

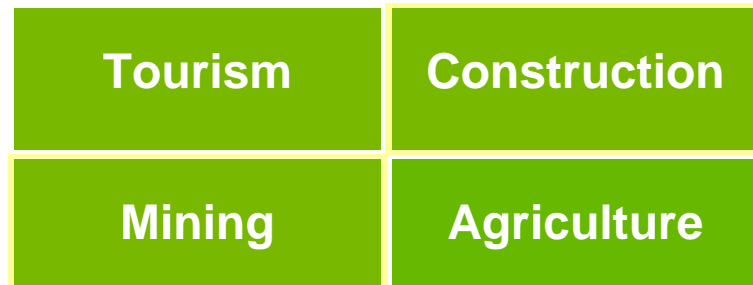
# Infrastructure Management and Delivery Industry Forum

Structures update

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# Government Priorities

## Four Pillars of the Queensland Economy



## The Queensland Plan

*A 30 year vision for Queensland*

## Queensland Public Service Values



Customers  
First



Ideas into  
Actions



Unleash  
Potential



Be  
Courageous



Empower  
People

# Scope

- Hydraulics
  - *“Design criteria for bridges and other structures”*
  - Specifications
  - ITS Gantries
-

# Hydraulics

- Hydraulic Design Brief
  - Bridge Scour Manual – including flood robustness
  - Storm Surge Manual – (under development)
  - Fish passage for culverts including  
Standard Drawings – (under development)
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# Design criteria for bridges and other structures

- Design life of elements
  - Advertising signs – new
  - Development applications adjustment to tunnels and bridges updated
  - Safety in Design
  - RSS walls and scour
  - Other improvements
-

# Specifications update

- MRTS14 – Steel guardrail
  - MRTS25 – Concrete Pipes
  - MRTS69 – Fibre composites
  - MRTS72 – Reinforced precast
  - MRTS82A – Finger joints
  
  - All new specifications have commentary
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# MRTS14 Steel beam guardrail

# Guardrail

- Guardrail is critical component to ensure safety of errant vehicle
  - Substandard guardrail will not behave as designed when impacted
  - Issues include material properties and geometry
  - Non conforming guardrail has been identified in Australia
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# MRTS25 Concrete pipes

# MRTS 25 Concrete Pipe

- Clearer alignment to Australian Standard e.g. durability class
  - Construction vehicle load cases defined
  - Special cases outside AS 4058 – Potential Acid Sulphate Soil (PASS) defined, wave action
  - Testing variation and defects types adjusted for TMR risk profile
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# MRTS69 Fibre Reinforced Girders



# Fibre Composites

- No Australian Standard exists for design and manufacture fibre composites
  - TMR at present owns 314 Timber Bridges
  - Ageing Timber girders need replacement
  - Sourcing quality hardwood timber girders is becoming increasingly difficult
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# Fibre Composites

- FRP Composite girders can provide a suitable alternative – (flexible design to exhibit strength and stiffness properties similar to good quality timber)
- Structural Health Monitoring



# Fibre Composites

**MRTS 69 A (Design)**  
**MRTS 69 B (Manufacture)**  
**MRTS 69 C (Installation)**

Trial Coulson Creek, Lake Moogerah Road,  
South Coast Region  
(early December)

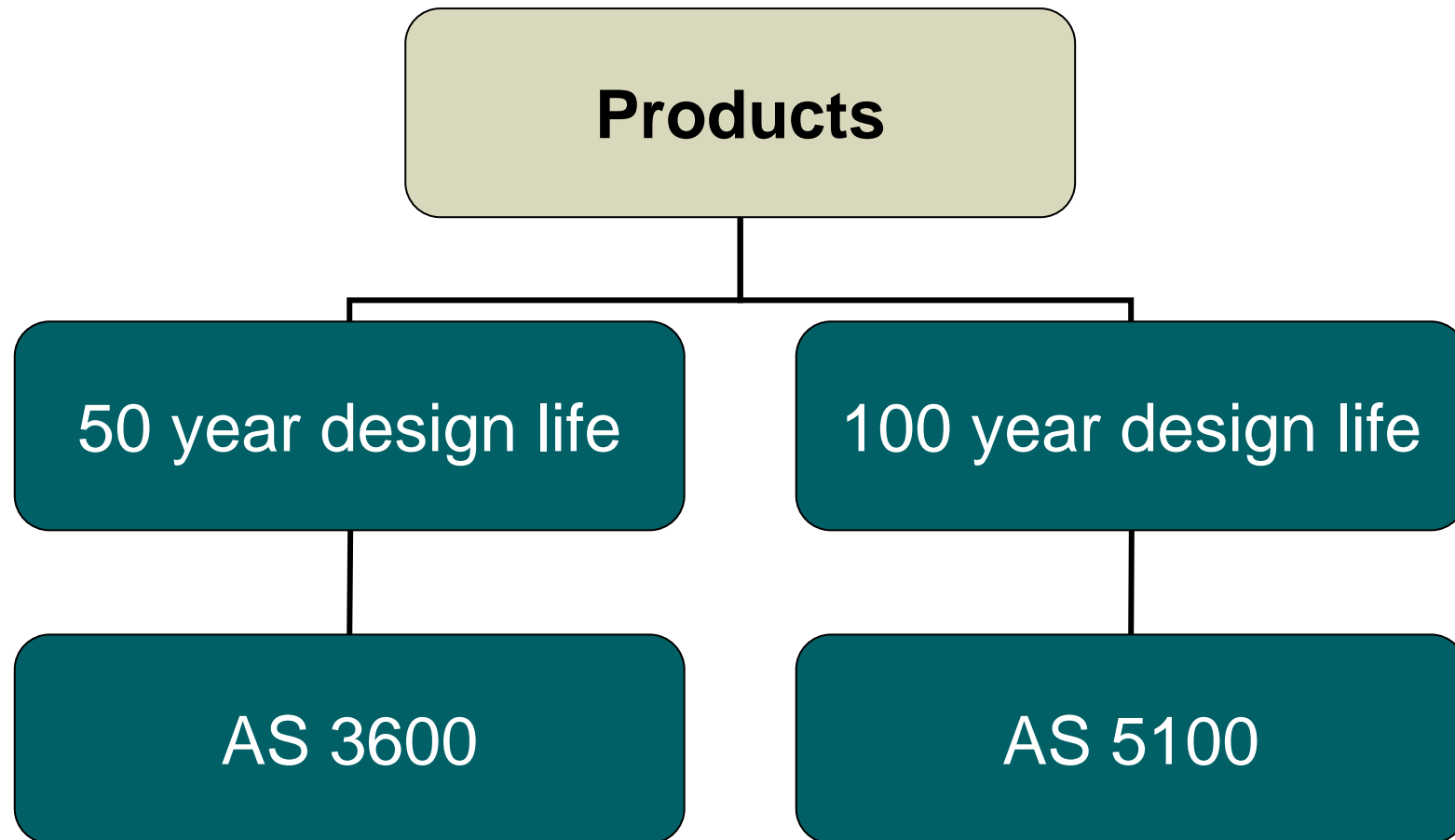


# **MRTS72**

## **Reinforced precast concrete**

# MRTS 72

## Reinforced Precast Concrete





# Key changes

## Design life for MRTS72

Design Life	Typical Applications
<b>100 years</b>	<ul style="list-style-type: none"><li>• Bridges</li><li>• Retaining walls</li><li>• Gantries and Cantilever signs over any portion of roadway</li><li>• Above carriageway tolling structures</li><li>• Gully pits within the traffic lanes, shoulders, medians or 2.0m clear zone from the edge of the shoulder</li><li>• Pipe and culvert head walls for pipe diameter greater than 800mm</li><li>• Culverts</li><li>• Critical drainage structures</li><li>• Tunnels</li></ul>
<b>50 years</b>	<ul style="list-style-type: none"><li>• Precast concrete kerbs, lintels, channels, ramp vehicular crossings, pipe and culvert headwalls less than 400mm (Standard drawing numbers 1033, 1311, 1312, 1313, 1321, 1322, 1442, 1443, 1444, 1446, 1459)</li></ul>

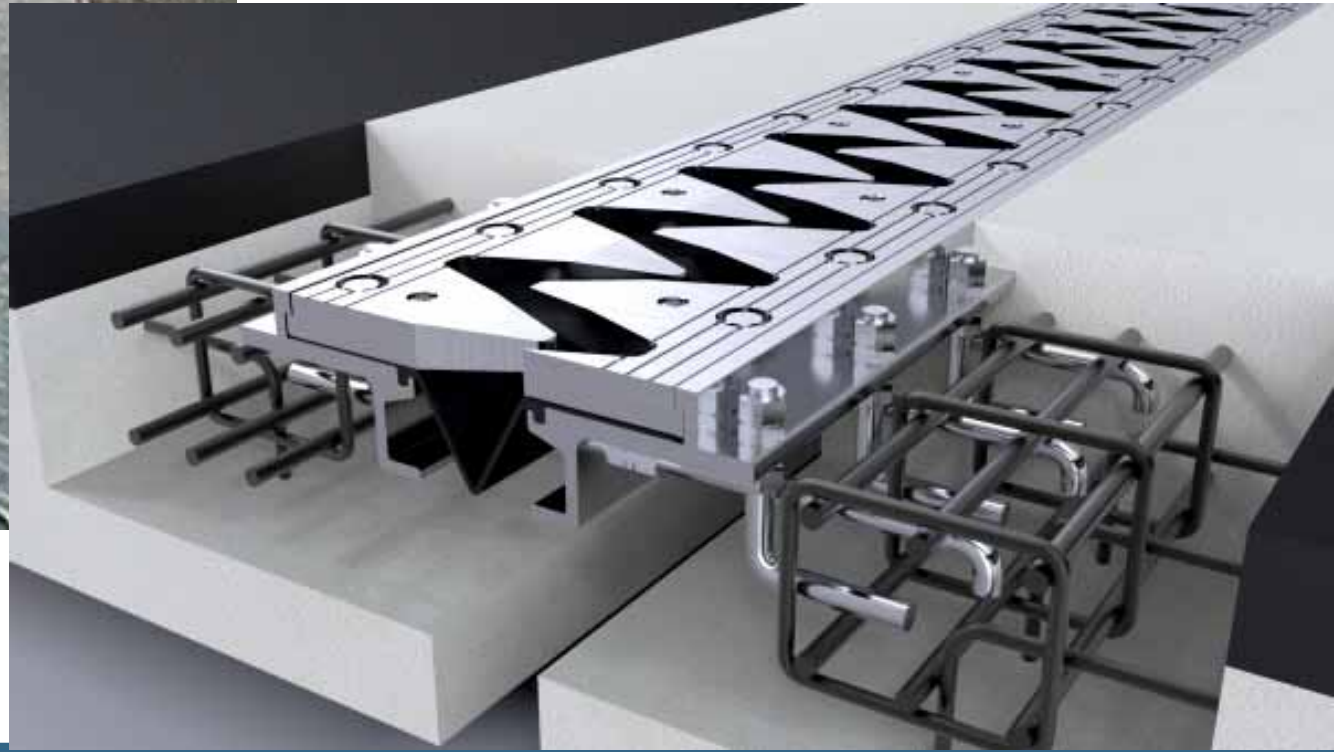
# Lifting details

- Factor of safety of 4
  - Minimum dynamic value 1.5 - higher values for rough ground
  - Higher values for repeated high use lifting e.g. portable concrete barriers
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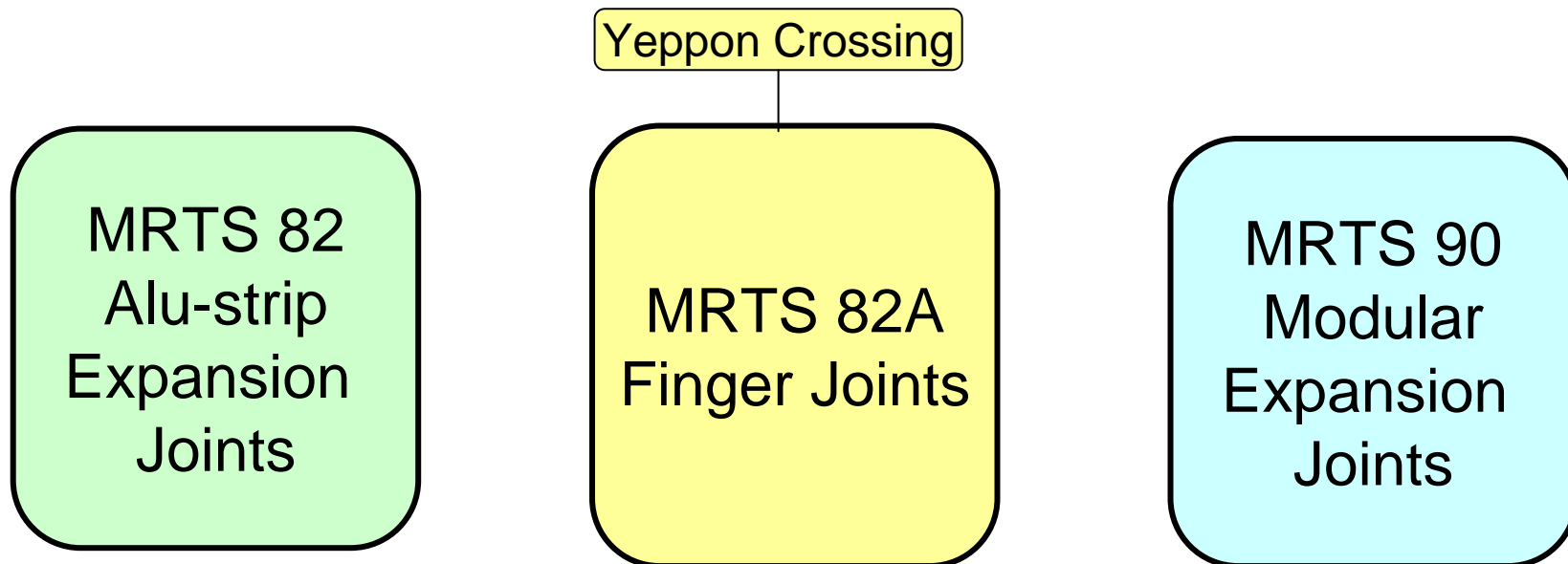
# Other changes

- Concrete testing by volume of concrete not per element
  - Blended cements in aggressive environments
  - Limit chloride content of aggregate in aggressive environment
  - Finish aligns with AS 3610 and crack limit defined
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# MRTS82A Finger joints



# MRTS82A Finger joints



Increasing joint movement



# Main features

- Design aligns to RMS criteria
  - Includes aluminium and steel finger joints
  - Both finger plates and saw tooth
  - Provide economical joints for medium length bridges
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# ITS Gantries



# Purpose of project

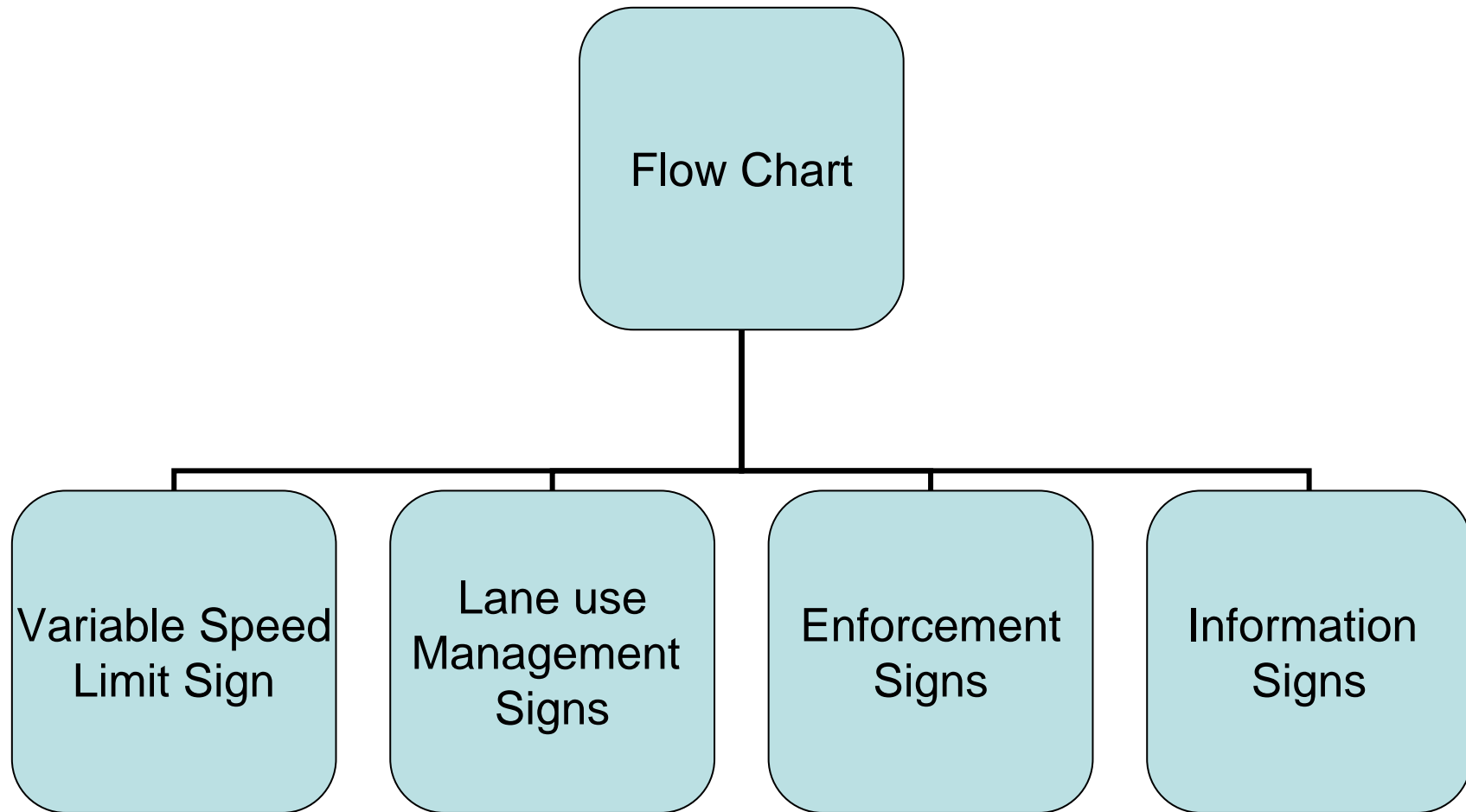
- Consistent state-wide approach
  - Define locations they required for
  - Develop suite of standard details, design criteria and specification
  - Value for money
  - Interdisciplinary project
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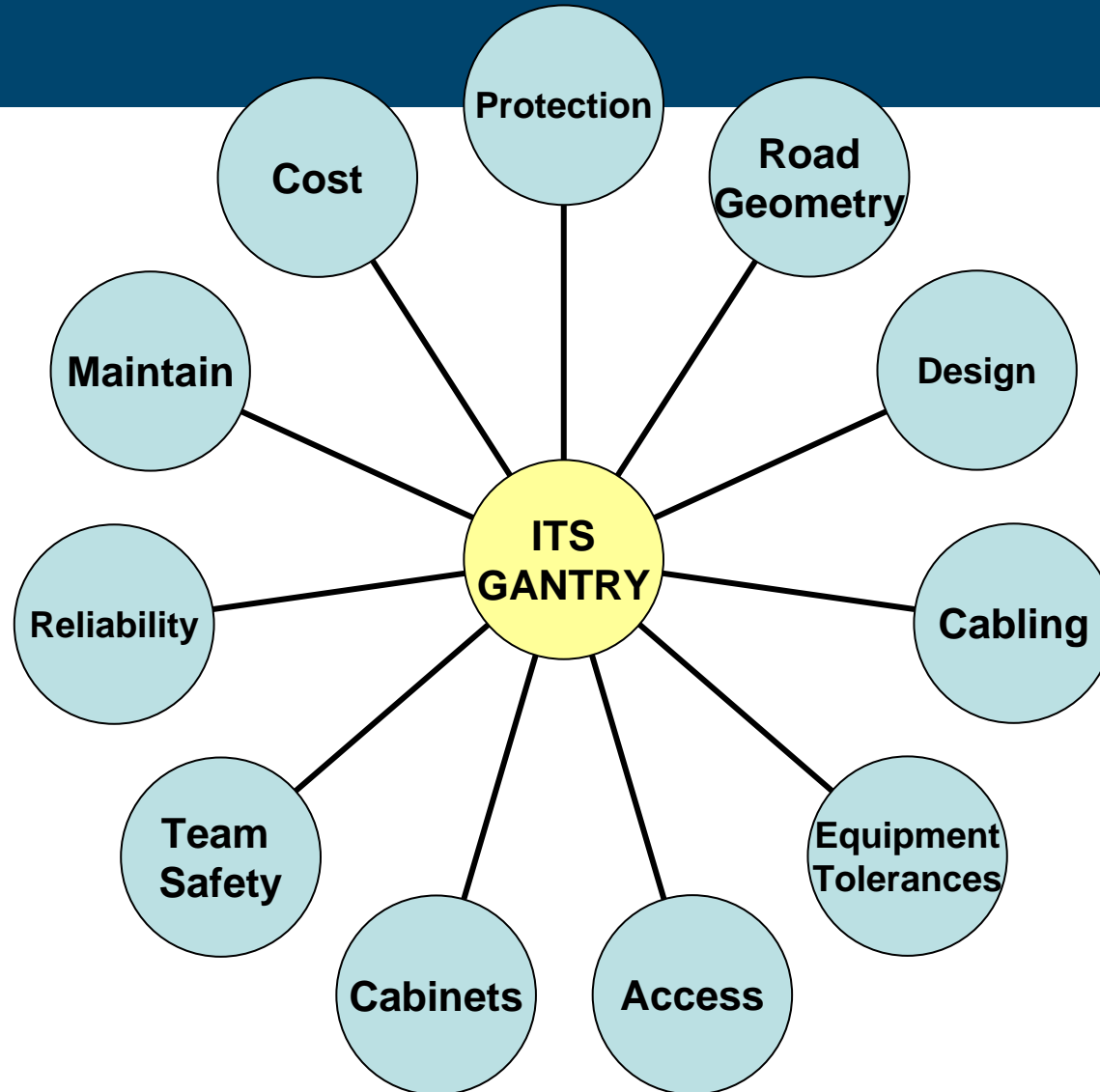
# Type of access to gantry

- No gantry – sign on side of road
  - Above carriageway gantry – ‘walk on’
  - Above carriageway gantry – road closure for access
  - Criteria of ITS gantry – rigid for enforcement
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# Process to determine gantry

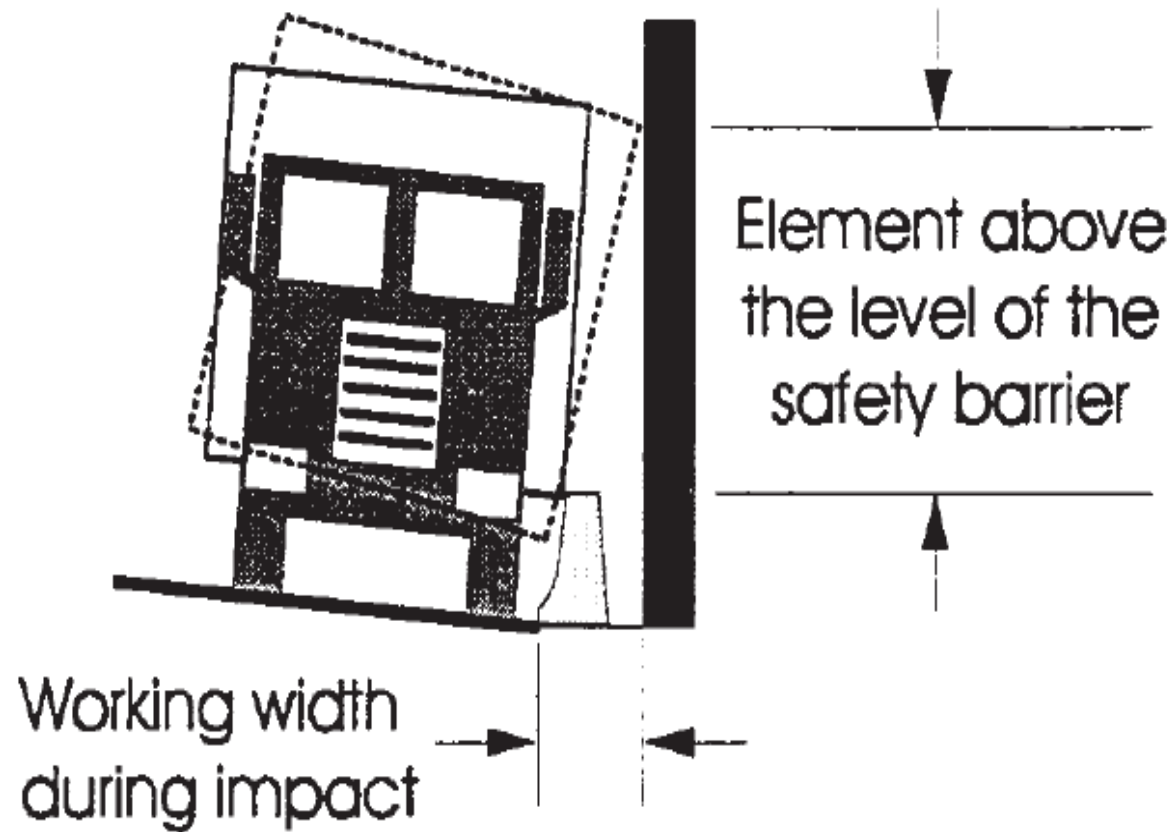


# ITS Gantry





# Barrier protecting overhead gantry



# Conclusions

- Structures is producing a significant number of new / updated documents
  - TMR has aligned to Australian Standards as a starting position
  - In some areas, where Australian Standard do not extend, e.g. Acid Sulphate Soil, TMR has defined criteria
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**Thank** *you*