

# The enhanced knowledge translation and exchange framework for road safety: a brief report on its development and potential impacts

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## ABSTRACT

Knowledge translation and exchange (KTE) can enable evidence-informed road safety policy and practice by reducing the gap between what is known to be effective and what actually occurs. A quality improvement project, undertaken within a government policy frame, was implemented in 2015 to produce an enhanced KTE framework for road safety (the framework). Information was collected from 35 road safety stakeholders in the UK, the Netherlands, Norway and Sweden. Thirteen KTE facilitators were identified that covered research funding and production, the expertise of knowledge users and dissemination practices. The framework was subsequently developed, which separated facilitators seen as essential for a KTE system, from others perceived as aspirational due to their lesser influence and the considerable time and resources required for their implementation. The framework provides a heuristic device to enable policy agencies to holistically assess and improve current KTE systems for road safety, to encourage evidence-informed policy and practice.

## BACKGROUND

The field of road safety will transform in high-income countries (HICs) over coming decades due to the increased adoption of autonomous vehicles and other disruptive technologies.<sup>1</sup> While these advances may produce significant benefits, such as reducing road trauma by decreasing the influence of human error, they will present complex implementation challenges for policymakers and practitioners, including in relation to privacy and liability.<sup>2</sup> The subsequent diffusion of disruptive technologies into rapidly motorising low and middle income countries (LMICs) will scale up these challenges to a global level. The road safety community's response to these challenges will largely determine the future influence of road trauma on population health, worldwide.

The concept of knowledge translation and exchange (KTE) overlaps with related terms, such as knowledge transfer, which are collectively defined as K\*.<sup>3</sup> The general aim of KTE (and related terms) is to promote effective and efficient policies, practices and research investments by reducing the gap between what we know and do. KTE has gained attention over recent years as part of the increasing global emphasis on evidence-based practice, strengthening its evidentiary basis.<sup>4</sup>

KTE offers the road safety community a mechanism to address current and future challenges by facilitating collaborative learning and coordinated

actions among diverse stakeholders to promote evidence-informed policies and practices. A commonly referenced definition of KTE<sup>5</sup> was adapted for road safety as follows: KTE for road safety is a dynamic and iterative process that involves the co-production, synthesis, dissemination, exchange and ethically sound application of knowledge to improve the safety of road users.<sup>6</sup>

However, with a small number of exceptions,<sup>7 8</sup> KTE has been infrequently examined in the road safety literature and is largely neglected by transport policy agencies. Considering the millions of deaths and injuries caused by road trauma each year,<sup>9</sup> the critical role of KTE for enabling effective policy and practice, and the impending transformation of the road safety field overcoming decades to accommodate disruptive technologies, there are significant future gains to be made by more effective use of KTE in the field. This study aimed to generate a framework to enhance KTE in road safety and encourage evidence-informed policy and practice into the future.

## METHODS

A quality improvement project was implemented in 2015<sup>6</sup> when the first author worked in a road safety policy agency in Australia. To elicit views regarding effective KTE, information was collected via 6 individual and 14 group meetings with 35 road safety stakeholders in Sweden, Norway, the Netherlands and UK. These countries are recognised as global road safety leaders due to their low road trauma rates, advanced transport management systems and emphasis on evidence-informed policy.<sup>10</sup>

The project commenced with a review of the websites of prominent road safety organisations in each country to identify current approaches to KTE and suitable stakeholders to elicit information from. Emails were sent to potential participants, outlining the project and requesting a meeting. The stakeholders contacted were managers in transport departments (ie policymakers), senior representatives of non-government organisations (NGOs) and researchers from universities and institutes. Australian road safety stakeholders with professional experience in Europe verified the suitability of stakeholders invited to participate. While the inclusion of additional stakeholder groups may have strengthened the study, this was not possible due to budgetary limitations.

Twenty-four stakeholders were contacted, and four declined to participate. Three meetings were



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**Table 1** The enhanced KTE framework for road safety

KTE domains	KTE facilitators	
	Essential	Aspirational
▶ Research funding and production	<ul style="list-style-type: none"> <li>▶ A coordinated research plan that promotes strong evidence, establishes priorities equitably, encourages stakeholder collaboration and fosters a capable research workforce.</li> <li>▶ Adequate incentivisation for broad research dissemination within funding contracts (eg part of all research grants having to be used for KTE activities).</li> </ul>	▶ A specialised national road safety research institute that leads research production and KTE activities.
The research expertise of knowledge users	<ul style="list-style-type: none"> <li>▶ Senior policy managers with postgraduate research training.</li> <li>▶ Professional development courses for policymakers and practitioners to increase research and evaluation skills (eg short research and evaluation courses delivered by external consultants).</li> </ul>	▶ A professional academy for road safety practitioners to increase their capacity to capture and share tacit and experiential knowledge.
Research dissemination	<ul style="list-style-type: none"> <li>▶ Dissemination training for researchers.</li> <li>▶ Journals, reports and newsletters.</li> <li>▶ Conferences and government-facilitated multistakeholder forums at national and jurisdictional levels.</li> <li>▶ Working groups.</li> <li>▶ News and social media.</li> <li>▶ NGO boards and membership.</li> </ul>	▶ Comprehensive online knowledge portals with peer-reviewed research syntheses on priority topics, to increase the accessibility of road safety knowledge.

KTE, knowledge translation and exchange; NGO, non-government organisation.

attended by additional representatives of the same stakeholder groups, who were spontaneously invited by the primary individuals contacted. Nineteen researchers, nine NGO representatives and seven policymakers participated. Meetings lasted around 1 hour. Discussions focused on three areas: the KTE facilitators implemented in participants' countries; their impacts and importance and how a KTE system for road safety should be envisaged. The first author conducted the meetings, drawing upon past road safety policy and research<sup>11–13</sup> experience.

Notes were taken during meetings and thematically analysed,<sup>14</sup> based on abductive reasoning derived from discussions among the authors, to identify findings that were consistent across the four countries and relevant to Australia. Based on participants' comments and pragmatic analysis through a quality improvement, policy-focused lens, the KTE facilitators were separated into those seen as essential for an effective KTE system, and others viewed as aspirational, being less vital and requiring greater time and resources to implement. This type of tiered approach has been used to develop a national policy framework that promotes greater harmonisation of graduated licensing schemes across Australia.<sup>15</sup> A draft of the framework

was provided to some participants, who confirmed the validity of the general approach.

Ethics approval was not sought, as the quality improvement project was designed from a policy perspective, with data collected by a policymaker to enhance Australian road safety KTE. Nonetheless, participation was perceived to be low risk, and assurances of confidentiality were provided to stakeholders, including agreement that the names of individuals and organisations would not be included in any outputs generated.

## RESULTS

Thirteen facilitators of KTE in road safety were identified, covering three domains: research funding and production; the research expertise of knowledge users and research dissemination (table 1). Details about, and examples of, each facilitator are available in the project report.<sup>6</sup> Participants suggested that the KTE facilitators identified have helped to encourage strong appreciation for research evidence and cohesion among their road safety communities, facilitating evidence-informed policy and practice.

Potential impacts of facilitators in each KTE domain are outlined in table 2. The domains cross structural boundaries (ie

**Table 2** Potential impacts of the enhanced KTE framework for road safety

KTE domains	Structural boundaries		
	Individual	Organisational	System
Research funding and production	<ul style="list-style-type: none"> <li>▶ Greater researcher prioritisation of, and experience in, KTE</li> </ul>	<ul style="list-style-type: none"> <li>▶ Increased prioritisation of KTE by research organisations</li> </ul>	<ul style="list-style-type: none"> <li>▶ Stronger research evidence</li> <li>▶ KTE leadership by national research institutes</li> <li>▶ Increased co-production of relevant research</li> </ul>
The research expertise of knowledge users	<ul style="list-style-type: none"> <li>▶ Increased capacity of knowledge users to critically analyse, use and adapt research evidence for decision-making</li> </ul>	<ul style="list-style-type: none"> <li>▶ Stronger research and evaluation cultures in policy and practitioner agencies</li> </ul>	<ul style="list-style-type: none"> <li>▶ Enhanced capture and mobilisation of practitioner knowledge to strengthen the road safety evidence-base</li> </ul>
Research dissemination	<ul style="list-style-type: none"> <li>▶ Improved dissemination capabilities among researchers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Greater diffusion of research evidence within research, policy and practitioner organisations</li> </ul>	<ul style="list-style-type: none"> <li>▶ Increased transfer of research evidence to all stakeholders, including the public</li> <li>▶ More multistakeholder networks to diffuse knowledge throughout the road safety community</li> </ul>

KTE, knowledge translation and exchange.

## Brief report

individuals, organisations and overarching systems) and temporal dimensions (ie permanent initiatives and those used on an as-needed basis), while accounting for diverse types of knowledge (ie research evidence, and the tacit knowledge of both practitioners and policymakers).

## DISCUSSION

The framework presented in this paper highlights practical opportunities to improve KTE to promote evidence-informed policy and practice into the future. It incorporates diverse levers that can drive change at individual, organisation and system levels. The framework is consistent with prior work identifying generative, disseminative, absorptive and adaptive capacities as necessary elements of effective KTE systems.<sup>16</sup>

While the framework was developed from a national perspective, the development of separate KTE frameworks for specific road safety areas (eg younger drivers) and discrete governance units could also be productive. There are opportunities to expand the framework to encompass separate subsystems for different road safety areas and governmental layers.

Some of the facilitators identified (eg comprehensive online knowledge portals) are not implemented in Australia and many other countries, highlighting opportunities for practical improvements. The facilitators are more immediately viable for HICs, where considerable institutional resources are available. Nonetheless, the approach of developing KTE systems for road safety in LMICs is highly recommended.

The WHO and global philanthropic organisations have a demonstrated commitment to supporting vast programmes in LMICs to develop road safety management infrastructure.<sup>17</sup> While the importance of KTE is often acknowledged in such projects, greater emphasis on KTE *systems*, leveraging insights from the framework presented, could be further incorporated to engender sustained stakeholder collaboration and evidence-informed approaches.

Road safety stakeholders are encouraged to build upon the framework outlined in this paper and tailor it for their specific contexts. The diverse activities within the framework require involvement by different groups, making multistakeholder collaboration necessary for effective application. Government agencies are best placed to instigate such efforts, due to their resources and influence.

Encouraging widespread appreciation of the benefits of KTE, and the time and steps required to implement the facilitators effectively, should be core elements of stakeholder engagement plans that accompany efforts to introduce the framework. Such efforts should leverage insights from cognitive psychology and organisational theories of change to increase receptivity and support. As has been previously noted,<sup>18</sup> the shrewd application of implementation science theories, and their individual constructs, to support the application of KTE interventions in different contexts is recommended.

An important issue emphasised in the literature<sup>19</sup> is how KTE interventions should be evaluated. This is especially vital from the quality improvement perspective employed in this project, as evaluations can identify opportunities for ongoing enhancement.<sup>20</sup> Various approaches are outlined in the K\* literature, which emphasise the importance of specifying the intended outcomes of interventions, and the stakeholders and activities involved.<sup>3 4</sup> Evaluating the KTE facilitators in the framework regarding the research expertise of knowledge users seems the easiest initial step. Holistic evaluation of the framework, as opposed to the individual facilitators, requires further consideration as it will necessitate the complementary use of varied

methodologies that are suitable for assessing the discrete facilitators and activities involved.

## CONCLUSION

A period of rapid transformation in road safety is approaching due to the rollout of disruptive technologies. For road safety stakeholders to guide the impending changes effectively, KTE mechanisms must be available to capture and integrate their collective knowledge to enable efficient, evidence-informed decisions for policy and practice. This is currently important, but will be increasingly necessary over the next decade to accommodate the design and adaptation of technological and regulatory frameworks to facilitate the safe rollout of autonomous vehicles. The road safety community can draw upon the framework presented, along with recent advances in other policy fields, to develop effective KTE systems that support such goals.

## What is already known on the subject?

- ▶ Effective knowledge translation and exchange (KTE) can promote evidence-informed policy and practice.
- ▶ While KTE and related concepts are receiving increased attention in the research literature, there have been limited investigations of their application in road safety.

## What this study adds?

- ▶ This is the first project to present a framework to guide holistic planning for knowledge translation and exchange (KTE) in road safety.
- ▶ The framework presented can assist the development of robust KTE systems to enable road safety stakeholders to address impending challenges posed by disruptive technologies.

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### Plastic hair helmet

Another bicycle helmet prototype looks like the plastic hair on your guess is as good as mine (LEGO) figures. The design originated from an MBA thesis that explored whether kids would more often wear a helmet if it was appealing. Some potential users wanted different hairstyles and colours, including 'The Trump'.

### Indian train derailment kills 146

India's worst recent train crash killed 146 passengers when the train slid off the tracks. Fourteen cars were wrecked and over 200 people injured. This crash may have been caused by faulty tracks. Train safety is an ongoing problem in India. The railway system lacks modern signalling and communication. Most crashes are blamed on poor maintenance, outdated equipment and human error. The Prime Minister pledged last year to invest US\$137 billion over the next 5 years to modernise the railway network.

### More on texting and distraction

Distracted driving is now among the leading factors in fatal collisions across Canada. Five years of data suggest distraction is responsible for more road fatalities than impaired driving. But fines for using a cellphone while driving are insufficient to change this behaviour. As one victim put it, 'We've changed our attitude toward seat belts, toward drunk driving; let's change our attitude about phones'. Moreover, technology exists to shut down cellphones when a car is in motion. Comment: why is this not mandatory?



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