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Embedding Safe System in Victoria: Blockers, Enablers and Improvement Roadmap

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Abstract

The Safe System approach was adopted in Victoria in 2004. It has since been the cornerstone of every road safety strategy and action plan, most recently the Victoria Road Safety Strategy 2021-2030. Despite the absence of extensive and conclusive evidence, it is apparent that the limited integration of the Safe System approach into our road and transport management system has hindered its capacity to significantly reduce serious road trauma. In this project, five workshops were delivered by HA Consulting and Road Safety Victoria (RSV) to diagnose what implementation blockers exist and how road safety management systems and stakeholders could be enabled to implement the Safe System approach. Over 60 representatives attended the workshops from key road safety stakeholders and players. The anonymous workshop exercises identified a high personal alignment to the Safe System principles, a range of systemic practical day-to-day blockers, and suggestions for what could enable better Safe System aligned decision making. An improvement roadmap of concept-level projects was developed to address Safe System implementation blockers and implement the identified enabling measures.

Key findings

- Most participants demonstrated strong alignment with Safe System principles, but only 60% indicated that their current work practices fully incorporate the approach.
- Participants identified several Safe System Embedment goals, including significantly reduced road trauma, zero fatal and serious injuries, explicit political leadership and accountability, all transport projects being Safe System compliant, and better community support.
- Key blockers and enablers to Safe System Embedment were identified, including organisational culture and priorities, political decisions, community attitudes and support, policy and standards, technical capability and know-how, and mindset and change management.
- A Safe System Embedment roadmap has been developed, including a vision statement, key areas of intervention, and a list of essential intervention areas.
- Continuous investment in Safe System Embedment is necessary to achieve the Vision Zero targets. Organisational culture and leadership, capability and know-how, communication and engagement, and road management processes should be tailored to incorporate Safe System principles.

Background

The Safe System approach was adopted in Victoria in 2004 (Howard, 2004), and since then has been the cornerstone of every road safety strategy and action plan, most recently the Victoria Road Safety Strategy 2021-2030. However, a recent Victorian parliamentary inquiry (Parliament of Victoria, Economy and Infrastructure Committee, 2021) identified that the insufficient implementation and embedment of the Safe System approach in our road and transport man-

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agement system has stymied its potential to prevent serious trauma on our roads.

The vision of Road Safety Victoria (RSV), a division in the Victorian Government's Department of Transport and Planning, 'is to make every road journey safe and ensure that Victoria continues to be a leader in road safety initiatives and innovation' (Victorian State Government, Department of Transport and Planning, 2023). To diagnose why Safe System is not embedded in every transport decision, it is important to gauge key stakeholders' attitudes and beliefs towards the Safe System approach and identify key Safe System Embedment blockers and enablers. The findings were used to develop improvement projects as a part of a Safe System Embedment Roadmap.

Method

Five technical workshops were conducted. The aim was to provide a deeper understanding of why the Safe System approach has not been fully embedded in Victoria and how all the players in the road project and road safety management system could be enabled to do so. The workshops were designed to:

1. Present the Victorian Government's (and RSV's) vision to embed Safe System principles;
2. Understand key stakeholders' attitudes to zero road trauma and the Safe System principles;
3. Identify key Safe System Embedment blockers and enablers;
4. Develop specific concept level projects as a part of a Safe System Embedment Roadmap.

Over 60 representatives from key road safety stakeholders and players attended the workshops. The stakeholders included Network Integration, Major Roads Project Victoria, Road and Traffic Engineering, Policy and Innovation, Movement and Place, Network Planning, Corridor/Precinct Planning, Business Case, Pipeline and Programs, Strategic Planning, Safer Roads Program, Communications and Engagement, Local Government Areas, Bicycle Network, Victoria Walks, a developer, consultants, Transport Accident Commission, Victoria Police, Department of Justice, State Trauma System, Royal Australasian College of Surgeons, and community advocacy groups.

The workshops were run virtually via Microsoft Teams. Exercises were carried out using PowerPoint slides and Mentimeter question polls that allowed the audience to voluntarily input their answers anonymously using either a smartphone or an internet-connected device. No personal or identified information was recorded.

Results

Attitudes to zero road trauma and the Safe System principles

The anonymous poll suggested that there was a strong alignment of personal values towards the Safe System principles. Key findings included:

1. 12% of participants disagreed with the statement that 'No one should be killed or seriously injured on our roads';
2. Over 45% of participants believed that 'Zero deaths and serious injuries are possible before 2050';
3. 97% of participants agreed that 'The road system should be designed to be forgiving if people made mistakes';
4. Over 65% of participants agreed that 'While the public need to abide by road rules, the ultimate responsibility is upon the road authorities to keep them safe';
5. While 98% of the participants agreed that Safe System should be considered in their work, only 60% indicated that their current work processes and practices fully include the Safe System approach.

Short- to mid-term Safe System Embedment vision

The anonymous poll identified five vision areas for embedding the Safe System Embedment in the road safety and transport system within 1-3 years (short- to mid-term):

1. Road trauma outcomes

This area explores how the Safe System's full embedment in road safety and transport would impact actual road trauma outcomes in Victoria, according to participants' views.

- Significantly reduce trauma from crashes on the road;
- Zero fatal and serious injuries;
- On track to meet 2030 and 2050 targets.

2. Leadership

According to participants, Safe System Embedment would require leadership support, leading to positive changes in road safety leadership in Victoria.

- Explicit political leadership and accountability;
- All transport projects are Safe System compliant (Government policy);
- Better stories to create greater community support.

3. Priority setting

A complete Safe System Embedment would prioritise the safety of vulnerable road users and active travellers, according to the participants.

- Active transport is accepted and promoted;
- Safety for all is set at the outset and influences all other priorities and project options and funding.

4. Road and transport project lifecycle

The participants believed that a complete Safe System Embedment would improve the planning and delivery of road and transport projects in Victoria, leading to better safety outcomes.

- Flow on effect from strategy onto pipeline to network planning, to program planning, to development, to delivery and to evaluation;

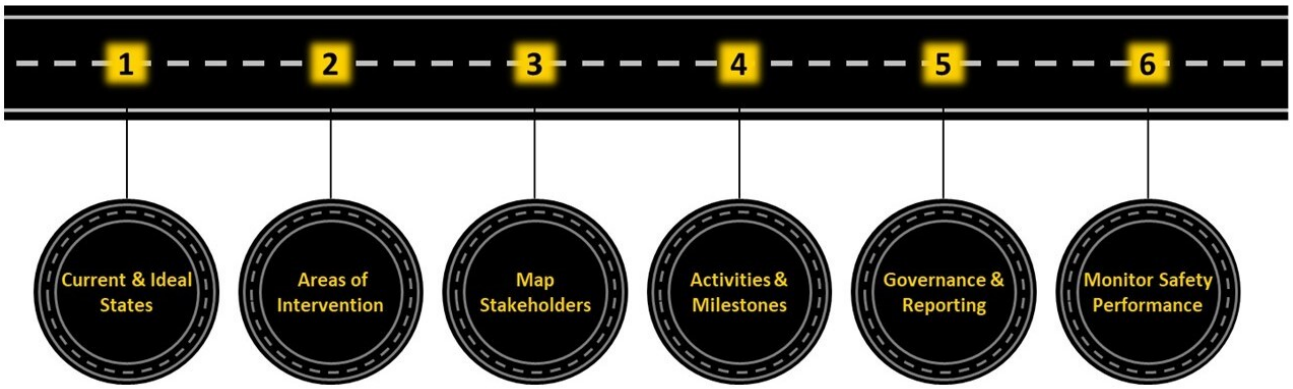

Figure 1. Key components of the Safe System Embedment roadmap

- Safe System is Business-as-Usual, not design exceptions;
- More viable funding options for local roads and active transport.

5. Safe System practice and capability

Improved Safe System capacity and capability are essential for a complete Safe System Embedment, and would in turn lead to positive changes in capacity and capability building in Victoria, according to the participants.

- Greater alignment between policies, standards and design guidelines and Safe System;
- What Safe System means in each scenario and for each road user;
- Document when Safe System outcomes are not achieved and why;
- Safe System capability and capacity are not exclusive;
- All practitioners need to know what is meant by Safe System in each scenario and are trained to apply it.

Key blockers and enablers

The workshop exercises identified specific blockers that typically stop a road and transport practitioner in Victoria from adopting and embedding Safe System in their daily work. These blockers were thematically analysed and could be categorised under five theme key areas:

1. Leadership: The need for strong and committed leadership, clear accountability and visibility, and setting and monitoring short-, mid- and long-term safety targets for every road user and every road.
2. Stakeholders: The importance of clear communication and engagement with the community, developing success stories, investing in gauging community sentiment and attitudes, and embedding the Safe System in organisational culture, policies, and strategies.
3. Processes: The need to establish road safety management processes, develop regional safety plans, embed the Safe System in network planning decisions and precinct structure plans, and ensure road safety is included in all relevant processes.
4. Technical Matters: The importance of providing clear case studies and easy-to-use best practice examples, specific safety support when there are restrictions and difficult decisions, developing network safety plans, and creating tools to provide data insights.
5. Practical Matters: The need to specify where expertise is required, create and celebrate incremental improvements, improve monitoring and evaluation, and include all modes, particularly active modes such as walking and cycling.

Further exercises were conducted to ascertain what might enable Victorian road and road safety practitioners and stakeholders to adopt and embed Safe System under the same themes, summarised in Table 1. The key themes synthesised from participant responses differ from the generic themes introduced at the workshop. This is because the initial themes were only meant to start conversations and encourage participants to share their own perspectives on these themes and other road safety blockers encountered in their practice.

Safe System Embedment roadmap and implications

The workshops found that no single blocker has been a chief cause to impede the full uptake of the Safe System approach in Victoria. Similarly, no single enabler could fulfil the embedment of Safe System in all transport decisions and actions. This knowledge in combination with the recent strategy and action planning activities in Victoria, led to the conception of a preliminary Safe System Embedment roadmap. Figure 1 shows the backbone of the developed Safe System Embedment roadmap. The roadmap is designed to guide the development, implementation, and monitoring of the embedment process, initially to achieve the state's 2030 safety targets and eventually the ultimate Zero by 2050 aspirations.

The first two steps are about establishing the vision and ascertaining key areas of intervention. Currently a draft Vi-

Table 1. Key Safe System Embedment blockers and enablers

Key Safe System Embedment Themes	Key Blockers	Key Enablers
Leadership	• Competing priorities for leaders, target setting and accountability • Not setting safety as a clear priority, which allows competing priorities to supersede safety at times • Not setting proper decision-making rules on how to set priorities and manage conflict	• Strong, committed leadership • Clear accountability and visibility • Clearly set and monitored short-, mid- and long-term targets for every road user (to ensure VRU are not left out because of the complexity of providing safe options for them) and state and local roads
Stakeholders and Community	• Community and road safety stakeholders not always supportive of reduced speed • Lack of timely and effective communication and engagement • Previous political announcements and commitments that might not align with safety outcomes anymore • Minority community voices weighted more heavily than majority voices	• Clear communication and engagement, goals, objectives, and strategies • Develop success stories – people need to see change in the real world • Invest in gauging the community's sentiments and attitudes • Embed Safe System in state, Local Government Areas and organisational culture, policies, and strategies
Processes	• Lack of timely inclusion of safety in planning, pipeline, integration, movement and place, etc. • Safety projects do not always produce the best Benefit-Cost Ratio • Not allocating appropriate funds at the right stage • Safety benefits balanced against other benefits of the transport system, rather than aiming to eliminate serious road trauma	• Establish road safety management processes • Establish where road safety sits in all the various, relevant processes • Develop regional safety plans • Embed Safe System in network planning decisions and precinct structure plans
Technical matters	• Lack of technical knowledge • Lack of specific, cost-effective solutions to persistent road safety problems such as pedestrian safety at high-speed intersections • Lack of viable, practical alternatives to change non-Safe System compliant policies and standards	• Clear case studies – develop a searchable, user-friendly database • Easy to use best-practice examples • Provide specific safety support when there are restrictions and difficult decisions • Develop network safety plans
Practical matters	• Counter-productive priority setting • Lack of time, funds, people, and subject matter experts • Unavoidable compromises due to environmental considerations, cultural and heritage rules, time, budget, etc. • Lack of data and insights	• Specify how to access expertise • Create and celebrate incremental improvements where drastic changes are not possible • Better monitoring and evaluation • Include all modes, particularly active modes such as walking and cycling • Development of tools to provide data insights

sion Statement for Safe System Embedment has been developed in consultation with the Transport Accident Commission, a key road safety partner in Victoria (internal report). It states that:

'Road safety partnership and key stakeholders in the State of Victoria are to sustainably achieve:

1. A culture where transport safety is inherent in all we do (Safe System Culture);
2. 50% reduction of crashes on the road resulting in fatalities and significant reductions in serious injuries by 2030;
3. Zero fatalities and serious injuries from crashes on the road by 2050;
4. Tangible road safety outcome milestones for all road users on the way to 2030/2050.

Furthermore, the thematic analyses of the workshop exercises yielded a list of key Safe System Embedment intervention areas that are deemed to be both essential and effective to achieve the stated vision. It should be noted that Safe System Embedment interventions are proposed activities and actions in alignment with our findings to overcome blockers and strengthen enablers to help the road safety partners better embed the Safe System in Victoria. As discussed later in this paper, we have developed several more specific projects under these intervention areas. These are informed by our results and were developed in response to our findings. They are:

- Policy and Standards;
- Strategy and Planning;
- Organisational Culture and Leadership;
- Government and Political Sphere;

Table 2. High-priority Safe System Embedment project concepts generated in workshops

Safe System Embedment project concepts	High-level objectives
1. Safe System Embedment in Frameworks and Processes	• To ensure Safe System is embedded and included in every decision in the road safety management and project governance processes
2. Safe System and Future Planning	• To work closely with practitioners and officers from various divisions and areas within the department to ensure Safe System is embedded in their activities. Areas include: network planning, network integration, corridor planning, precinct planning, movement and place and other key planning areas
3. Early, Proactive Safe System Integration	• To provide practical Safe System advice and support to key stakeholders during early stages of programs and projects
4. Safe System Embedment KPIs and Reporting	• To develop Safe System performance metrics in alignment with Safe System Embedment and the state road safety strategy
5. Safe System Plans for Regions and LGAs	• To support regions and LGAs to adopt the learnings of the Safe System Embedment and enhance their Safe System plans, targets, KPIs etc
6. Best-Practice Safe System Case Studies	• To provide clear, easy-to-use Safe System practice and solutions for persistent road safety problems that block key stakeholders • To provide communication and engagement material to all road safety practitioners, leaders, managers, politicians, advocacy groups to barrack for Safe System • To determine Safe System knowledge gaps amongst key stakeholders and provide them with best-practice Safe System measures and advice
7. Design Innovation project for specific issues	• To identify gaps in our Safe System infrastructure 'toolkit' that result in non-Safe System compliant outcomes on the network (e.g., the available measures for high-speed intersections and Vulnerable Road Users, and non-Safe System compliant speed limits) • To develop innovative solutions to address gaps in the toolkit
8. Safe System Capability Improvement	• To uplift practical Safe System knowledge amongst key stakeholders inside and outside the Department of Transport • To encourage politicians, leaders, managers, and decision makers to fully include Safe System in their decision making and communications
9. Pilot review of analysis of Safe System principles in fatality crashes for system learnings	• To create an in-depth understanding of systemic failures that contribute to fatal and serious injuries on our roads • To identify the roles and responsibilities of key players in the transport system to address the systemic failures

- Capability and Know-How;
- Communication and Engagement;
- Business Processes and Procedure.

Based on the Safe System Embedment intervention areas identified, Road Safety Victoria (RSV) is planning a range of improvement projects aimed at addressing the blockers and building on the ideas generated in the workshops. To ensure projects are prioritised appropriately, RSV consulted with key road safety partners and developed improvement project concepts that will be assessed based on urgency, level of effort required, and implementation costs.

The final short-list of the project concepts (Table 2) are now being assessed for funding and implementation by RSV. The key themes identified in the blocker-enabler analysis are being combined to create potentially effective projects with both immediate and long-term impacts on the status quo.

Conclusion and further Safe System Embedment suggestions

In conclusion, the technical workshops were successful in identifying key stakeholders' attitudes towards the Safe System principles, key enablers and blockers, and specific projects for embedding the Safe System approach in the road safety management system. Five online workshops were attended by over 60 representatives from key road safety stakeholders and players, and exercises were carried out using PowerPoint slides and Mentimeter question polls. The workshops identified specific blockers that typically prevent a road and transport practitioner in Victoria from adopting and embedding the Safe System approach in their daily work. The poll identified five vision areas for embedding the Safe System approach in the road safety and transport system within 1-3 years (short- to mid-term).

In response to these findings, a Safe System Embedment roadmap was developed to guide the development, implementation, and monitoring of the embedment process to

achieve the Victorian Government's 2030 safety targets and eventually the ultimate Zero by 2050 aspirations. Key components of the roadmap include establishing a vision and identifying key areas of intervention, such as policy and standards, strategy and planning, and communication and engagement. Road Safety Victoria is planning a range of improvement projects aimed at addressing blockers and building on the ideas generated by workshop participants, with a final short-list of high-priority projects being assessed for funding and implementation. These projects will have immediate and long-term impacts on the status quo, including the embedding of Safe System in every decision in road safety management and project governance processes, supporting regions and LGAs to enhance their Safe System plans, and uplifting practical Safe System knowledge amongst key stakeholders.

In addition to the above-mentioned roadmap, we suggest additional embedment interventions to be investigated in future research and practice projects, namely:

- Best Practice safe system treatments and process should be embedded into policies and standards.
- Continuous investment in and inclusion of Safe System Embedment in road safety strategies and action plans.
- Safe System needs to feature in the Vision, organisational overviews, personnel inductions and training, and leadership briefing.
- Keeping leaders informed and accountable through safety performance, target monitoring and reporting, and political leadership briefing and training.
- The majority of practitioners and stakeholders demand serious road trauma elimination, to achieve this they need access to cost-effective, viable and tailored-to-their-safety-problem solutions.
- Key messages, case studies, fact sheets and Subject Matter support are key to enable communication and engagement practitioners to bring the community and stakeholders along.

A detailed analysis of Road Management Process is key to identify processes where road safety tools, data, insights, and proactive support are needed.

Study limitations

While a wide range of road and transport professionals and practitioners from key organisations and stakeholders were engaged during the workshops, the findings may not be fully representative of all views and perspectives in Victoria. Safe System Embedment requires significant change management and culture change. Further investigation may be needed to understand the components of these change management activities.

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Author Contributions

All authors contributed to the conception and design of the study, participated in data collection and analysis, and drafted the initial version of the manuscript. Alavi designed and conducted the study. All authors participated in data collection, contributed to data interpretation, and critically revised the manuscript for intellectual content. All authors have read and approved the final version of the manuscript for publication.

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Human Research Ethics Review

As we did not seek ethical approval from the World Medical Association Declaration of Helsinki regarding research involving human subjects, we declare that the workshops were conducted in accordance with the 'General Rules of Professional Behaviour'. These rules include compliance with legislation such as the Privacy Act 1988 and the Australian Privacy Principles, as well as taking all reasonable precautions to ensure that participants were not harmed or adversely affected as a direct result of their participation in the workshop, as stated by the Research Society (2020). All information and responses from workshop attendees were collected anonymously through the use of Mentimeter question polls. Participants were informed of the workshop's nature and style, as well as how the anonymous information gathered from them would be used, and provided their clear and affirmative consent before participating. Participation was voluntary, and no misleading information about the general purpose and nature of the workshop was provided at the time of registration.

Data Availability Statement

We acknowledge and agree to make all materials, data, and protocols associated with the publication available to readers either in the text or on request.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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