Austroads Project: Road Cross Section Design, Road Stereotypes, Network-Wide Safety Plans and Safe System

David Bobbermen[a], Richard Fanning[a], Michael Tziotisb[b], Peter Aumann[b]

[a] Austroads, [b]ARRB

Abstract

With current and emerging practices in road design and road safety, as they relate to road cross sections, road agencies across Australia, New Zealand and a number of other countries have been making changes to the typical road sections to address context. This presentation will provide road planners, designers and safety practitioners dimensional guidance when implementing recommended treatments proposed under the safe system assessment. It will use road stereotype matrices to proactively support road design and road safety decision making. This is potentially a world-first performance-based road design approach in relation to road attributes for safety.

Introduction

With current and emerging practices in road design and road safety, as they relate to road cross sections, road design practitioners, road safety practitioners and road network managers are requiring guidance in regard to their application. Road agencies across Australia, New Zealand and a number of other countries have been making changes to the typical road sections to address context. Adopting these changes and integrating them into the Austroads Guide to Road Design must be performed with due diligence to ensure that while one functionality of the construction/maintenance lifecycle is enhanced by the changes, a negative impact is not inadvertently introduced at the same time.

The project will provide road planners, designers and safety practitioners dimensional guidance when implementing recommended treatments proposed under the safe system assessment framework with the contemporary outcome statement of "*safe mobility*". It will use road stereotype matrices to proactively support road design and decision making.

This project will deliver an innovative world-first outcome and meet the strategic priorities by supporting:

- Network-wide standard setting for corridors, corridor planning for cross section visions and investment decisions as part of safety plans
- Application of safe system thinking in an informed and measured way and the provision of warrants and dimensional guidance to support safe system
- Combined decision making for road designers and road safety practitioners for the best overall outcome
- An integrated approach to decision making including the disciplines of design, safety, planning and economics
- Capability development of practitioners when making the key road component and treatment decisions
- Use by time-poor road practitioners (for example local government engineers)

Objective and Issues

There have been many requests for the attributes used in calculating the priority of treatments and the priority of treatments across a cross section. There is a priority requirement to make the inherent risk of road components transparent to decision makers for network, corridor and project level decisions. This is particularly true when engineering decisions impact on safety and consequently the legal liability in decision making.

The overarching principles that have driven the design and development of outputs are:

- Harmonise all related for defined set of road stereotypes
- Provide consistency in the practical application of safe system treatments which can be realistically implemented
- Provide the outcome of a self-explaining road
- Support network-wide decision making so that the broader risk compensatory benefits from driver decisions can be realised.

A benefit of this project is to ensure that new design practices will provide value for money in road design as well creating the safest motoring environment.

Scope

The project has studied information on current and emerging practices, particularly those that may be innovative or unusual to ensure that they have been appropriately assessed and considered. The project will confirm their expected benefits and investigate the potential for unexpected adverse consequences.

The expected change will be the ability to use performance-based (safety risk) road design standards to inform network-planning (construction and intervention standards) which will constrain project treatments when ensuring a consistent road corridor. This is expected to be a possible world-first in performance based road design standards which proactively drives the safe system thinking into planning and subsequently into every day projects.

Network planning tasks and all road infrastructure programs, for example, safety programs, network planning programs, infrastructure enhancement programs, capital investment programs.

Providing guidance to designers and network operators in the implementation of safe system principles in light of competing demands associated with asset management, network analysis/management and delivery in the context of a performance based design process.

A key feature of the project was to set up the formats to ensure the stereotypes were easy to use and supported for:

- all road classes and types and scalable for all road jurisdictions
- both state and local government controlled road networks
- Identify the key infrastructure components which can be treated or enhanced to provide the greatest benefit to road user safety.
- both rural and urban situations,

- the range of typical combinations of cross section attributes from existing asset situations to aspirational 5 star safe road environments
- Road characteristics and dimensions (for treatment) which provide a balanced crash risk outcome for all road users and crash types
- Dimensional guidance to aid implementation of the Austroads Safe System Assessment Framework
- Highlight the incremental benefit for staged treatments to meet the higher order objective of a consistent corridor
- link this transparent and proactive decision-making process with star rating values.