



Road Asset Data Harmonisation: Unlocking Value through Data Collaboration



Austroads

Draft Standard

Institute of Public Works Engineers
Sustainability Conference May 2018

About the Data Standard – Why

Currently

- Incomplete, different and numerous data sets, and the need to convert them into useable formats
- Governments cannot attribute or differentiate costs to users
- Innovation, investment and greater economic efficiency across the transport system is limited.

What's in it for Local Government

- Facilitation of collaboration and benchmarking
- Maintenance planning opportunities
- Better investment decision making
- Simplify interaction with national reforms
- Accommodation of new technology



Business Case - Benefits Areas

Problem Definition

Inadequate data limiting road transport and infrastructure reforms

Road managers use of different standards a barrier to investments aimed at greater collaborations and national reform.

Multiple data standards creates duplication and inefficiency = increased costs for government and business.

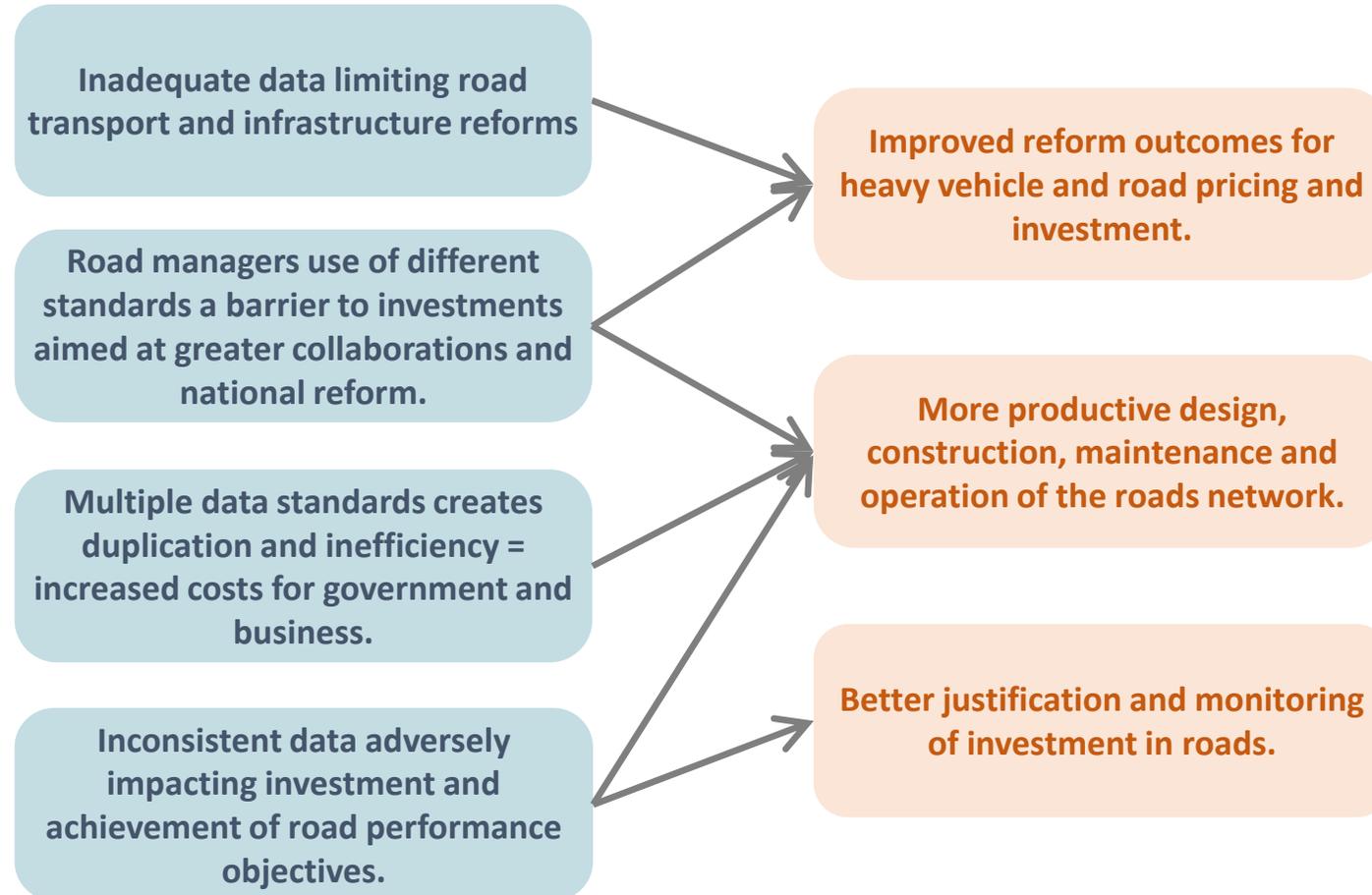
Inconsistent data adversely impacting investment and achievement of road performance objectives.

Benefit Areas

Improved reform outcomes for heavy vehicle and road pricing and investment.

More productive design, construction, maintenance and operation of the roads network.

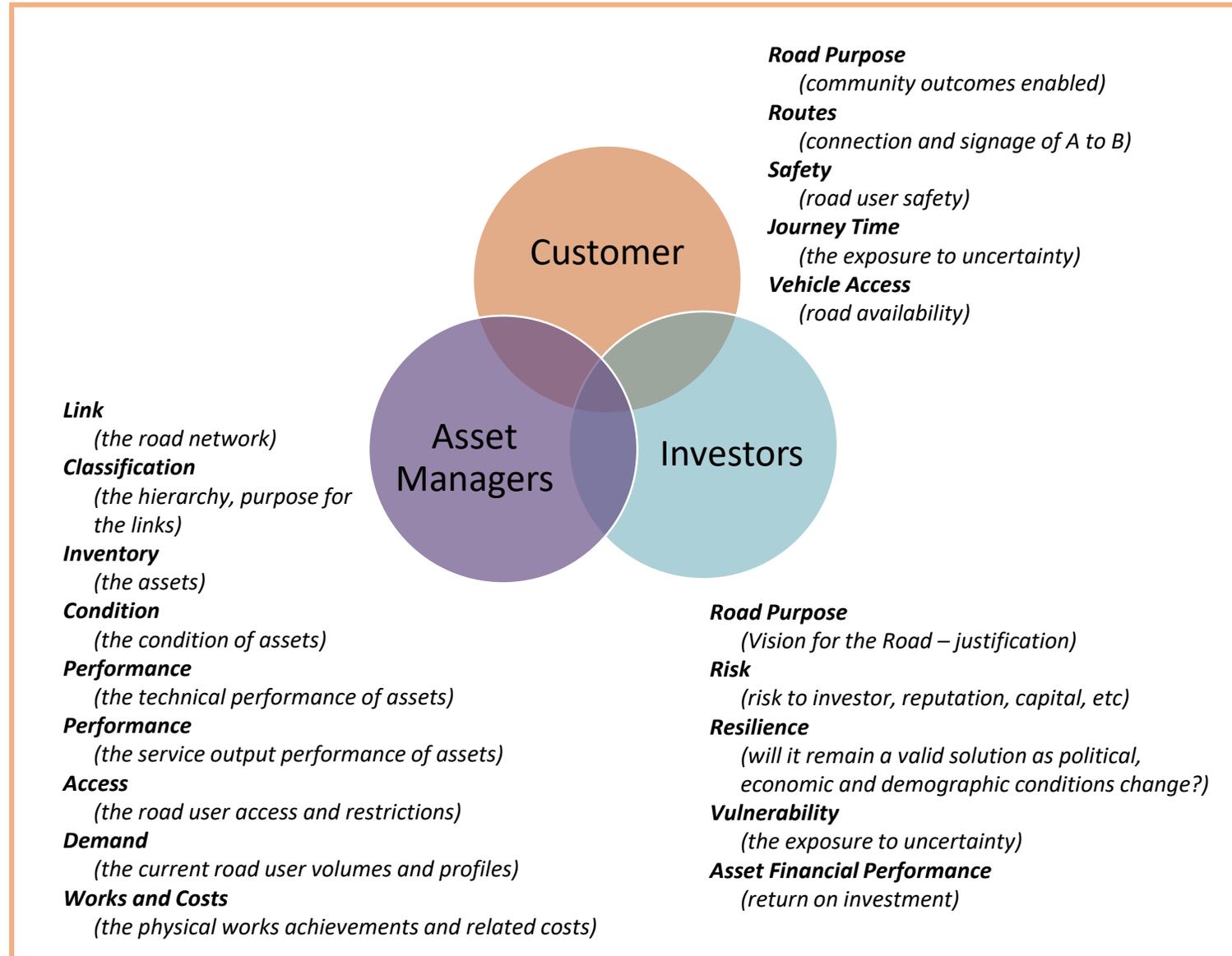
Better justification and monitoring of investment in roads.



About the Data Standard – What Is It?

This Standard

- establishes a common understanding of the meaning of the data
- ensures correct and proper use and interpretation of the data.
- 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.



About the Data Standard: Location Referencing

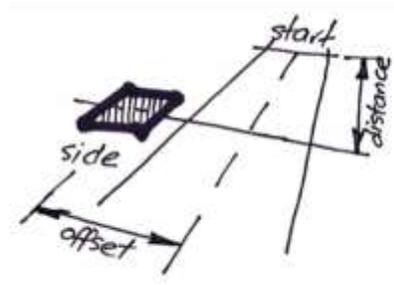
- Sophistication Levels:

- 1D
- 2D
- 3D

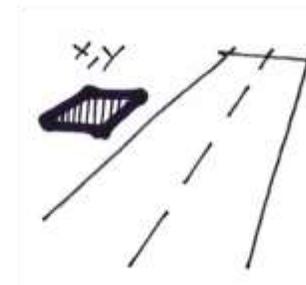
- Accommodation of different requirements:

- Across asset groups
- Some are on a maturity journey

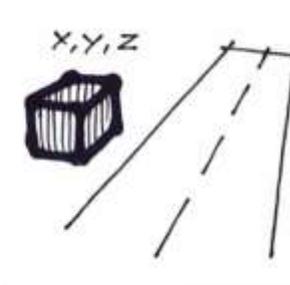
LOCATION REFERENCING (L)		
L1	L2	L3
Non Graphical Asset Register <ul style="list-style-type: none">• Network 1D spatially located.• Asset location referenced by centreline distance/side/offset and known locations.	2D Digital and Graphical Representation <ul style="list-style-type: none">• Network 2D spatially located.• Assets spatially referenced in a 2D context.	3D Digital and Graphical Representation <ul style="list-style-type: none">• Network 3D spatially located.• Assets spatially referenced in a 3D context.



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.

Data Sharing Challenges

People:

- Competitive culture
- Historical errors – mistrust
- Limited funding to modernize systems and approaches
- Limited current collaboration opportunities
- Limited capacity to make good use of data



Data:

- Variation of environmental conditions across jurisdictions
- Not well defined, understood or utilised
- Collected inconsistently- gaps
- Complex
- Varied data quality and maturity hampers aggregation

Systems

- Siloed
- Vast number of varied systems
- Legacy systems and business processes

Implementation Keys

Staged Adoption Proposed

- Key exchangeable data first
- Outcome focus priority data sets
 - Data transformation
 - Local Government Pilots
 - Road Agency Pilots
- Proof of Concept for knowledge sharing

Link to National and State Programs

- Grants Commission alignment with data standard definitions
- Investment Programs, seeking compliant data

Data Standard Governance Development and Maintenance

Supporting Knowledge Framework

- data sharing agreements
- single platform, multiple lenses
- input, store, process, transmit & output data

Education ,Training and Support

- *Platform specific training*
 - Data Management*
 - Data extraction
 - Data transformation
 - Data Analysis

Network definition

- Link ID
- Link section (LS) ID
- X co-ordinate start node
- Y co-ordinate start node
- Road ID
- LS: Length
- LS: Number of lanes
- LS: Traffic speed band
- LS: type of pavement construction
- LS: ownership organisation

Classification (currently based on NZ road framework)

- Functional Classification - One Road Classification System
- Economic & Social - Estimated population served by road
- Economic & Social – Tourist route
- Economic & Social – Hospital access

Inventory (e.g. bridges, culverts, lighting, pavement, pavement surface, traffic signals)

- Unique asset identifier
- Design life
- Construction date
- Valuation – cost per unit of asset
- Asset type descriptors (many and varied depending on the asset)
Example: Pavement
 - Surfacing material type
 - Layer width
 - Layer material

Condition

- Visually measured condition
- Kerb and channel visual condition
- Subjective condition survey date-time

Demand

- Vehicle kilometres travelled
- Gross Vehicle Mass kilometres
- Equivalent Standard Axles kilometres
- Population (within catchment)
- Traffic growth

Utilisation

- Average annual daily traffic
- Current and future utilisation
- Percentage of aadt that are HVs
- Number of vehicles during peak hour

Access

- Restriction type (e.g. axle limit) and user group applies to
- Restriction value

Performance (Asset)

- Design life, life achieved, useful life
- Return on construction expenditure (BCR)
- Total capital spend – upgrade/expansion
- Recurrent spend - maintenance

Performance (Service)

- Smooth travel exposure (% of total travel)
- Road fatalities (per 100,000 population)
- PM peak (urban) actual travel speed

Work and costs

- Forward works treatment estimated cost
- Forward work treatment actual completed cost
- Maintenance – work activity (e.g. resurface)
- Maintenance – actual amount paid

Priority Data Set - Maintenance

- Highest benefits from
 - improving maintenance outcomes
 - via sharing of standardised data
 - Data relevant to informing maintenance activities
- Austroads refining a ‘maintenance’ focused priority dataset
- This will be subject to consultation over the coming months.

Piloting the Priority Data Sets



Road Manager Participation

- 4-6 Local Government Clusters
- Rural, regional and urban councils
- Take place in multiple States/Territories
- 20-30 Councils
- 1-3 Road Authorities

Priority Data Sets

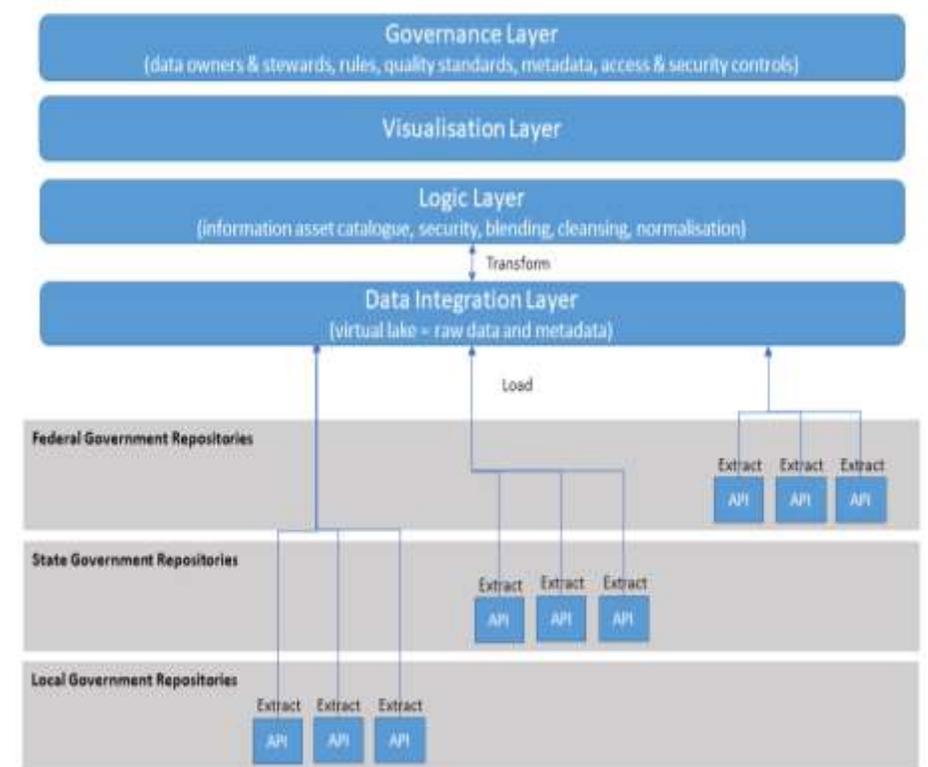
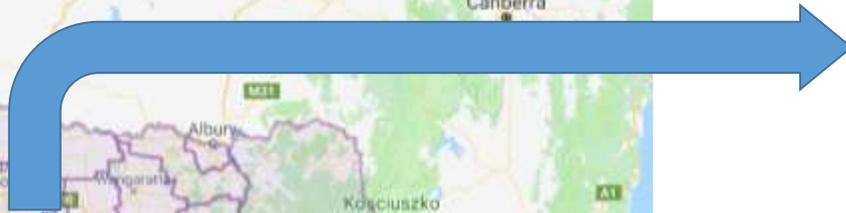
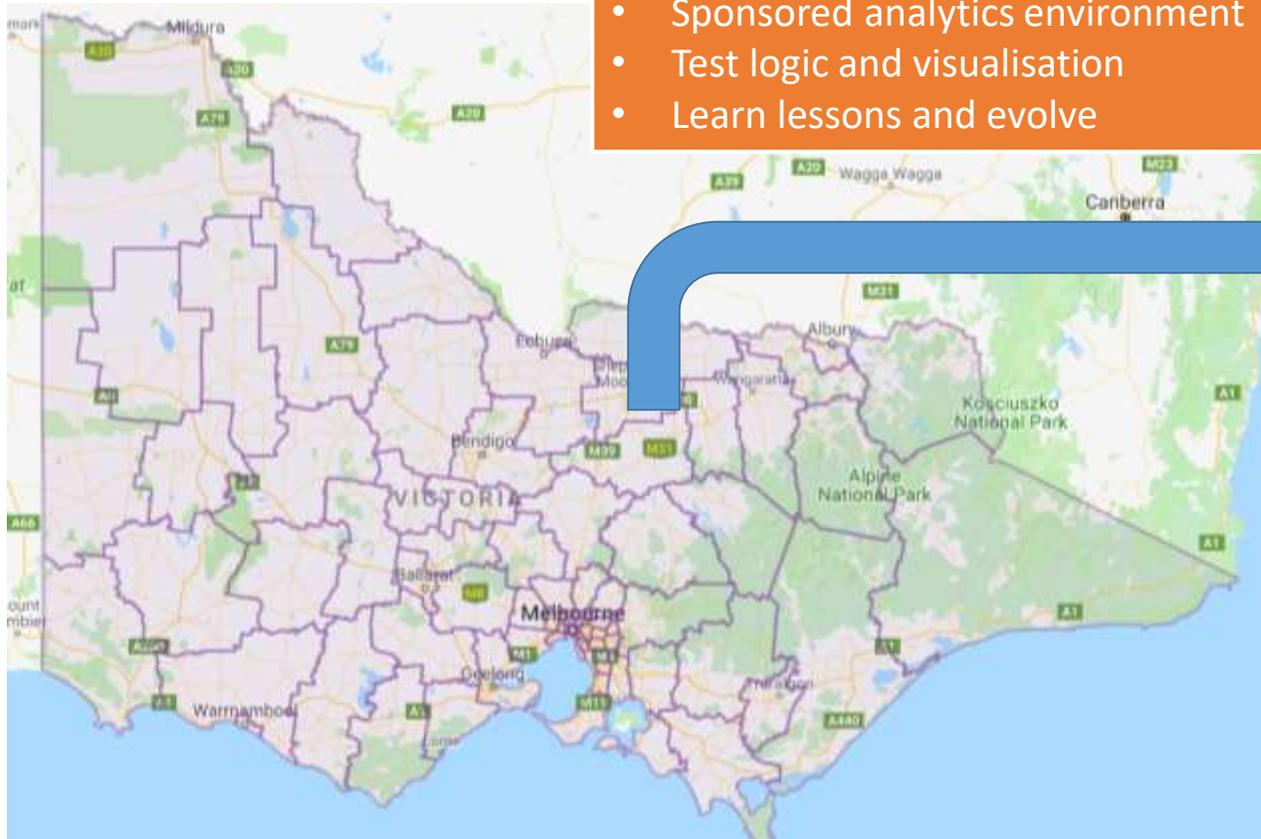
- Maintenance Priority Data Set
- National Reporting Priority Data Set
- Continuously improved data sets

Proof-of-Concept

- Stage gate, assurance
- Spin up and configure cloud analytics environment
- Security access rules
- Connect to source systems
- Apply logic analysis tools
- Capture governance lessons and business rules

Proof of Concept

- Proof of Concept: Knowledge Sharing Framework
- Assisted Data Extraction
- Security and access rules
- Sponsored analytics environment
- Test logic and visualisation
- Learn lessons and evolve



Summary

- Road Asset Data Standard developed to be useful for the whole sector.
- Implementation focusing on piloting priority data sets
- Maintenance and connecting to road sector reform are initial focus of harmonisation efforts
- Pilots are being scoped for 2018/19 involving proof of concept of knowledge framework components
- Engagement on data standard, priority data sets and participation in pilots

Further Information

<http://www.austroads.com.au/road-operations/asset-management/road-data-harmonisation-project>

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