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THE WINSTON CHURCHILL MEMORIAL TRUST OF AUSTRALIA

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The NRMA-ACT Road Safety Trust Churchill Fellowship

To improve Australian road safety policy processes by enhancing knowledge translation and exchange amongst key stakeholders

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Acknowledgements

This project would not have been possible without the support I received from a number of organisations and individuals. First, the Winston Churchill Memorial Trust of Australia and NRMA-ACT Road Safety Trust, who sponsored my fellowship. Both Trusts provide opportunities for Australians to improve the nation and should be commended for their work. Second, the NSW Centre for Road Safety, where I spent 18 months learning about the science and art of policy.

Third, Associate Professor David Greenfield from the Australian Institute of Health Innovation and Professor Rebecca Ivers from the George Institute for Global Health, who were the professional and project referees for my fellowship application. Fourth, Associate Professor Teresa Senserrick from the University of New South Wales and Dr Charlotte Bax from the SWOV Institute for Road Safety Research, who facilitated my contact with several informants and provided constructive feedback throughout the project. Fifth, my wonderful mother, who accompanied me during a considerable portion of my travels and welcomed my stress with grace. Sixth, my lovely wife, who accompanied me in two countries and provided ongoing emotional support.

My final acknowledgement is pre-emptive and directed to the road safety stakeholders of Australia. I hope this report will encourage you to collaborate more effectively to implement evidence-informed policies that reduce the road toll. The community deserves our best efforts.

Low fruit picked and stale

don't idle by winter fire

improve the orchard

Executive summary

There is broad acceptance that an evidence-informed approach to policy and practice is necessary to reduce the number of deaths and injuries on Australian roads. This approach requires research to be disseminated effectively throughout the road safety community, yet policymakers, practitioners and researchers find this difficult to achieve. For this reason, improved Knowledge Translation and Exchange (KTE) amongst road safety stakeholders is needed to reduce the road toll.

Dr Reece Hinchcliff was awarded a Winston Churchill Memorial Trust Fellowship in 2014, which was sponsored by the NRMA-ACT Road Safety Trust, to enhance KTE amongst Australian road safety stakeholders. To identify improvement opportunities, Dr Hinchcliff held 20 meetings with 35 influential stakeholders in the United Kingdom, Norway, Sweden and the Netherlands. These countries are viewed as global road safety leaders and have renowned KTE systems in place.

Thirteen key KTE facilitators were identified across three domains: research funding and production; the research expertise of knowledge users (e.g. policymakers and practitioners); and research dissemination. Examples of facilitators viewed as *necessary* for effective road safety KTE systems, and those which are more *aspirational* in nature, are provided in the framework below.

KTE domains	Facilitators necessary for effective KTE systems (examples)	Aspirational KTE facilitators
Research funding and production	A coordinated national research plan that establishes priorities equitably and fosters an effective research workforce	A specialised national road safety research institute
The research expertise of knowledge users	Professional development courses for policymakers and practitioners to increase research and evaluation skills	A professional academy for road safety practitioners
Research dissemination	Government-facilitated, multi-stakeholder forums at national and jurisdictional levels	Online knowledge-portals with peer-reviewed research syntheses on priority topics

It is recommended that road safety stakeholders use the framework to systematically assess and improve the KTE systems operating in Australia. The institutionalisation of ideal KTE systems will require stakeholders to implement the aspirational facilitators identified. Employment of this approach is also recommended for other nations and in particular, Low and Middle Income Countries, to maximise the potential benefits of road safety research investment.

Conference presentations and seminars will be delivered in 2015 and 2016 to disseminate the project findings. For further inquiries, please use the contact details below.



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Background

This section will contextualise the project by providing a brief overview of Australian road safety. The theoretical foundations of the project will then be outlined, along with its aims and methods.

Road safety in Australia

There is much to admire about Australia's history of road safety. Even with significant growth in the population and number of registered vehicles over the past four decades, the number of deaths on our roads has fallen from 3,798 in 1970 to 1,157 in 2014¹. Considerable progress has been made towards the National Road Safety Strategy 2011–2020 target of a 30 per cent reduction in casualties, though further improvement will be required to meet this objective.

The dramatic road toll reduction in Australia over recent decades has been produced by evidence-based advances in, for example, vehicle design, road engineering, enforcement practices and licensing schemes. These initiatives have been supported by the funding of high quality research by federal and jurisdictional transport policy agencies and national research councils.

Road safety in Australia is managed using the Safe System approach, which underpins the National Road Safety Strategy 2011-2020 and several jurisdictional strategies². It represents road transport as a complex system requiring multifaceted interventions to reduce road deaths and injuries. The interaction of key road safety domains are accounted for: road users (safer people), road and roadside engineering (safer roads), vehicle design and features (safer vehicles) and safer speeds.

The Safe System approach has improved road safety in Australia and other international adopters by accepting that road users are fallible and will make errors that result in crashes, regardless of their compliance with road rules. This makes it vital for road safety stakeholders to collaboratively design road transport systems that protect road users, despite the inevitability of human errors.

Many Australian road safety policy and research agencies are organised around the Safe System, with separate units specialising in roads, vehicles and people. This helps agencies to holistically address road safety by accounting for each domain and their interrelationships.

The unfinished project

Despite the significant recent improvements in Australian road safety, there remains a clear need for further action. People are still dying and sustaining injuries on our roads. In addition to the grief this inflicts on the nation, it also costs around \$27 billion annually - the equivalent of 1.8 per cent of Australian Gross Domestic Product³. The question is, what more can be done to keep reducing the road toll, considering that most initiatives with proven effectiveness are already in place?

To help answer this question, the Federal Government's Bureau of Infrastructure, Transport and Regional Economics (BITRE) reviewed the benefits and costs of measures to encourage safer drivers, build safer roads and drive safer cars⁴. The conclusions concentrated on the need for strategic investment in infrastructure safety and improvements in the safety of the vehicle fleet. This became the focus of the National Road Safety Strategy – Action Plan 2015-17⁵.

While the need for such actions is clear, we also need to broadly consider how road safety is managed in Australia. As the BITRE report noted, *“road safety management is a growing focus of attention as various institutions and jurisdictions recognise that the limits to improved road safety performance are, in part, shaped by the capacity of the road safety management system operating in a country”*⁴. The key elements of a road safety management system are illustrated in Figure 1, which identifies research and knowledge transfer as core institutional management functions.

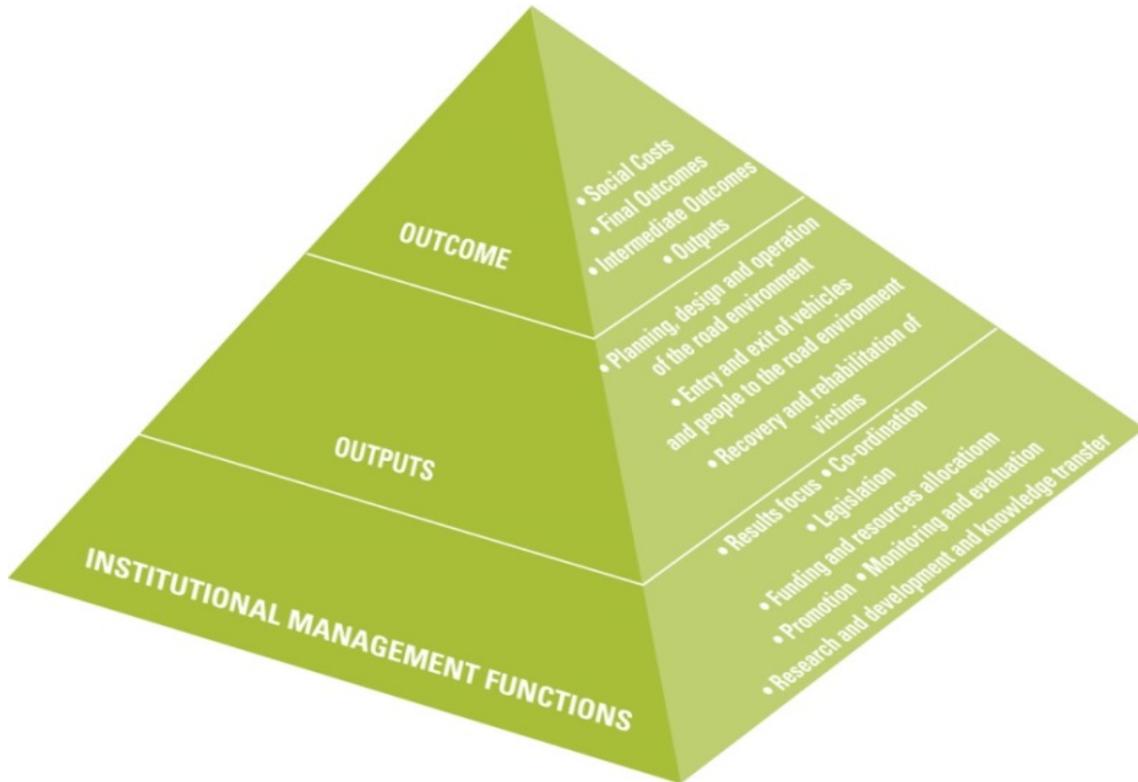


Figure 1: Key elements of a road safety management system⁶

The importance of knowledge transfer was highlighted in February 2013, when the National Health and Medical Research Council and Australasian College of Road Safety hosted a workshop to develop a national road safety research framework⁷. The draft framework produced aims to encourage efficient funding of research, development and evaluation activities at a national level. The aspiration is to use research strategically to decrease the rate of casualties on Australian roads.

Goal seven of the framework is to ensure that road safety research is communicated promptly, disseminated widely, made publicly available and promoted to encourage translation into policy and practice. The implicit message is that the potential applications of road safety research for policy and practice are not being fully realised due to deficiencies in dissemination processes. This project was developed to respond to this important challenge facing the Australian road safety community.

Theoretical foundations

It is widely accepted that research evidence should be used effectively to maximise the benefits resulting from public policies. Policymaking is depicted as a rational process concerned with identifying problems and evaluating potential solutions. This is described as an evidence-based policy approach⁸. Yet policies infrequently reflect research evidence, with this discrepancy identified as a serious issue requiring increased global attention⁹.

The divergence between research and policy is largely due to the nature of policy processes. There is not always a predictable policy cycle involving problem definition, agenda-setting, evaluation of alternatives and the implementation, evaluation and revision of solutions¹⁰. Instead, policy can happen incrementally and also through irregular punctuations to existing equilibriums¹¹.

Furthermore, policies may not be developed as a response to problems, but instead exist long before problems have been formulated or recognised as important¹². This occurs in environments

with competing advocacy coalitions deploying strategic rhetoric to install their views as the dominant policy position. In short, policy processes are highly complex and not easily explained.

Research may also be used in complex ways, including *politically* to justify existing policy decisions, *tactically* to justify policy inertia, or to *enlighten* new ways of conceptualising a policy issue¹³. Different types of research use may produce more or less obvious types of impacts on policy¹⁴.

There are also technical issues regarding the increasing scientific complexity and uncertainty that accompany the movement of research into policy contexts¹⁵. This creates ethical dilemmas, as the broader consequences of potential policy decisions become more difficult to estimate using research evidence. Research also contends with other competing rationalities, including public preferences and economic factors¹⁶. For these reasons, evidence-based policy is merely an aspiration, with evidence-informed policy a more realistic concept.

Previous studies have found that road safety policies are not always made based on the best available research evidence^{17, 18}. While it is attractive to devise a single method of ensuring that road safety policies are always evidence-based, policy processes are too complex for simplistic reductionism. Instead, efforts should focus on ensuring that stakeholders are mutually aware of, understand and use the best available research evidence to *inform* their decision-making.

Knowledge Translation and Exchange (KTE) is a useful concept to help pursue these aims. It helps to address what knowledge is needed, who produces it, what form it takes, and how accessible it is²⁰. KTE can occur at varied levels (e.g. individuals, organisations and policy systems) and stages of the policy process, including agenda-setting and policy formulation.

The crux of KTE is an appreciation of the need to exchange evidence and translate it into appropriate forms for different stakeholders, to promote appreciation of its value as knowledge relevant to policy and practice. Due to its pragmatic principles, KTE provides an ideal concept through which to understand and promote collaborative, evidence-informed policymaking for Australian road safety.

Project overview

The chief investigator of this project, Dr Reece Hinchcliff, is a public health researcher whose PhD thesis examined research use in graduated licensing policy in Australia and the United States. He has applied his research training as a university-based academic and a road safety policymaker.

In 2014 Dr Hinchcliff was awarded a Winston Churchill Memorial Trust Fellowship. The aim of the Trust is to provide opportunities for Australians to travel overseas and conduct research that enriches society. His fellowship was sponsored by the NRMA-ACT Road Safety Trust, which was established by the ACT Government and NRMA Insurance to enhance road safety in Australia.

The fellowship supported travel to the Netherlands, United Kingdom, Norway and Sweden during 2015. These four countries are viewed as global road safety leaders because of their low road tolls and advanced management systems^{19, 20}. The rationale was that insights into effective KTE for road safety in these countries would highlight opportunities to make improvements in Australia. However, this does not imply that these countries are not facing their own road safety challenges, or that they have nothing to learn from Australian road safety management systems.

Within each country, meetings and seminars were arranged with policymakers (e.g. managers of road safety units within national transport departments), researchers from universities and road safety research institutes, and NGOs representing road safety practitioners in the fields of engineering and public education. In total, 20 meetings involving 35 individuals were convened.

To identify suitable participants, published reports and the websites of prominent organisations were reviewed. Australian stakeholders were conferred with to verify the suitability of the potential

participants identified. Emails were sent to potential participants, which outlined the project and requested their participation. Redirections to previously unknown stakeholders occurred commonly.

Participants were assured that no names of individuals or organisations would be used in any published outputs. This makes some examples presented in the results seem overly diffuse. Readers can, however, locate more specific details on the internet using the general descriptions provided. Confidentiality was necessary, as informants were asked to critically assess the road safety management systems operating in their countries.

In some cases, meetings were unexpectedly attended by additional individuals or follow-up meetings were arranged. Whilst necessary to execute the project, these recruitment methods made it challenging to ascertain a valid response rate. However, as only four individuals declined to participate, it is unlikely that response bias confounded the results.

In each meeting, the project was introduced and participants were asked questions about a range of KTE topics. Notes were taken during meetings, rather than digital recordings. This was necessary to generate the trust required for informants to provide honest answers, yet prevented the inclusion of quotes in the report. The meeting notes were thematically analysed to identify emergent issues and a framework for KTE in Australian road safety was formed using the results. A draft version of the framework was provided to informants in later meetings, who confirmed its validity.

Results

The first part of the results provides context for later sections by summarising the views of informants regarding the road safety trajectories of their countries. Subsequent sections examine the KTE facilitators identified in three domains: research funding and production; the research expertise of knowledge users (e.g. policymakers and practitioners); and research dissemination.

Road safety trajectories

The Netherlands, United Kingdom, Norway and Sweden have low road tolls and possess renowned road safety management systems. Nonetheless, informants explained that road safety is a complex dynamic system influenced by social, cultural, political and technical factors. Changes can arise from these diverse fields, making it difficult to predict future road safety performance.

A common theme was that most interventions with proven capacity to produce substantial road trauma reductions have already been implemented in each country. Cooperative intelligent transport systems were seen to provide significant promise, but not in the immediate future. Informants believed the limited low hanging fruit left available will make it increasingly difficult to obtain the road trauma reductions required to meet their national objectives. In this respect, there are clear parallels to the current situation in Australia.

Significant road safety challenges were identified in each country. These related to several issues: rapid technological advancements; transport system complexity (e.g. increasing interaction between road user groups); bureaucratic turnover (i.e. lack of knowledge continuity in government agencies); political developments (e.g. governments opposed to restrictions on civil liberties); community perceptions (e.g. opposition to intelligent speed adaptation); and the influence of lobby groups.

An additional theme concerned the implications of movements in each country towards decentralised policy development and delivery. Due to these localism agendas, informants believed that national transport agencies have less ability (or desire) to ensure the delivery of coherent, evidence-informed strategies for road safety policy and practice across smaller governance units (e.g. regions, municipalities).

Despite identifying several challenges, informants believed that serious declines in road safety performance are unlikely because of existing safety nets, such as the availability of reliable crash, offence and licensing data. Rigorous surveillance systems are also in place in Australia, and were seen by informants to underlie effective KTE by providing evidentiary feedback loops that allow potential road safety problems to be identified and addressed efficiently.

The KTE systems in each country visited were represented as a further safety net preventing declines in road safety performance. Based on informant comments, it emerged that the KTE systems of each country are slightly varied, yet cover the same three key domains. The general argument presented was that these domains are interrelated and should function harmoniously to achieve an effective KTE system that strengthens collaboration between researchers, policymakers and practitioners.

Research funding and production

The funding and production of research was seen to influence its use in policy and practice. Three KTE facilitators related to this issue were highlighted:

- Incentivisation for research dissemination within funding contracts
- A coordinated research plan that establishes priorities equitably and fosters an effective research workforce
- A specialised national road safety research institute

Incentivisation for research dissemination within funding contracts

Informants believed that effective research dissemination requires significant financial investment and only occurs when incentivised sufficiently within funding contracts. Effective dissemination was viewed more broadly than project briefs to the specific government agencies, industry groups or research councils funding research projects.

Norway employs an approach that should be considered in Australia, where grant applications must include a detailed dissemination plan and allocate a designated amount of funding for such activities. Multi-stakeholder seminars are arranged for project close-out and bespoke websites are developed for large projects funded by the lead research council²¹. Contracts also generally permit the publication of findings in academic journals.

Informants also discussed a European Union funding scheme²² that is designed to build collaborative networks between researchers and other stakeholders to encourage KTE. These grants have an explicit focus on encouraging interaction between researchers and other stakeholders, crossing national boundaries and disseminating research in lay terms for the general public.

It is important to note that Australian road safety research contracts and competitive grants often include dissemination components. However, it is not incentivised and valued to the same extent as in Norway and the other countries visited, and there are no strong mechanisms in place to hold researchers accountable for these deliverables, highlighting an opportunity for improvement.

A coordinated research plan that establishes priorities and fosters an effective research workforce

As described in the background section, a draft national road safety research framework was recently developed in Australia. Despite its intuitive appeal, the framework is yet to be politically endorsed. To examine the perceived value of this approach, informants were asked how road safety research funding is coordinated in their countries and its implications for KTE.

A holistic national framework that incorporates transport agency and research council funding was seen as sensible, but unique. While road safety is a strategic focus of both primary sources of road

safety research funding in each country, informants explained that they are generally not combined into a single strategy or framework. Nonetheless, Norway's Transport 2025 Research Program, started in 2015, was identified as a template that could guide the development of a more systematic focus on road safety in Australian research council funding schemes.

Informants supported the concept of an integrated framework, yet raised questions concerning how it should be designed. Points for consideration included the consultation and decision-making processes for establishing and altering priorities equitably (i.e. who should be involved) and the appropriate period of time between iterations (i.e. annually or every several years).

Nonetheless, informants believed that the positive road safety performance of their countries has been strongly influenced by transport agencies and national road safety research institutes collaboratively establishing national research plans. This was believed to have helped ensure funding continuity, producing strong evidence and highly skilled and resilient communities of practice in the research workforce. As considerable experience was viewed as necessary for researchers to build the capabilities and networks required to engage in KTE, funding continuity in the form of a national plan, was seen to be vital to encourage effective KTE systems.

A specialised national road safety research institute

The main organisations that produce road safety research in the four countries visited are university-based groups, industry consultants and specialised national research institutes. It was believed that national research institutes are the main producers and disseminators of road safety research within each country, and also have significant influence on national research priority-setting processes.

Each has a workforce composed of senior researchers, early career researchers and PhD scholars, along with administrative and marketing teams. They are mostly independent bodies, yet in some cases were previously a subsidiary government organisation. Each operates from a central office, yet collaborates with diverse stakeholders across their respective countries and internationally.

Informants noted that each national research institute is known and respected by stakeholders, both at a national and international level, for the quality of their outputs and their expertise regarding research dissemination. The practical focus of their activities was highlighted by an example from one institute, where weekly meetings are arranged that involve staff discussing new political and policy activities that may impact their current and future research directions.

It was also explained that national research institutes' focus on developing trusting relationships with key stakeholders is a key reason for their influential roles. The relationships between researchers at such institutes and senior policymakers are, in some cases, so trusting that they share draft policy briefs. Additionally, relationships between the media departments of national research institutes and policy agencies were seen to provide opportunities for the collective development of press releases to promote coherent and mutually reinforcing positions on policy and research issues.

Informants explained that close relationships require significant time to develop, which means that newer research groups find this more difficult to achieve. It was also commonly stated that the managers of national research institutes in some countries are former senior policymakers. These managers were believed to increase their employee's appreciation for the norms and needs of knowledge users and foster KTE cultures within their organisations.

National road safety research institutes in the countries visited are funded by a combination of direct block grants from transport policy agencies, along with project grants obtained through research councils, policy agencies, international organisations and industry groups. Informants noted that in recent years, funding arrangements have become increasingly weighted towards project contracts, as block funding decreases due to austerity measures.

Block funding was seen to provide more opportunities for long-term research and organisational security. Nonetheless, some informants proposed that block funding arrangements can increase the ability of transport agencies to independently define the entire national research agenda. This can introduce self-censorship by national research institutes, as they avoid investing time in proposals that are unlikely to be viewed as fundable due to pragmatic, often political reasons.

The research expertise of knowledge users

A second KTE area concerned the capacity of policymakers and practitioners to understand, value and use research appropriately. Three KTE facilitators emerged as particularly important:

- Senior policy managers with postgraduate research training
- Professional development courses for policymakers and practitioners to increase research and evaluation skills
- A professional academy for road safety practitioners

Senior policy managers with postgraduate research training

Research evidence exists alongside other forms of information that affect policy development, such as experiential knowledge. Informants suggested that to promote effective KTE based on research evidence, senior managers in road safety policy agencies require considerable appreciation for research, which is best developed through postgraduate university training.

In the countries visited, informants noted that senior managers of road safety policy agencies generally possess postgraduate qualifications. In Norway and Sweden, a number of managers hold doctoral qualifications and their theses concerned road safety topics. This was seen to have instilled a high level of understanding regarding the relative strength of different study designs, enabling evidence-informed policy dialogues between researchers and policymakers.

Furthermore, informants noted that some policymakers undertake postgraduate university degrees during their professional careers. Having employer support for such training was viewed as necessary. Professional doctorates, whereby policymakers can obtain a doctoral qualification by designing and reporting the results of action research projects undertaken as part of their everyday work, were recommended as a potentially valuable approach.

Exchange programs formally occurred in some of the countries visited, which involved researchers and policymakers spending time working in their opposite fields. Yet informants strongly argued that they ceased due to challenges associated with their management that made them impractical.

Professional development courses for policymakers and practitioners to increase research and evaluation skills

There was acceptance that it may not be practical to mandate that all senior managers either have, or obtain, postgraduate university qualifications. As such, informants outlined other types of professional development opportunities being provided to policymakers and practitioners in their countries to increase the research expertise of both workforces.

Such opportunities typically involve short courses or diplomas regarding research and evaluation content relevant to their daily work tasks, which are delivered by either universities or industry groups. Informants noted that employers can support such initiatives by providing time off work for their employees or, in some cases, design bespoke courses for their staff.

The overarching intent of professional development opportunities was described as building ‘an evaluation culture’ in the workforce. Self-directed learning opportunities were also identified for this

purpose. For example, the 'E-valu-it' website²³ and toolkit in the United Kingdom was developed through collaboration between government, an NGO and research experts to encourage rigorous evaluation of education, training and publicity interventions. Such courses were seen to increase the research capacity of workforces, facilitating greater appreciation for research and KTE.

Professional academies for practitioners

Research evidence is generally difficult to adapt to the reality of delivering road safety interventions at a regional level. Practitioners are often frustrated that the information they require has not been produced and that much research is irrelevant to practice. This can make it challenging to produce evidence-informed guidelines for implementing road safety initiatives.

For these reasons, it was recommended that a platform is required to encourage practitioners to learn from one another and access professional development opportunities to increase their research knowledge and expertise. In the United Kingdom this type of platform exists in the form of a national academy. As previously explained, due to confidentiality requirements the academy cannot be named in this report. However, it is well known and easily identified on the internet.

The academy was described as aspiring to provide road safety practitioners with support and guidance to develop and enhance the right tools and skills to deliver effective, evidence-informed road safety interventions. The NGO managing the academy is currently developing a Road Safety Practitioners' Standard which will form a quality assurance minimum requirement for training courses promoted on the academy website. The rationale is that this will help ensure that road safety activity across the United Kingdom is evidence-informed, focussed on achieving positive results, robustly evaluated and recognised as good practice. There are membership options for individuals and organisations and the cost is relatively minimal.

Evaluation guides and training are provided through the academy, with the intention of facilitating the development of strong evidence and avoiding duplication of ineffective interventions. While online guides were viewed positively, interpersonal teaching through seminars and conferences was seen to be more effective as it encourages active learning and provides opportunities to share experiential knowledge. This was seen to offer opportunities for practitioners to build communities of practice that are resilient to changes in the policy environment.

Research dissemination

Unsurprisingly, the way research is disseminated was seen to influence KTE. The effectiveness of dissemination was viewed as an outcome of whether the sender selects appropriate communication channels and styles that suit the norms of intended receivers.

There was agreement amongst informants that the dissemination practices of most researchers could be improved. A common view was that effective dissemination requires researchers to provide a believable, concise narrative that identifies a problem and uses a practical frame to explain how an intervention can address it. Dissemination courses for researchers were seen to be beneficial and courses from the United States health system²⁴ were provided as examples of an ideal approach.

Due to the existence of prior studies on styles of research communication^{25, 26}, this issue was not targeted in project meetings. Instead, informants were asked to critically discuss effective research dissemination channels in their countries. Their comments highlighted that dissemination should involve channels that 'push' research to stakeholders, as well as government-facilitated mechanisms that provide structured opportunities for ongoing exchange of knowledge amongst stakeholders. Six types of dissemination channels were viewed as especially vital:

- Journals, reports, fact sheets and newsletters

- Conferences, seminars and government-facilitated multi-stakeholder forums
- Working groups
- News and social media
- NGO boards and membership

Journals, reports, fact sheets and newsletters

Informants proposed that peer-reviewed journals remain an important channel for disseminating road safety research and provided two main reasons. First, the peer-review process provides quality control, meaning published papers outline results that are reliable for the purposes of policy and practice. Second, journal papers often influence public policy discourse via the news media. However, there was a common view that other channels should also be used by researchers to complement their use of journals, due to the long timeframes required for publication and the infrequent review of journals by policymakers and practitioners.

As previously outlined, the majority of road safety research in the countries visited is funded by transport policy agencies and industry groups via discrete project contracts. The outputs of such contracts are generally reports, making them an important dissemination channel. In addition to project reports, some national research institutes also publish strategic reports that, for example, identify the evidence supporting specific road safety measures. These types of reports were seen as KTE tools to promote discussion about such measures and encourage Members of Parliament (MPs) and the broader public to consider evidence-informed policy solutions.

Informants proposed that research reports are generally published on the websites of funding agencies or research organisations. There was agreement that due to their considerable length, reports need to be adapted to provide more user-friendly resources for the road safety community. However, there were different opinions regarding whether such adaptation processes have the potential to compromise how accurately audiences interpret the results. To address this problem, some national research institutes publish a compendium of reports for each project, involving short, medium and full-length reports, which allows readers to select the level of detail they desire.

Informants in one country noted that their national research institute publishes fact sheets regarding topics believed to be of high interest. These synthesise research on a topic in one page. This approach is already used by various Australian government agencies, including NSW Health. Some organisations also produce regular newsletters to disseminate research and other types of information. These were seen to provide an efficient dissemination method and a good source of information for the media and practitioners regarding locally-focused information.

Online knowledge portals

Informants noted the importance of using online platforms to facilitate KTE amongst stakeholders. In the Netherlands, Norway and Sweden, the websites of individual organisations were seen as the main online dissemination mediums.

The United Kingdom provides the most prominent example of an online dissemination approach. There are currently a number of knowledge portals that have different foci and intended audiences. There are knowledge portals that aim to share small-scale case studies with practitioners, and those that provide large research syntheses on broad topics for the general public.

Informants explained that while it would be theoretically beneficial to create a single road safety knowledge portal, this idea is impractical because they are a key tool for marketing and income generation for the organisations responsible for their operation. Nonetheless, the organisations responsible for different knowledge portals were conscious of avoiding duplication or contradiction

between them. Some informants proposed it was likely that a national framework will be established to strategically demarcate their boundaries.

The key issue raised concerned the rigour and range of information provided by knowledge portals. Sub-issues included: how research syntheses are produced; how syntheses are peer-reviewed; how the resulting reports are published; how syntheses are updated to maintain their relevance and validity; and whether the information provided has links to other portals.

In general, the topics for research syntheses are determined collaboratively by NGO boards involving representatives of transport and other government agencies, practitioners and researchers from universities and national institutes. The contracts to produce research syntheses are outsourced to content experts, which increases both validity and costs. Knowledge portals were seen to require approximately AUD \$30k to develop and the same amount each year to maintain effectively.

Draft synthesis reports are peer-reviewed by a panel of research experts, based on rigorous guidelines that are publicly available. This increases validity, but requires in-kind support by reviewers and lengthens the production process. The outputs of syntheses are often provided in varied levels of depth and contain links to the references included. There is also a recent movement to link reports to government websites that provide crash data. Reports are grouped into overarching topic areas and cross-referenced to increase their accessibility.

A key issue raised was that knowledge portals need to be a living resource with regular content updates. This was seen to involve content on new issues and updates to old content. Some informants noted the importance of responsible organisations developing communications plans for their publicity. Additionally, the need to provide a 'how to guide' for readers was noted, so they can reach informed opinions about the information presented. A final suggestion was that knowledge portals should contain a stakeholder analysis section that identifies key organisations in different fields of road safety, to help people identify ideal sources of road safety knowledge.

Conferences, seminars and government-facilitated multi-stakeholder forums

Many informants noted their regular attendance at national research conferences and saw these as a critical dissemination channel. Yet it was commonly proposed that the KTE potential of research conferences is limited by their predominantly academic audiences. Other more valuable types of conferences were identified, including those arranged by practitioners. These were seen to provide opportunities to disseminate road safety research that is directly relevant to this group.

National research institutes also conduct seminars regarding a variety of road safety topics. This was viewed as an increasingly important dissemination channel due to the diverse stakeholders attending these events. The timeframes and effort required to build a critical mass of attendees were identified as barriers that prevent smaller research groups from initiating such events.

All informants believed that a key element of effective KTE involves structured and interactive forums that bring together researchers, policymakers and practitioners at different levels to engage in deliberative dialogues. In some countries visited, there are government-supported forums attended by all key stakeholders, which present new research on emerging policy issues and updates on progress towards national objectives. These were viewed as premier KTE facilitators.

In Sweden, there are also regular sub-forums that focus on specific issues and discuss options to achieve objectives in these areas. Swedish informants explained that these forums began because their country was failing to reach its national objectives, and senior stakeholders believed that insufficient stakeholder collaboration was an influencing factor. The need for governments to financially support and more broadly facilitate such forums was frequently emphasised.

Working groups

It was widely believed that long-term working groups that involve diverse stakeholders are critical for exchanging research and other road safety knowledge. Due to their facilitation of ongoing stakeholder interaction, working groups were also seen to promote the translation of knowledge by increasing members' appreciation for the norms and needs of other stakeholders.

Working groups at regional levels were seen as especially vital, as links between practitioners, local authorities and researchers can be limited. Regional working groups were described as helping to foster ongoing contact between regional stakeholders, appreciation for each other's roles and agreement upon appropriate, coordinated actions.

News and social media

There was consensus regarding the importance of the news media for disseminating road safety research to the public. All informants discussed their efforts to engage the news media through press releases produced by their organisational media departments. The challenge of providing sufficient research detail, whilst maintaining mass appeal, was commonly raised.

There was agreement that social media is not being used efficiently as a dissemination channel in any country visited. Examples of the limited social media activities employed included providing links to published papers and reports via Twitter. When asked to explain the reason why stakeholders have not fully embraced social media, informants suggested that many organisations have insufficient capacity to provide regular appealing content to keep audiences engaged.

NGO boards and membership

As many road safety NGOs have boards composed of representatives from different stakeholder groups, this was viewed as another important research dissemination channel. In one of the countries visited, there is a unique NGO that involves MPs, former transport ministers and technical experts, amongst an array of other stakeholders. Again, while the organisation cannot be named in this report, they can be easily found online.

This NGO was seen to provide opportunities for academics to explain research directly to MPs, circumventing the potential for senior managers of policy agencies to act as gatekeepers that impede the flow of evidence to the political sphere. Informants believed this was a critical organisation for road safety KTE in the United Kingdom and other countries could consider the feasibility of replicating the approach. The use of Parliamentary Friendship Groups in Australia could serve as a useful vehicle for developing this type of NGO.

Conclusions

This project aimed to provide recommendations to improve Australian road safety policy processes by enhancing KTE amongst key stakeholders. The recommendations were developed using insights into effective KTE for road safety, which were elicited from leading road safety stakeholders in the Netherlands, United Kingdom, Norway and Sweden.

The rationale for visiting these four countries was that their low road tolls, compared to Australia, are influenced by their superior KTE systems. This view was formed based on recent Australian work identifying the need for more effective KTE systems^{4, 7}, international projects concluding that KTE is performed well in the countries visited²⁰, and the views of Australian road safety stakeholders.

The results highlight 13 key facilitators of KTE in road safety, which were perceived by informants to provide substantial benefits. These facilitators fall into three domains: research funding and production, the research expertise of knowledge users, and research dissemination.

Each domain is interlinked, meaning KTE for road safety should be conceptualised holistically. The domains cross structural boundaries (i.e. individuals, organisations and overarching systems) and temporal dimensions (i.e. permanent initiatives and those used on an as-needed basis). In these respects, the findings generally correspond to previous studies examining KTE in healthcare²⁷

The objective of a Churchill Fellowship is for the recipient to interpret their findings through the lens of their professional experience. For this reason, I assessed which KTE facilitators should be considered necessary for effective KTE systems in Australia. These facilitators already are, or should be, implemented at national and/or jurisdictional levels. KTE facilitators that may not be necessary, yet hold considerable promise, were termed aspirational facilitators.

The division was made based on two principles. First, informants' explicit statements and implicit assumptions about the relative importance of different KTE facilitators. Second, my appreciation for the feasibility of implementing identified facilitators within existing jurisdictional road safety environments. The result of this division is the framework presented below.

Table 1: A framework for KTE in Australian road safety

KTE domains	Facilitators necessary for effective KTE systems	Aspirational KTE facilitators
Research funding and production	<ul style="list-style-type: none"> • Adequate incentivisation for research dissemination within funding contracts • A coordinated research plan that establishes priorities equitably and fosters an effective research workforce 	A specialised national road safety research institute
The research expertise of knowledge users	<ul style="list-style-type: none"> • Senior policy managers with postgraduate research training • Professional development courses for policymakers and practitioners to increase research and evaluation skills 	A professional academy for road safety practitioners
Research dissemination	<ul style="list-style-type: none"> • Dissemination training for researchers • Journals, reports, fact sheets and newsletters • Conferences, seminars and government-facilitated multi-stakeholder forums at national and jurisdictional levels • Working groups • News and social media • NGO boards and membership 	Knowledge portal(s) with peer-reviewed research syntheses on priority topics

Some of the KTE facilitators identified are already implemented in Australia. For example, the Annual Road Safety Forum and the Australasian Road Safety, Education and Policing Conference provide opportunities for research dissemination and stakeholder collaboration. In such cases, the project findings should be used to consider how these initiatives could be improved.

However, there are several KTE facilitators identified in this project that are not in place in Australia. The draft National Road Safety Research Framework has not been politically endorsed and the dissemination of research findings is inadequately incentivised in most research contracts. Many senior managers in policy and delivery agencies possess limited research expertise and road safety researchers are generally ineffective communicators, with limited access to professional training. According to the project findings, these features of the Australian road safety sector are likely impeding effective KTE and should be addressed.

Fundamental improvements to Australian road safety KTE systems will also require jurisdictional and national stakeholders to consider implementing the aspirational facilitators identified. For example, a national road safety research institute could operate in combination with a national research framework to maximise the efficiency of research investment by prioritising topics of national importance and building a critical mass of organisational KTE expertise. The model of a national research institute has been proven effective in leading road safety nations and their operational features, including funding structures, have been outlined in this report to provide initial direction.

The funding of a national research institute would likely need to be partially sourced from the funding currently provided to university-based research groups. The negative impacts this may produce would be overwhelmed by the opportunities awarded to the research workforce, in the form of a stable national institute with long-term funding. The most critical requirements for a national research institute to be established effectively would be the selection of a manager that has considerable experience and influence in both research and policy circles, and clear prioritisation guidelines to ensure equitable coverage of different jurisdictions' research needs.

Additionally, there needs to be greater support provided to Australian road safety practitioners. Despite being a vital link between research and its impacts, practitioners are inadequately prioritised as knowledge users or research partners. Providing more rigorous training programs and opportunities for practitioner collaboration across regions, in the form of a professional academy, would help develop strong communities of practice to facilitate KTE at a system level.

Finally, the multitude of Australian websites providing road safety research to the public and other stakeholders should be complemented with a national knowledge portal containing peer-reviewed research syntheses of key topics. This would help to democratise road safety research knowledge in the community. The findings from the United Kingdom show this is valuable, feasible and requires minimal financial investment. There are further examples from healthcare that provide templates to inform the design of a national road safety knowledge portal²⁸.

The project did not aim to explicitly analyse the role and influence of politics and politicians on KTE for road safety. The limited political focus was due to its overriding focus on how KTE systems can be institutionalised to promote effective collaboration between road safety stakeholders. Nonetheless, it would be naïve to believe that political rationale and power do not, in some circumstances, impede effective KTE for road safety and produce undesirable outcomes.

Effective KTE will never provide an absolute panacea for political deficiencies. The challenge for Australian road safety stakeholders is to create resilient KTE systems that reduce the potential scope of such influence. This report provides a foundation to enable stakeholders to meet this challenge.

Dissemination and evaluation

The KTE framework outlined in this report will not improve road safety if it remains mere ink or pixels. Its value will be determined by its influence on institutional structures and individual behaviours within the Australian road safety environment.

To encourage uptake of the findings, a collaborative philosophy was used throughout the project. Informed by best-practice for applied research projects²⁹, road safety stakeholders were given opportunities to influence the aims, design and the interpretation of findings. The goal was to ensure the project remained sensitive to the needs of policymakers, practitioners and researchers.

The findings will be promoted through a peer-reviewed scientific journal paper, conferences presentations and seminars. The latter activities will be implemented predominantly at a jurisdictional level. This is because in Australia's federal system, jurisdictional governments have responsibility for most areas of road safety management.

The final question is how project success will be judged. It may be possible to empirically evaluate the impacts of the KTE facilitators outlined in the framework, though one would need to determine the level and areas where proposed impacts should be expected to occur. In any case, a recently developed tool could assist this process, which measures and scores the extent to which individuals and organisations use research to inform the development of a policy document³⁰. This could also be used in relation to implementation guidelines for practitioners.

A less resource-intensive approach could involve gaining feedback from Australian road safety stakeholders, via an online survey, regarding the following issues:

- The extent of support for the framework
- The presence of identified KTE facilitators in different jurisdictions
- The relative importance of the KTE facilitators identified
- The likelihood of, or actual uptake, of the framework or specific KTE facilitators

A longitudinal design could be used, whereby subsequent surveys are undertaken annually to identify changes in responses over time. The feasibility of these and other project evaluation strategies will be finalised through discussion with researchers and policymakers over coming months. The aim is to build upon this report by determining evidence-informed options to continue improving the KTE framework and its application over time.

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