

MUARC ECIS Fact Sheet 1: Achieving Vision Zero through the Safe System - Insights from the Enhanced Crash Investigation Study (ECIS)¹

The Vision Zero concept and the Safe System

Implemented first in Sweden (1997), *Vision Zero* is an approach to road safety that rests on the principle that no person should be seriously injured or killed when using the road transport system.

Vision Zero places distinct responsibilities on designers, operators, and users of the road transport system to ensure safety, and that the goal of eliminating serious injury is realised.

Consistent with *Vision Zero*, the *Safe System* approach is a powerful advocacy framework and model to understand and address the key risks within the road transport system.

Principles of Vision Zero

- Loss of health and life is an unacceptable trade-off for the ideal of unfettered mobility.
- Mobility ought to be a function of the level of in-built safety of the road transport system.
- Humans are fallible and prone to error.
- The human body has a limited ability to withstand the forces of a crash without being injured.
- To protect road users from injury, the system must be built around the physical tolerance of the human body to crash forces.

A model to achieve Vision Zero

The *Vision Zero Model of Safe Travel*² provides the basis for understanding how the elements of the road transport system interact and how an inherently safe system will prevent road users involved in a crash from being seriously injured.

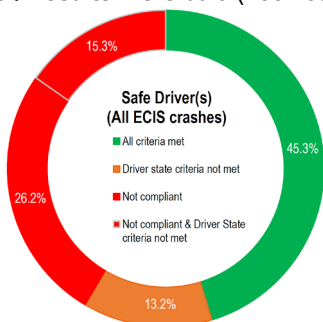
The *Vision Zero* model states that the level of injury sustained in a crash is a consequence of impact speed and the level of safety provided by the vehicle and the road infrastructure.

Due to the relationships between the speed limit, driver speed choice and speed at impact, the speed limit is the critical regulator of the overall safety of the system (see *Fact Sheet 2*).

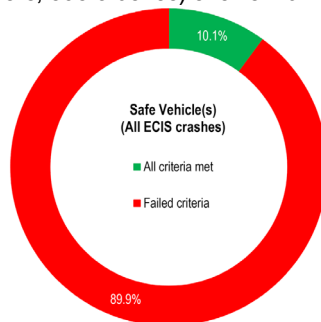
The *Vision Zero* model asserts that once all *Safe Driver*, *Safe Vehicle*, and *Safe Roads* criteria are met, the road transport system is 'inherently safe,' and no-one would be seriously injured (defined as MAIS 3+ severity level) were a crash to occur.

The *Safe Driver* criteria are the minimum expectations of the driver; once met, drivers can reasonably expect that the system is designed and operated to protect all system users from serious injury when other events, such as errors, occur.

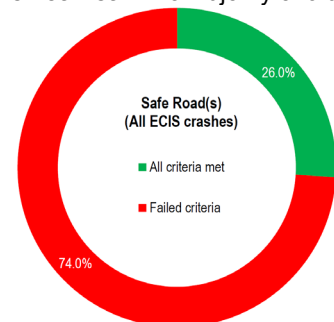
Data / Results: ECIS data (400 hospitalised drivers, 393 crashes) shows that the criteria **were not met** in the majority of crashes.



Criteria (driver compliance): seatbelt worn, within speed limit, BAC within legal limit, no illicit drugs, not handling mobile phone. Criteria (driver state): not excessively drowsy; no misuse/abuse prescription medication)



Criteria: Vehicle has 5-star ANCAP safety rating, frontal and side airbags fitted; Electronic Stability Control (ESC) fitted



Criteria: Speed limit defined according to crash type (head-on, run-off-road, across path/side impact, rear impact) and available road infrastructure.

What does ECIS tell us about the performance of the road transport system?

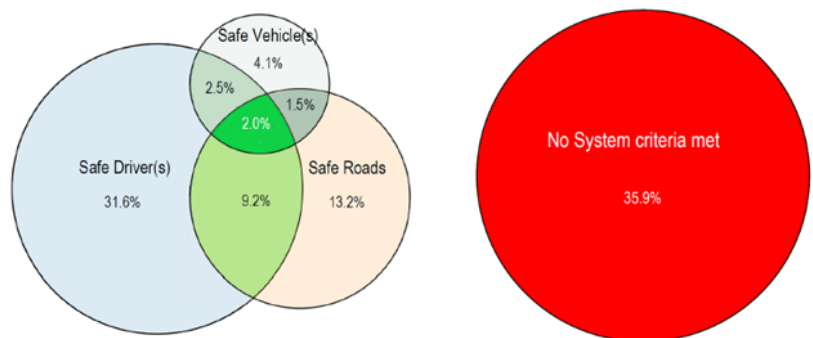
One or more of the *Safe Driver*, *Safe Vehicle*, and *Safe Roads* criteria were met in 64.1% of ECIS crashes.

Drivers meeting the *Safe Driver* criteria (e.g., compliant with speed limit) were largely unsupported by *Safe Vehicles* (e.g., driving a 3-star vehicle) and/or *Safe Roads* (no centre barrier), as shown in Venn diagram

None of the *Safe Driver*, *Safe Vehicle*, and *Safe Roads* criteria were met in 35.9% of crashes.

Consistent with the *Vision Zero* model, in crashes (2%) where all criteria were met, no driver sustained an MAIS 3+ (serious) injury.

Venn diagram (below) showing the percent of crashes where the *Safe Driver*, *Safe Vehicle*, and *Safe Roads* criteria were met (and overlap), and not met.



Implications – Substantial opportunity exists to improve the safety of Victoria's road transport system and prevent many drivers being seriously injured in a crash. Improved vehicle safety, matching speed limits to surrounding infrastructure and the safety of the vehicle fleet, installing safe road infrastructure, and improved driver compliance will all play a role in achieving *Vision Zero*.

1 Fitzharris, M, Lenné, MG, Corben, B, Pok Arundell, T, Peiris, S, Liu, S, Stephens, A, Fitzgerald, M, Judson, R, Bowman, D, Gabler, C, Morris, A & Tingvall. Overview and analysis of serious injury crashes – crash types, injury outcomes and contributing factors, ECIS Report 1 (MUARC Report 343). Melbourne Vic Australia: Monash University, 2020. <https://doi.org/10.26180/23305325>

2 Tingvall C, Lie A, Johansson R. Traffic Safety in Planning - A Multidimensional Model for the Zero Vision. In: von Holst H, Nygren A, Andersson ÅE, editors. Transportation, Traffic Safety and Health – Man and Machine: Second International Conference. Brussels, Belgium: Springer Berlin Heidelberg; 1996. Published 2000. p. 61-9.