and coordinated across different disciplines. The International Infrastructure Management Manual (2015) describes asset management as "the combination of management, financial, economic, engineering, and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner." The prime objective is to deliver defined outcomes from infrastructure assets that add value to the organisation and its customers. Value can be defined in different ways depending upon the asset outcomes required. Typical outcomes from asset management include minimising cost of assets, minimising asset risk, and maximising customer experience.

The asset management investment planning process includes the identification for asset acquisition, which may require new assets created through a design and construction delivery process. New assets, whether constructed or acquired, are incorporated into the existing asset portfolio and managed in conjunction with the existing portfolio of assets.

Planning

The asset management objectives define the outcomes that are required from the assets in terms of both asset and service performance. Organisations that focus on asset services tend to configure the asset management system on strategic long-term planning that maximises the value of assets. A focus on assets typically drives an asset preservation based planning strategy, which needs to be effectively balanced with the demand driven asset development focussed planning strategy.

The asset management objectives will determine the asset management outputs including the asset and service performance requirements. This planning phase explores the options available to the organisation including non-asset solutions to deliver the defined asset management objectives. Asset planning is typically performed in three broad types: strategic planning; tactical planning; and operational planning.

The strategic planning process is essentially at the heart of asset management where informed decisions are made for the future based upon an understanding of the required asset outcomes (or levels of service), future asset and service performance, asset related risk, and the cost to achieve the required asset outputs.

This exercise requires a clearly defined process that identifies:

- **How** Risk assessment, prioritisation, and justification process;
- **Who** Ownership and the key stakeholders involved; and
- **When** Timing for completing the steps in the planning process.

Acquisition

The tactics for creating or renewing an asset. This phase explores options such as new construction, inheriting an existing asset, improving an existing asset, buying a new asset, or outsourcing the asset related services. Project justification analysis, such as a benefit to cost ratio and a triple bottom line approach are typically used to determine the best option for the organisation and its stakeholders. It is important to consider the ongoing cost of operations, maintenance and renewal in any analysis when comparing options over the same time period.

Operations

Asset preservation practice is shifting from short-term reactive maintenance activities, to proactive long-term planned asset preservation strategies and related routine and periodic maintenance activities. This practice requires clearly defined levels of service and related physical works intervention criteria, which determine the triggers for action. Supporting tasks include appropriate asset condition monitoring programs followed by data analysis for understanding condition and performance.

Disposal

Asset disposal occurs when the asset becomes redundant in its current form or function. Either the service is no longer needed, the current assets can no longer provide the service capacity, or technological advances have created a more cost effective alternative asset. In some cases, the new asset solution may incorporate the current asset in full or part.

Design

The key consideration in the design process is to understand the required level of service. This is typically captured in the form of design criteria that provide the desired outcome from the asset. Given that the asset will be inherited into the asset management system, it is also good practice to undertake an asset management design review, where the ongoing operational, maintenance, and renewal costs are assessed and potentially ‘designed out’ or ‘reduced’. This phase aims to maximise the effectiveness of the designed asset.

Construction

The longevity of the asset is determined by the quality of materials and the general quality of construction. Accordingly, the construction quality management process becomes very important to maximising the useful life of the asset. A key asset management consideration during construction is the transfer of as-built asset data into the asset owners Asset Information Management System.

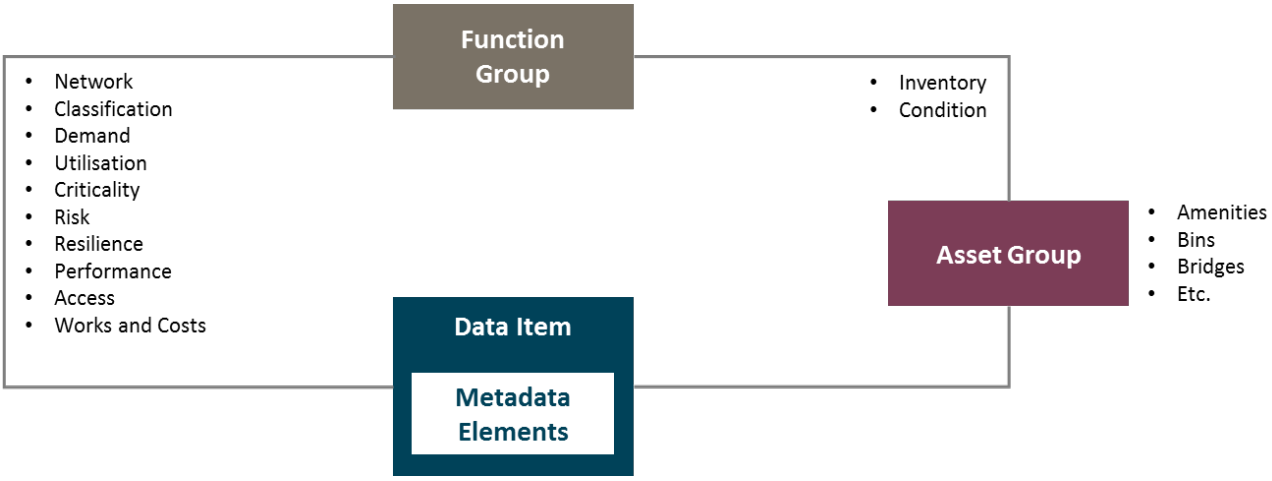
3. Function Groups and Data Items

3.1 Data Specification Structure

The data specifications are specifically structured to allow both asset management practitioners and data specialists to navigate to their areas of interest. The data items are grouped in accordance with standard asset management functional practice and the data items are presented to suit data architecture requirements.

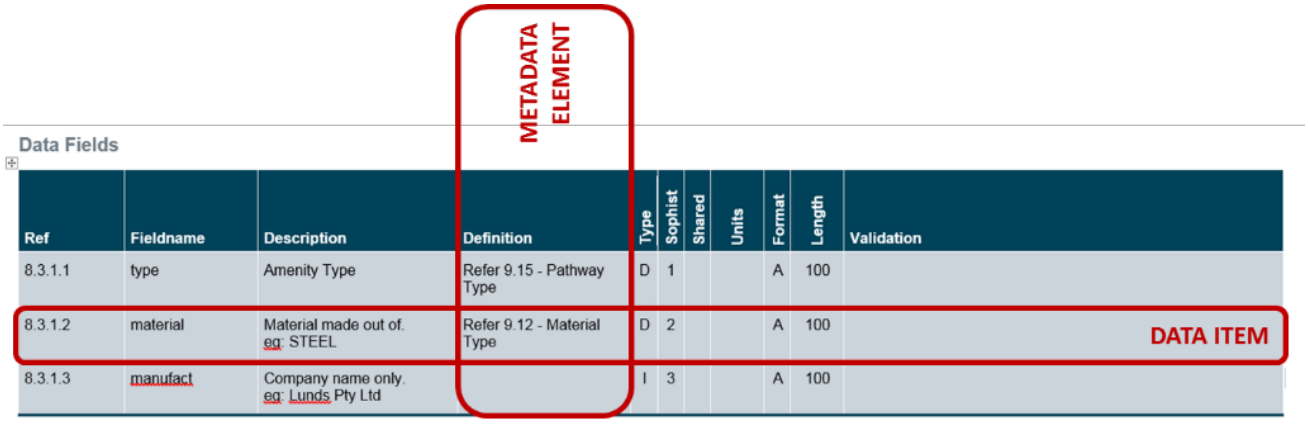
This Standard is primarily structured into function groups. The inventory, and to a limited extent, the condition function group are further broken down by asset groups. Refer Figure 3.1.

Figure 3.1: Data Specification Structure



In terms of the data specifications, data Items are represented in rows and the Metadata Elements are represented by the columns, as shown in Figure 3.2.

Figure 3.2: Data Items and Metadata Elements



3.2 Function Groups

3.2.1 Function Group Scope

This Standard defines the data requirements for a road Asset Information Management System (AIMS) and for reporting, to support activities for road management and investment purposes. The function groups are described in Table 3.1.

Table 3.1: Function Groups

Function Group	Sub-Functions	Scope	Examples
Network	• Link • Link Section • Network • Node • Road	Roads comprise road link sections that aggregate to form the road network.	Roads segmented by intersections, change in pavement type, and environment.
Classification	• Economic and Social • Functional Classification	Road links are classified into management categories such as functional use, ranked hierarchy, physical form, or funding.	Highways, arterial roads, collector roads, local roads, life-lines, and freight routes.
Inventory	Common Classes • General • Valuation • Additional Specific Classes • Amenities • Bins • Bridge Major Culvert Component • Culverts Minor (Pipes) • Fences • ITS • Kerb and Channel • Landscaping • Lighting • Linemarking • Mechanical and Electrical • Parking • Pathways • Pavement • Pavement Surfacing • Pits • Poles • Public Art • Public Toilets • Retaining Walls • Road Barriers • Shelters • Signs • Slopes • Structures	Location of assets relative to the road corridor.	Linear 1D referencing, Geospatial Information System (GIS) 2D referencing, and Built Information Model (BIM) 3D referencing.

Function Group	Sub-Functions	Scope	Examples
Inventory (continued)	• Table Drains • Traffic Management Devices • Traffic Signals • Trees • Tunnels • Vehicle Crossings		
	• Point • Polyline • Polygon	Description of the asset in terms of scope, attributes, and dimensions.	Material type, size, diameter, width, length.
Condition	• Collection – Timing • Surface • Subjective Condition • Visually measured Condition • Climate • Pavement – Cracking • Pavement – Deflection • Pavement – Roughness • Pavement – Rutting • Pavement Surface – Skid • Pavement Surface – Texture • Bridge • Kerb and Channel • Pathway/ Footpaths • Unsealed Roads	The measured condition of assets.	Condition rating, condition profiling,
Demand	• Design • Population • Road Use • Traffic Growth	Use demand for an asset.	Traffic growth factors and traffic loading.
Utilisation	• Bicycles • Capacity • Output • Pedestrians • Traffic Volumes	The monitoring and recording of classified usage from traffic, cycles, and pedestrians across the road network.	Annual average daily traffic, classified traffic counts.
Criticality	• Output	Identification of the network road links and assets that are a priority to the community they serve.	Life lines, roads of significance, high priority road links.
Risk	• Consequence • General • Likelihood • Monitoring • Output	The identification, quantification, mitigation, and monitoring of road link and asset risks. This forms the basis for a road focused risk register.	Risk type, risk exposure, probability of occurrence, and consequence.
Resilience	• Output	The ability for a road link or asset to be restored following an event. This function forms the basis for route management and asset management contingency planning.	Events, outage time, contingency plan, and restoration time.

Function Group	Sub-Functions	Scope	Examples
Performance (asset)	• Achievement • Asset Life • Inventory • Output	Technical performance of an asset.	Pavement deflection.
Performance (finance)	• Development Program / Project Assessment • Investment • Financial	Financial performance of the assets and services.	Return on expenditure, Capital spend, Asset sustainability ratio.
Performance (service)	• Achievement • Customer Experience • Customer Safety (Condition) • Journey Interruptions • Public Transport • Road Safety • Travel Speed • Unplanned Incidents • User Satisfaction	Performance of an asset from the customer or end user's perspective.	Smooth travel exposure, reliability, journey experience, operating speed, and congestion.
Access	• Identification • Time period	Road access and restrictions.	Vehicle type, vehicle weight, vehicle dimensions, and road geometrics.
Works and Costs	• FWP • Maintenance • Output	Physical work activities and the metrics to measure costs.	Sealing, major patching, resealing, asphalt resurfacing, and bridge repainting.

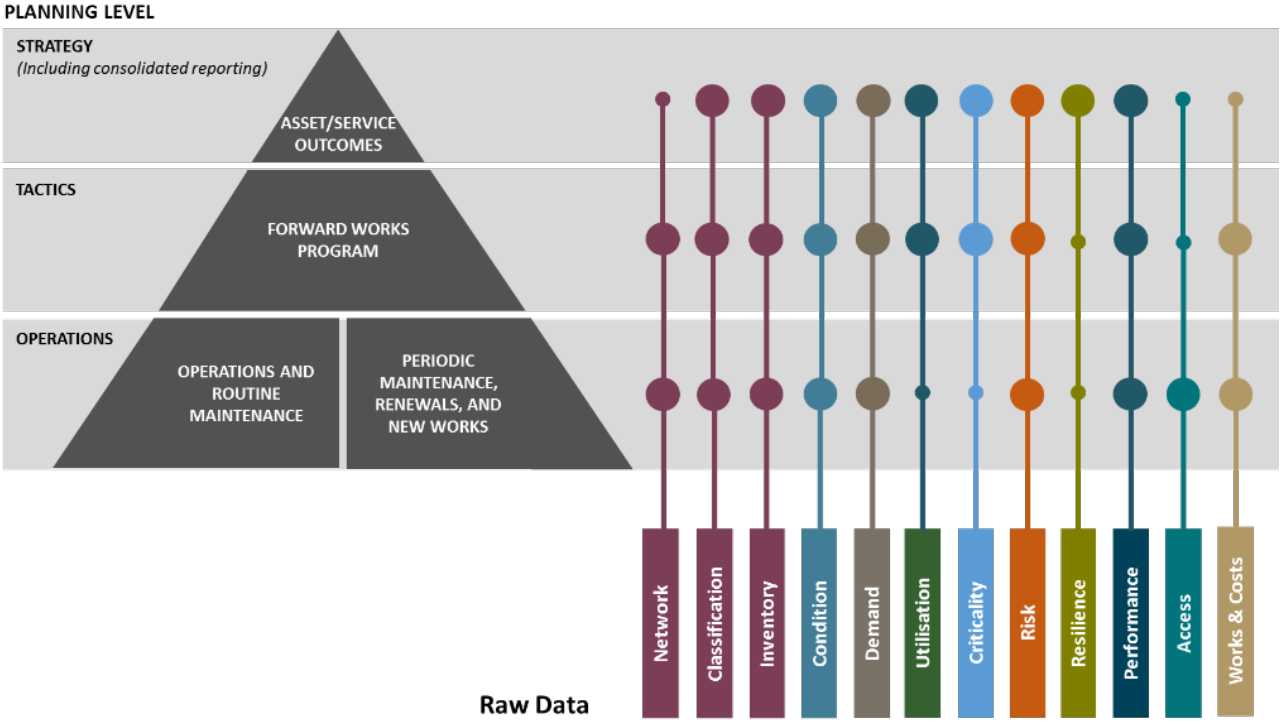
Asset data items presented in this Standard cover the whole-of-life management of assets required to support and substantiate decisions made over the life cycle. These decisions include but are not limited to the following:

- Investment management requirements including asset capitalisation and 'whole-of-life' costs;
- Asset handover requirements including asset acceptance information; and
- Asset configuration change requirements including asset approvals or sub-component approvals, new assets, configuration and operational changes including changes in asset strategy and concessions to Standards.

A vertically integrated Asset Management System (AMS) creates a framework for effective asset management practice by directly linking the operational activities to the delivery of the asset management objectives. This linkage is sometimes referred to as 'the golden thread' or 'line of sight' in a business context. This AMS allows asset management objectives and outcomes to be understood, asset services to be monitored, readily shared asset related information, and promotes informed decision making.

The following Figure 3.3 relates the function groups to the typical three levels of asset management planning activity within an organisation:

Figure 3.3: Asset Related Activities and Asset Data



Strategy The asset and service outcomes that deliver on the organisation's asset management objectives including organisational wide asset portfolio management and investment activities. Strategy has a long-term focus (ie. 10 years plus). The data requirements that support strategic asset planning and reporting include data items primarily pertaining to classification, inventory, condition, performance, and demand.

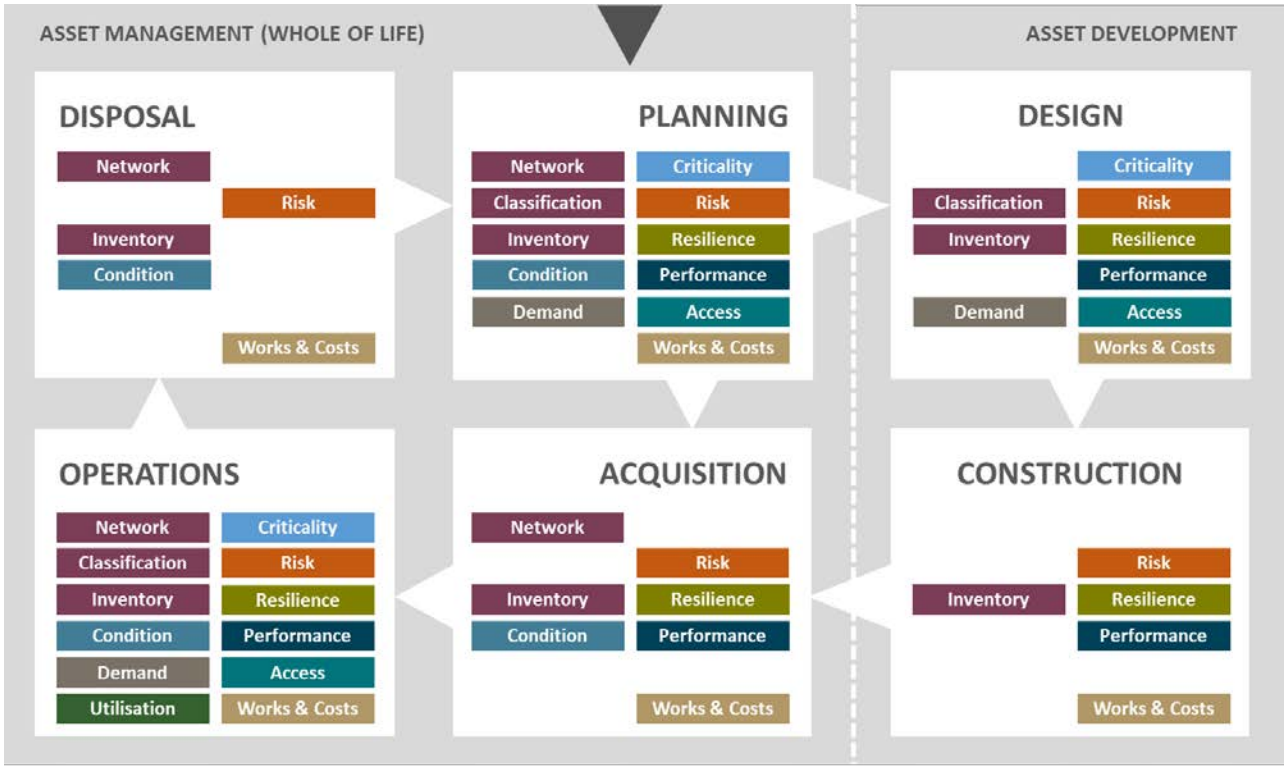
Tactics The tactical activities that manage the assets and related services to deliver the required asset management objectives. This includes evidence based decision making for developing the forward works program for each asset group. Tactics have a medium-term focus (ie. up to 6 years). The data requirements that support tactical asset planning and reporting include data items primarily pertaining to network, classification, inventory, condition, performance, demand, and works & costs.

Operations The transactional activities that operate and maintain the assets. This includes data collection, road network operational activities, routine maintenance, periodic maintenance, asset renewals/replacements/refurbishments, and new assets. Operations have a short-term focus (ie. 1 to 3 years). The data requirements that support operational asset planning and reporting are contained under all the functional groups provided in this Standard.

3.2.2 Asset Lifecycle and Function Groups

Figure 3.4 presents the typical asset management and asset development activities and their related function groups.

Figure 3.4: Asset Related Activities and Asset Data



The purpose for the data is dependent upon the Asset Management (AM) phase as shown in Table 3.2.

Table 3.2: Function Groups and Asset Management Life-Cycle Phase

Function Group	AM Phase	Activities
Network	Planning	• Defining the sections of road that collectively describe the road network and its connectivity.
	Acquisition	• When an asset is acquired, the network definition will need to be updated.
	Operations	• Many operational functions rely on software/systems which in turn rely on an up to date network definition.
	Disposal	• When an asset is disposed, the network definition model will need to be updated.
Classification	Planning	• Defining the road type by form or purpose.
	Design	• The classification may determine the design criteria.
	Operations	• Performing operations in respect to the defined road classification.
Inventory	Planning	• Providing an accurate record of the existing assets, which can be considered for recycling/reuse in a design phase for a refurbished/expanded asset.
	Design	• Different design standards apply to roads of different functional classifications.
	Construction	• Documenting the detailed 'as-constructed' assets and components including metadata where appropriate.
	Acquisition	• Capturing the scope of the assets in the asset register.
	Operations	• Accessing the inventory data for operational purposes.
	Disposal	• Removing the disposed asset from the asset register.

Function Group	AM Phase	Activities
Condition	Planning	• Developing the condition monitoring programs for the assets and components.
	Acquisition	• Capturing the asset condition in a condition register for assets that are not new.
	Operations	• Capturing all condition related data on the assets and components in a condition register during the life of the asset.
	Disposal	• Condition is a determinant of residual value / risk / cost of disposal / decommissioning.
Demand	Planning	• Forecasting the future demand for the roadway/footpath based upon historic demand data.
	Design	• The application of the forecast future demand in the design process to ensure that the design is appropriate for the load/volume over an appropriate useful life.
	Operations	• Recording the traffic volume and utilisation data that semantically reflects the traffic demand for the roadway/footpath facility
Utilisation	Operations	• Recording the usage (vehicles, cyclists, pedestrians) and assessing the utilisation with respect to capacity.
Criticality	Design	• Ensuring alignment and linkage between the asset criticality rating and the associated design requirements.
	Planning	• Observing the criticality rating on road links and assets for design purposes and acquisition considerations.
	Operations	• Prioritising incident response activities by critical road links and prioritising reinstatement works by asset.
Risk	Planning	• Mitigating any risk when planning assets and services.
	Design	• Ensuring that risks are designed out or managed in the design solution.
	Construction	• Recording any risks that arise as a result of construction.
	Acquisition	• Capturing any risks from new assets in the risk register.
	Operations	• Accessing and maintaining the risk register for operational purposes.
	Disposal	• Removing any recorded risks on disposed assets from the risk register.
Resilience	Planning	• Understanding and setting planning criteria that addresses the specified level of resilience for the critical road links and assets.
	Design	• Balancing the design scope with the required level of resilience as recorded.
	Construction	• Recording the level of resilience provided for in the design and construction of new assets.
	Acquisition	• Recording the level of resilience in all acquired assets.
	Operations	• Applying the level of resilience for operational purposes, including incident response and reinstatement of critical road links.
Performance (asset, service, financial)	Planning	• Defining the existing or required asset and service performance characteristics.
	Design	• Application of the required asset and service performance characteristics.
	Construction	• Documenting the measured asset and service performance characteristics at construction completion.
	Acquisition	• Capturing the delivered asset and service performance achievements for the assets into the asset performance register.
	Operations	• Assessing the performance of the assets and services.

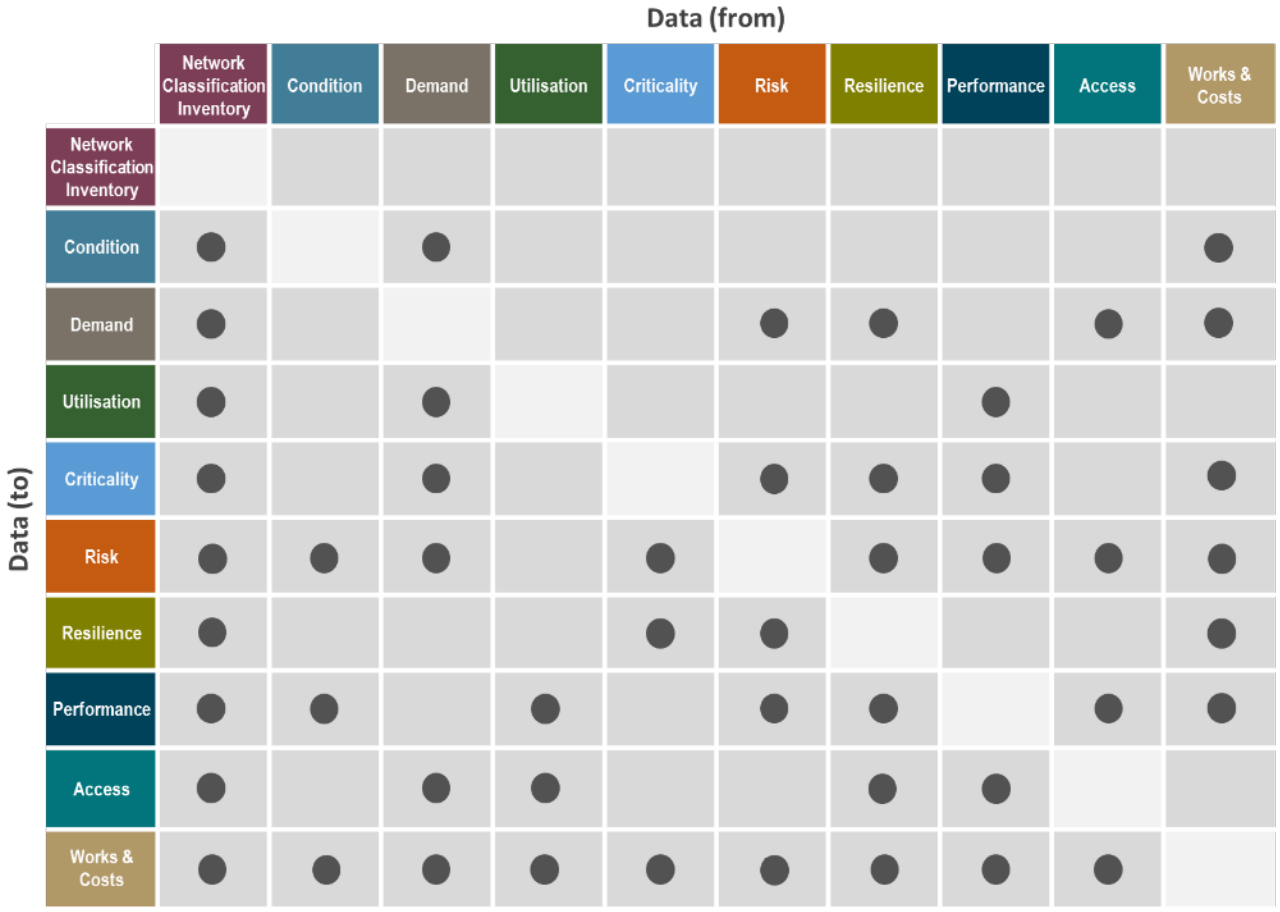
Function Group	AM Phase	Activities
Access	Planning	• Using the access restriction data for route planning purposes.
	Design	• Augmentation of road network configurations resulting from road design will often result in changes to core access data (e.g. bridge heights).
	Operations	• Using the access restriction data to assist in the operational aspects of managing a road network. This includes transporting over-dimension/over-weight loads and temporary restrictions resulting from incidents.
Works and Costs	Planning	• Using the historic ownership costs from similar assets to assess future costs when planning and justifying new assets. • Analysing historic costs for recurring or intensive maintenance activities, with view to replacing the asset with a more cost-effective solution.
	Design	• Designing 'out' and designing 'for' operations and maintenance with an intent to minimise the cost of ownership. • Developing level of service requirements for a whole-of-life design approach. • Assessing the cost of ownership resulting from the proposed design.
	Construction	• Assessing the impacts to the designed useful life as a result of the quality of construction and the materials used. • Developing operations and maintenance plans.
	Acquisition	• Transferring and accepting either new or existing assets into the 'asset management system' or the asset register.
	Operations	• Recording the costs to operate and maintain the assets. • Reporting the cost to the asset and services for investment metric and benchmarking purposes. • Updating or revaluing the built assets.
	Disposal	• Removing disposed assets from all future works plans. • Removing disposed assets from the asset/financial registers and associated asset valuation reports.

This Standard has been specifically developed for broad use regardless of the asset management phase.

3.2.3 Function Group Relationships

Some of the function groups presented in this Standard are inter-related, where data is exchanged between related function groups. These relationships have been mapped and presented in Figure 3.5.

Figure 3.5: Function Group Relationships



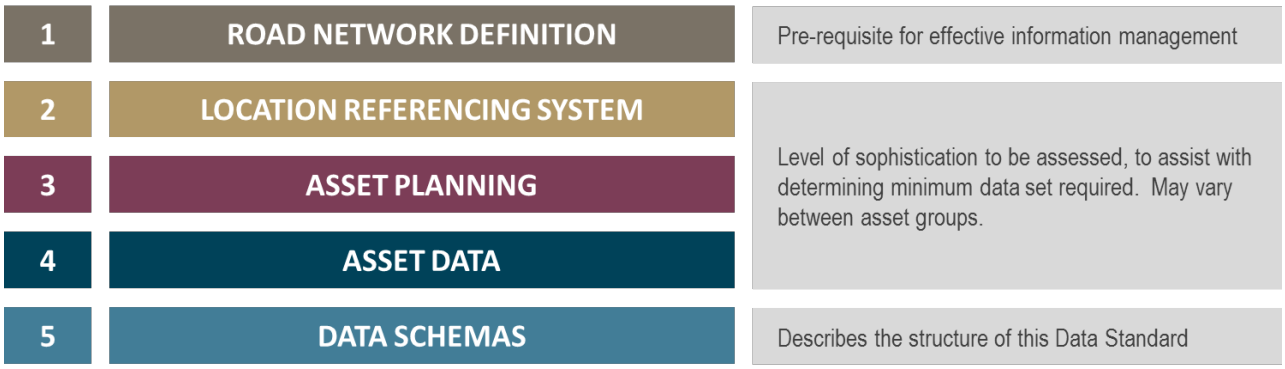
4. Setting the Context

4.1 Using This Standard

This section guides the user through a series of logical steps to establish the relationship between an organisation's road management and investment practice and the relevant data items contained in this Standard. It is recognised that organisations operate at different levels of sophistication and accordingly this Standard incorporates three broad levels of practice, which are explained in this section. Levels of sophistication have been provided for location referencing, asset management planning, and asset data. Section 4.7 provides guidance to organisations on determining its optimal level of sophistication, which may vary between managed asset groups.

The key steps to using this Standard are shown in Figure 4.1.

Figure 4.1: Using this Standard



4.2 Road Network Definition

4.2.1 Road Network Topology

This Standard allows for various levels of sophistication for collecting, managing, and using inventory data, and asset location referencing. The lowest level of asset location referencing uses the road centreline as the principle reference point. Accordingly, this referencing method requires the road network to be defined and geospatially represented as road centreline nodes and links.

This section provides information regarding the lowest common method for achieving a network centreline model. Organisations may use a more sophisticated topology model that better represents its road network, however the principles presented here are likely to still apply. The guidance provided in this section is not intended to be read as a specification.

It is recognised that some organisations create and use static sectioning for their business process and reporting. This type of sectioning generally represents multiple attributes within the one section, however when the attribute criteria changes, it necessitates a change in the network section. By its nature, this approach results in changes to the network model, because it utilises aggregation of these sections to derive a network model.

The preferred approach is to divide the individual attributes that are defined within a static section and create an individual layer for this data. For example, if in the past link sections have been created based on pavement type, traffic volume, pavement width and speed, then individual layers for the individual dataset would be created. In this case separate layers would be created for pavement type, traffic volume, pavement width and speed. The benefit of this approach is that it enables the network model to be dynamically segmented using any individual, or combined data sets.

The definitions for a node and link follows:

Node Intersection points of links within a road network.

Link In a road network, portion of a road (single links) between two junctions or interchanges or intersections. Its basic characteristics are length, vehicle speeds, travel times, and number of lanes.

Figure 4.2 and Figure 4.3 illustrate the node and link representation.

Figure 4.2: Road Network Definition Model – Example Road Configuration

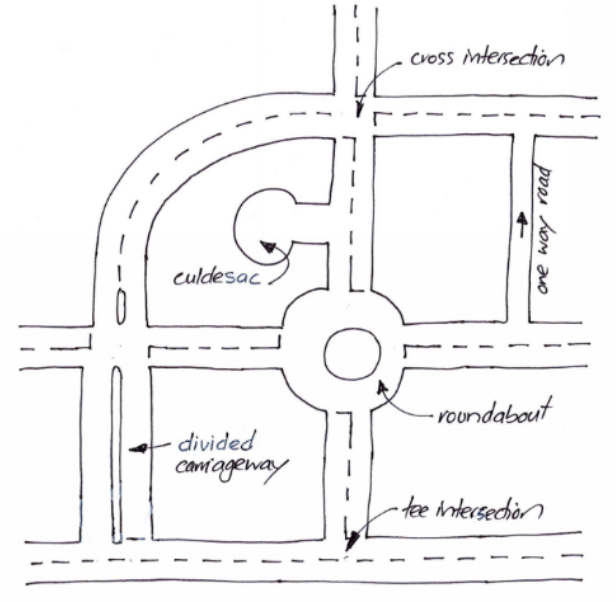
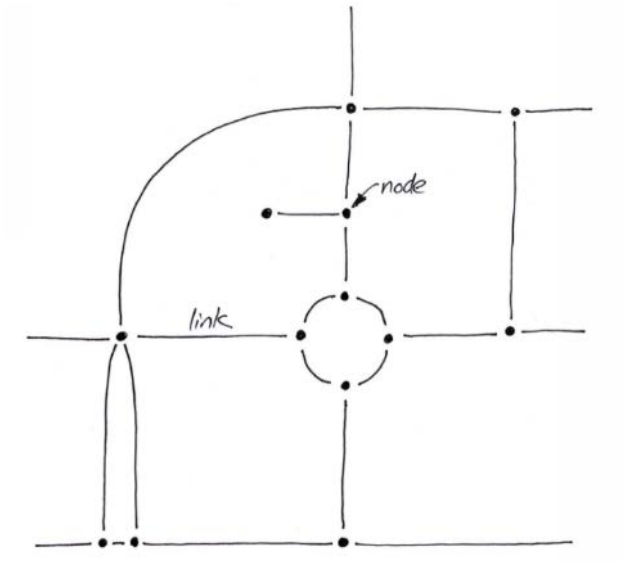


Figure 4.3: Road Network Definition Model – Example Nodes and Links Representation



4.2.2 Link Sections

A road link is typically a section of road with homogenous features such as traffic and loading volumes, pavement type (sealed, unsealed, structural, bridge), width, number of lanes and urban/rural classification along its length. This section does not specify the criteria for defining or creating link sections, however does provide practical guidance.

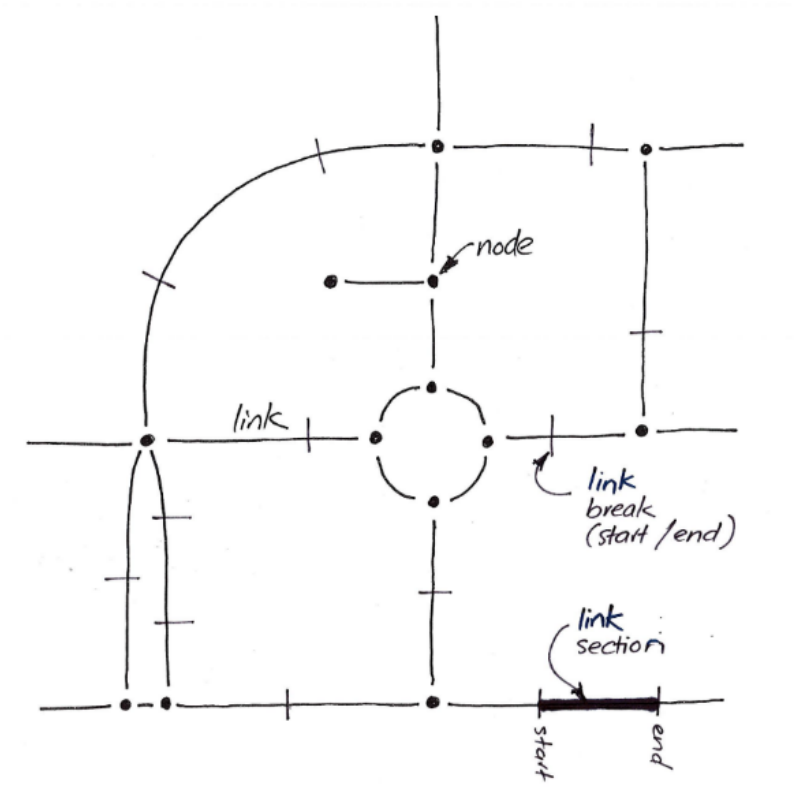
Link sections can be either static or be dynamically determined based upon the criteria applied. Dynamic link sections are more likely to feature in the future as the availability of data expands and the purpose for the link is refined.

A road may be broken down into multiple link sections if any of the following criteria change along its length such as:

- A change in the number of lanes, i.e. from 2 to 3 (at the start of a passing lane).
- The speed limit changes to greater than 70km/hr (urban to rural).
- The width changes by more than 2.5m over a significant length (typically >100m).
- Traffic volumes and/or composition change significantly such as at major intersections.
- The road changes in surface type i.e. sealed to unsealed, thin surface flexible to bridge.

Link section data includes dimension and road section characteristics and provides the principal framework for all road corridor assets to be attached to. Link breaks define the start or end of each link section.

Figure 4.4: Road Network Definition Model – Example Link Sections



Road length is an aggregation of the link sections for that road. However, there are different groups of links that need to be considered.

4.2.3 Relative Lengths

This Standard consistently applies a common principle for the relative relationship between roads, link sections, and assets. Basic rules for defining the length of these entities, in terms of link sections are:

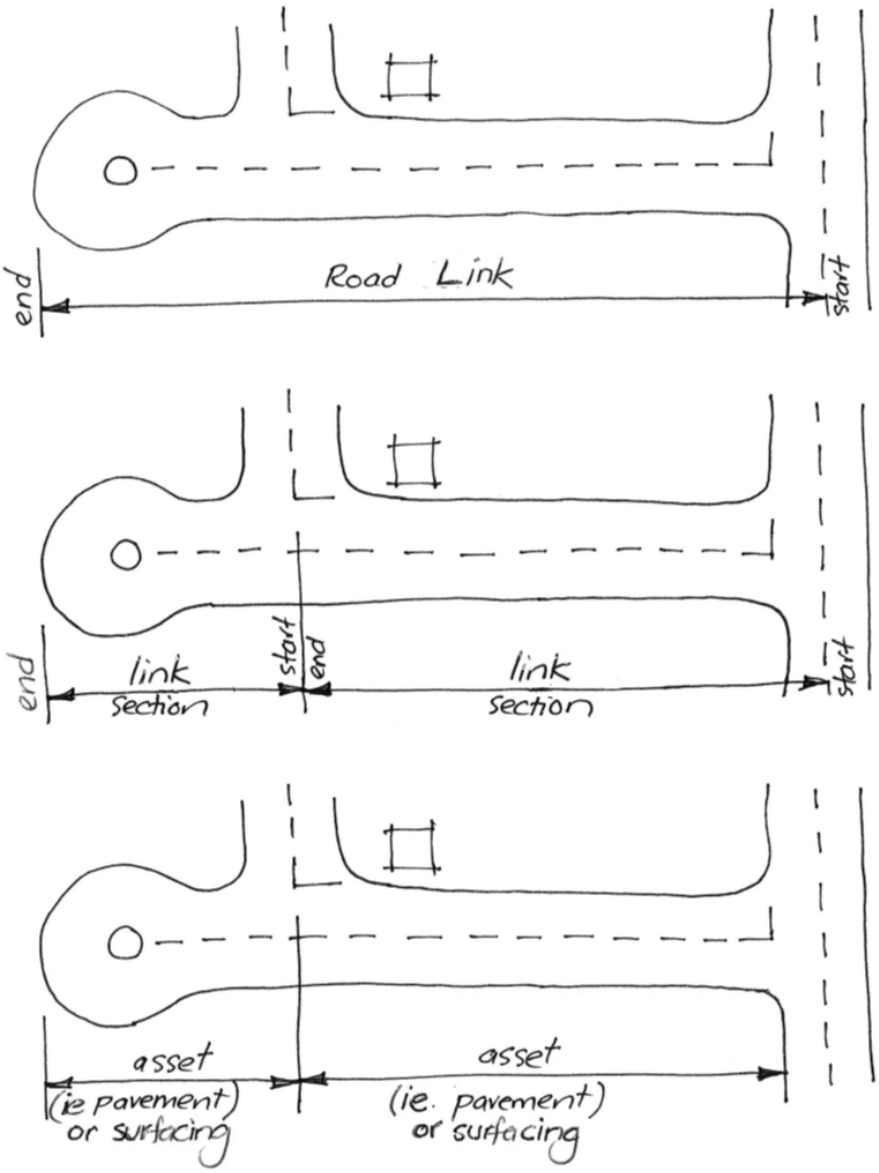
Road Link Length The aggregated length of the link sections along the same road.

Link Section Length A section of road that represents homogeneous features such as the road surface width or road classification.

Asset Length The measured length of physical assets that are attached to roads and link sections such as retaining walls, road pavement, and footpaths. Note that asset lengths do not need to be contained within an individual link section length, provided the Asset Information Management System is configured to allow asset registration against contiguous lengths of link sections along a road.

The following Figure 4.5 provides a visual representation of these three entities:

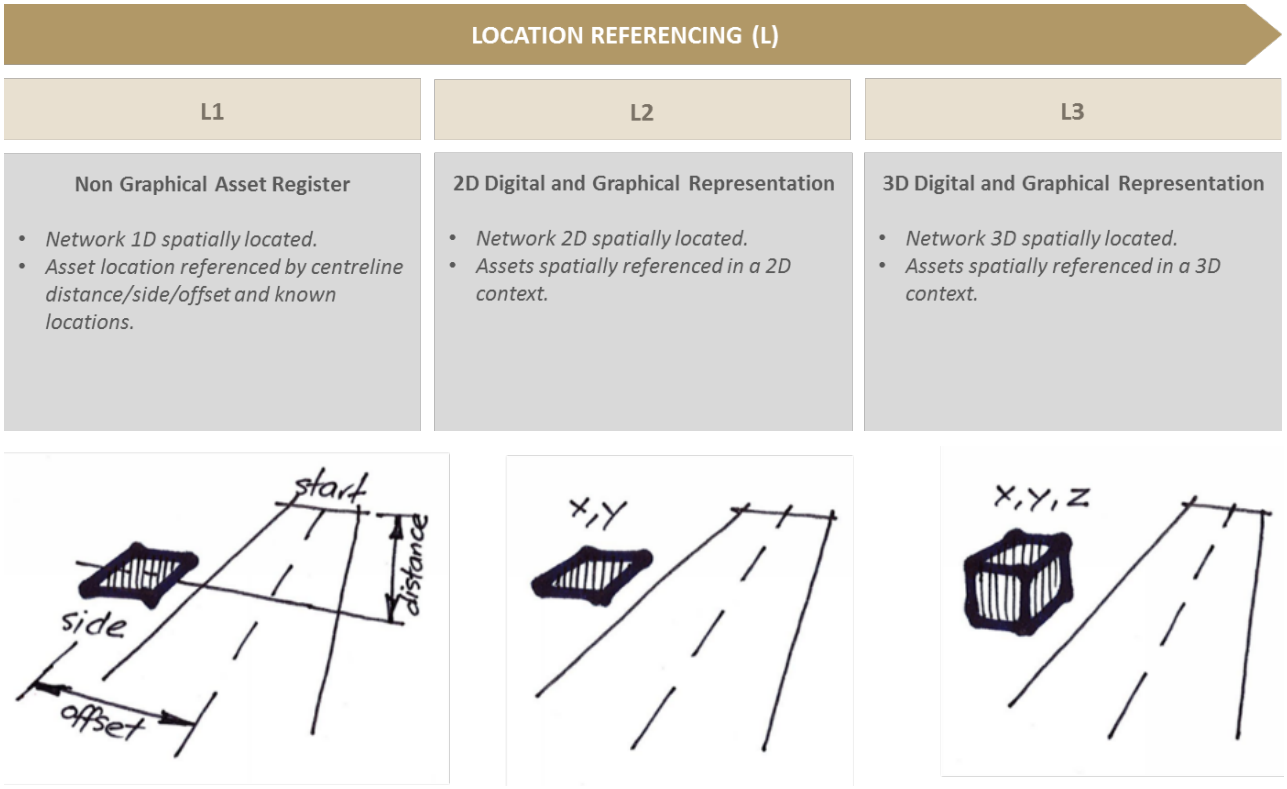
Figure 4.5: Road Link Features



4.3 Location Referencing System

It is recognised that road agencies use different levels of sophistication in its location referencing based upon its resources, capabilities, technology, and the required accuracy for asset planning purposes. There are broadly three methods of location referencing. The methods are not mutually exclusive. All three systems have been incorporated into this Standard:

Figure 4.6: Practice Sophistication (Location Referencing)



Includes a simple chainage based reference of the start and endpoint in relation to the centreline of the road.

Includes a point or polyline or polygon representation of an asset of the as constructed detailed location (x, y co-ordinates as appropriate) in a spatial environment.

Includes a point or polyline or polygon representation of an asset of the as constructed detailed location (x, y, z co-ordinates as appropriate) in a spatial environment.

Organisations are encouraged to maintain their existing location referencing systems regardless of whether this system is deemed to exceed the minimum required level of sophistication. Spatial referencing is likely to be universally used by all stakeholders in the future and is already the basis for location referencing for existing 'as-constructed' data capture processes (e.g. R-Spec and ADAC).

4.4 Asset Planning

Data requirements are a function of the Asset Management System requirements. They are determined in part by the Asset Management Planning practice. The asset management planning practice, within an organisation, is typically determined by the asset management objectives that need to be delivered and the corresponding decision making process. The International Standard ISO 55001: Management System – Asset Management, provides the requirements for asset planning and the related planning instruments that support the organisations asset related service objectives.

For many organisations, the current planning process is a symptom of past practice and may not represent desired practice. Maturity in the planning process evolves over time, typically in response to delivering organisational objectives and improvements in planning capability. Other determinates include resources, capabilities, technology, and the budget approval processes.

The asset planning process is inclusive of:

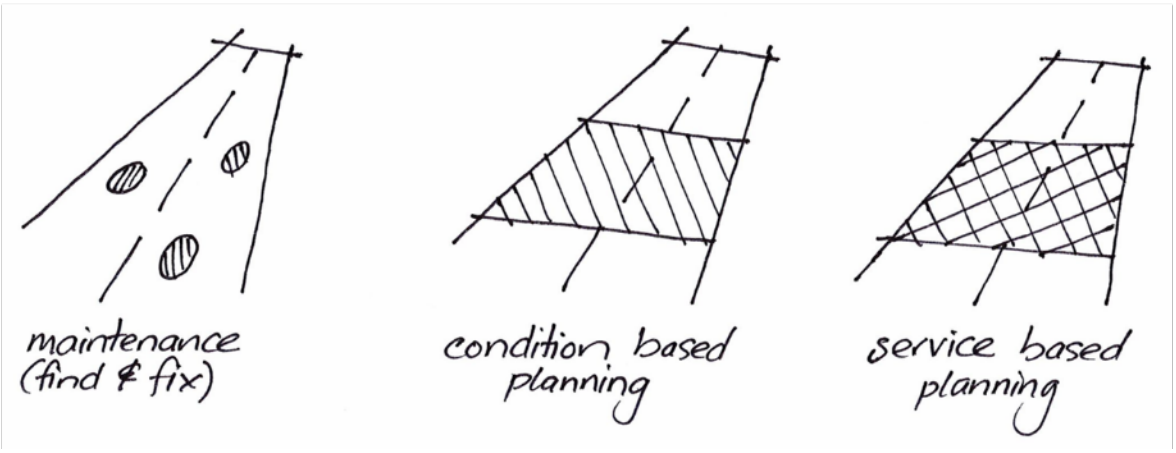
- Asset preservation planning, covering maintenance and renewal activities, focussed on maintaining services levels of the existing portfolio of assets; and
- Asset development planning, covering both improvement and expansion activities, focussed on increasing the asset portfolio to enhance service levels by augmenting existing assets and creating new assets.

It is recognised that road agencies operate at different levels of sophistication for asset planning, which can broadly be grouped into three categories. Each level of sophistication incrementally requires more detailed data to inform the decision process. All three planning practices have been incorporated into this Standard (Figure 4.7):

Figure 4.7: Practice Sophistication Matrix (Asset Planning)

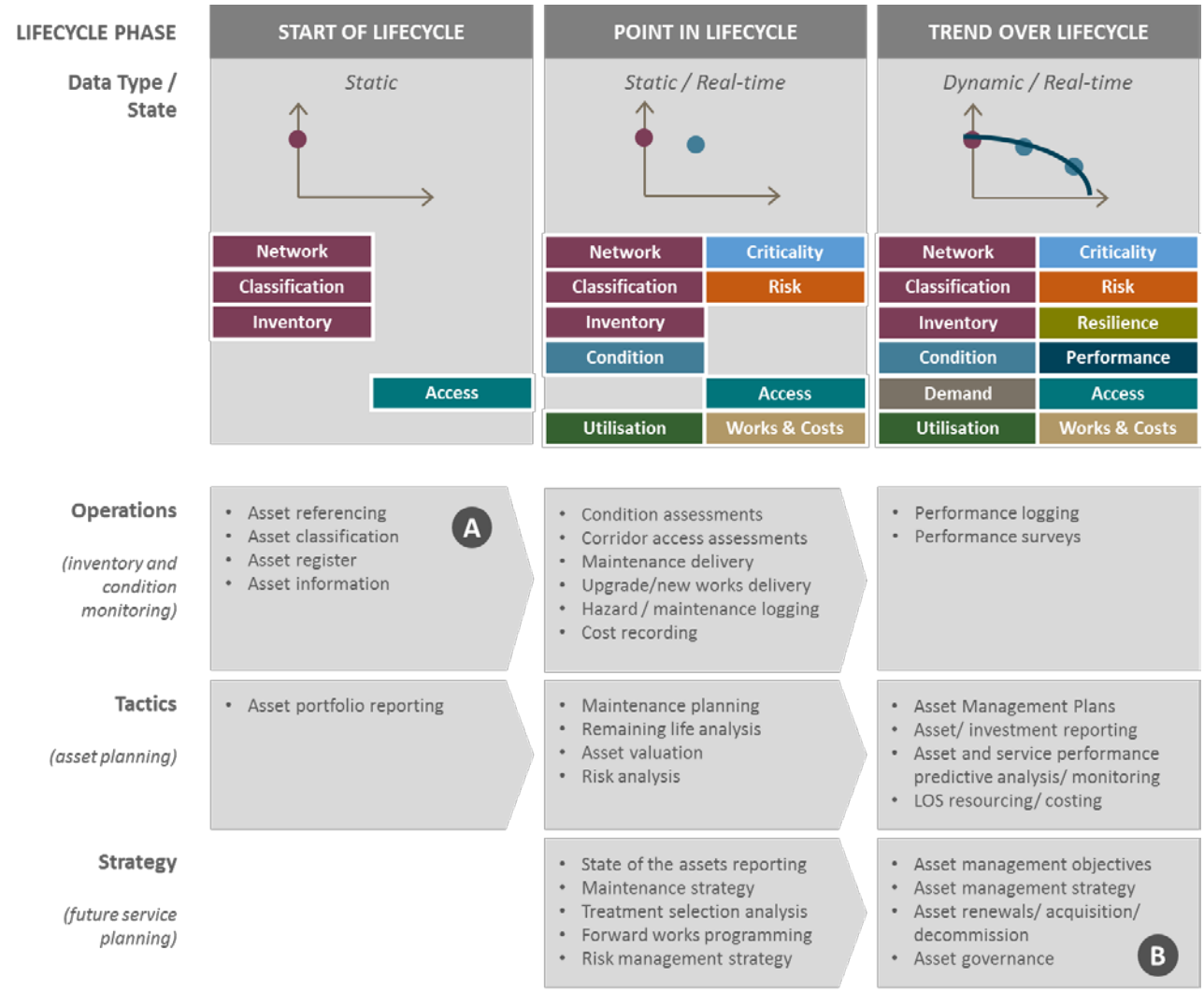
ASSET PLANNING (P)

P1	P2	P3
Reactive (Limited Asset Planning) • *Defect identification and repair.* • *No planned asset preservation works.* • *No quantitative analysis.* • *Guided by top management.* • *Politically driven prioritisation of development projects.* • *Development projects announced in advance of robust planning.* • *Business Cases completed retrospectively after a commitment has been made.* • *Development projects are planned without consideration of life cycle cost implications.* • *Development projects are planned independently of renewal program needs.*	**Proactive Asset Planning** • *Asset condition assessments.* • *Asset management objectives defined.* • *Asset / service performance analysis.* • *Asset level of service defined.* • *Asset management strategies.* • *Prioritised asset works.* • *Prioritisation of development projects is driven by documented selection criteria.* • *Development projects announced only following robust planning and business case approval.* • *Development project business cases include consideration of life cycle cost implications.* • *Renewal program needs considered prior to approval of development projects.*	**Optimised Asset Planning** • *Asset services defined.* • *Asset demand analysis.* • *Asset service analysis.* • *Asset investment options and strategy.* • *Asset portfolio optimisation.* • *Asset linkage to organisational objectives.* • *Development project planning phase announced, contingent on business case and funding.* • *Required increases in operations, maintenance and renewal programs established for whole of development project forward pipeline.* • *Investment processes balance renewal program needs with development project needs, to optimise risk and network level service outcomes.*



An asset planning maturity matrix is shown in Figure 4.8, which was developed, in conjunction with stakeholder organisations, to identify the potential outcome from evolving asset management practices. This figure shows how an organisation can evolve from simply reacting to asset defects (maintenance delivery) to developing a planned approach for delivering asset service outcomes that link to the organisations objectives (A to B).

Figure 4.8: Asset Planning Maturity Model



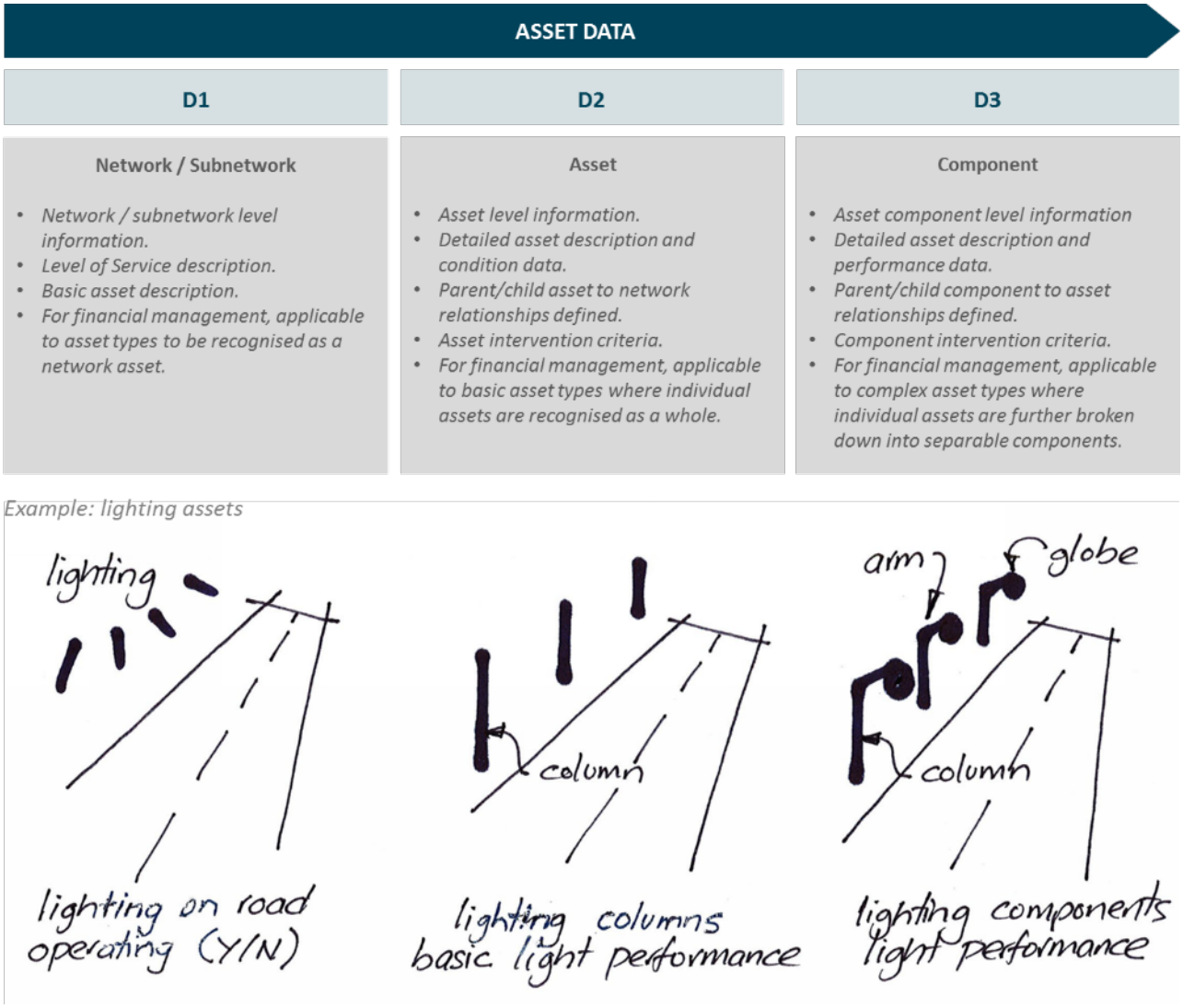
This matrix includes both function group, as it relates to asset lifecycle, and level of data application in terms of operations, tactics, and strategy (including organisational level reporting).

4.5 Asset Data

The asset data needs typically align with the asset planning processes and any asset related reporting requirements. Accordingly, this Standard presents three levels of sophistication that support different levels of asset planning practice being network, asset, and component (Figure 4.9). The data associated with each level is progressively more detailed as the level of sophistication increases.

As a guiding principle data, should be collected which is sufficient but no more than is necessary to implement the business requirements of the organisation. The business requirement would include reporting. In some instances, this might require collecting only Network level data (D1) and in other instances component level data (D3).

Figure 4.9: Practice Sophistication Matrix (Asset Data)



4.6 Data Schemas

4.6.1 Function Groups

This Standard has structured asset data tables under fourteen function groups that collectively support common activities across road management and investment responsibilities. Accordingly, the data items within each function group has been developed by considering their:

- Meaningful purpose and use with the function group;
- Integration with other function groups to support inter-operability; and
- Context relative to other data items.

As described in Section 3.2 and detailed in Section 8, this Standard is structured around the following function groups:

1. Network
2. Classification
3. Inventory
4. Condition
5. Demand
6. Utilisation
7. Criticality
8. Risk
9. Resilience
10. Performance (Asset)
11. Performance (Financial)
12. Performance (Service)
13. Access
14. Works and Costs

4.6.2 Data Items

To assist information management and data specialists will a quick reference guide, Appendix A captures all the individual data items in alpha numeric order. This approach allows efficient identification of individual data items, as an alternative means to navigation of this Standard.

4.6.3 Asset Management and Investment Activities

To ensure completeness and integration of the data items across the various function groups, asset management and investment activities have been defined. This approach has identified the core business activities that occur within road agencies and allows the data requirements to be clearly identified. Furthermore, this approach allows an alternative means to navigate this Standard where an asset management and investment activity becomes the starting point for locating data specification details.

Appendix B uses a matrix structure to map the function groups detailed in Section 8 against the following core road management and investment activities:

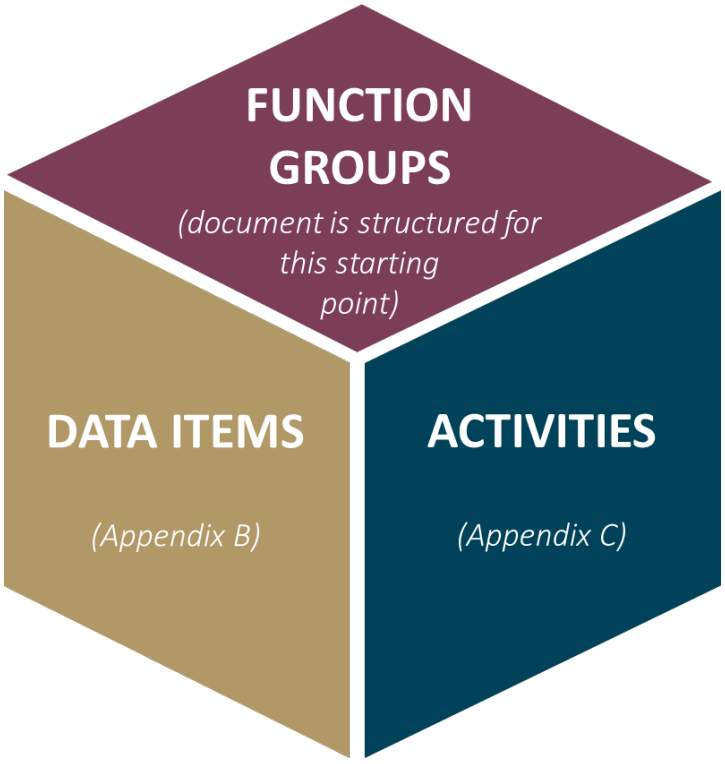
- Network definition;
- Information management;
- Corridor Management;
- Maintenance management;
- Road safety management;
- Asset financial management;
- Asset management data analytics, modelling, planning, and optimisation;
- Asset Management System (ISO 55001: Management System for Managing Assets);
- Asset reporting and communication; and
- Asset and project development.

4.6.4 Logical Navigation to Data Specifications

As shown in Figure 4.10, this Standard has been structured to allow the user to locate desired data items via the three different navigation methods as follows:

- Function Groups;
- Data items; and
- Activities.

Figure 4.10: Data Standard Navigation Options



Function Groups	Section 8 of the document is structured by function groups.
Data Items	Appendix B contains a listing of the unique data items regarding the related function groups and asset groups where applicable.
Activities	Appendix C contains a listing of road management and investment activities with a reference to related function groups.

4.7 Determining the Appropriate Levels of Sophistication

It is recognised that road agencies operate at different levels of sophistication in its asset management and investment practices. Sophistication in practice is typically influenced by investment prioritisation and budget processes, asset group scope, technical capability, software tools, tactical decision making process, and certain reporting requirements.

Not all data items detailed in this Specification will be applicable to all organisations. To assist with determining which data items are considered applicable to an organisation. This section provides guidance to assess an appropriate level of sophistication, in terms of:

- 'L' - Location Referencing (Section 4.3);
- 'P' - Asset Planning (Section 4.4); and
- 'D' - Asset Data (Section 4.5).

The data items in the Standard have been categorised into one of the above three categories, as recorded in the 'Purpose' metadata element field, and then assessed against the sophistication definitions in Sections 4.3, 4.4 and 4.5. That is, each individual data item is notionally identified as being required to meet sophistication level 1, 2 or 3 under one of the above three categories. This approach allows an organisation to broadly target the data items that are generally applicable to the level of sophistication they have selected. Level of sophistication increases from one through to three.

The assessment of data item sophistication in this Standard in not definitive and should be considered a guide to agencies as they assess their minimum data requirements to meet a specific level of sophistication. That is, each organisation will need to ascertain the applicability of the individual data items, identified against the level of sophistication, with regards to the business requirements within its asset management and investment practices.

To assist organisations to determine their target level of sophistication, guidance is provided in Figure 4.11. Importantly, an organisations assessment of the required level of sophistication can be applied at an asset portfolio or asset group level or asset component level, depending upon the organisation's requirements. Best results will generally be achieved by starting with assessment of sophistication requirements at an asset group level.

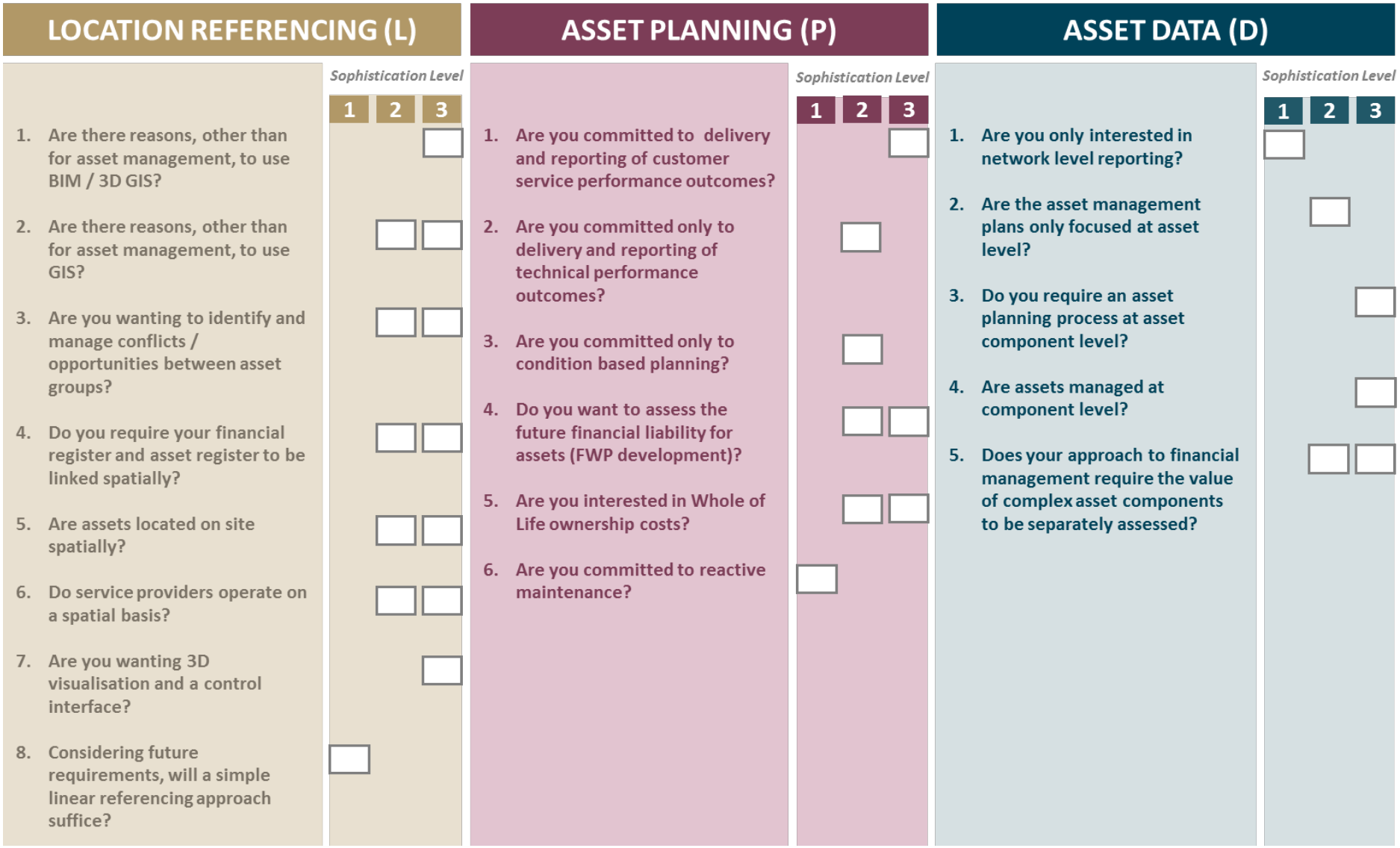
Using the Sophistication Guide

Organisations wishing to utilise the sophistication guide in Figure 4.11 should complete the following three steps:

1. Determine the level of assessment to be undertaken (i.e. asset portfolio, asset group or asset component). If available, this step will be assisted by reference to the organisation's asset componentisation structure (or asset hierarchy);
2. Answer all questions, for each data aspect. Where the answer is "yes", then place a tick in the boxes adjacent to this question. There may be more than one box ticked, indicating that more than one level of sophistication can deliver the required outcome; and
3. Once all the questions are answered for each data aspect, then assess the level of sophistication that is most appropriate based upon the responses to the questions. If multiple levels of sophistication are triggered, then the organisation will need to balance the degree of compromise against the cost of implementation.

Careful consideration is to be given to the future organisational objectives in determining what might be an appropriate level of sophistication.

Figure 4.11: Levels of Sophistication Guidance



5. Asset Data Life Cycle

Data for asset management and investment purposes is created and collected in phases that correspond to the general lifecycle of asset data:

Data Creation Data creation typically refers to the development of the inventory data that forms part of the asset register. Data creation should to be informed by clearly documented data specifications. For road assets, inventory data is typically created by either translating the as-constructed documentation or by field identification and measure of the existing assets;

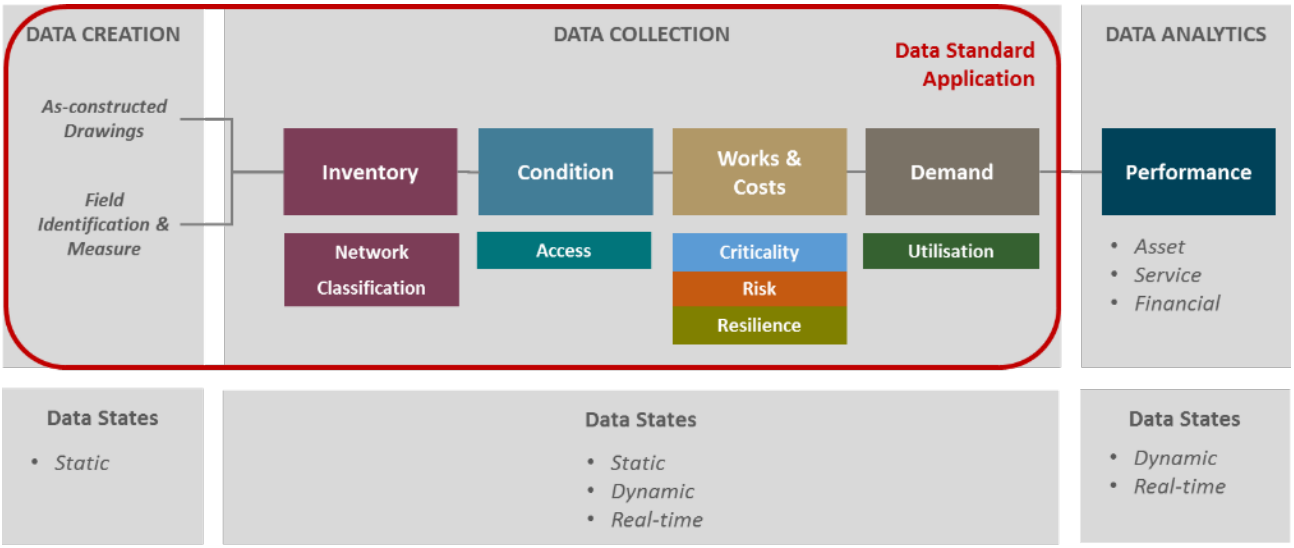
Data Collection Data collection typically refers to the data required for asset management planning purposes. Data collection should be informed by clearly documented data specifications. This data is collected following asset acquisition (operations and maintenance phase) and provides the base data for analysis of asset condition, utilisation, and performance; and

Data Analysis Data analytics refers to the science of examining the raw data with the purpose of drawing conclusions about that information. This information directly informs the asset planning decision process.

Data Maintenance Data maintenance refers to the ongoing storage, updating, and reporting of data and applies to all phases.

Figure 5.1 presents the three key data phases and their relevant function groups:

Figure 5.1: Data Phases Supporting Decision Making



Road data can exist in three distinct states depending upon the data type:

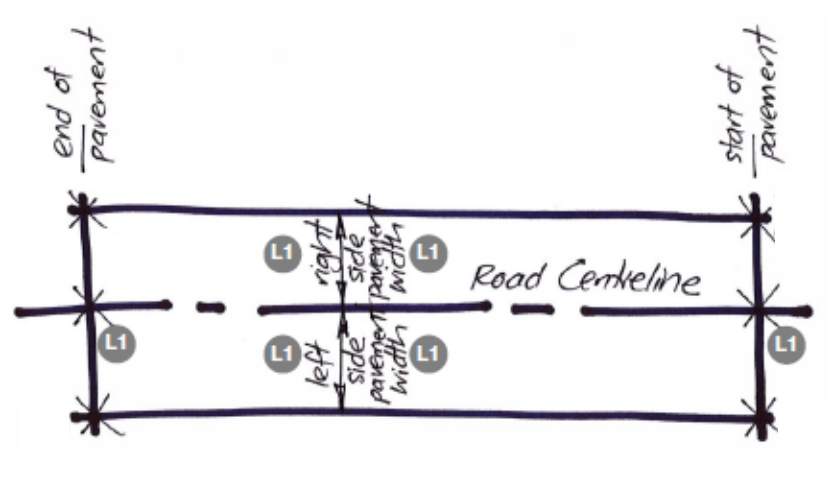
Static Data	Data that does not change over time (e.g. fixed inventory such as pavement formation);
Dynamic Data	Data that changes over time, however measured periodically (e.g. condition data); and
Real-time Data	Data that is being measured on a continuous basis and is dynamically changing (e.g. live traffic congestion or average speed monitoring)

6. Data Classes

6.1 Data Class Definition

Each data class, presented in this Standard, is defined by the data class metadata elements presented in Table 6.1: Data Class Metadata Elements.

Table 6.1: Data Class Metadata Elements

Metadata Element Name	Definition
Reference number	Each class has a unique reference number. E.g. 8.3.13
Name	The name of the Class. E.g. pathways. For asset groups, this is the name of the first level of the asset taxonomy.
Definition and comment	The document contains an extended definition and comment about the Class as the preamble under each data class. E.g. “The portion of a road (typically granular layers) placed above the design subgrade level for the support of vehicular traffic, and upon which the pavement surface (wearing course) is applied.”
Valid location types	The valid locations that can be used for this Class, if relevant. E.g. a bridge can be located and defined linearly or spatially.
Graphic	A graphic further explains the Class and may contain metadata about some of the data items. E.g. where to measure the length. 

6.2 Data Class Attributes (Data Item)

Each Data Class has a defined set of attributes or data items, where each attribute is defined by the metadata elements shown below in table 6.2. This ensures that each attribute is well understood and consistently interpreted.

The definitions for each data type is shown in table 6.3.

Table 6.2: Data Class Attributes Metadata Elements

Metadata Element Name	Short Code	Definition
Data Item Reference number	Ref	Each Item is uniquely identified by a reference number, 9.9.9, or 9.9.9.9. As well as being unique, this identifies the document section where the item is located.
Data Item Name	Name	A meaningful (lower case) name for the data item, e.g. 'number of lanes'. Note that generally this does not include the name of the class (so not 'carriageway number of lanes'). Abbreviations are avoided but may be included when very well known – these are explained in the definition part of the metadata.
Short code	Code	Legacy data stores and applications may have a restriction on the number of characters that can be used, so optionally some data consumers may need a consistent short code. E.g. lane_no. The separating character is always '_'. There is a maintained code glossary (e.g. number is always shortened to 'no' and not sometimes to 'num'). The length of these codes is limited to TEN characters including any underscores. This code may be effectively meaningless to a person, or may be commonly used by Subject Matter Experts.
Definition	Definition	A generally relatively short definition of the item. E.g. 'A sequential number for every lane on a carriageway'.
Example	Example	Sometimes it is useful to include some sample values. E.g. '1,2 or 3' would reinforce the definition for lane number.
Data type	Type	A classification identifying one of various types of data, such as alphanumeric, integer or Boolean. The list of Data Types is defined in table 6.3
Number Precision	Precision	Is the number of digits in a numerical value. For example, the number 123.45 has a precision of 5.
Number Scale	Scale	Scale is the number of digits to the right of the decimal point in a number. For example, the number 123.45 has a scale of 2.
Data Item Units	Units	Only where relevant, the unit of measure for the item, for example metres, centimetres, kilometres.
List of values	List	A list of allowable values will be provided for data items where the item must be constrained to one of a set of values. E.g. the list of allowable materials that a deck can be constructed from. (i.e. allowable list of values)
Key Purpose for Data Item	Purpose	A category of the main purpose the data is used for. This is either: L Location D Descriptive P Planning (forecasting the future asset state and financial liability) I Optional descriptive data – 'Information'
Sophistication	Soph	The assessed level of sophistication as defined in section 4. This is a guide only and organisations will need to determine whether the data item is applicable for its asset management practice. Either 1, 2 or 3.
Industry Reference	References	The most relevant industry reference, which in most cases also formed the basis for the related data items.
Prioritised Harmonised Set	PHS	Data item identified as a priority for implementation by Road Agencies for industry benefit and effective asset management practice. Codes represent: N Network Reporting (input to a reported network measure). M Management (asset and service).

Table 6.3: Data Types Definition

Name	Short Code	Technical Specification	Precision	Scale	Definition
alphanumeric	AN(m)	varchar(m)			[a-z], [A-Z], [0-9], [-] Letter and digits where m is the maximum number of characters allowed. E.g. AN(4) could be 34AB but not 456ABC
alpha	A(m)	varchar(m)			[a-z],[A-Z],[-] Alphabetical (letters only), where m is the maximum number of characters allowed. E.g. A (4) could be Fred but not Freda.
decimal	DC(p,s)	number(p,s)			Fixed precision and scale numbers with precision (p) and scale (s). Precision is the maximum total number of decimal digits that will be stored, both to the left and to the right of the decimal point. It applies to numeric fields. Length is the maximum length of characters applied to non-numeric fields. Scale is the number of decimal digits that will be stored to the right of the decimal point. This number is subtracted from 'p' to determine the maximum number of digits to the left of the decimal point. E.g. Decimal(5,2) is 999.99 maximum.
integer	I	integer			Positive whole numbers only
date	D	date			Format DD/MM/CCYY
date time	DT	datetime			Format DD/MM/CCYY:HH:MM:SS
money	Mo	number(12,2)	8	2	Dollars and cents
boolean	B	Boolean			Boolean has two defined values, typically True, False, expressed as Yes (Y) or No (N) in this Standard.
metres	M	number(8,2)	8	2	A numeric data type used when the units are always measured in metres.
well known text	WKT	wkt			The standard text mark-up language for spatial reference system, representing either a single point, polyline or polygon (multi points, lines and polygons are excluded)

Note: For attributes the m, p and s are specified as separate metadata elements, but can be displayed as one.

7. Data Item Specifications (Common Classes)

The data items presented in this section apply to all function groups in section 8. These common classes have been separated for clarity.

The level of sophistication for the provision of location referencing data in not considered to be cumulative. Therefore, if an organisation is operating at level 3, they are not required to provide the requirements for levels 1 and 2. The level of detail at a higher level is capable of providing that for the lower level. For example, level 3 can provide the requirements for level 2 and/or 1.

7.1 Object Locations

All assets (objects) are represented, spatially as a point, polyline, or polygon, depending on the extent of the asset. The appropriate graphical representation has been specified, for each asset group, in the inventory section of this Standard. This common class data set provides the specification for each graphical representation:

7.1.1 Points

Table 7.1: Inventory Location References – Points

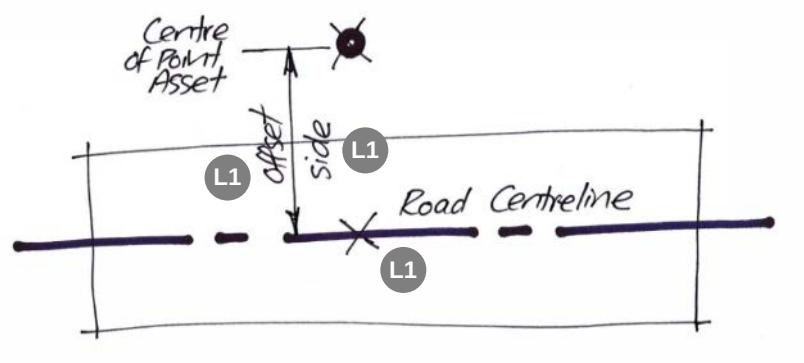
Soph	Location Data (point)	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline	
	Side	Either left, right or centre of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 7.2: Inventory Location References – Points - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.1.1.1	Location description	loc_desr	Location description if not attached to a road, such as Park name, property address		A	100				L	1		
7.1.1.2	Location distance	loc_dist	Distance to the asset from the road origin		I	6		m		L	1		M
7.1.1.3	Side	loc_side	Side of the road the asset is located on relative to the defined network orientation	Left	A	10			Code List 9.47	L	1		
7.1.1.4	Offset	loc_offset	Distance from road centreline in metres		DC	3	1	m		L	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.1.1.5	Projection	loc_proj	Projection the data is reported in including zone if appropriate	NZTM2000 or MGA94 Zn 54	AN	100				L	2		
7.1.1.6	Vertical datum	loc_vert	Vertical height datum used to report the data	AHD	AN	100				L	2		
7.1.1.7	X coordinate	loc_x	Y coordinate locator point at end of asset		DC	9	2	m		L	2		M
7.1.1.8	Y coordinate	loc_y	Original coordinate system prior to transformation		DC	9	2	m		L	2		M
7.1.1.9	Z coordinate	loc_z	Z coordinate (elevation) locator point at centre of asset		DC	9	2			L	3		M

7.1.2 Polylines

Table 7.3: Inventory Location References – Polylines

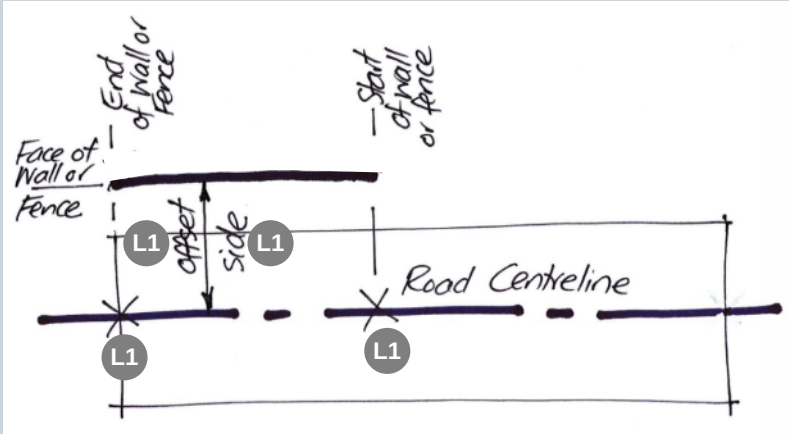
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of asset	Linear distance along road centreline	
	End of asset	Linear distance along road centreline	
	Side	Either left or right of the road centreline	
	Start of asset offset measurement	Dimension between the road centreline and the asset	
	End of asset offset measurement	Dimension between the road centreline and the asset	
L2	Road ID	The unique road identifier	
	Polyline (asset)	X, Y geometric data	
L3	Road ID	The unique road identifier	
	Polyline (asset)	X, Y, Z geometric data	

Table 7.4: Inventory Location References – Polylines - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.1.2.1	Location description	loc_desr	Location description if not attached to a road, such as Park name, property address		A	100				L	1		
7.1.2.2	Start location	loc_s	Distance to the asset start point relative to the network orientation		I	6		m		L	1		
7.1.2.3	End location	loc_e	Distance to the asset end point from the road origin		I	7		m		L	1		
7.1.2.4	Side of road start	loc_s_si	Side of the road the asset start is located on relative to the defined network orientation	Left	A	10			Code List 9.47	L	1		
7.1.2.5	side of road end	loc_e_si	Side of the road the asset end is located on relative to the defined network orientation	Left	A	10			Code List 9.47	L	1		
7.1.2.6	Start lateral offset	loc_dis_s	Lateral offset measured from the road centreline at its start location, in the increasing direction of travel		DC	3	1	m		L	1		
7.1.2.7	End lateral offset	loc_dis_e	Lateral offset measured from the road centreline at its end location, in the increasing direction of travel		DC	3	1	m		L	1		
7.1.2.8	Start width	loc_wid_s	Width in metres of the asset at the start displacement		DC	5	2	m		L	1		
7.1.2.9	End width	loc_wid_e	Width in metres of the asset at the end displacement		DC	5	2	m		L	1		
7.1.2.10	Projection	loc_proj	Projection the data is reported in including zone if appropriate	NZTM2000 or MGA94 Zn 54	AN	100				L	2		
7.1.2.11	Vertical datum	loc_vert	Vertical height datum used to report the data	NZVD 2009	AN	100			AHD, NZVD 2009	L	2		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.1.2.12	X coordinate start	loc_x_s	X coordinate locator point at start of asset		DC	9	2			L	2		M
7.1.2.13	Y coordinate start	loc_y_s	Y coordinate locator point at start of asset		DC	9	2			L	2		M
7.1.2.14	Y coordinate end	loc_x_e	X coordinate locator point at end of asset		DC	9	2			L	2		M
7.1.2.15	X coordinate end	loc_y_e	Y coordinate locator point at end of asset		DC	9	2			L	2		M
7.1.2.16	Z coordinate start	loc_z_s	Z coordinate locator point at centre of asset		DC	9	2			L	3		M
7.1.2.17	Z coordinate end	loc_z_e	Z coordinate locator point at centre of asset		DC	9	2			L	3		M

7.1.3 Polygons

Table 7.5: Inventory Location References – Polygons

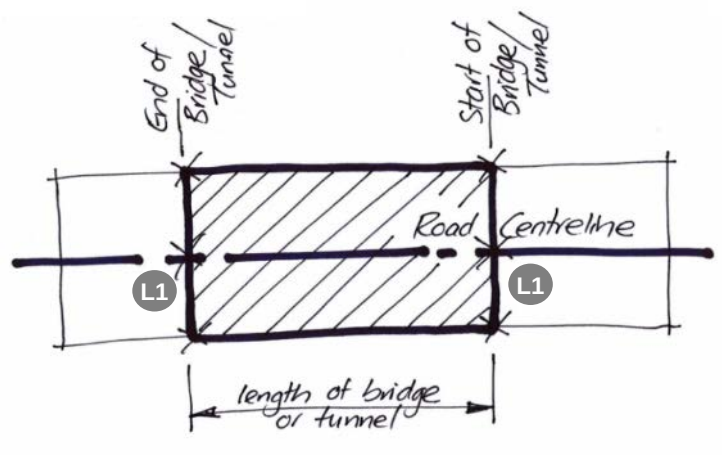
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Asset start	Linear distance along road centreline	
	Asset end	Linear distance along road centreline	
	Side	Either left or right of the road centreline	
	Asset width (left)	Measurement of asset width on left side of road centreline	
	Asset width (right)	Measurement of asset width on left side of road centreline	
L2	Road ID	The unique road identifier	
	Polygon (asset perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (asset perimeter)	Polygon geometric data (X,Y,Z)	

Table 7.6: Inventory Location References – Polygons - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.1.3.1	Location description	loc_desr	Location description if not attached to a road, such as Park name, property address		A	100				L	1		
7.1.3.2	Start location left	loc_l_s	Distance to the asset start point, left hand side, relative to the defined network orientation		I	6		m		L	1		
7.1.3.3	Start location right	loc_r_s	Distance to the asset start point, right hand side, relative to the defined network orientation		I	6		m		L	1		
7.1.3.4	End location left	loc_l_e	Distance to the asset end point from the road origin, on the left-hand side		I	6		m		L	1		
7.1.3.5	End location right	loc_r_e	Distance to the asset end point from the road origin, on the right-hand side		I	6		m		L	1		
7.1.3.6	Start lateral offset left	loc_l_s_of	Lateral offset measured from the centreline to the left corner at its start location. Side is determined by the direction of increasing distance along the link		DC	3	1	m		L	1		
7.1.3.7	Start lateral offset right	loc_r_s_of	Lateral offset measured from the centreline to the right corner at its start location. Side is determined by the direction of increasing distance along the link		DC	3	1	m		L	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.1.3.8	End lateral offset left	loc_l_e_of	Lateral offset measured from the centreline to the left corner at its end location asset. Side is determined by the direction of increasing distance along the link		DC	3	1	m		L	1		
7.1.3.9	End lateral offset right	loc_r_e_of	Lateral offset measured from the centreline to the left corner at its end location. Side is determined by the direction of increasing distance along the link		DC	3	1	m		L	1		
7.1.3.10	Projection	loc_proj	Projection the data is reported in including zone if appropriate	NZTM2000 or MGA94 Zn 54	AN	100				L	2		
7.1.3.11	Vertical datum	loc_vert	Vertical height datum used to report the data	AHD	AN	100				L	2		M
7.1.3.12	X coordinate start left	loc_x_s_l	X coordinate locator point at start of asset left hand side		DC	9	2			L	2		
7.1.3.13	Y coordinate start left	loc_y_s_l	Y coordinate locator point at start of asset left hand side		DC	72				L	2		
7.1.3.14	X coordinate start right	loc_x_s_r	X coordinate locator point at start of asset left hand side		DC	9	2			L	2		
7.1.3.15	Y coordinate start right	loc_y_s_r	Y coordinate locator point at start of asset right hand side		DC	9	2			L	2		
7.1.3.16	X coordinate end left	loc_x_e_l	X coordinate locator point at end of asset left hand side		DC	9	2			L	2		
7.1.3.17	Y coordinate end left	loc_y_e_l	Y coordinate locator point at end of asset left hand side		DC	9	2			L	2		
7.1.3.18	X coordinate end right	loc_x_e_r	X coordinate locator point at end of asset right hand side		DC	9	2			L	2		
7.1.3.19	Y coordinate end right	loc_y_e_r	Y coordinate locator point at end of asset right hand side		DC	9	2			L	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.1.3.20	Z coordinate start left	loc_z_s_l	Z coordinate (elevation) locator point at start of asset left hand side		DC	7	2			L	3		
7.1.3.21	Z coordinate start right	loc_z_s_r	Z coordinate (elevation) locator point at start of asset right hand side		DC	7	2			L	3		
7.1.3.22	Z coordinate end left	loc_z_e_l	Z coordinate (elevation) locator point at end of asset left hand side		DC	7	2			L	3		
7.1.3.23	Z coordinate end right	loc_z_e_r	Z coordinate (elevation) locator point at end of asset right hand side		DC	7	2			L	3		

7.2 Data Control

It is important to record the accuracy of the data at the time of recording.

Table 7.7: Data Control - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.2.1	Data date	dat_date	The date the data was originally collected and recorded.		D	100				P	1		
7.2.2	Data owner	dat_owner	The owner of the data.		AN	100				P	1		
7.2.3	Data source	dat_source	The original source of the data.		AN	100				P	1		
7.2.4	Data confidence	dat_confid	The implied confidence of the data as determined by the method of data creation.		A	100			Code List 9.8	P	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
7.2.5	Data editor	dat_editor	The person who entered the data into the database.		AN	100				P	1		
7.2.6	Data editor	dat_edit	The date the data was last edited.		D	100				P	1		

8. Data Specifications (Data Classes)

8.1 Network Definition

Overview

All road agencies need to define its road network in terms of the road links and their connectivity. This network model provides the basis for route planning and referencing network related data that cannot be directly associated with road based assets.

Scope

This section provides the data items that describe the road network including the links and link sections that form the basis for the network. The road network model is the prime location reference for most asset related function groups. Section 4.1 provides guidance on how to define the road network including detailed information on a topologic model.

Table 8.1: Network Definition - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Network													
8.1.1	Network Name	network_na	Name of the road network	Example City Council	A	50				L	1		M
Node													
8.1.2	Node ID	node_id	Unique reference identifier for the network node	1234567	I	10				L	1		M
8.1.3	X coordinate start node	node_x_s	The X coordinate locator point that defines the start node of a road		DC	9	2			L	1		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.1.4	Y coordinate start node	node_y_s	The Y coordinate locator point that defines the start node of a road		DC	9	2			L	1		M
8.1.5	Z coordinate start node	node_z_s	The Z coordinate (elevation) locator point that defines the start node of a road		DC	7	2			L	1		M
8.1.6	X coordinate end Node	node_x_e	The X coordinate locator point that defines the end node of a road		DC	9	2			L	1		M
8.1.7	Y coordinate end Node	node_y_e	The Y coordinate locator point that defines the end node of a road		DC	9	2			L	1		M
8.1.8	Z coordinate end Node	node_z_e	The Z coordinate (elevation) locator point that defines the end node of a road		DC	7	2			L	1		M
Link													
8.1.9	Link ID	link_id	Unique reference identifier for the network link between two nodes. Every link must have a start node and an end node		I	10				L	1		
8.1.10	Link traffic flow	link_tflow	The flow direction of traffic on the link. This can either be one or two-way flow. One way flow can be in the increasing or decreasing direction. The increasing direction is denoted by the direction of travel from the start node to the end node	One way decreasing	AN	50			Code List 9.61	L	1		
8.1.11	Link length	link_len	The actual distance between the start and end node for a road. This is the link length		I	6		m		D	1		
Road													
8.1.12	Road ID	road_id	Unique reference identifier for an existing road		I	10				L	1		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.1.13	Road name	road_name	Road name spelled in full, no abbreviations for type of road. For subdivision roads, the proposed name can be available from the organisation it will be vested to	Jones Drive	A	100				L	1		M
8.1.14	Road Length	road_len	Total length of road network, measured in kilometers. Divided carriageways in excess of 200m are considered separate roads in forward and reverse directions.		I	7		km		P	1		NM
8.1.15	Lane Kilometre Length	lanekm_len	Total length of road network, measured in lane kilometers. Hard shoulders are not considered a lane, unless they are signed for periodic use during peak periods.		I	7		km		P	2		NM
8.1.16	Number of Major Structures	no_str_tot	Total number of major structures across the road network, including bridges and major culverts.		I	6		#		P	1		
8.1.17	Number of Bridge Structures	no_str_bri	Total number of bridges across the road network.		I	6		#		P	1		NM
8.1.18	Number of Major Culvert Structures	no_str_cul	Total number of major culverts across the road network.		I	6		#		P	1		NM

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Link Section													
8.1.19	Link section ID	link_s_id	A link that is broken into more than one part creates a link section. Each link section has a unique ID to identify it. Where only one link exists between nodes there is no link section, or link section ID		I	10				L	1		M
8.1.20	Link section start displacement	link_s_s	The start displacement of the link section as determined by the network orientation		I	6		m		L	1		M
8.1.21	Link section end displacement	link_s_e	The end displacement of the link section as determined by the network orientation		I	6		m		L	1		M
8.1.22	Link section length	link_s_len	The length of the link section calculated by deducting the link section end displacement from the link section start displacement		I	6		m		D	1		NM
8.1.23	Link section average width	link_s_wid	The weighted average width of the link section measured between edge of pavement to edge of pavement for unsealed roads. For sealed roads from edge of seal to edge of seal where no kerb is present, or kerb face to kerb face.		DC	3	1	m		D	1		M
8.1.24	Link section uniform width	link_s_uni	An indicator that represents the consistency in the link section width. Where the measured width variation is less than 1.0m use uniform, and if greater use varying		A	1			U - uniform width, V - varying width	D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.1.25	Reserve width left from centreline	res_wid_l	The lateral offset distance from the road centreline to the left side of the corridor reserve boundary. Side is determined by the network orientation	10.5	DC	3	1	m		D	1		
8.1.26	Reserve width right from centreline	res_wid_r	The lateral offset distance from the road centreline to the right side of the corridor reserve boundary. Side is determined by the network orientation	10.5	DC	3	1	m		D	1		
8.1.27	Number of lanes left of centreline	links_lanl	Number of trafficable lanes within the link section, left of the centreline	2	I	1		#		D	1		M
8.1.28	Number of lanes right of centreline	links_lanr	Number of trafficable lanes within the link section, right of the centreline	2	I	1		#		D	1		M
8.1.29	Average lane width left of centreline	links_llr	Average width of trafficable lanes, within the link section, left of the centreline	2	I	2	1	m		D	1		M
8.1.30	Average lane width right of centreline	links_lwr	Average width of trafficable lanes, within the link section, right of the centreline	2	I	2	1	m		D	1		M
8.1.31	Separate link sections for traffic flow direction	links_div	Identifies if the carriageway for vehicle flow in the opposite direction is separated by means of a physical barrier (divided), or undivided (no physical barrier)		A	1			D – divided, U - undivided	D	1		M
8.1.32	Traffic flow direction	traf_dir	One way or two-way traffic	O- One way	A	1			Code List 9.61	D	1		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.1.33	Traffic setting	traf_set	Urban or rural indicator for the link section		A	1			U - posted speed limit < or = 70km/hr, R - posted speed limit > 70km/hr	D	1		NM
8.1.34	Type of pavement construction	pave_const	The type of pavement on the link section		A	3			Code List 9.70	D	1		M
8.1.35	Ownership organisation	owner	The link section that defines the ownership location of a road		A	30				D	1		M
8.1.36	Operator organisation	operator	The link section that defines the operator location of a road		A	30				D	1		
8.1.37	Maintainer organisation	maintainer	The link section that defines the maintainer location of a road		A	30				D	1		
8.1.38	Maintenance contract reference	maint_con	The link section that defines the maintenance location of a road		AN	10				D	2		

8.2 Classification

Overview

Classification for a transport network/system attributes to each component link a functional priority or status level within the network. Any network will generally include links classified at most levels across this spectrum within it. In this Standard the New Zealand One Network Road Classification (ONRC) has been used as an example of a classification system.

Scope

The naming system for each status level used varies across National, State, and Local Authorities but the approach in each case will have the highest level for network links that are strategic with high volumes that deliver economic or community benefits. At lower levels the links provide almost purely local access that delivers local or private benefits. Between these two extremes are identified levels that combine and acknowledge compromises between general benefits (through traffic flow) and local benefits (property access) at differing levels.

Higher order links tend to be costlier to maintain and operate but comprise a far smaller percentage by length of the network. Priority at the higher order links is to support economic outcomes through traffic flow, at the expense of access and local use. In lower order links, access and local use increases, at the expense of through traffic flow efficiency. Increased priority is given to shared access and dedicated space for non-car based travellers, such as pedestrians and cyclists, as the classification hierarchy decreases.

Data items are provided for different organisational activities and are structured by intended use:

- In a land use planning context classification is used to define the purpose of the link and then attach suitable development limits or rules that support or protect that purpose;
- In a network modelling context classification is used to describe the way a road is expected to support the network operation; the levels of classification will reflect expected operational performance; and
- In a funding context, although all network components may justify some funding, higher level classification can be used to justify higher investment, more significant improvements, more urgent/responsive maintenance, and closer monitoring.

Table 8.2: Classification - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Functional													
8.2.1	Functional Classification - One Road Classification System	ctype_onrc	The functional classification for the carriageway section as defined in the One Network Road Classification system	National	A	6			Code List 9.19	D	1		
Economic and Social													
8.2.2	Estimated population served by road	pop	The estimated population served by the road as determined by a catchment analysis		I	7		#		D	1		
8.2.3	Criticality	crit_conn	A Boolean function returning positive if the route has been identified by the road manager as serving a critical social, economic or functional need. Road links to remote regions or is sole connectivity in urban areas; or roads that have no alternative routes	Y - Yes	B	1			Y or N	D	1		
8.2.4	Freight value in motion	fr_sig_val	The estimated gross value of freight using the route per annum. Freight value > $3B	Y - Yes	B	1			Y or N	D	1		
8.2.5	Freight weight in motion	fr_sig_wgt	The estimated gross mass of freight using the route per annum		I	2		MT		D	1		
8.2.6	Airport access passengers in motion	air_pass	The estimated number of airport passengers using the route per annum		I	8		#		D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.2.7	Tourist route	tourism	A Boolean function returning a positive where a route is either a) identified as a scenic or tourist route in a regional tourist strategy or b) provides access to 5 tourist destinations designated in a regional tourist strategy. Road serves top 5 tourist destinations or has regional/local significant tourist destinations or significant scenic routes	Y - Yes	B	1			Y or N	D	1		
8.2.8	Hospital Access Road	hospitals	A Boolean function returning positive where a route is a primary or secondary access to a hospital, ambulance depot or other medical centre that provides emergency response. Road provides access to tertiary or regional hospitals	Y - Yes	B	1			Y or N	D	1		

8.3 Inventory

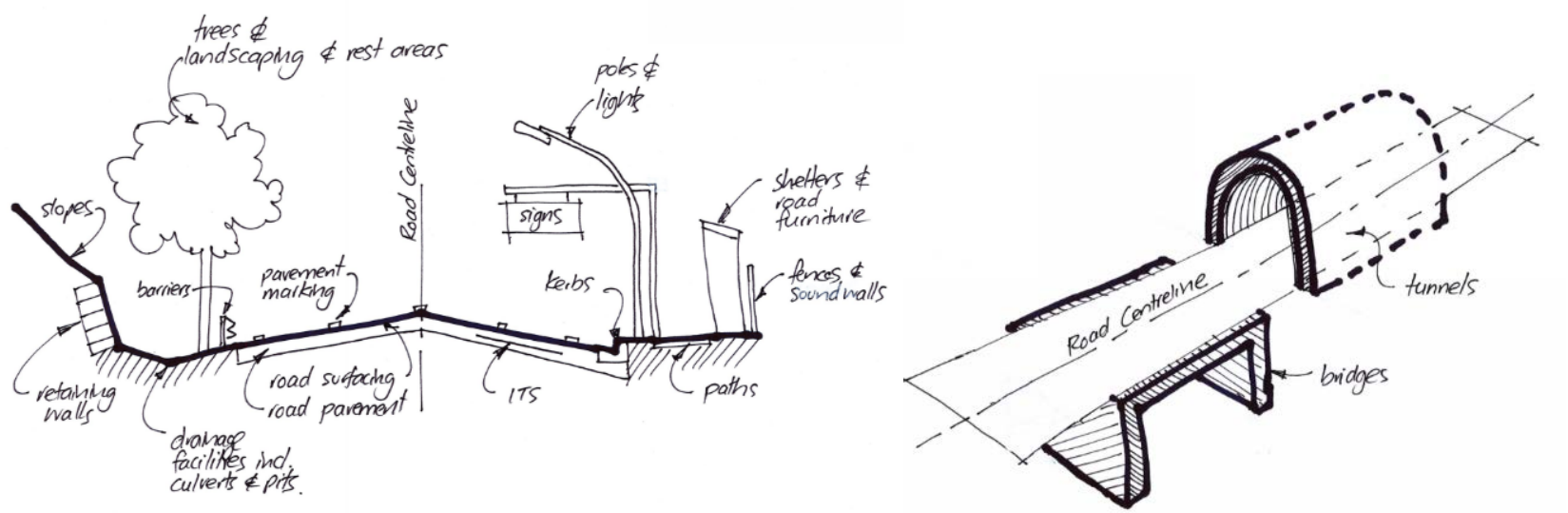
Overview

Inventory is the basic information about assets that includes describing the location, type and attributes of the asset. Asset inventory information is fundamental to making informed asset management decisions, and it's associated reporting. Asset inventory elements and associated components are therefore critical for aggregated asset reporting, service standards, asset performance measurement or asset management activities.

Scope

Road Corridors comprise different asset groups and each of those groups have a number of characteristics describing the various components. This data is used to create the Asset Register and in the context of this project will be referred to as the Inventory. Inventory data is required as a result of subdivision development; works or programs such as minor or major capital works, renewals and maintenance activities. It is "as constructed" data that is provided as a record, at a particular point in time.

Figure 8.1: Typical Assets on a Road Corridor



The data items that are common to all asset groups have been separately identified as common classes.

Table 8.3: Inventory Common Classes - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
General													
8.3.0.1	Unique asset identifier	asset_id	The unique asset identifier		AN	20				D	1		NM
8.3.0.2	Asset class	asset_clas	The asset class or group	Bridge	A	20			Code List 9.2	D	1		NM
8.3.0.3	Contractor or suppliers Unique asset ID	cont_id	The contractor or suppliers Unique ID for the asset		AN	10				D	1		
8.3.0.4	Owner of the asset	owner	Owner of the asset	Frankston City Council	A	100				D	1		
8.3.0.5	Data source	dat_source	Data source and its accuracy	As Designed drawings	AN	50				D	1		
8.3.0.6	Project or contract Id that created the asset	works_id	The project or contract Id that created the asset.		AN	20				D	1		
8.3.0.7	Permit number	permit_no	For WA Consortium members, this refers to Western Australian Planning Commission reference number. Other jurisdictions to use local references as appropriate.		AN	20				D	1		
8.3.0.8	As Constructed Plan Number	plan_no	As Constructed drawing plan number	6080R212	AN	20				D	1		
8.3.0.9	Subdivision or Project Name	works_name	Subdivision or Project Name. Field can be used for either a subdivision or capital works project	Rockbank Rise	AN	100				D	1		
8.3.0.10	Work type that created the asset	works_type	The type of work that has created the asset.		A	1			P- Project S - Subdivision	D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.0.11	Construction Organisation name	const_co	Construction Company name only	Jamieson Construction	A	100				D	1		
8.3.0.12	Design Company name	design_co	Design Company name only	Fred Charles & Associates	A	100				D	1		
8.3.0.13	Subdivision stage or project number	stage_no	Subdivision or Project Stage Number. Field can be used for either a subdivision or capital works project.	7 or 3B	AN	10				D	1		
8.3.0.14	Design life	life_cons	The design life expected at the time of construction / installation		I	3				P	2		M
Valuation													
8.3.0.15	Construction date	const_date	Date the asset was constructed/built/ installed		D	8			dd/mm/ccyy	P	2		M
8.3.0.16	Construction cost	const_cost	Construction cost in Australian/New Zealand Dollars. Currency is to be relevant to the jurisdiction.	1000000	Mo	10	2	$		P	2		M
8.3.0.17	Operation status	asset_stat	Current operational state of the asset.	ABN - Abandoned	A	30			Code List 9.3	P	2		M
8.3.0.18	Financial currency	currency	Currency used to estimate costs	AUD (Australian Dollars)	Mo	10	2	$	AUD or NZD	P	2		
8.3.0.19	Valuation type	value_type	Valuation type	RC - Replacement Cost	A	4			Code List 9.73	P	2		NM
8.3.0.20	Assessed cost in Australian/New Zealand Dollars	value	Assessed cost in Australian/New Zealand Dollars. Currency is to be relevant to the jurisdiction.	1000000	Mo	10	2	$		P	2		NM
8.3.0.21	Unit cost	unit_cost	Cost per unit of the asset	130.25	Mo	10	2	$		P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.0.22	Valuation year	value_year	The date the valuation was undertaken	ddmmyyyy	D	8		yr		P	2		M
Additional Information													
8.3.0.23	Comments	comments	Any additional comments that relate to this asset		AN	250				I	3		
8.3.0.24	Photo reference	photo_ref	Reference photograph of asset.	dd/mm/ccyy [description].jpg	AN	100				I	3		
8.3.0.25	Data editor	added_by	The person who added the data to the asset register		A	20				I	3		
8.3.0.26	Data added date	added_date	The date the data was added to the asset register	ddmmyyyy	D	8				I	3		
8.3.0.27	Vesting date	vest_date	The date the asset was vested (ownership transfer) to the road agency	ddmmyyyy	D	8				I	3	All	
8.3.0.28	Vesting source	vest_org	The organisation gifting (vesting) the asset to the road agency		A	20				I	3	8.3.0.23	

8.3.1 Amenities

A feature or facility that is provided in a location that is not covered by the other asset groups (i.e. gas BBQ).

Table 8.4: Amenities - Location References

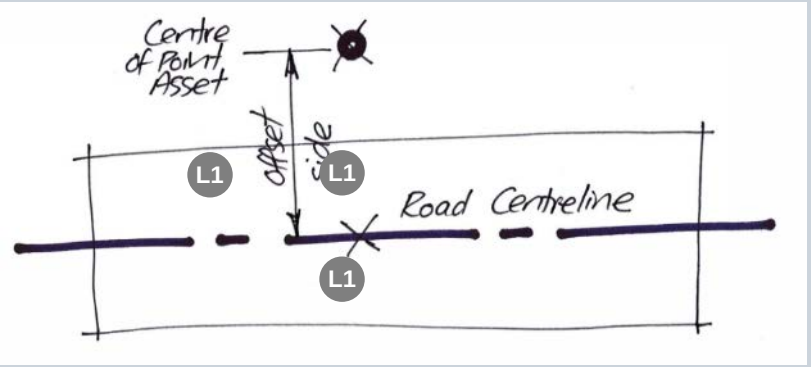
Soph	Location Data (point)	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.5: Amenities - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.1.1	Type	amen_type	Amenity Type		A	100			Code List 9.28	D	1		
8.3.1.2	Material	amen_mat	Material made out of	Steel	A	100			Code List 9.26	D	2		
8.3.1.3	Manufacturer	amen_manuf	Company name only	Lunds Pty Ltd	A	100				I	3		
8.3.1.4	Model number	amen_model	Model number	JK-001-A	AN	30				I	3		

8.3.2 Bins

A receptacle that is used to store litter and is emptied at a determined frequency. It is often placed on the footpath, or grass berm area.

Table 8.6: Bins - Location References

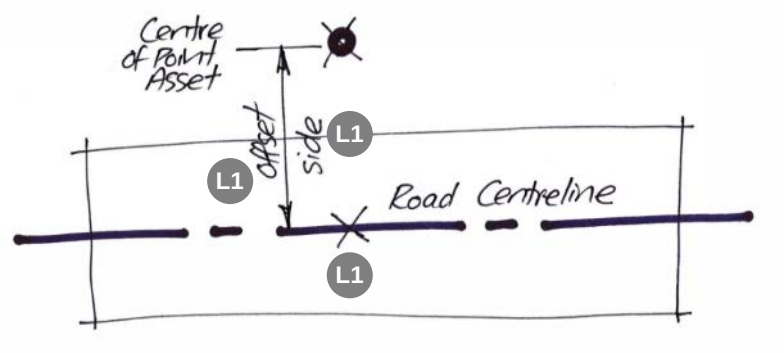
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.7: Bins - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.2.1	Capacity	bin_cap	Bin Capacity in Litres	240	I	3		L		D	1		
8.3.2.2	Type	bin_type	Bin Type	SR	A	100				D	1		
8.3.2.3	Bin intended use	bin_use	The intended use of the bin. Recycle, waste, glass only, green clippings etc.	Recycle	A	20			Code List 9.3	P	1		
8.3.2.4	Liner present	bin_liner	A bin liner is present	N - No	B	1			Y or N	I	2		
8.3.2.5	Manufacturer	bin_manuf	Manufacturing company name only	BIF Pty Ltd	A	100				I	3		
8.3.2.6	Material	bin_mat	Material the bin is made out of	Steel	A	100			Code List 9.26	I	2		
8.3.2.7	Model number	bin_model	Model number	Ef-456-S	AN	30				I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.2.8	Supplier	bin_suppl	Bin Supplier	Visy	AN	100				I	3		

8.3.3 Bridge / Major Culvert

A structure designed to provide passage for road users over an obstacle by spanning it. Major culverts have a cross sectional area of more than 3.4 sq.m.

Table 8.8: Bridge - Location References

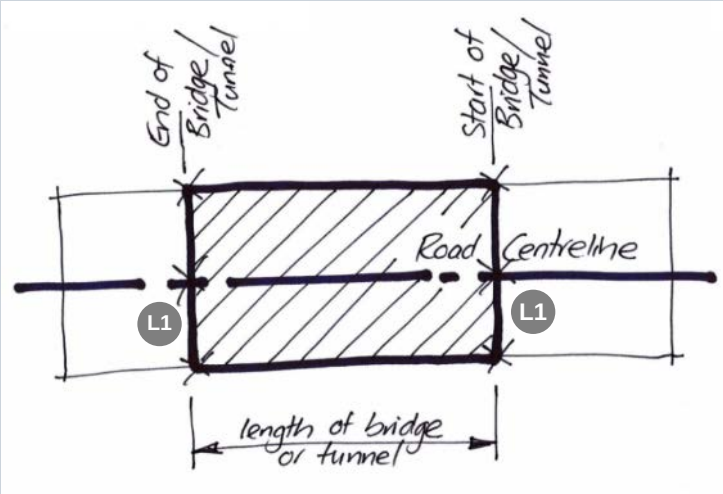
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of bridge	Linear distance along road centreline / spatial	
	End of bridge	Linear distance along road centreline / spatial	
	Bridge width (left)	Measurement of bridge width on left side of road centreline	
	Bridge width (right)	Measurement of bridge width on right side of road centreline	
L2	Road ID	The unique road identifier	
	Polygon (bridge perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (bridge perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.9: Major Culverts - Location References

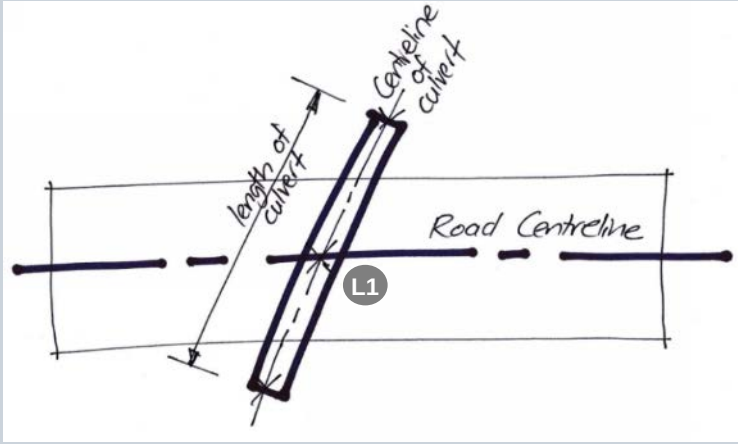
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centre of culvert	Linear distance along the road centreline	
L2	Road ID	The unique road identifier	
	Polyline (culvert centreline)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (culvert centreline & invert levels)	Polyline geometric data (X,Y,Z)	

Table 8.10: Bridge and Major Culverts - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.3.1	Bridge Width Left of Centreline	br_wid_l	The lateral offset distance from the road centreline to the left hand extent of the bridge. Side is determined by the direction of increasing distance along the link		DC	3	1	m		L	1		
8.3.3.2	Bridge Width Right of Centreline	br_wid_r	The lateral offset distance from the road centreline to the right-hand extent of the bridge. Side is determined by the direction of increasing distance along the link		DC	3	1	m		L	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.3.3	Waterway Name	ww_name	Populate the waterway name if a waterway passes through the culvert or beneath the bridge		A	100				L	1		
8.3.3.4	Beam Material	beam_mat	For a bridge the material the beam is constructed of. Populate only if Bridge/Major Culvert Components is not used	CONC - Concrete	A	100				D	1		
8.3.3.5	Column or Pile Material	br_col_mat	For a bridge the material the column or pile is constructed of. Populate only if Bridge/Major Culvert Components is not used.	CONC - Concrete	A	100			Code List 9.27	D	1		
8.3.3.6	Deck Material	br_dek_mat	For a bridge the material the deck is constructed of. Populate only if Bridge/Major Culvert Components is not used.	Wood	A	100			Code List 9.27	D	1		NM
8.3.3.7	Earthquake Rating	br_eq_rate	Earthquake rating of the structure		DC	6	2			D	1		
8.3.3.8	Foundation material	br_fnd_mat	Foundation material		A	100				D	1		
8.3.3.9	Foundation type	br_fnd_typ	Foundation type		A	30				D	1		
8.3.3.10	Entrance Gate	br_gate	The bridge has a gate at the entrance	Y - Yes	B	1			Y or N	D	1		
8.3.3.11	Number of Beams	br_beam_no	Number of beams	6	I	2		#		D	1		
8.3.3.12	Number of columns or Piles	br_col_no	Number of columns or piles	8	I	2		#		D	1		
8.3.3.13	Number of Piers	br_pier_no	Number of piers	4	I	2		#		D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.3.14	Pier Material	br_pie_mat	Pier material. Populate only if Bridge/Major Culvert Components is not used.	CONC - Concrete	A	100				D	1		
8.3.3.15	Safety Rail Material	br_rai_mat	Safety rail material	Steel	A	30				D	1		
8.3.3.16	Safety Rails Present	br_rail	The structure has safety rails	Y - Yes	B	1			Y or N	D	1		
8.3.3.17	Cell Type For Major Culvert	br_cel_typ	If a major culvert the type of culvert structure. Populate only if Bridge/Major Culvert Components is not used.	Box	A	30			Code List 9.31	D	2		
8.3.3.18	Vertical Clearance	br_clear	Distance between water feature and the bridge at the high water mark in metres. In the event of inland water at high water mark or tidal water at high tide. Populate only for a bridge if it is over a watercourse.		DC	6	2			D	2		
8.3.3.19	Function of the Feature	br_func	Function of the feature	OR - Over Road	A	100			Code List 9.19	D	2		
8.3.3.20	Number of Spans or Cells	br_spans	Number of spans of the bridge or number of cells of the major culvert	3	I	2		#		D	2		
8.3.3.21	Feature Structure Type	br_struc	Feature Structure Type.	Stock crossing/ underpass	A	100			Code List 9.5	D	2		M
8.3.3.22	Cell Material For Major Culvert	br_cel_mat	Populate only if the structure is a major culvert and if Bridge/Major Culvert Components is not used.	Pre-cast Concrete	A	30				D	3		
8.3.3.23	Length	br_len	Total length of the structure in metres	20.5	DC	4	2	m		D	3		NM

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.3.24	Width	br_wid	Total width of the structure in metres	2.45	DC	5	2	m		D	3		M
8.3.3.25	State Or National Heritage Listing	br_heritag	The structure is in the state or national heritage listing	Y - Yes	B	1			Y or N	P	1		
8.3.3.26	Vehicular Load Limit	br_ld_lim	Vehicular gross load limit on the structure.	250	I	5		kg		P	1		M
8.3.3.27	Abutment Material	br_abu_mat	Abutment material. Populate only if Bridge/Major Culvert Components is not used.	CONC - Concrete	A	100				I	2		
8.3.3.28	Area	br_area	Area of the component in square metres if the dimensions are not uniform	25.35	DC	6	2	sq.m		D	1		
8.3.3.29	Height	br_hei	Height of the component in mm	2300	I	4		mm		D	1		
8.3.3.30	Length	br_co_len	Length of the component in metres	6.23	DC	4	2	m		D	1		
8.3.3.31	Number of components	br_comps	Number of same type of components with the same dimensions and material	4	I	2		#		D	1		
8.3.3.32	Width	br_wid_co	Width of the component in metres	2.45	DC	5	2	m		D	1		
8.3.3.33	Component type	br_co_type	Component type	TB - T Beam,	A	30			Code List 9.7	D	3		
8.3.3.34	Component material	br_co_mat	Component material	Wood	A	100			Code List 9.27	D	3		
8.3.3.35	Component code	br_co_code	Structure component code according to the Bridge Inspection Manual used in each jurisdiction	1S - Steel box girder	AN	6			Code List 9.6	I	3		

8.3.4 Culverts (Minor)

One or more adjacent pipes or enclosed channel that conveys surface water run-off, or a stream, below the formation level of a road. Minor culverts have a cross sectional area of less than 3.4 sq.m.

Table 8.11: Culverts (Minor) - Location References

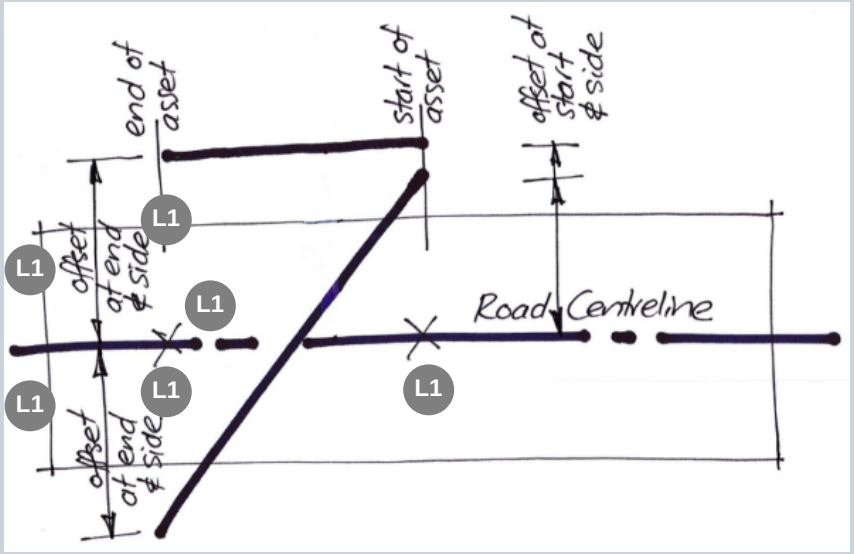
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of culvert/pipe section	Linear distance along road centreline / spatial	
	End of culvert/pipe section	Linear distance along road centreline / spatial	
	Start side	Side of road centreline	
	End side	Side of road centreline	
	Start offset measurement	Dimension between the road centreline and the culvert/pipe centreline	
	End offset measurement	Dimension between the road centreline and the culvert/pipe centreline	
L2	Road ID	The unique road identifier	
	Polyline (culvert/pipe centreline)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (culvert/pipe centreline & invert levels)	Polyline geometric data (X,Y,Z)	

Table 8.12: Culverts (Minor) - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.4.1	Downstream Pit Number	cul_pit_no	Downstream Pit Number. This number must form part of the Pipe section number.		AN	15				L	1		
8.3.4.2	Downstream X Coordinate	cul_dn_x	Downstream end-of-pipe X Coordinate. Will be used in the computation check of the pipe length		DC	9	2			L	2		
8.3.4.3	Downstream Y Coordinate	cul_dn_y	Downstream end-of-pipe Y Coordinate. Will be used in the computation check of the pipe length.		DC	9	2			L	2		
8.3.4.4	Upstream X Coordinate.	cul_up_x	Upstream end-of-pipe X Coordinate. Will be used in the computation check of the pipe length		DC	9	2			L	2		
8.3.4.5	Upstream Y Coordinate	cul_up_y	Upstream end-of-pipe Y Coordinate. Will be used in the computation check of the pipe length		DC	9	2			L	2		
8.3.4.6	Internal pipe Diameter or Width	cul_dia	Internal pipe Diameter of the pipe or Width if the pipe is non-circular	450	I	4		mm		D	1		
8.3.4.7	Non Circular Pipe height	cul_hei	Pipe Height. Needs to be populated for non-circular pipes	450	I	4		mm		D	1		
8.3.4.8	Pipe section length	cul_len	Pipe section length in metres	100.55	DC	5	2	m		D	1		
8.3.4.9	Pipe material	cul_mat	Pipe material.	RC	A	100			Code List 9.26	D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.4.10	Unique number derived from pit numbers	cul_pit_no	Unique number in this Stage derived from pit numbers. The downstream (1st number) should generally be smaller than the upstream (2nd number). i.e. Pipe Section 13 - 14. As a rule of thumb, the "downstream-up" principal should be followed when numbering the pipe sections.	37-38A	AN	30				D	1		
8.3.4.11	Pipe type	cul_type	Pipe type.	Pipe, open, culvert, subsoil	A	100			Code List 9.31	D	1		
8.3.4.12	Pipe configuration	cul_config	This field ONLY needs to be populated when the pipe configuration inside a SWALE trench or Culvert contains more than 1 (one) pipe	Example 1. - Configuration of conduits/pipes in culverts 3x150 i.e. 3 conduits / pipes @ 150mm diameter each. Example 2. - Configuration of conduits/ pipes in culverts 3x150x300 i.e. 3 conduits / pipes @ 150mm diameter/width by 300 height each.	AN	50				D	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.4.13	Structure location	cul_in_out	This field ONLY needs to be populated when an inlet or outlet structure exists. Describe extent of inlet, outlet or other feature.	Outlet backflow prevention valve. Outlet energy reducing device.	A	50				D	2		
8.3.4.14	Pipe shape	cul_shape	Shape of the pipe		A	10			Code List 9.30	D	2		
8.3.4.15	Upstream Pit Number	cul_up_pit	Upstream Pit Number. This number must form part of the Pipe section number		AN	15				D	2		
8.3.4.16	2nd pipe diameter	cul_dia_2	Populate ONLY when the pipe type is non circular and has two diameters. For egg shaped pipes (W1 = Dia_Width ; W2 = Width2 ; H = Height)	200	I	4		mm		D	2		
8.3.4.17	Downstream Invert Level	cul_dn_inv	Downstream end-of-pipe Invert Level. When recording the invert levels, it stands to reason that the downstream invert level must be smaller than the upstream invert level.		DC	5	2			D	3		
8.3.4.18	Relined or renewed material	cul_in_mat	Relined or renewed material	Fibreglass	A	30				I	2		
8.3.4.19	Relining or renewal method	cul_in_met	Relining or renewal method	CUREDIP - Cured in place	A	100			CUREDIP - Cured in place SLUPVC - Slip lined with uPVC & grouted	I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.4.20	Upstream end-of-pipe Invert Level	cul_up_inv	Upstream end-of-pipe Invert Level. When recording the invert levels, it stands to reason that the downstream invert level must be smaller than the upstream invert level.		DC	5	2			D	3		

8.3.5 Fences

A permanent structure that encloses an area, often constructed with posts connected by rails. It can be provided for protection for an area, security or to define a boundary.

Table 8.13: Fences - Location References

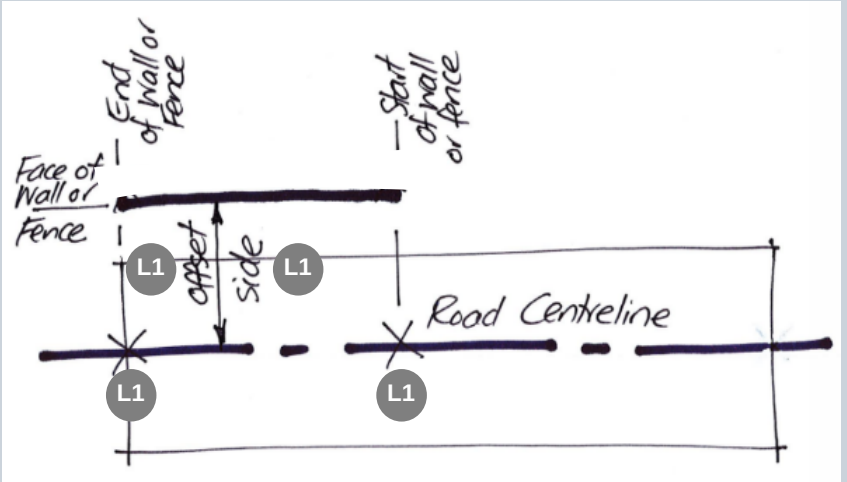
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of fence section	Linear distance along road centreline / spatial	
	End of fence section	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Start of fence offset measurement	Dimension between the road centreline and face of fence	
	End of fence offset measurement	Dimension between the road centreline and face of fence	
L2	Road ID	The unique road identifier	
	Polyline (face of fence)	X, Y geometric data	
L3	Road ID	The unique road identifier	
	Polyline (face of fence)	X, Y, Z geometric data	

Table 8.14: Fences - Data Items

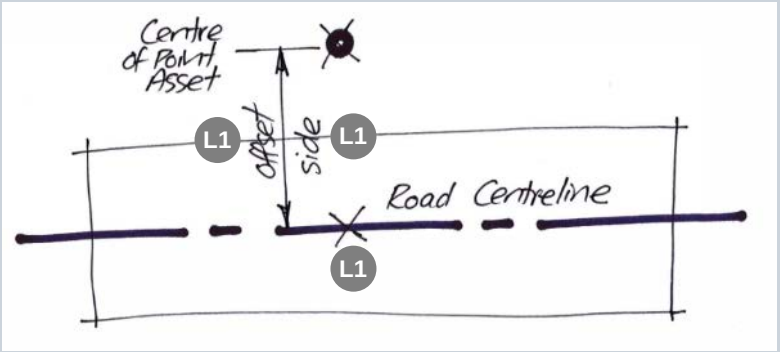
Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.5.1	Drop protection	fen_prot	If the fence provides protection to large drops		A	1				D	1		
8.3.5.2	Type	fen_typ	Fence type	Post and rail, rail, electric, picket, post and wire etc.	A	100			Code List 9.17	D	1		
8.3.5.3	Function	fen_func	Fence function	SEC - Security	A	100			Code List 9.16	D	2		
8.3.5.4	Height	fen_hei	Height of the fence in metres	2.1	DC	5	2	m		D	3		
8.3.5.5	Length	fen_len	Length of the fence		DC	4	2	m		D	3		
8.3.5.6	Material	fen_mat	Fence material	Wrought Iron	A	100			Code List 9.26	D	3		
8.3.5.7	Joint ownership	fen_joint	Is the fence in joint ownership		A	1				I	3		
8.3.5.8	Manufacturers name	fen_manuf	Manufacturers name	Streetsmart Group Ltd	A	100				I	3		

8.3.6 ITS Assets

Point Assets

An Intelligent Traffic Systems asset or component that is defined by a point (i.e. it has no length).

Table 8.15: ITS (Point Assets) - Location References

Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Polyline Assets

An Intelligent Traffic Systems asset or component that has a start and end point, and an associated length.

Table 8.16: ITS (Linear Assets) - Location References

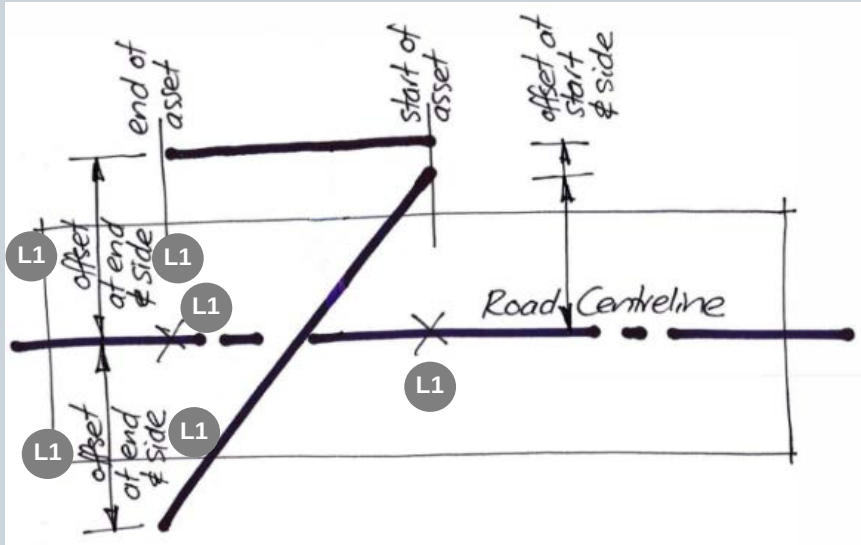
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of ITS section	Linear distance along road centreline / spatial	
	End of ITS section	Linear distance along road centreline / spatial	
	Start side	Side of road centreline	
	End side	Side of road centreline	
	Start offset measurement	Dimension between the road centreline and the ITS centreline	
	End offset measurement	Dimension between the road centreline and the ITS centreline	
L2	Road ID	The unique road identifier	
	Polyline (ITS)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (ITS)	Polyline geometric data (X,Y,Z)	

Table 8.17: ITS Assets - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
General													
8.3.6.1	Site name	its_site	Site name		A	30				L	1		
8.3.6.2	Type	its_type	Asset ITS Component Type	CCTV	A	100				D	1		
8.3.6.3	Above or below surface level	its_abobel	Height above surface or depth below surface. +ve number if above ground, -ve if below		DC	4	2	m		D	2		
8.3.6.4	Access requirements	its_access	Access requirements	Traffic Management	A	30				I	2		
8.3.6.5	Power source	its_power	Power source	Main	A	30			Code List 9.35	I	1		
Polyline													
8.3.6.6	Contractor suppliers unique ID	its_l_suid	Contractor ID		AN	30				D	1		
8.3.6.7	Contractors unique ID	its_l_coid	Contractor's Unique ID of the 'Asset_To' asset		AN	30				D	1		
8.3.6.8	Controller ID	its_l_cnid	Controller ID		AN	30				D	1		
8.3.6.9	Conduit length	its_l_len	Conduit section length in metres (m)		DC	4	2	m		D	1		
8.3.6.10	Housing type	its_l_type	Housing type	Conduit	A	30				D	2		
8.3.6.11	Conduit material	its_l_clen	Conduit material.	Copper	A	100			Code List 9.26	D	2		
8.3.6.12	Defects liability end date	its_l_liae	End date of defects liability period	ddmmyyyy	D	8				P	1		
8.3.6.13	Design life	its_l_dl	Design life length in years	5	I	3				P	2		
8.3.6.14	Maintenance requirements	its_l_mreq	Maintenance requirements		A	100				P	2		
8.3.6.15	Defect liability start date	its_l_lias	Starting date of defects liability period	ddmmyyyy	D	8				P	3		
8.3.6.16	Installer	its_l_ints	Installer		A	30				I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.6.17	Manufacturer	its_l_manu	Manufacturer		A	100				I	3		
8.3.6.18	Supplier	its_l_supp	Supplier		A	30				I	3		
8.3.6.19	Warranty end date	its_l_wend	Warranty end date	ddmmyyyy	D	8				I	2		
Point													
8.3.6.20	Controller ID	its_p_cnid	Controller ID	DT13426	AN	30				D	1		
8.3.6.21	Control system type	its_p_type	Control system type		A	30				D	1		
8.3.6.22	Data logger present	its_p_log	A data logger is present	Y - Yes	B	1			Y or N	D	1		
8.3.6.23	Connected radar unit	its_p_rad	Whether a Radar Unit is connected or not	Y - Yes	B	1			Y or N	D	1		
8.3.6.24	Unique ID of the asset	its_p_uniq	Unique ID of the asset	RNDG367	AN	30				D	1		
8.3.6.25	Communication method	its_p_comm	Communication method. Bluetooth, microwave	Bluetooth	A	30				D	3		
8.3.6.26	Housing type	its_p_htyp	Housing type	Conduit	A	30				D	3		
8.3.6.27	UPS is connected	its_p_ups	Whether a UPS is connected or not	Y - Yes	B	1			Y or N	D	3		
8.3.6.28	Design life in years	its_p_des	Design life length in years	25	I	4				P	1		
8.3.6.29	Defects liability end date	its_p_liae	End date of defects liability period	ddmmyyyy	D	8				P	1		
8.3.6.30	Maintenance requirements	its_p_mreq	Maintenance requirements		A	100				P	1		
8.3.6.31	Start date of defects liability period	its_p_lias	Starting date of defects liability period	ddmmyyyy	D	8				P	1		
8.3.6.32	Installer	its_p_ints	Installer		A	30				I	3		
8.3.6.33	IP address	its_p_ipad	IP address	123.45.123.155	AN	30				I	2		
8.3.6.34	Manufacturer	its_p_manu	Manufacturer		A	100				I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.6.35	Model number	its_p_mod	Model number		AN	30				I	2		
8.3.6.36	Mounting type	its_p_moun	Mounting type		A	30				I	3		
8.3.6.37	Pin number or password	its_p_pass	Pin number or password		AN	30				I	2		
8.3.6.38	Serial number	its_p_seri	Serial number		AN	30				I	3		
8.3.6.39	Supplier	its_p_supp	Supplier		A	30				I	3		
8.3.6.40	Warranty end date	its_p_ware	Warranty end date	ddmmyyyy	D	8				I	3		
Polygon													
8.3.6.41	Communication method	its_pl_com	Communication method. Bluetooth, microwave	Microwave	A	30				D	2		
8.3.6.42	Control system type	its_pl_cs	Control system type		A	30				D	2		
8.3.6.43	UPS is connected	its_pl_ups	Whether a UPS is connected or not	Y - Yes	B	1			Y or N	D	2		

8.3.7 Kerb and Channel

The kerb and channel combine to form a surfaced open drain to capture and discharge run off from the road.

Table 8.18: Kerb and Channel - Location References

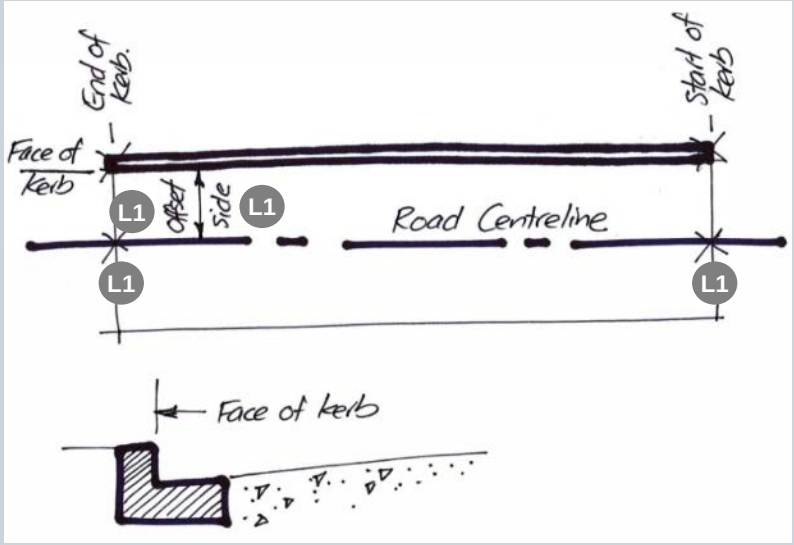
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of asset section	Linear distance along road centreline / spatial	
	End of asset section	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Start offset measurement	Dimension between the road centreline and the asset centreline	
	End offset measurement	Dimension between the road centreline and the asset centreline	
L2	Road ID	The unique road identifier	
	Polyline (kerb face)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (kerb face)	Polyline geometric data (X,Y,Z)	

Table 8.19: Kerb and Channel - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.7.1	Material	kc_mat	Kerb material	CONC - Concrete	A	100			Code List 9.26	D	1		
8.3.7.2	Type	kc_typ	Kerb Type	Mountable Kerb	A	100			Code List 9.22	D	1		
8.3.7.3	Width	kc_wid	With of the kerb excluding the channel. Channel width is included in the link dimensions	100	I	3		mm		D	1		
8.3.7.4	Length	kc_len	Length of the kerb in metres	30.25	DC	4	2	m		D	3		
8.3.7.5	Responsible Authority	kc_resp	The name of the responsible Authority for maintenance purposes.		A	100				I	1		

8.3.8 Landscaping

Areas that have been modified for visual effect and typically include planting or vegetation such as gardens. It can also include hard landscaping.

Table 8.20: Landscaping - Location References

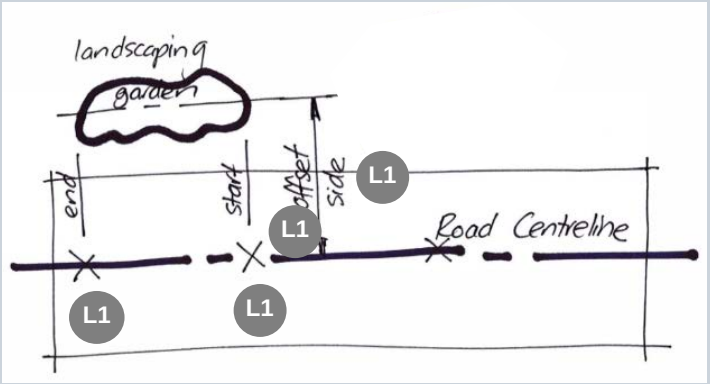
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of landscaping	Linear distance along road centreline / spatial	
	End of landscaping	Linear distance along road centreline / spatial	
	Side	Either left / right of the road centreline	
	Landscaping width	Measurement of width of landscaping	
	Offset measurement	Dimension between the road centreline and landscaping centreline	
L2	Road ID	The unique road identifier	
	Polygon (landscaping perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (landscaping perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.21: Landscaping - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.8.1	Depth	land_dep	Depth of the material where the landscaping feature does not contain water. Or the average depth of water for a water feature. Height of the hedge if the feature is a hedge		I	4		mm		D	1		
8.3.8.2	Material	land_mat	Material	Fibreglass	A	100			Code List 9.26	D	1		
8.3.8.3	Type of Landscaping	land_typ	Type of Landscaping		A	100				D	1		

8.3.9 Lighting

Assets that primarily provide illumination to the road surface for the purpose of safety.

Table 8.22: Lighting - Location References

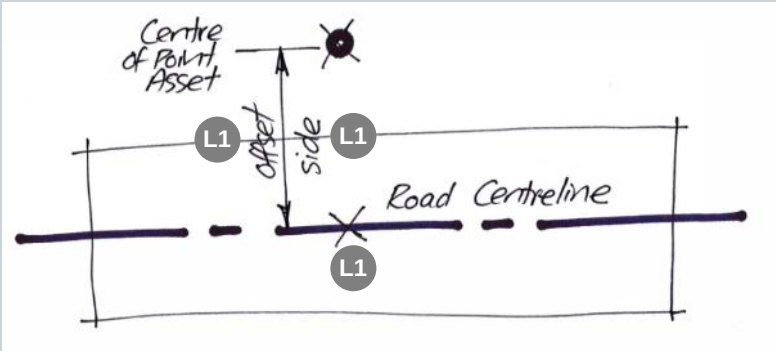
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.23: Lighting - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.9.1	Bracket height	l_brk_hei	Height from the ground to the bottom of the bracket	6.32	DC	5	2	m		D	1		
8.3.9.2	Bracket length	l_brk_len	Length of the bracket	1200	I	4		mm		D	1		
8.3.9.3	Connection Type	l_conn_typ	Connection Type	AGND - Above ground	A	10				D	1		
8.3.9.4	Luminaire capacity	l_cap	Luminaire capacity		I	3				D	1		
8.3.9.5	Luminaire model type	l_model	Luminaire model type		A	100				D	1		
8.3.9.6	Number of luminaires	l_lum_num	Number of luminaires	2	I	2		#		D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.9.7	Pole type	l_pole_typ	Pole type	PEDEST - Pedestal	A	30			PEDEST - Pedestal CANT - Cantilever	D	1		
8.3.9.8	Connected to smart grid	l_smart_gd	The light is connected to a smart grid	Y - Yes	B	1			Y or N	D	1		
8.3.9.9	Lighting Type	l_typ	Lighting Type	Directional	A	100			Code List 9.23	D	1		
8.3.9.10	Luminaires wattage	l_wattage	Wattage of the Luminaires.	100	I	3		Watt		D	1		
8.3.9.11	Control Point number	l_icp_no	Installation Control Point number		AN	30				P	1		
8.3.9.12	Bracket angle	l_brk_ang	Angle of the bracket clockwise from bracket to pole	125	I	3		degrees		I	2		
8.3.9.13	Bracket material	l_brk_mat	Bracket material		A	30				I	2		
8.3.9.14	Bracket mounting type	l_brk_mnt	Mounting type of the bracket		A	30				I	2		
8.3.9.15	Bracket Orientation	l_brk_orie	Orientation of the bracket. Angle from North, clockwise to the bracket (its bearing).	225	I	3		degrees		I	2		
8.3.9.16	Bracket type	l_brk_typ	Bracket type		A	30				I	2		
8.3.9.17	Bulk circuit connection	l_conn	Bulk circuit connection		A	30				I	2		
8.3.9.18	Light colour	l_col	Light colour		A	30				I	1		
8.3.9.19	LED chip manufacturer	l_led_manu	LED chip manufacturer.	ABC Manufacturing	A	30				I	3		
8.3.9.20	Luminaire manufacturer	l_manuf	Luminaire manufacturer	IBEX Co.	A	100				I	3		
8.3.9.21	Manufacturer Importer name	l_manu_imp	Name of the Manufacturer or Importer	Australian Lighting Company	A	100				I	3		
8.3.9.22	Power supply company	l_power_co	Power supply company.	Power Co.	A	30				I	1		
8.3.9.23	Light shade type	l_shd_typ	Light shade type		A	30				I	2		

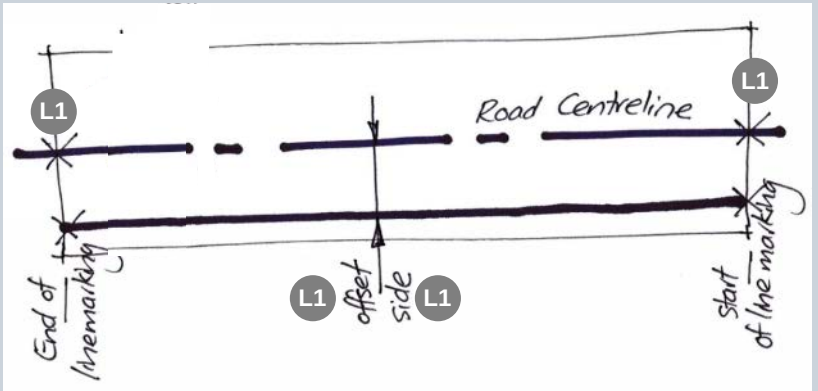
Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.9.24	Lighting design standard	l_des_std	Standard the light is designed to		A	30				I	3		
8.3.9.25	Upcast angle	l_tilt_ang	Upcast angle, clockwise from horizontal. Horizontal = 0 degrees	20	I	3		degrees		I	3		

8.3.10 Line-Marking Assets

Lines, painted or otherwise applied, that delineate lane boundaries and guide traffic with respect to overtaking and the like. These markings have a start and end point and a corresponding length.

Polyline Assets

Table 8.24: Line Marking (Polyline Assets) - Location References

Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of asset section	Linear distance along road centreline / spatial	
	End of asset section	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Start offset measurement	Dimension between the road centreline and the asset centreline	
	End offset measurement	Dimension between the road centreline and the asset centreline	
L2	Road ID	The unique road identifier	
	Polyline (centreline of marking lines)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (centreline of marking lines)	Polyline geometric data (X,Y,Z)	

Point Assets

Lines, painted or otherwise applied, that delineate lane boundaries and guide traffic with respect to overtaking and the like. Point assets are typically symbols etc.

Table 8.25: Line Marking (Point Assets) - Location References

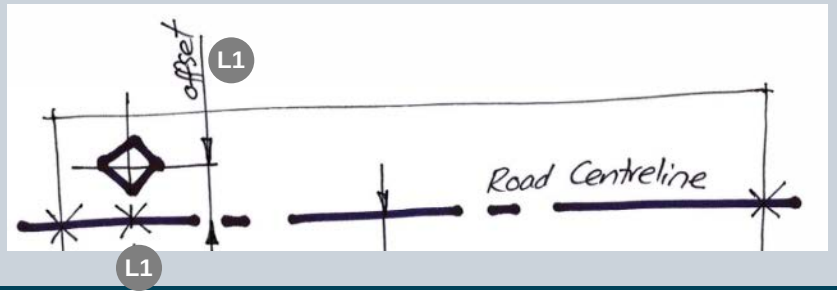
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.26: Line-Marking - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
General													
8.3.10.1	Audible	lin_aud	The marking has audible capability	Y – Yes	B	1			Y or N	D	2		
8.3.10.2	Colour	lin_colour	Colour of the line marking	White	A	30				D	2		
8.3.10.3	Reflect	lin_refl	The marking is reflectorized	Y – Yes	B	1			Y or N	D	2		
8.3.10.4	Spacing	lin_spcng	Spacing between two markings in the polygon	spacing between two diagonal or chevron markings (600mm)	I	4		mm		D	2		
8.3.10.5	Type	lin_typ	Type of marking	Chevron	A	100				D	2		
8.3.10.6	Application Rate	lin_app_r	Application rate used when painting the marking in square metres per second (m2/s)		DC	6	2			I	3		

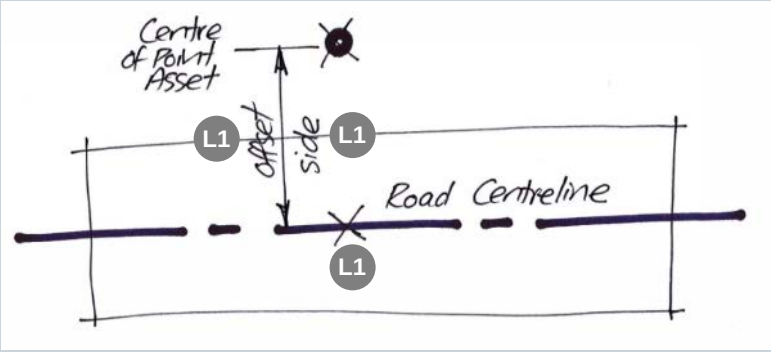
Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.10.7	Manufacturer	lin_manuf	Manufacturer of the paint used for marking		A	100				I	3		
8.3.10.8	Paint Brand	lin_paint	Brand name of the paint used for marking		A	30				I	3		
Polylines and Polygons													
8.3.10.9	Thickness	lin_thick	Thickness of the line in microns (1x10-6m)	200	I	3				D	1		
8.3.10.10	Width	linem_wid	Width of the line	100	I	3		mm		D	1		
Point													
8.3.10.11	Thickness	line_p_thi	Thickness of the line in microns (1x10-6m)	200	I	3				D	1		

8.3.11 Mechanical and Electrical Assets

Point Assets

Mechanical and electrical asset sub-components. They are often connected to other assets such as tunnels. Point assets have no length.

Table 8.27: Mechanical and Electrical (Point Assets) - Location References

Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Polyline Assets

Mechanical and electrical asset sub-components. They are often connected to other assets such as tunnels. Linear assets have a start and end point with an associated length.

Table 8.28: Mechanical and Electrical (Linear Assets) - Location References

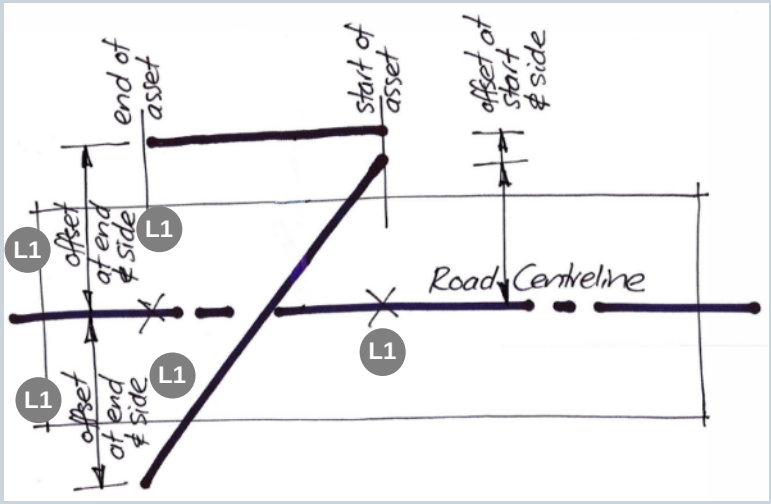
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of asset section	Linear distance along road centreline / spatial	
	End of asset section	Linear distance along road centreline / spatial	
	Start side	Either left or right of the road centreline	
	End side	Either left or right of the road centreline	
	Start offset measurement	Dimension between the road centreline and the asset centreline	
	End offset measurement	Dimension between the road centreline and the asset centreline	
L2	Road ID	The unique road identifier	
	Polyline (M&E)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (M&E)	Polyline geometric data (X,Y,Z)	

Table 8.29: Mechanical and Electrical - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
General													
8.3.11.1	Site name	me_site	Site name		A	30				L	1		
8.3.11.2	Absolute Surface height	me_ab_surf	Height above surface or depth below surface. +ve number if above ground, -ve if below		DC	4	2	m		D	1		
8.3.11.3	Asset sub type	me_sub_typ	The asset sub type	Fire Protection - Foam System Lines	A	30			Code List 9.24	D	1		
8.3.11.4	Type	me_typ	Asset Component Type	Fire	A	100				D	1		
8.3.11.5	Design life	me_des_lif	Design life length in years	20	I	2		Yr		P	1		
8.3.11.6	Defects liability end date	me_liab_e	End date of defects liability period	ddmmyyyy	D	8				P	1		
8.3.11.7	Maintenance requirements	me_maintre	Maintenance requirements		A	100				P	1		
8.3.11.8	Defects liability start date	me_dl_star	Start date of defects liability period	ddmmyyyy	D	8				P	3		
8.3.11.9	Access requirements	me_access	Specific access requirements	Traffic Management	A	30				I	2		
8.3.11.10	Installer	me_install	Name of the installer for the equipment		A	30				I	3		
8.3.11.11	Manufacturer	me_manu	Manufacturer		A	100				I	3		
Polyline													
8.3.11.12	Diameter	me_dia	Conduit Diameter in millimetres (mm)	100	I	3		mm		D	1		
8.3.11.13	Length	me_lin_len	Conduit section length in metres (m)		DC	4	2	m		D	1		
8.3.11.14	Material	me_con_mat	Conduit material	PVC	A	100			Code List 9.26	D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Point													
8.3.11.15	Communication method	me_commtyp	Communication method. Bluetooth, microwave	Bluetooth	A	30				D	1		
8.3.11.16	Controller ID	me_cont_id	Controller ID		AN	30				D	1		
8.3.11.17	Control system type	me_cs_typ	Control system type		A	30			Code List 9.24	D	1		
8.3.11.18	Data logger present	me_dat_log	Whether there's a data logger present	Y - Yes	B	1			Y or N	D	1		
8.3.11.19	Housing type	me_housing	The housing type present	Cabinet	A	30				D	1		
8.3.11.20	UPS is connected	me_ups	A UPS is connected	Y - Yes	B	1			Y or N	D	1		
8.3.11.21	Purchase date	me_purch	Purchase date	ddmmyyyy	D	8				P	1		
8.3.11.22	Model number	me_mod_no	Model number		AN	30				I	3		
8.3.11.23	Mounting type	me_mount	Mounting type		A	30			Code List 9.24	I	3		
8.3.11.24	Power source	me_power	Power source	Grid	A	30			Code List 9.35	I	1		
8.3.11.25	Serial number	me_seri_no	Serial number		AN	30				I	2		
8.3.11.26	Supplier	me_supp	Supplier		A	30				I	3		
8.3.11.27	Warranty end date	me_warrend	Warranty end date	ddmmyyyy	D	8				I	3		

8.3.12 Parking

The purpose, method of control, and restriction type are recorded for designated on road, off road parking areas.

Table 8.30: Parking - Location References

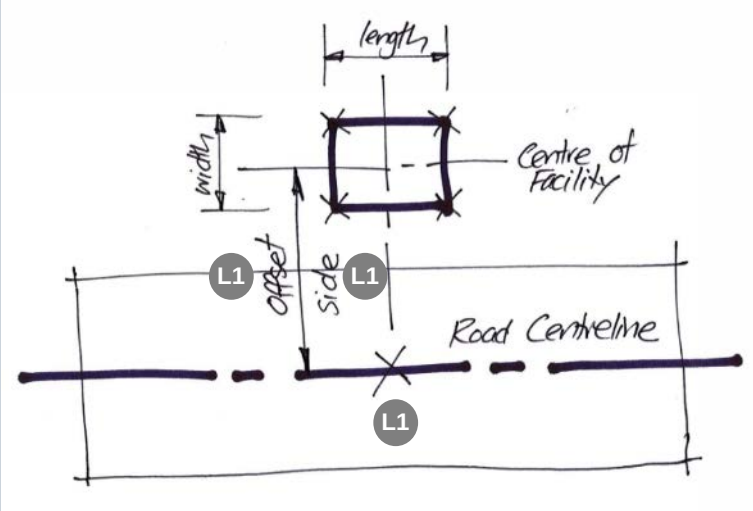
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centre of parking bay	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and the parking facility	
L2	Road ID	The unique road identifier	
	Polygon (parking bay perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (parking bay perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.31: Parking - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.12.1	Bay number	bays	Number of parking bays in a parking area		I	3				D	1		
8.3.12.2	Metered parking	meter	Parking is controlled by a meter	Y - Yes	B	1			Y or N	D	1		
8.3.12.3	Purpose	purpose	Purpose of the car park.	Disabled	A	20			Code List 9.27	D	3		

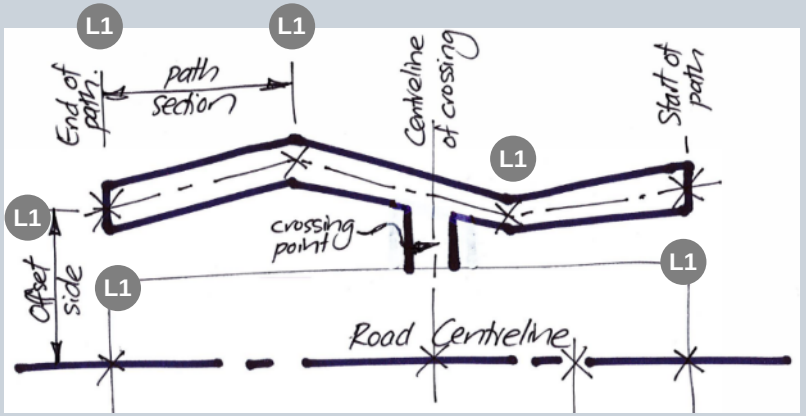
Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.12.4	Type	park_type	Type of car park	ONRD - On Road	A	100			ONRD - On Road OFFRD - Off Road	D	3		
8.3.12.5	Permit availability	permits	Permit parking present at this location	Y - Yes	B	1			Y or N	I	3		

8.3.13 Pathways

Pathways, also referred to as footpaths, are a public way that is reserved for the movement of pedestrians, motorised wheel chairs and personal mobility scooters.

Polyline Assets

Table 8.32: Pathways - Location References

Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of asset section	Linear distance along road centreline / spatial	
	End of asset section	Linear distance along road centreline / spatial	
	Side	Either left / right of the road centreline	
	Start offset measurement	Dimension between the road centreline and the asset centreline	
	End offset measurement	Dimension between the road centreline and the asset centreline	
L2	Road ID	The unique road identifier	
	Polyline (pathway centreline)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (pathway centreline)	Polyline geometric data (X,Y,Z)	

Point Assets

An area set aside for the purpose of allowing pathway users to cross the road, typically connecting to a pathway on the other side.

Table 8.33: Pathway Crossing Points - Location References

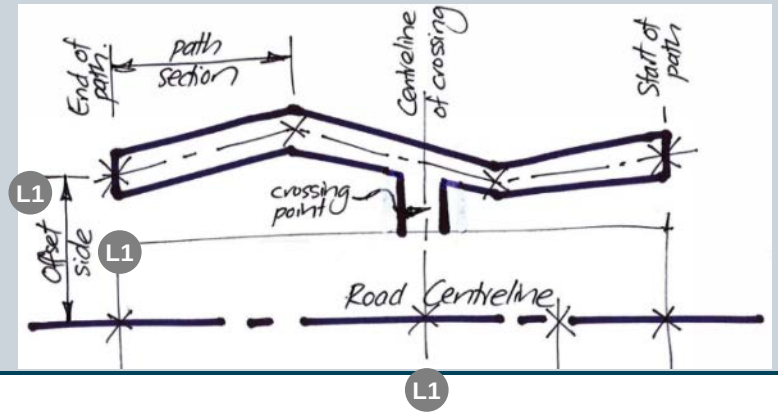
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left / right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.34: Pathways - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.13.1	Local name	path_name	Local name of the pathway		A	100				L	1		
8.3.13.2	BaseDepth	path_b_dep	Depth of the base course material in millimetres (mm)	100	I	3		mm		D	1		
8.3.13.3	BaseType	path_b_typ	Type of the base course material		A	100			Code List 9.26	D	1		
8.3.13.4	Depth Crossing	path_c_dep	Depth of surface material (concrete) for the crossing in millimetres	150	I	3				D	1		
8.3.13.5	Depth Pathway	path_dep	Depth of the pathway seal in millimetres	100	I	3				D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.13.6	Number of steps	path_steps	Number of steps within the section		I	3				D	1		
8.3.13.7	Rail type	path_r_typ	Rail type associated with steps	Top rail with wire rope	A	30				D	1		
8.3.13.8	Pathway is reinforced	path_reo	The Pathway is reinforced	Y - Yes	B	1			Y or N	D	1		
8.3.13.9	Sub base depth	path_s_dep	Depth of the sub-base course material in millimetres (mm)		I	3		mm		D	1		
8.3.13.10	Sub base type	path_s_typ	Type of the sub-base course material. As per VicRoads Standard Specification		A	100			Code List 9.26	D	1		
8.3.13.11	Width	path_wid	If the segment is a set of stairs with irregular width, an average width is to be included.		DC	3	2	m		D	1		
8.3.13.12	Obstruction type	path_obst	Obstruction type that will impede the pathway	Locked gate	A	250				D	2		
8.3.13.13	Rail material	path_r_mat	Material of rail associated with steps.	Wood	A	30				D	2		
8.3.13.14	Crossing Material	cross_mat	The material the asset is constructed of	CONC - Concrete	A	30			Code List 9.26	D	3		
8.3.13.15	Crossing Type	cross_type	Identifies the type of pathway crossing	Bevelled	A	30				D	3		
8.3.13.16	Crossing width	cross_wdth	Width of the crossing in metres		DC	3	2	m		D	3		
8.3.13.17	Length pathway	path_len	Length of the pathway in metres		DC	4	2	m		D	3		
8.3.13.18	Material Pathway	path_mat	Pathway material	CONC - Concrete	A	100			Code List 9.26	D	3		
8.3.13.19	Pathway type	path_typ	Pathway Type	Beach Access	A	100			Code List 9.28	D	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.13.20	Treatment	path_treat	Treatment of the pathway	Resurfacing	A	100			Code List 9.60	P	2		
8.3.13.21	Instruction	path_instr	Instructions for getting round an obstruction such as a locked gate or barrier on a pathway	The contact details of the person with a gate key	AN	250				I	3		

8.3.14 Pavement

The portion of a road (typically granular layers) placed above the design subgrade level for the support of vehicular traffic, and upon which the pavement surface (wearing course) is applied.

Table 8.35: Pavement - Location References

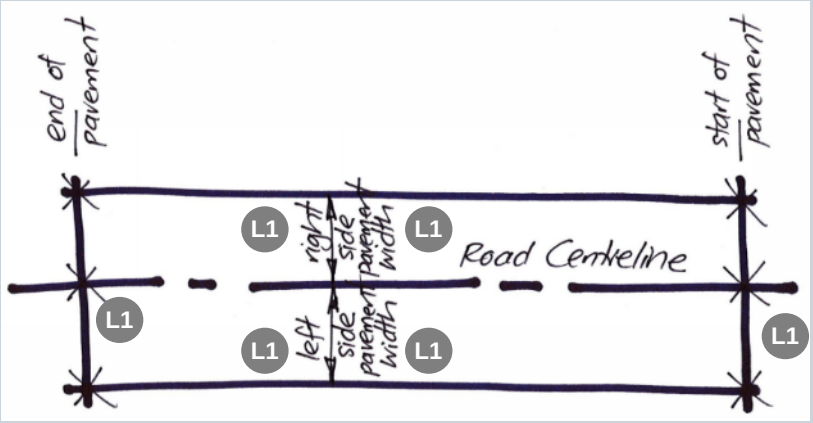
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of pavement	Linear distance along road centreline / spatial	
	End of pavement	Linear distance along road centreline / spatial	
	Pavement width (left)	Measurement of pavement width on left side of road centreline	
	Pavement width (right)	Measurement of pavement width on right side of road centreline	
L2	Road ID	The unique road identifier	
	Polygon (pavement perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (pavement perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.36: Pavement - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
General													
8.3.14.1	Lateral width left	p_wid_l	Lateral distance measured from the road centreline to the left side of the formed pavement. Side is determined by the direction of increasing distance along the link		DC	5	2	m		L	1		
8.3.14.2	Lateral width right	p_wid_r	Lateral distance measured from the road centreline to the right side of the formed pavement. Side is determined by the direction of increasing distance along the link		DC	5	2	m		L	1		
8.3.14.3	Chainage at start of street segment	road_from	Chainage at start of street segment. 'SLK_from' is for WA members and 'Road_from' is for other jurisdictions. This is to be the starting chainage of the centreline. Chainage is to correspond with the pavement length		I	6		m		L	1		M
8.3.14.4	Chainage at end of street segment	road_to	Chainage at end of street segment. 'SLK_to' is for WA members and 'Road_to' is for other jurisdictions. The finishing chainage of the centreline.		I	6				L	1		M
8.3.14.5	Centreline segment length	seg_cl_len	Centreline segment length between chainages in metres		DC	4	2	m		D	1		
8.3.14.6	Material Source	mat_source	The originating source of the material	Quarry	A	50				D	2		
8.3.14.7	Material Source Name	mat_s_name	The name of the originating source of the material	Winstones	A	50				D	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.14.8	Recycled Percentage	p_recy_per	The percentage of recycled material used in the pavement construction	15	I	3		%		D	2		
8.3.14.9	Recylced Material	p_recy_mat	The name of the recycled material used in the pavement construction	Winstones	A	50				D	2		
8.3.14.10	Design ESA	design_esa	Design equivalent standard axles used in the pavement design, in millions (1x106)	1.5	DC	2	1	MESA		P	2		
8.3.14.11	Load Limit	p_axle_max	Maximim axle load in tonnes.	1.5	DC	2	1	tonne		P	2		
Pavement Layers													
8.3.14.12	Layer depth	p_lay_dep	Depth of material for the layer		I	3		mm		D	1		
8.3.14.13	Layer material	p_lay_mat	Type of material for the layer		A	100			Code List 9.26	D	1		
8.3.14.14	Layer number	p_lay_no	The order of the pavement layers from top (layer 1) to bottom. The layer number has the youngest layer at top (top layer), with the oldest at the bottom		A	2				D	1		
8.3.14.15	Layer Stabilising agent	p_lay_stab	Stabilizing agent used in the layer		A	30				D	1		
8.3.14.16	Stabilising agent percent	p_stab_pct	Stabilizing agent percentage in the layer		I	2				D	1		
8.3.14.17	Layer type	p_lay_typ	The type of layer the information relates to. This can be either the subgrade or a pavement layer		A	1			S - Subgrade L - Pavement layer	D	1		
8.3.14.18	Layer width	p_lay_wid	Width of material for the layer excluding the feather edge. Generally this is the width of pavement underneath the surfacing		DC	5	2	m		D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.14.19	layer CBR	p_lay_cbr	Californian Bearing Ratio (CBR) for the natural ground and granular (non-modified) layer		DC	5	2			P	2		
8.3.14.20	layer UCS	p_lay_ucs	Unconfined compressive strength (UCS) for a modified granular or bound layer, including subgrades		DC	3	2	Mpa		P	2		

8.3.15 Pavement Surfacing

The part of the pavement upon which the traffic travels, that is specifically designed to resist abrasion from traffic and to minimise the entry of water.

Table 8.37: Surfacing - Location References

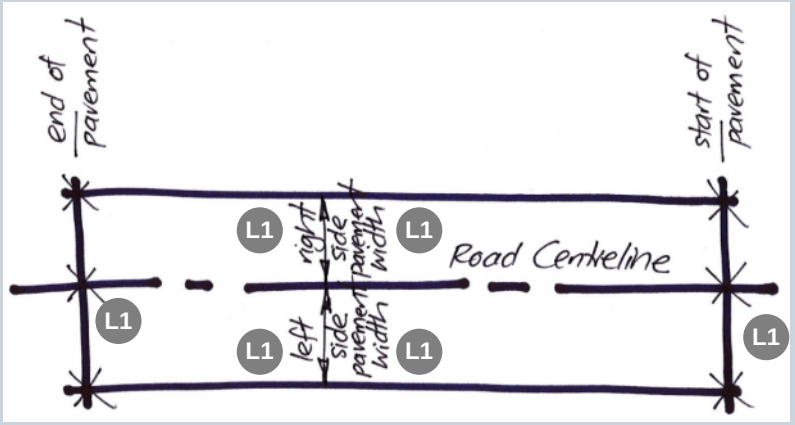
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of pavement surfacing	Linear distance along road centreline / spatial	
	End of pavement surfacing	Linear distance along road centreline / spatial	
	Pavement surfacing width (left	Measurement of pavement surfacing width on left side of road centreline	
	Pavement surfacing width (right)	Measurement of pavement surfacing width on right side of road centreline	
L2	Road ID	The unique road identifier	
	Polygon (pavement surfacing perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (pavement surfacing perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.38: Pavement Surfacing - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
General													
8.3.15.1	Lateral width left	s_wid_l	Lateral distance measured from the road centreline to the left side of the pavement surfacing. Side is determined by the direction of increasing distance along the link		DC	5	2	m		L	1		
8.3.15.2	Lateral width right	s_wid_r	Lateral distance measured from the road centreline to the right side of the formed pavement. Side is determined by the direction of increasing distance along the link		DC	5	2	m		L	1		
8.3.15.3	Length of seal	seal_len	The length of seal for the layer		I	5		m		D	1		
8.3.15.4	Width of seal	seal_wid	Width of the seal layer. The seal width is only required for a partial width seal, and will have an offset from the centreline		DC	6	2			D	1		
8.3.15.5	Road surface status	psurf_stat	The status of the current surfacing type.	S, U	A	1				D	1		NM
8.3.15.6	Year of current surface installation	seal_year	The calendar year of the most recent surfacing.		I	2		Yr		D	1		M
8.3.15.7	Design life	s_life_des	Design life length in years for the surface	10	I	2		Yr		P	2		
8.3.15.8	Seal specification	seal_spec	The specification covering the way the contract is managed and warranted	P17	AN	30			P17 P4	I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Surrfacing Detail													
8.3.15.9	Smallest chip size	chip_small	The smallest chip size for a two chip seal	Two Chip 3,5 seal, the smallest chip size is 5	I	2				D	1		
8.3.15.10	Largest Chip	chip_large	The largest chip size for a two chip seal	Two Chip 3,5 seal, the largest chip size is 3	I	2				D	1		
8.3.15.11	Depth of the seal	s_dep	The depth of the seal in millimetres. This is used for non-chip seal surfaces that have a depth such as slurry, concrete, and asphaltic concrete. Chip seals have a depth of 0		I	3				D	1		
8.3.15.12	Seal layer function	s_func	Function of the seal layer	M - Membrane	A	30			Code List 9.59	D	1		
8.3.15.13	Surfacing material type	s_mat	A description of the material type of the surfacing layer		A	30				D	1		M
8.3.15.14	The surface layer number	s_lay_no	The surface layer number.		A	1			1 to 99	D	1		
8.3.15.15	Polished Stone Value of Chip for the seal layer	psv	Polished Stone Value of Chip for the seal layer		I	2			50 to 65	P	2		
8.3.15.16	Additive quantity	s_add_quan	Additive Quantity used in the seal (pph)		I	3			0 to 100	I	3		
8.3.15.17	Type of additive	s_add_typ	Type of additive used in the seal		A	4			Code List 9.56	I	3		
8.3.15.18	Adhesion agent quantity	s_adh_quan	Quantity of Adhesion agent used in the seal (pph)	5	I	3		%	0 to 100	I	3		
8.3.15.19	Adhesion agent	s_add_typ	Adhesion agent used in the seal		A	30			Code List 9.57	I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.15.20	Average Least Dimension	s_ald	Average Least Dimension of the chip		DC	4	2	mm	0 to 20	I	3		
8.3.15.21	Binder application rate	s_bind_rat	Binder application rate of the seal (litres per square metre)	2.3	DC	6	2			I	3		
8.3.15.22	Binder type	s_bind_typ	Binder type of used in the seal		A	30			Code List 9.58	I	3		
8.3.15.23	Cutter Quantity	s_cut	Cutter Quantity used in the seal (pph)		I	2		%	0 to 20	I	3		
8.3.15.24	Cutter type	s_cut_typ	Cutter type used in the seal		A	30				I	3		
8.3.15.25	Elastic recovery	s_elas_rec	Elastic recovery of the polymer modified seal. This information has to be obtained from the polymer modified asphalt cement provider as it is specific to the mix. Applicable to polymer modified mixes only. This is different to torsional recovery and should not be confused. Specified as a percent	15	I	3		%	0 to100	I	3		
8.3.15.26	Quantity of flux	s_flux	Quantity of flux used in the seal (pph)		I	3			0 to 10	I	3		
8.3.15.27	Polymer percentage	s_poly	Polymer percentage in the seal layer		I	3			0 to 50	I	3		
8.3.15.28	Polymer type	s_ply_typ	Polymer type in the seal layer		AN	100				I	3		
8.3.15.29	Percentage of recycle material	s_recy_mat	Percentage of recycle material in the seal layer		I	3			0 to 100	I	3		
8.3.15.30	Recycled component	s_recy	Recycled component in the seal layer		A	10			Code List 9.26	I	3		
8.3.15.31	Binder softening point	s_bind_sp	Softening point of the binder used in seal layer (degrees Celsius)		I	3				I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.15.32	Quarry source	s_source	The name of the Quarry the aggregate used for chip sealing or asphalt mix was sourced from		A	30				I	3		

8.3.16 Pits

Includes assets referred to as catch pit, sumps and Manhole chambers. Catch pits/ sumps are a concrete pit at the end of a water channel used to settle out solids before the water flow enters a pipe drain. A hole or depression into which water is drained.

Table 8.39: Pits - Location References

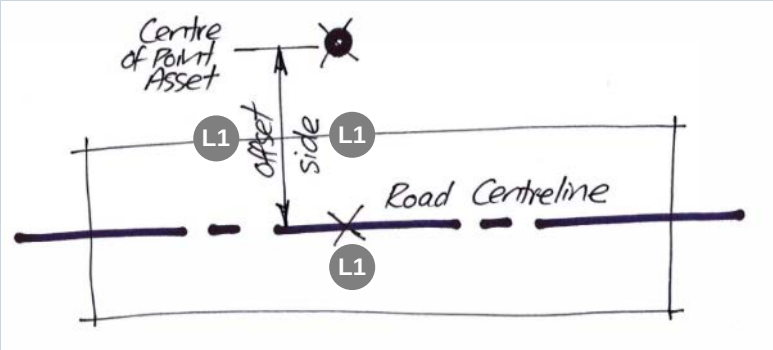
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.40: Pits - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.16.1	X Coordinate	pit_x	X Coordinate locator point in metres. Will be used in the check of pipe endpoints compared to pit locator points		DC	9	2			L	2		
8.3.16.2	Y Coordinate	pit_y	Y Coordinate locator point in metres. Will be used in the check of pipe endpoints compared to pit locator points		DC	9	2			L	2		
8.3.16.3	Diameter width	pit_dia	Side width of pit or diameter if circular	600	I	4		mm		D	1		
8.3.16.4	Length	pit_len	Side length of pit if not circular	900	I	3		m		D	1		
8.3.16.5	Lid Type	pit_li_typ	Pit lid type	Grate	A	40			Code List 9.33	D	1		
8.3.16.6	Pit number	pit_no	Unique number in this Subdivision or Project Stage	39A	AN	15				D	1		
8.3.16.7	Type	pit_typ	Type of pit	Twin	A	100				D	1		
8.3.16.8	Litter trap type	pit_trap	Type of litter trap	Sand Trap	A	20			Code List 9.34	D	2		
8.3.16.9	Depth	pit_dep	Natural or Finished Surface level to invert of outlet pipe in metres	1.27	DC	3	2			D	3		
8.3.16.10	Fence present	pit_fence	Existence of a fence around the asset	Y - Yes	B	1			Y or N	D	3		
8.3.16.11	Finished surface level	pit_level	Cover Level Metres - Finished Surface Level (FSL) of pit		DC	7	2			D	3		
8.3.16.12	Number of step irons	pit_steps	Number of step irons. If no step irons enter “0”	4	I	2				D	3		
8.3.16.13	Construction Type	pit_st_typ	Construction Type	Insitu	A	6			Code List 9.32	I	3		

8.3.17 Poles

These are poles onto which other assets are connected such as traffic signal, street lights, CCTV cameras etc.

Table 8.41: Poles - Location References

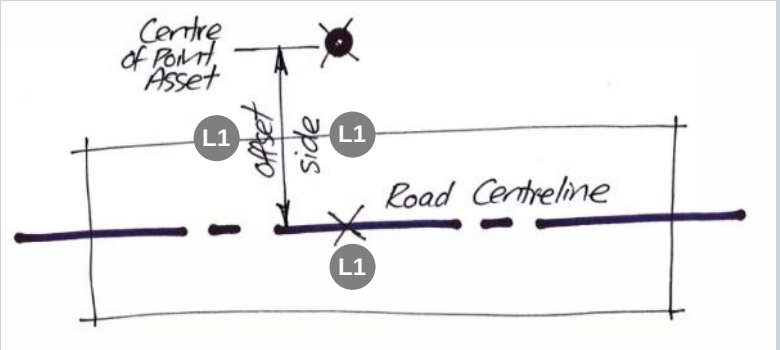
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.42: Poles - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.17.1	Pole height	pole_hei	Pole height from the ground surface	7.6	DC	4	2	m		D	1		
8.3.17.2	Pole Material	pole_mat	Pole Material type	CONC - Concrete	A	10			Code List 9.26	D	1		
8.3.17.3	Pole type	pole_typ	Pole type		A	30				D	1		
8.3.17.4	Pole earth method	pole_earth	Method used to earth the pole		A	30				D	2		
8.3.17.5	Foundation material	pofoun_mat	Foundation material of the pole	CONC - Concrete	A	100				D	2		
8.3.17.6	Foundation type	pole_found	Foundation type of the pole		A	30				D	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.17.7	Pole controller	pole_cntrl	Pole controller type	Time	A	30				D	2		
8.3.17.8	Pole finish	pole_finsh	Pole finish	Powder Coated	A	30				D	2		
8.3.17.9	Pole attachments present	pole_attac	Pole attachments are present	Y - Yes	B	1			Y or N	I	3		
8.3.17.10	Pole Manufacturer	pole_manuf	Pole manufacturer.	Jones Manufacturing	A	100				I	3		
8.3.17.11	Pole model number	pole_model	Pole model number.	J1234	AN	20				I	3		
8.3.17.12	Design Standard	pole_stand	Design Standard for the pole		A	30				I	3		

8.3.18 Public Art

Public art or memorials that require maintenance and form part of the asset register.

Table 8.43: Public Art - Location References

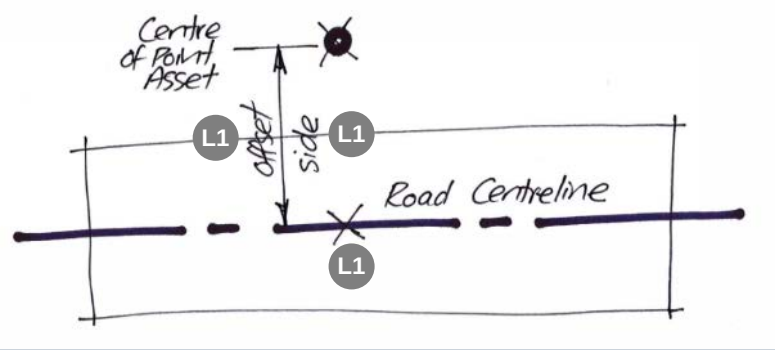
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left / right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.44: Public Art - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.18.1	Description of Artwork	art_desc	Description of Artwork.	Statue of Child	A	100				D	1		
8.3.18.2	Artwork material	art_mat	Artwork material.	Brass	A	100			Code List 9.26	D	1		
8.3.18.3	Type	art_type	Type of artwork or memorial	Statue, Memorial	A	100				D	1		
8.3.18.4	Plaque description	plaque_des	Plaque description on the art work or memorial		AN	250				D	3		
8.3.18.5	Engineering report author	art_en_rep	Who undertook the Engineering Report. This field ONLY needs to be populated in the event that structural works are required for safety. If more notes required enter in the “Comments” field	Council engineer	AN	50				P	2		
8.3.18.6	Who undertook the Safety or Risk Assessment.	risk_asses	Who undertook the Safety or Risk Assessment. This field ONLY needs to be populated if a risk assessment is done. If more notes required enter in the “Comments” field	Contractor	AN	50				P	2		
8.3.18.7	Construction Cost or Value for Insurance Purposes in Australian/New Zealand Dollars	value	Construction Cost or Value for Insurance Purposes in Australian/New Zealand Dollars. Currency is to be relevant to the jurisdiction.	1000000	Mo	10	2	$		P	2		
8.3.18.8	Artist Name only.	artist	Artist Name only	Peter Graham	A	100				I	3		
8.3.18.9	Donated by	donated_by	Who donated the public art feature. This could be a seat, sculpture, painting etc.	Generous Foundation	A	100				I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.18.10	Electrical Certification (where artwork is electrical or has lighting)	elec_cert	Electrical Certification (where artwork is electrical or has lighting). ONLY needs to be populated in the event that the Artwork is electrical or lighting is required. A certificate is required after working on an electrical installation and connecting it to a source of electricity by the person for whom the work was done.		AN	50				I	3		

8.3.19 Public Toilets

Public toilet or ablution blocks that contain toilets, and /or changing and washing facilities.

Table 8.45: Public Toilets - Location References

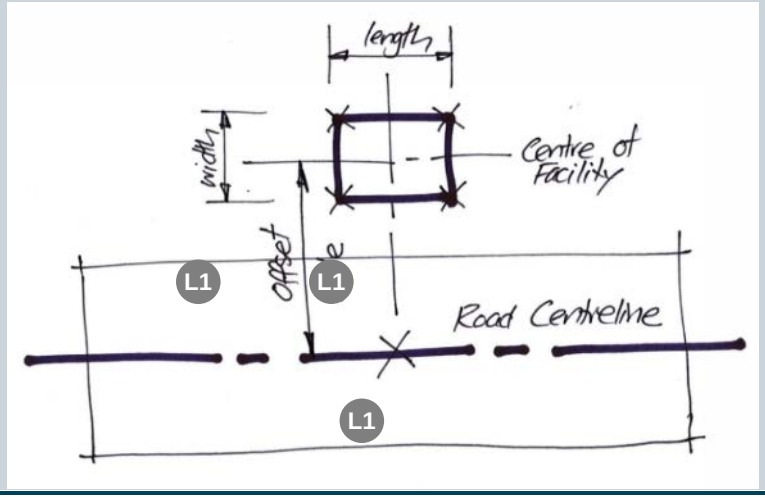
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centre of facility	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and the facility	
L2	Road ID	The unique road identifier	
	Polygon (Toilet block perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (Toilet block perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.46: Public Toilets - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.19.1	Changing facilities present	wc_change	If the Public Toilet contains changing facilities	Y - Yes	B	1			Y or N	D	2		
8.3.19.2	Floor material	wc_flo_mat	Floor material	Tiles, Concrete	A	100				D	2		
8.3.19.3	Number of female showers	wc_fem_shw	Number of Female Shower Facilities	2	I	2				D	2		
8.3.19.4	Number of male showers	wc_mal_shw	Number of Male Shower Facilities	2	I	2				D	2		
8.3.19.5	Number of unisex showers	wc_uni_shw	Number of Unisex Shower Facilities	2	I	2				D	2		
8.3.19.6	Roof material	wc_roo_mat	Toilet Roof Material	Steel and Fibreglass	A	100			Code List 9.26	D	2		
8.3.19.7	Toilet wall material	wc_wal_mat	Toilet Wall Material	Brick	A	100			Code List 9.26	D	2		
8.3.19.8	Number of benches	wc_bench	Number of Benches	1	I	2				D	3		
8.3.19.9	Number of baby change fixtures	wc_baby	Number of Baby Change Fixtures		I	2				D	3		
8.3.19.10	Number of female disabled WC fixtures	wc_fem_dis	Number of Female Disabled WC Fixtures	2	I	2				D	3		
8.3.19.11	Number of female WC fixtures	wc_fem	Number of Female WC Fixtures	2	I	2				D	3		
8.3.19.12	Number of unisex WC fixtures	wc_uni	Number of Unisex WC Fixtures	2	I	2				D	3		
8.3.19.13	Number unisex disabled WC fixtures	wc_uni_dis	Number of Unisex Disabled WC Fixtures	2	I	2				D	3		
8.3.19.14	Number of male disabled WC fixtures	wc_mal_dis	Number of Male Disabled WC Fixtures	2	I	2				D	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.19.15	Number of male urinal fixtures	wc_mal_uri	Number of Male Urinal Fixtures	4	I	2				D	3		
8.3.19.16	Number of male WC fixtures	wc_mal_fix	Number of Male WC Fixtures	2	I	2				D	3		
8.3.19.17	Sharp disposal present	wc_sharps	If the Public Toilet contains Sharp Disposal Facilities	Y - Yes	B	1			Y or N	D	3		
8.3.19.18	Waste water disposal	wc_waste	The waste water disposal method	Town Sewer or Septic Tank	A	20				D	3		
8.3.19.19	Toilet partition material	wc_par_mat	Toilet Partition Material	Wood	A	20			Code List 9.26	I	3		

8.3.20 Retaining Walls

A wall constructed to resist lateral pressure from the adjoining ground or to maintain in position a mass of earth. These can be for pavement, pathways, natural/cut slope protection, fore shore protection and around bridge abutments.

Table 8.47: Retaining Walls - Location References

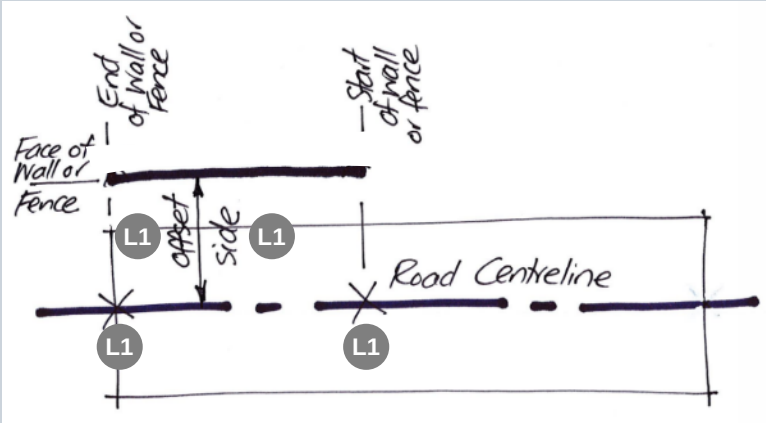
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of wall section	Linear distance along road centreline / spatial	
	End of wall section	Linear distance along road centreline / spatial	
	Side	Either left / right of the road centreline	
	Start of wall offset	Dimension between the road centreline and face of wall	
	End of wall offset measurement	Dimension between the road centreline and face of wall	
L2	Road ID	The unique road identifier	
	Polyline (face of wall)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (face of wall)	Polyline geometric data (X,Y,Z)	

Table 8.48: Retaining Walls - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.20.1	Lateral offset face	rw_offset	Lateral offset in metres from the road centreline to the asset face, at the asset start point, from the increasing direction of travel		DC	3	1	m		L	1		
8.3.20.2	Length of retaining wall	rw_len	Length of the retaining wall		DC	4	2	m		D	1		
8.3.20.3	Restraining mechanism of the asset	rw_restrai	Restraining mechanism of the asset	Gravity	A	30			Code List 9.41	D	1		
8.3.20.4	Structure type	struc_typ	Structure type	Gabion Basket, Sea Wall	A	30			Code List 9.42	D	1		
8.3.20.5	Average height	avg_hei	Average height of the asset in metres (m)	5.3	DC	3	1	m		D	2		
8.3.20.6	Drainage mechanism	drainage	Drainage mechanism	P - Porous	A	30			Code List 9.14	D	2		
8.3.20.7	Face area of wall	rw_fac_are	Face area of the wall in square metres (m2)	25.16	DC	6	2	sq.m		D	2		
8.3.20.8	Face material	rw_fac_mat	Wall face material	Brick	A	30			Code List 9.26	D	2		
8.3.20.9	Foundation type	found_typ	Foundation type		A	30				D	2		
8.3.20.10	Wall post material	rw_pos_mat	Wall post material	CONC - Concrete	A	100				D	2		
8.3.20.11	Maximum height	rw_max_hei	Maximum height of the asset in metres (m)	5.3	DC	5	2	m		D	3		
8.3.20.12	Number of anchorage rows	rw_tie_row	Number of anchorage rows	10	I	3				D	3		
8.3.20.13	Anchoring system	rw_tie_sys	Anchoring system of the asset		A	30				D	3		
8.3.20.14	Maintained by organisation	maintained	Who maintains the asset	Wellington City Council	A	100				P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.20.15	Features above the wall	rw_above	Features above the wall	Bank	A	30			Code List 9.1	I	3		
8.3.20.16	Back tilt angle	rw_tilt	Back tilt angle measured from the vertical	10°	I	2				I	3		
8.3.20.17	Features below the wall	rw_below	Features below the wall	SEA	A	30			Code List 9.1	I	3		
8.3.20.18	Face thickness	rw_fac_thi	Face thickness of the wall in millimetres (mm)	150	I	4		mm		I	3		

8.3.21 Road Barriers

Provides protection from errant vehicles/ road users for safety purposes. They are designed to allow for vehicles to be deflected to safety from a hazard. They are used to separate opposing traffic flows, and also as protection from hazards.

Table 8.49: Road Barriers - Location References

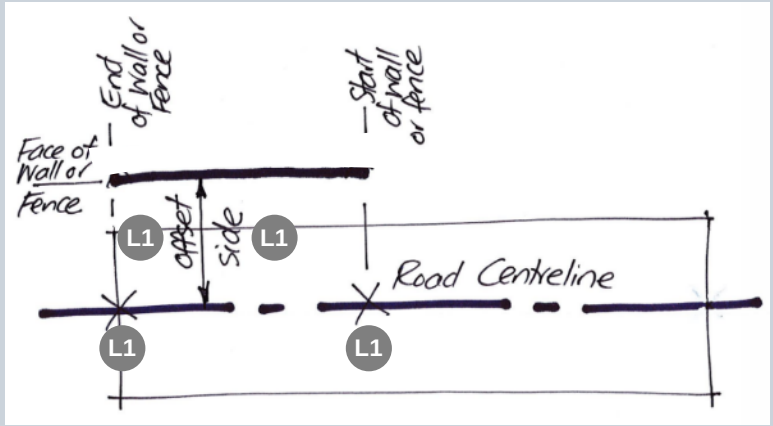
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of barrier section	Linear distance along road centreline / spatial	
	End of barrier section	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Start of barrier offset measurement	Dimension between the road centreline and face of barrier	
	End of barrier offset measurement	Dimension between the road centreline and face of barrier	
L2	Road ID	The unique road identifier	
	Polyline (face of barrier)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (face of barrier)	Polyline geometric data (X,Y,Z)	

Table 8.50: Road Barriers - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.21.1	Lateral offset face	rb_offset	Lateral offset in metres from the road centreline to the asset face, at the asset start point, from the increasing direction of travel		DC	3	1	m		L	1		
8.3.21.2	Length of barrier	rb_len	Length of the road barrier in metres	125.68	DC	5	2	m		D	1		
8.3.21.3	Material barrier rail.	rb_rai_mat	Material of the road barrier rail	Steel	A	100			Code List 9.26	D	1		
8.3.21.4	Road barrier type	rb_typ	Road barrier type	Noise Attenuation	A	100			Code List 9.43	D	1		
8.3.21.5	Height of barrier	rb_hei	Height of the road barrier measured from the ground surface	650	I	4		mm		D	2		
8.3.21.6	Material barrier posts	rb_pos_mat	Material of barrier posts	Wood	A	100			Code List 9.26	D	2		
8.3.21.7	Attachments on the barrier	rb_attach	Attachments on the barrier	reflectorised discs	A	30				D	2		
8.3.21.8	Rail width	rb_wid	Rail width	200	I	4		mm		D	2		
8.3.21.9	Barrier end style	rb_styl_e	End style of the barrier		A	30				D	3		
8.3.21.10	Barrier End style	rb_end_typ	End style type of the barrier		A	30				D	3		
8.3.21.11	Ground fixed method	rb_grn_fix	How the barrier is fixed to the ground		A	30				D	3		
8.3.21.12	Barrier number of posts	rb_posts	Number of posts in the barrier	10	I	2				D	3		
8.3.21.13	Barrier start style	rb_styl_s	Start style of the barrier		A	30				D	3		
8.3.21.14	Barrier start type	rb_typ_s	Start type of the barrier		A	30				D	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.21.15	Coating system	coat_sys	Coating system		A	30				I	2		
8.3.21.16	Model number	rb_mod_no	Model number of the barrier		AN	30				I	3		
8.3.21.17	Paint colour	paint_colo	Paint colour of the barrier		A	30				I	2		

8.3.22 Shelters

A structure that provides weather protection to various road users. It can include cycle, bus and pedestrian shelters.

Table 8.51: Shelters - Location References

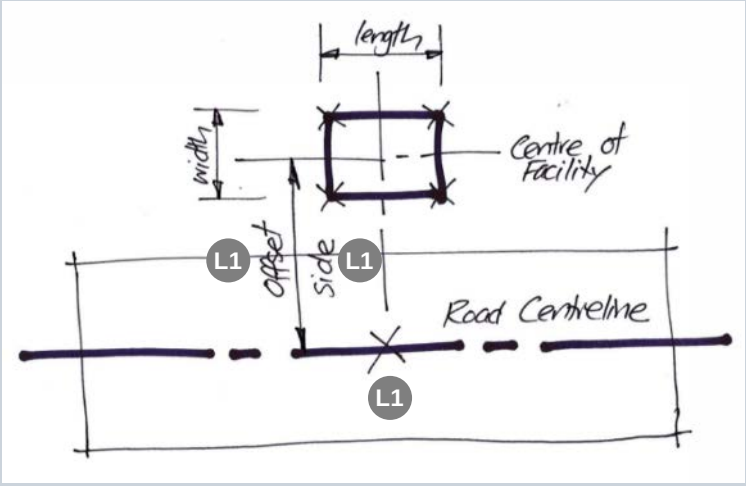
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centre of facility	Linear distance along the road centreline	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and the facility	
L2	Road ID	The unique road identifier	
	Polygon (Shelter perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (Shelter perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.52: Shelters - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.22.1	Shelter type	sh_typ	Shelter type.	Pedestrian, Bus, Tram etc.	A	100			Code List 9.46	D	1		
8.3.22.2	Disabled access available	sh_dis_acc	Disabled access availability.	Y - Yes	B	1			Y or N	D	2		
8.3.22.3	Floor material	sh_flr_mat	Floor material		A	100			Code List 9.26	D	2		
8.3.22.4	Roof material	sh_roo_mat	Roof material		A	100			Code List 9.26	D	2		
8.3.22.5	Wall material	sh_wal_mat	Wall material		A	100			Code List 9.26	D	2		
8.3.22.6	Seating material	seat_mat	Seating material in the bus shelter.	Plastic	A	100			Code List 9.26	D	3		
8.3.22.7	Advertising on shelter	advert	If there is any advertising displayed on the shelter.	Y - Yes	B	1			Y or N	I	3		
8.3.22.8	Shelter manufacturer	sh_manuf	Shelter manufacturer		A	100				I	3		
8.3.22.9	Model number of shelter	sh_model	Model number of Shelter		AN	20				I	3		

8.3.23 Signs

Typically, traffic signs that can be a board, plate, screen or other device displaying words, figures, symbols or anything else to regulate, direct, or warn road users. They may or may not be illuminated.

Table 8.53: Signs - Location References

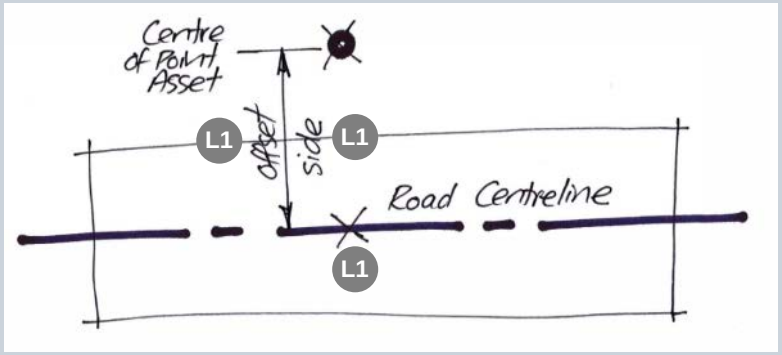
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.54: Signs - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.23.1	Sign Type	sign_typ	Sign type. Refer to Australian Standards or MOTSAM (NZ)		A	100				D	1		
8.3.23.2	Ground height	sign_hei	Height from ground to bottom of the sign panel		DC	3	1	m		D	2		
8.3.23.3	Sign height	sign_hei	Total height of the sign	1200	I	4		mm		D	2		
8.3.23.4	Number of posts	sign_posts	Number of sign posts	2	I	2				D	2		
8.3.23.5	Post Material	sign_p_mat	Material of the sign post	Wood	A	100				D	2		
8.3.23.6	Width of sign	sign_wid	Total width of the sign	500	I	4		mm		D	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.23.7	Frame material	sign_frame	Sign frame material		A	30				D	3		
8.3.23.8	Number of sign panels	sign_panel	Number of panels in the sign	4	I	2				D	3		
8.3.23.9	Strengthening bar present	sign_stren	Whether there's a strengthening bar	Y - Yes	B	1			Y or N	D	3		
8.3.23.10	Background colour	sign_bcol	Background colour		A	30				I	2		
8.3.23.11	Background material	sign_b_mat	Background material		A	30				I	2		
8.3.23.12	Wording on sign	sign_words	Wording on the sign or if there are no words, a description of the sign		A	250				I	1		
8.3.23.13	Legend colour	sign_wordc	Legend colour		A	30				I	2		
8.3.23.14	Legend material	sign_wordm	Legend material		A	30				I	2		
8.3.23.15	Sign manufacturer	sign_manuf	Sign manufacturer		A	100				I	3		
8.3.23.16	Sign angle	sign_angle	Orientation of the sign. Angle from North, clockwise to the bracket (its bearing).	225	I	3		Degrees		I	2		
8.3.23.17	Panel material	sign_mat	Material of the sign panel	Aluminium	A	100				I	1		
8.3.23.18	Australian Standard Reference	sign_refsd	Australian Standard Reference		AN	100				I	3		
8.3.23.19	Local Sign Reference Number	sign_refno	Standard Local Sign Reference Number.		AN	100				I	3		
8.3.23.20	Support type	sign_supp	Support type of the sign	On a post	A	100				I	2		

8.3.24 Slopes

Slope assets include the natural and mechanical treatment to either stabilise slopes or to control the degradation of slopes.

Table 8.55: Slopes - Areas - Location References

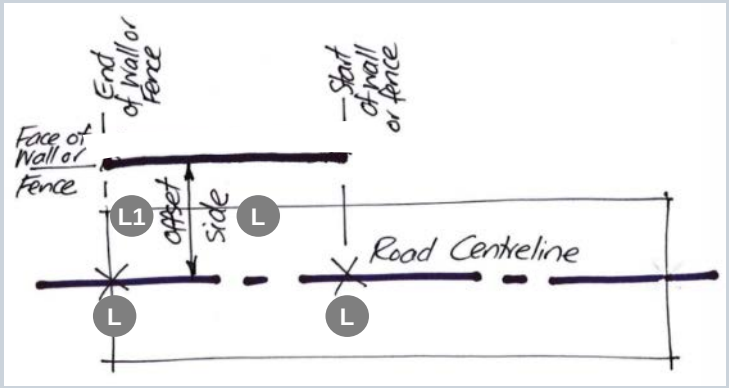
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centre of slope	Linear distance along the road centreline	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and the slope	
L2	Road ID	The unique road identifier	
	Polygon (slope perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (slope perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.56: Slopes - Mechanical Devices - Location References

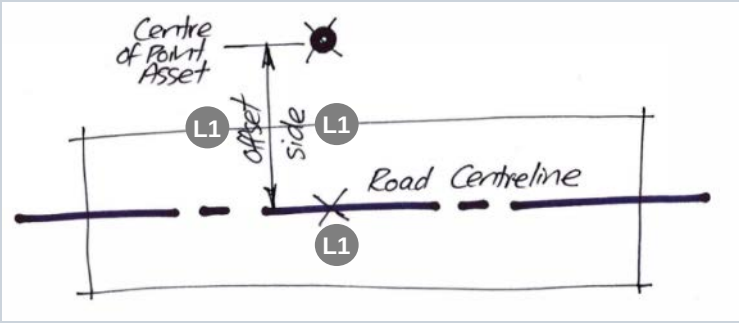
Soph	Location Data	General Guidance	Diagram
L1	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
	Height measurement	The slope dimension between the base of the slop and the restraint asset	
L2	Point (asset centre point)	Point geometric data (X,Y)	
L3	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.57: Slopes - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.24.1	Area of slope face	slope_area	The area obtained from plans, or accurately measured on site		I	6		sq.m		D	1		
8.3.24.2	Slope in cut or fill	slope_typ	Whether the slope was created by a cutting (above road slope) or filling activity (embankment below or above road slope)	Cut or Fill	A	1			C - Cut F- Fill	D	1		
8.3.24.3	Gradient of batter slope	slope_grad	Expressed as the rise (change in height from the ground to the top of the slope) over the run (the horizontal ground distance from the toe of the slope to where the rise is measured from), expressed as a percentage		A	3		%		D	1		
8.3.24.4	Slope length	slope_len	This is the actual length of the slope measured from the start point to the end point	1020.25	I	5		m		D	1		
8.3.24.5	Average height	slope_hei	This is a weighted average height calculated from [area] / [length], where area is known		DC	3	1	m		D	1		
8.3.24.6	Planting exists	slope_plan	Planting exists to stabilise the slope	N - No	B	1			Y or N	D	1		
8.3.24.7	Slope is reinforced	slope_rein	The Bank is reinforced	N - No	B	1			Y or N	D	1		
8.3.24.8	Active or passive drainage	slope_drn	The type of drainage utilised. Active where the drainage is assisted by pumping or other means, or is passive by way of natural gravity	Active or Passive	A	1			A - Active P - Passive	D	2		
8.3.24.9	Vegetation type planted	veg_typ	Vegetation Type planted		A	30			Code List 9.55	D	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.24.10	Type of anchors	anchor_typ	Type of anchors used for the stabilising material if not vegetated		A	30			Code List 9.49	I	2		
8.3.24.11	Type of drainage liner	dr_liner	The type of drainage liner utilised	Impermeable	A	30			Code List 9.50	I	3		
8.3.24.12	Bank foundation material	found_mat	The foundation material of the Bank		A	30			Code List 9.52	I	2		
8.3.24.13	Geotextile Fabric used	geotextile	Geotextile Fabric used		A	30			Code List 9.51	I	2		
8.3.24.14	Geotechnical monitoring equipment	slope_mon	Geotechnical monitoring equipment used for slopes		A	50			Code List 9.53	I	2		
8.3.24.15	Slope seismic rating	slope_seis	The seismic rating for the slope		A	2			Code List 9.54	I	3		
8.3.24.16	Standpipe installed	standpipe	Has a standpipe been installed to monitor ground water levels	Y - Yes	B	1			Y or N	I	3		

8.3.25 Structures

Assets included under structures are sign gantries, and others that are not defined elsewhere. Bridges have their own asset group so are not included here.

Table 8.58: Structures - Location References

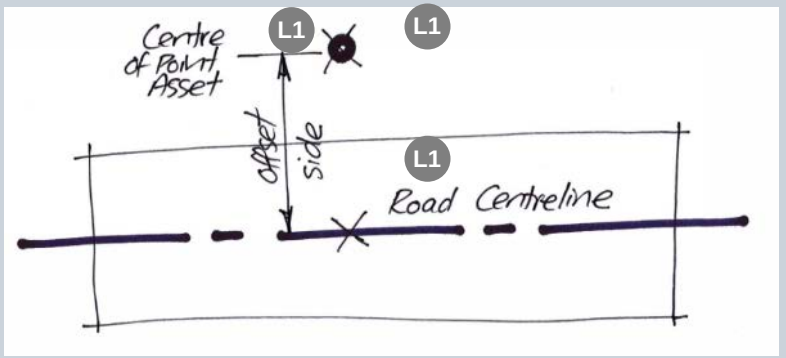
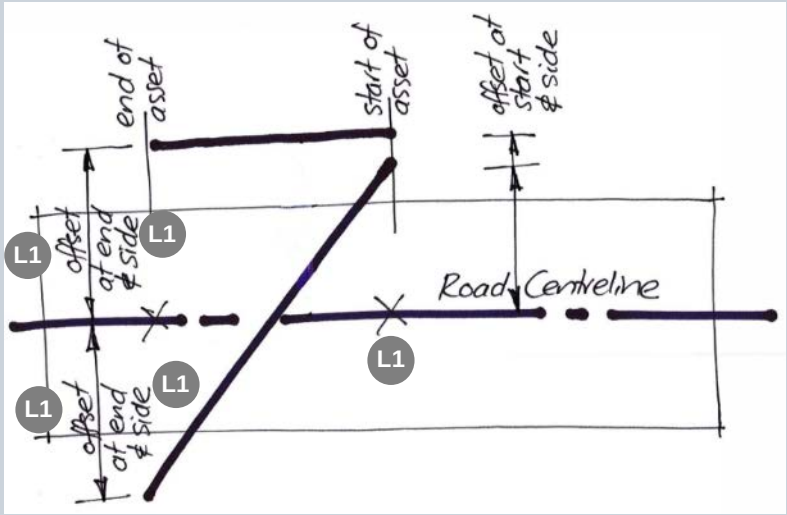
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of asset section	Linear distance along road centreline / spatial	
	End of asset section	Linear distance along road centreline / spatial	
	Start side	Either left or right of the road centreline	
	End side	Either left or right of the road centreline	
	Start offset measurement	Dimension between the road centreline and the asset centreline	
	End offset measurement	Dimension between the road centreline and the asset centreline	
L2	Road ID	The unique road identifier	
	Polyline (structure)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (structure)	Polyline geometric data (X,Y,Z)	

Table 8.59: Structures - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.25.1	Structure height	struc_hei	Structure height		DC	5	2	m		D	1		
8.3.25.2	Structure material	struc_mat	Material of the structure		A	100			Code List 9.26	D	1		
8.3.25.3	Structure type	struc_typ	Structure type	Cantilever	A	100				D	1		
8.3.25.4	Structure width	struc_wid	Structure width		DC	5	2	m		D	1		
8.3.25.5	Structure surface finish	struc_fin	Structure finish	Paint Finish	A	30				D	2		
8.3.25.6	Foundation material	found_mat	Foundation material		A	100				D	2		
8.3.25.7	Structure foundation type	struc_ftyp	Foundation type of the structure		A	30				D	2		
8.3.25.8	Structure number of supports	struct_sup	Number of supports on the structure		I	2				D	2		
8.3.25.9	Structure attachments	struc_att	Attachments on the structure	Sign, Light	A	30				I	3		
8.3.25.10	Structure manufacturer	struc_manu	Structure manufacturer		A	100				I	3		

8.3.26 Table Drains

A longitudinal drain, parallel to the road, which conveys surface water run-off from the road to outlet drains. It is an unsurfaced alternative to a kerb and channel system typically used in a residential street.

Table 8.60: Table Drains - Location References

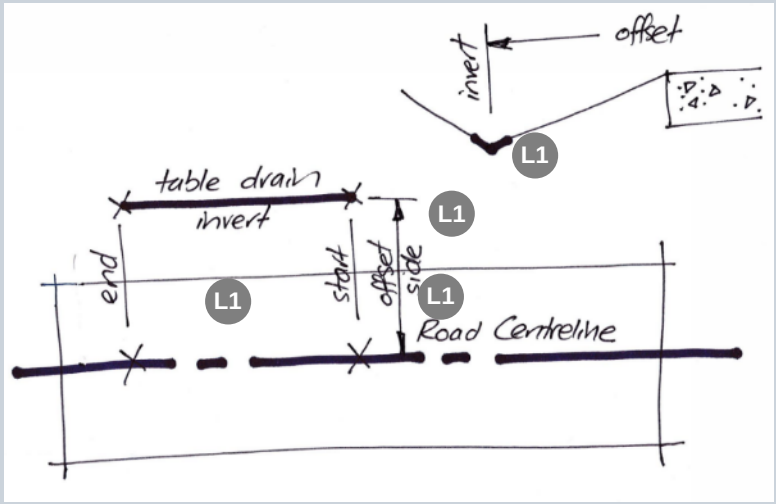
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of drain section	Linear distance along road centreline / spatial	
	End of drain section	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Start of drain offset measurement	Dimension between the road centreline and invert of drain	
	End of drain offset measurement	Dimension between the road centreline and invert of drain	
L2	Road ID	The unique road identifier	
	Polyline (invert of drain)	Polyline geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polyline (invert of drain)	Polyline geometric data (X,Y,Z)	

Table 8.61: Table Drains - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.26.1	Table drain length	drn_len	Length of the table drain in metres	30.25	DC	5	2	m		D	1		
8.3.26.2	Table drain depth	drn_dep	Average depth of the table drain in metres measured from ground level to invert of the drain	1.05	DC	3	1	m		D	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.26.3	Table drain material	drn_mat	The material the table drain is constructed of	Earth	A	100			Code List 9.26	D	2		
8.3.26.4	Table drain shape	drn_shape	The general shape of the table drain	V shaped, trapezoidal	A	100				D	2		
8.3.26.5	Table drain width	drn_wid	Average width of the table drain measured at ground level	2.25	DC	4	2	m		D	2		
8.3.26.6	Authority responsible for maintenance	drn_resp	The name of the responsible Authority for maintenance purposes.		A	100				I	3		

8.3.27 Tactile Paving

Tactile pavers used on approaches to pedestrian crossing point to aid visually impaired persons to a safe crossing point.

Table 8.62: Tactile Paving - Location References

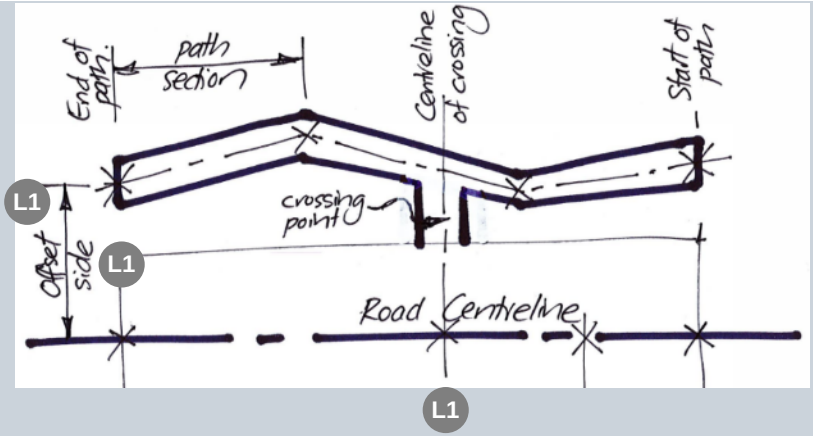
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.63: Tactile Paving - Data Items

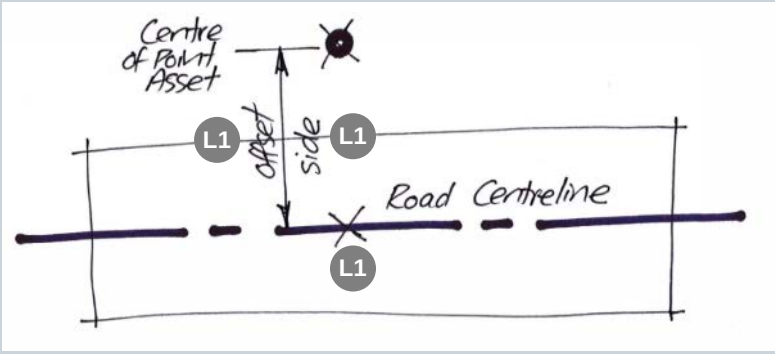
Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.27.1	Tactile paving type	pav_typ	The type of tactile paver that has been used	Tiles, Blocks	A	100			Code List 9.28	D	2		
8.3.27.2	Number of paving tiles	pav_tiles	The number of each tactile paver type present at the location	20	I	2				D	3		

8.3.28 Traffic Management Devices

Point Assets

Traffic management devices that manage and control and flow or speed or vehicles/ road users. It includes width restrictions, speed humps/ platforms, pedestrian crossings, roundabouts and splitter islands. A point asset is defined by a point and has not length (i.e. bollards).

Table 8.64: Traffic Management Devices (Point Assets) - Location References

Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Polygon Assets

Traffic management devices that manage and control and flow or speed or vehicles/ road users. It includes width restrictions, speed humps/ platforms, pedestrian crossings, roundabouts and splitter islands. A polygon asset has a defined shape and area such as an island.

Table 8.65: Traffic Management Devices (Polygon Assets) - Location References

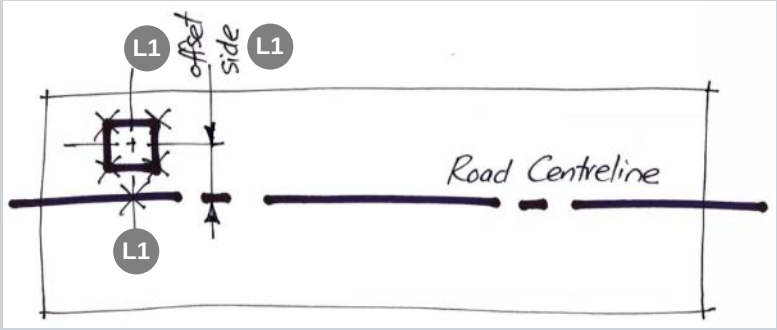
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of device	Linear distance along road centreline / spatial	
	End of device	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Device width	Measurement of width of device	
	Offset measurement	Dimension between the road centreline and device centreline	
L2	Road ID	The unique road identifier	
	Polygon (device perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (device perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.66: Traffic Management Devices - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Point													
8.3.28.1	Traffic Management Point Material	tm_mat	The material the traffic management point is constructed of	Steel	A	100			Code List 9.26	D	1		
8.3.28.2	Traffic Management Point Type	tm_p_typ	The type of point traffic management device	Bollard	A	100			Code List 9.62	D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.28.3	Company name only	tm_manuf	The manufacturing company for the point traffic management device	Lunds Pty Ltd	A	100				I	3		
8.3.28.4	Model number	tm_model	The model number for the point traffic management device	JK-011-S	AN	30				I	3		
Polygon													
8.3.28.5	Traffic management device material	tm_mat	Material of the feature. If the feature is a roundabout, include material of Annulus (external area of the roundabout) here.	Rubber	A	100			Code List 9.26	D	1		
8.3.28.6	Traffic management device type	tm_typ	Traffic Management device type.	RBT	A	100			Code List 9.62	D	1		
8.3.28.7	Diameter of roundabout	tm_is_dia	Diameter of the roundabout in metres	1.05	I	3		m		D	2		
8.3.28.8	Traffic Management device infill material	tm_in_mat	The material of the infill of the asset. This field is only to be completed if TYPE is a Roundabout or the asset has an infill	Grass	A	100				D	2		
8.3.28.9	Traffic management device kerb type	kerb_typ	The type of kerb		A	100			Code List 9.22	D	2		

8.3.29 Traffic Signals

Traffic signals includes all the components of the signal, but not the pole, as this is included in poles. Components include pedestrian call boxes, target boards, lanterns, controllers etc.

Table 8.67: Traffic Signals - Location References

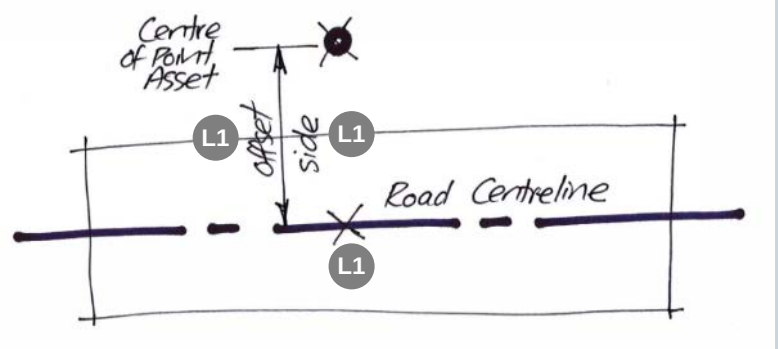
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.68: Traffic Signals - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.29.1	Signal pole number	ts_pole_id	The pole number assigned to the traffic signal pole in accordance with traffic signal design. Pole numbering goes clockwise around the intersection from the signal control box	AB1234	AN	30				L	1		
8.3.29.2	Site name for the signals	ts_site	The site name that is allocated to the signal set	Browns/ John Intersection	A	30				L	1		
8.3.29.3	Signal unique asset ID	ts_unqi_id	The unique asset ID allocated to the signal asset	AD1234	AN	30				L	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.29.4	Controller ID	ts_cont_id	The Controller ID assigned to the signals	123-346-125435	AN	30				D	1		
8.3.29.5	Control system type	ts_cs_typ	Control system type		A	30				D	2		
8.3.29.6	Ground height to bottom of signal	signal_hei	Height from the ground surface to the bottom of the signal target board		DC	5	2	m		D	2		
8.3.29.7	Signal type	ts_sig_typ	Signal type		A	100				D	2		
8.3.29.8	Pedestrian call box type	cbox_typ	Pedestrian call box type		A	30				D	3		
8.3.29.9	Data logger present	ts_dat_log	Whether there's a data logger present	Y - Yes	B	1			Y or N	D	3		
8.3.29.10	Earthing type for signal pole	ts_eth_typ	Earthing type for the traffic signal pole		A	30				D	3		
8.3.29.11	Luminaire size	ts_lum_siz	Luminaire size of the signal aspects. This is generally 200 or 300mm	200	I	3		mm	200, 300	D	3		
8.3.29.12	Luminaire type	ts_lum_typ	Luminaire type		A	100				D	3		
8.3.29.13	Pedestrian call box present	ts_callbox	If there's a pedestrian call box at the signal installation	Y - Yes	B	1			Y or N	D	3		
8.3.29.15	Radar Unit is connected	ts_radar	Whether a Radar Unit is connected or not	Y - Yes	B	1			Y or N	D	3		
8.3.29.16	Target board length	tboard_len	Target board length measured from the highest point of the target board to the lowest	1500	I	4		mm		D	3		
8.3.29.17	Target board material	tboard_mat	Target board material	Aluminium	A	30				D	3		
8.3.29.18	Target board width	tboard_wid	Target board width	300	I	3		mm		D	3		
8.3.29.19	Defects liability end date	ts_dlp_end	End date of defects liability period	ddmmyyyy	D	8				P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.29.20	Defects liability start date	ts_dl_sta	Start date of defects liability period	ddmmyyyy	D	8				P	2		
8.3.29.21	Maintenance requirements	ts_mainreq	Maintenance requirements		A	100				P	2		
8.3.29.22	Signal maintenance company	ts_maintco	Name of the company who maintains the signals		A	250				P	2		
8.3.29.23	Purchase cost	purch_cost	The overall cost paid at time of installation, or the vested cost through subdivision	180000	Mo	10	2	$		P	2		
8.3.29.24	Purchase date	ts_purchda	The purchase date for the signal installation, or vested date through subdivision	ddmmyyyy	D	8				P	2		
8.3.29.25	Access to asset	ts_access	Access to asset		A	30				I	3		
8.3.29.26	Attachments type present on the poles	ts_attach	The attachment type to the signal pole	Banner Arms	A	30				I	3		
8.3.29.27	Manufacturer of call box	ts_make	Manufacturer of the call box		AN	30				I	3		
8.3.29.28	Call box model number	ts_cbmodel	Call box model number		AN	30				I	3		
8.3.29.29	Luminaire manufacturer	ts_lum_man	Luminaire manufacturer		A	100				I	3		
8.3.29.30	Manufacturer of the signal	ts_maunf	Manufacturer of the signal		A	100				I	3		
8.3.29.31	Model number	ts_model	Model number	MN12453	AN	30				I	3		
8.3.29.32	Mounting type	ts_mnt_typ	Mounting type		A	30				I	3		
8.3.29.33	Signal connected to a smart pad	smart_pad	The signal is connected to a smart pad	Y - Yes	B	1			Y or N	I	3		
8.3.29.34	Signal supplier	ts_supp	The traffic signal supplier	TSL	A	30				I	3		
8.3.29.35	Video detection present	video_det	If video detection is present at this signal installation	Y - Yes	B	1			Y or N	I	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.29.36	Visor type	visor_type	Visor type		A	30				I	3		
8.3.29.37	Warranty end date	ts_war_end	Warranty end date for the traffic signal installation	ddmmyyyy	D	8				I	3		

8.3.30 Trees

The location of planted trees, planting method as well as botanical identification. They can be within the berm, or special landscaped areas.

Table 8.69: Trees - Location References

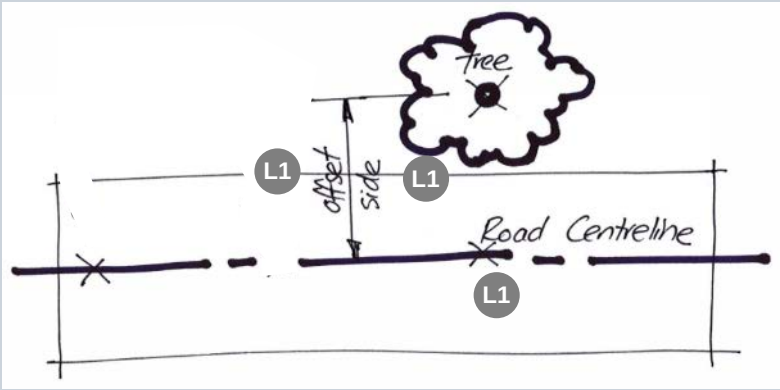
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Point (asset centre point)	Point geometric data (X,Y,Z)	

Table 8.70: Trees - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.30.1	Diameter of trunk	tree_dia	Diameter of the trunk at breast height (in metres)		DC	4	2	m		D	2		
8.3.30.2	Height at capture	tree_hei	Height of the tree at the time of data capture		DC	5	2	m	Code List 9.65	D	2		
8.3.30.3	Genus	tree_genus	Genus of the tree		A	30				D	3		
8.3.30.4	Tree guards present	tree_guard	Tree/ Plant guards are present	Y - Yes	B	1			Y or N	D	3		
8.3.30.5	Stock type	tree_stock	Stock type of the tree		AN	50				D	3		
8.3.30.6	Tree Age	tree_age	Age of the tree at time of capture		A	2			Code List 9.63	P	2		
8.3.30.7	Tree Endemic status	tree_stat	Endemic status of the tree	New Zealand native, exotic	AN	100				P	2		
8.3.30.8	Maintenance requirements	tree_maint	Maintenance issues/requirements	Seasonal fruiting	A	250				P	2		
8.3.30.9	Tree significance	tree_sig	If the tree has any special significance, or status	Historical	A	100			Code List 9.67	P	2		
8.3.30.10	Pruning time interval	tree_prune	Time period between pruning cycles		I	2		mth		P	3		
8.3.30.11	Common name	tree_commo	Common Name	River Red Gums	A	100				I	3		
8.3.30.12	Tree Planting method	tree_metho	Planting method for the tree	Remnant	A	100			Code List 9.66	I	3		
8.3.30.13	Tree environment for roots	tree_roots	The environment the tree is planted into and if it will be root constrained	Tree Pit	A	100			Code List 9.64	I	3		
8.3.30.14	Tree species	tree_speci	Tree Species	Eucalyptus Camaldulensis	A	100				I	2		
8.3.30.15	Support type for tree	tree_supp	Support type of the tree	One post	A	100				I	3		
8.3.30.16	Overhead wires present	tree_wires	Overhead wires are present within the trees envelope	Y - Yes	B	1			Y or N	I	2		

8.3.31 Tunnels

A tunnel is an underground roadway, dug through the surrounding soil and enclosed except for the entrance and exit. The physical details of the tunnel are described here with any mechanical and electrical components recorded under that asset group, and the same for lighting and any ITS assets. Details are recorded for various components including the portal, buttress, capping beam and barrel.

Table 8.71: Tunnels - Location References

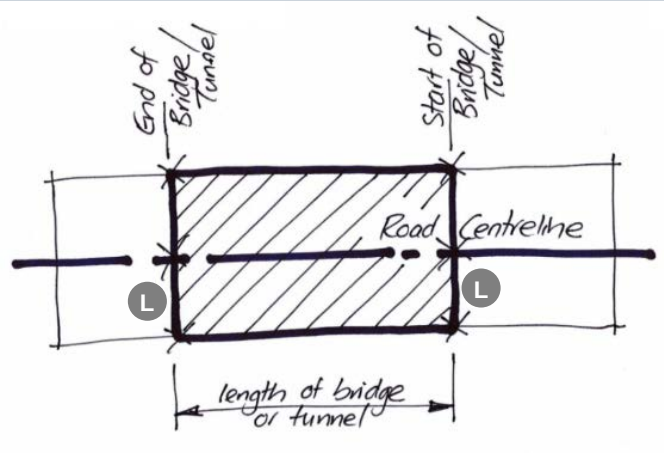
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Start of tunnel	Linear distance along road centreline / spatia	
	End of tunnel	Measurement of tunnel width on left side of road centreline	
	Tunnel width (left)	Measurement of tunnel width on left side of road centreline	
	Tunnel width (right)	Measurement of tunnel width on left side of road centreline	
L2	Road ID	The unique road identifier	
	Polygon (tunnel perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon (tunnel perimeter)	Polygon geometric data (X,Y,Z)	

Table 8.72: Tunnels - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.31.1	Left Tunnel Width	tun_wid_l	Lateral measurement from the road centreline to the left inside edge of the barrel. Left side is defined from the road origin, travelling in the increasing direction.		DC	4	2	m		L	1		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.31.2	Right Tunnel Width	tun_wid_r	Lateral measurement from the road centreline to the right inside edge of the barrel. Right side is defined from the road origin, travelling in the increasing direction.		DC	5	2	m		L	1		M
8.3.31.3	Tunnel length	tun_len	Length of the tunnel measured along the centreline of the tunnel.		DC	5	2	m		L	1		NM
8.3.31.4	Tunnel services	tun_serv	An indication of whether the tunnel includes services (lighting, extraction, communications, etc.) or is simply an unserviced tunnel.		A	1				L	1		NM
8.3.31.5	Earthquake Rating	eq_rating	The earthquake rating for the tunnel		DC	6	2			D	1		
8.3.31.6	Maximum trafficable height	tun_mx_hei	This is the maximum trafficable height that can pass through the tunnel, providing for an "as of right" width envelope. It may require a lane closure to allow passage down the centre of the tunnel. The high is measured from the road surface to the point that provides the "as of right" width dimension		DC	3	1	m		D	1		M
8.3.31.7	Tunnel Clearance	tun_clear	The height measured from the road surface, at the outside edge of the traffic lane, to the inside surface of the barrel. This is the maximum height that can pass while staying within the traffic lane. Consideration will also need to be given if lower		DC	6	2			D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
			restrictions are present within the tunnel										
8.3.31.8	Tunnel Function	tun_func	The function the tunnel provides whether it be for the passage of pedestrians, vehicles, rail, bicycles, or a combination of road users	PED - Pedestrian underpass	A	100			Code List 9.68	D	1		
8.3.31.9	Tunnel Structure Type	tun_st_typ	A category for the different types of tunnels	UND - Underpass	A	100			Code List 9.69	D	1		
8.3.31.10	Barrel height	tun_ba_hei	Height of the tunnel measured from the road surface to the highest point on the inside of the barrel		DC	5	2	m		D	2		
8.3.31.11	Barrel material	tun_ba_mat	The material that the barrel in constructed of.	CONC - Concrete	A	30				D	2		
8.3.31.12	Barrel surface treatment type	tun_ba_typ	The type of surface treatment that exists on the barrel	paint	A	30				D	2		
8.3.31.13	Barrel thickness	tun_ba_thi	The thickness of the constructed barrel. This is measured as the thickness from the tunnel cut face to the inside finished surface		I	4		mm		D	2		
8.3.31.14	Barrel width	tun_ba_wid	Measured at the road surface and is the inside width of the barrel		DC	5	2	m		D	2		
8.3.31.15	Buttress height	tun_bu_hei	Measured from the road surface to the underside of the capping beam. This is recorded as the average height for multiple variable heights.		DC	5	2	m		D	2		
8.3.31.16	Buttress material	tun_bu_mat	The material the buttress is constructed of	Wood	A	30				D	2		
8.3.31.17	Capping beam material	tun_ca_mat	The material the capping beam is constructed of	CONC - Concrete	A	30				D	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.31.18	Number of emergency exits	tun_e_exit	The number of all emergency exits within the length of the tunnel. This includes vehicular and pedestrian		I	2		#		D	2		
8.3.31.19	Number of buttresses	tun_bu_num	The total number of buttresses		I	2		#		D	2		
8.3.31.20	Portal height	tun_po_hei	Measured from the road surface to the underside of the capping beam. This is recorded as the average height for multiple variable heights		DC	6	2			D	2		
8.3.31.21	Portal material	tun_po_mat	The material the portal is constructed of	CONC - Concrete	A	30				D	2		
8.3.31.22	Portal width	tun_po_wid	Measured at the road surface from the left inside edge to the right hand inside edge of the portal. Where portal widths vary at each end the average shall be recorded		DC	5	2	m		D	2		
8.3.31.23	Barrel installation date	tun_ba_dat	The date the barrel construction was completed	ddmmyyyy	D	8				P	2		
8.3.31.24	Plate or plaque year	plaque_yr	The year displayed on the structure plate attached to the structure, or the year the structure was commissioned for use.	yyyy	D	4				P	2		
8.3.31.25	Barrel surface treatment installation date	tun_ba_sur	The date the barrel surface treatment was completed	ddmmyyyy	D	8				P	2		
8.3.31.26	Barrel surface treatment colour	tun_ba_col	The colour of the barrel surface treatment	White	A	30				I	2		

8.3.32 Vehicle Crossings

These are a formed area where vehicles are permitted to cross over channel and footpath. The exact extend of this defined area varies between jurisdictions. Vehicle crossing construction and type can vary depending on its use (i.e. residential, commercial, industrial etc.).

Table 8.73: Vehicle Crossing Points - Location References

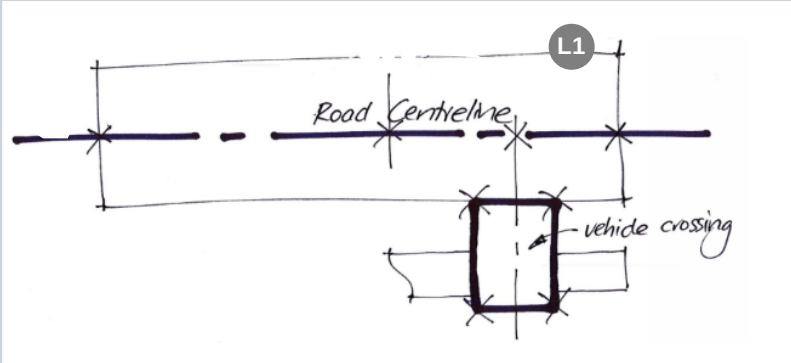
Soph	Location Data	General Guidance	Diagram
L1	Road ID	The unique road identifier	
	Centreline distance to asset centre at ground level	Linear distance along road centreline / spatial	
	Side	Either left or right of the road centreline	
	Offset measurement	Dimension between the road centreline and asset centre point	
L2	Road ID	The unique road identifier	
	Polygon (crossing perimeter)	Polygon geometric data (X,Y)	
L3	Road ID	The unique road identifier	
	Polygon geometric data (X,Y)	Polygon geometric data (X,Y,Z)	

Table 8.74: Vehicle Crossings - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.32.1	Vehicle crossing material	cross_mat	The finished surface material of the vehicle crossing	CONC - Concrete	A	100			Code List 9.26	D	1		
8.3.32.2	Vehicle crossing type	cross_typ	The constructed type of vehicle crossing	Residential, commercial, industrial etc.	A	100			Code List 9.28	D	1		
8.3.32.3	Vehicle crossing depth	cross_dep	The constructed depth of the finished surface for the vehicle crossing	150	I	3		mm		D	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.3.32.4	Vehicle crossing reinforcing mesh present	cross_reo	Reinforcing mesh has been used in the construction of the vehicle crossing. This could be specified in an organisations construction standards	Y - Yes	B	1			Y or N	D	2		
8.3.32.5	Vehicle crossing width excluding splays	cross_wid	Width of the vehicle crossing in metres excluding the splays. Measured at the road reserve boundary	3	DC	3	1	m		D	2		
8.3.32.6	Vehicle crossing basecourse depth	crs_b_dep	Depth of the base course material	100	I	3		mm		D	3		
8.3.32.7	Vehicle crossing base course type	crs_b_typ	Type of the base course material		A	100			Code List 9.26	D	3		
8.3.32.8	Vehicle crossing subbase course depth	crs_s_dep	Depth of the sub-base course material	0	I	3		mm		D	3		
8.3.32.9	Vehicle crossing subbase course type	crs_s_typ	Type of the sub-base course material.		A	100			Code List 9.26	D	3		

8.4 Condition

Overview

Condition data describes asset information that relates to either its functional performance or where it sits in its lifecycle. Understanding condition data is fundamental to many asset management practices including planning, valuation and predictive modelling. Condition data will often interact with other pieces of data to inform items such as access, performance, risk, works and costs.

The items listed below are considered core to road management. If collected, they should be able to be reported in this way to allow easy comparison. It is in no way intended to be a definitive list of all data items, nor is it intended to restrict the collection of additional items. It is acknowledged that advances in technology may warrant changes to this list.

Scope

There are many methods of assessing condition which are often intended to fit a specific business, operational or management requirement. Collection standards can also be driven by historical or technological restrictions. This data standard outlines three levels of sophistication (Soph) which can be applied to the method of how the data is collected.

Soph 1: Subjective Condition Assessment

The assessment is done subjectively with no relation to any standard or measurement. This is often just a simple visual inspection with the reporting being a discrete variable ranging from “as new” to “end of life”.

Soph 2: Subjective Measured Condition Assessment

The assessment is still done subjectively but made in relation to a standard, guideline or measurement. The use of a standard, guideline or measurement is to try add some portability, comparability and reliability to the data. The measurement is often an estimate taken visually, or an overall score extrapolated from descriptive words and pictures.

Soph 3: Objective Measured Condition Assessment

The assessment is typically a scientific measure as defined by a specified test method, such as the Austroads Test Methods. This includes automated parameters such as roughness, rutting and texture.

It is understood that there are items that fall between these levels of sophistication. Generally, the higher the level of sophistication, the higher the level of accuracy, although this may differ depending on each situation. Where appropriate, a reference has been given to the most relevant standard for further details about that data item. Many data items are covered in detail under the *Austroads Guide to Asset Management*.

Table 8.75: Condition - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Subjective													
8.4.1	Subjective condition	cond_subj	A numerical rating, established by desktop judgement, that represents the current condition of an asset in meeting its defined service objectives		I	1			Code List 9.7	P	1		
8.4.2	Subjective condition survey date-time	cond_date	Date-time that subjective condition survey was done	ddmmyyyy	D	8				P	1		M
8.4.3	Subjective condition survey operator	cond_name	Name of operator that subjective condition survey was done by		AN	20				P	1		
Visually Assessed Condition													
8.4.4	Visually measured condition	cond_vis	A numerical rating of the condition based on a visual inspection using a documented guideline with the aim of repeatable results		I	1			Code List 9.7	P	2		NM
8.4.5	Visual stripping	cond_strip	Area of stripping as a percentage		I	3		%		P	2		
8.4.6	Visual ravelling	cond_rav	Area of ravelling as a percentage		I	3		%		P	2		
8.4.7	Visual patching	cond_patch	Area of all patching as a percentage		I	3		%		P	2		
8.4.8	Visual edge drop off	cond_ed	Percentage length with edge drop off		I	3		%		P	2		
8.4.9	Visual cracking area	cond_crack	Percentage area affected by cracking		I	3		%		P	2		M
8.4.10	Visual measured rutting	cond_rut	Average manually measured rut		I	2		mm		P	2		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Climate													
8.4.11	Thornthwaite Moisture Index	clim_tmi	Thornthwaite Moisture Index		I	3			Typically -60 to 200	P	3		
Pavement Cracking													
8.4.12	All cracking extent	cr_all_ex	The percentage affected area of a 100m section where lcracking is evident in the traffic lane		I	3		%		P	3	AGAM05E-06	M
8.4.13	All cracking severity	cr_all_sv	Average width of the cracking over the 100m section		I	1		mm		P	3	AGAM05E-06	
8.4.14	Longitudinal cracking extent	cr_long_ex	The percentage affected area of a 100m section where longitudinal cracking is evident in the traffic lane		I	3		%		P	3	AGAM05E-06	
8.4.15	Longitudinal cracking severity	cr_long_sv	Average width of the longitudinal cracking over the 100m section		I	1		mm		P	3	AGAM05E-06	
8.4.16	Transverse cracking extent	cr_tran_sv	The percentage affected area of a 100m section where transverse cracking is evident in the traffic lane		I	3		%		P	3	AGAM05E-06	
8.4.17	Transverse cracking severity	cr_tran_ex	Average width of the transverse cracking over the 100m section		I	1		mm		P	3	AGAM05E-06	
8.4.18	Crocodile/block cracking severity	cr_croc_sv	The percentage affected area of a 100m section where crocodile cracking is evident in the traffic lane		I	3		%		P	3	AGAM05E-06	
8.4.19	Crocodile/block cracking extent	cr_croc_ex	Average width of the crocodile cracking over the 100m section		I	1		mm		P	3	AGAM05E-06	
8.4.20	Cracking survey date-time	cr_date	Date-time that cracking survey was done	ddmmyyyy	D	8				P	1		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.21	Cracking survey operator	cr_name	Name of operator that crackingsurvey was done by		AN	20				P	1		
Pavement Deflection													
8.4.22	Deflection testing vehicle	p_df_veh	Type of vehicle used to measure deflection		AN	20			Code List 9.13	P	3	AGAM05D-08	M
8.4.23	Pavement deflection d0	p_df_d0	Pavement deflection at the test load. As measured using a Benkelman beam, deflectograph, falling weight deflectometer or traffic speed deflectometer. Not normalised.		DC	4		µm		P	3	AGAM05D-08	M
8.4.24	Pavement deflection d200	p_df_d200	Pavement deflection at 200mm from the test load. As measured using a Benkelman beam, deflectograph, falling weight deflectometer or traffic speed deflectometer. Not normalised		DC	4		µm		P	3	AGAM05D-08	
8.4.25	Pavement deflection d300	p_df_d300	Pavement deflection at 300mm from the test load. As measured using a Benkelman beam, deflectograph, falling weight deflectometer or traffic speed deflectometer. Not normalised		DC	4		µm		P	3	AGAM05D-08	
8.4.26	Pavement deflection d900	p_df_d900	Pavement deflection at 900mm from the test load. As measured using a Benkelman beam, deflectograph, falling weight deflectometer or traffic speed deflectometer. Not normalised		DC	4		µm		P	3	AGAM05D-08	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.27	Pavement deflection d1500	p_df_d1500	Pavement deflection at 900mm from the test load. As measured using a Benkelman beam, deflectograph, falling weight deflectometer or traffic speed deflectometer. Not normalised		DC	4		µm		P	3	AGAM05D-08	
8.4.28	Actual applied load	p_df_act	Actual applied load for pavement deflection testing in kN		I	3		kN		P	3	AGAM05D-08	
8.4.29	Ambient air temperature	temp_air	Ambient air temperature		DC	3	1	deg		P	3	AGAM05D-08	
8.4.30	Pavement temperature	temp_pave	Pavement temperature		DC	3	1	deg		P	3	AGAM05D-08	
8.4.31	Deflection survey date-time	p_df_date	Date-time that deflection survey was done	ddmmyyyy	D	8				P	1		M
8.4.32	Deflection survey operator	p_df_name	Name of operator that deflection survey was done by		AN	20				P	1		
Pavement Roughness													
8.4.33	Lane roughness quarter car	iri_lane	Pavement roughness expressed as Lane IRIqc, reported at 100m intervals		DC	4	2	m/km		P	3	AGAM05B-07	NM
8.4.34	Inner wheel path roughness	iri_iwp	Pavement roughness expressed as IRIqc, reported at 100m intervals		DC	4	2	m/km		P	3	AGAM05B-07	M
8.4.35	Outer wheel path roughness	iri_owp	Pavement roughness expressed as IRIqc, reported at 100m intervals		DC	4	2	m/km		P	3	AGAM05B-07	M
8.4.36	Roughness survey date-time	iri_date	Date-time that roughness survey was done	ddmmyyyy	D	8				P	1		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.37	Roughness survey operator	iri_name	Name of operator that roughness survey was done by		AN	20				P	1		
Pavement Rutting													
8.4.38	Rut depth lane	rut_lane	The maximum rut as measured using a 3m straight edge, across both lanes, and reported at 100m intervals		DC	3	1	mm		P	3	AGAM05C-07	
8.4.39	Rut depth inner	rut_iwp	Maximum rut depth inner wheel path. Measured using a 2m straight edge, at the deepest transverse cross section point, and reported at 100m intervals		DC	3	1	mm		P	3	AGAM05C-07	NM
8.4.40	Rut depth standard deviation inner	rut_iwp_sd	Pavement rutting in terms of standard deviation in the inner wheel path. The standard deviation of the maximum rut depths collected over the 100m section		DC	3	1	mm		P	3	AGAM05C-07	
8.4.41	Rut depth inner wheel path 0-<5mm	rut_iwp_5	The percentage of a 100m section where the average inner wheel path rutting depth <=5mm		I	3		%		P	3	AGAM05C-07	
8.4.42	Rut depth inner wheel path >5mm-<10mm	rut_iwp_10	The percentage of a 100m section where the average inner wheel path rutting depth >5mm,<=10mm		I	3		%		P	3	AGAM05C-07	
8.4.43	Rut depth inner wheel path >10mm-<15mm	rut_iwp_15	The percentage of a 100m section where the average inner wheel path rutting depth >10mm,<=15mm		I	3		%		P	3	AGAM05C-07	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.44	Rut depth inner wheel path >15-<20mm	rut_iwp_20	The percentage of a 100m section where the average inner wheel path rutting depth >15mm,<=20mm		I	3		%		P	3	AGAM05C-07	
8.4.45	Rut depth inner wheel path >20-<25mm	rut_iwp_25	The percentage of a 100m section where the average inner wheel path rutting depth >20mm, <=25mm		I	3		%		P	3	AGAM05C-07	
8.4.46	Rut depth inner wheel path >25-<30mm	rut_iwp_30	The percentage of a 100m section where the average inner wheel path rutting depth >25mm, <=30mm		I	3		%		P	3	AGAM05C-07	
8.4.47	Rut depth inner wheel path >30-<35mm	rut_iwp_35	The percentage of a 100m section where the average inner wheel path rutting depth >30mm, <=35mm		I	3		%		P	3	AGAM05C-07	
8.4.48	Rut depth inner wheel path >35-<40mm	rut_iwp_40	The percentage of a 100m section where the average inner wheel path rutting depth >35mm, <=40mm		I	3		%		P	3	AGAM05C-07	
8.4.49	Rut depth inner wheel path >40mm	rut_iwp_X0	The percentage of a 100m section where the average inner wheel path rutting depth >40mm		I	3		%		P	3	AGAM05C-07	
8.4.50	Rut depth outer	rut_owp	Maximum rut depth outer wheel path. Measured using a 2m straight edge, at the deepest transverse cross section point, and reported at 100m intervals		DC	3	1	mm		P	3	AGAM05C-07	NM
8.4.51	Rut depth standard deviation inner	rut_owp_sd	Pavement rutting in terms of standard deviation in the left wheel path. The standard deviation of the maximum rut depths collected over the 100m section		DC	3	1	mm		P	3	AGAM05C-07	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.52	Rut depth outer wheel path 0-<5mm	rut_owp_5	The percentage of a 100m section where the average outer wheel path rutting depth <=5mm		I	3		%		P	3	AGAM05C-07	
8.4.53	Rut depth outer wheel path >5mm-<10mm	rut_owp_10	The percentage of a 100m section where the average outer wheel path rutting depth >5mm,<=10mm		I	3		%		P	3	AGAM05C-07	
8.4.54	Rut depth outer wheel path >10mm-<15mm	rut_owp_15	The percentage of a 100m section where the average outer wheel path rutting depth >10mm,<=15mm		I	3		%		P	3	AGAM05C-07	
8.4.55	Rut depth outer wheel path >15-<20mm	rut_owp_20	The percentage of a 100m section where the average outer wheel path rutting depth >15mm,<=20mm		I	3		%		P	3	AGAM05C-07	
8.4.56	Rut depth outer wheel path >20-<25mm	rut_owp_25	The percentage of a 100m section where the average outer wheel path rutting depth >20mm, <=25mm		I	3		%		P	3	AGAM05C-07	
8.4.57	Rut depth outer wheel path >25-<30mm	rut_owp_30	The percentage of a 100m section where the average outer wheel path rutting depth >25mm, <=30mm		I	3		%		P	3	AGAM05C-07	
8.4.58	Rut depth outer wheel path >30-<35mm	rut_owp_35	The percentage of a 100m section where the average outer wheel path rutting depth >30mm, <=35mm		I	3		%		P	3	AGAM05C-07	
8.4.59	Rut depth outer wheel path >35-<40mm	rut_owp_40	The percentage of a 100m section where the average outer wheel path rutting depth >35mm, <=40mm		I	3		%		P	3	AGAM05C-07	
8.4.60	Rut depth outer wheel path >40mm	rut_owp_X0	The percentage of a 100m section where the average outer wheel path rutting depth >40mm		I	3		%		P	3	AGAM05C-07	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.61	Rutting survey date-time	rut_date	Date-time that rutiing survey was done	ddmmyyyy	D	8				P	1		M
8.4.62	Rutting survey operator	rut_name	Name of operator that rutiing survey was done by		AN	20				P	1		
Pavement Surface Skid													
8.4.63	SCRIM speed	sfc_speed	Speed of Sideways-force Coefficient Routine Investigation Machine (SCRIM) for testing		I	3		km/h		P	3	AGAM05F-09	
8.4.64	SCRIM inner wheel path	sfc_iwp	Skid resistance as collect by a Sideways-force Coefficient Routine Investigation Machine (SCRIM) in the inner wheel path		DC	3		SFC		P	3	AGAM05F-09	
8.4.65	SCRIM outer wheel path	sfc_owp	Skid resistance as collect by a Sideways-force Coefficient Routine Investigation Machine (SCRIM) in the outer wheel path		DC	3		SFC		P	3	AGAM05F-09	
8.4.66	SCRIM survey time-date	sfc_date	Date-time that rutiing survey was done	ddmmyyyy	D	8				P	1		
8.4.67	SCRIM vehicle	sfc_veh	Sideways-force Coefficient Routine Investigation Machine (SCRIM) vehicle description		AN	20			Code List 9.45	P	3	AGAM05F-09	
8.4.68	Skid Resistance Test	skid_test	The Method used to measure the road surface skid resistance.		AN	10			Code List 9.48	P	3	AGAM05F-09	
8.4.69	Skid resistance 20m	sk_res_20	Skid resistance as characterised by the coefficient of friction. Ratio of the traction force to the vertical load averaged over a 20m length		DC	3	2			P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.70	Skid resistance 50m	sk_res_50	Skid resistance as characterised by the coefficient of friction. Ratio of the traction force to the vertical load averaged over a 50m length		DC	3	2			P	2		
Pavement Surface Texture													
8.4.71	SMTD Pavement texture inner wheel path	tx_SMT_iwp	Pavement texture Sensor Measured Texture Depth (SMTD) measured in the inner wheel path reported at 100m intervals		DC	3	1	mm		P	3	AGAM05G-09	
8.4.72	SMTD Pavement texture outer wheel path	tx_SMT_owp	Pavement texture Sensor Measured Texture Depth (SMTD) measured in the outer wheel path reported at 100m intervals\		DC	3	1	mm		P	3	AGAM05G-09	
8.4.73	SMTD Pavement texture between wheel path	tx_SMT_bwp	Pavement texture Sensor Measured Texture Depth (SMTD)) between the left and right wheel paths reported at 100m intervals		DC	3	1	mm		P	3	AGAM05G-09	
8.4.74	MPD Pavement texture inner wheel path	tx_MPD_iwp	Pavement texture Mean Profile Depth (MPD) measured in the inner wheel path reported at 100m intervals		DC	3	1	mm		P	3	AGAM05G-09	M
8.4.75	MPD Pavement texture outer wheel path	tx_MPD_owp	Pavement texture Mean Profile Depth (MPD) measured in the outer wheel path reported at 100m intervals\		DC	3	1	mm		P	3	AGAM05G-09	M
8.4.76	MPD Pavement texture between wheel path	tx_MPD_bwp	Pavement texture Mean Profile Depth (MPD) between the left and right wheel paths reported at 100m intervals		DC	3	1	mm		P	3	AGAM05G-09	M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.77	Texture survey date-time	tx_date	Date-time that texture survey was done	ddmmyyyy	D	8				P	1		M
8.4.78	Texture survey operator	tx_name	Name of operator that texture survey was done by		AN	20				P	1		
Bridge													
8.4.79	Bridge condition state 1	br_cond_1	Percent of asset at bridge condition grade 1		I	3		%	Condition 1 = Excellent	P	2	AGAM06-09	M
8.4.80	Bridge Condition state 2	br_cond_2	Percent of asset at bridge condition grade 2		I	3		%	Condition 2 = Good	P	2	AGAM06-09	M
8.4.81	Bridge condition state 3	br_cond_3	Percent of asset at bridge condition grade 3		I	3		%	Condition 3 = Fair	P	2	AGAM06-09	M
8.4.82	Bridge condition state 4	br_cond_4	Percent of asset at bridge condition grade 4		I	3		%	Condition 4 = Poor	P	2	AGAM06-09	M
8.4.83	Bridge conditIon state overall	br_cond	Overall bridge condition expressed as a whole number		I	1			1, 2, 3 or 4	P	2	AGAM06-09	NM
8.4.84	Bridge survey date-time	br_cond_dt	Date that the bridge was inspected	ddmmyyyy	D	8				P	1		M
8.4.85	Bridge survey operator	br_cond_in	Name of the bridge inspector		AN	20				P	1		
Kerb and Channel													
8.4.86	Kerb and channel visual condition	kc_cond	Visually assessed condition of kerb and channel		I	1			Code List 9.7	P	2	IPWEA PN02	
8.4.87	Kerb and channel survey date-time	kc_date	Date-time that kerb and channel survey was done	ddmmyyyy	D	8				P	1		
8.4.88	Visually measure condition survey operator	kc_name	Name of operator that visually measured condition survey was done by		AN	20				P	1		
Paths and Footpaths													
8.4.89	Pathway visual condition	path_cond	Visually assessed condition of pathway/footpath asset		I	1			Code List 9.7	P	2	IPWEA PN01	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.4.90	Pathways survey date-time	path_date	Date-time that pathways survey was done	ddmmyyyy	D	8				P	1		
8.4.91	Pathways survey operator	path_name	Name of operator that pathways survey was done by		AN	20				P	1		
Unsealed Roads													
8.4.92	Unsealed road profile	us_profile	Condition of crossfall/cambre to allow water to run off surface		I	1			Code List 9.7	P	2	AGPT06-09	
8.4.93	Unsealed drainage condition	us_drain	Numerical rating of the drainage condition		I	1			Code List 9.7	P	2	AGPT06-09	
8.4.94	Gravel depth	us_gv_dep	Gravel depth as measured in OWP or as appropriate		DC	2		mm		P	3	AGPT06-09	
8.4.95	Unsealed survey date-time	us_date	Date-time that unsealed survey was done	ddmmyyyy	D	8				P	1		
8.4.96	Unsealed survey operator	us_name	Name of operator that unsealed survey was done by		AN	20				P	1		

8.5 Demand

Overview

"Demand" refers to measurement of the required usage and/or traffic loading of the asset. Most road management agencies record data in some form about the usage of the asset. Most commonly this would include traffic information. Demand asset data therefore includes data like average daily traffic, annual traffic, percentage heavy vehicles and similar information. There are different standards and practices of measurement and recording of demand information.

Scope

The current demand on a road is most commonly measured by agencies in the form of:

- The number of vehicles using a section of road in a given period (traffic count); and/or
- The traffic loading; and/or
- The traffic composition by type.

Traffic and usage information can be represented in many ways. The Austroads Strategic Business Case includes only "current demand" however demand is a dynamic parameter that changes over time. Historical record keeping and predictive estimates are important data requirements in terms of service performance measurement, predictive modelling, road design and road planning.

The vehicle classification classes included in the data tables below refer to the following:

- Australian classes are as per the Austroads vehicle classification system; and
- New Zealand classes are as per the NZTA Vehicle Classification Scheme

Application of Levels of Sophistication

Demand data such as traffic volume is typically referenced (spatially or linear). Accordingly an inventory level of sophistication can be applied to demand data.

In terms of applying a level of asset planning sophistication the following approach has been generally applied to each data item:

A1 Could represent AADT data.

A2 Could represent AADT with some information of commercial vehicles / traffic spectrum.

A3 Could represent a detailed traffic distribution with vehicle loading etc.

Table 8.76: Demand - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Design													
8.5.1	Equivalent Standard Axle	esa	The number of equivalent standard axle repetitions (SAR) which would cause the same damage as the standard load. The standard load is a single axle with dual wheels carrying a total load of 80 kN		I	9				P	2		
8.5.2	Is a Bus/Public Transport Route	bus_route	Transport routes are defined and attached to each road section.	Y – Yes	B	1			Y or N	P	3		
Population													
8.5.3	Population	pop_catch	Total population within the relevant catchment (Road Authority boundary).		I	8		#		P	3		
Road Use													
8.5.4	Vehicle Kilometers Travelled	vkt	A measure of traffic demand and is the length of a section of road in kilometres multiplied by the AADT on it. The yearly VKT is the daily VKT multiplied by the number of days in that year (365 or 366 days).		I	10		vkt		P	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.5.5	Gross Vehicle Mass kilometres	GVM_km	A measure of traffic demand and is the length of a section of road in kilometres multiplied by the cumulative Gross Vehicle Mass (GVM) on it. The yearly GVM-km is the daily GVM-km multiplied by the number of days in that year (365 or 366 days). GVM of a vehicle, means the maximum loaded mass of the vehicle, as follows: a) If the Regulator has specified the vehicle's maximum loaded mass under Section 57—specified by the Regulator under that section*; or b) Otherwise—stated by the vehicle's manufacturer.		I	10		vkt		P	3		
8.5.6	Equivalent Standard Axles kilometres	ESA_km	A measure of traffic demand and is the length of a section of road in kilometres multiplied by the cumulative Equivalent Standard Axles (ESA) on it. The yearly ESA-km is the daily ESA-km multiplied by the number of days in that year (365 or 366 days). ESA's is the number of standard axle loads that are equivalent in damaging effect on a pavement to a given vehicle or axle loading.		I	10		vkt		P	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.5.7	Passenger Car Unit equivalent kilometres	PCU_km	A measure of traffic demand and is the length of a section of road in kilometres multiplied by the cumulative Passenger Car Units (PCU) on it. The yearly PCU-km is the daily PCU-km multiplied by the number of days in that year (365 or 366 days). PCU is a measure involving the conversion of different types of vehicles into their equivalent passenger cars in terms of operating characteristics.		I	10		vkt		P	3		
Traffic Growth													
8.5.8	Annual growth (% / year) of all vehicle classes	trf_gr_all	The annual growth, expressed as a percentage growth for all vehicle classes		DC	4	1	%		P	2		NM
8.5.9	Annual growth (% / year) of all light vehicles	trf_gr_lcv	The annual growth, expressed as a percentage growth for all light vehicles classes (New Zealand: class 1-3 Australia class 1-2)		DC	4	1	%		P	2		
8.5.10	Annual growth (% / year) of all buses	trf_gr_bus	The annual growth, expressed as a percentage growth for all buses (New Zealand: class 4 Australia: some vehicle classified under classes 3, 4, 6 and 7.		DC	4	1	%		P	2		
8.5.11	Annual growth (% / year) of all heavy vehicles	trf_gr_hcv	The annual growth, expressed as a percentage growth for all heavy vehicles (New Zealand: class 5-14 Australia: classes 3-12)		DC	4	1	%		P	2		NM
8.5.12	Annual growth (% / year) of cycles	trf_gr_cyc	The annual growth, expressed as a percentage growthfor cycles		DC	4	1	%		P	2		

8.6 Utilisation

Utilisation is the current usage versus current capacity and is typically presented as a ratio. The ratio defines the proportion of an asset's available capacity that is being used.

Most road management agencies record data in some form about the usage of the asset. Most commonly this would include traffic information. Utilisation asset data therefore includes data like average daily traffic, annual traffic, percentage heavy vehicles, pedestrian counts, bicycle counts and similar information. There are different standards and practices of measurement and recording of utilisation information.

Determining the capacity of the assets is typically modelled. The level of sophistication of these varies considerably. All these models will draw on inputs from existing inventory data and intersection controls data and provide outputs such as Network Capacity (veh/hr), and Lane Capacity (veh.hr).

Utilisation can be measured in two substantive ways: current utilisation; and forecast utilisation. The method used to calculate the utilisation is determined by the road controlling authority and recorded in the appropriate data field (eg crrent utilisation, future utilisation).

Scope

The current utilisation on a road is most commonly measured by agencies in the form of:

- The number of vehicles using a section of road in a given period (traffic count); and/or
- The traffic loading; and/or
- The traffic composition by type.
- Capacity analysis is generally a modelled output.

In terms of determining capacity the required inputs will vary based on the model being used, however typically this will include inventory items such as:

Intersection types;

- 85^{th} percentile speed
- Lane control types
- Number of lanes
- Width of lanes.

Current utilisation is a simple ratio of current usage/current capacity.

Table 8.77: Utilisation - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Bicycles													
8.6.1	Number of bicycles per hour	cycl_hr_xx	The number of bicycles in the xx- hour of the day		I	5		#		P	3		
8.6.2	Trips per month	cycl_mth	The number of bicycles trips per month		I	5		#		P	3		
8.6.3	User Classification	cycl_user	Bicyles user profiles		I	250				P	3		
Capacity													
8.6.4	Intersection control type	int_type	Intersection control type	uncontrolled, round about, give way, stop, signalised	A	12				P	3		
8.6.5	85% Speed	speed_85	85% operating speed on road section		I	3				P	3		
8.6.6	Turn movement counts	turn_count	Turn movement counts per turn type		I	4				P	3		
Output													
8.6.7	Model name/ version	util_mod	Model name and version number used to calculate utlilisation		I	20				P	3		
8.6.8	Current utilisation	util_cur	Ratio of current utilisation to current capacity		I	2		%		P	3		
8.6.9	Future utilisation	util_fut	Ratio of future utilisation to current capacity or future capacity		I	2		%		P	3		
Pedestrians													
8.6.10	Number of pedestrians per hour	ped_hr	The number of pedestrian in the xx-th hour of the day		I	5		#		P	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.6.11	Passenger km travelled on public transport	ped_km	Passenger km travelled on public transport data collected via electronic ticketing systems		I	5		#		P	3		
Traffic Volumes													
8.6.12	Average annual daily traffic	aadt_all	Typically the total volume of traffic (sum of vehicles travelling in both direction on a two-way road) at a location over a period of 365 days divided by 365. Practically, the counting period should be a minimum of 7 continuous days and, if known, seasonal factors would be applied.		I	5				P	2		NM
8.6.13	Annual average weekday traffic	aawt_all	The average daily traffic volume at the specified location on weekdays (Monday to Friday). This is expressed as number of vehicles per day.		I	5				P	2		
8.6.14	Traffic classification used	traf_cl_sy	Each country has pre-defined classes definition that differ slightly. They are based on the number of axles, axle spacing, weight and length of vehicle. New Zealand: New Zealand specifies 14 classes Australia: Austroads specifies 12 classes		AN	20				P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.6.15	Traffic classification system class number	traf_class	Each country has pre-defined classes definition that differ slightly. They are based on the number of axles, axle spacing, weight and length of vehicle. New Zealand: New Zealand specifies 14 classes Australia: Austroads specifies 12 classes		I	2				P	2		
8.6.16	Number of vehicles during peak hour	peak_hr_v	The number of vehicles at the specified location during the hour of the day that observes the highest traffic volumes. Note the period with the highest volumes may not commence at the start of any hour.		I	6				P	2		
8.6.17	Number of vehicles per hour	hr_vol	The number of vehicles per hour. xx is the xx-th hour during the day		I	6				P	2		
8.6.18	Average annual daily traffic per lane	aadt_lane	Typically the volume of traffic per lane at a location over a period of 365 days divided by 365. Practically, the counting period should be a minimum of 7 continuous days and, if known, seasonal factors would be applied.		I	5				P	2		
8.6.19	Annual average weekday traffic per lane	aawt_lane	The average daily traffic volume per lane at the specified location on weekdays (Monday to Friday).		I	5				P	2		
8.6.20	Percentage of aadt classified as motorbike	aadt_bke	The percentage of the aadt where the traffic volume is classified as a motorbike.		I	3		%		P	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.6.21	Percentage of aadt per lane classified as motorbike	aadt_bke_l	The percentage of the aadt per lane where the traffic volume is classified as a motorbike.		I	3		%		P	3		
8.6.22	Percentage of aadt classified as car	aadt_car	The percentage of the aadt where the traffic volume is classified as car. Light vehicle includes cars, motorbikes and other small vehicles New Zealand: class 1-3 Australia: class 1-2		I	3		%		P	2		
8.6.23	Percentage of aadt per lane classified as car	aadt_car_l	The percentage of the aadt per lane where the traffic volume is classified as car. Light vehicle includes cars, motorbikes and other small vehicles New Zealand: class 1-3 Australia: class 1-2		I	3		%		P	2		
8.6.24	Percentage of aadt classified as bus	aadt_bus	The percentage of the aadt where the traffic volume is classified as bus. New Zealand: class 4 Australia: some vehicles classified under classes 3, 4, 6 and 7		I	3				P	2		
8.6.25	Percentage of aadt classified as bus per lane	aadt_bus_l	The percentage of the aadt per lane where the traffic volume is classified as bus. New Zealand: class 4 Australia: classes 3 and some vehicles classified under 6-7		I	3				P	2		
8.6.26	Percentage of aadt classified as heavy vehicles	aadt_hcv	The percentage of the aadt where the traffic volume is classified as heavy vehicles. New Zealand: class 5-14 Australia: classes 3-12		I	3				P	2		NM

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.6.27	Percentage of aadt per lane classified as heavy vehicles	aadt_hcv_l	The percentage of the aadt per lane where the traffic volume is classified as heavy vehicles. New Zealand: class 5-14 Australia: classes 3-12		I	3				P	2		
8.6.28	Average annual daily traffic per class	aadt_cl	Each country has pre-defined classes definition that differ slightly. They are based on the number of axles, axle spacing, weight and length of vehicle. New Zealand: New Zealand specifies 14 classes Australia: Austroads specifies 12 classes		I	3		%	Maximum allowable percentage is 100%	P	2		
8.6.29	Average annual daily traffic per class per lane	aadt_cl_l	Each country has pre-defined classes definition that differ slightly. They are based on the number of axles, axle spacing, weight and length of vehicle. New Zealand: New Zealand specifies 14 classes Australia: Austroads specifies 12 classes		I	3		%	Maximum allowable percentage is 100%	P	2		
8.6.30	Number of vehicles during peak hour per lane	veh_p_h_ln	The number of vehicles at the specified location during the hour of the day that observes the highest traffic volumes per lane. Note the period with the highest volumes may not commence at the start of any hour.		I	6				P	2		
8.6.31	Number of vehicles per lane per hour	veh_hr_ln	The number of vehicles of traffic per hour per lane. xx is the xx-th hour during the day		I	6				P	2		

8.7 Criticality

Overview

Criticality considers the importance of assets in the delivery of the organisational obligations and objectives. In a road context, this can be considered in two ways:

- At an asset or component level, in terms of how individual the assets impact the route; and
- At a road level, in terms of the importance of that route.

The organisational objectives may include economic development, economic sustainability, safety, preservation of life, and community welfare.

Scope

The criticality of a component or route should reflect the importance of that item against the organisational obligations and objectives. These items are rated by importance, with consideration for the potential impact to the delivery of the objectives. The scope includes:

- The assessment of components/routes to determine if their function is critical in regard to the delivery of the objectives, and
- Identification of the essential assets for prioritied management.

Table 8.78: Criticality - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.7.1	Critical Rating	crit_comp	A criticality rating that describes the importance of the item to the organisation.		I	1			Code List 9.11	P	1		

8.8 Risk

Overview

Risk analysis determines the potential to gain or lose something of 'value', that is determining the probability of quantifiable damage, injury, liability, loss, or any other negative occurrence caused by external or internal vulnerabilities, and that may be avoided through pre-emptive action.

Risks analysis should be undertaken on all asset related activities such as planning, design, construction, acquisition, operations and disposal. Risk assessment is part of the process of continual improvement rather than a one-off action. Assessments need to be reviewed and updated within the risk registers throughout an asset life.

Scope

Components of Risk

Most organisations align their risk practices with the principles contained within AS/NZS ISO 31000:2009, Risk Management – Principles and Guidelines.

Risk is quantified in terms of the consequences of an event and the associated likelihood of occurrence:

- Likelihood: defined as the chance of an event happening
- Consequence: defined as the outcome of an event, expressed qualitatively or quantitatively

Likelihood of failure is the product of an event occurring in terms of a given return period, an example matrix is summarised in the table below:

Likelihood Rating Code	Descriptor	Description
1	Improbable	The event has not been known to occur
2	Unlikely	The event does occur from time to time (e.g. once every 50 years)
3	Possible	The event might occur within the near future (e.g. within 10 years)
4	Likely	The event has occurred several times in recent times (e.g. every 3 years)
5	Almost Certain	The event is expected to occur at least annually

The consequence of failure is typically considered within a multi-criteria analysis including:

- Health and Safety: an assets ability to deliver the required service level within acceptable health and safety limits.
- Socio-Cultural: an assets ability to impact on the social, economic, and cultural outcomes of the communities they are servicing

- Financial: an assets ability to deliver the desired outcomes within the financial limits.
- Environmental: an assets ability to deliver the desired outcomes within the environmental limits.
- Governance: an assets ability to deliver the desired outcomes within the reputational limits, and legislative requirements.

A typical consequence assessment is summarised in the table below. The consequence grade considers the number of people potentially affected by an event, and whether the consequence is temporary or permanent.

Consequence Grade	Health and Safety	Governance	Financial	Environmental	Socio/Cultural
	Assets through all of the asset functions are managed in a manner that is safe for all people while constructing, maintaining, or using the asset.	*Assets through all of the asset functions are managed in a manner that permits the RCA to maintain a good reputation within the community* *Assets through all of the asset functions are managed in a manner that complies with legislative requirements*	*Assets deliver the desired outcomes in a financially sustainable manner for both the present and future.* *Assets deliver the desired outcomes in a manner that does not have a negative financial impact on stakeholders and customers.*	*Assets through all of the asset functions are managed in a manner that minimises environmental impact.*	*Assets deliver the desired outcomes in a manner that contributes to the social, economic and cultural wellbeing of the community.*
1	Potential injury or impact on health limited to individuals. Basic medical intervention such as GP visit may be required but fully recoverable after days/weeks.	The event generated minor interest within the organisation. External interest is confined to just a few individuals. Minor non-compliance with legal or regulatory requirements that is not expects to result in investigation or comment/censure from regulatory government authorities. Manage within normal delegations.	Financial impact accommodated within annual reactive works budget. Negligible financial impact on individual customers and stakeholders.	Negligible impact to localised area. Environmental impact is reversible within days/weeks/months.	Asset can be reinstated, or alternative route be established within 12 hours.
2	Some individuals may require medical intervention, but effects are fully recoverable after days/weeks.	The event generates minor community interest. Reported in local media. Non-compliance with legal or regulatory requirements that could result in	Financial impact cannot be accommodated within annual reactive works budget. Requires funds to be diverted from other work areas but	Environmental impact to localised areas. Environmental impacts are fully reversible within months to a year.	Asset can be reinstated, or alternative route be established within 24 hours.

Consequence Grade	Health and Safety	Governance	Financial	Environmental	Socio/Cultural
		investigation comment/censure or warning from regulatory or government authority. Manage within normal delegations and inform executives.	expenditure can be accommodated within the organisation's overall annual budget. Negligible financial impact on multiple customers or stakeholders.		
3	Significant impact. Individuals may potentially suffer permanent injury from the event.	The event generates community discussion, regional media discussion. Non-compliance with legal or regulatory requirements resulting in fine or legal action. Senior leadership and Chief Executive actively engaged in managing risk.	The financial impact of the event cannot be accommodated within the organisation's annual budget. Financial loss to multiple stakeholders. Loss is more than negligible but does not impact on the sustainability of financially stable businesses.	Significant damage to the environment. Damage to the environment is recoverable within years.	Asset can be reinstated, or alternative route be established within 48 hours.
4	Individuals could potentially be exposed to circumstances that could cause fatalities.	National media coverage, some sections of the community lose confidence in the organisation. Non-compliance with legal or regulatory requirements resulting in fine or legal action greater than $100,000. Supervision by external regulator or federal advisory.	The organisation's overall budget for several years is affected by the event. Financial losses to multiple customers or stakeholders. Loss may affect the financial sustainability of some businesses.	Significant damage to the environment. The environment may take decades to recover.	Asset can be reinstated, or alternative route be established within 1 week.
5	Multiple fatalities might occur.	International media coverage, widespread and sustained loss of confidence in the organisation. High level government intervention that could result in loss of authority to operate service or Ministerial inquiry, criminal prosecution punishable by imprisonment.	The organisation's long term financial sustainability is threatened. Local stakeholders and customers unable to continue operate due to financial impact of the event.	Serious damage to the environment. Long term impacts may not be fully reversible.	Asset can be reinstated, or alternative route be established within 2 weeks

Calculating Risk

To determine a risk rating score the consequence and likelihood matrix below can be used. The approach involves:

- Identifying the sources of risk that may lead to the failure of an asset
- Identifying the consequences of an event occurring and assign a consequence score for each of the consequence categories that are affected. Assign an overall consequence score based on the highest consequence score assigned to each of the individual categories
- Predicting the likelihood of the event occurring and assign a likelihood score for each of the consequence categories that are affected. Assign an overall likelihood score based on the highest likelihood score assigned to each of the individual categories
- Assigning a risk score based on the consequence and likelihood scores assigned.

Risk Matrix		Consequence Grade				
		1	2	3	4	5
Likelihood Grade	1	1	1	2	3	4
	2	1	2	3	3	4
	3	2	2	3	4	5
	4	2	3	4	5	5
	5	3	4	4	5	5

Managing and Monitoring Risks

For risk management to be effectively managed for following practices need to be included as a minimum:

- Documenting risks within a risk register
- Developing mitigation and monitoring plans
- Regular review the risks to ensure the risk score is applicable
- Update the mitigation and monitoring plans as necessary.

Table 8.79: Risk - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Consequence													
8.8.1	Consequence Rating overall	risk_co	The overall consequence rating considering the impact of asset failure across the predefined list of stakeholders and organisational objectives		I	1			1 to 5	P	1	AS/NZS ISO 31000:2009	
8.8.2	Consequence Rating Health and Safety	risk_co_hs	The health and safety consequence rating considering the impact of asset failure across the predefined list of stakeholders and organisational health and safety objectives		I	1			1 to 5	P	1	AS/NZS ISO 31000:2009	
8.8.3	Consequence Rating Socio Cultural	risk_co_se	The socio-cultural consequence rating considering the impact of asset failure across the predefined list of stakeholders and organisational sociocultural objectives		I	1			1 to 5	P	1	AS/NZS ISO 31000:2009	
8.8.4	Consequence Rating Financial	risk_co_fi	The financial consequence rating considering the impact of asset failure across the predefined list of stakeholders and organisational financial objectives		I	1			1 to 5	P	1	AS/NZS ISO 31000:2009	
8.8.5	Consequence Rating Environmental	risk_co_en	The environmental consequence rating considering the impact of asset failure across the predefined list of stakeholders and organisational environmental objectives		I	1			1 to 5	P	1	AS/NZS ISO 31000:2009	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.8.6	Consequence Rating Governance	risk_co_go	The governance consequence rating considering the impact of asset failure across the predefined list of stakeholders and organisational governance objectives		I	1			1 to 5	P	1	AS/NZS ISO 31000:2009	
General													
8.8.7	Risk ID	risk_id	Unique identifier for risks contained within the risk register		AN	10				P	1	AS/NZS ISO 31000:2009	
8.8.8	Risk Date	risk_date	Date initial risk assessment undertaken	ddmmyyyy	D	8			dd/mm/ccyy	P	1	AS/NZS ISO 31000:2009	
Likelihood													
8.8.9	Likelihood Rating Overall	risk_le	Overall likelihood rating considering how often the hazard is likely to occur		I	1			1 to 5	P	1	AS/NZS ISO 31000:2009	
Monitoring													
8.8.10	Schedule monitoring plan review date	risk_mo_dt	Date for next scheduled review of the risk rating, mitigation and monitoring plan	ddmmyyyy	D	8			dd/mm/ccyy	P	2	AS/NZS ISO 31000:2009	
8.8.11	Montioring plan identifier	risk_mo_id	Unique identifier for the monitoring and mitigation plan for each risk within the risk register		AN	10				P	2	AS/NZS ISO 31000:2009	
Output													
8.8.12	Risk Rating Overall	risk_rate	Overall risk rating identified by likelihood and consequence		I	1			1 to 5	P	1	AS/NZS ISO 31000:2009	

8.9 Resilience

Overview

Resilience of road transportation lifelines is dependent on their vulnerability to a loss of quality or serviceability, and the time taken to bring them back into original usage state after the reduction or loss of service.

Resilience is considered in three states: Damage State, Access State, and Duration State. The reason for this is that after an event some availability may be able to be reinstated in a relatively short time frame. These three states can be assessed for various scenarios on primary routes, and be plotted on to a GIS layer to understand the impact of an event at a network level.

Scope

When considering resilience, the following three states need to be considered.

Resilience State:

Resilience State	Description State
Damage state	Damage State represents the severity of damage to the road and cost of damage repairs.
Access state	Access State indicates whether the road section would be able to be used either at full level, at various reduced levels or not at all. This gives an indication of the degree of access on that section of the road network after an event.
Duration state	Duration State indicates the duration over which the road will be in the Access State above. This gives an indication of the duration of loss or reduced access in links along the road network.

Damage State:

Damage Level	Damage State	Damage Description
1	Slight	Only slight damage that requires routine maintenance
2	Light	Minor damage requiring clean-up of small slips (few cubic metres) and debris and culverts
3	Moderate	Moderate damage requiring removal of moderate volume of slip debris (tens of cubic metres), small scale repair of underslips (less than 2 m high walls) and minor repair to walls, culverts and other structures
4	Severe	Severe damage requiring clearing of large volumes of slip materials (hundreds of cubic metres) and stabilisation, significant structures to repair underslips and major repair to walls, replacement of culverts and other structures.
5	Extensive	Extensive damage requiring clearing of major volumes of landslides and stabilisation, large structures to repair underslips, damages to walls and other structures.

Access State:

Access Level	Access State	Access Description
1	Full	Full access except condition may require care
2	Poor	Available for slow access, but with difficulty by normal vehicles due to partial lane blockage, erosion or deformation.
3	Single Lane	Single lane access only with difficulty due to poor condition of remaining road
4	Difficult	Road accessible single lane by only 4x4 off road vehicles.
5	Closed	Road closed and unavailable for use

Duration State:

Duration Level	Duration State	Duration Description
1	Open	No closure, except for maintenance
2	Minor	Condition persists for up to 3 days
3	Moderate	Condition persists for 3 days to 2 weeks
4	Severe	Condition persists for 2 weeks to 3 months
5	Long Term	Condition persists for > 3 months

Table 8.80: Resilience - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.9.1	Event scenario that route/ road section resilience is being considered for.	resil_sc	Event scenario that route/ road section resilience is being considered for.	Flood, Earthquake, Storm, etc	AN	250				P	2		
8.9.2	Damage State	resil_dam	Qualitive measure that represents the severity of damage to the route/road section in terms of actual or potential damage.		I	1			1 to 5	P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.9.3	Access State	resil_ava	Qualitive measure that indicates whether the road section would be able to be used either at full level, at various reduced levels or not at all in terms of actual or potential road section availability.		I	1			1 to 5	P	2		
8.9.4	Duration	resil_out	Indicated the duration over which the reoute/road section will be in the Access State above. Qualitive measure in terms of the duration over which the route/road section will be in the Availability State above.		I	1			1 to 5	P	2		

8.10 Performance (Asset)

Overview

Asset performance, in terms of this Standard, refers to technical levels of service (TLoS) derived from objective data and measured qualitatively. Measurement of TLoS enables asset owners and users to understand how the network of assets is performing.

Technical performance measures currently vary significantly between road agencies and local councils. There is an option of standardisation of asset performance standards and measures where funding bodies might require specific asset performance indicators to be provided by road agencies and local councils as a condition of funding. These measures are typically used to aggregate information for reporting purposes and comparative analysis of performance.

Scope

Asset performance data can be used by a wide range of stakeholders to rate the efficiency and effectiveness of how asset systems are performing. This section incorporates a range of technically focussed asset performance measures, separated into sub-categories.

The *Achievement* sub-category provides a list a general data fields which will apply to performance measures within the other sub-categories.

The *Asset Life* sub-category provides a number of performance measures which can be applied to each of the Asset Groups listed in section 8.3 Inventory.

Performance measure targets may be aspirational, which are set without robust consideration of available budget to achieve the typically stretch target; or performance measure targets may be achievable, which are set with due consideration of available budget. This data standard does not attempt to set targets for performance measures; as performance measure targets are a function of available budget and risk appetite, which will vary between road management authorities.

Table 8.81: Performance (Asset) - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Achievement													
8.10.1	Performance category	perf1_cat	Performance category	FINAN – Financial	A	7			Code List 9.29	P	2		
8.10.2	Performance measure target_achievable	perf1_achb	Required technical performance value, determined as achievable in consideration of available funding envelope		AN	10				P	3		
8.10.3	Target date for Performance measure target_achievable	tach1_date	Target date for delivery of target set under Performance measure target_achievable	ddmmyyyy	D	8				P	3		
8.10.4	Performance measure target_aspirational	perft1_asp	Required technical performance value, considered aspirational without consideration of available funding envelope		AN	10				P	2		
8.10.5	Target date for Performance measure target_aspirational	tasp1_date	Target date for delivery of target set under Performance measure target_aspirational	ddmmyyyy	D	8				P	2		
8.10.6	Performance actual	perf1_act	Actual technical performance value		AN	10				P	2		
8.10.7	Actual date for Performance actual	act1_date	Actual date performance measured for Performance actual	ddmmyyyy	D	8				P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Asset Life													
8.10.8	Design life	life_des	The total number of years the asset is expected to provide service, designed for a high level of reliability (typically 90 to 95%). Note: The Design life is typically shorter than the Useful life.		I	3		yrs		P	1		M
8.10.9	Useful life assessed	life_use_a	The total number of years the asset is expected to provide service, based on a subjective assessment or engineering estimationis, beyond which the asset is no longer acceptable for use. Note: The Useful life is typically longer than the Design life.		I	3		yrs		P	1		
8.10.10	Useful life calculated	life_use_c	The total number of years the asset is expected to provide service, based on the assessed/estimated mean of a mature asset stock, beyond which the asset is no longer acceptable for use. Note: The Useful life is typically longer than the Design life.		I	3		yrs		P	2		
8.10.11	Useful life calculation method	life_use_m	The method used to calculate the useful life for the asset	DESK - Desktop	I	3		yrs	Code List 9.36	P	2		
8.10.12	Out of service date	life_e	The date the asset was taken out of service or replaced	ddmmyyyy	D	8				P	1		
8.10.13	End of life reason	life_e_r	The reason for the asset being taken out of service or replaced		A	2			Code List 9.15	P	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.10.14	Life achieved	life_ach	The number of years the asset was actually in service		I	3		yrs		P	1		
8.10.15	Asset age	asset_age	The current age of the asset		I	3		yrs		P	1		M
8.10.16	Remaining life assessed	life_rem_a	The subjectively assessed remaining life for the asset		I	3		yrs		P	1		M
8.10.17	Remaining life calculated	life_rem_c	The calculated remaining life for the asset		I	3		yrs		P	2		
8.10.18	Remaining life calculation method	life_rem_m	The method used to calculate the remaining life for the asset	DESK - Desktop	I	3		yrs	Code List 9.36	P	2		
Output													
8.10.19	Resurfacing coverage across total network	surf_pc	The area of the total pavement network (i.e. sealed and unsealed) resurfaced (i.e. reseal and thin asphalt on sealed network plus granular resheet on unsealed network), expressed as a percentage of the total network area at the start of the year. Reported annually.		DC	3	1	%	0 to 100	P	2		M
8.10.20	Resheeting coverage across unsealed network	surf_us_pc	The area of the unsealed pavement network resurfaced (i.e. granular resheet), expressed as a percentage of the total unsealed network area at the start of the financial year. Reported annually.		DC	3	1	%	0 to 100	P	2		M
8.10.21	Resurfacing coverage across sealed network	surf_s_pc	The area of the sealed pavement network resurfaced (i.e. reseal and thin asphalt), expressed as a percentage of the total sealed network area at the start of the financial year. Reported annually.		DC	3	1	%	0 to 100	P	2		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.10.22	Sprayed seal coverage across sealed network	sseal_pc	The area of the sealed pavement network resurfaced with a sprayed seal, expressed as a percentage of the total sealed network area covered by sprayed seal at start of the year. Reported annually.		DC	3	1	%	0 to 100	P	2		M
8.10.23	Asphalt resurfacing coverage across sealed network	asphalt_pc	The area of the sealed pavement network resurfaced with a thin asphalt treatment, expressed as a percentage of the total sealed network area covered by asphalt at start of the financial year. Reported annually.		DC	3	1	%	0 to 100	P	2		M
8.10.24	Pavement rehabilitation network coverage	rehab_pc	The area of the sealed pavement network rehabilitated, expressed as a percentage of the total sealed network area at the start of the financial year. Reported annually.		DC	3	1	%	0 to 100	P	2		M
8.10.25	Major structures replaced	struct_pc	The total number of major structures (i.e. bridges and major culverts) replaced, expressed as a percentage of the total number of structures across the network at start of the financial year. Reported annually.		DC	3	1	%	0 to 100	P	2		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.10.26	Bridges replaced	bridge_pc	The total number of bridges (i.e. excluding major culverts) replaced, expressed as a percentage of the total number of bridges across the network at start of the financial year. Reported annually.		DC	3	1	%	0 to 100	P	2		M
8.10.27	Major culverts replaced	maj_cul_pc	The total number of major culverts (i.e. excluding bridges) replaced, expressed as a percentage of the total number of major culverts across the network at start of the financial year. Reported annually.		DC	3	1	%	0 to 100	P	2		M

8.11 Performance (Financial)

Overview

Financial performance, in terms of this Standard, refers to Financial Level of Service (FLoS) measures that provide an indication of the financial efficiency and effectiveness derived from objective data and measured qualitatively. Measurement of FLoS enables asset owners and users to understand how the network of assets is performing in terms of financial return and sustainability.

Scope

Financial performance data can be used by a wide range of stakeholders to rate the financial efficiency and effectiveness of the asset system.

Table 8.82: Performance (Finance) - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Development Program / Project Assessment													
8.11.1	Return on Construction Expenditure BCR <1	rce_less1	Percentage of total programmed expenditure in a financial year with BCR less than 1.0. The BCR used is that one attributed to a project when the decision to fund the project was made.		DC	3	1	Graph		P	3	Austroads National Performance Indicators NPI6.1. Typically represented as a graph along with other BCR band widths.	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.11.2	Return on Construction Expenditure BCR 1-2	rce_1to2	Percentage of total programmed expenditure in a financial year with BCR less between 1.0 and 2.0. The BCR used is that one attributed to a project when the decision to fund the project was made.		DC	3	1	Graph		P	3	Austroads National Performance Indicators NPI6.1. Typically represented as a graph along with other BCR band widths.	
8.11.3	Return on Construction Expenditure BCR 2-3	rce_2to3	Percentage of total programmed expenditure in a financial year with BCR less between 2.0 and 3.0. The BCR used is that one attributed to a project when the decision to fund the project was made.		DC	3	1	Graph		P	3	Austroads National Performance Indicators NPI6.1. Typically represented as a graph along with other BCR band widths.	
8.11.4	Return on Construction Expenditure BCR 3-4	rce_3to4	Percentage of total programmed expenditure in a financial year with BCR less between 3.0 and 4.0. The BCR used is that one attributed to a project when the decision to fund the project was made.		DC	3	1	Graph		P	3	Austroads National Performance Indicators NPI6.1. Typically represented as a graph along with other BCR band widths.	
8.11.5	Return on Construction Expenditure BCR 4-5	rce_4to5	Percentage of total programmed expenditure in a financial year with BCR less between 4.0 and 5.0. The BCR used is that one attributed to a project when the decision to fund the project was made.		DC	3	1	Graph		P	3	Austroads National Performance Indicators NPI6.1. Typically represented as a graph along with other BCR band widths.	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.11.6	Return on Construction Expenditure BCR >5	rce_great5	Percentage of total programmed expenditure in a financial year with BCR greater than 5.0. The BCR used is that one attributed to a project when the decision to fund the project was made.		DC	3	1	Graph		P	3	Austroads National Performance Indicators NPI6.1. Typically represented as a graph along with other BCR band widths.	
Financial													
8.11.7	Operating Surplus Ratio	fin_osr	The operating result (exclusive of capital income) expressed as a percentage of total operating income (also exclusive of capital income). It assesses the entity's financial performance.		DC	3	1	%		P	2	Australian Infrastructure Financial Management Manual (AIFMM)	
8.11.8	Net Financial Liabilities Ratio	fin_nflr	The magnitude of net financial liabilities relative to operating income. It is calculated based on its level of debt and other financial liabilities less financial assets all expressed as a ratio of operating revenue (exclusive of capital income).		DC	3	1	%		P	2	Australian Infrastructure Financial Management Manual (AIFMM)	
8.11.9	Asset Renewal Funding Ratio	fin_arfr	The ratio of asset renewal and replacement expenditure for a period relative to the asset renewal and replacement expenditure identified as warranted in an asset management plan for the same period. It assesses the entity's asset renewal and replacement performance. NOTE: Where an entity does not yet have a reliable forecast of renewal requirements, it should cautiously adopt the Asset Sustainability Ratio as a substitute.		DC	3	1	%		P	3	Australian Infrastructure Financial Management Manual (AIFMM)	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.11.10	Asset Sustainability Ratio	fin_asr	The ratio of asset replacement expenditure relative to depreciation for a period. It measures whether assets are being renewed at the rate they are wearing out.		DC	3	1	%		P	2	Australian Infrastructure Financial Management Manual (AIFMM)	
Investment													
8.11.11	Total Capital Spend	capex_tot	Relatively large (material) expenditure, which has benefits, expected to last for more than 12 months. Capital expenditure includes renewal, upgrade and expansion expenditure. Measured as a three-year rolling average of historical capital spend, including renewal, upgrade and expansion capital expenditure.		Mo	10	2	$ x 103		P	1	Australian Infrastructure Financial Management Manual (AIFMM)	M
8.11.12	Capital Spend – Upgrade and Expansion	capex_ue	Upgrade capital is expenditure which replaces a previously existing asset with enhanced capability or function, where an option existed for replacement without the enhanced capability or functionality (e.g. widening the sealed area of an existing road, replacing drainage pipes with pipes of greater capacity). Expansion capital is expenditure that creates new assets to provide a new service/output or extends the capacity of an existing asset to new beneficiaries (e.g. building of a new road or building of a new culvert where one did not previously exist). Measured as a three-year rolling average of historical capital spend, excluding renewal capital expenditure.		Mo	10	2	$ x 103		P	2	Australian Infrastructure Financial Management Manual (AIFMM)	M
8.11.13	Capital Spend – Renewals	capex_ren	Renewal capital is expenditure on an existing asset or on replacing an		Mo	10	2	$ x 103		P	2	Australian Infrastructure	NM

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
			existing asset, which returns the service capability of the asset up to that which it had originally (e.g. resurfacing or resheeting a material section of the road network, replacing a material section of a drainage network with pipes of the same capacity). Measured as a three year rolling average of historical capital spend, excluding upgrade and expansion capital expenditure. NOTE: Histroical definitions of road network maintenance expenditure typically covered both maintenance and renewal. For the avoidance of doubt, renewal expenditure (Capex) is not considered maintenance expenditure (Opex).									Financial Management Manual (AIFMM)	
8.11.14	Total Recurrent Spend	opex_tot	Recurrent expenditure, which is relatively small (immaterial) or that which has benefits expected to last less than 12 months. Recurrent expenditure is continuously required to maintain and asset or provide a service. Recurrent expenditure includes operating and maintenance expenditure. Measured as a three year rolling average of historical operating spend, including maintenance, operating and depreciation expenditure.		Mo	10	2	$ x 103		P	1	Australian Infrastructure Financial Management Manual (AIFMM)	M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.11.15	Recurrent Spend – Maintenance	opex_maint	Maintenance is recurrent expenditure, which is regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the required level of service (e.g. defect patching, guard rail tensioning). Measured as a three year rolling average of historical recurrent spend, excluding operations and depreciation expenditure. NOTE: Histroical definitions of road network maintenance expenditure typically covered both maintenance and renewal. For the avoidance of doubt, maintenance expenditure (Opex) excludes renewal expenditure (Capex).		Mo	10	2	$ x 103		P	2	Australian Infrastructure Financial Management Manual (AIFMM)	NM
8.11.16	Recurrent Spend – Operations	opex_oper	Operations is recurrent expenditure, which is continuously required to provide a service (e.g. street sweeping, grass mowing, power, fuel, staff, on-costs, overheads). Measured as a three-year rolling average of historical recurrent spend, excluding maintenance and depreciation expenditure.		Mo	10	2	$ x 103		P	2	Australian Infrastructure Financial Management Manual (AIFMM)	NM
8.11.17	Depreciation Expense	opex_dep	Depreciation expense is the sum of asset depreciation resulting from the systematic allocation of the depreciable amount of an asset over its useful life.		Mo	10	2	$ x 103		P	2	Australian Infrastructure Financial Management Manual (AIFMM)	

8.12 Performance (Service)

Overview

Levels of service have traditionally been presented in terms of technical or engineering focused requirements, such as intervention triggers and response time requirements. In recognition of the increasing focus in the way the assets support the delivery of the service to the community, customer levels of service are being used to evaluate the service performance of asset systems.

Customer levels of service (CLoS) are used by road managing agencies to monitor, evaluate and report on the service performance of the asset systems managed by their jurisdiction to support the organisation's stated objectives. CLoS typically measure performance in the context of road user mobility, safety, amenity or accessibility. These outcomes are important for a range of users including car drivers, freight, emergency services, public transport operators and for non-car based travellers such as pedestrians and cyclists.

CLoS may be measured in either a qualitative or quantitative manner. A CLoS describes the ability of the road network to provide safe and efficient access to road users. Because CLoS are predominantly KPI focused they are often presented as metrics derived from existing datasets. Information from datasets such as traffic volumes and speed, maintenance requests and schedules, road closures, crashes, transport asset inventories and public transport journeys are all used to measure CLoS outcomes.

Despite efforts towards harmonising service performance measures across the roads sector, such as the Austroads National Performance Indicators, CLoS continue to vary significantly between road agencies and local governments. A harmonised set of asset performance standards and measures may aid in measuring performance more closely aligned to the road user's experience. Adoption of a harmonised set of CLoS, supplemented by TLoS, will provide a more complete set of performance measures to aid interaction of road agencies and local governments with their customers and funding agencies.

Scope

Service performance data can be used by a wide range of stakeholders to rate the efficiency and effectiveness of how asset systems are performing. This section incorporates a range of customer focussed service performance measures, separated into sub-categories.

The Achievement sub-category provides a list a general data fields which will apply to performance measures within the other sub-categories.

Performance measure targets may be aspirational, which are set without robust consideration of available budget to achieve the typically stretch target; or performance measure targets may be achievable, which are set with due consideration of available budget. This data standard does not attempt to set targets for performance measures; as performance measure targets are a function of available budget and risk appetite, which will vary between road management authorities.

Table 8.83: Performance (Service) - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Achievement													
8.12.1	Performance category	perf_cat	Performance category	FINAN – Financial	A	7			Code List 9.29	P	2		
8.12.2	Performance measure target_achievable	perf_ta_ac	Required technical performance value, determined as achievable in consideration of available funding envelope		AN	10				P	3		
8.12.3	Target date for Performance measure target_achievable	perf_ta_da	Target date for delivery of target set under Performance measure target_achievable	ddmmyyyy	D	8				P	3		
8.12.4	Performance measure target_aspirational	perf_tx	Required technical performance value, considered aspirational without consideration of available funding envelope		AN	10				P	2		
8.12.5	Target date for Performance measure target_aspirational	perf_tx_da	Target date for delivery of target set under Performance measure target_aspirational	ddmmyyyy	D	8				P	2		
8.12.6	Performance actual	perf_act	Actual service performance value achieved.		AN	10				P	2		
8.12.7	Actual date for Performance actual	perf_a_da	Actual date performance measured for Performance actual	ddmmyyyy	D	8				P	2		
Customer Experience													
8.12.8	Smooth Travel Exposure Urban (4.2 IRI)	ste_u_420	Proportion of travel undertaken each year on urban roads with a roughness level condition of less than 4.2 IRI		DC	4	1	%		P	3	Austroads National Performance Indicators NPI_4.2.1	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.9	Smooth Travel Exposure Rural (4.2 IRI)	ste_r_420	Proportion of travel undertaken each year on rural roads with a roughness level condition of less than 4.2 IRI		DC	4	1	%		P	3	Austroads National Performance Indicators NPI_4.2.2	
8.12.10	Smooth Travel Exposure All (4.2 IRI)	ste_a_420	Proportion of travel undertaken each year on all roads with a roughness level condition of less than 4.2 IRI		DC	4	1	%		P	3	Austroads National Performance Indicators NPI_4.2.3	
8.12.11	Smooth Travel Exposure Urban (5.33 IRI)	ste_u_533	Proportion of travel undertaken each year on urban roads with a roughness level condition of less than 5.33 IRI		DC	4	1	%		P	3	Austroads National Performance Indicators NPI_4.2.7	
8.12.12	Smooth Travel Exposure Rural (5.33 IRI)	ste_r_533	Proportion of travel undertaken each year on rural roads with a roughness level condition of less than 5.33 IRI		DC	4	1	%		P	3	Austroads National Performance Indicators NPI_4.2.8	
8.12.13	Smooth Travel Exposure All (5.33 IRI)	ste_a_533	Proportion of travel undertaken each year on all roads with a roughness level condition of less than 5.33 IRI		DC	4	1	%		P	3	Austroads National Performance Indicators NPI_4.2.9	
Customer Safety (Condition)													
8.12.14	Reported number of hazards	hazards	Reported number of hazards across all network infrastructure assets, reported from Maintenance Management System on a monthly basis.		I	3		%		P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.15	Reported number of defects	defct_num	Reported number of defects across all infrastructure assets, reported from Maintenance Management System on a monthly basis.		I	3		#		P	2		
8.12.16	Reported number of defects on pathways	defct_path	Reported number of defects across pathway assets, reported from Maintenance Management System on a monthly basis.		I	3		#		P	2		
8.12.17	Reported number of defects on pavement surface	defct_surf	Reported number of defects across pavement assets, reported from Maintenance Management System monthly.		I	3		#		P	2		
8.12.18	Reported number of service issues for traffic restraining devices	defct_rail	Reported number of defects, faults and non-conformances to standards across traffic restraining device assets (i.e. bridge side rails, guardrails, wire rope barriers, crash cushions). Defects and faults reported via Maintenance Management system and non-conformances to standards assessed via inspections.		I	3		#		P	3		
8.12.19	Reported number of service issues for lighting	defct_ligt	Reported number of defects, faults and non-conformances to standards across lighting assets. Defects and faults reported via Maintenance Management system and non-conformances to standards assessed via night time inspections.	3 – Acceptable	I	1				P	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.20	Pathways meeting the level of service standard	sci_path	Percentage of pathways by area, across the network, within the defined and documented level of service standard.		I	3		%		P	3		
8.12.21	Pavement Surfacing meeting the level of service standard	sci_pave	Percentage of pavement surfacings by area, across the network, within the defined and documented level of service standard.		I	3		%		P	3		
8.12.22	Achieved service request response time	sreq_time	Achieved service request response time.	Y – Yes	B	1				P	2		
8.12.23	Service request response time compliance	sreq_compl	Measures service request response time compliance, via percentage of requests actioned in accordance with pre-determined and documented response timelines. Uses 'Achieved service request response time' as core input variable.		DC	4	1	%		P	3		
Journey Interuptions													
8.12.24	Duration of interruption due to planned works	work_dur	The duration of the planned works.		I	3		days		P	2		
8.12.25	Work sites meeting planned closure times	work_close	Percentage of time targets met for planned road closures. Number of sites that meet planned closure target expressed as a percentage of the total number of sites planned for closure. Journey planning information		I	3		%		P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
			prior to journey. Customers are informed at least x days ahead of a planned event of delays exceeding a given threshold.										
8.12.26	Proportion of planned work sites	wsites_len	The total length of planned work sites in metres, expressed as a percentage of the total network length, measured month by month.		DC	3	1	%		P	3		
8.12.27	Actual travel speed at planned work sites	work_atsu	Weighted aggregate speed on a representative sample of planned work sites along arterial roads and freeways in major cities.		DC	3	1	km/hr		P	3		
8.12.28	Actual delay at planned work sites	work_delay	The delay resulting from planned works. Weighted aggregate speed on a representative sample of planned work sites minus the Nominal Travel Speed.		DC	3	1	km/hr		P	3		
Public Transport													
8.12.29	Public transport reliability	pt_reliab	Public transport reliability		I	3		%		P	3		
8.12.30	Public transport travel time reliability	ttime_rel	Public transport travel time. % of time target is met		I	3		%		P	3		
Road Safety													
8.12.31	Crash date	crash_date	Crash date	ddmmyyyy	D	8			dd/mm/ccyy	P	2	AS/NZS ISO 31000:2009	
8.12.32	Crash location	crash_loc	Crash location {Refer location referencing section}		I	6				P	2	Base data fields used to capture core input data for	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
												Austroads National Performance (Road Safety) Indicators	
8.12.33	Road user involved	crash_r_us	Vehicles/road users involved in crash. Identify the vehicle types involved in all reported crashes including cyclists and pedestrians Used to facilitiate reporting for a number of Road Safety measures that rely on data relating to reported crashes		A	3			Code List 9.9	P	2	Base data fields used to capture core input data for Austroads National Performance (Road Safety) Indicators	
8.12.34	Crash severity	crash_sev	Crash severity, categorised as one of fatal, serious, minor, non-injury. Used to facilitiate reporting for a number of Road Safety measures that rely on data relating to reported crashes		A	1			Code List 9.10	P	2	Base data fields used to capture core input data for Austroads National Performance (Road Safety) Indicators	
8.12.35	Crash count	crash_cnt	Total average annual crash count, by location.		I	4		#		P	2	Base data fields used to capture core input data for Austroads National Performance (Road Safety) Indicators	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.36	Crash count number of years of data	crash_yrs	Number of years over which the average annual crash count was calculated.		I	2		yrs		P	2	Base data fields used to capture core input data for Austroads National Performance (Road Safety) Indicators	
8.12.37	Total crash count (Population)	crash _p	Total crashes per 100,000 population		I	4		# / km*108		P	3		
8.12.38	Total crash count (Vehicle-Kilometres Travelled)	crash _t	Total crashes per 100 million veh-kms		I	4		# / km*108		P	3		
8.12.39	Number of Serious Casualty Crashes	scc	Count of crashes involving hospitalisation or death during the year		I	6		#		P	2	Input field for Austroads National Performance Indicators NPI2.1, NPI2.2, NPI2.7 and NPI2.8	
8.12.40	Serious Casualty Crashes (Population)	scc_p	Serious Casualty Crashes per 100,000 population		DC	4	1	# / p*105		P	3	Austroads National Performance Indicators NPI 2.1	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.41	Serious Casualty Crashes (Vehicle-Kilometres Travelled)	scc_t	Serious Casualty Crashes per 100 million veh-kms		DC	3	1	# / km*108		P	3	Austroads National Performance Indicators NPI2.2	
8.12.42	Number of Road Fatalities	sf	Count of fatalities resulting from road crashes during the year		I	4		#		P	2	Input field for Austroads National Performance Indicators NPI2.3 and NPI2.4	
8.12.43	Road Fatalities (Population)	sf_p	Fatalities per 100,000 population		DC	3	1	# / p*105		P	3	Austroads National Performance Indicators NPI2.3	
8.12.44	Road Fatalities (Vehicle-Kilometres Travelled)	sf_t	Fatalities per 100 million veh-kms		DC	3	2	# / km*108		P	3	Austroads National Performance Indicators NPI2.4	
8.12.45	Number of Persons Hospitalised	sph	Count of persons admitted to hospital resulting from road crashes per year.		I	6		#		P	2	Input field for Austroads National Performance Indicators NPI2.5 and NPI2.6	
8.12.46	Persons Hospitalised (Population)	sph_p	Persons hospitalised per 100,000 population		DC	4	1	# / p*105		P	3	Austroads National Performance Indicators NPI2.5	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.47	Persons Hospitalised (Vehicle-Kilometres Travelled)	sph_t	Persons hospitalised per 100 million veh-kms		DC	3	1	# / km*108		P	3	Austroads National Performance Indicators NPI2.6	
8.12.48	Social Cost of Serious Casualty Crash	ssc	Average social cost per serious casualty crash.		Mo	10	2	$		P	2	Input field for Austroads National Performance Indicators NPI2.7 and NPI2.8	
8.12.49	Social Cost of Serious Casualty Crashes (Population)	ssc_p	AU$ million cost of serious casualty crashes per 100,000 population		Mo	10	2	$ / p*105		P	3	Austroads National Performance Indicators NPI2.7	
8.12.50	Social Cost of Serious Casualty Crashes (Vehicle-Kilometres Travelled)	ssc_t	$ million cost of serious casualty crashes per 100 million veh-kms		Mo	10	2	$ / km*108		P	3	Austroads National Performance Indicators NPI2.8	
8.12.51	Collective Road Safety Risk	saferisk_c	Average annual fatal and serious injury crashes per km Collective Road Safety Risk is a measure of the total number of fatal and serious injury crashes per kilometre over a section of road. (Collective Road Safety Risk can also be described as the Crash Density)		A	4			Code List 9.44	P	3	kiwiRAP	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.52	Personal Road Safety Risk	saferisk_p	Average annual fatal and serious injury crashes per 100 million vehicle-km Personal Road Safety Risk is a measure of the danger to each individual using the state highway being assessed. (Personal Road Safety Risk can also be described as the Crash Rate)		A	4			Code List 9.44	P	3	kiwiRAP	
Travel Speed													
8.12.53	Nominal Travel Time	ntt	Nominal travel time of link, measured in minutes.		I	3		min		P	3	Input field for Austroads National Performance Indicators NPI7.2, NPI7.3.1, NPI7.3.2, NPI7.3.3. and NPI7.3.4	
8.12.54	Actual Travel Time	att	Actual travel time of link, measured in minutes.		I	3		min		P	3	Input field for Austroads National Performance Indicators NPI7.3.1, NPI7.3.2, NPI7.3.3. and NPI7.3.4	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.55	Mean Travel Time	mtt	Mean travel time of link, measured in minutes.		I	3		min		P	3	Input field for Austroads National Performance Indicators NPI7.1.1, NPI7.1.2, NPI7.1.3, NPI7.1.4, NPI7.4.1, NPI7.4.2, NPI7.4.3 and NPI7.4.4.	
8.12.56	Standard Deviation of Travel Times	sdtt	Standard Deviation of travel times of link.		DC	3	2			P	3	Input field for Austroads National Performance Indicators NPI7.4.1, NPI7.4.2, NPI7.4.3 and NPI7.4.4.	
8.12.57	AM Peak Actual Travel Speed (Urban)	atsu_amp	Weighted aggregate speed (measured over the full financial year) on a representative sample of arterial roads and freeways in major cities during AM peak hours.		DC	3	1	km/hr		P	3	Austroads National Performance Indicators NPI 7.1.1	
8.12.58	PM Peak Actual Travel Speed (Urban)	atsu_pmp	Weighted aggregate speed (measured over the full financial year) on a representative sample of arterial roads and freeways in major cities during PM peak hours.		DC	3	1	km/hr		P	3	Austroads National Performance Indicators NPI 7.1.2	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.59	Off Peak Actual Travel Speed (Urban)	atsu_off	Weighted aggregate speed (measured over the full financial year) on a representative sample of arterial roads and freeways in major cities during off peak hours.		DC	3	1	km/hr		P	3	Austroads National Performance Indicators NPI 7.1.3	
8.12.60	All Day Actual Travel Speed (Urban)	atsu_day	Weighted aggregate speed (measured over the full financial year) on a representative sample of arterial roads and freeways in major cities over the whole day.		DC	3	1	km/hr		P	3	Austroads National Performance Indicators NPI 7.1.4	
8.12.61	Nominal Travel Speed (Urban)	ntsu	Weighted aggregate speed (measured over the full financial year) on a representative sample of arterial roads and freeways in major cities, assuming vehicles travel at the posted speed limit.		DC	3	1	km/hr		P	3	Austroads National Performance Indicators NPI 7.2	
8.12.62	AM Peak Congestion Indicator (Urban)	cgi_amp	Difference between Actual and Nominal Travel Time (measured over the full financial year) — delay from traffic conditions which do not permit travel at the posted speed limit during AM Peak hours.		DC	3	1	Min/km		P	3	Austroads National Performance Indicators NPI 7.3.1	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.63	PM Peak Congestion Indicator (Urban)	cgi_pmp	Difference between Actual and Nominal Travel Time (measured over the full financial year) — delay from traffic conditions which do not permit travel at the posted speed limit during PM Peak hours.		DC	3	1	Min/km		P	3	Austroads National Performance Indicators NPI 7.3.2	
8.12.64	Off Peak Congestion Indicator (Urban)	cgi_off	Difference between Actual and Nominal Travel Time (measured over the full financial year) — delay from traffic conditions which do not permit travel at the posted speed limit during off peak hours.		DC	3	1	Min/km		P	3	Austroads National Performance Indicators NPI 7.3.3	
8.12.65	All Day Congestion Indicator (Urban)	cgi_day	Difference between Actual and Nominal Travel Time (measured over the full financial year) — delay from traffic conditions which do not permit travel at the posted speed limit over the whole day.		DC	3	1	Min/km		P	3	Austroads National Performance Indicators NPI 7.3.4	
8.12.66	AM Peak Variability of Travel Time (Urban)	vtt_amp	Variability of travel time (measured over the full financial year) on a representative sample of arterial roads and freeways in the urban metropolitan area during AM Peak hours.		DC	3	1	%		P	3	Austroads National Performance Indicators NPI 7.4.1	

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.12.67	PM Peak Variability of Travel Time (Urban)	vtt_pmp	Variability of travel time (measured over the full financial year) on a representative sample of arterial roads and freeways in the urban metropolitan area during PM Peak hours.		DC	3	1	%		P	3	Austroads National Performance Indicators NPI 7.4.2	
8.12.68	Off Peak Variability of Travel Time (Urban)	vtt_off	Variability of travel time (measured over the full financial year) on a representative sample of arterial roads and freeways in the urban metropolitan area during off peak hours.		DC	3	1	%		P	3	Austroads National Performance Indicators NPI 7.4.3	
8.12.69	All Day Variability of Travel Time (Urban)	vtt_day	Variability of travel time (measured over the full financial year) on a representative sample of arterial roads and freeways in the urban metropolitan area over the whole day.		DC	3	1	%		P	3	Austroads National Performance Indicators NPI 7.4.4	
Unplanned Incidents													
8.12.70	Time to respond to incident	inc_r_time	Incident response time. Time to respond and restore service from the time of event occurring/reported	30/06/2005:08:10:24	DT	14				P	2		
User Satisfaction													
8.12.71	User Satisfaction Index	usi	The USI is an indicator which measures road users' satisfaction with the road system. Index of users' qualitative evaluation of satisfaction with road system outcomes expressed as a mean score out of 5.	5 - Very Dissatisfied	I	1			Code List 9.72	P	3		

8.13 Access

Overview

Access and restrictions for the transport network/system includes the factors that affect or limit travel use or behaviour by some or all users of the road asset, often based on some characteristic of the user.

Access can be empowered or restricted on typically the following basis:

- Single mode only links or lanes (cycleway, busway or part-time bus lanes);
- Motorway (no cycling, no pedestrians, bus or T2 lanes);
- Vehicle weight limits (often due to bridge or pavement strength limits);
- Vehicle size limits (vehicle width, height, length, say through tunnels or under overbridges);
- Heavy Goods Vehicles in general (residential zones or Central Business Area lanes);
- Tolled access (payment is required to travel); and
- One way travel or speed restrictions.

Access and restrictions can be permanent or temporary. Those that are permanent, once installed take significant process to change and thus rarely change. To manage the restriction or empowerment significant warning needs to be located within the road corridor and consistent supporting systems like signage in place.

Scope

Permanent access and restrictions or mode empowerment are usually focused on strategic network level outcomes and are quite specific. To ensure those vehicles to be excluded or empowered are addressed usually there will be detailed legal background to the situation.

Temporary access control can be used as an operational management tool through applying periodic, seasonal, or temporary to address specific local conditions. Periodic control is most often associated with facilities like schools and typically major sports stadia, when there are specific times that controls are required to manage operational safety and efficiency.

Access and restrictions are recorded using differing transport datasets for permanent or temporary situations. The need for on-road warning and legal requirements for permanent controls means they are embedded into the network assets through warning signage and road markings. Mapping of permanent restrictions is helpful to understand the strategic nature of them, this also suits enforcement since some controls can cover large areas and many links within a network.

Table 8.84: Access – Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Identification													
8.13.1	Restriction ID	restr_id	Unique identification code for the restriction		AN	10				D	1		
8.13.2	Restriction type	restr_type	The restriction type.	DIR – Direction	A	10			Code List 9.39	D	1		M
8.13.3	Restriction reason	restr_cse	The reason for the restriction being applied	Weather	A	10			Code List 9.38	D	1		M
8.13.4	User group restriction applies to	restr_app	The user group that the restriction applies to.	MOTORB – Motor bikes	A	6			Code List 9.40	D	1		M
8.13.5	Restriction unit	restr_unit	Unit for the value dimensioning the restriction.		A	2			m – metres kg – kilograms	D	1		M
8.13.6	Restriction value	restr_val	Unit of measure for the restriction	10.28 metres	DC	8	2			D	1		
8.13.7	Organisation responsible	restr_resp	The organisation responsible for the asset causing the restriction	A – asset owned by agency	A	1			A – asset owned by agency O – asset owned by others	D	1		
8.13.8	Restriction owner	restr_ownr	The owner of the asset causing the restriction		A	1				D	1		
Time Period													
8.13.9	Restriction status	restr_stat	The status of the restriction.	P - permanent	A	1			P - permanent T - temporary	D	1		
8.13.10	Restriction period	restr_peri	The time period the restriction applies	C - continuous (24/7)	A	1			C - continuous (24/7) P - periodic	D	1		
8.13.11	Restriction start date	restr_s	The date the restriction starts	38533	D	8				D	1		
8.13.12	Restriction end date	restr_e	The date the restriction ends	38533	D	8				D	1		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.13.13	Restriction day	restr_day	The days that the restriction applies.		A	20			M,T,W,TH,F,SA,SU	D	1		
8.13.14	Restriction start time	restr_t_s	The time the restriction starts	30/06/2005:08:10:24	DT	14				D	1		
8.13.15	Restriction end time	restr_t_e	The time the restriction ends	30/06/2005:10:10:30	DT	14			dd/mm/ccyy:hh:mm:ss	D	1		

8.14 Works and Costs

Overview

The purpose of this function group is to provide a data set for planning, describing and capturing maintenance and forward works and the associated costs. This data is currently used by road agencies for a variety of purposes including:

Traffic Advisory Active physical road works activities are communicated to road users, typically via a publically accessed website or digital notification subscription service, by the road agencies. This information promotes road network efficiency;

Asset Register Physical works achievement, principally capital and renewal works, should be reflected in the asset register and any related financial registers. The capture of this information provides a trigger for action and the basis for reconciling any updates;

Valuation Impacts Capital and renewal projects directly impact the asset valuation through the provision of new assets. This data set will provide the basis for recognising new assets and the associated capital cost. The costs alone could also provide the basis for establishing appropriate replacement costs across the asset portfolio;

Investment Profiles The capture of construction, renewal and maintenance costs over time will provide the basis for producing historic investment profiles for each asset group. This information may also provide the basis for projecting future costs profiles;

Intervention Parameters Defining the intervention triggers which may prompt road agencies to undertake works on the basis of safety, condition, cost of maintenance, efficiency (due to the proximity of similar or complementary works) or the consequences of asset failure. The treatment type will depend of the trigger parameter;

Intervention Criteria	Determining the point at which intervention is warranted in terms of level of service condition or least cost where accumulated historic and future maintenance costs exceed the cost of the treatment proposed;
Replacement Analytics	The recording of the expected useful life at the time of construction will provide the basis for determining the actual return on capital investment. Calculating the remaining life will assist to determine the anticipated end of asset life and renewal or replacement timing and cost;
Cost Estimates	Recording works achievement with the related cost will provide a basis for refining future cost estimates for similar works;
Condition Indicator	Rising maintenance costs, associated with the same asset, can be an empirical indicator of asset condition and potential remaining life; and
Treatment Selection	Cost monitoring and related condition analysis will provide an indication of systemic maintenance issues where accumulated cost can be compared to more extensive treatments beyond continued maintenance. Treatment selection analysis requires a sound understanding of accumulated costs as well as a predicted future works and costs.

Scope

The capture of works and costing data can impact on management and investment decisions from a number of sources for the delivery of:

- Capital Projects inclusive of asset upgrades;
- Rehabilitation, Routine and Planned Maintenance; and
- “Special” Road Projects.

Works and Costing data is a critical indicator in investment decisions and can be accessed from a number of sources including:

- Industry established tools including pavement management systems (estimated costs), maintenance management systems (achieved costs and works);
- Industry publications (estimated costs); and
- Financial management systems (capital costs etc.).

Table 8.85: Works and Costs - Data Items

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Forward Works Plan													
8.14.1	Forward works program category	fwp_treat	The proposed FWP treatment	Replace	A	5			Code List 9.21	P	2		M
8.14.2	Forward works program treatment reason	fwp_reason	The reason for the treatment	High maintenance costs	A	10			Code List 9.20	P	2		M
8.14.3	Planned forward work treatment start year	fwp_yr_s	This is the first year of the financial year. For example: 2016 for the 2016_2017 financial year	yyyy	D	4		yrs		P	2		M
8.14.4	Forward works program treatment location start	fwp_start	This is the start of the forward works program treatment length		I	6		m		L	2		M
8.14.5	Forward works program treatment location end	fwp_end	This is the end of the forward works program treatment length		I	6		m		L	2		M
8.14.6	Forward work program intervention parameter	fwp_param	The reason for planning a treatment	Safety, condition, asset preservation, end of economic life	A	20				L	2		
8.14.7	Forward work program intervention threshold	fwp_thresh	Defining the parameter or condition that triggers the intervention treatment	Texture < 0.6mm (safety)	AN	20				L	2		M
8.14.8	Forward works treatment estimated cost	fwp_cest	This is the estimated cost allocated to the future treatment		MO	10	2	$		P	2		M
8.14.9	Planned forward treatment end year	fwp_end_yr	This is the planned year that the treatment in the work program ends		I	4		Yrs		P	2		M

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
Maintenance													
8.14.10	Maintenance defect ID	mt_def_id	Unique identification number that relates to the defect		AN	10				P	2		
8.14.11	Defect description	mt_def	A description of the identified hazard or defect	Pot holes	A	20			Code List 9.12	P	2		M
8.14.12	Status of work	mt_status	The status of the work identified to address the recorded defect	Programmed	A	2			Code List 9.73	P	2		M
8.14.13	Unit for payment	mt_unit	The unit for payment for the work activity used to remedy the defect	sqm - Square metres	A	3			Code List 9.71	P	2		
8.14.14	Work quantity	mt_quan	The quantity of the actual work completed to address the recorded defect, for a given activity		DC	7	1			P	2		M
8.14.15	Work schedule rate	mt_crate	The contract schedule rate or proxy rate that applies to the maintenance activity to address the identified defect.		Mo	10	2	$		P	2		
8.14.16	Actual paid amount	mt_cost	The actual amount paid that applies to the maintenance activity to address the identified defect. This should be calculated from the quantity and rate. [maint_work_rte] x [maint_work_quantity]		Mo	10	2	$		P	2		M
8.14.17	Date approved for payment	mt_date_a	This is the date the completed work was approved for payment	ddmmyyyy	D	8				P	2		
8.14.18	Defect liability start date	mt_dlp_s	Starting date of defects liability period	ddmmyyyy	D	8				P	3		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.14.19	Defect liability end date	mt_dlp_e	End date of defects liability period	ddmmyyyy	D	8				P	3		
8.14.20	Source Identification	mt_id	The hazard or defect is identified from a routine patrol inspection activity or from an external source (call centre).	Routine inspection or External Source	AN	20				P	3		
8.14.21	Source Identification Reference	mt_ref	Enquiry Tracking System reference number or similar	500759144	AN	20				P	3		
8.14.22	Date and time of creation	mt_date_cr	The date and time that the hazard or defect was identified or of notification from an external source	dd/mm/ccyy:HH:MM:SS	DT	14				P	3		
8.14.23	Intervention parameter	mt_int_par	The reason for undertaking or planning the repair of a hazard or defect.	Safety, condition, asset preservation	A	20				P	3		
8.14.24	Intervention threshold	mt_int_thr	The point at which intervention is required.	Potholes greater than 300mm diameter and greater than 100mm deep, all other potholes	AN	20				P	3		
8.14.25	Action completed	mt_action	Define whether a hazard or defect has been rectified or appropriate warning signage installed	Completed	A	20			Code List 9.73	P	2		
8.14.26	Date and time of completion	mt_compl	The date and time that the hazard or defect was rectified or warning signage was installed.	dd/mm/ccyy:HH:MM:SS	DT	14				P	2		
8.14.27	Location reference type	mt_loc	The type of location reference that applies to the maintenance activity.		I	6		m		P	2		

Ref	Name	Code	Definition	Example	Type	Precision	Scale	Unit	List	Purpose	Soph	Industry Reference	PHS
8.14.28	Activity group	mt_act_grp	The overall work activity group	Reactive Mainatenance	A	12			Code List 9.25		2		M
8.14.29	Work activity	mt_act	The work activity that is planned or has been undertaken	Repaint, remove	A	20			Code List 9.25	P	2		M
8.14.30	Maintenance cycle	mt_cyc	The timing of the cycle which the work activity is undertaken	Monthly, yearly, summer, winter	A	20					1		
Output													
8.14.31	Forward work treatment actual completed cost	fwp_cost_a	This is for completed works and is an all inclusive cost to do the work		Mo	10	2	$		P	2		
8.14.32	Routine maintenance efficiency	rme	Routine Maintenance Efficiency expressed as a percentage		I	3		%	0 to 100	P	1		
8.14.33	Percent routine maintenance	prm	The percentage of the network that is receiving routine maintenance		I	3		%	0 to 100	P	1		
8.14.34	Benefit cost ratio	bcr	A value measure for undertaking an activity relative to its cost		DC	3	1			P	2		
8.14.35	Depreciated replacement cost	drc	Depreciated replacement cost for asset		Mo	10	2	$		P	2		
8.14.36	Actual work treatment start date	treat_s_a	This is the date that the actual treatment in the work program started	ddmmyyyy	D	8				P	1		
8.14.37	Actual work treatment end date	treat_e_a	This is the date that the actual treatment in the work program ended	ddmmyyyy	D	8				P	1		

9. Referenced Code Lists

This section provides the code lists that are referenced by attributes:

Table 9.1: Above-Below Retain Wall

Code	Description
BANK	Bank
C-PROP	Council property
DWY	Driveway
OPEN	Open Space
PATH	Path
PRIV	Private Property
ROAD	Roadway
SEA	Sea
STRU	Structure
WCOURSE	Waterway

Table 9.2: Asset Class

Code	Description
AMENITY	Amenities
BINS	Bins
BRIDGE MAJOR CULVERT	Bridge / Major Culvert
CULVERT MINOR	Culverts (Minor)
FENCE	Fences
ITS	ITS Assets
KERB AND CHANNEL	Kerb and Channel
LANDSCAPING	Landscaping
LIGHTING	Lighting
LINEMARKING	Linemarking Assets
MECH AND ELEC	Mechanical and Electrical Assets
PARKING	Parking
PATHWAY	Pathways
PAVEMENT	Pavement
PAVEMENT SURFACING	Pavement Surfacing
PIT	Pits
POLES	Poles
PUBLIC ART	Public Art
PUBLIC TOILET	Public Toilets
RETAINING WALL	Retaining Walls
ROAD BARRIER	Road Barriers
SHELTER	Shelters
SIGN	Signs
SLOPE	Slopes
STRUCTURE	Structures
TABLE DRAIN	Table Drains
TACTILE PAVING	Tactile Paving
TRAFFIC DEVICE	Traffic management Devices
TRAFFIC SIGNAL	Traffic Signals
TREE	Trees
TUNNEL	Tunnels
VEHICLE CROSSING	Vehicle Crossings

Table 9.3: Asset Status

Code	Description
ABN	Abandoned or Disused
INACTIVE	Not in current use, however available
INUSE	In-Use
OTHER	Other Use
PLANNED	Planned
REM	Removed
ABN	Abandoned or Disused

Table 9.4: Bin Intended Use

Code	Description
GLASS	Glass Only
GREEN	Green Waste
HAZCHEM	Hazardous Material
RECYC	Recycle
WASTE	Waste

Table 9.5: Bridge Major Culvert

Code	Description
CUL	Culvert
FB	Footbridge
PED	Pedestrian Overpass/underpass
RAC	Road and Separate Cycleway
RAIL	Rail
RAP	Road and Pedestrian
RAR	Road and Rail
RB	Road bridge
UP	Stock crossing/Underpass

Table 9.6: Component Code

Code	Description
1S	Steel Box Girder
24C	Cast-Insitu Abutment
3T	Timber Through Truss
8P	Precast Deck Slab

Table 9.7: Component Type

Code	Description
BG	Box Girder
COL	Column
TB	T Beam

Table 9.8: Condition Rating

Code	Description
1	Very Good ('as-new')
2	Good (minor defects)
3	Fair or Moderate (significant maintenance)
4	Poor (significant renewal/ rehabilitation required)
5	Very Poor (significant defects in need of major works by way of replacement)

Table 9.9: Confidence

Code	Description
A	Assessed
G	Guessed
M	Measured
U	Unknown

Table 9.10: Crash Road User Classification

Code	Description
A	Articulated Truck
B	Bus
C	Car
E	Pedestrian
F	SUV / 4x4
H	Heavy Truck
I	Bicycle
K	Skateboard / In-line Skater
L	Light Truck
M	Motorcycle
O	Other / Unknown
P	Moped
Q	Equestrian
R	Heavy Rigid Truck
S	School Bus
U	Ute
V	Van
W	Wheeled Pedestrian (e.g. wheelchair)
X	Taxi / Taxi Van

Table 9.11: Crash Severity

Code	Description
FAT	Fatal injury crash
MIN	Minor injury crash
NON	Non-injury crash
SER	Serious injury crash

Table 9.12: Criticality Rating

Code	Description
1	Essential to the organisation in delivering its service obligations (ie. life line routes)
2	Has a high potential to directly impact essential services
3	Has a low potential to directly impact essential services
4	Has no potential to impact any service obligations

Table 9.13: Defect

Code	Description
ACCIDENT	Vehicle accident
ADMIN	Administration
AGG LOSS	Aggregate Loss
APR REP	Approach Repair
BLOCKDD	Blocked
BROKEN	Broken
COND	Condition
CORRODED	Corroded
CORRUG	Corrugations
CRACK	Cracking
DAMGED	Damaged
DEBRIS	Debris
DECK REN	Deck Renew
DECK REP	Deck Repair
DEFORM	Deformation
DEPRESS	Depression
DETRITUS	Detritus
DRAIN INAD	Drainage - Inadequate
DUST	Dust Nuisance
EDGE BRK	Edge Break
EROSION	Erosion, includes scouring
FOUND	Foundation
GRAFF	Graffiti
INSP	Inspections
JOINT	Joint Repair
LANDSLIP	Landslip
LEANING	Leaning - sign
LEVEL SERV	Level of Service not being met
LITTER	Litter
LOOSE	Loose
LOW SURF	Low Surface
PAIN	Painting
POT HOLES	Pot holes
RAIL MAINT	Rail Maintenance
REDUND	Redundant
RUTTING	Rutting
SATURATED	Saturated Pavement
SHAPE	Shape - Cross Sectional
STRUCT	Structural Members
TEXTURE BLEED	Texture - bleeding road surface
TEXTURE POLISHED	Texture - polished road surface
TRENCH	Trench Settlement
UNEV SURF	Uneven Surface
UNSAFE	Unsafe
VEGET	Vegetation

Table 9.14: Deflection Test

Code	Description
BB	Benklemen Beam
DFG	Deflectograph
FWD	Falling Weight Deflectometer
TSD	Traffic Speed Deflectometer

Table 9.15: Drainage Mechanism

Code	Description
P	Porous
S	Sub Soil
W	Weep Hole

Table 9.16: End of Life Reason

Code	Description
CD	Capacity / Demand
CS	Change of Standards
EL	Deterioration / End of Life
MP	Major Project Impact
OU	Other / Unknown
SC	Safety Considerations
TO	Technological Obsolecence

Table 9.17: Fence Function

Code	Description
AGRI	Agriculture
PERIM	Perimeter
PRIV	Privacy
SECURITY	Security

Table 9.18: Fence Type

Code	Description
BOLLARD	Bollard
ELECTRIC	Electric
PICKET	Picket style fence
POOL	Pool wire type fence
POSTTR	Post and Top Rail
POSTW	Post and Wire
RAIL	Rail only
WOODPAL	Wooden Paling Fence

Table 9.19: Function of the Feature

Code	Description
OR	Over Road
OW	Over Watercourse
UR	Under Road

Table 9.20: Functional Classification

Code	Description
ART	Arterial [2]
ACC	Access [6a]
ALV	Access Low Volume [6b]
NAT	National [1b]
NHV	National High Volume [1a]
PC	Primary Connector [4]
REG	Regional [3]
SC	Secondary Connector [5]

Note: for definitions of each functional classification refer to: http://www.nzta.govt.nz/assets/Road-Efficiency-Group/docs/functional-classification.pdf. Numbers in square brackets denote hierarchy of classification system.

Table 9.21: Forward Works Program Reason

Code	Description
BLEED	Bleeding
COND	Condition
CRACK	Cracking
DEFORM	Deformation
INAD DRAIN	Inadequate Drainage
MAINT	High Maintenance Costs
OPER	Operational
PPM	Pavement Performance Modelling Recommendation
SAFETY	Safety
SC	Second Coat

Table 9.22: Forward Works Program Treatment

Code	Description
IMPROVE	Improvement to existing assets (betterment of existing assets e.g. seal widening/extension)
NEW	New asset creation
RENEW	Refurbishment of an existing asset to a new condition
REPLACE	Replacement of exising assets (e.g. rehabilitation, resurfacing, footpath replacement)

Table 9.23: Kerb Type

Code	Description
BK	Barrier kerb (kerb)
BKC	Barrier kerb & channel (kerb & channel)
BUN	Bund
CPK	Car park kerb
DDC	Dish drain/channel
FK	Flat kerb
HAL	Half Pipe Channel
LK	Layback Kerb & channel
MK	Mountable kerb
MKC	Mountable kerb & channel
RK	Riley kerb
RKC	Roll top kerb & channel
SBK	Semi-Barrier kerb
SBKC	Semi-Barrier kerb & channel
SH	Shoulder
SK	Separation kerb

Code	Description
SLO	Slot Channel
SMK	Semi-Mountable kerb
SMKC	Semi-Mountable kerb & channel

Table 9.24: Lighting Type

Code	Description
BOL	Bollard
DIR	Directional
FEA	Feature (spot highlight)
NAV	Navigational
SOL	Solar
SPT	Sport Lighting
STR	Street Light
TWN	Twin Light
UPL	Up Light

Table 9.25: M&E ITS Types & Sub-Types

Code	Description
CABL-CDLN	Cables - Communication & Data Lines
CABL-PWLN	Cables - Power Lines
COMM-FTR	Communication - Fibre termination rack
COMM-MCP	Communication - Manual call point
COMM-MEP	Communication - Motorist emergency phone
COMM-PANC	Communication - Public address network controller
COMM-SNS	Communication - Sensor
COMM-SPK	Communication - Speaker
ELEC-BAT	Power/electrical (fixed/ stand-by) - Batteries
ELEC-CBR	Power/electrical (fixed/ stand-by) - Circuit breaker
ELEC-CBRSP	Power/electrical (fixed/ stand-by) - Circuit breaker – stand-by power
ELEC-CNC	Power/electrical (fixed/ stand-by) - Control cabinet
ELEC-CNP	Power/electrical (fixed/ stand-by) - Control panel
ELEC-CNT	Power/electrical (fixed/ stand-by) - Contactor
ELEC-CNTSP	Power/electrical (fixed/ stand-by) - Contactor – stand-by power
ELEC-DSB	Power/electrical (fixed/ stand-by) - Distribution board
ELEC-DSBSP	Power/electrical (fixed/ stand-by) - Distribution board – stand-by power
ELEC-EESL	Power/electrical (fixed/ stand-by) - Emergency exit strobe light
ELEC-GSSP	Power/electrical (fixed/ stand-by) - Generator set – stand-by power
ELEC-HWR	Power/electrical (fixed/ stand-by) - Hardware??
ELEC-IABC	Power/electrical (fixed/ stand-by) - Incoming ACB??
ELEC-ISO	Power/electrical (fixed/ stand-by) - Isolator
ELEC-JBX	Power/electrical (fixed/ stand-by) - Junction box
ELEC-KBS	Power/electrical (fixed/ stand-by) - Keyboards
ELEC-LFT	Power/electrical (fixed/ stand-by) - Light fitting
ELEC-PFC	Power/electrical (fixed/ stand-by) - PF correction
ELEC-PLCC	Power/electrical (fixed/ stand-by) - PLC components
ELEC-PLCIO	Power/electrical (fixed/ stand-by) - PLC I/O
ELEC-PLCPU	Power/electrical (fixed/ stand-by) - PLC CPU redundancy
ELEC-PLCS	Power/electrical (fixed/ stand-by) - PLCs
ELEC-PMT	Power/electrical (fixed/ stand-by) - Photo meter
ELEC-PWMSB	Power/electrical (fixed/ stand-by) - Power meter – stand-by power
ELEC-PWMT	Power/electrical (fixed/ stand-by) - Power meter
ELEC-SPD	Power/electrical (fixed/ stand-by) - Surge protection device
ELEC-SSU	Power/electrical (fixed/ stand-by) - Soft start unit
ELEC-SWT	Power/electrical (fixed/ stand-by) - Switch
ELEC-TRB	Power/electrical (fixed/ stand-by) - Termination block
ELEC-TRNS	Power/electrical (fixed/ stand-by) - Transformer
ELEC-UPS	Power/electrical (fixed/ stand-by) - UPS
ELEC-VSD	Power/electrical (fixed/ stand-by) - Variable speed drive
FIRE-ASD	Fire Protection - Aspirating smoke detector

Code	Description
FIRE-COB	Fire Protection - CO bottle
FIRE-DELG	Fire Protection - Deluge System Lines
FIRE-DTV	Fire Protection - Drain & test valve
FIRE-EEC	Fire Protection - Emergency eq. cabinets
FIRE-FDM	Fire Protection - Fire damper
FIRE-FDR	Fire Protection - Fire door
FIRE-FEX	Fire Protection - Fire extinguisher
FIRE-FIP	Fire Protection - Fire indication panel
FIRE-FSW	Fire Protection - Flow switch
FIRE-FSYS	Fire Protection - Foam System Lines
FIRE-FTR	Fire Protection - Flow transmitter
FIRE-GAC	Fire Protection - Gas actuator
FIRE-GSGP	Fire Protection - Gas suppression gas bottle
FIRE-GSS	Fire Protection - Gas solenoid switch
FIRE-HRL	Fire Protection - Hose reel
FIRE-IVL	Fire Protection - Isolation valve
FIRE-LHD	Fire Protection - Linear heat detector
FIRE-LHDC	Fire Protection - Linear heat detection controller
FIRE-LTR	Fire Protection - Level transmitter
FIRE-PCP	Fire Protection - Pipe coupling
FIRE-PDM	Fire Protection - Pulsation dampener
FIRE-PGG	Fire Protection - Pressure gauge
FIRE-PMP	Fire Protection - Pump
FIRE-PTR	Fire Protection - Pressure transmitter
FIRE-SCF	Fire Protection - Smoke control fan
FIRE-SDT	Fire Protection - Smoke detector
FIRE-SGL	Fire Protection - Sight glass
FIRE-SIN	Fire Protection - Surfactant injection
FIRE-SNB	Fire Protection - Snubber
FIRE-SND	Fire Protection - Sounders
FIRE-SPLN	Fire Protection - Sprinkler Lines
FIRE-SPR	Fire Protection - Sprinkler heads
FIRE-STR	Fire Protection - Strainer
FIRE-TMS	Fire Protection - Temperature sensor
FIRE-TNK	Fire Protection - Tank
FIRE-TSN	Fire Protection - Tank sensor
FIRE-VLV	Fire Protection - Valve
SECU-AVIDC	Security - Auto video incident detection camera
SECU-CAM	Security - Camera
SECU-CCTV	Security - CCTV camera
SECU-CNTL	Security - Controller
SECU-DOOR	Security - Door
TRAFF-ILP	Traffic Management Devices - Inductive loop
TRAFF-LUS	Traffic Management Devices - Lane use signals
TRAFF-OHD	Traffic Management Devices - Over height detector
TRAFF-TCB	Traffic Management Devices - Traffic control barrier
TRAFF-TSG	Traffic Management Devices - Traffic signals
TRAFF-VMS	Traffic Management Devices - Variable message sign
VAC-ACN	Ventilation & Air conditioning - Air conditioner
VAC-ASN	Ventilation & Air conditioning - Air sensor
VAC-DCT	Ventilation & Air conditioning - Duct
VAC-DIF	Ventilation & Air conditioning - Diffuser
VAC-DUCT	Ventilation & Air Conditioning - Ducts
VAC-FLT	Ventilation & Air conditioning - Filter
VAC-HCM	Ventilation & Air conditioning - Hydrocarbon compressor
VAC-HTR	Ventilation & Air conditioning - Hydrocarbon trap
VAC-HYS	Ventilation & Air conditioning - Hydrocarbon sensor
VAC-JFN	Ventilation & Air conditioning - Jet fan
VAC-LVR	Ventilation & Air conditioning - Louver
VAC-PIPE	Ventilation & Air Conditioning - Pipes
VAC-PTR	Ventilation & Air conditioning - Pressure transducer
VAC-SAT	Ventilation & Air conditioning - Sound attenuator
VAC-SNS	Ventilation & Air conditioning - Sensor

Code	Description
VAC-VFN	Ventilation & Air conditioning - Ventilation fan
VAC-VSD	Ventilation & Air conditioning - Variable speed drive

Table 9.26: Maintenance Activity

Code	Description
CALIBRATE	Calibration (e.g. weigh in motion)
CLEAN	Clean (e.g. signs, guide posts, toliets, catchpits)
COLLECT	Data collection (e.g.traffic counting)
CRACK FILL	Crack Filling
CRACK SEAL	Crack Sealing
DIGOUT	Digout
EDGE	Edge repair (e.g. edgebreak)
EMPTY	Empty (e.g.bins, stock effluent)
ENERGY	Energy charges (e.g. streetlighting)
FIRE	Fire management
GRADING	Grading
INSIT STAB	Insitu Stabilisation
INSPECT	Inspections (e.g. routine, cyclic, planned)
MAINT PREVENT	Maintenance (preventative e.g. culvert cleaning, bus stops, landscaping, barriers)
MAINT REACTIVE	Maintenance (routine repairs)
MILLING	Milling
MIN LEVEL	Minor Levelling/Regulation
MONITOR	Monitoring (e.g. surveillance, traffic monitoring)
MOWING	Mowing (e.g. verges, medians)
OVERLAY	Overlay
POT HOLE	Pot Hole Repairs
PROGR	Programming
PROTECT	Protection (e.g.trees, security fencing)
REALIGN	Realign (e.g.signs)
REINSTATE	Reinstate (e.g. fallen sign)
REMOVE	Remove (e.g.graffiti, debris, trees)
REPAINT	Repaint
REPAIRS	Repairs (reactive e.g vandalism, signs)
REPLACE	Replace (e.g.missing sign, missing RRPRM's, Missing guide posts, bridge components)
REPORTNG	Reporting
RE-SHEET	Re-sheet (e.g.unsealed roads)
RESPONSE	Incident response (e.g. stock, crashes, floods, fires, storms, ice gritting, snow clearing)
RESURFACE	Resurface
RIP REMAKE	Rip and Remake
SERV COV ADJUST	Service Cover Adjustment
SHLDR MAINT	Shoulder Maintenance
SWEEEPING	Sweeping (e.g.street cleaning)
TRAFF MAN	Traffic Management
TRIMMING	Trimming (e.g. trees)
WATER CUT	Water Cutting

Table 9.27: Material

Code	Description
ABL	Asphalt – Black
AL	Aluminium
ARD	Asphalt – Red
BED	Bedrock
BITUMEN	Bitumen
BOULDER	Boulders
BRASS	Brass
BRICK	Brick
BSTN	Bluestone
CCONC	Coloured Concrete
CLAY	Clay
CONC	Concrete
CORR	Corrugated Steel/Aluminium
CU	Copper
EAG	Exposed Aggregate
EARTH	Earth
FIBERG	Fibreglass
FIBRERC	Fibre reinforced concrete
GEW	Glazed Earthenware
GMT	Gunmetal
GR	Grass
GRAVEL	Gravel
GUNN	Gunnite
GWI	Galvanised Wrought Iron
HDPE	High Density Polyethylene
IRON	Iron

Code	Description
KD	Kiln Dust
LIME	Lime
MDPE	Medium Density Polyethylene
MI	Malleable Iron
MSW	Mild Steel Welded
NYL	Nylon
OPVC	Oriented PVC
ORG	Organic
PAINT	Paint
PE	Polyethylene
PHB	Phosphor Bronze
PPP	Polypropylene
PVC	Polyvinylchloride
RC	Reinforced Concrete – No Class
RC1	Reinforced concrete Class 1
RC2	Reinforced concrete Class 2
RC3	Reinforced concrete Class 3
RC4	Reinforced concrete Class 4
RUBBER	Rubber
SAND	Sand
SPD	Glazed Stoneware
SPIR	Spiral Wound Steel/Aluminium
SSTEEL	Stainless Steel
SSTEEL316	Stainless Steel (grade 316)
STEEL	Steel
STONE	Stone
THERMOPLASTIC	Thermoplastic
TILE	Tiles
TIMBER	Timber
UCON	Un-reinforced Concrete
UNK	Unknown
UPVC	Un-plasticised Polyvinyl chloride
UPVC-P	Profile-Wall Un-plasticised Polyvinylchloride
UPVC-S	Un-plasticised Polyvinylchloride
VC	Vitreous clay
WC	Wood Chip
WI	Wrought Iron

Table 9.28: Parking Purpose

Code	Description
BUS	Bus
DIP	Diplomatic
DIS	Disabled
LOZ	Loading Zone
MC	Motorcycle
POL	Police
REG	Regular
RES	Residents
TAX	Taxi

Table 9.29: Pathway Type

Code	Description
BA	Beach Access
BW	Bikeway
CL	Cycle lane
CT	Cycle track
FP	Footpath
HT	Horse Trail
PA	Pedestrian Access
PR	Pram Crossing
SP	Shared Path (cycles / pedestrians)
WT	Walking Track

Table 9.30: Performance Category

Code	Description
ACHIEVE	Achievement
ALIFE	Asset Life
CUSTEXP	Customer Experience
CUSTSAF	Customer Safety (Condition)
DEVPROG	Development Program / Project Assessment
FINANCE	Financial
INCIDNT	Unplanned Incidents
INVENT	Inventory
INVEST	Investment
JNYINT	Journey Interuptions
OUTPUT	Output
PUBLIC	Public Transport
RDSAFE	Road Safety
TSPEED	Travel Speed
USERSAT	User Satisfaction

Table 9.31: Pipe Shapes

Code	Description
ARCH	Arch pipe
CIRC	Circular pipe
EGG	Egg pipe
EGG2	Egg pipe (elongated)
OVAL	Oval pipe
RECT	Rectangular pipe
UTOP	U-shape pipe
PARB	Parabolic channel (broad)
PARN	Parabolic channel (narrow)
RCTC	Rectangular channel
TRAP	Trapezoidal channel
USCH	U-shape channel
VSCH	V-shape channel

Table 9.32: Pipe Type

Code	Description
CLEAN	A pipe that carries clean roof water
CULVERT	Minor culvert
INLET	Inlet
OPEN	Open drain
OUTFALL	Outfall discharge point
OVERFLOW	Pipe that carries excess water to or from a pit
PIPE	A pipe used to convey liquids
SUBSOIL	A slotted or perforated pipe laid below ground

Table 9.33: Pit Construction Type

Code	Description
AN	Annealed
CAST	Cast-insitu
CORR	Corrugated
EX	Extruded
F	Folded
GC	Gravity cast
HD	Hard drawn
LB	Lock bar
MC	Mandrill cast
PC	Precast
RIV	Riveted
S	Seamless
SC	Spun cast
UNK	Unknown

Table 9.34: Pit Lid Type

Code	Description
CA	Cast iron
CI	Concrete insert
CO	Concrete
F	Fibreglass
GA	Steel-Gatic
GR	Grate

Table 9.35: Pit Litter Type

Code	Description
GPT	Gross Pollutant Trap
LTSK	Litter Sock
OWSP	Oil & Water Separator
SDTR	Sediment Trap
SNTR	Sand Trap
TRRT	Trash Rack/Rubbish Trap

Table 9.36: Power Source

Code	Description
BATTERY	Battery Supply
GENERATOR	Power Generator (Petrol or Diesel)
GRID	Direct off the power grid
MAIN	Mains power supply
SOLAR	Solar Panels
WIND	Wind Turbine

Table 9.37: Remaining Asset Life Calculation Method

Code	Description
DESK	Desktop assessment
ENG	Engineering model
FIELD	Field Assessment

Table 9.38: Restriction Reason

Code	Description
BUILT	Built Asset
GEOM	Geometrics
HAZARDM	Hazardous Materials
NATURAL	Natural asset (i.e. tree, cutting etc.)
REG	Regulatory
VEHICLE	Vehicle Type
WEATHER	Weather

Table 9.39: Restriction Type

Code	Description
ACCESS	Access
AGRI	Agricultural machinery
AXLE	Axle limit
DIR	Direction
HAZCHEM	Hazardous Material
HEIGHT	Height (Vertical) clearance
LENGTH	Length
TOLL	Toll fee applicable
WEIGHT	Weight
WIDTH	Width clearance

Table 9.40: Restriction User Group

Code	Description
ALL	All vehicles
ALLXB	All vehicles except buses
BUS	Buses
CAR	Cars
CYCL	Cyclists
HCV	Heavy Commercial vehicles
MOTORB	Motorbikes
PED	Pedestrians

Table 9.41: Retain Wall Restraint Type

Code	Description
CANT	Cantilever
CSTEM	Cantilever Stem / Counterfort
FACE	Facing
GRAVITY	Gravity
NONE	None
PIN	Pins and nails
TIED	Tied

Table 9.42: Retain Wall Type

Code	Description
ANCHORED	Anchored
BORED	Bored Pile
CANTILEVER	Cantilevered
GRAVITY	Gravity
MECHANICAL	Mechanical Stabilisation
SHEET	Sheet Pile
SOIL-NAIL	Soil Nailing
SOIL-STREN	Soil Strengthening

Table 9.43: Road Barrier Type

Code	Description
GUARD	Guardrail
NJB	New Jersey Barrier
NOISE	Noise Attenuation
SAFETY	Safety barrier
SIGHT	Sight rail
WIRE	Wire rope

Table 9.44: Safety Related Risk Rating

Code	Description
LOW	Collective Risk ≤0.039 Personal Risk ≤4
LOWMED	Collective Risk 0.04 ≤ 0.069 Personal Risk 4 ≤ 4.9
MED	Collective Risk 0.07 ≤ 0.10 Personal Risk 5 ≤ 6.9
MEDHIGH	Collective Risk 0.11 ≤ 0.189 Personal Risk 7 ≤ 8.9
HIGH	Collective Risk 0.19+ Personal Risk 9+

Table 9.45: SCRIM Vehicle

Code	Description
UNKNOWN	Unknown vehicle
NSW	NSW SCRIM
VIC	Victorian SCRIM
UK	UK Certified SCRIM Vehicle

Table 9.46: Shelter Type

Code	Description
BUS	Bus
PED	Pedestrian
TRAM	Tram

Table 9.47: Side of Road

Code	Description
B	Both
C	Centre
L	Left
R	Right

Table 9.48: Skid Resistance Test Device

Code	Description
GRIPTESTER	Grip Tester
ROAR	Norsemeter ROAR
SCRIM	SCRIM
UNKNOWN	Unknown vehicle

Table 9.49: Slope Anchors

Code	Description
GROUND	Ground Anchor
ROCK	Rock Bolts
SOIL	Soil Anchors

Table 9.50: Slope Drain Liner

Code	Description
CONCRETE	Concrete
GRAVEL	Gravel
PLASTIC	Plastic
ROCK	Rock
SOIL	Soil
VEGE	Vegetation

Table 9.51: Slope Fabric

Code	Description
COIR	Coir Matting
GEOGRID	Geogrid
GEOMAT	Geomat
GEOTEXTILE	Geotextile
JUTE-MAT	Jute Matting
JUTE-MESH	Jute Mesh

Table 9.52: Slope Material

Code	Description
ROCK	Rock
SOIL	Soil

Table 9.53: Slope Monitoring

Code	Description
ACCOUSTIC	Acoustic Emission technique
CRACK	Crack Monitor
EXTENSION	extensometers
GPS	Global Positioning System
GROUND	Ground survey
INCLINE	inclinometers
LASER	Laser Image Scanning
PHOTOS	Photographic
PIEZO	piezometers
RADAR	Slope Stability Radar
TILT	tiltmeters
SURVEY	Total Station
VISUAL	Visual

Table 9.54: Slope Seismic Rating

Code	Description
H	High (1.0-2.5% landslide area or 10-30 1s/km2)
L	Low (<0.5% landslide area and <3 1s/km2)
M	Moderate (0.5-1.0% landslide area or 3-10 1s/km2)
VH	Very high (>2.5% landslide area or >30 1s/km2)

Table 9.55: Slope Vege

Code	Description
GRASS	Grass
SHRUB-DEC	Shrub - deciduous
SHRUB-EVE	Shrub - evergreen
TREE-DEC	Tree - deciduous
TREE-EVE	Tree - evergreen

Table 9.56: Surface Additive Type

Code	Description
CRBR	Crumb Rubber
EFXC	Emoflex C
EMO	Emoflex
EVA	Ethyl Vinyl Acetate
NRLX	Natural Rubber Latex
PEEH	Techniflex EH Polymer
PM01	Techniflex PMB 101
PM05	Techniflex PMB 105
PM30	Techniflex PMB 130
PMB1	Techniflex PMB 100
PMB4	Techniflex PMB 400
PMB6	Techniflex PMB 600
PMB8	Techniflex PMB 800
PMBP	Paveflex PMB
POL1	Polybilt 101
POL2	Polybilt 102
POL3	Polybilt 103
POLY	Polymer
SAMC	Sam C
SAMF	Samfilla
SBR	Styrene Butadiene Rb
SX50	Fulton Hogan Paveflex 50
SX60	Fulton Hogan Paveflex 60
UNKN	UNKNOWN
XCS4	XCS 104

Table 9.57: Surface Adhesion Type

Code	Description
AA	Ammonia
BP50	BP50C
BTRN	Bitran H
CC10	CC101
CECA	CECA EXP 3747
D184	Dinoram 184
DHBG	Diamin HBG
DMPL	Duomeen T(Pastille)
DMPS	Duomeen T(Paste)
DMT	DMT
DOLB	Diamin OLB
DT	ours
MGA1	Megamine 100
MGBA	Megamine BA
N422	Redicote N422
N561	Redicote N561
N606	Redicote N606
N893	Redicote N893
P200	Polyram L200
RDIZ	Redicote Z
SHTA	Shell Tenicon A
TAA3	Tomah 3000
UNKN	UNKNOWN
WTFX	Wetfix C

Table 9.58: Surface Binder Type

Code	Description
B130	Bitumen 130/150
B180	Bitumen 180/200
B45	Bitumen 45/55
B60	Bitumen 60/70
B80	Bitumen 80/100
E180	Emulsion 180/200
E80	Emulsion 80/100
EC55	Emulsion Cationic quick set, 55
EC60	Emulsion Cationic quick set, 60
EC64	Emulsion Cationic quick set, 64
EC65	Emulsion Cationic quick set, 65
EC68	Emulsion Cationic quick set, 68
EC80	Emulsion Cationic quick set, 80
PME	Polymer Modified Emulsion
PORT	Portland Cement
QS	QSK 1
RE	Rubber Emoflex
RUB	Rubberised Bitumen
SKS	SKS-EN

Code	Description
SL	SLKP - EN
UNKN	Unknown
WATR	Water

Table 9.59: Surface Treat Type

Code	Description
1C	First coat
2C	Second coat
MEM	Membrane seal
RSL	Reseal

Table 9.60: Surface Type

Code	Description
ASPHALT	Asphalt
CHIP	Stone chip
CONCRETE	Concrete
GRAVEL	Gravel
OTHER	Other

Table 9.61: Traffic Flow Direction

Code	Description
C	Counterflow/ changeable direction
O	One way
T	Two way traffic flow

Table 9.62: Traffic Device

Code	Description
BOL	Bollard
CHI	Chicane
IP	Intersection Platform
MS	Median strip
PC	Pedestrian Crossing
PR	Pedestrian Refuge
RBT	Roundabout
RPAV	Raised pavement
RS	Rumble Strip
SB	Speed Bump
SC	School Crossings
SI	Splitter island

Table 9.63: Tree Age

Code	Description
MA	Mature – 20-80% of life expectancy in situ
OM	Over-mature – > 80% of life expectancy in situ
SM	Semi-mature – < 20% of life expectancy in situ
YN	Young – Recently planted

Table 9.64: Tree Environment for Roots

Code	Description
CELLB	Cell Block
FOOTPATH	Footpath
NO TREATMENT	No treatment
PIT	Tree Pit
UNKNOWN	Unknown

Table 9.65: Tree Height

Code	Description
1	< 5m
2	5m – 10m
3	10m – 15m
4	15m – 25m
5	> 25m

Table 9.66: Tree Planting Method

Code	Description
PL	Planted
RM	Remnant
SS	Self-Sown
UNK	Unknown

Table 9.67: Tree Significance

Code	Description
CUL	Cultural
END	Endangered
HIS	Historical
LNS	Landscape
NONE	None
SCI	Scientific
STS	Streetscape

Table 9.68: Tunnel Function

Code	Description
CUL	Cultural
END	Endangered
HIS	Historical
LNS	Landscape
NONE	None
SCI	Scientific
STS	Streetscape

Table 9.69: Tunnel Structure Type

Code	Description
ARCH	Arch
OVER	Overpass
UND	Underpass

Table 9.70: Type of Pavement Construction

Code	Description
B	Bridge
C	Concrete
GB	Granular Bound
GU	Granular Unbound
IB	Interlocking Block
SA	Structural Asphalt
U	Unsealed

Table 9.71: Units

Code	Description
cu	Cubic Metres
Ea	each
hr	Hours
kg	Kilograms
km	Kilometres
l	Litres
m	Metres
sqm	Square metres
t	Tonnes

Table 9.72: User Satisfaction

Code	Description
1	Very Satisfied
2	Satisfied
3	Acceptable
4	Dissatisfied
5	Very Dissatisfied

Table 9.73: Valuation Type

Code	Description
DRC	Depreciated Replacement Cost
ODRC	Optimised Depreciated Replacement Cost
RC	Replacement Cost

Table 9.74: Work Status

Code	Description
COMPL	Completed
DEF	Deferred
INPRO	In Progress
ONHOLD	On Hold
PROG	Programmed
SIGNED	Warning signage installed
UNDERINV	Under Investigation

10. Glossary of Terms and Definitions

Assessed is a term used to describe the accuracy of the data being recorded. It indicates that data has been calculated or estimated using available and related information or data.

Asset is something that has potential or actual value to an organisation. Value can be tangible or intangible, financial or non-financial. Tangible assets are physical assets which refer to equipment, inventory and properties owned by the organisation. Tangible assets are the opposite of intangible assets, which are non-physical assets such as leases, brands, digital assets, use rights, licences, intellectual property rights, reputation or agreements.

Asset function is used to represent one or more asset groups that perform the same function within an asset group.

Asset group assets having common characteristics that distinguish them separately (different manufacturer, different specification or different components) within an asset function.

Asset information is the combined set of data (graphical and non-graphical) and documents (drawings, manuals, plans, certificates) required to support the management of assets over the assets life cycle.

Asset information management is the discipline of managing the asset-related data and documents to a sufficient quality to support organisational objectives and outcomes.

Asset information repository a recognised physical or electronic location for the storage and management of asset information.

Asset information repository custodian a person responsible for managing an asset information repository and the processes related to the creation and maintenance of the information and provision of access to the information in the repository.

Asset information system a set of interrelated repositories of structured asset information and related processes required to manage the asset portfolio over the life cycle.

Asset life the period from conception to end-of-life.

Asset portfolio assets that are within the scope of the asset management system.

Asset register contains the definition and description of each asset in the asset portfolio. The asset register includes all the data required to ensure unique identification of the asset.

Asset system represents a top-level grouping of related asset groups.

Attribute piece of data forming a partial description of an object or entity.

Availability the measure of the percentage of time that an item or system is available to perform its designated function.

Configuration interrelated functional and physical characteristics of an asset defined in asset.

Configuration change refers to a change in functional or physical configuration of an asset.

Corridor is a linear zonal area within a boundary and defined by a start and end node that contains road infrastructure assets to support the operation of transport services.

Data information collected and stored but not yet interpreted or analysed (graphical and non-graphical).

Data harmonisation is to combine data definition and format from heterogeneous sources into integrated, consistent and unambiguous data specification to create unified understanding and to facilitate data sharing between organisations.

Data standardisation is to specify data definition and data format.

Defect an irregularity or fault in the asset that requires attention. Actions may include cleaning, repair, or further inspections.

Document information for use in the briefing, design, construction, operation, maintenance and disposal of a project or asset, including but not limited to correspondence, drawings, schedules, specifications, calculations, spreadsheets, reports, manuals and certificates.

Drawing static, printed or geographical representation of part or all a project or asset.

Dynamic data collected over time about how the asset is operating, performing, its condition, work done and measurements which change through its operation and maintenance.

Graphical data is typically conveyed using geometric data.

Guessed is a term used to describe the accuracy of the data being recorded; It indicates best judgement of the person providing the data, without any basis of measure.

Life cycle stages for an asset from conception through to disposal and any residual risks or liability period.

Maintainability is a characteristic of design and installation, expressed as the probability that an item will be restored to operating condition, within a given period, using prescribed procedures and resources.

Maintenance in the context of this document has two components:

- Routine maintenance, also referred to as recurrent maintenance, is a collective of all preventative and repair activities excluding renewals. Includes planned inspections, preventative maintenance, corrective maintenance and emergency response; and
- Renewals maintenance, also referred to as capital maintenance or major periodic maintenance (MPM), includes the cyclic renewal and upgrading of assets to avoid deterioration in their condition to ensure long term asset performance and financial sustainability.

Measured is a term used to describe the accuracy of the data being recorded; It indicates that the data is based upon a recognised standard and system of measure.

Metadata is data that provides information about other data. Two types of metadata exist: structural metadata and descriptive metadata. Structural metadata is data about the containers of data. Descriptive metadata uses individual instances of application data or the data content.

Non-graphical data is conveyed using alphanumeric characters.

Reliability the probability that a specified item will perform a specified function within a defined environment, for a specified length of time

Rural Classification where the posted road speed limit is greater than 70 km/hr.

Static data (or configuration data) defines the assets themselves (their design data) and the normal conditions in which they operate and interact with other assets.

Urban Classification where the posted road speed limit is 70 km/hr or less.

References

Austroads (2007) AGAM05B-07. *Guide to Asset Management Part 5B: Roughness.* Sydney, Austroads.

Austroads (2007) AGAM05C-07. *Guide to Asset Management Part 5C: Rutting.* Sydney, Austroads.

Austroads (2008) AGAM05D-08. *Guide to Asset Management Part 5D: Strength.* Sydney, Austroads.

Austroads (2006) AGAM05E-06. *Guide to Asset Management Part 5B: Cracking.* Sydney, Austroads.

Austroads (2009) AGAM05F-09. *Guide to Asset Management Part 5B: Skid Resistance.* Sydney, Austroads.

Austroads (2009) AGAM05G-09. *Guide to Asset Management Part 5G: Texture.* Sydney, Austroads.

Austroads (2011) AGPT05-11. *Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design.* Sydney, Austroads.

Austroads (2009) AGAM05A-09. *Guide to Asset Management Part 5A: Inventory.* Sydney, Austroads.

Austroads (2005) AP-R276/05. *Consistency in Approaches to Road Network Segmentation and Data Aggregation – Review of Current Practice.* Sydney, Austroads.

Austroads (2006) AP-R289/06. *Guidelines for the Development of a Level of Service Framework Based on Community Consultations.* Sydney, Austroads.

Austroads (2014) AGPT04B-14. Guide to Pavement Technology Part 4B: Asphalt. Sydney, Austroads.

Austroads (2015) AP-C87-15. *Austroads Glossary of Terms (2015 Edition)*. Sydney, Austroads.

Bureau of Infrastructure, Transport and Regional Economics (2015). *Australian Infrastructure Statistics – Yearbook 2015.* Canberra, Department of Infrastructure and Regional Development.

Australian Local Government Association (2015). *National State of the Assets Report 2015.* ACT, ALGA.

WALGA (2013/14). *Report on Local Government Road Assets and Expenditure 2013/14.* WALGA.

ARRB (2016). *Road Visual Condition Assessment Manual.* Perth, WALGA.

Western European Road Directors, Sub-Group Road data (2003). *Data Management for Road Administrations A Best Practice Guide, Version 2.0*. Western European Road Directors

Austroads (2009) AGAM05H-09. *Guide to Asset Management Part 5H: Performance Modelling.* Sydney, Austroads.

Austroads (2009) AGAM06-09. *Guide to Asset Management Part 6: Bridge Performance.* Sydney, Austroads.

Austroads (2009) AGAM07-09. *Guide to Asset Management Part 7: Road Related Assets Performance.* Sydney, Austroads.

Institute of Public Works Engineering Australasia (2015). *International Infrastructure Management Manual (IIMM), 5th Edition.* IPWEA

The Road Efficiency Group (2014). *One Network Road Classification Performance Measures, Final.* The Road Efficiency Group.

Institute of Public Works Engineering Australasia (2015). *Australian Infrastructure Financial Management Manual (AIFMM), Australian Edition 2015.* Sydney, IPWEA

ISO (2014) ISO 55001:2014(E). *Asset management – Management systems: Requirements, First Edition.* Switzerland, ISO

Appendix A Example Network Reporting Measures

Reporting Category		Measure Item	Unit	PHS Data Item(s)	Application Algorithm for Reporting
Network Dimensions	Road	Length	Km	road_len	sum of [road_len]
		Lane Kilometre	Km	lanekm_len	sum of [lanekm_len]
		Sealed Road	Km	link_s_len psurf_stat	Sum of [link_s_len] where [psurf_stat] = “S”
		Unsealed Road	Km	link_s_len psurf_stat	Sum of [link_s_len] where [psurf_stat] = “U”
		Sealed Urban Road	Km	link_s_len psurf_stat traf_set	Sum of [link_s_len] where [psurf_stat] = “S” and where [traf_set] = “U”
		Sealed Rural Road	Km	link_s_len psurf_stat traf_set	Sum of [link_s_len] where [psurf_stat] = “S” and where [traf_set] = “R”
		Unsealed Urban Road	Km	link_s_len psurf_stat traf_set	Sum of [link_s_len] where [psurf_stat] = “U” and where [traf_set] = “U”
		Unsealed Rural Road	Km	link_s_len psurf_stat traf_set	Sum of [link_s_len] where [psurf_stat] = “U” and where [traf_set] = “R”
	Bridges	Number	Num	asset_id asset_clas no_str_bri no_str_cul	Count of [asset_id) where [asset_clas] = “bridge major culvert” Or [no_str_bri] + [no_str_cul]
		Length	m	br_len	Sum of [br_len]
		Length Timber	m	br_len br_dek_mat	Sum of [br_len] where [br_dek_mat] = “timber”
	Tunnels	Number	Num	asset_id asset_clas	Count of [asset_id] where [asset_clas] = “tunnel”
		Length	m	tun_len	Sum of [tun_len]
		Length Lined and Serviced	m	tun_len tun_serv	Sum of [tun_len] where [tun_serv] = “S”
	Valuation	Replacement Cost	$	value value_type asset_clas	Sum of [value] where [value_type] = “replacement cost” and where [asset_clas] = “pavement + pavement surfacing + bridge major culvert + tunnel”
Network Use and Demand	Traffic Volume	Average AADT ALL National Classification	Num	aadt_all link_s_len ctype_onrc	Weighted average [aadt_all] by [link_s_len] where [ctype_onrc] = “NAT” or “NHV”
		Average AADT ALL Regional Classification	Num	aadt_all link_s_len ctype_onrc	Weighted average [aadt_all] by [link_s_len] where [ctype_onrc] = “REG”

Reporting Category		Measure Item	Unit	PHS Data Item(s)	Application Algorithm for Reporting
Network Use and Demand (continued)	Traffic Volume (continued)	Average AADT ALL Arterial Classification	Num	aadt_all link_s_len ctype_onrc	Weighted average [aadt_all] by [link_s_len] where [ctype_onrc] = “ART”
		Average AADT ALL Primary Collector Classification	Num	aadt_all link_s_len ctype_onrc	Weighted average [aadt_all] by [link_s_len] where [ctype_onrc] = “PC”
		Average AADT ALL Secondary Collector Classification	Num	aadt_all link_s_len ctype_onrc	Weighted average [aadt_all] by [link_s_len] where [ctype_onrc] = “SC”
		Average AADT ALL Access Classification	Num	aadt_all link_s_len ctype_onrc	Weighted average [aadt_all] by [link_s_len] where [ctype_onrc] = “ACC” or “ALV”
	Percent-age HCV	Average AADT HCV National Classification	Num	aadt_hcv link_s_len ctype_onrc	Weighted average [aadt_ hcv] by [link_s_len] where [ctype_onrc] = “NAT” or “NHV”
		Average AADT HCV Regional Classification	Num	aadt_hcv link_s_len ctype_onrc	Weighted average [aadt_ hcv] by [link_s_len] where [ctype_onrc] = “REG”
		Average AADT HCV Arterial Classification	Num	aadt_hcv link_s_len ctype_onrc	Weighted average [aadt_ hcv] by [link_s_len] where [ctype_onrc] = “ART”
		Average AADT HCV Primary Collector Classification	Num	aadt_hcv link_s_len ctype_onrc	Weighted average [aadt_ hcv] by [link_s_len] where [ctype_onrc] = “PC”
		Average AADT HCV Secondary Collector Classification	Num	aadt_hcv link_s_len ctype_onrc	Weighted average [aadt_ hcv] by [link_s_len] where [ctype_onrc] = “SC”
		Average AADT HCV Access Classification	Num	aadt_hcv link_s_len ctype_onrc	Weighted average [aadt_ hcv] by [link_s_len] where [ctype_onrc] = “ACC” or “ALV”
	Traffic Growth	Average %Growth ALL National Classification	%	trf_gr_all link_s_len ctype_onrc	Weighted average [trf_gr_all] by [link_s_len] where [ctype_onrc] = “NAT” or “NHV”
		Average %Growth ALL Regional Classification	%	trf_gr_all link_s_len ctype_onrc	Weighted average [trf_gr_all] by [link_s_len] where [ctype_onrc] = “REG”
		Average %Growth ALL Arterial Classification	%	trf_gr_all link_s_len ctype_onrc	Weighted average [trf_gr_all] by [link_s_len] where [ctype_onrc] = “ART”
		Average %Growth ALL Primary Collector Classification	%	trf_gr_all link_s_len ctype_onrc	Weighted average [trf_gr_all] by [link_s_len] where [ctype_onrc] = “PC”
		Average %Growth ALL Secondary Collector Classification	%	trf_gr_all link_s_len ctype_onrc	Weighted average [trf_gr_all] by [link_s_len] where [ctype_onrc] = “SC”

Reporting Category		Measure Item	Unit	PHS Data Item(s)	Application Algorithm for Reporting
Network Use and Demand (continued)	Traffic Growth (continued)	Average %Growth ALL Access Classification	%	trf_gr_all link_s_len ctype_onrc	Weighted average [trf_gr_all] by [link_s_len] where [ctype_onrc] = “ACC” or “ALV”
	HCV Growth	Average %Growth HCV National Classification	%	trf_gr_hcv link_s_len ctype_onrc	Weighted average [trf_gr_hcv] by [link_s_len] where [ctype_onrc] = “NAT” or “NHV”
		Average %Growth HCV Regional Classification	%	trf_gr_hcv link_s_len ctype_onrc	Weighted average [trf_gr_ hcv] by [link_s_len] where [ctype_onrc] = “REG”
		Average %Growth HCV Arterial Classification	%	trf_gr_hcv link_s_len ctype_onrc	Weighted average [trf_gr_ hcv] by [link_s_len] where [ctype_onrc] = “ART”
		Average %Growth HCV Primary Collector Classification	%	trf_gr_hcv link_s_len ctype_onrc	Weighted average [trf_gr_ hcv] by [link_s_len] where [ctype_onrc] = “PC”
		Average %Growth HCV Secondary Collector Classification	%	trf_gr_hcv link_s_len ctype_onrc	Weighted average [trf_gr_ hcv] by [link_s_len] where [ctype_onrc] = “SC”
		Average %Growth HCV Access Classification	%	trf_gr_hcv link_s_len ctype_onrc	Weighted average [trf_gr_ hcv] by [link_s_len] where [ctype_onrc] = “ACC” or “ALV”
	Sealed Roads	Average Visual Sealed Pavement Condition National Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “S” and [ctype_onrc] = “NAT” or “NHV” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Average Visual Sealed Pavement Condition Regional Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “S” and [ctype_onrc] = “REG” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Average Visual Sealed Pavement Condition Arterial Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “S” and [ctype_onrc] = “ART” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Average Visual Sealed Pavement Condition Primary Collector Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “S” and [ctype_onrc] = “PC” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*

Reporting Category		Measure Item	Unit	PHS Data Item(s)	Application Algorithm for Reporting
Condition Profile (using visually assessed data)		Average Visual Sealed Pavement Condition Secondary Collector Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “S” and [ctype_onrc] = “SC” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Average Visual Sealed Pavement Condition Access Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “S” and [ctype_onrc] = “ACC” or “ALV” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
	Unsealed Roads	Average Visual Unsealed Pavement Condition National Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “U” and [ctype_onrc] = “NAT” or “NHV” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Average Visual Unsealed Pavement Condition Regional Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “U” and [ctype_onrc] = “REG” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Average Visual Unsealed Pavement Condition Arterial Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “U” and [ctype_onrc] = “ART” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Average Visual Unsealed Pavement Condition Primary Collector Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “U” and [ctype_onrc] = “PC” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Average Visual Unsealed Pavement Condition Secondary Collector Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “U” and [ctype_onrc] = “SC” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
		Profile Visual Unsealed Pavement Condition Access Classification	km	link_s_len psurf_stat ctype_onrc cond_vis	Sum of [link_s_len] where [psurf_stat] = “U” and [ctype_onrc] = “ACC” or “ALV” and [cond_vis] = “1” *(repeat for [cond_vis] = 2, 3, 4 and 5)*
	Bridges	Timber Bridge Condition	m	br_len br_dek_mat br_cond	Sum of [br_len] where [br_dek_mat] = “timber” and [br_cond] = “1” *(repeat for [br_cond] = 2, 3 and 4)*
		Other Bridge Condition	m	br_len br_dek_mat br_cond	Sum of [br_len] where [br_dek_mat] ≠ “timber” and [br_cond] = “1” *(repeat for [br_cond] = 2, 3 and 4)*
	Tunnels	Lined Tunnel Condition	m	tun_len tun_serv cond_vis	Sum of [tun_len] where [tun_serv] = “S” and [cond_vis] = “1” *(repeat for [br_cond] = 2, 3, 4 and 5)*

Reporting Category		Measure Item	Unit	PHS Data Item(s)	Application Algorithm for Reporting
	Tunnels (continued)	Unlined Tunnel Condition	m	tun_len tun_serv cond_vis	Sum of [tun_len] where [tun_serv] = “U” and [cond_vis] = “1” *(repeat for [br_cond] = 2, 3, 4 and 5)*
Condition Profile (using machine measured data)	Sealed Roads (Roughness)	Average Measured Sealed Pavement Roughness National Classification	km	iri_lane ctype_onrc	Sum of [iri_lane] where [ctype_onrc] = “NAT” or “NHV” and [iri_lane] “>2.3 and <=3.1” *(repeat for [iri_lane] >3.1 and <=3.8, >3.8 and <=4.6, >4.6 and <=5.3, >5.3)*
		Average Measured Sealed Pavement Roughness Regional Classification	km	iri_lane ctype_onrc	Sum of [iri_lane] where [ctype_onrc] = “REG” and [iri_lane] “>2.3 and <=3.1” *(repeat for [iri_lane] >3.1 and <=3.8, >3.8 and <=4.6, >4.6 and <=5.3, >5.3)*
		Average Measured Sealed Pavement Roughness Arterial Classification	km	iri_lane ctype_onrc	Sum of [iri_lane] where [ctype_onrc] = “ART” and [iri_lane] “>2.3 and <=3.1” *(repeat for [iri_lane] >3.1 and <=3.8, >3.8 and <=4.6, >4.6 and <=5.3, >5.3)*
		Average Measured Sealed Pavement Roughness Primary Collector Classification	km	iri_lane ctype_onrc	Sum of [iri_lane] where [ctype_onrc] = “PC” and [iri_lane] “>2.3 and <=3.1” *(repeat for [iri_lane] >3.1 and <=3.8, >3.8 and <=4.6, >4.6 and <=5.3, >5.3)*
		Average Measured Sealed Pavement Roughness Secondary Collector Classification	km	iri_lane ctype_onrc	Sum of [iri_lane] where [ctype_onrc] = “SC” and [iri_lane] “>2.3 and <=3.1” *(repeat for [iri_lane] >3.1 and <=3.8, >3.8 and <=4.6, >4.6 and <=5.3, >5.3)*
		Average Measured Sealed Pavement Roughness Access Classification	km	iri_lane ctype_onrc	Sum of [iri_lane] where [ctype_onrc] = “ACC or “ALV” and [iri_lane] “>2.3 and <=3.1” *(repeat for [iri_lane] >3.1 and <=3.8, >3.8 and <=4.6, >4.6 and <=5.3, >5.3)*
	Sealed Roads (Rutting)	Maximum Measured Sealed Pavement Rutting National Classification	mm	rut_owp rut_iwp ctype_onrc	Max of [rut_owp] or [rut_iwp] where [ctype_onrc] = “NAT” or “NHV” and [rut_xxx] “>10 and <=15” *(repeat for [rut_xxx] >15 and <=20, >20 and <=25, >25 and <=30, >30)*
		Maximum Measured Sealed Pavement Rutting Regional Classification	mm	rut_owp rut_iwp ctype_onrc	Max of [rut_owp] or [rut_iwp] where [ctype_onrc] = “REG” and [rut_xxx] “>10 and <=15” *(repeat for [rut_xxx] >15 and <=20, >20 and <=25, >25 and <=30, >30)*

Reporting Category		Measure Item	Unit	PHS Data Item(s)	Application Algorithm for Reporting
Condition Profile (using machine measured data) (continued)	Sealed Roads (Rutting) (continued)	Maximum Measured Sealed Pavement Rutting Arterial Classification	mm	rut_owp rut_iwp ctype_onrc	Max of [rut_owp] or [rut_iwp] where [ctype_onrc] = “ART” and [rut_xxx] “>10 and <=15” *(repeat for [rut_xxx] >15 and <=20, >20 and <=25, >25 and <=30, >30)*
		Maximum Measured Sealed Pavement Rutting Primary Collector Classification	mm	rut_owp rut_iwp ctype_onrc	Max of [rut_owp] or [rut_iwp] where [ctype_onrc] = “PC” and [rut_xxx] “>10 and <=15” *(repeat for [rut_xxx] >15 and <=20, >20 and <=25, >25 and <=30, >30)*
		Maximum Measured Sealed Pavement Rutting Secondary Collector Classification	mm	rut_owp rut_iwp ctype_onrc	Max of [rut_owp] or [rut_iwp] where [ctype_onrc] = “SC” and [rut_xxx] “>10 and <=15” *(repeat for [rut_xxx] >15 and <=20, >20 and <=25, >25 and <=30, >30)*
		Maximum Measured Sealed Pavement Rutting Access Classification	mm	rut_owp rut_iwp ctype_onrc	Max of [rut_owp] or [rut_iwp] where [ctype_onrc] = “ACC” or “ALV” and [rut_xxx] “>10 and <=15” *(repeat for [rut_xxx] >15 and <=20, >20 and <=25, >25 and <=30, >30)*
Financial Perform-ance	All Assets	Average Annual Renewal Expenditure	$	capex_ren	[capex_ren]
		Average Annual Maintenance Expenditure	$	opex_maint	[opex_maint]
		Average Annual Operations Expenditure	$	opex_oper	[opex_oper]

Appendix B Data Items Listing

Code	Name	Function & Asset Group	Ref
aadt_all	Average annual daily traffic	Utilisation-Traffic volumes	8.6.12
aadt_bke	Percentage of aadt classified as motorbike	Utilisation-Traffic volumes	8.6.20
aadt_bke_l	Percentage of aadt per lane classified as motorbike	Utilisation-Traffic volumes	8.6.21
aadt_bus	Percentage of aadt classified as bus	Utilisation-Traffic volumes	8.6.24
aadt_bus_l	Percentage of aadt classified as bus per lane	Utilisation-Traffic volumes	8.6.25
aadt_car	Percentage of aadt classified as car	Utilisation-Traffic volumes	8.6.22
aadt_car_l	Percentage of aadt per lane classified as car	Utilisation-Traffic volumes	8.6.23
aadt_cl	Average annual daily traffic per class	Utilisation-Traffic volumes	8.6.28
aadt_cl_l	Average annual daily traffic per class per lane	Utilisation-Traffic volumes	8.6.29
aadt_hcv	Percentage of aadt classified as heavy vehicles	Utilisation-Traffic volumes	8.6.26
aadt_hcv_l	Percentage of aadt per lane classified as heavy vehicles	Utilisation-Traffic volumes	8.6.27
aadt_lane	Average annual daily traffic per lane	Utilisation-Traffic volumes	8.6.18
aawt_all	Annual average weekday traffic	Utilisation-Traffic volumes	8.6.13
aawt_lane	Annual average weekday traffic per lane	Utilisation-Traffic volumes	8.6.19

Code	Name	Function & Asset Group	Ref
act1_date	Actual date for Performance actual	Performance (Asset)-Achievement	8.10.7
added_by	Data editor	Inventory-All - C Additional	8.3.0.25
added_date	Data added date	Inventory-All - C Additional	8.3.0.26
advert	Advertising on shelter	Inventory-Shelters	8.3.22.7
air_pass	Airport access passengers in motion	Classification-Economic and Social	8.2.6
amen_manuf	Manufacturer	Inventory-Amenities	8.3.1.3
amen_mat	Material	Inventory-Amenities	8.3.1.2
amen_model	Model number	Inventory-Amenities	8.3.1.4
amen_type	Type	Inventory-Amenities	8.3.1.1
anchor_typ	Type of anchors	Inventory-Slopes	8.3.24.10
art_desc	Description of Artwork	Inventory-Public Art	8.3.18.1
art_en_rep	Engineering report author	Inventory-Public Art	8.3.18.5
art_mat	Artwork material	Inventory-Public Art	8.3.18.2
art_type	Type	Inventory-Public Art	8.3.18.3
artist	Artist Name only.	Inventory-Public Art	8.3.18.8
asphalt_pc	Asphalt resurfacing coverage across sealed network	Performance (Asset)-Output	8.10.23
asset_age	Asset age	Performance (Asset)-Asset Life	8.10.15
asset_clas	Asset class	Inventory-All - A General	8.3.0.2
asset_id	Unique asset identifier	Inventory-All - A General	8.3.0.1

Code	Name	Function & Asset Group	Ref
asset_stat	Operation status	Inventory-All - B Valuation	8.3.0.17
atsu_amp	AM Peak Actual Travel Speed (Urban)	Performance (Service)-Travel Speed	8.12.57
atsu_day	All Day Actual Travel Speed (Urban)	Performance (Service)-Travel Speed	8.12.60
atsu_off	Off Peak Actual Travel Speed (Urban)	Performance (Service)-Travel Speed	8.12.59
atsu_pmp	PM Peak Actual Travel Speed (Urban)	Performance (Service)-Travel Speed	8.12.58
att	Actual Travel Time	Performance (Service)-Travel Speed	8.12.54
avg_hei	Average height	Inventory-Retaining Walls	8.3.20.5
bays	Bay number	Inventory-Parking	8.3.12.1
bcr	Benefit cost ratio	Works and Costs-Output	8.14.34
beam_mat	Beam Material	Inventory-Bridge Major Culvert	8.3.3.4
bin_cap	Capacity	Inventory-Bins	8.3.2.1
bin_liner	Liner present	Inventory-Bins	8.3.2.4
bin_manuf	Manufacturer	Inventory-Bins	8.3.2.5
bin_mat	Material	Inventory-Bins	8.3.2.6
bin_model	Model number	Inventory-Bins	8.3.2.7
bin_suppl	Supplier	Inventory-Bins	8.3.2.8
bin_type	Type	Inventory-Bins	8.3.2.2
bin_use	Bin intended use	Inventory-Bins	8.3.2.3
br_abu_mat	"Abutment Material"	Inventory-Bridge Major Culvert	8.3.3.27
br_area	Area	Inventory-Bridge Major Culvert	8.3.3.28
br_beam_no	Number of Beams	Inventory-Bridge Major Culvert	8.3.3.11
br_cel_mat	Cell Material For Major Culvert	Inventory-Bridge Major Culvert	8.3.3.22
br_cel_typ	Cell Type For Major Culvert	Inventory-Bridge Major Culvert	8.3.3.17
br_clear	Vertical Clearance	Inventory-Bridge Major Culvert	8.3.3.18
br_co_code	Component code	Inventory-Bridge Major Culvert	8.3.3.35
br_co_len	Length	Inventory-Bridge Major Culvert	8.3.3.30
br_co_mat	Component material	Inventory-Bridge Major Culvert	8.3.3.34
br_co_type	Component type	Inventory-Bridge Major Culvert	8.3.3.33
br_col_mat	Column or Pile Material	Inventory-Bridge Major Culvert	8.3.3.5
br_col_no	Number of columns or Piles	Inventory-Bridge Major Culvert	8.3.3.12
br_comps	Number of components	Inventory-Bridge Major Culvert	8.3.3.31
br_cond	Bridge conditlon state overall	Condition-Bridge	8.4.83
br_cond_1	Bridge conditlon state 1	Condition-Bridge	8.4.79
br_cond_2	Bridge conditlon state 2	Condition-Bridge	8.4.80
br_cond_3	Bridge conditlon state 3	Condition-Bridge	8.4.81
br_cond_4	Bridge conditlon state 4	Condition-Bridge	8.4.82
br_cond_dt	Bridge survey date-time	Condition-Bridge	8.4.84
br_cond_in	Bridge survey operator	Condition-Bridge	8.4.85
br_dek_mat	Deck Material	Inventory-Bridge Major Culvert	8.3.3.6
br_eq_rate	Earthquake Rating	Inventory-Bridge Major Culvert	8.3.3.7
br_fnd_mat	Foundation material	Inventory-Bridge Major Culvert	8.3.3.8

Code	Name	Function & Asset Group	Ref
br_fnd_typ	Foundation type	Inventory-Bridge Major Culvert	8.3.3.9
br_func	Function of the Feature	Inventory-Bridge Major Culvert	8.3.3.19
br_gate	Entrance Gate	Inventory-Bridge Major Culvert	8.3.3.10
br_hei	Height	Inventory-Bridge Major Culvert	8.3.3.29
br_heritag	State Or National Heritage Listing	Inventory-Bridge Major Culvert	8.3.3.25
br_ld_lim	Vehicular Load Limit	Inventory-Bridge Major Culvert	8.3.3.26
br_len	Length	Inventory-Bridge Major Culvert	8.3.3.23
br_pie_mat	Pier Material	Inventory-Bridge Major Culvert	8.3.3.14
br_pier_no	Number of Piers	Inventory-Bridge Major Culvert	8.3.3.13
br_rai_mat	Safety Rail Material	Inventory-Bridge Major Culvert	8.3.3.15
br_rail	Safety Rails Present	Inventory-Bridge Major Culvert	8.3.3.16
br_spans	Number of Spans or Cells	Inventory-Bridge Major Culvert	8.3.3.20
br_struc	Feature Structure Type	Inventory-Bridge Major Culvert	8.3.3.21
br_wid	Width of Structure	Inventory-Bridge Major Culvert	8.3.3.24
br_wid_co	Width of Component	Inventory-Bridge Major Culvert	8.3.3.32
br_wid_l	Bridge Width Left of Centreline	Inventory-Bridge Major Culvert	8.3.3.1
br_wid_r	Bridge Width Right of Centreline	Inventory-Bridge Major Culvert	8.3.3.2

Code	Name	Function & Asset Group	Ref
bridge_pc	Bridges replaced	Performance (Asset)-Output	8.10.26
bus_route	Is a Bus/Public Transport Route	Demand-Design	8.5.2
capex_ren	Capital Spend – Renewals	Performance (Financial)-Investment	8.11.13
capex_tot	Total Capital Spend	Performance (Financial)-Investment	8.11.11
capex_ue	Capital Spend – Upgrade and Expansion	Performance (Financial)-Investment	8.11.12
cbox_typ	Pedestrian call box type	Inventory-Traffic Signals	8.3.29.8
cgi_amp	AM Peak Congestion Indicator (Urban)	Performance (Service)-Travel Speed	8.12.62
cgi_day	All Day Congestion Indicator (Urban)	Performance (Service)-Travel Speed	8.12.65
cgi_off	Off Peak Congestion Indicator (Urban)	Performance (Service)-Travel Speed	8.12.64
cgi_pmp	PM Peak Congestion Indicator (Urban)	Performance (Service)-Travel Speed	8.12.63
chip_large	Largest Chip	Inventory-Pavement Surfacing	8.3.15.10
chip_small	Smallest chip size	Inventory-Pavement Surfacing	8.3.15.9
clim_tmi	Thornthwaite Moisture Index	Condition-Climate	8.4.11
coat_sys	Coating system	Inventory-Road Barriers	8.3.21.15
comments	Comments	Inventory-All - C Additional	8.3.0.23
cond_crack	Visual cracking area	Condition-Visually assessed condition	8.4.9
cond_date	Subjective condition survey date-time	Condition-Subjective condition	8.4.2
cond_ed	Visual edge drop off	Condition-Visually assessed condition	8.4.8

Code	Name	Function & Asset Group	Ref
cond_name	Subjective condition survey operator	Condition-Subjective condition	8.4.3
cond_patch	Visual patching	Condition-Visually assessed condition	8.4.7
cond_rav	Visual ravelling	Condition-Visually assessed condition	8.4.6
cond_rut	Visual measured rutting	Condition-Visually assessed condition	8.4.10
cond_strip	Visual stripping	Condition-Visually assessed condition	8.4.5
cond_subj	Subjective condition	Condition-Subjective condition	8.4.1
cond_vis	Visual assessed condition	Condition-Visually assessed condition	8.4.4
const_co	Construction Organisation name	Inventory-All - A General	8.3.0.11
const_cost	Construction cost	Inventory-All - B Valuation	8.3.0.16
const_date	Construction date	Inventory-All - B Valuation	8.3.0.15
cont_id	Contractor or suppliers Unique asset ID	Inventory-All - A General	8.3.0.3
cost_unit	Unit cost	Inventory-All - B Valuation	8.3.0.21
cr_all_ex	All cracking extent	Condition-Pavement - Cracking	8.4.12
cr_all_sv	All cracking severity	Condition-Pavement - Cracking	8.4.13
cr_croc_ex	Crocodile/block cracking extent	Condition-Pavement - Cracking	8.4.19
cr_croc_sv	Crocodile/block cracking severity	Condition-Pavement - Cracking	8.4.18

Code	Name	Function & Asset Group	Ref
cr_date	Cracking survey date-time	Condition-Pavement - Cracking	8.4.20
cr_long_ex	Longitudinal cracking extent	Condition-Pavement - Cracking	8.4.14
cr_long_sv	Longitudinal cracking severity	Condition-Pavement - Cracking	8.4.15
cr_name	Cracking survey operator	Condition-Pavement - Cracking	8.4.21
cr_tran_ex	Transverse cracking severity	Condition-Pavement - Cracking	8.4.17
cr_tran_sv	Transverse cracking extent	Condition-Pavement - Cracking	8.4.16
crash _p	Total crash count (Population)	Performance (Service)-Road Safety	8.12.37
crash _t	Total crash count (Vehicle-Kilometres Travelled)	Performance (Service)-Road Safety	8.12.38
crash_cnt	Crash count	Performance (Service)-Road Safety	8.12.35
crash_date	Crash date	Performance (Service)-Road Safety	8.12.31
crash_loc	Crash location	Performance (Service)-Road Safety	8.12.32
crash_r_us	Road user involved	Performance (Service)-Road Safety	8.12.33
crash_sev	Crash severity	Performance (Service)-Road Safety	8.12.34
crash_yrs	Crash count number of years of data	Performance (Service)-Road Safety	8.12.36
crit_comp	Critical Rating	Criticality-Output	8.7.1
crit_conn	Criticality	Classification-Economic and Social	8.2.3
cross_dep	Vehicle crossing depth	Inventory-Vehicle Crossings	8.3.32.3

Code	Name	Function & Asset Group	Ref
cross_mat	Crossing Material	Inventory-Pathways	8.3.13.14
cross_mat	Vehicle crossing material	Inventory-Vehicle Crossings	8.3.32.1
cross_reo	Vehicle crossing reinforcing mesh present	Inventory-Vehicle Crossings	8.3.32.4
cross_typ	Vehicle crossing type	Inventory-Vehicle Crossings	8.3.32.2
cross_type	Crossing Type	Inventory-Pathways	8.3.13.15
cross_wdth	Crossing width	Inventory-Pathways	8.3.13.16
cross_wid	Vehicle crossing width excluding splays	Inventory-Vehicle Crossings	8.3.32.5
crs_b_dep	Vehicle crossing basecourse depth	Inventory-Vehicle Crossings	8.3.32.6
crs_b_typ	Vehicle crossing base course type	Inventory-Vehicle Crossings	8.3.32.7
crs_s_dep	Vehicle crossing subbase course depth	Inventory-Vehicle Crossings	8.3.32.8
crs_s_typ	Vehicle crossing subbase course type	Inventory-Vehicle Crossings	8.3.32.9
ctype_onrc	Functional Classification - One Road Classification System	Classification-Functional Classification	8.2.1
cul_config	Pipe configuration	Inventory-Culverts Minor (Pipes)	8.3.4.12
cul_dia	Internal pipe Diameter or Width	Inventory-Culverts Minor (Pipes)	8.3.4.6
cul_dia_2	2nd pipe diameter	Inventory-Culverts Minor (Pipes)	8.3.4.16
cul_dn_inv	Downstream Invert Level	Inventory-Culverts Minor (Pipes)	8.3.4.17
cul_dn_x	Downstream X Coordinate	Inventory-Culverts Minor (Pipes)	8.3.4.2
cul_dn_y	Downstream Y Coordinate	Inventory-Culverts Minor (Pipes)	8.3.4.3
cul_hei	Non Circular Pipe height	Inventory-Culverts Minor (Pipes)	8.3.4.7
cul_in_mat	Relined or renewed material	Inventory-Culverts Minor (Pipes)	8.3.4.18
cul_in_met	Relining or renewal method	Inventory-Culverts Minor (Pipes)	8.3.4.19
cul_in_out	Structure location	Inventory-Culverts Minor (Pipes)	8.3.4.13
cul_len	Pipe section length	Inventory-Culverts Minor (Pipes)	8.3.4.8
cul_mat	Pipe material	Inventory-Culverts Minor (Pipes)	8.3.4.9
cul_pit_dn	Downstream Pit Number	Inventory-Culverts Minor (Pipes)	8.3.4.1
cul_pit_no	Unique number derived from pit numbers	Inventory-Culverts Minor (Pipes)	8.3.4.10
cul_shape	Pipe shape	Inventory-Culverts Minor (Pipes)	8.3.4.14
cul_type	Pipe type	Inventory-Culverts Minor (Pipes)	8.3.4.11
cul_up_inv	Upstream end-of-pipe Invert Level	Inventory-Culverts Minor (Pipes)	8.3.4.20
cul_up_pit	Upstream Pit Number	Inventory-Culverts Minor (Pipes)	8.3.4.15
cul_up_x	Upstream X Coordinate.	Inventory-Culverts Minor (Pipes)	8.3.4.4
cul_up_y	Upstream Y Coordinate	Inventory-Culverts Minor (Pipes)	8.3.4.5
currency	Financial currency	Inventory-All - B Valuation	8.3.0.18
cycl_hr_xx	Number of bicycles per hour	Utilisation-Bicycles	8.6.1
cycl_mth	Trips per month	Utilisation-Bicycles	8.6.2

Code	Name	Function & Asset Group	Ref
cycl_user	User Classification	Utilisation-Bicycles	8.6.3
dat_confid	Data confidence	Data Control-Data Control	7.2.4
dat_date	Data date	Data Control-Data Control	7.2.1
dat_edit	Data edit date	Data Control-Data Control	7.2.6
dat_editor	Data editor	Data Control-Data Control	7.2.5
dat_owner	Data owner	Data Control-Data Control	7.2.2
dat_source	Data source	Data Control-Data Control	7.2.3
dat_source	Data source	Inventory-All - A General	8.3.0.5
defct_ligt	Reported number of service issues for lighting	Performance (Service)-Customer Safety (Condition)	8.12.19
defct_num	Reported number of defects	Performance (Service)-Customer Safety (Condition)	8.12.15
defct_path	Reported number of defects on pathways	Performance (Service)-Customer Safety (Condition)	8.12.16
defct_rail	Reported number of service issues for traffic restraining devices	Performance (Service)-Customer Safety (Condition)	8.12.18
defct_surf	Reported number of defects on pavement surface	Performance (Service)-Customer Safety (Condition)	8.12.17
design_co	Design Company name	Inventory-All - A General	8.3.0.12
design_esa	Design ESA	Inventory-Pavement All	8.3.14.10
donated_by	Donated by	Inventory-Public Art	8.3.18.9
dr_liner	Type of drainage liner	Inventory-Slopes	8.3.24.11
drainage	Drainage mechanism	Inventory-Retaining Walls	8.3.20.6

Code	Name	Function & Asset Group	Ref
drc	Depreciated replacement cost	Works and Costs-Output	8.14.35
drn_dep	Table drain depth	Inventory-Table Drains	8.3.26.2
drn_len	Table drain length	Inventory-Table Drains	8.3.26.1
drn_mat	Table drain material	Inventory-Table Drains	8.3.26.3
drn_resp	Authority responsible for maintenance	Inventory-Table Drains	8.3.26.6
drn_shape	Table drain shape	Inventory-Table Drains	8.3.26.4
drn_wid	Table drain width	Inventory-Table Drains	8.3.26.5
elec_cert	Electrical Certification	Inventory-Public Art	8.3.18.10
eq_rating	Earthquake Rating	Inventory-Tunnels	8.3.31.5
esa	Equivalent Standard Axle	Demand-Design	8.5.1
ESA_km	Equivalent Standard Axles kilometres	Demand-Road Use	8.5.6
fen_func	Function	Inventory-Fences	8.3.5.3
fen_hei	Height	Inventory-Fences	8.3.5.4
fen_joint	Joint ownership	Inventory-Fences	8.3.5.7
fen_len	Length	Inventory-Fences	8.3.5.5
fen_manuf	Manufacturers name	Inventory-Fences	8.3.5.8
fen_mat	Material	Inventory-Fences	8.3.5.6
fen_prot	Drop protection	Inventory-Fences	8.3.5.1
fen_typ	Type	Inventory-Fences	8.3.5.2
fin_arfr	Asset Renewal Funding Ratio	Performance (Financial)-Financial	8.11.9
fin_asr	Asset Sustainability Ratio	Performance (Financial)-Financial	8.11.10
fin_nflr	Net Financial Liabilities Ratio	Performance (Financial)-Financial	8.11.8

Code	Name	Function & Asset Group	Ref
fin_osr	Operating Surplus Ratio	Performance (Financial)-Financial	8.11.7
found_mat	Bank foundation material	Inventory-Slopes	8.3.24.12
found_mat	Foundation material	Inventory-Structures	8.3.25.6
found_typ	Foundation type	Inventory-Retaining Walls	8.3.20.9
fr_sig_val	Freight value in motion	Classification-Economic and Social	8.2.4
fr_sig_wgt	Freight weight in motion	Classification-Economic and Social	8.2.5
fwp_cest	Forward works treatment estimated cost	Works and Costs-FWP	8.14.8
fwp_cost_a	Forward work treatment actual completed cost	Works and Costs-Output	8.14.31
fwp_end	Forward works program treatment location end	Works and Costs-FWP	8.14.5
fwp_end_yr	Planned forward treatment end year	Works and Costs-FWP	8.14.9
fwp_param	Forward work program intervention parameter	Works and Costs-FWP	8.14.6
fwp_reason	Forward works program treatment reason	Works and Costs-FWP	8.14.2
fwp_start	Forward works program treatment location start	Works and Costs-FWP	8.14.4
fwp_thresh	Forward work program intervention threshold	Works and Costs-FWP	8.14.7
fwp_treat	Forward works program category	Works and Costs-FWP	8.14.1
fwp_yr_s	Planned forward work treatment start year	Works and Costs-FWP	8.14.3
geotextile	Geotextile Fabric used	Inventory-Slopes	8.3.24.13
GVM_km	Gross Vehicle Mass kilometres	Demand-Road Use	8.5.5

Code	Name	Function & Asset Group	Ref
hazards	Reported number of hazards	Performance (Service)-Customer Safety (Condition)	8.12.14
hospitals	Hospital Access Road	Classification-Economic and Social	8.2.8
hr_vol	Number of vehicles per hour	Utilisation-Traffic volumes	8.6.17
inc_r_time	Time to respond to incident	Performance (Service)-Unplanned Incidents	8.12.70
int_type	Intersection control type	Utilisation-Capacity	8.6.4
iri_date	Roughness survey date-time	Condition-Pavement - Roughness	8.4.36
iri_iwp	Inner wheel path roughness	Condition-Pavement - Roughness	8.4.34
iri_lane	Lane roughness quarter car	Condition-Pavement - Roughness	8.4.33
iri_name	Roughness survey operator	Condition-Pavement - Roughness	8.4.37
iri_owp	Outer wheel path roughness	Condition-Pavement - Roughness	8.4.35
its_abobel	Above or below surface level	Inventory-ITS Assets	8.3.6.3
its_access	Access requirements	Inventory-ITS Assets	8.3.6.4
its_l_clen	Conduit material	Inventory-ITS Line	8.3.6.11
its_l_cnid	Controller ID	Inventory-ITS Line	8.3.6.8
its_l_coid	Contractors unique ID	Inventory-ITS Line	8.3.6.7
its_l_dl	Design life	Inventory-ITS Line	8.3.6.13
its_l_ints	Installer	Inventory-ITS Line	8.3.6.16
its_l_len	Conduit length	Inventory-ITS Line	8.3.6.9
its_l_liae	Defects liability end date	Inventory-ITS Line	8.3.6.12

Code	Name	Function & Asset Group	Ref
its_l_lias	Defect liability start date	Inventory-ITS Line	8.3.6.15
its_l_manu	Manufacturer	Inventory-ITS Line	8.3.6.17
its_l_mreq	Maintenance requirements	Inventory-ITS Line	8.3.6.14
its_l_suid	Contractor suppliers unique ID	Inventory-ITS Line	8.3.6.6
its_l_supp	Supplier	Inventory-ITS Line	8.3.6.18
its_l_type	Housing type	Inventory-ITS Line	8.3.6.10
its_l_wend	Warranty end date	Inventory-ITS Line	8.3.6.19
its_p_cnid	Controller ID	Inventory-ITS Point	8.3.6.20
its_p_comm	Communication method	Inventory-ITS Point	8.3.6.25
its_p_des	Design life in years	Inventory-ITS Point	8.3.6.28
its_p_htyp	Housing type	Inventory-ITS Point	8.3.6.26
its_p_ints	Installer	Inventory-ITS Point	8.3.6.32
its_p_ipad	IP address	Inventory-ITS Point	8.3.6.33
its_p_liae	Defects liability end date	Inventory-ITS Point	8.3.6.29
its_p_lias	Start date of defects liability period	Inventory-ITS Point	8.3.6.31
its_p_log	Data logger present	Inventory-ITS Point	8.3.6.22
its_p_manu	Manufacturer	Inventory-ITS Point	8.3.6.34
its_p_mod	Model number	Inventory-ITS Point	8.3.6.35
its_p_moun	Mounting type	Inventory-ITS Point	8.3.6.36
its_p_mreq	Maintenance requirements	Inventory-ITS Point	8.3.6.30
its_p_pass	Pin number or password	Inventory-ITS Point	8.3.6.37
its_p_rad	Connected radar unit	Inventory-ITS Point	8.3.6.23
its_p_seri	Serial number	Inventory-ITS Point	8.3.6.38

Code	Name	Function & Asset Group	Ref
its_p_supp	Supplier	Inventory-ITS Point	8.3.6.39
its_p_type	Control system type	Inventory-ITS Point	8.3.6.21
its_p_uniq	Unique ID of the asset	Inventory-ITS Point	8.3.6.24
its_p_ups	UPS is connected	Inventory-ITS Point	8.3.6.27
its_p_ware	Warranty end date	Inventory-ITS Point	8.3.6.40
its_pl_com	Communication method	Inventory-ITS Polygon	8.3.6.41
its_pl_cs	Control system type	Inventory-ITS Polygon	8.3.6.42
its_pl_ups	UPS is connected	Inventory-ITS Polygon	8.3.6.43
its_power	Power source	Inventory-ITS Assets	8.3.6.5
its_site	Site name	Inventory-ITS Assets	8.3.6.1
its_type	Type	Inventory-ITS Assets	8.3.6.2
kc_cond	Kerb and channel visual condition	Condition-Kerb and Channel	8.4.86
kc_date	Kerb and channel survey date-time	Condition-Kerb and Channel	8.4.87
kc_len	Length	Inventory-Kerb and Channel	8.3.7.4
kc_mat	Material	Inventory-Kerb and Channel	8.3.7.1
kc_name	Visually measure condition survey operator	Condition-Kerb and Channel	8.4.88
kc_resp	Responsible Authority	Inventory-Kerb and Channel	8.3.7.5
kc_typ	Type	Inventory-Kerb and Channel	8.3.7.2
kc_wid	Width	Inventory-Kerb and Channel	8.3.7.3
kerb_typ	Traffic management device kerb type	Inventory-Traffic Management	8.3.28.9

Code	Name	Function & Asset Group	Ref
		Devices Polygon	
l_brk_ang	Bracket angle	Inventory-Lighting	8.3.9.12
l_brk_hei	Bracket height	Inventory-Lighting	8.3.9.1
l_brk_len	Bracket length	Inventory-Lighting	8.3.9.2
l_brk_mat	Bracket material	Inventory-Lighting	8.3.9.13
l_brk_mnt	Bracket mounting type	Inventory-Lighting	8.3.9.14
l_brk_orie	Bracket Orientation	Inventory-Lighting	8.3.9.15
l_brk_typ	Bracket type	Inventory-Lighting	8.3.9.16
l_cap	Luminaire capacity	Inventory-Lighting	8.3.9.4
l_col	Light colour	Inventory-Lighting	8.3.9.18
l_conn	Bulk circuit connection	Inventory-Lighting	8.3.9.17
l_conn_typ	Connection Type	Inventory-Lighting	8.3.9.3
l_des_std	Lighting design standard	Inventory-Lighting	8.3.9.24
l_icp_no	Control Point number	Inventory-Lighting	8.3.9.11
l_led_manu	LED chip manufacturer	Inventory-Lighting	8.3.9.19
l_lum_num	Number of luminaires	Inventory-Lighting	8.3.9.6
l_manu_imp	Manufacturer Importer name	Inventory-Lighting	8.3.9.21
l_manuf	Luminaire manufacturer	Inventory-Lighting	8.3.9.20
l_model	Luminaire model type	Inventory-Lighting	8.3.9.5
l_power_co	Power supply company	Inventory-Lighting	8.3.9.22
l_shd_typ	Light shade type	Inventory-Lighting	8.3.9.23
l_smart_gd	Connected to smart grid	Inventory-Lighting	8.3.9.8
l_tilt_ang	Upcast angle	Inventory-Lighting	8.3.9.25
l_typ	Lighting Type	Inventory-Lighting	8.3.9.9
l_wattage	Luminaires wattage	Inventory-Lighting	8.3.9.10
land_dep	Depth	Inventory-Landscaping	8.3.8.1
land_mat	Material	Inventory-Landscaping	8.3.8.2
land_typ	Type of Landscaping	Inventory-Landscaping	8.3.8.3
lanekm_len	Lane Kilometre Length	Network-Road	8.1.15
life_ach	Life achieved	Performance (Asset)-Asset Life	8.10.14
life_cons	Design life at construction	Inventory-All - A General	8.3.0.14
life_des	Design life	Performance (Asset)-Asset Life	8.10.8
life_e	Out of service date	Performance (Asset)-Asset Life	8.10.12
life_e_r	End of life reason	Performance (Asset)-Asset Life	8.10.13
life_rem_a	Remaining life assessed	Performance (Asset)-Asset Life	8.10.16
life_rem_c	Remaining life calculated	Performance (Asset)-Asset Life	8.10.17
life_rem_m	Remaining life calculation method	Performance (Asset)-Asset Life	8.10.18
life_use_a	Useful life assessed	Performance (Asset)-Asset Life	8.10.9
life_use_c	Useful life calculated	Performance (Asset)-Asset Life	8.10.10
life_use_m	Useful life calculation method	Performance (Asset)-Asset Life	8.10.11
lin_app_r	Application Rate	Inventory-Linemarking All	8.3.10.6
lin_aud	Audible	Inventory-Linemarking All	8.3.10.1

Code	Name	Function & Asset Group	Ref
lin_colour	Colour	Inventory-Linemarking All	8.3.10.2
lin_manuf	Manufacturer	Inventory-Linemarking All	8.3.10.7
lin_paint	Paint Brand	Inventory-Linemarking All	8.3.10.8
lin_refl	Reflect	Inventory-Linemarking All	8.3.10.3
lin_spcng	Spacing	Inventory-Linemarking All	8.3.10.4
lin_thick	Thickness	Inventory-Linemarking Lines and Polygons	8.3.10.9
lin_typ	Type	Inventory-Linemarking All	8.3.10.5
line_p_thi	Thickness	Inventory-Linemarking Point	8.3.10.11
linem_wid	Width	Inventory-Linemarking Lines and Polygons	8.3.10.10
link_id	Link ID	Network-Link	8.1.9
link_len	Link length	Network-Link	8.1.11
link_s_e	Link section end displacement	Network-Link Section	8.1.21
link_s_id	Link section ID	Network-Link Section	8.1.19
link_s_len	Link section length	Network-Link Section	8.1.22
link_s_s	Link section start displacement	Network-Link Section	8.1.20
link_s_uni	Link section uniform width	Network-Link Section	8.1.24
link_s_wid	Link section average width	Network-Link Section	8.1.23
link_tflow	Link traffic flow	Network-Link	8.1.10
links_div	Separate link sections for traffic flow direction	Network-Link Section	8.1.31
links_lanl	Number of lanes left of centreline	Network-Link Section	8.1.27
links_lanr	Number of lanes right of centreline	Network-Link Section	8.1.28
links_lwl	Average lane width left of centreline	Network-Link Section	8.1.29
links_lwr	Average lane width right of centreline	Network-Link Section	8.1.30
loc_desr	Location description	Location Referencing-Point	7.1.1.1
loc_desr	Location description	Location Referencing-Polyline	7.1.2.01
loc_desr	Location description	Location Referencing-Polygon	7.1.3.01
loc_dis_e	End lateral offset	Location Referencing-Polyline	7.1.2.07
loc_dis_s	Start lateral offset	Location Referencing-Polyline	7.1.2.06
loc_dist	Location distance	Location Referencing-Point	7.1.1.2
loc_e	End location	Location Referencing-Polyline	7.1.2.03
loc_e_si	side of road end	Location Referencing-Polyline	7.1.2.05
loc_l_e	End location left	Location Referencing-Polygon	7.1.3.04
loc_l_e_of	End lateral offset left	Location Referencing-Polygon	7.1.3.08
loc_l_s	Start location left	Location Referencing-Polygon	7.1.3.02
loc_l_s_of	Start lateral offset left	Location Referencing-Polygon	7.1.3.06
loc_offset	Offset	Location Referencing-Point	7.1.1.4
loc_proj	Projection	Location Referencing-Point	7.1.1.5
loc_proj	Projection	Location Referencing-Polyline	7.1.2.1

Code	Name	Function & Asset Group	Ref
loc_proj	Projection	Location Referencing-Polygon	7.1.3.1
loc_r_e	End location right	Location Referencing-Polygon	7.1.3.05
loc_r_e_of	End lateral offset right	Location Referencing-Polygon	7.1.3.09
loc_r_s	Start location right	Location Referencing-Polygon	7.1.3.03
loc_r_s_of	Start lateral offset right	Location Referencing-Polygon	7.1.3.07
loc_s	Start location	Location Referencing-Polyline	7.1.2.02
loc_s_si	Side of road start	Location Referencing-Polyline	7.1.2.04
loc_side	Side	Location Referencing-Point	7.1.1.3
loc_vert	Vertical datum	Location Referencing-Point	7.1.1.6
loc_vert	Vertical datum	Location Referencing-Polyline	7.1.2.11
loc_vert	Vertical datum	Location Referencing-Polygon	7.1.3.11
loc_wid_e	End width	Location Referencing-Polyline	7.1.2.09
loc_wid_s	Start width	Location Referencing-Polyline	7.1.2.08
loc_x	X coordinate	Location Referencing-Point	7.1.1.7
loc_x_e	X coordinate end	Location Referencing-Polyline	7.1.2.14
loc_x_e_l	X coordinate end left	Location Referencing-Polygon	7.1.3.16
loc_x_e_r	X coordinate end right	Location Referencing-Polygon	7.1.3.18
loc_x_s	X coordinate start	Location Referencing-Polyline	7.1.2.12
loc_x_s_l	X coordinate start left	Location Referencing-Polygon	7.1.3.12
loc_x_s_r	X coordinate start right	Location Referencing-Polygon	7.1.3.14
loc_y	Y coordinate	Location Referencing-Point	7.1.1.8
loc_y_e	Y coordinate end	Location Referencing-Polyline	7.1.2.15
loc_y_e_l	Y coordinate end left	Location Referencing-Polygon	7.1.3.17
loc_y_e_r	Y coordinate end right	Location Referencing-Polygon	7.1.3.19
loc_y_s	Y coordinate start	Location Referencing-Polyline	7.1.2.13
loc_y_s_l	Y coordinate start left	Location Referencing-Polygon	7.1.3.13
loc_y_s_r	Y coordinate start right	Location Referencing-Polygon	7.1.3.15
loc_z	Z coordinate	Location Referencing-Point	7.1.1.9
loc_z_e	Z coordinate end	Location Referencing-Polyline	7.1.2.17
loc_z_e_l	Z coordinate end left	Location Referencing-Polygon	7.1.3.22
loc_z_e_r	Z coordinate end right	Location Referencing-Polygon	7.1.3.23
loc_z_s	Z coordinate start	Location Referencing-Polyline	7.1.2.16
loc_z_s_l	Z coordinate start left	Location Referencing-Polygon	7.1.3.2
loc_z_s_r	Z coordinate start right	Location Referencing-Polygon	7.1.3.21

Code	Name	Function & Asset Group	Ref
maint_con	Maintenance contract reference	Network-Link Section	8.1.38
maintained	Maintained by organisation	Inventory-Retaining Walls	8.3.20.14
maintainer	Maintainer organisation	Network-Link Section	8.1.37
maj_cul_pc	Major culverts replaced	Performance (Asset)-Output	8.10.27
mat_s_name	Material Source Name	Inventory-Pavement All	8.3.14.7
mat_source	Material Source	Inventory-Pavement All	8.3.14.6
me_ab_surf	Absolute Surface height	Inventory-Mechanical and Electrical Assets	8.3.11.2
me_access	Access requirements	Inventory-Mechanical and Electrical Assets	8.3.11.9
me_commtyp	Communication method	Inventory-Mechanical and Electrical Point	8.3.11.15
me_con_mat	Material	Inventory-Mechanical and Electrical Line	8.3.11.14
me_cont_id	Controller ID	Inventory-Mechanical and Electrical Point	8.3.11.16
me_cs_typ	Control system type	Inventory-Mechanical and Electrical Point	8.3.11.17
me_dat_log	Data logger present	Inventory-Mechanical and Electrical Point	8.3.11.18
me_des_lif	Design life	Inventory-Mechanical and Electrical Assets	8.3.11.5
me_dia	Diameter	Inventory-Mechanical and Electrical Line	8.3.11.12
me_dl_star	Defects liability start date	Inventory-Mechanical and Electrical Assets	8.3.11.8
me_housing	Housing type	Inventory-Mechanical and Electrical Point	8.3.11.19
me_install	Installer	Inventory-Mechanical and Electrical Assets	8.3.11.10
me_liab_e	Defects liability end date	Inventory-Mechanical and Electrical Assets	8.3.11.6
me_lin_len	Length	Inventory-Mechanical and Electrical Line	8.3.11.13
me_maintre	Maintenance requirements	Inventory-Mechanical and Electrical Assets	8.3.11.7
me_manu	Manufacturer	Inventory-Mechanical and Electrical Assets	8.3.11.11
me_mod_no	Model number	Inventory-Mechanical and Electrical Point	8.3.11.22
me_mount	Mounting type	Inventory-Mechanical and Electrical Point	8.3.11.23
me_power	Power source	Inventory-Mechanical and Electrical Point	8.3.11.24
me_purch	Purchase date	Inventory-Mechanical and Electrical Point	8.3.11.21
me_seri_no	Serial number	Inventory-Mechanical and Electrical Point	8.3.11.25
me_site	Site name	Inventory-Mechanical and Electrical Assets	8.3.11.1
me_sub_typ	Asset sub type	Inventory-Mechanical and Electrical Assets	8.3.11.3

Code	Name	Function & Asset Group	Ref
me_supp	Supplier	Inventory-Mechanical and Electrical Point	8.3.11.26
me_typ	Type	Inventory-Mechanical and Electrical Assets	8.3.11.4
me_ups	UPS is connected	Inventory-Mechanical and Electrical Point	8.3.11.20
me_warrend	Warranty end date	Inventory-Mechanical and Electrical Point	8.3.11.27
meter	Metered parking	Inventory-Parking	8.3.12.2
mt_act	Work activity	Works and Costs-Maintenance	8.14.29
mt_act_grp	Activity group	Works and Costs-Maintenance	8.14.28
mt_action	Action completed	Works and Costs-Maintenance	8.14.25
mt_compl	Date and time of completion	Works and Costs-Maintenance	8.14.26
mt_cost	Maintenance paid amount	Works and Costs-Maintenance	8.14.16
mt_crate	Work schedule rate	Works and Costs-Maintenance	8.14.15
mt_cyc	Maintenance cycle	Works and Costs-Maintenance	8.14.30
mt_date_a	Date approved for payment	Works and Costs-Maintenance	8.14.17
mt_date_cr	Date and time of creation	Works and Costs-Maintenance	8.14.22
mt_def	Defect description	Works and Costs-Maintenance	8.14.11
mt_def_id	Maintenance defect ID	Works and Costs-Maintenance	8.14.10

Code	Name	Function & Asset Group	Ref
mt_dlp_e	Defect liability end date	Works and Costs-Maintenance	8.14.19
mt_dlp_s	Defect liability start date	Works and Costs-Maintenance	8.14.18
mt_id	Source Identification	Works and Costs-Maintenance	8.14.20
mt_int_par	Intervention parameter	Works and Costs-Maintenance	8.14.23
mt_int_thr	Intervention threshold	Works and Costs-Maintenance	8.14.24
mt_loc	Location reference type	Works and Costs-Maintenance	8.14.27
mt_quan	Work quantity	Works and Costs-Maintenance	8.14.14
mt_ref	Source Identification Reference	Works and Costs-Maintenance	8.14.21
mt_status	Status of work	Works and Costs-Maintenance	8.14.12
mt_unit	Unit for payment	Works and Costs-Maintenance	8.14.13
mtt	Mean Travel Time	Performance (Service)-Travel Speed	8.12.55
network_na	Network Name	Network-Network	8.1.1
no_str_bri	Number of Bridge Structures	Network-Road	8.1.17
no_str_cul	Number of Major Culvert Structures	Network-Road	8.1.18
no_str_tot	Number of Major Structures	Network-Road	8.1.16
node_id	Node ID	Network-Node	8.1.2
node_x_e	X coordinate end Node	Network-Node	8.1.6
node_x_s	X coordinate start node	Network-Node	8.1.3
node_y_e	Y coordinate end Node	Network-Node	8.1.7
node_y_s	Y coordinate start node	Network-Node	8.1.4

Code	Name	Function & Asset Group	Ref
node_z_e	Z coordinate end Node	Network-Node	8.1.8
node_z_s	Z coordinate start node	Network-Node	8.1.5
ntsu	Nominal Travel Speed (Urban)	Performance (Service)-Travel Speed	8.12.61
ntt	Nominal Travel Time	Performance (Service)-Travel Speed	8.12.53
operator	Operator organisation	Network-Link Section	8.1.36
opex_dep	Depreciation Expense	Performance (Financial)-Investment	8.11.17
opex_maint	Recurrent Spend – Maintenance	Performance (Financial)-Investment	8.11.15
opex_oper	Recurrent Spend – Operations	Performance (Financial)-Investment	8.11.16
opex_tot	Total Recurrent Spend	Performance (Financial)-Investment	8.11.14
owner	Owner of the asset	Inventory-All - A General	8.3.0.4
owner	Ownership organisation	Network-Link Section	8.1.35
p_axle_max	Load Limit	Inventory-Pavement All	8.3.14.11
p_df_act	Actual applied load	Condition-Pavement - Deflection	8.4.28
p_df_d0	Pavement deflection d0	Condition-Pavement - Deflection	8.4.23
p_df_d1500	Pavement deflection d1500	Condition-Pavement - Deflection	8.4.27
p_df_d200	Pavement deflection d200	Condition-Pavement - Deflection	8.4.24
p_df_d300	Pavement deflection d300	Condition-Pavement - Deflection	8.4.25
p_df_d900	Pavement deflection d900	Condition-Pavement - Deflection	8.4.26
p_df_date	Deflection survey date-time	Condition-Pavement - Deflection	8.4.31
p_df_name	Deflection survey operator	Condition-Pavement - Deflection	8.4.32
p_df_veh	Deflection testing vehicle	Condition-Pavement - Deflection	8.4.22
p_lay_cbr	layer CBR	Inventory-Pavement	8.3.14.19
p_lay_dep	Layer depth	Inventory-Pavement	8.3.14.12
p_lay_mat	Layer material	Inventory-Pavement	8.3.14.13
p_lay_no	Layer number	Inventory-Pavement	8.3.14.14
p_lay_stab	Layer Stabilising agent	Inventory-Pavement	8.3.14.15
p_lay_typ	Layer type	Inventory-Pavement	8.3.14.17
p_lay_ucs	layer UCS	Inventory-Pavement	8.3.14.20
p_lay_wid	Layer width	Inventory-Pavement	8.3.14.18
p_recy_mat	Recylced Material	Inventory-Pavement All	8.3.14.9
p_recy_per	Recycled Percentage	Inventory-Pavement All	8.3.14.8
p_stab_pct	Stabilising agent percent	Inventory-Pavement	8.3.14.16
p_wid_l	Lateral width left	Inventory-Pavement All	8.3.14.1
p_wid_r	Lateral width right	Inventory-Pavement All	8.3.14.2
paint_colo	Paint colour	Inventory-Road Barriers	8.3.21.17
park_type	Type	Inventory-Parking	8.3.12.4
path_b_dep	BaseDepth	Inventory-Pathways	8.3.13.2
path_b_typ	BaseType	Inventory-Pathways	8.3.13.3
path_c_dep	Depth Crossing	Inventory-Pathways	8.3.13.4
path_cond	Pathway visual condition	Condition-Pathway/Foot paths	8.4.89
path_date	Pathways survey date-time	Condition-Pathway/Foot paths	8.4.90

Code	Name	Function & Asset Group	Ref
path_dep	Depth Pathway	Inventory-Pathways	8.3.13.5
path_instr	Instruction	Inventory-Pathways	8.3.13.21
path_len	Length pathway	Inventory-Pathways	8.3.13.17
path_mat	Material Pathway	Inventory-Pathways	8.3.13.18
path_name	Pathways survey operator	Condition-Pathway/Foot paths	8.4.91
path_name	Local name	Inventory-Pathways	8.3.13.1
path_obst	Obstruction type	Inventory-Pathways	8.3.13.12
path_r_mat	Rail material	Inventory-Pathways	8.3.13.13
path_r_typ	Rail type	Inventory-Pathways	8.3.13.7
path_reo	Pathway is reinforced	Inventory-Pathways	8.3.13.8
path_s_dep	Sub base depth	Inventory-Pathways	8.3.13.9
path_s_typ	Sub base type	Inventory-Pathways	8.3.13.10
path_steps	Number of steps	Inventory-Pathways	8.3.13.6
path_treat	Treatment	Inventory-Pathways	8.3.13.20
path_typ	Pathway type	Inventory-Pathways	8.3.13.19
path_wid	Width	Inventory-Pathways	8.3.13.11
pav_tiles	Number of paving tiles	Inventory-Tactile Paving	8.3.27.2
pav_typ	Tactile paving type	Inventory-Tactile Paving	8.3.27.1
pave_const	Type of pavement construction	Network-Link Section	8.1.34
PCU_km	Passenger Car Unit equivalent kilometres	Demand-Road Use	8.5.7
peak_hr_v	Number of vehicles during peak hour	Utilisation-Traffic volumes	8.6.16
ped_hr	Number of pedestrians per hour	Utilisation-Pedestrians	8.6.10
ped_km	Passenger km travelled on public transport	Utilisation-Pedestrians	8.6.11
perf_a_da	Actual date for Performance actual	Performance (Service)-Achievement	8.12.7
perf_act	Performance actual	Performance (Service)-Achievement	8.12.6
perf_cat	Performance category	Performance (Service)-Achievement	8.12.1
perf_ta_ac	Performance measure target_achievable	Performance (Service)-Achievement	8.12.2
perf_ta_da	Target date for Performance measure target_achievable	Performance (Service)-Achievement	8.12.3
perf_tx	Performance measure target_aspirational	Performance (Service)-Achievement	8.12.4
perf_tx_da	Target date for Performance measure target_aspirational	Performance (Service)-Achievement	8.12.5
perfa_ach	Performance measure target_achievable	Performance (Asset)-Achievement	8.10.2
perfa_act	Performance actual	Performance (Asset)-Achievement	8.10.6
perfa_asp	Performance measure target_aspirational	Performance (Asset)-Achievement	8.10.4
perfa_cat	Performance category	Performance (Asset)-Achievement	8.10.1
permit_no	Permit number	Inventory-All - A General	8.3.0.7
permits	Permit availability	Inventory-Parking	8.3.12.5
photo_ref	Photo reference	Inventory-All - C Additional	8.3.0.24
pit_dep	Depth	Inventory-Pits	8.3.16.9
pit_dia	Diameter width	Inventory-Pits	8.3.16.3
pit_fence	Fence present	Inventory-Pits	8.3.16.10
pit_len	Length	Inventory-Pits	8.3.16.4
pit_level	Finished surface level	Inventory-Pits	8.3.16.11

Code	Name	Function & Asset Group	Ref
pit_li_typ	Lid Type	Inventory-Pits	8.3.16.5
pit_no	Pit number	Inventory-Pits	8.3.16.6
pit_st_typ	Construction Type	Inventory-Pits	8.3.16.13
pit_steps	Number of step irons	Inventory-Pits	8.3.16.12
pit_trap	Litter trap type	Inventory-Pits	8.3.16.8
pit_typ	Type	Inventory-Pits	8.3.16.7
pit_x	X Coordinate	Inventory-Pits	8.3.16.1
pit_y	Y Coordinate	Inventory-Pits	8.3.16.2
plan_no	As Constructed Plan Number	Inventory-All - A General	8.3.0.8
plaque_des	Plaque description	Inventory-Public Art	8.3.18.4
plaque_yr	Plate or plaque year	Inventory-Tunnels	8.3.31.24
pofoun_mat	Foundation material	Inventory-Poles	8.3.17.5
pole_attac	Pole attachments present	Inventory-Poles	8.3.17.9
pole_cntrl	Pole controller	Inventory-Poles	8.3.17.7
pole_earth	Pole earth method	Inventory-Poles	8.3.17.4
pole_finsh	Pole finish	Inventory-Poles	8.3.17.8
pole_found	Foundation type	Inventory-Poles	8.3.17.6
pole_hei	Pole height	Inventory-Poles	8.3.17.1
pole_manuf	Pole Manufacturer	Inventory-Poles	8.3.17.10
pole_mat	Pole Material	Inventory-Poles	8.3.17.2
pole_model	Pole model number	Inventory-Poles	8.3.17.11
pole_stand	Design Standard	Inventory-Poles	8.3.17.12
pole_typ	Pole type	Inventory-Poles	8.3.17.3
pop	Estimated population served by road	Classification-Economic and Social	8.2.2
pop_catch	Population	Demand-Population	8.5.3
prm	Percent routine maintenance	Works and Costs-Output	8.14.33

Code	Name	Function & Asset Group	Ref
psurf_stat	Road surface status	Inventory-Pavement Surfacing All	8.3.15.5
psv	Polished Stone Value of Chip for the seal layer	Inventory-Pavement Surfacing	8.3.15.15
pt_reliab	Public transport reliability	Performance (Service)-Public Transport	8.12.29
purpose	Purpose	Inventory-Parking	8.3.12.3
rb_attach	Attachments on the barrier	Inventory-Road Barriers	8.3.21.7
rb_end_typ	Barrier End style	Inventory-Road Barriers	8.3.21.10
rb_grn_fix	Ground fixed method	Inventory-Road Barriers	8.3.21.11
rb_hei	Height of barrier	Inventory-Road Barriers	8.3.21.5
rb_len	Length of barrier	Inventory-Road Barriers	8.3.21.2
rb_mod_no	Model number	Inventory-Road Barriers	8.3.21.16
rb_offset	Lateral offset face	Inventory-Road Barriers	8.3.21.1
rb_pos_mat	Material barrier posts	Inventory-Road Barriers	8.3.21.6
rb_posts	Barrier number of posts	Inventory-Road Barriers	8.3.21.12
rb_rai_mat	Material barrier rail.	Inventory-Road Barriers	8.3.21.3
rb_styl_e	Barrier end style	Inventory-Road Barriers	8.3.21.9
rb_styl_s	Barrier start style	Inventory-Road Barriers	8.3.21.13
rb_typ	Road barrier type	Inventory-Road Barriers	8.3.21.4
rb_typ_s	Barrier start type	Inventory-Road Barriers	8.3.21.14
rb_wid	Rail width	Inventory-Road Barriers	8.3.21.8
rce_1to2	Return on Construction Expenditure BCR 1-2	Performance (Financial)-Development Program / Project Assessment	8.11.2
rce_2to3	Return on Construction	Performance (Financial)-	8.11.3

Code	Name	Function & Asset Group	Ref
	Expenditure BCR 2-3	Development Program / Project Assessment	
rce_3to4	Return on Construction Expenditure BCR 3-4	Performance (Financial)-Development Program / Project Assessment	8.11.4
rce_4to5	Return on Construction Expenditure BCR 4-5	Performance (Financial)-Development Program / Project Assessment	8.11.5
rce_great5	Return on Construction Expenditure BCR >5	Performance (Financial)-Development Program / Project Assessment	8.11.6
rce_less1	Return on Construction Expenditure BCR <1	Performance (Financial)-Development Program / Project Assessment	8.11.1
rehab_pc	Pavement rehabilitation network coverage	Performance (Asset)-Output	8.10.24
res_wid_l	Reserve width left from centreline	Network-Link Section	8.1.25
res_wid_r	Reserve width right from centreline	Network-Link Section	8.1.26
resil_ava	Access State	Resilience-Output	8.9.3
resil_dam	Damage State	Resilience-Output	8.9.2
resil_out	Duration	Resilience-Output	8.9.4
resil_sc	Event scenario that route/ road section resilience is being considered for.	Resilience-Output	8.9.1
restr_app	User group restriction applies to	Access-Identification	8.13.4
restr_cse	Restriction reason	Access-Identification	8.13.3
restr_day	Restriction day	Access-Time Period	8.13.13
restr_e	Restriction end date	Access-Time Period	8.13.12
restr_id	Restriction ID	Access-Identification	8.13.1
restr_ownr	Restriction owner	Access-Identification	8.13.8
restr_peri	Restriction period	Access-Time Period	8.13.10
restr_resp	Organisation responsible	Access-Identification	8.13.7
restr_s	Restriction start date	Access-Time Period	8.13.11
restr_stat	Restriction status	Access-Time Period	8.13.9
restr_t_e	Restriction end time	Access-Time Period	8.13.15
restr_t_s	Restriction start time	Access-Time Period	8.13.14
restr_type	Restriction type	Access-Identification	8.13.2
restr_unit	Restriction unit	Access-Identification	8.13.5
restr_val	Restriction value	Access-Identification	8.13.6
risk_asses	Who undertook the Safety or Risk Assessment.	Inventory-Public Art	8.3.18.6
risk_co	Consequence Rating overall	Risk-Consequence	8.8.1
risk_co_en	Consequence Rating Environmental	Risk-Consequence	8.8.5
risk_co_fi	Consequence Rating Financial	Risk-Consequence	8.8.4
risk_co_go	Consequence Rating Governance	Risk-Consequence	8.8.6
risk_co_hs	Consequence Rating Health and Safety	Risk-Consequence	8.8.2
risk_co_se	Consequence Rating Socio Cultural	Risk-Consequence	8.8.3
risk_date	Risk Date	Risk-General	8.8.8
risk_id	Risk ID	Risk-General	8.8.7
risk_le	Likelihood Rating Overall	Risk-Likelihood	8.8.9

Code	Name	Function & Asset Group	Ref
risk_mo_dt	Schedule monitoring plan review date	Risk-Monitoring	8.8.10
risk_mo_id	Montioring plan identifier	Risk-Monitoring	8.8.11
risk_rate	Risk Rating Overall	Risk-Output	8.8.12
rme	Routine maintenance efficiency	Works and Costs-Output	8.14.32
road_from	Chainage at start of street segment	Inventory-Pavement All	8.3.14.3
road_id	Road ID	Network-Road	8.1.12
road_len	Road Length	Network-Road	8.1.14
road_name	Road name	Network-Road	8.1.13
road_to	Chainage at end of street segment	Inventory-Pavement All	8.3.14.4
rut_date	Rutting survey date-time	Condition-Pavement - Rutting	8.4.61
rut_iwp	Rut depth inner	Condition-Pavement - Rutting	8.4.39
rut_iwp_10	Rut depth inner wheel path >5mm-<10mm	Condition-Pavement - Rutting	8.4.42
rut_iwp_15	Rut depth inner wheel path >10mm-<15mm	Condition-Pavement - Rutting	8.4.43
rut_iwp_20	Rut depth inner wheel path >15-<20mm	Condition-Pavement - Rutting	8.4.44
rut_iwp_25	Rut depth inner wheel path >20-<25mm	Condition-Pavement - Rutting	8.4.45
rut_iwp_30	Rut depth inner wheel path >25-<30mm	Condition-Pavement - Rutting	8.4.46
rut_iwp_35	Rut depth inner wheel path >30-<35mm	Condition-Pavement - Rutting	8.4.47
rut_iwp_40	Rut depth inner wheel path >35-<40mm	Condition-Pavement - Rutting	8.4.48
rut_iwp_5	Rut depth inner wheel path 0-<5mm	Condition-Pavement - Rutting	8.4.41
rut_iwp_sd	Rut depth standard deviation inner	Condition-Pavement - Rutting	8.4.40
rut_iwp_X0	Rut depth inner wheel path >40mm	Condition-Pavement - Rutting	8.4.49
rut_lane	Rut depth lane	Condition-Pavement - Rutting	8.4.38
rut_name	Rutting survey operator	Condition-Pavement - Rutting	8.4.62
rut_owp	Rut depth outer	Condition-Pavement - Rutting	8.4.50
rut_owp_10	Rut depth outer wheel path >5mm-<10mm	Condition-Pavement - Rutting	8.4.53
rut_owp_15	Rut depth outer wheel path >10mm-<15mm	Condition-Pavement - Rutting	8.4.54
rut_owp_20	Rut depth outer wheel path >15-<20mm	Condition-Pavement - Rutting	8.4.55
rut_owp_25	Rut depth outer wheel path >20-<25mm	Condition-Pavement - Rutting	8.4.56
rut_owp_30	Rut depth outer wheel path >25-<30mm	Condition-Pavement - Rutting	8.4.57
rut_owp_35	Rut depth outer wheel path >30-<35mm	Condition-Pavement - Rutting	8.4.58
rut_owp_40	Rut depth outer wheel path >35-<40mm	Condition-Pavement - Rutting	8.4.59
rut_owp_5	Rut depth outer wheel path 0-<5mm	Condition-Pavement - Rutting	8.4.52
rut_owp_sd	Rut depth standard deviation inner	Condition-Pavement - Rutting	8.4.51
rut_owp_X0	Rut depth outer wheel path >40mm	Condition-Pavement - Rutting	8.4.60
rw_above	Features above the wall	Inventory-Retaining Walls	8.3.20.15
rw_below	Features below the wall	Inventory-Retaining Walls	8.3.20.17
rw_fac_are	Face area of wall	Inventory-Retaining Walls	8.3.20.7

Code	Name	Function & Asset Group	Ref
rw_fac_mat	Face material	Inventory-Retaining Walls	8.3.20.8
rw_fac_thi	Face thickness	Inventory-Retaining Walls	8.3.20.18
rw_len	Length of retaining wall	Inventory-Retaining Walls	8.3.20.2
rw_max_hei	Maximum height	Inventory-Retaining Walls	8.3.20.11
rw_offset	Lateral offset face	Inventory-Retaining Walls	8.3.20.1
rw_pos_mat	Wall post material	Inventory-Retaining Walls	8.3.20.10
rw_restrai	Restraining mechanism of the asset	Inventory-Retaining Walls	8.3.20.3
rw_tie_row	Number of anchorage rows	Inventory-Retaining Walls	8.3.20.12
rw_tie_sys	Anchoring system	Inventory-Retaining Walls	8.3.20.13
rw_tilt	Back tilt angle	Inventory-Retaining Walls	8.3.20.16
s_add_quan	Additive quantity	Inventory-Pavement Surfacing	8.3.15.16
s_add_typ	Type of additive	Inventory-Pavement Surfacing	8.3.15.17
s_add_typ	Adhesion agent	Inventory-Pavement Surfacing	8.3.15.19
s_adh_quan	Adhesion agent quantity	Inventory-Pavement Surfacing	8.3.15.18
s_ald	Average Least Dimension	Inventory-Pavement Surfacing	8.3.15.20
s_bind_rat	Binder application rate	Inventory-Pavement Surfacing	8.3.15.21
s_bind_sp	Binder softening point	Inventory-Pavement Surfacing	8.3.15.31
s_bind_typ	Binder type	Inventory-Pavement Surfacing	8.3.15.22
s_cut	Cutter Quantity	Inventory-Pavement Surfacing	8.3.15.23
s_cut_typ	Cutter type	Inventory-Pavement Surfacing	8.3.15.24
s_dep	Depth of the seal	Inventory-Pavement Surfacing	8.3.15.11
s_elas_rec	Elastic recovery	Inventory-Pavement Surfacing	8.3.15.25
s_flux	Quantity of flux	Inventory-Pavement Surfacing	8.3.15.26
s_func	Seal layer function	Inventory-Pavement Surfacing	8.3.15.12
s_lay_no	The surface layer number	Inventory-Pavement Surfacing	8.3.15.14
s_life_des	Design life	Inventory-Pavement Surfacing All	8.3.15.7
s_mat	Surfacing material type	Inventory-Pavement Surfacing	8.3.15.13
s_ply_typ	Polymer type	Inventory-Pavement Surfacing	8.3.15.28
s_poly	Polymer percentage	Inventory-Pavement Surfacing	8.3.15.27
s_recy	Recycled component	Inventory-Pavement Surfacing	8.3.15.30
s_recy_mat	Percentage of recycle material	Inventory-Pavement Surfacing	8.3.15.29
s_source	Quarry source	Inventory-Pavement Surfacing	8.3.15.32
s_wid_l	Lateral width left	Inventory-Pavement Surfacing All	8.3.15.1
s_wid_r	Lateral width right	Inventory-Pavement Surfacing All	8.3.15.2

Code	Name	Function & Asset Group	Ref
saferisk_c	Collective Road Safety Risk	Performance (Service)-Road Safety	8.12.51
saferisk_p	Personal Road Safety Risk	Performance (Service)-Road Safety	8.12.52
scc	Number of Serious Casualty Crashes	Performance (Service)-Road Safety	8.12.39
scc_p	Serious Casualty Crashes (Population)	Performance (Service)-Road Safety	8.12.40
scc_t	Serious Casualty Crashes (Vehicle-Kilometres Travelled)	Performance (Service)-Road Safety	8.12.41
sci_path	Pathways meeting the level of service standard	Performance (Service)-Customer Safety (Condition)	8.12.20
sci_pave	Pavement Surfacing meeting the level of service standard	Performance (Service)-Customer Safety (Condition)	8.12.21
sdtt	Standard Deviation of Travel Times	Performance (Service)-Travel Speed	8.12.56
seal_len	Length of seal	Inventory-Pavement Surfacing All	8.3.15.3
seal_spec	Seal specification	Inventory-Pavement Surfacing All	8.3.15.8
seal_wid	Width of seal	Inventory-Pavement Surfacing All	8.3.15.4
seal_year	Year of current surface installation	Inventory-Pavement Surfacing All	8.3.15.6
seat_mat	Seating material	Inventory-Shelters	8.3.22.6
seg_cl_len	Centreline segment length	Inventory-Pavement All	8.3.14.5
sf	Number of Road Fatalities	Performance (Service)-Road Safety	8.12.42
sf_p	Road Fatalities (Population)	Performance (Service)-Road Safety	8.12.43
sf_t	Road Fatalities (Vehicle-Kilometres Travelled)	Performance (Service)-Road Safety	8.12.44
sfc_date	SCRIM survey time-date	Condition-Pavement Surface - Skid	8.4.66
sfc_iwp	SCRIM inner wheel path	Condition-Pavement Surface - Skid	8.4.64
sfc_owp	SCRIM outer wheel path	Condition-Pavement Surface - Skid	8.4.65
sfc_speed	SCRIM speed	Condition-Pavement Surface - Skid	8.4.63
sfc_veh	SCRIM vehicle	Condition-Pavement Surface - Skid	8.4.67
sh_dis_acc	Disabled access available	Inventory-Shelters	8.3.22.2
sh_flr_mat	Floor material	Inventory-Shelters	8.3.22.3
sh_manuf	Shelter manufacturer	Inventory-Shelters	8.3.22.8
sh_model	Model number of shelter	Inventory-Shelters	8.3.22.9
sh_roo_mat	Roof material	Inventory-Shelters	8.3.22.4
sh_typ	Shelter type	Inventory-Shelters	8.3.22.1
sh_wal_mat	Wall material	Inventory-Shelters	8.3.22.5
sign_angle	Sign angle	Inventory-Signs	8.3.23.16
sign_b_mat	Background material	Inventory-Signs	8.3.23.11
sign_bcol	Background colour	Inventory-Signs	8.3.23.10
sign_frame	Frame material	Inventory-Signs	8.3.23.7
sign_elev	Ground height	Inventory-Signs	8.3.23.2
sign_hei	Sign height	Inventory-Signs	8.3.23.3
sign_manuf	Sign manufacturer	Inventory-Signs	8.3.23.15
sign_mat	Panel material	Inventory-Signs	8.3.23.17
sign_p_mat	Post Material	Inventory-Signs	8.3.23.5

Code	Name	Function & Asset Group	Ref
sign_panel	Number of sign panels	Inventory-Signs	8.3.23.8
sign_posts	Number of posts	Inventory-Signs	8.3.23.4
sign_refno	Local Sign Reference Number	Inventory-Signs	8.3.23.19
sign_refsd	Australian Standard Reference	Inventory-Signs	8.3.23.18
sign_stren	Strengthening bar present	Inventory-Signs	8.3.23.9
sign_supp	Support type	Inventory-Signs	8.3.23.20
sign_typ	Sign Type	Inventory-Signs	8.3.23.1
sign_wid	Width of sign	Inventory-Signs	8.3.23.6
sign_wordc	Legend colour	Inventory-Signs	8.3.23.13
sign_wordm	Legend material	Inventory-Signs	8.3.23.14
sign_words	Wording on sign	Inventory-Signs	8.3.23.12
signal_hei	Ground height to bottom of signal	Inventory-Traffic Signals	8.3.29.6
sk_res_20	Skid resistance 20m	Condition-Pavement Surface - Skid	8.4.69
sk_res_50	Skid resistance 50m	Condition-Pavement Surface - Skid	8.4.70
skid_test	Skid Resistance Test	Condition-Pavement Surface - Skid	8.4.68
slope_area	Area of slope face	Inventory-Slopes	8.3.24.1
slope_drn	Active or passive drainage	Inventory-Slopes	8.3.24.8
slope_grad	Gradient of batter slope	Inventory-Slopes	8.3.24.3
slope_hei	Average height	Inventory-Slopes	8.3.24.5
slope_len	Slope length	Inventory-Slopes	8.3.24.4
slope_mon	Geotechnical monitoring equipment	Inventory-Slopes	8.3.24.14
slope_plan	Planting exists	Inventory-Slopes	8.3.24.6
slope_rein	Slope is reinforced	Inventory-Slopes	8.3.24.7
slope_seis	Slope seismic rating	Inventory-Slopes	8.3.24.15
slope_typ	Slope in cut or fill	Inventory-Slopes	8.3.24.2
smart_pad	Signal connected to a smart pad	Inventory-Traffic Signals	8.3.29.33
speed_85	85% Speed	Utilisation-Capacity	8.6.5
sph	Number of Persons Hospitalised	Performance (Service)-Road Safety	8.12.45
sph_p	Persons Hospitalised (Population)	Performance (Service)-Road Safety	8.12.46
sph_t	Persons Hospitalised (Vehicle-Kilometres Travelled)	Performance (Service)-Road Safety	8.12.47
sreq_compl	Service request response time compliance	Performance (Service)-Customer Safety (Condition)	8.12.23
sreq_time	Achieved service request response time	Performance (Service)-Customer Safety (Condition)	8.12.22
ssc	Social Cost of Serious Casualty Crash	Performance (Service)-Road Safety	8.12.48
ssc_p	Social Cost of Serious Casualty Crashes (Population)	Performance (Service)-Road Safety	8.12.49
ssc_t	Social Cost of Serious Casualty Crashes (Vehicle-Kilometres Travelled)	Performance (Service)-Road Safety	8.12.50
sseal_pc	Spray seal resurfacing coverage across sealed network	Performance (Asset)-Output	8.10.22
stage_no	Subdivision stage or project number	Inventory-All - A General	8.3.0.13

Code	Name	Function & Asset Group	Ref
standpipe	Standpipe installed	Inventory-Slopes	8.3.24.16
ste_a_420	Smooth Travel Exposure All (4.2 IRI)	Performance (Service)-Customer Experience	8.12.10
ste_a_533	Smooth Travel Exposure All (5.33 IRI)	Performance (Service)-Customer Experience	8.12.13
ste_r_420	Smooth Travel Exposure Rural (4.2 IRI)	Performance (Service)-Customer Experience	8.12.9
ste_r_533	Smooth Travel Exposure Rural (5.33 IRI)	Performance (Service)-Customer Experience	8.12.12
ste_u_420	Smooth Travel Exposure Urban (4.2 IRI)	Performance (Service)-Customer Experience	8.12.8
ste_u_533	Smooth Travel Exposure Urban (5.33 IRI)	Performance (Service)-Customer Experience	8.12.11
struc_att	Structure attachments	Inventory-Structures	8.3.25.9
struc_fin	Structure surface finish	Inventory-Structures	8.3.25.5
struc_ftyp	Structure foundation type	Inventory-Structures	8.3.25.7
struc_hei	Structure height	Inventory-Structures	8.3.25.1
struc_manu	Structure manufacturer	Inventory-Structures	8.3.25.10
struc_mat	Structure material	Inventory-Structures	8.3.25.2
struc_typ	Structure type	Inventory-Retaining Walls	8.3.20.4
struc_typ	Structure type	Inventory-Structures	8.3.25.3
struc_wid	Structure width	Inventory-Structures	8.3.25.4
struct_pc	Major structures replaced	Performance (Asset)-Output	8.10.25
struct_sup	Structure number of supports	Inventory-Structures	8.3.25.8

Code	Name	Function & Asset Group	Ref
surf_pc	Resurfacing coverage across total network	Performance (Asset)-Output	8.10.19
surf_s_pc	Resurfacing coverage across sealed network	Performance (Asset)-Output	8.10.21
surf_us_pc	Resheeting coverage across unsealed network	Performance (Asset)-Output	8.10.20
tach1_date	Target date for Performance measure target_achievable	Performance (Asset)-Achievement	8.10.3
tasp1_date	Target date for Performance measure target_aspirational	Performance (Asset)-Achievement	8.10.5
tboard_len	Target board length	Inventory-Traffic Signals	8.3.29.16
tboard_mat	Target board material	Inventory-Traffic Signals	8.3.29.17
tboard_wid	Target board width	Inventory-Traffic Signals	8.3.29.18
temp_air	Ambient air temperature	Condition-Pavement - Deflection	8.4.29
temp_pave	Pavement temperature	Condition-Pavement - Deflection	8.4.30
tm_in_mat	Traffic Management device infill material	Inventory-Traffic Management Devices Polygon	8.3.28.8
tm_is_dia	Diameter of roundabout	Inventory-Traffic Management Devices Polygon	8.3.28.7
tm_manuf	Company name only	Inventory-Traffic Management Devices Point	8.3.28.3
tm_mat	Traffic Management Point Material	Inventory-Traffic Management Devices Point	8.3.28.1
tm_mat	Traffic management device material	Inventory-Traffic Management Devices Polygon	8.3.28.5

Code	Name	Function & Asset Group	Ref
tm_model	Model number	Inventory-Traffic Management Devices Point	8.3.28.4
tm_p_typ	Traffic Management Point Type	Inventory-Traffic Management Devices Point	8.3.28.2
tm_typ	Traffic management device type	Inventory-Traffic Management Devices Polygon	8.3.28.6
tourism	Tourist route	Classification-Economic and Social	8.2.7
traf_cl_sy	Traffic classification used	Utilisation-Traffic volumes	8.6.14
traf_class	Traffic classification system class number	Utilisation-Traffic volumes	8.6.15
traf_dir	Traffic flow direction	Network-Link Section	8.1.32
traf_set	Traffic setting	Network-Link Section	8.1.33
treat_e_a	Actual work treatment end date	Works and Costs-Output	8.14.37
treat_s_a	Actual work treatment start date	Works and Costs-Output	8.14.36
tree_age	Tree Age	Inventory-Trees	8.3.30.6
tree_commo	Common name	Inventory-Trees	8.3.30.11
tree_dia	Diameter of trunk	Inventory-Trees	8.3.30.1
tree_genus	Genus	Inventory-Trees	8.3.30.3
tree_guard	Tree guards present	Inventory-Trees	8.3.30.4
tree_hei	Height at capture	Inventory-Trees	8.3.30.2
tree_maint	Maintenance requirements	Inventory-Trees	8.3.30.8
tree_metho	Tree Planting method	Inventory-Trees	8.3.30.12
tree_prune	Pruning time interval	Inventory-Trees	8.3.30.10
tree_roots	Tree environment for roots	Inventory-Trees	8.3.30.13
tree_sig	Tree significance	Inventory-Trees	8.3.30.9
tree_speci	Tree species	Inventory-Trees	8.3.30.14
tree_stat	Tree Endemic status	Inventory-Trees	8.3.30.7
tree_stock	Stock type	Inventory-Trees	8.3.30.5
tree_supp	Support type for tree	Inventory-Trees	8.3.30.15
tree_wires	Overhead wires present	Inventory-Trees	8.3.30.16
trf_gr_all	Annual growth (% / year) of all vehicle classes	Demand-Traffic Growth	8.5.8
trf_gr_bus	Annual growth (% / year) of all buses	Demand-Traffic Growth	8.5.10
trf_gr_cyc	Annual growth (% / year) of cycles	Demand-Traffic Growth	8.5.12
trf_gr_hcv	Annual growth (% / year) of all heavy vehicles	Demand-Traffic Growth	8.5.11
trf_gr_lcv	Annual growth (% / year) of all light vehicles	Demand-Traffic Growth	8.5.9
ts_access	Access to asset	Inventory-Traffic Signals	8.3.29.25
ts_attach	Attachments type present on the poles	Inventory-Traffic Signals	8.3.29.26
ts_callbox	Pedestrian call box present	Inventory-Traffic Signals	8.3.29.13
ts_cbmodel	Call box model number	Inventory-Traffic Signals	8.3.29.28
ts_cont_id	Controller ID	Inventory-Traffic Signals	8.3.29.4
ts_cost	Traffic signal purchase cost	Inventory-Traffic Signals	8.3.29.23
ts_cs_typ	Control system type	Inventory-Traffic Signals	8.3.29.5
ts_dat_log	Data logger present	Inventory-Traffic Signals	8.3.29.9
ts_dl_sta	Defects liability start date	Inventory-Traffic Signals	8.3.29.20
ts_dlp_end	Defects liability end date	Inventory-Traffic Signals	8.3.29.19

Code	Name	Function & Asset Group	Ref
ts_eth_typ	Earthing type for signal pole	Inventory-Traffic Signals	8.3.29.10
ts_lum_man	Luminaire manufacturer	Inventory-Traffic Signals	8.3.29.29
ts_lum_siz	Luminaire size	Inventory-Traffic Signals	8.3.29.11
ts_lum_typ	Luminaire type	Inventory-Traffic Signals	8.3.29.12
ts_mainreq	Maintenance requirements	Inventory-Traffic Signals	8.3.29.21
ts_maintco	Signal maintenance company	Inventory-Traffic Signals	8.3.29.22
ts_make	Manufacturer of call box	Inventory-Traffic Signals	8.3.29.27
ts_maunf	Manufacturer of the signal	Inventory-Traffic Signals	8.3.29.30
ts_mnt_typ	Mounting type	Inventory-Traffic Signals	8.3.29.32
ts_model	Model number	Inventory-Traffic Signals	8.3.29.31
ts_pole_id	Signal pole number	Inventory-Traffic Signals	8.3.29.1
ts_purchda	Purchase date	Inventory-Traffic Signals	8.3.29.24
ts_radar	Radar Unit is connected	Inventory-Traffic Signals	8.3.29.15
ts_sig_typ	Signal type	Inventory-Traffic Signals	8.3.29.7
ts_site	Site name for the signals	Inventory-Traffic Signals	8.3.29.2
ts_supp	Signal supplier	Inventory-Traffic Signals	8.3.29.34
ts_unqi_id	Signal unique asset ID	Inventory-Traffic Signals	8.3.29.3
ts_war_end	Warranty end date	Inventory-Traffic Signals	8.3.29.37
ttime_rel	Public transport travel time reliability	Performance (Service)-Public Transport	8.12.30
tun_ba_col	Barrel surface treatment colour	Inventory-Tunnels	8.3.31.26
tun_ba_dat	Barrel installation date	Inventory-Tunnels	8.3.31.23
tun_ba_hei	Barrel height	Inventory-Tunnels	8.3.31.10
tun_ba_mat	Barrel material	Inventory-Tunnels	8.3.31.11
tun_ba_sur	Barrel surface treatment installation date	Inventory-Tunnels	8.3.31.25
tun_ba_thi	Barrel thickness	Inventory-Tunnels	8.3.31.13
tun_ba_typ	Barrel surface treatment type	Inventory-Tunnels	8.3.31.12
tun_ba_wid	Barrel width	Inventory-Tunnels	8.3.31.14
tun_bu_hei	Buttress height	Inventory-Tunnels	8.3.31.15
tun_bu_mat	Buttress material	Inventory-Tunnels	8.3.31.16
tun_bu_num	Number of buttresses	Inventory-Tunnels	8.3.31.19
tun_ca_mat	Capping beam material	Inventory-Tunnels	8.3.31.17
tun_clear	Tunnel Clearance	Inventory-Tunnels	8.3.31.7
tun_e_exit	Number of emergency exits	Inventory-Tunnels	8.3.31.18
tun_func	Tunnel Function	Inventory-Tunnels	8.3.31.8
tun_len	Tunnel length	Inventory-Tunnels	8.3.31.3
tun_mx_hei	Maximum trafficable height	Inventory-Tunnels	8.3.31.6
tun_po_hei	Portal height	Inventory-Tunnels	8.3.31.20
tun_po_mat	Portal material	Inventory-Tunnels	8.3.31.21
tun_po_wid	Portal width	Inventory-Tunnels	8.3.31.22
tun_serv	Tunnel services	Inventory-Tunnels	8.3.31.4
tun_st_typ	Tunnel Structure Type	Inventory-Tunnels	8.3.31.9
tun_wid_l	Left Tunnel Width	Inventory-Tunnels	8.3.31.1
tun_wid_r	Right Tunnel Width	Inventory-Tunnels	8.3.31.2
turn_count	Turn movement counts	Utilisation-Capacity	8.6.6

Code	Name	Function & Asset Group	Ref
tx_date	Texture survey date-time	Condition-Pavement Surface - Texture	8.4.77
tx_MPD_bwp	MPD Pavement texture between wheel path	Condition-Pavement Surface - Texture	8.4.76
tx_MPD_iwp	MPD Pavement texture inner wheel path	Condition-Pavement Surface - Texture	8.4.74
tx_MPD_owp	MPD Pavement texture outer wheel path	Condition-Pavement Surface - Texture	8.4.75
tx_name	Texture survey operator	Condition-Pavement Surface - Texture	8.4.78
tx_SMT_bwp	SMTD Pavement texture between wheel path	Condition-Pavement Surface - Texture	8.4.73
tx_SMT_iwp	SMTD Pavement texture inner wheel path	Condition-Pavement Surface - Texture	8.4.71
tx_SMT_owp	SMTD Pavement texture outer wheel path	Condition-Pavement Surface - Texture	8.4.72
us_date	Unsealed survey date-time	Condition-Unsealed Roads	8.4.95
us_drain	Unsealed drainage condition	Condition-Unsealed Roads	8.4.93
us_gv_dep	Gravel depth	Condition-Unsealed Roads	8.4.94
us_name	Unsealed survey operator	Condition-Unsealed Roads	8.4.96
us_profile	Unsealed road profile	Condition-Unsealed Roads	8.4.92
usi	User Satisfaction Index	Performance (Service)-User Satisfaction	8.12.71
util_cur	Current utilisation	Utilisation-Output	8.6.8
util_fut	Future utilisation	Utilisation-Output	8.6.9
util_mod	Model name/ version	Utilisation-Output	8.6.7
value	Assessed cost in Australian/New Zealand Dollars	Inventory-All - B Valuation	8.3.0.20
value_type	Valuation type	Inventory-All - B Valuation	8.3.0.19
value_year	Valuation year	Inventory-All - B Valuation	8.3.0.22
veg_typ	Vegetation type planted	Inventory-Slopes	8.3.24.9
veh_hr_ln	Number of vehicles per lane per hour	Utilisation-Traffic volumes	8.6.31
veh_p_h_ln	Number of vehicles during peak hour per lane	Utilisation-Traffic volumes	8.6.30
vest_date	Vesting date	Inventory-All - C Additional	8.3.0.27
vest_org	Vesting source	Inventory-All - C Additional	8.3.0.28
video_det	Video detection present	Inventory-Traffic Signals	8.3.29.35
visor_type	Visor type	Inventory-Traffic Signals	8.3.29.36
vkt	Vehicle Kilometers Travelled	Demand-Road Use	8.5.4
vtt_amp	AM Peak Variability of Travel Time (Urban)	Performance (Service)-Travel Speed	8.12.66
vtt_day	All Day Variability of Travel Time (Urban)	Performance (Service)-Travel Speed	8.12.69
vtt_off	Off Peak Variability of Travel Time (Urban)	Performance (Service)-Travel Speed	8.12.68
vtt_pmp	PM Peak Variability of Travel Time (Urban)	Performance (Service)-Travel Speed	8.12.67
wc_baby	Number of baby change fixtures	Inventory-Public Toilets	8.3.19.9
wc_bench	Number of benches	Inventory-Public Toilets	8.3.19.8

Code	Name	Function & Asset Group	Ref
wc_change	Changing facilities present	Inventory-Public Toilets	8.3.19.1
wc_fem	Number of female WC fixtures	Inventory-Public Toilets	8.3.19.11
wc_fem_dis	Number of female disabled WC fixtures	Inventory-Public Toilets	8.3.19.10
wc_fem_shw	Number of female showers	Inventory-Public Toilets	8.3.19.3
wc_flo_mat	Floor material	Inventory-Public Toilets	8.3.19.2
wc_mal_dis	Number of male disabled WC fixtures	Inventory-Public Toilets	8.3.19.14
wc_mal_fix	Number of male WC fixtures	Inventory-Public Toilets	8.3.19.16
wc_mal_shw	Number of male showers	Inventory-Public Toilets	8.3.19.4
wc_mal_uri	Number of male urinal fixtures	Inventory-Public Toilets	8.3.19.15
wc_par_mat	Toilet partition material	Inventory-Public Toilets	8.3.19.19
wc_roo_mat	Roof material	Inventory-Public Toilets	8.3.19.6
wc_sharps	Sharp disposal present	Inventory-Public Toilets	8.3.19.17
wc_uni	Number of unisex WC fixtures	Inventory-Public Toilets	8.3.19.12
wc_uni_dis	Number unisex disabled WC fixtures	Inventory-Public Toilets	8.3.19.13
wc_uni_shw	Number of unisex showers	Inventory-Public Toilets	8.3.19.5
wc_wal_mat	Toilet wall material	Inventory-Public Toilets	8.3.19.7
wc_waste	Waste water disposal	Inventory-Public Toilets	8.3.19.18
work_atsu	Actual travel speed at planned work sites	Performance (Service)-Journey Interruptions	8.12.27
work_close	Work sites meeting planned closure times	Performance (Service)-Journey Interruptions	8.12.25
work_delay	Actual delay at planned work sites	Performance (Service)-Journey Interruptions	8.12.28
work_dur	Duration of interruption due to planned works	Performance (Service)-Journey Interruptions	8.12.24
works_id	Project or contract Id that created the asset	Inventory-All - A General	8.3.0.6
works_name	Subdivision or Project Name	Inventory-All - A General	8.3.0.9
works_type	Work type that created the asset	Inventory-All - A General	8.3.0.10
wsites_len	Proportion of planned work sites	Performance (Service)-Journey Interruptions	8.12.26
ww_name	Waterway Name	Inventory-Bridge Major Culvert	8.3.3.3

Appendix C Activities Listing

Activity Group	Activity	Network Location Ref / Connectivity	Related Function Group							
			Inventory incl. asset loc. Ref.	Condition	Classification	Access	Asset Performance	Service Performance	Demand	Works and Costs
Network Definition	Road Network Configuration	Y			Y	Y				
	Road Classification (function based)	Y			Y	Y			Y	
	Road Classification (form based)	Y	Y		Y	Y				
	Bridge Classification	Y	Y		Y	Y				
	Road Function Assessment	Y			Y	Y			Y	
Information Management	Asset Inventory Register - Add	Y	Y		Y	Y				
	Asset Inventory Register - Maintain	Y	Y	Y	Y	Y				Y
	Asset Inventory Register - Delete	Y	Y	Y	Y	Y				Y
	Asset Inventory Register - Merge	Y	Y	Y		Y				Y
	Asset Inventory Register - Critical Assets		Y		Y	Y	Y			
	Asset Condition Assessments - General	Y	Y	Y		Y	Y			
	Asset Condition Assessments - Bridge		Y	Y	Y	Y	Y			
	Asset Condition Assessments - Culvert		Y	Y			Y			
	Pavement Condition - Visual		Y	Y						
	Pavement Condition - High Speed	Y		Y		Y				
	Litigation Defence	Y	Y	Y	Y	Y	Y			Y
	Traffic Counting	Y			Y	Y				
	Weigh Station Data Recording and Monitoring	Y	Y		Y	Y				
	Over Height Monitoring	Y	Y							

Activity Group	Activity	Network Location Ref / Connectivity	Related Function Group							
			Inventory incl. asset loc. Ref.	Condition	Classification	Access	Asset Performance	Service Performance	Demand	Works and Costs
Corridor Management	Levels of Service Achievement (technical)	Y	Y	Y					Y	
	Levels of Service Achievement (customer)	Y	Y		Y	Y		Y	Y	
	Road Capacity Analysis	Y	Y		Y				Y	
	Restricted Access Vehicle - Overweight	Y	Y	Y	Y	Y	Y			
	Restricted Access Vehicle – Over dimension	Y	Y		Y	Y		Y		
	Restricted Access Vehicle - Hazardous Goods	Y				Y		Y		
	Restricted Access Vehicle - High Perform Motor Vehicles	Y				Y		Y		
	Traffic Network Modelling	Y	Y		Y	Y			Y	
	Traffic Planning	Y	Y		Y				Y	
	Traffic Congestion Analysis	Y	Y		Y	Y			Y	
	Traffic Movement Efficiency Analysis	Y	Y		Y	Y	Y		Y	Y
	Traffic Impact Assessments	Y	Y		Y	Y			Y	
	Traffic Management Coordination	Y	Y		Y			Y	Y	Y
	Travel Time Reliability Assessment	Y	Y		Y	Y	Y	Y	Y	Y
	Freight/Bus Route Planning	Y	Y		Y	Y		Y		
	Multi-Modal Transport Accessibility and Planning	Y	Y		Y	Y		Y	Y	
	Heavy Vehicle Permit Approvals	Y	Y	Y	Y		Y			Y
	Public Transport Performance Analysis	Y	Y		Y			Y		
	Public Transport Service Coverage Planning	Y	Y		Y			Y		
	Real Time Journey Planning	Y	Y		Y			Y	Y	Y
	Traffic Predictions				Y	Y		Y	Y	
	Journey Impact Analysis	Y	Y		Y			Y	Y	Y
	Intersection Analysis	Y	Y		Y			Y	Y	
	Amenity Values Assessment	Y	Y					Y		
	Noise Control and Monitoring	Y	Y	Y	Y		Y	Y		Y
	Service Requests	Y						Y		Y

Activity Group	Activity	Network Location Ref / Connectivity	Related Function Group							
			Inventory incl. asset loc. Ref.	Condition	Classification	Access	Asset Performance	Service Performance	Demand	Works and Costs
Maintenance Management	Defect Recording	Y		Y	Y					
	Defect Repair	Y			Y					Y
	Defect Analysis and Reporting	Y		Y	Y				Y	Y
	Erosion and Sediment Control Plans	Y	Y	Y	Y		Y			
	Dust Control and Monitoring	Y	Y	Y	Y		Y	Y	Y	
	Repair Cost Recovery	Y	Y		Y	Y				Y
	(Resource) Consent Compliance					Y				
Road Safety Management	Safety Measure Achievement (technical)	Y	Y		Y		Y			
	Safety Measure Achievement (customer)	Y	Y		Y			Y		
	Road Safety Index	Y			Y		Y	Y	Y	
	Road Hazard Register	Y	Y		Y		Y	Y		
	Crash Investigations	Y	Y	Y	Y		Y			Y
Asset Financial Management	Asset Valuation		Y	Y	Y	Y	Y		Y	Y
	Benefit Cost Analysis		Y	Y	Y	Y	Y		Y	Y
	Maintenance Efficiency Analysis	Y	Y		Y				Y	Y
	Triple Bottom Line Analysis		Y	Y	Y	Y	Y	Y	Y	Y
	Efficiency Index Analysis	Y	Y		Y	Y	Y	Y	Y	
	Environmental Index Analysis	Y	Y		Y	Y	Y	Y	Y	
	Funding Requests				Y	Y	Y	Y	Y	Y

Activity Group	Activity	Network Location Ref / Connectivity	Related Function Group							
			Inventory incl. asset loc. Ref.	Condition	Classification	Access	Asset Performance	Service Performance	Demand	Works and Costs
Asset Management Planning	Asset Demand Assessment	Y	Y					Y	Y	
	Asset Demand Management	Y	Y		Y	Y		Y	Y	
	Asset Capability Assessment	Y	Y		Y		Y	Y		
	Condition Index Reporting		Y	Y						
	Asset Performance (condition) Modelling	Y	Y	Y			Y		Y	
	Asset Performance (outcomes) Modelling	Y	Y	Y	Y		Y	Y	Y	Y
	Asset Remaining Life Assessments		Y	Y			Y		Y	
	Levels of Service Definition (technical)	Y	Y		Y	Y	Y			
	Levels of Service Definition (customer)	Y	Y		Y			Y		
	Forwards Works Plan Development	Y	Y		Y	Y	Y	Y	Y	Y
	Asset Portfolio Rationalisation	Y	Y	Y	Y	Y	Y	Y	Y	Y
Asset Management System (ISO55001)	AM Policy Development							Y		
	SAMP Development	Y	Y	Y	Y	Y	Y	Y	Y	Y
	AM Objectives Development				Y	Y	Y	Y	Y	Y
	AMP Development	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SOP Development			Y			Y		Y	Y
Asset Reporting and Communication	COAG level Benchmarking		Y	Y				Y		
	Road Network Reporting		Y	Y	Y	Y	Y	Y	Y	Y
	Road Asset Reporting		Y	Y	Y	Y	Y			Y
	ALGA State of Assets Reporting		Y	Y	Y					
	NZTA Network Performance Reporting		Y	Y	Y		Y	Y		Y
	Road user Feedback Register							Y		
	Real Time Journey Advisory Services	Y			Y			Y		Y
	Journey Experience Reporting	Y					Y	Y		
	Road user Information	Y			Y	Y	Y	Y		Y
	Road Network Mapping	Y	Y		Y	Y				Y

Activity Group	Activity	Network Location Ref / Connectivity	Related Function Group							
			Inventory incl. asset loc. Ref.	Condition	Classification	Access	Asset Performance	Service Performance	Demand	Works and Costs
Asset Development	Geometric Design	Y				Y			Y	
	Pavement Design	Y	Y	Y	Y	Y	Y		Y	
	Surfacing Design	Y	Y		Y	Y		Y	Y	
	Modifying Existing Assets		Y	Y	Y	Y	Y		Y	

Austroads

Level 9, 287 Elizabeth Street
Sydney NSW 2000 Australia

Phone: +61 2 8265 3300

austroads@austroads.com.au
www.austroads.com.au