Safer Journeys for engineers

Safer Journeys

A safe road system is engineered well

Safer Journeys is New Zealand's road safety strategy to 2020, with the vision of a 'safe road system increasingly free of death and serious injury'.

At the heart of Safer Journeys is the Safe System approach, which recognises that people make mistakes and some crashes are inevitable. It states that people need to be protected from crash forces, and accommodates Safe System principles in the design and maintenance of roads and roadsides.

The responsibility of the road engineering sector is to help take New Zealand toward the vision of a safe road system increasingly free of death and serious injury. The sector will do this by creating a more forgiving road system that reduces the price paid for human error. No one should pay for a mistake with their life or limb.

Good road engineering sets the foundation for a Safe System that protects people from death and serious injury when mistakes occur.

The Safe System principles are:

1. People make mistakes and some crashes are inevitable.
2. Our bodies don't withstand crash forces well.
3. System designers and system users must share responsibility for managing crash forces to a level that doesn't result in death or serious injury.
4. We need to strengthen all parts of the system: roads and roadsides, speeds, vehicles, and users.

What does it mean for engineers?

The Safe System approach recognises engineers, planners, fleet managers, asset managers, enforcers and utility providers, to name just a few, as 'system designers' of our roads and roadsides. We all share responsibility for creating a more forgiving road system.

We need roads and roadsides that are self explaining, forgiving, and help to manage conflicts and travel speeds to an appropriate level.

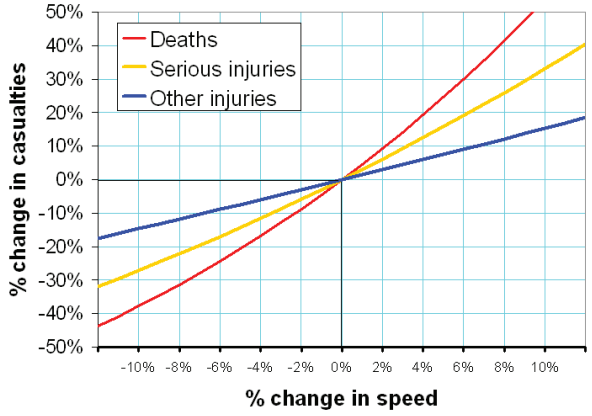
Adopting the Safe System approach also means understanding where engineering fits with other system design issues, thinking beyond infrastructure and taking a joined up approach. For example, recommendations about speed limits and speed management approaches should take into account urban design and how the road network will be used, as well as the design standard of the road and roadside.

To create a Safe System, engineers need to work closely with other system designers such as land use and urban planners, traffic operations, police, road safety psychologists and utility companies.

Examples of how engineers can apply the Safe System principles are shown over the page.

Examples of how engineers can apply Safe System principles

The Safe System principles can be applied in road and roadside design, maintenance and asset management. In engineering terms, it is about understanding and managing crash forces to within survivable limits.



The Safe System approach means a change in mindset	
From	**To**
Prevent all injury crashes	Prevent deaths and serious injuries
Focus mainly on blackspots	Also address high-risk corridors
Base risk analysis on history	Base it on science/predictive assessment
Assume that crashes result from human failure (blame the victim and stick to the standards)	Look at what part the system played in creating the error and the severity of the outcome
Focus on the roads	Roads and roadsides
Focus on the infrastructure	Think about how the human uses the infrastructure
Mitigate crash frequency	Mitigate crash severity and frequency

The aim is to reduce the potential for error, prevent errors resulting in crashes, and the severity of crash outcomes when crashes do occur. While these principles can be applied on any road, future safety programmes, both minor and major capital, need to focus our efforts on high-risk rural roads, high-risk intersections and the safety of motorcyclists.

These programmes of work should address high severity, head-on, run-off-road, intersection and vulnerable road user casualties where the greatest safety returns and value for money can be achieved. Sometimes infrastructure improvements are uneconomic, will be delayed for some time or are otherwise not possible. In these cases, other Safe System initiatives, in particular safe speeds, need to be considered.

Below is a list of guides and recommended treatments that will apply (and have benefits) across the whole system:

High-risk rural roads

- Shift focus from targeting isolated blackspots to addressing high-risk corridors to reduce the incidence and outcomes of crashes (in particular run-off-road and head-on).
- Identify high-risk road sections based on the actual or predicted high-severity crash density (crashes/km) and crash rate (crashes/vkt).
- Determine the appropriate level of treatment which may vary from high cost Safe System infrastructure investments such as realignments, installation of median and side barriers on higher-risk, higher-volume corridors, through to lower-cost delineation improvements (including rumble strips), skid resistance and speed management.
- Consider the use of flexible, energy absorbing, cost effective barrier systems to provide forgiving roadsides as opposed to the traditional wide median and clear zone treatments.
- Consider the opportunities for intelligent transport systems such as electronic warning signs and electronic speed management.

For more information see the *High risk rural roads guide.*

High-risk intersections

- Identify high-risk sites based on either their high-severity crash history and/or crash types such as crossing or turning movements or where the crash rate is worse than expected.
- Avoid creating complex driver decisions, minimise the number of conflict points and conflict angles, and keep potential collision areas free of hazardous roadside furniture.
- Look to challenge some of the more traditional intersection forms particularly in high-volume and high-speed situations, and how right turn and cross movements and traffic speeds are better managed.
- Consider how pedestrians and cyclists are catered for at all intersections – remembering that lower speeds can reduce severity.
- When designing roundabouts which are one of the safest forms of intersection, vulnerable road users need to be considered too.
- Pay particular regard to visibility issues for all road users.

For more information see the *High risk intersections guide.*

Motorcycling

- Identify high-risk and favoured motorcycling routes and gain a clear understanding of the key crash types on those routes, in order to identify the potential treatments that would be most likely to reduce the risk of a serious or fatal crash.
- Recognise that many surface obstacles (eg manholes, steel plates, rail crossings, loose gravel) can create sudden changes in surface friction and can cause a loss of traction. Consider possible treatments to minimise the risks associated with these hazards for motorcyclists.
- Identify safe locations for roadside objects such as power poles and road signage.
- Restrict and manage on-street parking where it potentially obstructs sight distances for motorcyclists (and other road users).
- Remove or relocate hazards in lean zones – specifically those close to the kerb or edge of seal. Allow for an angle of lean to 45 degrees.

For more information see *Safer Journeys for motorcycling on New Zealand roads.*

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