



Asset data guide (SM050)

Introduction

May 2026

Version 1

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More information

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This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

These documents are published as a pre-ratification consultation draft. They will remain in draft status for no more than 12 months from April 2026. Feedback can be posted to assetdataguidance@nzta.govt.nz.

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This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

Asset data guide overview

Background

The *Asset data guide* (SM050) (ADG) sets out the good practice for managing digital asset information within New Zealand road controlling authority (RCA) asset databases.

The ADG:

- **aligns with the Asset Management Data Standard (AMDS)**, which sets the national framework for data consistency by outlining **what** data to capture for individual assets
- **standardises data capture practices** by describing **how** to capture for transport assets
- **serves as a training reference** for new and existing users
- **links to other guidelines and standards** relating to specific assets.

Purpose and scope of this guide

Purpose

The ADG has been developed to support consistent, accurate, and standardised asset data management across New Zealand RCAs.

The primary purpose of the ADG is to provide practical, accessible guidance for users entering and managing asset data within asset management information systems (AMIS). It supports alignment with the AMDS. It serves as both a reference and training tool, offering definitions, attribute requirements, and contextual examples for each asset type.

Scope

The ADG focuses on the consistent and standardised management of asset-related data and information typically found in a transport AMIS. It is designed to support users in capturing, validating, and maintaining asset data in alignment with the AMDS.

The geographical and organisational scope of the guidance includes New Zealand RCA asset data and information.

While the ADG provides general asset data procedures for all RCAs, individual RCAs may in some cases have their own unique variations to selected procedures governing how their system is used.

The scope of the guidance content includes:

- **AMDS asset data descriptions:** Covering all transport-related asset types defined in AMDS, including required attributes, value lists, and metadata rules.
- **Other dataset descriptions:** Covering dataset descriptions which may not be part of AMDS, for example maintenance cost or treatment lengths.
- **Data capture and validation procedures:** Instructions for how asset data should be collected, entered, and quality-checked within AMIS environments.
- **Asset data policies and procedures:** Supporting documentation that governs how asset data is managed and updated.
- **Training and accreditation:** Guidance that supports user training and competency development for those responsible for asset data creation and entering data into the AMIS.

This scope ensures the ADG remains practical, operationally relevant, and interoperable with existing systems and standards across the transport sector.

The ADG should be used in conjunction with the relevant software user manual from the respective software vendors.

Quality assurance

The ADG is a link in the quality assurance chain between consultants and/or contractors, delegated authorities, and RCAs.

If specific contracts require data updating, the ADG expects that all data provided by consultants and contractors complies in all respects with the quality assurance requirements for data collection.

Sections of the ADG

The guide sections are split into individual pdfs. The layout is designed to be intuitive and modular, allowing users to easily navigate to the content most relevant to their role or task.

The documents are grouped into the following sections:

- **Introduction** (this section): Introduces the ADG's purpose, scope, and governance. It explains how the guide aligns with the AMDS and outlines its role in supporting consistent data capture across RCAs.
- **Network**: Covers network-level data, including definitions, attributes, and examples for infrastructure elements such as corridors, routes, and segments. This section helps users understand how network data is structured and validated.
- **Asset definitions**: The largest section, detailing individual asset types (such as barriers, markings, signs, pavements). Each asset table includes definitions, required attributes, and links to related standards. This section is essential for data editors working directly with asset and system tables.
- **Works planning and management**: Focuses on data related to maintenance, renewals, inspections, and fault reporting. It supports planning workflows and ensures that operational data is captured in a way that supports performance tracking and contract management.
- **Business operations**: Includes guidance on data that supports financials, contracts, and organisational processes. This section ensures that asset data integrates effectively with broader business systems and reporting requirements.

Governance and ownership

Key stakeholders

Key stakeholders include:

- **RCA asset database owners**, who need accurate and timely data for their decision-making processes.
- **Industry asset data maintainers**, who contribute to data capture, validation, other data processes and training.

Governance

The governance of the ADG is structured to ensure the document remains accurate, relevant, and aligned with sector needs.

Oversight is provided through a tripartite sponsorship model comprising Road Efficiency Group Te Ringa Maimoa (REG) Evidence & Insights (representing RCAs), the AMDS Programme (owner of the Asset Management Data Standard), and the NZ Transport Agency Waka Kotahi (NZTA) Asset Management team (document owner and responsible for ratification). The sponsors are responsible for setting strategic direction, and ensuring the guidance meets its contractual and operational purposes.

A hierarchy of roles supports the governance framework:

- **Stakeholder group**: comprises stakeholder representatives, will consider requests for additions and edits to the ADG.
- **Subject matter experts**: industry experts, consulted on additions and changes to the ADG.
- **Content stewards**: the AMDS and NZTA Asset Management team updates the ADG based on recommendations from the stakeholder group and advice from the subject matter experts.

- **Ratification:** the NZTA Asset Management team will handle the ratification process.

Feedback

The ADG is intended to be shared as a resource to assist all stakeholders. Feedback is welcomed on the content.

Provisional content will be shared for comment. Comments and suggestions will be considered by the stakeholder group.

Feedback from the sector can be sent to assetdataguidance@nzta.govt.nz

Associated standards

Data entered into RCA asset management information systems must conform to the standards outlined in this section.

Asset Management Data Standard

The Asset Management Data Standard (AMDS) provides a common language to describe the service, impact, and asset lifecycle across the transport system.

The AMDS forms the foundational framework for the asset definition sections within this guidance. It defines the structure, attributes, and value lists required to describe physical assets in a digital asset register, ensuring consistency across RCAs, contractors, and suppliers. By aligning with AMDS, the ADG supports standardised data capture, interoperability, and improved decision making across the transport sector.

Asset definitions in this guidance are derived from the AMDS tables, which specify mandatory, conditional, and optional fields for asset records. These definitions are structured to reflect the AMDS schema and business rules that govern attribute availability.

The ADG complements the AMDS by providing contextual guidance, examples, and navigation aids tailored to operational users. While the AMDS sets the technical baseline, the ADG interprets and presents this information, supporting training, accreditation, and field-based data entry.

The ADG links directly to the latest AMDS data dictionaries and value lists. This approach ensures that updates to the standard are reflected in the guidance without requiring manual revisions to each asset.

[Asset Management Data Standard](#)

Spatial and location referencing standards

AMDS geometry guidance

The primary system for capturing spatial locations is outlined in the *AMDS geometry guidance*.

The *AMDS geometry guidance* provides a spatial data framework for capturing and managing transport assets. Its primary aim is to ensure consistency, accuracy, and interoperability across asset datasets by standardising how spatial location and elevation attributes are recorded. The guidance outlines methods for determining asset positions using the NZ Transverse Mercator 2000 (NZTM2000) for horizontal coordinates and the NZ Vertical Datum 2016 (NZVD2016) for vertical positioning.

A key foundation of the *AMDS geometry guidance* is its alignment with the [LINZ Utility Location Standard](#), a national framework developed by the Surveyor-General to improve the accuracy and reliability of utility asset location data.

[Current data standard & provisional release notes for the AMDS](#) (see supporting documentation)

Linear referencing

Linear referencing is the other common method for describing the location of assets. Asset positions and events are recorded as the distance along a line, rather than by absolute map coordinates. Instead of saying 'this asset is at latitude X and longitude Y', linear referencing says 'this asset is 3120m from the defined start point along this road'.

While the AMDS defaults to spatial coordinates for asset location, linear referencing remains a secondary system for capturing data in asset management information systems such as AWM. Linear referencing is useful in scenarios where GPS is unreliable (such as gorges), where linear measurements are required (such as resurfacing lengths), or where descriptive location formats are preferred (such as signage indicating distance to towns).

State highway linear referencing

The linear referencing system for state highways is defined in the *Location referencing management system (LRMS) manual* (SM051). The LRMS framework is used to describe the position of assets and events along New Zealand's state highway network. It relies on reference stations (RS), physical markers placed at regular intervals and key locations such as intersections and regional boundaries, and route positions (RP), which measure distance from these stations.

[Location referencing management system \(LRMS\) manual \(SM051\)](#) (state highways only)

Glossary

Term	Definition
Asset	A physical component of a road system or network that delivers services or benefits to the community. Assets are identified separately if they are of sufficient value to warrant control and management (for example pavements, bridges, culverts, traffic signals, signs, streetlights, road reserves).
Asset & Work Manager (AWM)	An integrated road asset management information system (AMIS) and computerised maintenance management system (CMMS) (formerly known as RAMM). Currently used by all road controlling authorities in New Zealand, it stores asset inventory, condition, work orders (dispatches), maintenance contract financial information, maintenance history as well as managing the spatial and linear network information for local roads and state highways. Formerly owned by RAMM Software Limited, now owned by Thinkproject.
Asset inventory	A record of assets with key details such as location, dimensions, construction date, condition, maintenance history, and configuration.
Asset management (AM)	A systematic process of maintaining, operating and upgrading assets. AM combines engineering practice with business and financial principles to deliver best value to the community.
Asset Management Data Standard (AMDS)	A national, shared data standard developed to provide a consistent, integrated approach to land transport asset data. It defines common labels, categories and requirements for collecting, storing and sharing asset information. It was developed collaboratively by the NZ Transport Agency Waka Kotahi (NZTA) and the transport sector, and conformance to AMDS is becoming a requirement.
Asset management information system (AMIS)	A computer-based system for storing, managing, and analysing information about infrastructure assets. It supports decision making by holding inventory, condition, performance, and financial data in a structured format.

Asset management lifecycle	The complete cycle of asset activities, from planning and creation through to operation, maintenance, renewal, and eventual disposal.
Asset management plan (AMP)	This is a detailed plan outlining strategies for maintenance, renewal, and performance monitoring for specific asset classes. It informs strategic, tactical, and operational decisions and should align with sector best practice. The AMP is the key document supporting investment proposal for maintenance, operations and renewals (MOR) programmes for the National Land Transport Programme (NLTP).
Asset management strategy	A medium- to long-term plan that sets out how a group of assets will be managed to achieve agreed service levels. Includes creation, operation, maintenance, renewal, disposal, and performance monitoring.
Asset register	A fundamental tool, an asset register is a comprehensive inventory of all assets, including details on their identity, location, condition, value, and lifecycle status.
Attribute	A characteristic or property of an asset that is recorded in a database (for example material, width, age, installation date).
Average annual daily traffic (AADT)	The total volume of traffic passing a point on a road over one year, divided by 365 days (or 366 in a leap year). It represents the average daily traffic load on a road.
Base map	Set of background information that provides spatial orientation through giving fundamental geographic features and location referencing details.
Benefit–cost ratio (BCR)	An economic measure comparing the present value of a project's benefits to the present value of its costs. A BCR greater than 1 indicates benefits outweigh costs.
Candidate selection algorithm (CSA)	A method or tool within asset management systems that identifies road sections or assets that are candidates for treatment, based on condition, performance, or economic thresholds. It utilises the improved condition data being provided by CCDC.
Capital expenditure (CapEx)	Investment in new assets or major upgrades.
Chainage	The distance along the road from a reference point. Equivalent to the term displacement in NZ. Also sometimes just referred to as 'displacement'. Derived from imperial units (1 chain = 22 yards).
Common route	A section of highway where 2 different highway numbers share the same carriageway. Also called coincident highways.
Condition index	A measure that combines different condition parameters (for example roughness, rutting, cracking) into a single indicator of asset condition.
Condition monitoring	Regular inspection, measurement and reporting to track asset condition and identify when maintenance is needed.
Condition survey	The process of collecting data on the structural and functional condition of an asset or network.
Condition-based depreciation	A way of calculating depreciation of an asset based on its assessed physical condition rather than only on age or financial rules.
Configuration	The physical attributes of an asset that define its capacity and function (for example number of lanes for a road, span length for a bridge).

Consistent condition data collection (CCDC)	A standardised approach to gathering asset condition information so that data is reliable, comparable, and repeatable across networks, locations, and time periods.
Critical asset	An asset that is essential to the functioning of the network, or where failure would cause significant service disruption, cost, or safety risk.
Data migration	The process of mapping and transforming existing asset data into structures that conform with the required data standard. This includes triage of unused fields, mapping of attributes, and quality assurance.
Data quality	A measure of how accurate, complete, timely, and consistent asset data is.
Data standard	A structured framework of definitions, labels, categories, and data requirements that ensures consistent and comparable information.
Datum	Set of parameters and control points used to accurately define the 3-dimensional shape of the Earth (as an ellipsoid).
Decreasing direction	The direction of decreasing route position. It is the direction along the road when travelling toward the beginning of the road.
Deferred maintenance	Maintenance that should be carried out in the current year, based on condition or strategy, but has been delayed due to funding or other reasons.
Department of Conservation (DoC)	A New Zealand government agency responsible for conserving the natural and historic heritage of New Zealand, including the management of many public roads and tracks on conservation land.
Depreciated replacement cost (DRC)	A method of valuing assets based on the current cost of replacing the asset with a modern equivalent, less deductions for deterioration and obsolescence.
Depreciation	An accounting measure representing the asset's value that is consumed over a given time period, reflecting wear, age, or reduced service potential. It helps plan for future capital expenditures. In theory, funds equivalent to depreciation should be set aside annually to renew or replace assets at the end of their lifecycle.
Dispatch	AWM term for a work order. This is often created during inspections, so is the identification of potential work initially before other processes decide on what gets approved to be done.
Disposal	The process of removing an asset from service, through sale, demolition, recycling, or abandonment.
Forward work programme (FWP)	A planned schedule of maintenance, renewal, and capital works for assets, usually covering multiple years, that sets out what work will be done, when, and at what cost.
Geographic coordinates	The quantities of latitude and longitude which define the position of a point on the earth with respect to the reference spheroid.
Geographical information system (GIS)	A computer system that captures, stores, analyses, and displays spatial (map-based) data. Widely used in asset management for mapping and location referencing of assets.
Geo-referenced data	Spatial data that pertain to a location on the earth's surface.
Global Positioning System (GPS)	A location and navigation information technology using orbiting satellites transmitting timing data for ground geolocation.

Increasing direction	The direction of increasing route position. It is the direction along the road when travelling away from the beginning of the road.
Infrastructure strategy	Required for local authorities, an infrastructure strategy identifies significant infrastructure issues over a long timeframe (30 years +) and explores options for managing them.
International infrastructure management manual (IIMM)	A globally recognised guide (produced by IPWEA and partners) providing principles and practices for infrastructure asset management, widely used in New Zealand.
Key performance indicator (KPI)	A high-level metric used to measure the effectiveness of asset management or service delivery (such as percentage of roads in good condition).
Key performance measure (KPM)	A more detailed or technical measure used to monitor performance against objectives (eg average roughness level of pavement sections).
Lifecycle asset management plan LAMP	A LAMP outlines the long-term planning strategy for a state highway asset class, for example the 'Drainage LAMP'.
Levels of service (LoS)	Defined expectations for asset performance and delivery. Asset management aims to support delivering these levels of service cost-effectively. Decision makers need guidance on determining appropriate levels of service and the trade-offs involved. A measure of the quality and performance of an asset or network, usually expressed in terms meaningful to users (for example, smoothness, safety, travel time).
Lifecycle costing	The total cost of owning and operating an asset over its entire lifecycle, including planning, design, construction, operation, maintenance, and disposal.
Linear referencing	Process of identifying locations on the network by specifying a road, start position, direction and distance.
Local Government Act 2002 (as amended) (LGA 2002)	The main legislation governing New Zealand local authorities. It sets the framework for long-term plans, infrastructure strategies, financial management, and community engagement.
Location reference method	The technique used to identify the specific point (location) or segment of road, either in the field or in the office.
Location reference system	The total set of procedures for determining and retaining a record of specific points along a highway. Includes the location referencing method(s) together with the procedures for storing, maintaining, and retrieving the information about points and segments on the road.
Long-term plan (LTP)	A statutory planning document required under the Local Government Act 2002. Every local authority in New Zealand must prepare and adopt an LTP that covers a period of at least 10 years.
Maintenance	All actions needed to keep an asset as close as possible to its original condition, or to slow its deterioration. Maintenance may be routine (day-to-day tasks), periodic (larger programmed works), or deferred (delayed due to funding or priorities).
Maintenance achievement and cost records (MACR)	A register of maintenance activities completed by current and previous maintenance contracts. Often referred to as simply maintenance costs.

Maintenance intervention strategy (MIS)	A detailed statement of the types of maintenance activity appropriate for specific sites or treatment lengths. It is the principal method for conveying appropriate activities to parties involved in asset maintenance, ensuring optimum use of funding based on planned future treatments.
Maintenance management system	A system (usually software) used to plan, manage and record maintenance activities, budgets, and performance information. Sometimes called a computerised maintenance management system (CCMS).
Maintenance plan	A forward-looking list of maintenance activities and costs, usually covering 3–5 years, reviewed annually, with the first year funded.
Map projection	A systematic transformation of the latitude and longitude on the surface of the Earth to planar coordinates. New Zealand Transverse Mercator 2000 (NZTM) is the official standardised coordinate system used in New Zealand.
Metadata	Data describing a set of data, providing information such as the characteristics of a data set, the history of the data set, etc. Also called 'data about data'.
Net present value (NPV)	The difference between the present value of benefits and the present value of costs over a project's life, discounted to today's values. A positive NPV indicates a worthwhile investment.
Network hierarchy	The classification of roads (or other assets) based on their function within the transport system (such as arterial, collector, local).
NZ Transport Agency Waka Kotahi (NZTA)	The national transport agency responsible for co-funding, managing, and regulating New Zealand's land transport system, including management of the state highway network.
Operational expenditure (OpEx)	Ongoing expenses for day-to-day running and management of infrastructure.
Operations and maintenance (O&M)	The ongoing day-to-day activities required to keep assets functioning, including inspections, routine maintenance, minor repairs, and operational services.
Optimised demand management (ODM)	A process or toolset for analysing demand on a network and identifying the most cost-effective strategies to meet or reduce that demand, often applied to road space, capacity, or maintenance budgets.
Pavement	A multi-layered, engineered surface designed for vehicle and pedestrian traffic. It typically includes a hard surface layer (for example chipseal, asphalt or concrete) over structural layers (base and sub-base) supported by the natural ground (subgrade). Its purpose is to provide a smooth, safe surface and distribute loads without exceeding the subgrade's strength.
Performance indicator	A quantitative measure used to assess whether an asset is meeting its expected service levels.
Reference station (RS)	NZTA's permanent benchmarks along the state highway network.
Rehabilitation	Works that return an asset to a condition close to its original state; generally more extensive than maintenance but less than full replacement.
Renewal	Replacements or upgrades undertaken when assets reach the end of their useful lives (for example resurfacing a pavement, replacing bridge components).
Replacement	Substituting an existing asset with a new one of similar function. Usually referred to as a renewal.

Risk management	The process of identifying, assessing, and managing risks to assets, including safety, financial, operational, and environmental risks.
Road Asset & Maintenance Management (RAMM)	Now called Asset & Work Manager (AWM) by Thinkproject.
Road controlling authority (RCA)	Organisations responsible for managing roads in New Zealand, including NZTA (state highways) and territorial authorities (local roads). Other than NZTA, they are also known as approved organisations.
Safety intervention strategy (SIS)	As part of a safety management strategy, an SIS guides contractors on how safety-related matters should be addressed and prioritised in maintenance work.
Spatial data	Object and events that occur at real-world places and may therefore be represented on a map. May be physical (such as roads, bridges, accidents) or logical (administrative boundaries).
Supervisory control and data acquisition (SCADA)	A system that monitors and controls infrastructure facilities (for example pumps, lighting, tunnels, signals) using sensors, communication networks, and centralised control software.
Treatment lengths	These are uniformly performing contiguous sections of road used as building blocks for structuring, developing, and applying the forward work programme and maintenance intervention strategies.
Treatment selection algorithm (TSA)	A decision-support tool that uses pavement condition, performance, and cost data to recommend the most appropriate treatment for a road section (for example resurfacing, rehabilitation). This has been superseded by the candidate selection algorithm, which has updated methodologies and inputs.
True length	The actual driven distance between known locations (usually reference stations for state highways and start and end of a road for local authorities) along the traffic lane carrying vehicles moving in the increasing direction. This is as opposed to the 2-dimensional distance when viewed on a map.
Upgrade	Work to improve an asset's function, capacity, or performance beyond its original design.
Validation	The process of checking data against rules, standards, or reality to confirm accuracy and reliability.
Whole-of-lifecycle cost	Considers all costs associated with an asset from planning and acquisition through operation, maintenance, renewal, and disposal. Decision making should aim for value realisation across the full lifecycle.
Work order	A formal request or instruction to carry out maintenance, renewal, or construction on an asset. If using AWM, this is referred to as a 'dispatch'.

Contact

For questions, comments or feedback on the content of this guide, contact us at assetdataguidance@nzta.govt.nz.