Developing a Theoretical Framework for Improved Practical Application of a Coordinated Response in Road Safety

João Manual da Costa Canoquena
Master of Business Administration; Master of Education

A thesis submitted as fulfilment for the Degree of
Doctor of Philosophy
(**Road Safety Management and Strategy**)
Centre for Accident Research and Road Safety – Queensland (CARRS-Q)

2017

Keywords

Road safety; coordinated response; organizational domain; multi-disciplinary; road safety management; close coordination; local level; National Road Safety Strategy; policy integration; systems thinking; DST;

Abstract

Coordinated road safety countermeasures (responses) are a more effective way to reduce road traffic injuries than isolated action. However, the evidence in road safety literature appears to suggest that very little is known about the emergence or nature of coordinated road safety responses at a local level. In order to bridge this knowledge gap, the current research program developed conceptual tools through two theories (Policy Integration and the Dynamic Systems Theory) and four research objectives applied, predominantly, to the Australian road safety context. These objectives were to: *develop a descriptive model of local level coordinated responses in OECD countries* (RO1); *reconceptualise Policy Integration in order to provide a conceptual framework for coordinated responses* (RO2); *assess the utility and underlying structure of the new conceptual framework developed in* Research *objective 2* (RO3); and *understand how a systems theory explains the broader conceptual context for coordinated road traffic injury prevention responses* (RO4).

To address RO1, two research chapters (Chapters 6 and 7) and a set of data analyses (Chapter 8) were employed. The first research paper (Chapter 6) addressed RO1 by investigating the public attitudes in Australia to road safety as a feature of the policy context in which coordinated road safety countermeasures could emerge. The analyses of the public attitudes (Chapter 6) contributed to the development of the descriptive model. It added a feature to one of the facets of the model – i.e. the need for community buy-in. This chapter resulted in two continua (the first set of conceptual tools) for the measurement of community support for road safety countermeasures.

Chapter 7 contributed to RO1 by unveiling a wide range of variables related to the emergence of coordinated road safety countermeasures. These variables included triggers, context, facilitative activities and workflow models at a local level. This chapter allowed the nature of coordinated road safety strategies at a local level to be viewed as adaptive, with a system-orientation and independent yet inter-related networks of autonomous stakeholders. The workflows employed by these stakeholders to engender linked road safety programs were distributed (project-specific). In this predominantly Australian context of inter-dependences across road safety actors, the evaluation of coordinated responses was both informal and perceptual (realist) in nature.

Chapter 8 unveiled a depiction of the descriptive model (an additional conceptual tool) of the coordinated road safety responses adopted in Australia and some OECD countries. This model featured a phenomenon (a coordinated road safety response), its facets (actors, actions and context) and contributing factors (distal and proximal). The phenomenon was said to be activated by a wide range of triggers, although a unified consciousness to work together appeared to be the primary motivation. This trigger for coordinated work patterns amongst road safety stakeholders in Australia and some OECD countries was found to emerge as a result of the realization of inter-dependence across road safety actors and the existence of resilient cooperation across stakeholders. This inter-dependence was revealed to be associated with both resource scarcity and the realization that road traffic trauma in Australia and some OECD countries was a problem too big for a single stakeholder to tackle. In this sense, the need to develop clarity around priorities and emergent issues saw local level road safety coordinators forge a bond across stakeholders. This development of an understanding of the priorities and emergent issues was also aided

by a keen interest in road safety. As a result of the research in Chapter 8, a working definition of a coordinated road safety response at a local level was developed. A local level coordinated road safety response was defined as a community-supported, multi-pronged program driven by self-organised groups who were moderated by a local champion with an appreciation of the multi-faceted nature of road traffic crashes in an ever evolving ecology of social networks comprising inter-dependent and influential actors with a keen interest in local issues.

RO2 was examined in one published research paper (Chapter 9). The study in Chapter Nine generated a new Policy Integration (PI) principle – i.e. *Participatory Deliberative Integration* (PDI). Premised on stakeholders' commitment to strategy implementation, this new conceptual tool accounted for coordination through one of seven implementation processes, namely: *Commitment to Engagement*. *Commitment to Engagement* was shown, through principal component analyses, to encompass three dimensions or components – i.e. *indiscriminate stakeholder engagement*, *transparent communication* and *widespread stakeholder recognition* (Chapter 10).

This latter investigation (Chapter 10) addressed RO3 and suggested that *Commitment to Engagement* could be predicted by two variables or indicators, namely: *acknowledgement of a wide range of stakeholders* and *catering proportionately for all road users, including vulnerable road users*. These two variables were graphically illustrated in a typology. When applied optimally, these variables were argued to have the potential to result in linkages across road safety countermeasures. High levels of both variables were thought to engender opportunities to appreciate various facets of the issues emerging from crash data analyses. This appreciation was understood to result in the realisation that the facets

of the issues were too big for a single stakeholder to address in isolation in a context of resource scarcity, thus triggering coordinated effort.

RO4 was investigated in a published research paper (Chapter 11). Overall, this investigation of coordination at a system level revealed that except for *self-maintaining through centralisation of command*, the Australian transport safety system and that of other comparable OECD countries did not seem to differ significantly in the application of self-organising, a principle in the Dynamic Systems Theory which accounted for system-wide coordination, despite slight variations. Accordingly, the Australian transport system was found to centralise effort slightly more often than the Swedish, Canadian, British, New Zealander, Dutch, Finnish and Irish systems. These latter systems were found to be more adaptable to the environment in terms of effort coordination at a system level as these were perceived to be much quicker than the Australian transport system to both centralise and decentralise coordination. In this respect, the Australian transport safety system did not appear to centralise road safety effort coordination in response to a road traffic crash emergency – i.e. crash scene - (where centralisation of coordination was called for) as quickly as the systems elsewhere. In fact, the Australian transport system was found to lack self-augmenting (i.e. decentralisation of effort) and empowerment (i.e. delegation, funding self-organising groups). This latter finding was aligned with the results of the data analyses about public attitudes in Australia towards road safety countermeasures or responses (Chapter 6). In this sense, due to the low levels of self-augmenting of road safety effort in Australia, the central message (i.e. factual information about road trauma causing factors) about road traffic fatalities did not seem to be expanding beyond a central core of stakeholders or the road safety government-professional stakeholder cluster in

Australia (i.e. government agencies, academics and industry stakeholders). Not surprisingly, the analyses in Chapter 6 identified both scepticism and defiance towards road safety countermeasures in the public opinions in Australia. To afford the Australian road transport system the ability to self-organise, the present research program called for the deployment of coordinating processes at a system level which depict circular causality (hierarchies being influenced by grass-roots and vice-versa), continuity (a simultaneous deployment of a wide range of countermeasures) and self-augmenting (the spread of a core message to mobilise public approval) through the deployment of a local level coordinated response as defined above.

The significant contribution of the conceptual tools developed in this research program cannot be over-emphasised. The deployment of the descriptive model (Chapter 8), the typologies (public attitudes in Chapter 6 and optimal *Commitment to Engagement* in Chapter 10) and the development model for National Road Safety Strategies (NRSS) in *Participatory Deliberative Integration* (Chapter 9) should help to understand the emergence and nature of a coordinated response. Through the descriptive model and the typology for *Commitment to Engagement* road safety countermeasures can be assessed as being or not coordinated. The higher the presence of the features of the model and the typology is, the greater the likelihood of there being coordination at a local level. Coordination, in this sense, was conceptualised as representing *Commitment to Engagement*. The definition and the typology for optimal *Commitment for Engagement* can also help to evaluate the extent to which road safety countermeasures are coordinated at a local level. In addition, these tools, when optimally employed, should strengthen the culture around road safety in Australia by empowering local level champions of road safety.

Future research would expand on the evidence uncovered (i.e. the views of the survey and interview participants and the results of the analyses) and the tools developed herein. This expansion should see the evidence extended to other contexts and understood under a different set of circumstances, thus affording it external validity and potential generalisability beyond the Australian context and comparable OECD countries. The conceptual tools (i.e. the continua of public attitudes, the descriptive model, the NRSS development model and the typologies) herein developed should be trialled on a large scale to help adjust and/or calibrate them to relevant policy contexts. In this respect, it will be insightful to establish the extent to which the description of coordinated responses in Australia and some OECD countries presented in this thesis compares to other countries. Accordingly, it will be helpful to understand the gap (if any) across the income divide in terms of the extent to which *Commitment to Engagement*, as described herein, applies and whether or not the descriptive model along with the typology of *Commitment to Engagement* can predict new ways to engender optimally coordinated road safety responses at a local level across the income divide (low, medium and high income countries).

Contents

List of Figures

List of Tables

List of Abbreviations & Acronyms

ACRS	Australasian College of Road Safety
ATC	Australian Transport Council
BAC	Blood Alcohol Concentration
CARRS-Q	Centre for Accident Research and Road Safety – Queensland
CRSGs	Community Road Safety Groups
DST	Dynamic Systems Theory
HRSCTS	House of Representatives Standing Committee on Transport Safety
ITF	International Transport Forum
NRSS	National Road Safety Strategy
ODT	Organisational Design Theory
OECD	Organisation for Economic Co-operation and Development
PDI	Participatory Deliberative Integration
PI	Policy Integration
QUT	Queensland University of Technology
RSO	Road Safety Officer
SUNflower	SUN - **S**weden, **U**K and the **N**etherlands
TAC	Transport Accident Commission
WHO	World Health Organization
YDRSS	Young Driver Road Safety System

Definitions

The definitions provided below summarise the meanings assigned to these words throughout the present research program.

Centralisation	Hierarchical, coordinating processes which represent the work of a single entity with the function to bring together other institutions through control of the activities of these institutions. Centralisation can be achieved through legislation, best practices and statutory mandates. Through it power and decision-making are centralised. This process is herein contrasted with self-organising and decentralisation.
Decentralisation	This type of coordination results in the empowerment of community groups to co-design policies and strategies. In it, power and decision making are dispersed across a wide range of stakeholders. Communities of practice, associations and NGOs conduct decentralised coordination.
Horizontal coordination	Collegial processes, based on mutual adjustment across stakeholders who work cooperatively for the co-design of programs. Power and decision making are decentralised and non-hierarchical.
Response	This word is used in this thesis interchangeably with *countermeasure*, *intervention* and *measure*.
Vertical coordination	Hierarchical, mandated processes based on the standardisation of control and with a top-down flow of directives, approvals, specifications, requirements, accountability, frameworks and plans.
Whole of government	This term, 'whole of government', is herein replaced by 'government-professional stakeholder cluster' to distinguish it from the wider community (i.e. non - public office holders).

Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature: QUT Verified Signature

João Manuel da Costa Canoquena

Date: 2nd June 2017

Acknowledgements

The group of people I am indebted to in relation to this academic research project is much larger than this space allows me to divulge. Therefore, I will name only those who have directly contributed to this research program. Others, who have played a pivotal role in my upbringing and encouraged me to pursue my educational goals, will be herein mentioned collectively.

First and foremost, I would like to express my deepest gratitude to the support afforded to me by my principal supervisor, Dr. Mark King from CARRS-Q, Queensland University of Technology. Dr. King has patiently edited and re-edited a number of drafts of the current thesis and its individual research papers. In his feedback, Dr. King constructively lit the path ahead and laid the foundation for the publications which emerged from this research program. I am honoured to have had the privilege of working with Dr. Mark King.

Secondly, my most humble appreciation goes to Adjunct Professor Barry Watson. Professor Watson re-invigorated my interest in the topic of integration at various junctures of this long pursuit of completing a PhD. I was immensely fortunate to have had him added to my supervisory team. Under his guidance, the course of my PhD journey was thankfully re-directed towards a more feasible project. To him I say, wholeheartedly, thank you so very much.

I would like to make a special mention of three young people who make me a very proud father – i.e. Filipe and Emma. My son, Filipe, is a special person with a gift beyond his years. His birth transformed me immensely and made me a better human being. Emma, my daughter, is a joy of a young girl. She always brings a

smile to my face with her astute inquisitiveness. Their much younger sibling, Rochelle, is an adorable little baby.

My indebtedness also extends to Esperança M.B.S. Nunes. Her patience and understanding allowed me to spend hours on end isolated in a quarter of the house. I thank her dearly.

From the bottom of my heart, I would like to extend my gratitude to my parents (Filipe da Costa Canoquena and Maria da Conceição Francisco Canoquena), grandparents, siblings (Ana Maria and Florêncio), uncles, aunties, cousins, nephews (Lukeny, Anderson, Babado etc.), nieces (Brenda Simão, Filipa, Maggie etc.), brothers-in-law, sisters–in–law (Lidia etc.), and close friends (Alex, Nocas, Marilio, Adriano José Filipe, Nicolau Victor Assuilo, Kifo Marley, Miguel Helder, Margarida Simas, Maria Araujo, Altair da Silva, Dionisia Monteiro, Eva Beatriz, Melo, Lindalva, Amaral, Domingos Lopes, Elias, Crispim, Albano Cardoso, Domingos Loemba, Gamaliel, Nato, Francisco Fortunato, Netinho, Jomo Fortunato, Afonso Caxala, Manuel Francisco Pedro, Quinzinho, Armindo etc.) in Angola, Mozambique, Zimbabwe, Portugal, Brazil and Australia.

Mr. Luis and Mrs. Maria Hortense Nunes' unwavering support and dedication to my welfare have meant a great deal to me. I wish I could make them even prouder of me.

Sincere thanks also go to those who gave generously of their time to participate in both the interviews and the two online surveys. Their contribution has made the current research endeavour feasible. In this respect, I would like to make a special mention of Sara Hair who helped me immensely with the coding of the 544 public submissions. To her, I say, thank you so very much for your support. Your effort has been and will forever be much appreciated.

I am equally indebted to Ludmila de Almeida Tome whose support saw me through some of the toughest times in my life. She was the rock and pillar of inspiration for me. She allowed me to persevere in the face of adversity. To her, I say, a special thank you, and wish her the very best in life. To her mother (Ms Maria Gabriela de Almeida), who gave her time generously to listen to our challenges, I say may you enjoy a long and healthy life. These sincere wishes are extended to Artur Alexandre Tome Bernardo, Ludmila's first child, a four-year old who challenges me at every opportunity, to his greatest amusement.

Last, but by no means least, I would like to dedicate this thesis to my father, Filipe da Costa Canoquena, and my mother, Maria da Conceição Francisco Canoquena. To my father, I say, thank you for raising me with a clear notion of the importance of good education. To my mother, I say, thank you for instilling in me the social traits I have been able to count on today for this significant academic achievement.

Chapter 1: Thesis Introduction

As car occupant injury in Australia accounted for nearly half (48.24%) of the 1,428 transport crashes in 2013 (Australian Bureau of Statistics, 2015a), Australia's road safety interventions (i.e. responses or countermeasures) aimed at modifying road user risk behavior have focused on car-occupants and drivers. In this respect, Australia has employed compulsory seatbelt requirements, red light and speed cameras, enforcement of the laws governing road use and public awareness of road safety (Australian Bureau of Statistics, 2015a). In fact, compulsory seatbelt wearing legislation has become a standard feature of road safety in Australia (Jiang *et. al.*., 2015). In addition, random breath tests (RBTs), the chief drink driving enforcement strategy in Australia to deter and apprehend drink drivers (Ferris *et. al.*., 2013; Armstrong *et. al.*., 2013; Freeman *et. al.*., 2013), have been widely utilised in Australia (Jiang *et. al.*., 2015). When implemented in isolation and narrowly defined (excluding broader system issues - Whitelegg, 1983; Scott-Parker *et. al.* 2016), these road safety responses to road user risk behavior tend to be ineffective (Peden et al, 2004; WHO, 2013). In fact, systems-based (Scott-Parker, 2016), multi-sectoral responses (Peden *et. al.*, 2004; WHO, 2009; WHO, 2013; WHO, 2015) in road safety are required due to the interdependence across actions. For example, while legislation is essential to reducing road traffic crashes and casualties (i.e. deaths and injuries), both awareness-raising campaigns and law enforcement activities are just as critical to the success of legislation (Sleet and Branche, 2004). This joint work of legislation, public awareness-raising campaigns and enforcement measures requires the public health, transport, and enforcement sectors to coordinate responses.

Despite the proliferation of literature related to road safety in favour of the inter-play between countermeasures, understanding this interdependence across sectors may not help to understand how the system coordination can be improved from a conceptual perspective. Nor does this knowledge assist the appreciation of the full range of potential outcomes to be gained from interdependence countermeasures. Whether a coordinated road transport systems should only aim to deliver safety outcomes along with mobility is not discernible through existing literature. Indeed, the concept of coordinated response appears to be undefined in the context of road safety. It is, therefore, desirable to empirically unveil defining features (Wilson, 1963; Risjort, 2009) of coordinated road safety responses. It is also desirable to develop a conceptual understanding of coordinated responses in road safety.

This initial thesis chapter outlines the Research Context (1.1). In section 1.2, the Purpose of the thesis is explained. Section 1.3 describes the Significance and Scope of Research. Section 1.4 explains the thesis Compliance with the Regulations for a thesis by publication. Finally, section 1.5 provides a description of the remaining Chapters in this thesis.

1.1 Rationale for the Research

The examination of coordinated responses in road traffic injury prevention is important. Evidence from high income countries shows that relative success in preventing road traffic injuries can be achieved through concerted efforts at national level. Specifically, a number of countries, such as Australia, Canada, France, the Netherlands, Sweden and the United Kingdom have achieved steady declines in road traffic death rates through coordinated, multisectoral responses (WHO, 2013, p. 1). Such

responses involve implementation of a number of proven measures that address not only the safety of the road user, but also vehicle safety, the road environment and post-crash care (WHO, 2013, p.1).

Whilst policy development in road safety has focused on national level, inter-ministerial frameworks, little is known about the manner in which stakeholders generate road safety programs in a coordinated manner, especially at a local (county) level. This knowledge has the potential to allow this effort to be both documented and evaluated, thus allowing enhanced levels of effort coordination to be achieved in road traffic injury prevention.

1.2 Research Theoretical Framework

The fact that coordinated road safety responses are designed and implemented within a government-professional stakeholder cluster which interacts with the community outside this cluster calls for the examination of these types of coordinated interactions to be multi-disciplinary. In fact, two theories will need to be examined in order to understand how the government coordinates road safety countermeasure within its own cluster and outside this with the community. This thesis will, therefore, examine the nature of coordinated road traffic injury prevention responses from both a policy development perspective (through *Policy Integration*) and a systems thinking standpoint (through the *Dynamic Systems Theory*).

With its origins in mathematics and physics continuing to be acknowledged to date (De Bot, 2007; Bernhardt, 2010; Christie, 2011), DST galvanised various sciences at the turn of the century (Christie, 2011). Not surprisingly, it is employed in language acquisition (De Bot, 2007; Essner, 2008), play - literacy (Christie, 2011), speech therapy

(Bernhardt, 2010), emotion theory (Lewis, 2005), change in adults (King, 2011), developmental science (Lewis, 2005) to cite but a few fields of application. In fact, DST is employed in all fields of knowledge related to complex systems (De Bot, 2007).

DST holds that constituent parts of a system self–organize, coordinating and adjusting in a circular manner in response to bidirectional feedback, which results in new forms of organisation (Turner, 2006). More specifically, DST clarifies how a) new organisational forms emerge from change and complex systems, b) systems maintain fluidity (contracting whilst expanding), c) uncertainty forces re-organising and d) emergent order results from change and attempts to maintain continuity (King, 2011). Both emergent order and continuity explain self-organising (King, 2011). Self-organising represents a range of organisational activities, including, but not restricted to: learning from mistakes and attempting alternative routes to sustain activity (King, 2011).

The rationale for the choice of *Policy Integration* (PI) and *Dynamic Systems Theory* (DST) to explain the conceptual nature of coordinated road traffic injury prevention is relatively simple. The application of these theoretical concepts is expected to allow the nature of coordinated road traffic injury prevention to be made explicit and documented from at least two complementary angles. This approach allows coordination in road safety to be viewed from within (the government-professional stakeholder cluster through an integration theory) and outside the government-professional stakeholder cluster (the interaction between the government-professional stakeholder cluster and its environment through a systems-based theoretical construct). This is explained by a basic definition of a system. A system can be viewed as operating on two levels: within a government-professional stakeholder cluster, bringing together its parts and processes,

and between the government-professional stakeholder cluster and its environment, on the basis of interdependencies (Cummings, 1982). In this sense, whilst *PI* allows the parts and processes of a set of government sectors such as Health, the Police and Transport to be brought together, DST permits the interaction between this government-dominated government-professional stakeholder cluster and the broader context in which community safety is paramount to be investigated. Secondly, this set of theories is highly likely to allow for conceptual cohesion to emerge. This is due to the complementary nature of the two theories. In this sense, *PI* allows the inner-works of government in generating road safety policy to be scrutinised and investigated from one of its dimensions (i.e. coordination). Similarly, DST extends this knowledge to explain the manner in which the interactions amongst system components (i.e. road transport system and supporting systems) and outside actors (i.e. NGOs, communities of practice and the community) are manifested, thus allowing the nature of coordinated responses in road traffic injury prevention to be holistically conceptualised. In synthesis, DST allows the nature of coordinated road traffic injury prevention responses to be viewed beyond the government inter-agency domain or organisational domain (Trist, 1977). Indeed, the two theories employed in this thesis are intended to help to view coordinated responses from both a public policy perspective and a systems thinking standpoint.

1.3 Research Purpose

This thesis seeks to examine the nature of local level coordinated road safety responses in Australia and other OECD countries from a dual conceptual framework perspective (i.e. PI and DST). Viewed from these two perspectives, coordinated road safety countermeasures will be examined initially from a practical perspective to define

its features. Secondly, its conceptual framework will be investigated from both *PI* and *DST* standpoints.

This objective is further refined into aims in Chapters Three and Four. Both Chapters Three and Four will assist this thesis in determining the specific knowledge gaps related to the nature of local level coordinated road safety countermeasures.

1.4 Significance & Scope

The current thesis examines the nature of coordinated road safety responses at a local level. It looks at the interdependence across countermeasures and the manner in which these are combined to create the greatest downward impact on road traffic trauma. It does not examine any individual road safety intervention separately such as random breath testing, speed cameras, graduating licensing schemes, demerit points, red light cameras etc.

Local level is herein defined as county (Europe) or a government level below the State (Australia). In this sense, local level does not mean Provincial, National (Europe), State or Federal levels (Australia). It means the level at which community groups, parents, drivers, pedestrians, employers, schools, businesses, employees, scooter riders, motorcyclists, pedal cyclists, school mothers, school children, community-based agencies, local Councils (county authorities) and non-government organisations interact with and sustain the adverse effects of road traffic trauma.

The focus on Australia is due to the acknowledgement (albeit restricted to the national effort) in the WH's *Global Status Reports on Road Safety* (Peden *et. al.*., 2004;

WHO, 2009b; WHO, 2013; WHO, 2015) of the significant achievements made by Australia and other OECD countries over the last four decades in terms of road safety outcomes.

Therefore, the scope of the current thesis will be the management of road safety, especially its design of coordinated responses, the conceptual framework adopted to coordinate responses and the interactions between the whole of government and its environment. In this respect, this thesis does not examine any individual road safety intervention separately. Instead, it analyses the efforts made to bring countermeasures together in a coordinated manner.

1.5 Thesis by Publication

This thesis is herein presented as a thesis by publication in line with the definition used by the Queensland University of Technology.

1.6 Thesis Outline

The outline of the thesis herein provided (fig. 1.1) represents a broad overview of the thesis. It focuses on the two parts which constitute the current research program – i.e. practical (Part I) and conceptual/theoretical (Part II).

Part I illustrates the practical nature of coordinated responses in road traffic injury prevention. It comprises two research papers (Chapter Six and Seven) and a descriptive model (Chapter Eight).

Part II, on the other hand, depicts the conceptual framework, which is thought to underpin the development of coordinated road traffic injury prevention responses. This

part comprises two papers (Chapters Nine and Eleven) and a typology (Chapter Ten). The first of these papers reconceptualises *PI* and develops a new integration conceptualisation. The second research paper in Part II adopts a systems perspective to examine coordinated responses. It looks at the manner in which different components of a system contribute towards coordinated responses.

The typology, on the other hand, captures the measures by which coordinated responses can be gauged. It hypothesises the manner in which coordinated responses can be conceptually underpinned or supported.

A more detailed description of the chapters can be found in Chapter Five.

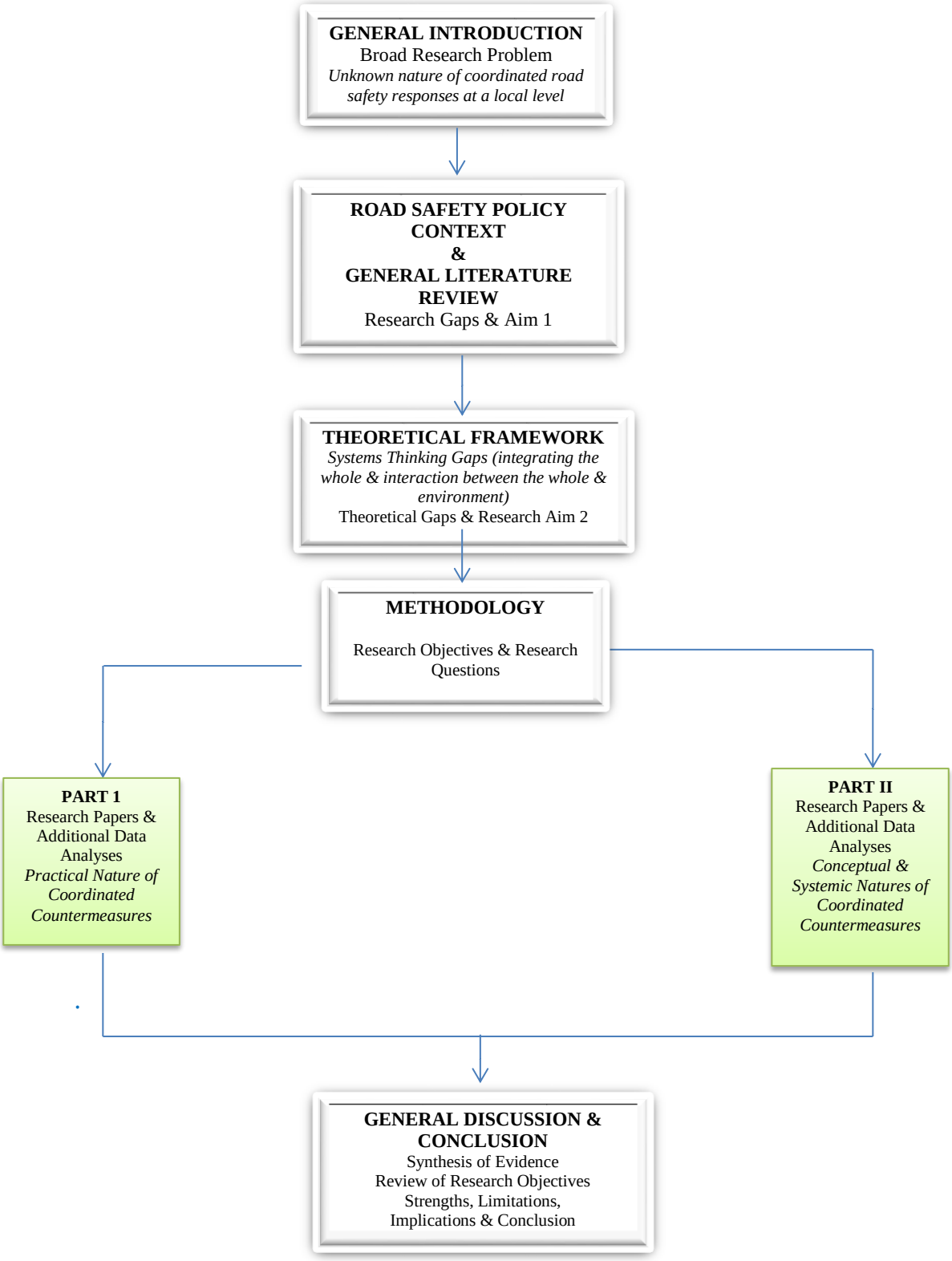


Figure 1.1. Thesis Structure

1.7 Publications Included in this Program

Journal articles (peer-reviewed)

Canoquena, Joao Manuel da Costa (2013) Reconceptualising of Policy Integration in road safety management. *Transport Policy*, *25*, pp. 61-80 Impact Factor: 1.49 (February, 2016)	*Published*
Canoquena, Joao Manuel da Costa & King, Mark (2015) Adaptive nature of coordinated road traffic injury prevention responses in some OECD countries. *Journal of Transport Geography*, *46*, pp. 81-88. Impact Factor: 2.65 (February, 2016)	*Published*
Canoquena, Joao Manuel da Costa & King, Mark (in Press) Developing public attitude monitoring tools in Road Traffic Injury Prevention to understand shifts towards moral commitment. *Journal of Health Services Research & Policy*	*Submitted*

Conference Proceedings (peer- review stream)

Canoquena, Joao Manuel da Costa & King, Mark (2015) Perceptions of the prevalence of self-organising amongst Australian road safety stakeholders: A comparative perspective. In*2015 Australasian Road Safety Conference,* 14 - 16 October 2015, Gold Coast, Qld	*Published*

1.8 Chapter Summary

This initial chapter pointed out the limitations of isolated action as a background to the need for the present research into the nature of coordinated road safety countermeasures. This need was said to relate to the absence of a theoretical framework to both understand and evaluate the nature of coordinated road safety responses. Furthermore, this initial chapter explained the research rationale, research theoretical framework, research objective, significance and scope.

Chapter 2: Australian and OECD Road Safety Policy Contexts

2.1 INTRODUCTORY COMMENTS

This second chapter in the thesis develops further the concept of the practical nature of coordinated responses presented in the first chapter. It outlines the policy context (practical) in Australia and some OECD countries, in which countermeasures in road safety are coordinated. It identifies institutions, institutional arrangements, perspectives and programs operating within this policy context.

A country's performance in terms of road safety or road traffic injury prevention is dependent upon its policy context - i.e. its structures and culture (Wegman and Oppe, 2010). These underpin the levels (or indicators) of road traffic trauma (Wegman *et. al.*., 2009; Wegman and Oppe, 2010). In this respect, a country's road safety (road traffic trauma), implementation (programs) and policy (directions and goals) performance indicators are entrenched in its policy context (Wegman and Oppe, 2010). Weaknesses in any one of the aforementioned three performance indicators (road safety, implementation and policy) reflect a need to strengthen the structures and culture of the country (Wegman and Oppe, 2010). Therefore, the extent to which Australia can successfully curb car-occupant casualties may dependent upon the strengths or weaknesses in its structures and culture. The stronger the road safety structures and culture are in Australia, the higher the likelihood of it being able to reduce, amongst other road traffic trauma types, car-occupant deaths and injuries, especially young drivers.

This chapter will describe both the structures and culture relevant to road safety in Australia and some OECD countries. To understand the extent to which Australia has strong structures and culture for positive road safety outcomes, its community perspectives, institutional arrangements and programs will be examined critically in this chapter under two broad headings – Structures in Road Safety Management (2.2) and Culture in Road Safety Management (2.3).

2.2 STRUCTURES IN ROAD SAFETY MANAGEMENT

The institutional framework in road safety for the coordination of multiple efforts at a national level in both Australia and some OECD countries represents a lead agency. Coordination by a lead agency is conducted through an inter-ministerial framework and focuses primarily on both planning and the mobilisation of political will.

2.2.1 Lead Agencies

The first of six recommendations made in the *World Report* (Peden *et. al..*, 2004), the appointment of a lead agency (see Appendix G) in government is thought to form part of a package of measures intended to improve the outcomes of road traffic injury prevention efforts. These agencies are expected to coordinate multiple efforts and be held publicly accountable for their actions (Peden *et. al..*, 2004; WHO, 2013). In fact, lead agencies are thought be vital in the development of national road safety strategies (WHO, 2013), a means by which leadership in the coordination of effort can be shown. These lead agencies are also encouraged to engage all significant stakeholders, including the wider community (Peden *et. al..*, 2004). This engagement **(**which is thought to be

achieved through awareness, communication and collaboration) is said to help establish and sustain national road safety effort (Peden *et. al.*., 2004).

Lead agencies have been regarded as ideal models in those cases where there are tensions between hierarchical and network models. In this sense, lead agencies have been seen as hybrid arrangements to supplement both traditional ministerial (departmental or agency) hierarchies and networks (Lagreid and Rykkja, 2015). Their specific role is to address the complexity, ambiguity and uncertainty in policy contexts (Lagreid and Rykkja, 2015).

Whilst the peer-reviewed literature on the role of lead agencies in road safety is scarce, it abounds in relation to the role of lead agencies in other OECD policy contexts. In a study of the role of the European Union in managing emerging transboundary issues and the effectiveness of crisis responses, Boin *et. al.*. (2014) juxtapose the role of lead agencies against that of networks. The former is said to represent the centralisation of functions (Boin *et. al.*., 2014; Mead *et. al.*., 2014) whereas the adoption of network models signals the decentralisation of roles (Boin *et. al.*., 2014).

In the case of an emerging crisis, the lead agency's role is said to be that of imposing control on the elements of a network in order to improve system coherence and maintain its efficiency (Boin *et. al.*., 2014). Effectively, the centralisation of the structures would represent single management, governance and budget (Mead *et. al.*., 2014). Similarly, Alexander (2008) views the concept of lead agency as a response to crisis and a source of coordination at the implementation level. Accordingly, a lead agency "… takes the lead when disaster strikes" (Alexander, 2008, p. 139).

Despite the need for leadership from a central agency, Alexander (2008) calls for a grass-roots approach in the management of crisis. This is said to be achieved through both participatory approaches and empowerment (Alexander, 2008, p. 144).

The benefit of the lead agency model is its ability to respond rapidly to emerging crisis (Boin *et. al..*, 2014). However, it is thought not to be highly regarded in Europe (Boin *et. al..*, 2014). In fact, it is regarded to be organisationally and politically inappropriate for the European context (Boin *et. al..*, 2014), although much of the evidence in the use of networks suggests the existence of shortcomings of the network model as a result of the fragmented process used to generate it in Europe. Boin and colleagues (2014) suggest the adoption of both models (agencification of networks) due to their merits (p. 428) and call for further research to understand the application of these models (p. 431). Agencification of networks refers to the institutionalisation of networks, which is thought to strengthen the nodes in them (Boin *et. al..*, 2014).

In Australia, the States (six in total) and Territories (two in total) have responsibility for Road Safety. The Federal government contributes to Road Safety through the administration of the National Road Safety Strategy and funding for such initiatives as the Blackspot Program. Each State/ Territory has the executive autonomy to govern their own affairs in response to local priorities, although the Federal government retains legislative powers over the territories. Accordingly, differences exist in the way road safety effort is led. This leadership is often found in the ministries (the cabinet) and institutions created to manage road safety. In Western Australia, for instance, Road Safety is a separate portfolio under the tutelage of the Deputy Premier. In New South Wales, road safety ceased to be a separate portfolio in 2017. Surprisingly,

the Northern Territory does not have a separate (standalone) Ministerial portfolio for Road Safety. The Northern Territory has the highest fatality rates (deaths by 100,000 population) in Australia.

Whilst much of the road safety effort in Australia is centralised, community groups and other stakeholders are encouraged to submit project proposals for funding. Of the most vocal advocates for enhanced levels of safety on the Australian roads, the Australasian College of Road Safety (ACRS), the Australian Automobile Association (AAA) and ANCAP are seen as networks with an independent voice (Job & Cook, 2012).

Despite the acknowledged benefits of both an independent voice (Job & Cook, 2012) and the need for flexible application of the most common models of leadership in road safety (i.e. lead agency and network approaches), the Australia model does not appear to offer neither flexibility nor an independent voice. It does have two national road safety coordinating committees (i.e. Austroads Safety Task Force and Strategic Vehicle Safety & Environment Group). However, it has very weak, under resourced networks. It does not have "… a large, autonomous organisation, which independently comments or compares road safety performance such as the Insurance Institute for Highway Safety in the USA, or the European Transport Safety Council" (McIntosh, 2013, p. 65). In McIntosh's (2013) view, "…no national program coordinates or attempts to encourage collaboration and measure the effectiveness of that collaboration of the many involved in reducing road trauma" (p.65).

2.2.2 Inter-ministerial Frameworks

At a national level, the coordination of road safety countermeasures is achieved in high income countries through inter-ministerial (inter-departmental or inter-agency) frameworks (cf. Howard and Breen, 2006; Bliss and Breen, 2009). In this inter-ministerial context, in which government departments' capabilities are combined, either a cabinet portfolio (a Ministry) or a cluster of cabinet portfolios (a Council of Ministries) is responsible for providing oversight over the planning or decision- making process in road traffic injury prevention. In addition, these models feature a sub-structure of the cabinet portfolios whose responsibility it is to conduct coordination. Accordingly, in Canada, New Zealand and Australia, a secretariat is responsible for coordination.

In Australia, the Council of Australian Governments (COAG) coordinates activities across the Federal and State levels of government. This body is expected to advance reform in Australia. However, road safety does not appear to feature high on the COAG's agenda (McIntosh, 2013, p. 65).

2.3 CULTURE IN ROAD SAFETY MANAGEMENT

The word culture in road safety has been associated with traffic safety (Naevestad and Bjørnskau, 2012), safety (Johnston, 2010b), car (Walker, Butland and Connel, 2000) and a number of behavior factors such as drinking. Apart from these associations, the word culture has also been viewed more broadly as a constituency. Johnston (2010b) regards this as 'culture around'. In this sense, the culture of road safety represents the constituency around road safety, which is said to be best defined within the institutional domain but not so well defined within communities (Johnston, 2010b). Similarly,

Naevestad and Bjørnskau (2012) suggest ways to apply traffic safety culture beyond the institutional setting. This is said to be achieved through peer groups (Naevestad and Bjørnskau, 2012).

Beyond this association between culture and road safety attitudes, social conscientiousness and practices, culture has also been viewed more generically. It has been seen as representing a world view (Nordfjaem *et. al.*, 2014). This world view can reflect the way issues are framed (belief system), managed (norms) and prioritised (political commitment, will).

2.3.1 Road Safety Management Culture as a Set of Priorities

Culture in road safety can represent the prioritisation of road traffic trauma. This has occurred in at least two ways. Firstly, in the Netherlands, the prioritisation of road trauma led to live parliamentary debates, dedicated funding for road traffic injury prevention and the enhanced authoritativeness of road safety programs and concepts (Bax *et. al..*, 2010). Secondly, prioritisation has also manifested itself through institutional changes. For example, the creation of the Institute for Road Safety Research in the Netherlands heralded a new era in road safety in this OECD country (Bax *et. al..*, 2010). It established the concept of Sustainable Safety (Bax *et. al..*, 2010).

Whether or not road safety issues are given a Ministerial portfolio in Australia can be said to be indicative of priorities. The position of road safety within a set of portfolios under a Minister can equally be indicative of its prioritisation. In Australia, the way in which ministerial responsibilities are perceived to cross-over amongst portfolios differs across the States and Territories. In some cases (Queensland, Victoria), Road

Safety is a portfolio along with Roads. In this case, the road design and its safety are managed within the same Ministerial portfolio. In other cases, road safety is framed differently. It co-exists with Justice and Correctional Services (Australian Capital Territory). In this case, the cross-over may be the enforcement aspect of Road Safety. In other cases, road safety comes under Infrastructure. This is the case in Tasmania where the Minister for Infrastructure has responsibility for Roads, Road Users and Road Safety. In this respect, the cross-over is thought to be the concept of building a safe transport network. The emphasis in all existing Ministerial portfolio arrangements is the constrained prioritisation of road safety (May et. al.,2008). Within this perspective, technical and regulatory approaches constitute the narrow frame of reference. Instead, Ministries with road safety responsibilities would benefit from a shift in synergies towards transport, environment, and energy (May et. al., 2008). New South Wales (NSW) presents the best example of how road safety would benefit from synergies with transport and environment. As part of the eighteen State priorities in NSW, child obesity is said to be a target for government intervention. The NSW government recognises that some of the solutions to child obesity will involve the provision of community environments which encourage physical activity. Active transport options are also deemed to be beneficial. This set of synergies amongst health, transport and the environment reflect the less constrained perspective to road safety.

In a study of educational resources associated with speed reduction campaigns, Rafetery, Kloeden & Royals (2014) reinforced the need for prioritising road safety from an environmental perspective. Out of two hundred and three pieces examined, only nine (4 per cent) were deemed effective. The best resources were framed around a wide range

of evidence and referred to environmental impacts of speed (e.g. emissions and noise), fuel economy, and travel time (Raftery, Kloeden & Royals, 2014).

An alternative way to prioritise road safety is to have it on the economic agenda. McIntosh (2012) asks for road safety to be regarded as a significant economic issue, urging governments to conduct inquiries into the cost to the economy and productivity of road traffic trauma.

2.3.2 Road Safety Management Culture as a Belief System

A belief system in road safety is a manifestation of the extent to which politicians and the public at large view and respond to road trauma or road traffic injury. Accordingly, road crashes can be framed in, at least, three different ways. These can be viewed as a major public health problem (Peden *et. al.*., 2004; McAndrews, 2013). This view contrasts with the opinion of road traffic trauma as an individual behavioural issue (McAndrews, 2013). Alternatively, a third perspective, the Vision Zero, views road traffic trauma as a road transport system-wide (all components of this system) issue. In it, the belief system is that safety should not be a trade-off for mobility (McAndrews, 2013).

Australia has responded to road traffic trauma mostly through technical and physical solutions (May *et. al*., 2008). This approach emphasizes enforcement and consequences (May *et. al*., 2008). Whilst these approached have helped Australia reduce its road toll significantly over the last forty years, their effect appears to have plateaued in recent years (WHO, 2015). This may be the case because these approaches are associated with car and road dominance (May *et. al.*, 2008). The result is a dependent top–down culture. This culture becomes safety conscious by avoiding penalties (May *et.*

al., 2008). However, this dependent top-down culture approach does not yield changes to the underlying issue of speeding or drink driving (May *et. al*., 2008). Elsewhere, the limitations of dependent top-down culture have also been highlighted. Framed as the safety-based argument, the approach is said to have limited impact on the underlying causes of road user risk behavior (Raftery, Kloeden & Royals, 2014). Instead, there are calls for a new belief system in road safety. Raftery, Kloeden & Royals (2014) ask for responses to speeding road users to centre around the way drivers rationalize their speeding behavior. This is supported by May and colleagues' (2008) calls for the emphasis of road safety interventions to be on the development of the ethic of care and responsibility (human dynamics of safety). The goal, in this view, is to develop an independent culture, which is actively caring for others, with good citizenship associated with good driving (May *et. al.*, 2008, p. 398).

On the other hand, from a public perspective, a belief system in road safety can be represented by public approval (i.e. the manner in which the risks in road safety and the countermeasures to address these issues are perceived by the public). May and colleagues (2008) alluded to this belief system in relation to public perception of speed and the use of the motor vehicle in Australia (i.e. the culture of speed in Australia).

In a systematic review of the road safety literature, Snortum (1990) examined public approval in the context of the enactment and subsequent amendments of the British Road Safety Act 1967. In this sense, this review made three significant contributions to knowledge about public approval in road safety. Firstly, Snortum's work unveiled key factors shaping public approval. These were said to be "powerful social forces" with their promotion of the consumption of alcohol (Snortum, 1990,

p.480) and the media with '… strong moral overtones in their stories …' (Snortum, 1990, p. 489). Secondly, Snortum (1990) identified two critical aspects of public approval, specifically: fear of apprehension and moral commitment. In this respect, citing research in Sweden and the USA, Snortum (1990) asserted that moral agreement with the law appeared to correlate more strongly with law-abiding behaviours (compliant road use) than the risk of arrest. Thirdly, Snortum (1990) identified a continuum in public perception. This range had tolerance of risk factors such as speed, at one extreme, and moral indignation, at the other. Moral indignation was said to be incited by the media through the intensity of publications (i.e. number of news items) around breaches committed by members of the establishment (people in responsible positions) (Snortum, 1990). In this case, public attitudes hardened or softened along this tolerance-moral indignation continuum (Snortum, 1990). In this respect, public tolerance represented a perspective of indifference towards road traffic injury risk factors such as speed and alcohol consumption. Hardening, on the other hand, would represent a shift away from tolerance towards disapproval of promotional measures for speed (e.g. motorsport) and alcohol consumption (e.g. beer advertisement). In fact, whilst tolerance posed challenges to legislative reform and law enforcement, hardening of public attitude meant increased approval of formal interventions in road safety (Snortum, 1990).

Fifteen years after Snortum's (1990) publication, research into the impact of motorsports upon public health shed further light on the manner in which public approval or support was shaped through "powerful social forces" (Snortum, 1990, p.480). Tranter and Lowes (2005) highlighted the adverse impact of the legitimacy of

motorsport messages. Tranter and Lowes argued that motorsports glorified speed and alcohol consumption (2005). This glorification was said to undermine public health promotion (Tranter and Lowes, 2005). In other words, by conferring legitimacy to speeding and alcohol consumption, motorsports were thought to increase the likelihood of tolerance towards these two road traffic injury risk factors to rise, thus reducing the potential for speed and alcohol reduction measures to enjoy public support.

In 2011, at the time of the launch of the draft 2011-2020 Australian National Road Safety Strategy, a new commentary about public support emerged. Relying predominantly upon the grey literature and media analyses, Jiggins (2011) anecdotally supported the assertions related to the role of the media narratives (Snortum, 1990) and vehicle marketing promotion (Tranter and Lowes, 2005). This author made a significant contribution to the attitudinal continuum in public approval. In this respect, Jiggins' observations noted that defiance could see motorists engaged in behaviour which actively eroded the effectiveness of road safety counter-measures such as the turning on of headlights to alert other motorists of the location of speed camera units (2011).

Most importantly, Jiggins' other contribution could be said to have been the provision of a rationale for WHO's consistent recommendation to secure public support in order to ensure effective law enforcement in road safety (WHO, 2009b; WHO, 2013). In this respect, Jiggins (2011) explained that public support allowed laws to work as a "wedge" incrementally driven between impulse and action. Furthermore, Jiggins (2011) explained the role of tolerance in public approval. When there is tolerance towards road traffic injury risk factors, people will tend to see it as a "normal" behaviour, becoming, therefore, reluctant to criminalise it (Jiggins, 2011).

The public in Australia have expressed their views about the road safety countermeasures in the draft copy of the 2011-2020 Australian national road safety strategy. Designed to secure public acceptance of the countermeasures (Collins, 2004) contained in the national road safety strategies, the consultation with the public conducted by the former Australian Transport Council in 2011 resulted in spontaneous, unfettered public attitudes from members of the public.

The results of the content analysis conducted by this author of the public submissions lodged with the former Australian Transport Council in early 2011 pointed to a need for the public in Australia to shift its attitudes to risk factors (see Chapter Six). This is so because it does appear as though sections of the Australian public regard mobile telephone use (for work purposes), speeding (just above the limit in urban areas and up to 130 on inter-State highways) and alcohol consumption (in low ranges) as "folk crime" (Tom Vanderbilt in Jiggins, 2011). The public attitudes or belief system in Australia need to shift from current tolerance to some road trauma risk factors to intolerance (moral indignation) towards these. This shift entails seeing speed, alcohol, mobile telephone use and other road injury contributing factors, with indignation (see Chapter Six).

2.3.3 Road Safety Management Culture as a Set of Norms

The norms (i.e. the way road traffic trauma issues are managed) in road safety management have been revealed through both reforms and public consultations.

The WHO global status reports call for reforms towards close, multisectoral coordination (WHO, 2009b; WHO, 2013; WHO, 2015). Reforms tend to be managed in

line with a political and administrative context in most countries (Kickert, 2007). This is true in the United Kingdom, for instance. In a study of local transport authorities, Hull (2008) provides a fairly detailed characterisation of the top-down, plan and framework-driven policy setting in the United Kingdom. Accordingly, Hull has found that Local Transport Plans and Local Development Frameworks have an influence on local projects, individuals and organisation behaviours (2008). In this highly centralised setting (i.e. high levels of centralised political power), the coordination of government policy was said to be dependent upon supervision and administrative order, authority and status-based government relationships, institutionalised beliefs and working practices (Hull, 2008).

Whilst Hull (2008) provided a bird-eye view on the manner in which road traffic trauma was managed in the UK's top-down, centralised policy setting, MacAndrews (2013) highlighted a decentralised, community-based approach to policy development – i.e. stakeholder consultation.

Stakeholder consultation plays a key role in policy development. This role is supported by the Vision Zero. In this systems-based approach, the public are called upon to demand safety improvements (MacAndrews, 2013). This constituency for safety (Johnston, 2010b) enjoys the support of the Swedish founded vision as a means by which popular organising around injury prevention can occur (McAndrews, 2013).

Seen widely as a way of engaging stakeholders (Summerhill, 1999; Macpherson, 2006; Austroads, 2006a), consultation has not always been a straightforward process. Controversy has existed as to when to involve stakeholders in community consultation. On the one hand, there is a belief that stakeholders should be involved in all aspects of

strategy development, particularly in specialist areas (Summerhill, 1999). This opinion is defended on the basis that experts are unable to fully appreciate the realities and priorities of those affected by policy implementation (Macpherson, 2006). On the other hand, stakeholder involvement in the initial stages of policy development, when expert input is said to be crucial for the formulation of concepts and frameworks, is regarded as inappropriate (Human, 2010). This latter view resonates with Austroads' (2006a) recommendation against the *blue sky approach*. In this perspective, stakeholder consultation is called for at a point when issues have been identified through expert examinations (Austroads, 2006a). In fact, Austroads proposes the elicitation of stakeholder comments at the point of strategy review (2006b). Such practice of engaging stakeholders at the review stage of policy development is consistent with the widely used consultation process in Australia for *issues and direction papers* (Austroads, 2002).

The drawback with strategy review consultation is the ubiquitous expectation of community consultation as a rubber-stamping process. This precludes policy from being broad enough to encompass the entire system (as opposed to a single component of the system). It fails to call for radical change in road safety to address its full set of variables such as land-use planning, private car usage, independent mobility, advocacy for an inherently safe system etc.

2.4 CHAPTER CONCLUSION

This chapter has set out the policy context as the key factor in determining the road safety performance of a country. In this policy context, as it relates to Australia, an number of weaknesses have been identified in this chapter, namely: the constrained perspective on road traffic crashes, the inappropriate synergies across ministerial

portfolios for road safety, the deficits in the responses adopted to address road user risk behavior, the cursory participation of the community in policy development and the enforcement-hindering populist opinions amongst the public in Australia. These weaknesses may explain the plateau (and rise in some States) in road traffic trauma rates experienced in Australia.

The chapter suggests shifts in the beliefs, norms and priorities in Australia. In addition, it provides a rationale for the focus on local level coordination to improve Australia's policy performance.

2.5 CHAPTER SUMMARY

This chapter outlined some of the factors which are thought to underpin a country's road safety performance (i.e. road traffic trauma, implementation and policy effectiveness). These factors were described in this chapter under two terms, namely: structure and culture. Accordingly, this chapter explained the role of the chief structure in road safety (i.e. lead agency) as somewhat controversial. This controversy has arisen from both its nature and the model underpinning it. Lead agencies appear to be viewed as ideal responses to crisis. However, their role in situations where there is no crisis is less clear. In addition, lead agencies as a model can be juxtaposed against networks. The adoption of either model, whilst clarified by the general literature, does not appear to be elucidated in road safety policy contexts.

The second chief structure in road safety policy context discussed in this chapter was a set of inter-ministerial frameworks. However, whilst the inter-ministerial frameworks outlined in this chapter appear to mobilise political will and adopt vertical

coordination at a national level, the role of grass-roots mechanisms does not seem to have been described in the context of road safety policy development. In this respect, it will be insightful to understand the manner in which other frameworks or workflows contribute to the design of policies in road safety at a local level.

The description of culture in this chapter presented both system-wide and public-specific norms, beliefs and issue prioritisation. In this case, this chapter identified the sources of reform, the political system as a cultural dimension, the main policy instrument (national road safety strategies) in road safety management, moral commitment as a catalyst to road traffic law abiding behaviour, influences upon public attitudes, the need for a shift in public attitude in Australia towards intolerance of road safety risk behaviour, the controversial place of stakeholder consultation in the policy development cycle, road safety as a public health and environmental issue and the need to leverage support for it.

This chapter supports this program of research in one significant manner. The outline of the policy context in Australia and some OECD countries provided in this chapter represents the background for the recommendations in the General Discussion chapter. These recommendations will need to bear in mind the policy context in which improvements can be made to current theory and practice in the coordination of road safety countermeasures.

Chapter 3: Literature Review

3.1 INTRODUCTORY COMMENTS

The concept of "coordinated response" appears to abound in almost all fields of knowledge. A recent search of the term on the Queensland University of Technology Library online Catalogue (375 online databases) resulted in fifty-seven different fields from Agriculture to Zoology. Interestingly enough, it appears to be applied more frequently in both Medicine and Biology than Public Health, the field most often associated with road safety management. In fact, of the 6,372 hits (last attempt on 18th February, 2016), 1,496 were found in Medicine (23.4%) and 1,192 in Biology (18.7%). In Public Health, however, the frequency is much lower. Only 561 hits were found in Public Health (8.8%) for the term "coordinated response".

This chapter documents the search approach for relevant literature related to the nature of coordinated road safety responses or countermeasures in Public Health (more specifically, road traffic injury prevention). This sub-field of Public Health in some countries but road traffic enforcement in others is examined in 3.2. In sub-section 3.3, the current research approach to the coordination of road safety countermeasures is reviewed. Sub-section 3.3 also provides a critique of this research approach whilst sub-section 3.4 summarises the chapter and establishes some implications arising out of the results of the critique of the literature relevant to the nature of coordinated road safety responses or countermeasures.

3.2 LITERATURE SEARCH APPROACH

3.2.1 Inclusion criteria & search terms

To identify relevant literature for the present research program, a combination of search terms was used. The two search terms used most successfully were as follows: “coordinated response” AND “road safety” or coordination AND “road traffic injury prevention” OR “road safety.” The Queensland University of Technology Library online catalogue was used to search for peer-reviewed articles and official publications relevant to the search terms. This search also adopted some filters. These were as follows: year of publication (2003+), language (English), publication format (conference proceedings and peer-reviewed journal articles), study area (government and public health). Library inquiries to assist in the establishment of the search terms were made. These inquiries were made with the Queensland University of Technology library personnel.

Initially, the first search term (“coordinated response” AND “road safety”) yielded only six publications. The second search term resulted in a much larger number of relevant publications. These were also more relevant to Public Health injury prevention than the first results. The use of the filters allowed the studies to be narrowed down to road traffic injury prevention and road safety. Because of the low number of actual studies, official publications from the OECD and the World Bank were also selected for further examination.

3.2.2 Selected Studies

The studies selected through the inclusion criteria listed above are illustrated in Table 3.2.

Two publications included in the literature review did not originate from the aforementioned search approach. These are Trist (1983) and the House of Representatives Standing Committee on Transport Safety (1986). These were included in the review of the extant literature for providing relevant background to the themes identified in it (the literature).

3.3 CURRENT RESEARCH APPROACHES INTO THE COORDINATION OF ROAD SAFETY COUNTERMEASURES

The current research approach into the coordination of road safety responses can be briefly summarised as a problem-solution approach. In this sense, the investigations into the nature of road traffic injury countermeasures have a) found coordination to be lacking; b) unveiled deficits in its application; and c) suggested ways to reduce deficits in the coordination of road traffic injury prevention.

To describe this approach, the terms road traffic injury prevention and road safety will herein be used interchangeably.

3.3.1 Deficits in the Coordination of Road Traffic Injury Prevention

The deficits in the coordination of road safety countermeasures/responses have predominantly been related to isolated action. These deficits have ranged from isolation, policy silos to the lack of funding. Accordingly, Wegman *et. al..*, (2012) examined the nature of the interventions to reduce cyclist casualties worldwide. These were said to be incidental (Wegman *et. al..*, 2012). In most instances, road safety interventions for reducing cyclist casualties were thought to be implemented in isolation (Wegman *et. al..*,

2012). In these cases, the lack of prioritisation had led to fragmentation and un-coordination (Wegman *et. al.*., 2012).

Assailly (2004) studied a social-sequential prevention model to understand drunk driving by young people. This examination led to the conclusion that although isolated actions were of little use in preventing drunk driving by young people, these were frequently adopted (Assailly, 2004). Assailly listed some isolated actions (2004). These were said to be publicity campaigns without other coordinated action and random breath testing enforcement by the police, which was not heavily publicized (Assailly, 2004). This lack of interaction across interventions may be explained by the inadequacy of appreciation of the prevailing governance across institutions (Hull, 2008). In other words, the lack of understanding of local institutional structures can impinge on an institution's ability to work across these structures (Hull, 2008).

Furthermore, the OECD (2006a) identified policy silos as a cause of the often observed lack of information sharing and joint work patterns in a number of member countries. In this context, Ministries were said not to share objectives or interests (OECD, 2006a). In addition, policy domains such as health and transport had their own priorities and objectives, with distinct responsibilities (OECD, 2006b).

Bliss, Breen and Howard (2011) examined weaknesses in attempts to coordinate road safety responses. This examination concluded that coordination was constrained by a focus on individual performance, amongst other factors (Bliss, Breen & Howard, 2011). In fact, Hull's findings (2008) support this assertion. In a study of local level coordinating institution roles, Hull found that the differences in administrative boundaries and timeframes caused disconnect across institutions (2008).

Similarly, data linkage limitations have equally been reported elsewhere. Frost *et. al.*. (2006) examined over 3,000 driving under the influence cases in Utah, USA. These authors identified the lack of standardised vocabulary and disparities in record keeping as impairments to the coordination of responses within a judicial system (Frost *et. al.*, 2006). In this case, the joint work of judges, education providers, probation officers and researchers was said to be compromised by the manner in which data were managed either through formatting (which was not shared across stakeholders) or poor record keeping (Frost *et. al..*, 2006).

3.3.2 Solutions to Deficits in the Coordination of Road Traffic Injury Prevention

The preceding section highlighted a number of deficits in attempts to coordinate road safety countermeasures. These were said to be isolated action, policy silos, constrained coordination and data linkage limitation across stakeholders.

Like Peden *et. al.*. (2004) and the WHO since, a number of researchers and global institutions have recommended measures to improve the coordination of road safety responses. In 2004, the *World Report* (Peden *et. al..*, 2004) issued generic recommendations for countries to '… foster collaboration between different groups …' (Peden *et. al..*, 2004, p. 61). This advice was said to mean the development of '… a set of coordinated interventions, cutting across many sectors and disciplines …' (Peden *et. al..*, 2004, 163).

In 1986, Australia laid the foundation for the creation of enhanced coordinated effort in road safety. By recommending the development of accident reporting criterion standard guidelines to be applied by all states, the House of Representatives Standing

Committee on Transport Safety strengthened its cooperative processes (HRSCTS, 1986). In addition, it suggested the removal of regulation variation across jurisdictions to help to operate road safety interventions in a coordinated manner (HRSCTS, 1986).

Similarly, Frost *et. al.*. (2006) have recommended the adoption of a 3-prong strategy to harmonize data. Firstly, data management systems in road safety are expected to be shifted to a comprehensive data capturing approach, which is evaluation and post-collection focused (Frost *et. al.*., 2006). Secondly, it is advised that data should be managed with the information needs of relevant stakeholders in mind (Frost *et. al.*., 2006). Thirdly, unique identifiers are applied to cases to facilitate reference (Frost *et. al.*, 2006).

Coordination effectiveness has been linked to effective public – private dialogue (Biau *et. al.*, 2008). This dialogue is said to be facilitated by the rationalisation of responsibilities within governments (Biau *et. al.*, 2008). Streamlining duties in this manner should see ministries regrouped into more effective government agencies, thus allowing shared responsibilities to be clarified (Biau *et. al.*, 2008).

In addition, regulatory reform may be required to engender coordination within government (OECD, 2006b). These reforms are said to require mandated communication across departments by legal means (OECD, 2006b). Moreover, the reforms may see the creation of specific institutional bodies, with coordinative portfolios (OECD, 2006b).

Furthermore, governments are urged to adopt open and participatory approaches, which aid information sharing (OECD, 2006b). This enhancement to idea exchanges may be facilitated by a steering group, whose role can also be to promote enhanced

understanding of priorities, terminologies and objectives through regular meetings (OECD, 2006b). In fact, government agencies are asked to align around chief priorities (Hull, 2008). For instance, in a study of local council coordinating roles, Hull (2008) identified hierarchical systems of governance, in which the triggers for coordination were thought to be the aims of accessing funding and influencing spending decision-making in the UK. This study recommended the use of wider instruments to coordinate the work of institutions participating in coordinated effort at a local level (Hull, 2008). These instruments, much like the triple-bottom line in the *Transport Integration Act 2010* operating in the Australian State of Victoria, were said to be legal, economic, political and technical (Hull, 2008).

The need for leadership for coordination at a senior level was equally thought to be critical (Hull, 2008). This guidance would translate into the introduction of a comprehensive set of statutory requirements, rules of engagement, priorities and agendas (Hull, 2008). These instruments serve the function of conferring authority upon a coordinating institution (Hull, 2008). This latter proposition aligns with the WHO's first recommendation for improvement in road safety management. In its initial road traffic injury status report, the WHO urged member countries to create a lead agency with the authority to coordinate injury prevention measures (Peden *et. al..,* 2004). In this organisational domain (i.e. the space where different road safety actors meet), there is a need for participating agencies to surrender their sovereignty to a referent, leading institution (Trist, 1977).

The creation of a lead agency fulfils an identified need for coordination and oversight across departmental boundaries. In these cases of cross-cutting responsibilities,

there is often a policy failure, if the responsibility to implement coordination is shared among too many actors (Bridgman and Davis, 2000). In fact, success in coordinated effort is said to be often associated with a single, coordinating agency (Bridgman and Davis, 2000). This assertion has been subsequently endorsed. For example, the House of Commons Transport Committee in the UK has suggested that an independent road safety commission be established to work across the government-professional stakeholder cluster to integrate efforts (House of Commons Transport Committee, 2008).

3.4 CRITIQUE OF CURRENT RESEARCH APPROACHES INTO COORDINATION OF ROAD SAFETY COUNTERMEASURES

To fully assess the current status of the ability to address the deficits (general inadequacies) in the coordination of road safety strategies, the present study examined each inadequacy closely. This examination resulted in a series of problem components or specific inadequacies (table 3.1). For instance, *isolated action* (Assailly, 2004; Hull, 2008) appeared to comprise the following specific inadequacies: enforcement not publicised, publicity campaigns without other actions and no knowledge of governance structures (table 3.1). It is worth noting that the lack of funding did not seem to significantly comprise other more specific deficits other than access to financial resources as described in the literature, although it may be thought to be associated with the lack of political will or the unavailability of local competence for fund raising (i.e. adaptive strategies as illustrated in Chapter Seven).

Table 3.1: Coordination Deficit Examination

General Inadequacy (deficit)	Specific Inadequacy (deficit components)
Isolated actions (Assailly,2004; Hull, 2008)	• Enforcement not publicized • Publicity campaigns without other actions • No knowledge of governance structures
Fragmented approaches (UN Regional Commissions, 2010)	• Policy silos • Lack of information sharing and joint work patterns • No sharing of objectives or interest across ministries • Overlapping functions (duplication)
Focus on individual agency (Hull, 2008; Bliss, Breen & Howard, 2011)	• Focus on individual performance • differences in administrative boundaries and timeframes • constrained framework-based approaches
lack of data harmonization (Frost *et. al.*, 2006; World Bank, 2008)	• different reporting definitions • lack of standardised vocabulary • disparities in record keeping
Lack of management instrument for coordination (OECD, 2006; Hull, 2008)	• no guidelines or a framework for coordination • no statutory requirements to coordinate • no economic imperatives to coordinate • lack of documents to regulate stakeholder interaction

Each solution to a deficit presented in the literature was examined on its own. This examination investigated the extent to which the solution alone as described in the reviewed literature addressed the components of the coordination inadequacy/problem (table 3.2). For instance, whilst the approach in Frost *et. al.*. (2006) only partially addresses the deficits in data harmonisation for not addressing different reporting definitions, non-standardisation of vocabulary or different record keeping, the *Accident Reporting Criterion Standard Guidelines* (HRSCTS, 1986) appears to more comprehensively resolve the data harmonisation specific inadequacies. Likewise, regular meetings and role clarity do not seem to address the more attitudinal issue of policy silos. Furthermore, although effective management of relationships may increase information sharing (both formally and informally) and engender trust, it may not

address the lack of shared interests. Similarly, rationalisation of responsibilities does seem to address the overlapping of functions. However, it is highly unlikely to resolve the issue of there not being shared interests (cultural/political) or the more pervasive challenge of policy silos, which does not appear to be uniquely structural.

Table 3.2: Analysis of the Approaches to Address Coordination Deficits

Deficits in Coordination of Road Safety Responses	Evaluation of Solutions	
	Partial Resolution	Comprehensive Resolution
Lack of priotisation (Howard & Breen, 2006; Wegman *et. al.*, 2012)		***steering group*** (OECD, 2006b) ***align effort around chief priorities*** (Hull, 2008)
Isolated action (Assailly,2004; Hull, 2008)	***Create close coordination*** (HRSCTS, 1986; Operation Evaluation Department – World Bank, 2004; UN Regional Commissions, 2010)	
Fragmented approach (UN Regional Commissions, 2010) ***Uncoordinated effort*** (Freeman and Rossi, 2012)	***regular meetings, effective management of relationships, and clearly defined roles*** (Operation Evaluation Department – World Bank, 2004) ***rationalisation of responsibilities*** (Biau *et. al.*, 2008) ***Establish a Lead Agency*** (Bridgman and Davis, 2000; Peden *et. al.*., 2004; House of Commons Transport Committee, 2008; Camkin, 2010)	***joint understanding of policy problems*** (OECD, 2006b) ***collective appreciation of a problem*** (Trist, 1983)
Focus on individual agency performance (Hull, 2008; Bliss, Breen & Howard, 2011)	***Establish a Lead Agency*** (Bridgman and Davis, 2000; Peden *et. al.*., 2004; House of Commons Transport Committee, 2008; Camkin, 2010)	
Lack of funding for coordination (UN, 2005; World Bank, 2008;)		***Increase political commitment*** (Peden *et. al.*, 2004; WHO, 2013)
lack of data harmonisation (Frost *et. al*., 2006; World Bank, 2008)	***Harmonise data management*** (Frost *et. al*.., 2006) and	***accident reporting criterion standard guidelines*** (HRSCTS, 1986)
Lack of management instrument for coordination (OECD, 2006; Hull, 2008)		***Increase political commitment*** (Peden *et. al.*, 2004; WHO, 2013) ***Employ wider instruments*** (Trist, 1983; Peden *et. al.*, 2004; Hull, 2008)

There are coordination deficits which are not comprehensively resolved or researched by current approaches. These include *isolated action* and *focus on individual agency performance*.

3.5 CHAPTER CONCLUSION

This chapter reviewed the extant literature relevant to the study of coordinated road safety countermeasures. More specifically, this third chapter examined the manner in which the selected publications investigated the use of coordination approaches in the design and implementation of road traffic injury prevention responses.

The evidence in the extant literature appears to suggest that coordination has been investigated as a remedy to deficits in efforts to link road safety countermeasures. In most attempts to address the identified deficits in the coordination of road safety countermeasures there appears to have been a tendency to adopt predominantly procedural approaches (effort alignment, close coordination, regular meetings, relationship management, wider instruments, data harmonisation etc.). Other solutions have been structural (steering group, streamlined departments and a lead agency) and interactional (joint understanding of policy, collective appreciation of a problem and political commitment). This approach has left *isolated actions* and *a focus on individual performance* only partially resolved, at least theoretically.

Policy silos or *isolated action* as well as the *focus on individual agency performance* seem to have three dimensions, apart from procedural, structural and interactional. These deficits tend to be conceptual (absence of a framework to align goals and agendas), political (lack of leadership to integrate effort) and cultural (absence

of norms of mutual adjustment, horizontal coordination and a belief in inter-dependence).

Whilst this chapter has identified the approach to investigate the nature of road safety coordination as being mostly deficit oriented, it has also denoted a clear gap in knowledge relevant to the study of coordinated road safety countermeasures. This refers to the paucity of evidence about the way in which coordinated road safety countermeasures in Australia or some OECD countries emerge. Put otherwise, there does not appear to be much evidence about road safety countermeasures, which have been successfully coordinated. Indeed, the triggers, contributing factors and facets of these coordinated road safety countermeasures seem not to have been examined in the context of Australia or the OECD.

3.6 SUMMARY AND IMPLICATIONS

The lack of research into the emergence of coordinated road safety responses identified in this chapter has significant implications for institutional capacity building. In this sense, institutional frameworks for the reduction of road traffic injuries such as lead agencies, national road safety strategies and inter-ministerial frameworks can benefit from an in-depth understanding of the manner in which local level stakeholders engender coordinated road safety responses. This is most pertinent in the current decade of action. Whilst global institutions such as the World Bank and the World Health Organization promote the need to galvanise and sustain road fatality reduction efforts in this decade of action, two findings have called for the need to increase the pace of effort in coordinating road safety countermeasures. In 2012, Hyder *et. al.*. (2012) warned of the existence of an implementation gap globally. This was said to represent weak

institutional capacity to implement road safety countermeasures, which included deficits in coordination. In 2015, the global status report (WHO, 2015) noted that the global fatality rates had plateaued. It too called for enhanced levels of multi-sectoral coordination (WHO, 2015). Therefore, understanding the emergence of coordinated road traffic injury prevention responses is crucial in this latter part of the decade of action in road safety.

3.7 RESEARCH AIM (RA1)

This chapter has provided the conceptual research background, which allows this thesis to outline its aims. In this sense, it is noted that there is a need to expand on the dimensions of coordination. There is, in this respect, a need to understand coordination interactional dimensions. In addition, coordination should stop being viewed solely as a remedy for errors in planning, design and implementation of road safety countermeasures as a result of weak institutional capabilities. It should be perceived as a critical component of planning, design and implementation of countermeasures. However, this claim of significance for these aspects of road safety management is not satisfactorily substantiated in the extant literature. In this sense, it is not known why coordination should be considered early in the management of road safety countermeasures. Most importantly, there is a need to investigate coordination of road safety countermeasures or coordinated road safety countermeasures as a chief focus. In this case, the current thesis will not focus on any road safety countermeasure in particular (e.g. seat belts, Random Breath Tests, speed cameras, graduating licensing schemes, ignition inter-locks, roundabouts, rumble strips, crossing islands, safety edge etc.). Instead, it will examine the emergence of coordinated road safety countermeasures

in order to understand their practical nature. This involves investigating the manner in which road safety countermeasures are successfully coordinated or linked at a local level.

Therefore, the first research aim for the present thesis is to investigate the procedural nature of coordinated road safety countermeasures in highly successful road safety managing countries with a view to identifying factors contributing to the need to link countermeasures (i.e. interdependence across interventions). This aim can be achieved through the development of a descriptive model of coordinated road safety countermeasures. This model identifies the manner in which road safety countermeasures are combined or linked (coordinated).

Chapter 4: Theoretical Framework

4.1 INTRODUCTORY COMMENTS

In most OECD countries, road traffic injury prevention represents a shared responsibility across a number of government portfolios. Likewise, the work of this consortium of government agencies and professional stakeholders can be said to represent a government-professional stakeholder cluster within a broader societal context (i.e. the system). Therefore, road traffic injury prevention is regarded as a policy field requiring a holistic perspective or a systems thinking approach (Peden *et. al..*, 2004; May *et. al.*, 2008; WHO, 2009b; WHO, 2013; WHO, 2015).

Accordingly, this chapter outlines the manner in which two theories will be used in this thesis to examine the nature of coordinated road safety responses within an integrated framework. These theories are, respectively: *Policy Integration* (PI) and the *Dynamic Systems Theory* (DST). Neither is herein used to generate hypotheses about its premises. Instead, these theories contribute to the development of knowledge about coordinated road safety responses in the context of an integrated approach.

In section 4.2, DST is distinguished from the Safe Systems approach. Section 4.3 defines *Policy Integration;* outlines its benefits and describes its conceptual weaknesses. Section 4.4 explains DST whilst section 4.5 provides a summary of the present chapter.

4.2 SYSTEMS THINKING

At this juncture, it appears relevant to denote a clear distinction between DST and the *Safe Systems approach*. Whilst both perspectives view road safety crashes holistically, the object of study in these constructs differs. Systems thinking through DST examines the manner in which the system behaves in relation to its environment. It is a contingency-based theory. It is not concerned with an inclusive approach in the analysis of system component efficiency. This is the domain of the *Safe Systems approach*. This approach aims to ensure all parts of the road transport system operate efficiently, thus enhancing the safety resilience of the system. However, it does not look at the larger picture – i.e. the behaviour of the entire road transport system in relation to its environment. In other words, whilst DST has the potential to help society understand the need to reduce private car use as it adversely affects the environment in which the road transport operates, the Safe Systems approach assists mankind in making road transport systems inherently safe by reducing their failure rate and ensuring their failures do not result in fatalities. In this sense, both can coexist. Whilst the Safe Systems approach enhances the safety reliability of the transport system (yielding ever greater safety outcomes), DST helps to manage it flexibly to retain its resilience as it faces an ever changing road safety environment (yielding outcomes beyond safety such independent cultures, reduced car dominance etc.).

4.3 POLICY INTEGRATION

4.3.1 Definition

Policy Integration (PI) represents the interaction amongst cross-sectoral objectives and approaches (Nilsson, 2003; Mickwitz, 2007; Soderberg, 2011). This whole of government principle underpins the incorporation of public policy principles across government agencies (Mickwitz, 2007). Within the PI framework, Health policy principles are incorporated into Transport, the Police and Social Services (fig. 4.1). For example, the Health promotion of active lifestyles can be accommodated in Transport through the provision of infrastructure for cycling and walking.

Having originated in management science's disbanding of the 'silo thinking', integration tackled a fundamental issue in government policy development – i.e. the need to incorporate policies from seemingly unrelated government institutions (Mickwitz, 2007). Its intent was to create the 'whole of government' approach (Lafferty, 2003; Stewart, 2006), thus eliminating the focus on *individual agency performance* and *isolated actions*.

In government, this inter-sectoral working form (Hull, 2008) combines a range of transport policy interventions with social policy instruments (May *et. al*., 2003). Such alignment of effort sees Transport, Health and Police authorities collaborating closely to generate a coordinated response to road traffic deaths (WHO, 2009b). It can equally manifest itself through the harmonisation of terminology across sectors, data linkage and combining comprehensive, clear legislative frameworks with public awareness campaigns (WHO, 2009b). For instance, the enforcement of alcohol impairment laws (e.g. through random breath testing) can be combined with publicity campaigns (Peden

et. al., 2004). These public awareness campaigns have the potential to secure a) public support for high visibility law enforcement activities and b) a shared social norm for safety (Peden *et. al.,* 2004). This mobilisation of road safety effort can lead to increased levels of compliance with road traffic regulations (Peden *et. al*., 2004).

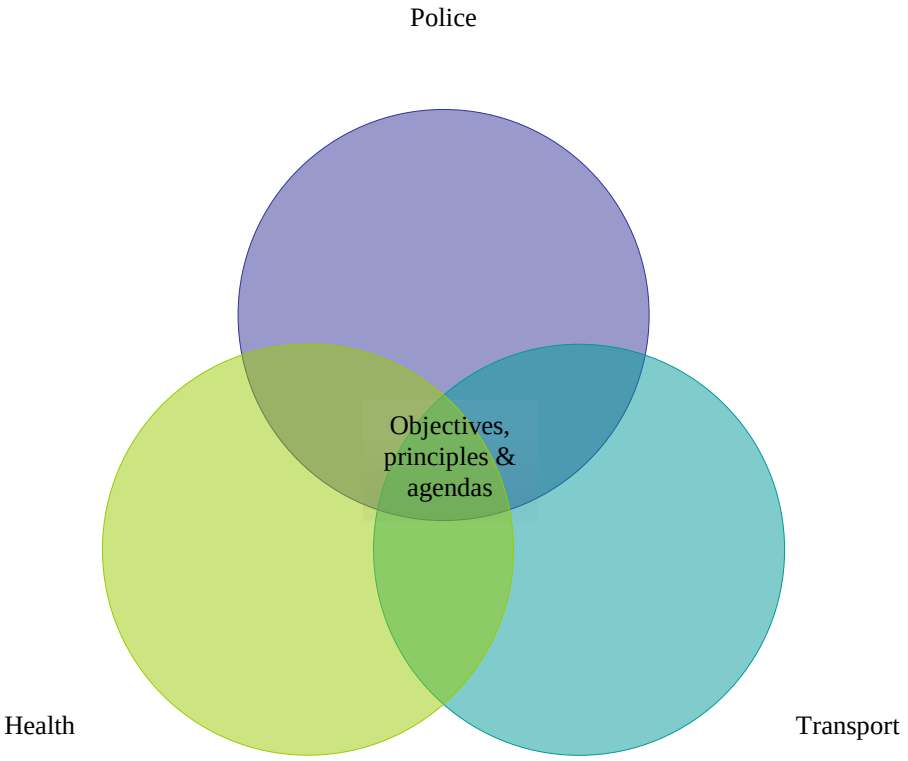


Figure 4.1. PI(main government agencies)

4.3.2 Conceptualisation Weaknesses of PI

Policy Integration, as it is currently conceived, has failed to account for both the broad social context of policy development (Dann, 2009) and the ethicality of the

approach in the public sector (Hasting, 2004), especially its failure to gain moral commitment or acceptance as a viable option to deliver a continuum of services. Moreover, despite its benefits of reducing duplication and rationalising scarce resources, PI appears to have failed to gain root in public administration due to the dearth of knowledge related to its processes (Leutz, 1999; May *et. al..*, 2003; Connor, 2005). In other words, a lack of knowledge about the design of PIhas been noted (May *et. al.*, 2003). Just how it can be designed does not appear to have been clarified.

The adoption of PI in social outcome–based settings seems to be additionally hampered by a lack of universality in its interpretation (May *et. al..*, 2003; Browne, 2008), which is not assisted by the unclear nature of its practical application (Nilsson, 2003). In fact, PI has remained mostly rhetoric, with rather complex and politically difficult implementation processes (Nilsson, 2003). Therefore, there is a need to reconceptualise PI in order to understand the conceptual nature of coordinated road safety responses.

4.4 SYSTEMS THEORIES

4.4.1 Safe Systems Approach

Integration, as the joining of the parts to form a government-professional stakeholder cluster (i.e. the whole of government), is intrinsically interrelated with the concept of the S*afe Systems principle.* Like integration, the *Safe Systems* approach conceives of road traffic crashes as the result of both internal and external factors, which converge to cause adverse changes on a system (Leveson, 2009).

In 2004, the WHO acknowledged that a systems approach had the potential to help countries build hazard free roads (Peden *et. al..*, 2004). It equally stressed the need for

countries to expand their approaches to target aspects within their respective systems beyond road user behavior changing measures (Peden *et. al.*., 2004). In fact, the adoption of the systems approach by developed countries has resulted in reduced rates of motor vehicle–related injuries and fatalities (Hazen and Ehiri, 2006; WHO, 2015). In addition, the system approach allows fatalistic beliefs to be dispelled and multidisciplinary action to occur (Hazen and Ehiri, 2006), hence its resemblance and complementarity with integration.

Leveson echoes the WHO recommendations by arguing that system failures, rather than human fault, explain more accurately the occurrence of crashes (2009). This system-centered view has gained a degree of acceptance in road safety by governments around the world. The 2009 – 2010 Action Plan for the Australian National Road Safety Plan listed the task of making the road transport system more forgiving of mistakes committed by road users as the first goal of the Safe System Framework (Australian Transport Council, 2010). In Sweden, the focus on the system's increased tolerance of human error has driven this country's vision for a future of zero road fatalities (Swedish Road Administration, 2006).

Whilst the *Safe Systems* approach expands the scope of action beyond road users, its application can be supplemented by other system-based perspectives. In this sense, the interaction of the road transport system (including its supporting systems such as legislation, enforcement, road trauma-care etc.) with its broader environment can be conceived through DST and its principle of *self-organising*.

4.4.2 DST: Self-Organising

This section outlines the definition and nature of self-organising, predominantly from an organisational design perspective. It also provides specific examples of self-organising in road safety, from a community-based viewpoint.

4.4.2.1 **Definition of Self-Organising**

Self–organised organisations exhibit distributed, as opposed to centralised, control and are, therefore, flexible (Pahl-Wostl, 2005). Unplanned self–organising occurs as a result of constraints imposed by the interaction between internal (organisational) and external (environmental) variables (King, 2011). Communities of practice, which emerge mostly in knowledge–inducing organisations (Snyder, 2000), are typical examples of self–organising. In organisations where communities of practice thrive, informal networks self–select and stay connected through mutual passion (Wenger and Snyder, 2001).

4.4.2.2 **Nature of Self-organising**

Self-organising represents the work of NGOs and communities of practice. These institutions, unlike government agencies, are not mandated (i.e. statutorily accountable) and operate independently of government institutions. Self-organising also accounts for the manner in which a system reacts to its environment. In this sense, systems can centralise or decentralise in response to environmental threats such as increases in road traffic injury. Both the independent nature of the operations of the actors within a self-organised system and the system's responses to changes in the environment afford it both resilience and flexibility as it coordinates its responses.

Self–organised institutions are able to generate order out of disorder instinctively (Lewis, 2005). The emergence of orderliness occurs as a result of a combination of self-augmenting (positive) and self-maintaining (negative) feedback processes (Lewis, 2005). Positive feedback, or self-augmenting, is the vehicle for the emergence of new forms, as new elements in the system are mobilised causing the amplification of change (Lewis, 2005). In turn, change is amplified by the factors which arise out of the change itself (Lewis, 2005). In other words, in a society where very few self-organising institutions exist, change may remain localised.

YOURS, a community of practice dedicated to capacity building amongst the youth, is but an example of an institution which can be mobilised to amplify change. With its various networks, YOURS' initiatives self-augment through collegial relationships across the members of the network, which increase the flow of information (Browne, 2008). Similarly, the adoption of public consultation procedures by transport agencies before the issuing of traffic guidelines can aid the self-augmenting nature of the new instruments.

Negative feedback, on the other hand, or self–maintaining, or self–stabilisation, attain equilibrium as the effects of a system on another are compensated by reciprocal effects in the opposite direction (Lewis, 2005). In road safety, this would mean an upward response to increases in road traffic trauma. Road traffic trauma cause downward pressure on a system (i.e. increased hospitalisation, low productivity, disability-adjusted life years lost etc.). The responses to road traffic trauma should be in the opposite direction, thus reducing the burden on the system. This upward response allows the system to regain stability. It restores orderliness as individual elements

relinquish independence and embed into the system (Lewis, 2005) by means of bidirectional feedback processes (Turner, 2006). This ability to bounce back emerges from the interaction of a system's underlying components (Bernhardt, 2010).

Negative feedback is typical of inter-agency work patterns in emergencies, when a central, lead agency takes over whilst others surrender some of their powers. Trist (1977) identifies the former as referent organizations and the latter as constituent institutions. For instance, in road safety, lead agencies (or referent organisations) may be called upon to regulate and mediate the capabilities and functions of the constituent institutions within an inter-organisational domain (Trist, 1983).

Furthermore, there are other processes involved in self-organised systems, namely: circular causality and continuity. Circular Causality identifies two parts of a system, which repeatedly impact upon each other, namely: a higher-order part (structures, hierarchies) and a lower-order part (processes, grass-roots). These mutually reinforcing components of a system (Googins and Rochlin, 2000), in which power does not reside at any single point (Trist, 1983), epitomise the transfer of vicarious learning (Gong, 2008). In this process, best practice institutions impact on the behaviour of observing agencies (Gong, 2008). In return, large agencies may alter their operations in response to the uptake of best practices by smaller ones (Gong, 2008). A change in the higher order function alters the manner in which the lower-order parts of the same system interact. This change in the lower-order interaction patterns gives rise to modifications in the way the higher–order functions (Lewis, 2005). This mutual dependency of cause (e.g. changes in the local processes) and effect (e.g. alterations in the global structure) diminishes the influence of the environment on a system's direction (Küppers, 1999),

thus rendering it resilient. In road safety, for instance, circular causality is best demonstrated through the process of introducing countermeasures (e.g. BAC of 0.00%). Initially, these may meet with resistance from the public, forcing alterations to them. One such change may represent the adoption of the measure for a scientifically identified category of road users rather than as a blanket approach. This change from the hierarchy will then filter through the grass-roots and interpreted as an acceptance of the interdependence across actors in the system, thus enabling the development of moral commitment towards the new countermeasure. Unless these processes of mutual change (altering target group and reducing resistance towards the new measure) occur, the system resilience is compromised as it is unable to function in a circular causality - oriented manner.

Continuity represents a system's ability to flexibly respond to stress with a repertoire of responses. In this sense, the simultaneous deployment of road safety interventions at various levels of society aids the maintenance of continuity. For instance, such repertoire of responses could include the establishment of awareness campaigns, in which influential members of society appeal to road users to adhere to road rules, accompanied by accountability measures. Some of these accountability measures may include liability insurance premiums, community initiatives in the form of educational institutions' staggered timetables to minimise traffic around school zones, the removal of road defects, the construction of pedestrian crossing lights alongside the designation of safe drop off areas for children and the institutionalisation of incentives to walk and cycle as a means of active mobility.

These principles of self-organising (i.e. self-augmenting, self-maintaining, circular causality and continuity) can contribute to our understanding of the nature of coordinated responses in a range of manners. Firstly, knowledge of the nature of coordinated responses in road traffic injury prevention is intrinsically related with self-organising principles. For example, in a self-maintaining system, where there is a lead agency, the nature of coordinated responses is likely to be centralised. Likewise, in a self-augmenting system, where NGOs and communities of practice undertake education campaigns, the nature of coordinated responses is highly likely to be decentralised. Systems, which do not view road traffic trauma as negative feedback and react to bounce back, may succumb to the downward pressure of road traffic trauma. Similarly, when the interdependency between hierarchies and grass-roots are not recognised, the system's ability to mount resilient responses is compromised. In fact, systems that respond to negative feedback (i.e. road traffic trauma) with a single approach fail to adopt continuity, thus compromising the system integrity. Where circular causality is prevalent or perceived to be prevalent, the coordination of the road traffic injury prevention responses can be expected to be recursive with both vertical and horizontal participation of a variety of stakeholders. Likewise, where continuity prevails or is perceived to prevail, it can be assumed that the nature of coordinated responses will be one of simultaneous deployment of countermeasures.

4.4.2.3 **Illustrative Examples of Self-organising**

The manner in which the government-professional stakeholder cluster (road transport system and its supporting tools such as traffic rules, road design standards, vehicle safety features, licensing systems, enforcement etc.) and its environment (community, road user risk behavior, crash data, self-organised organisations etc.) interact can be conceptualised through the four processes explained above, namely: *self-maintaining* (centralisation), *self-augumenting* (decentralisation and empowerment), *circular causality* (advocacy) and *continuity* (simultaneous deployment of responses).

This set of interactions is depicted in Figure 4.2. In this illustration, the road transport system and its supporting instruments may interact with the community through self-augmenting activities conducted by self-organised interest groups to ensure community safety. These programs will feature both empowerment and delegation, if the crash data show a stabilised trend (i.e. plateau or insignificant/marginal variations) or low levels of negative feedback. In this context, NGOs and other interest groups are funded and supported to undertake road user behavior changing programs.

Nonetheless, this same government-professional stakeholder cluster may opt to address trends in crash data through self-maintaining, if these trends show a marked rise or a crisis (existence of negative feedback or downward pressure on the system). In this scenario, the efforts are coordinated by a central agency within the government-professional stakeholder cluster towards the community and self-organised groups. This centralisation of effort or vertical coordination represents the appointment of a lead agency; the deployment of inter-ministerial coordination frameworks; and the development of a national road safety strategy with planned activities.

In fig. 4.2, this vertical interaction is not open or bidirectional in Australia. It tends to be fairly closed and unidirectional. Predominantly, it is a top-down interaction whereby most of the stakeholders at the bottom do not feed experiences or advocate for change back to the top (Scott-Packer *et at*, 2016).

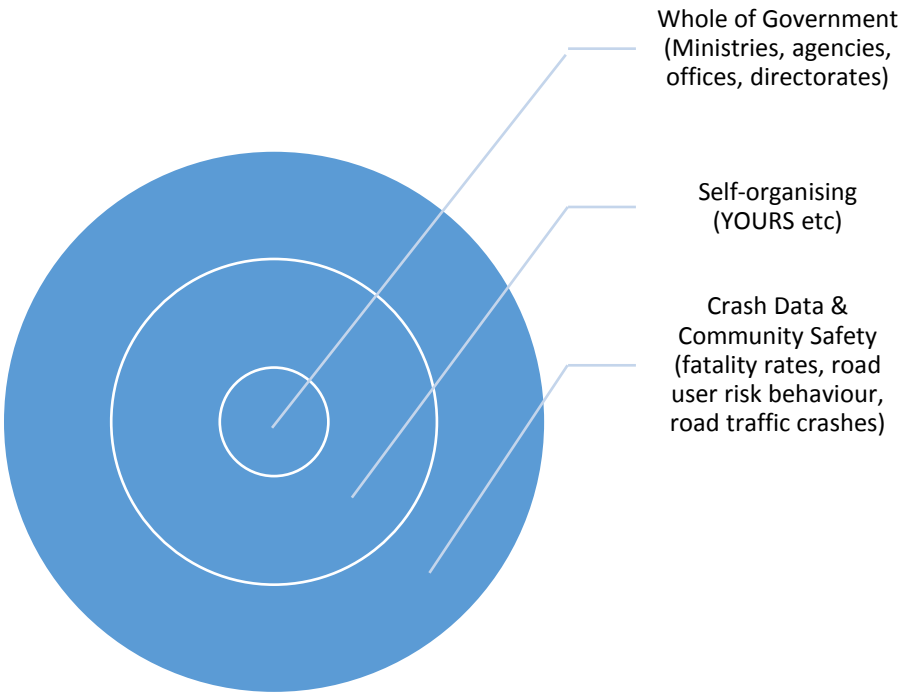


Figure 4.2 Interaction between the Government-professional stakeholder cluster and its Environment

4.5 Chapter Conclusion

Both PI and DST have explanatory values in the investigation of the nature of coordinated responses. PI, when reconceptualised, should allow the inter-workings of the organisational domain (Trist, 1977) to be conceptually understood. Likewise, DST permits the interaction between this domain and its environment to be theoretically examined. It provides an appreciation of the system far beyond the behavour of its components (the domain of the Safe Systems approach). DST can help to explain how countries which centralise (self-maintaining) the management of road safety inflexibly limit the potential for their road transport systems to go beyond stability. Self-maintaining can only be used as a temporary measure. It is an approach which allows the system to bounce back (typical of the restorative resilience of emergency management). However, for the road transport system to have inherent safety resilience, other more proactive, coordination-based approaches such as continuity, circular causality and self-augmenting are required. Inherent safety resilience can be viewed as a property of a system which does not succumb to road traffic trauma because it continuously applies proactive measures to keep road traffic trauma occurrence and severely at marginal levels.

4.6 SUMMARY AND IMPLICATIONS

This chapter outlined the relevant principles related to two theories, which will guide the development of a conceptual framework for coordinated responses in road safety. These theories, PI and the DST, were contextualised within the public policy

field of road safety. This contextualisation involved the provision of practical road safety-based examples for the principles associated with both theories.

The implication of the present chapter to the thesis is threefold. Firstly, PI will need to be reconceptualised in order to address the conceptual weakness identified in this chapter. This reconceptualisation will help to generate a theory better suited to the policy context outlined in Chapter Two, which calls for an ethic of care, independent culture and environmental outcomes to strengthen the cultural weaknesses identified in the Australian policy context.

Secondly, there appears to be a need to understand the nature of the interaction between the government-professional stakeholder cluster and its environment in Australia and some OECD countries. This interaction, in practice, represents policy coordination. Currently, this is recommended by the World Health Organization to be conducted through a lead agency or vertical centralisation. In this respect, due to the impact of vertical coordination on local level interactions across stakeholders and the overall nature of coordinated responses, it is imperative that centralisation as a model of coordination be investigated within a systems approach. In fact, it will be useful to draw lessons from the present research in this thesis as to whether or not vertical coordination or centralisation continues to be a viable coordination option for Australia and some OECD countries for the latter part of the decade of action. If it is shown not to be so, centralisation (vertical coordination) will be argued to be less than ideal for the Australian policy context, which requires strengthening of its cultural indicators. It will be further argued that local level coordination options should be considered in order to develop inherent safety resilience across road transport system.

4.7 **RESEARCH AIM (RA2)**

The second research aim is to examine the conceptual and systemic nature of coordinated road safety responses within an Australian setting primarily. This aim will allow coordination to be investigated within a government-professional stakeholder cluster (PI reconceptualisation) and between the government-professional stakeholder cluster and its environment (explanatory value of DST). These two complementary perspectives will allow the coordination of road safety countermeasures to be viewed comprehensively, thus allowing road safety coordinators and stakeholders alike to make informed choices from a range of coordination options. The present research aim will result in a new principle of PI, which takes account of community participation in policy design. In addition, the present research aim will yield an understanding of the way in which the government-professional stakeholder cluster coordinates road traffic injury prevention programs with its outside environment in order to secure community safety (inherent safety resilience).

Secondly, the investigation of a conceptual framework which accounts for the emergence of coordinated responses has its own benefits. It allows the underpinnings or principles of the design of coordinated responses to be exposed, thus permitting countries to emulate the coordinated efforts of Australia and other OECD countries. In this respect (i.e. knowledge transfer), it is admitted that "there is no standard package of interventions suitable for all contexts and countries …" (Peden, 2005, p. 90). However, the underpinnings supporting the development of road safety strategies are said not to differ substantially from culture to culture (Peden *et. al.*., 2004; Peden, 2005). In fact, it is imperative to understand the manner in which a theory can help to engender

coordinated responses. This is due to the potential for this conceptual framework to contribute to the alignment of goals and objectives across stakeholders. This alignment of both goals and objectives across institutional boundaries, as the drivers of commitment and goodwill, represents the greatest challenge in linking strategies (Hull, 2005; Hull, 2008). In fact, the absence of a conceptual framework for coordination can lead partners to accept or reject requests for participation in work (OECD, 2006). In Norway, for example, tunnel constructors have refused to incorporate safety measures into tunnel construction (OECD, 2006). This refusal kept Fire Authorities out of tunnel construction for a period of time (OECD, 2006). However, it was resolved through a guideline. This document prescribed the participation of local Fire Authorities in the early planning stages of new tunnels in Norway. In addition, it provided detailed instructions for the execution of risk analyses, thus allowing road safety changes to be made before the completion of tunnel construction (OECD, 2006). Indeed, the significance of instruments to regulate interactions across institutions has also been highlighted elsewhere. In the UK, Hull (2008) found the absence of management instruments for coordination as critical. These non-existent enablers of coordination were said to be legal (institutional rules, legal responsibilities), economic (fiscal), political (autonomy, powers, politicians' support) and technical instruments to coordinate effort at a local level (Hull, 2008, p. 97).

Chapter 5: Research Design

5.1 INTRODUCTORY COMMENTS

This chapter follows on from two critical chapters in this thesis, namely: the literature review (Chapter Three) and the theoretical framework (Chapter Four). Whilst the literature review identified the existence of little research into the emergence of coordinated responses in road traffic injury prevention and the unresolved issues of *isolated action* along with the *focus on individual agency performance*, the theoretical framework highlighted weaknesses related to *PI* in the context of road traffic injury prevention. Furthermore, the theoretical framework outlined in the previous chapter identified the need to understand the manner in which the government-professional stakeholder cluster interacts with its environment through the *DST* in order to have inherent safety resilience in the road transport system. These gaps point to a need to investigate the conceptual, practical and systemic natures of coordinated road safety responses.

Whilst the aforementioned gaps could be bridged through research questions alone, this exercise would not aid the practical application of coordinated responses. In fact, mere characterisation of coordinated responses through research questions would be highly unlikely to be of significance to road safety management as a field of both study and public health safety application. In all likelihood, it would potentially create *islands of knowledge* (Glaser and Strauss, 1971; Walsh and Downe, 2005) and/or *one shot research* (Estabrooks *et. al.*., 1994). This would not remedy the deficits in the adoption of coordinated responses as identified in Chapter Three. Therefore, the present

research program will address the chief research aim of investigating the conceptual, practical and systemic nature of coordinated road safety responses within an Australian (predominantly) setting by developing tools to guide the design of coordinated responses. These conceptual tools should aid the practical application of coordinated responses in road safety. This practical application refers to institutional ability to link road safety countermeasures in a coordinated manner, whilst securing community acceptance of the countermeasures.

This chapter outlines the methodology employed to achieve the chief research aim of investigating the conceptual, practical and systemic natures of coordinated road safety responses (5.2).

The participants to the studies in this research program are briefly described in section 5.3. Section 5.4 outlines the instruments employed to gather and analyse the data in this thesis. The procedures and timeline employed in the present thesis are outlined in 5.5. A description of the studies and their contribution to the research program is provided in 5.6.

Section 5.7 outlines the ethics approval for the current research program whilst 5.8 summarises the current chapter.

5.2 METHODOLOGY AND RESEARCH DESIGN

In order to investigate the conceptual, practical and systemic natures of coordinated road safety responses within an Australian setting primarily so as to aid their practical application, this program of research will employ, at the thesis level, research

aims and objectives and, at the research paper level, research questions. These goals are broadly outlined below.

5.2.1 Research Aims

The literature review identified a primary research concern with cultural, structural and procedural deficits in the implementation of road safety countermeasures. For most part, these deficits appear to have been comprehensively addressed. The two exceptions to this are: isolated actions (procedural; political) and focus on individual agency performance (structural; administrative), which appear to have only been partially resolved.

The literature relevant to coordination in road safety also revealed a lack of research into the emergence of coordinated road safety responses. In other words, it did not show how road safety countermeasures were coordinated from a practical (local level implementation) point of view. Nor did it illustrate a conceptual framework for the coordination of road safety strategies. This framework represents theories which explain the way in which governments and other stakeholders coordinate road safety programs. Furthermore, little is known about the extent to which road safety strategies can be conceptualised from a systems thinking perspective. This represents knowledge of the manner in which the government-professional stakeholder cluster interacts with its environment, where community safety is paramount. Therefore, there is a need to investigate the practical (description of implementation), conceptual (theory about the coordination of policies) and systemic (theory to explain the relationship between the policy context and its environment) natures of coordinated road safety responses.

Accordingly, this program of research comprises two research aims. The first of these aims investigates the practical nature of coordinated responses. The practical nature is seen to represent the empirical factors related to the emergence of road safety coordinated responses. These are triggers, enhancers, obstacles and facets of a coordinated response in road safety.

The second research aim examines the conceptual and systemic natures of coordinated road safety responses. By conceptual, it is meant the theory guiding the development of coordinated road safety responses within governments or within the inter- government agency domain. More specifically, the conceptual nature of coordinated responses in road safety is believed to be explained by PI and one of its three dimensions – i.e. coordination.

The systemic nature relates to the view of coordinated responses from a system-wide perspective. This systems based approach should enable coordination to both be broadened and encompass the processes which explain the interaction between the government-professional stakeholder cluster (i.e. road safety agencies and respective stakeholders) and its environment (community safety and road traffic crash data). This understanding is herein thought to be achieved through the examination of the explanatory value of DST within a road safety context.

Both research aims cited above will be achieved through specific research objectives.

5.2.2 Research Objectives

5.2.2.1 **Research Objective 1 (RO1)**

The literature review identified a problem-solution approach in the investigation of the road safety countermeasures. This approach was said not to help to understand the emergence of coordinated road safety responses as it focused primarily on coordination deficits rather than the features of coordinated road safety responses. Put otherwise, it failed to illustrate an ideally coordinated response from which to draw lessons.

In addition, whilst the WHO has provided a description of coordinated responses in some countries as being represented by statutory coordinating functions of traffic safety agencies, a National Road Safety Strategy (NRSS), targets, descriptive statistics about institutional frameworks for coordination and the multi-sectoral nature of the NRSS (Peden *et. al.*., 2004; WHO, 2009b; WHO, 2013), it has not made the description of the nature of coordinated responses specific to local level implementation. , it is not known from this generalised national level, planning-based description how the local level institutional framework for the implementation of coordination in road safety can be depicted graphically. In this sense, there is no descriptive model of coordinated road safety responses at the implementation level. Accordingly, the first research objective (RO1) is to:

a) *develop a descriptive model of local level coordinated responses in OECD countries.*

A descriptive model provides a '… fine grained description …' (Cassar, 2003) of the relationship between factors (Luthans et. al, 1988; Cassar, 2003), a process (Etgar,

2008; Murdoch, 2012) or a phenomenon (Cassar, 2003). Used when there is a paucity of theoretical and empirical investigations about a process (Murdoch, 2012), descriptive models are theoretical frameworks, which guide investigation (Nower, 2006). Descriptive models depict preconditions for stages (Etgar, 2008) or predisposing factors (Nower, 2006). In addition, a descriptive model can help to establish causal relationships across contributing factors (Murdoch, 2012).

Whilst most models tend to describe individual actions, these can also be used to describe collaborative relationships (Fink, 2008). For instance, Stephenson (2006) conceptualizes the process of humanitarian assistance coordination, focusing on structures, actors, actions and enabling institutional conditions rather than individuals and cognitive processes. In this descriptive model, coordinated humanitarian assistance is depicted as loose structural ties, which are subject to strategic and contextual factors (Stephenson, 2006).

Descriptive models are widely viewed as theoretical models (Ward and Hudson, 1998; Cassar, 2003; Nower, 2006). In fact, Ward and Hudson (1998) conceive of descriptive model design as theory building. In this case, a descriptive model comprises three levels (Ward and Hudson, 1998). The first level (Level I), is multifactorial and seeks to explain a phenomenon (Ward and Hudson, 1998). At this level, the phenomenon is described as an event from its inception, stages and continuation (Ward and Hudson, 1998). The second level, middle level (Level II), explores contributing factors or the role of broader factors in the occurrence, development and maintenance of the phenomenon (Ward and Hudson, 1998). The third level is viewed as a micro level with the focus shifting from broader issues to the actual procedural considerations (Ward

and Hudson, 1998). This conceptualisation of model design is supported elsewhere. In Cassar's (2003) terms, the layers of abstraction in descriptive model design can be rather inclusive.

Cassar (2003) groups factors into three theory forming levels. Like Ward and Hudson (1998), Cassar views the first level (level I) as a description of the phenomenon in terms of the factors leading up to its occurrence. The second level, not unlike Ward and Hudson (1998), seeks to identify factors associated with the broader phenomena (Cassar, 2003). At level III, the process to carry out the phenomenon is described in detail, with proximal (e.g. cognitive, behavioural, motivational and affective) and distal (indirect) factors being identified. Distal (indirect) and proximal (direct) contributing factors are also thought to pre-dispose and aid the conduct of an action (Murdoch, 2012). Furthermore, descriptive models can be used to also depict interactions across factors. In fact, descriptive models can be made to capture a process (or offence/event/case/act) chain which unfolds over a period of time (Cassar, 2003). This process orientation may generate stages with preconditions for the stages and potential benefits arising out of the engagement in an identified activity related with each stage (Etgar, 2008).

5.2.2.2 **Research Objective 2 (RO2)**

The ill-conception of *PI* was identified in Chapter FOUR (Theoretical Framework). Consequently, this research program will:

a) *reconceptualise PI in order to provide a conceptual framework for coordinated responses.*

A reconceptualisation (RO2) starts with a concept analysis, which is intended to identify, clarify and refine concepts (Fawcett, 1994). The identification, clarification and refinement of a concept allow its presence to be examined and measured (Henneman *et. al..*, 1995). This means defining relevant attributes or empirical indicators and criteria by which the concept can be judged to be in evidence in a given situation (Powers and Knapp, 2010). In fact, this line of inquiry allows an abstract representation of the phenomenon of interest to be generated (Avant, 2006). In this sense, a concept analysis enables a deepening of the understanding of the relationship between the features of a construct (Collins, 2011).

Subsequently, a reconceptualisation can be achieved through the adoption of a qualitative data analysis method such as the Grounded Theory Method. This methodology uses the concept analysis as a coding scheme to develop a new construct.

5.2.2.3 **Research Objective 3 (RO3)**

For the new principle of integration (i.e. as a result of the reconceptualisation) to gain practical usefulness, its concepts need to gain specificity. To this end, the dimension in the new concept equivalent to coordination will be further refined in this research program through additional data analyses. , the underlying structure of the new concept for coordination will be investigated through an assessment of its predictive value. To this end, this thesis will:

b) *assess the utility and underlying structure of the new coordination conceptual framework developed in Research Objective 2.*

5.2.2.4 **Research Objective 4 (RO4)**

Whilst it is important to understand the manner in which the "government-professional stakeholder cluster of government" coordinates responses within itself through inter-ministerial frameworks and the principle of *policy integration*, it is just as useful to develop knowledge about the broader system (systems thinking or systemic) in which the government-professional stakeholder cluster interacts with its environment. In other words, coordination within a government-professional stakeholder cluster is just as important as coordination between the government-professional stakeholder cluster and its environment. This view allows the inner-workings of the parts to be understood both in isolation and holistically. It also enables the nature of coordination to be investigated from both conceptual/administrative and systemic perspectives.

It is, therefore, desirable to:

c) *understand how a systems theory explains the broader system-based context for coordinated road traffic injury prevention responses*

Table 5.1 illustrates the manner in which the research aims and objectives relate to the knowledge gaps identified in previous chapters.

Table 5.1: Addressing Knowledge Gaps

Knowledge Gap	Research aim	Research Objective	Chapter
• Insufficient investigation of the emergence of a coordinated road safety response – little knowledge about its facets, triggers etc.	1	1	6, 7 & 8
• Weaknesses in the conceptualization of *policy integration*, • The need for a theory which explains the emergence of coordinated road safety responses which secure community acceptance	2	2	9
• The need for specificity of the new theory	2	3	10
• The need to understand the coordination of road safety countermeasures from a systems perspective	2	4	11

5.2.3 Research Questions

As a thesis by publication, the current research program is predominantly guided by research aims and objectives. The actual research questions, which are intended to develop the evidence for these aims and objectives can be found in the individual research papers. This allows the studies to be tailored to both the gaps identified in the current thesis and the specific journal's audience. In fact, the research questions used in the studies have been shaped by the readership and editorial requirements of the journals targeted for publication.

Table 5.2 maps the research questions with both the aims and objectives.

Table 5.2: Research Questions

Research Aim	Research Objective	Chapter	Research Questions
1	1	6	*Given the importance of moral commitment in supporting legislation and enforcement, what practical tools can be developed to monitor it and its shifts (path trend)? What is the path trend in moral commitment within the Australian public with an interest in road safety?*
1	1	7	*How was this program coordinated with other programs? How and why was the need to coordinate with other programs identified? What were the success factors? What is the typical coping strategy in the coordination of road traffic injury prevention responses? What are the triggers of coordinated responses? What variables explain the choice of coping strategy in the coordination of road traffic injury prevention responses?*
1	1	8	*What is the nature of the phenomenon under study (i.e. the type of countermeasure combination; its onset, continuation and sustainability? What are the contributing factors (distal and proximal) to the way the facets of the phenomenon (i.e. policy context, actions and actors) operate? How could*

			the phenomenon, its facets and contributing factors be depicted graphically?
2	2	9	*How do stakeholders with institutional knowledge of policy development in road safety perceive of the importance given to PI in the development of NRSS? What conceptual framework (i.e. concept analysis) of PI can be developed from stakeholders' perspectives? How does the new principle differ from the existing one? How can this new principle be applied in transport policy development?*
2	3	10	*How many latent variables or model components are represented by the nine variables in table 10.2? What is the utility (predictive value) of the variables in the new model?*
2	4	11	*Which principles of self-organising are more frequently perceived as prevalent in the Australian road safety context? How does this Australian perception contrast with the perceptions of other comparable stakeholders?*

5.2.4 Data Management

This section provides an overview of the data collection and analysis procedures employed to address the research aims and questions. Four data collection events were undertaken. The data gathered were examined through a mixture of qualitative and quantitative methodologies. Detailed descriptions of these procedures and methods can be found in Chapters Six, Seven, Eight, Nine, Ten and Eleven.

5.2.4.1 Data Collection

Initially, the public comments made in response to community consultation for the 2011-2020 Australian National Road Safety Strategy were accessed to address the first research aim. These PDF files were exported to NVivo10 for analysis. This analysis contributed to the development of the typology in Chapter Ten. It helped to outline

community attitudes, thus providing a context for the development of a tool (i.e. a typology) in the tenth chapter for securing positive community attitudes towards road safety countermeasures.

Cassar (2003) stresses that the strength of a descriptive model lies in its empirical data generation, in which participants speak from personal, recent experience. This need to identify participants with personal, recent experience guided the semi-structured interviews (Chapter 7) with highly experienced local level road safety coordinators.

The semi-structured, ethnographic interviews were conducted with highly experienced, local level road safety coordinators in Australia and some OECD countries. These interviews helped to address the first research aim from an implementation perspective. To recruit the interviewees, e-mail invitations were sent to all potential interviewees identified in a sampling frame. Those road safety coordinators who replied to the e-mail and made themselves available for the Skype interviews within the prescribed period of data collection were included in the studies. This approach provided all members of the sampling frame an equal chance of participating in the interviews. The selection of the members of the sampling frame was aided by the information provided on the websites of relevant transport, planning and road safety departments in Australia and the OECD.

Subsequently, online questionnaires were designed from the qualitative data obtained through the semi-structured interviews. Specifically, two questionnaires were developed. The first incorporated variables extracted from the semi-structured interviews. This questionnaire targeted an OECD audience to further investigate the practical and conceptual natures of coordinated responses.

The second self-administered, online survey focused on Australia. It was designed from the comments made by the professional and public stakeholders in relation to the draft copy of the 2011-2020 Australian National Road Safety Strategy.

5.2.4.2 **Data Analysis**

Following the review of the literature, which identified an emphasis on procedural natures of the coordination of road safety responses, this research program narrowed its research aims down to conceptual, practical and systemic natures of coordinated road safety strategies. To examine these three aspects of the nature of coordinated road safety responses, a mixture of qualitative and quantitative data analysis techniques were employed. In this respect, content and thematic analyses (through NVivo10 and manual; see Chapters Six, Seven and Nine for details of the analyses) were employed to explore the texts of the semi-structured interviews and the written public submissions. In addition, descriptive and inferential statistical techniques (through SPSS 22) were applied to the data to quantify the variables relevant to the research aims, objectives and questions. Further details of the data analysis techniques employed in the current thesis can be found in the research papers and additional analyses for the descriptive model, the typology and the underlying structure of the new coordination concept.

5.2.5 Demarcation of Scope of Research

A '… fine grained description …' (Cassar, 2003) of coordinated road safety responses is herein thought to be achievable through an investigation of the actual processes utilised to coordinate responses in road safety.

To this end, those closest to the implementation processes employed to coordinate road safety programs at a local level will form part of the sample. The local knowledge assumed to be obtainable from these local level road safety countermeasure coordinators is expected to be both specific and illustrative of in-depth understanding of the manner in which coordinated responses in road safety are developed.

Furthermore, research objective 2 seeks to produce a detailed, empirical description of coordinated road safety responses. It assumes the existence of coordinated road safety responses in high income countries (Peden *et. al..,* 2004). Therefore, the present thesis will predominantly investigate coordinated road safety responses in Australia and some OECD countries.

However, whilst many of the practical factors arising out of the investigation of the nature of coordinated road safety responses will apply to OECD nations, the principles underpinning the findings from the present research program are expected to have broader implications. Although the perspectives investigated in this program of research originate from some OECD countries, the lessons drawn from their experiences may have external validity beyond the OECD geographic boundaries.

The present research program places emphasis on the emergence of coordinated responses in road safety. In this sense, it does not focus on any particular road traffic injury risk factor such as speed. Nor does it examine any specific countermeasure to risk factors such as speed cameras. Instead, it investigates the coordination (linkages and synergies) of strategies (responses) employed to address road traffic injury risk factors like speed.

5.3 PARTICIPANTS

The present program of research will identify experienced road traffic injury prevention coordinators in Australia and other OECD countries. These experts are expected to have in-depth knowledge and appreciation of the nature of coordinated responses in road traffic injury prevention at a local level. Their inclusion in the present thesis is owed to the WHO's acknowledgement that Australia and other OECD countries lead the world in the coordination of road traffic injury prevention countermeasures (2009b; 2013; 2015).

These professional stakeholders are expected to have worked with the community and other stakeholders in order to develop coordinated road traffic injury prevention countermeasures. These are countermeasures which are linked and yield outcomes beyond a single dimension of road trauma risk factors.

The experience of the participants is expected to be at least five years and preferably at a local level in Australia or another OECD country. Such focus on local level is justified on the grounds that the current research program centres around the implementation processes employed to engender coordinated effort. In this sense, stakeholders with only national level, planning experience will be deemed to be of less usefulness to the study than those involved in the actual implementation of coordinated action.

Particularly, this program of research will seek to recruit professional road safety stakeholders in Australia. These study participants are expected to have knowledge of the policy context in Australia relevant to road safety such as knowledge of linked countermeasures in road safety and synergies across them.

In addition, this research program will engage road safety experts from the OECD. The countries from the OECD will be chosen on the extent to which these are widely acknowledged as exemplary performers in terms of road safety management (i.e. low fatality rates) as shown in the World Health Organization's road safety reports (see WHO, 2009b; WHO, 2013 and WHO, 2015).

5.4 INSTRUMENTS

For the semi-structured interviews, an initial sampling frame will be used to identify potential interviewees. Subsequently, an interview guide will be employed to guide the collection of information in a semi-structured way. All interviews will be audio recorded with the consent of the interviewees.

The two online questionnaires will be designed on QUT Key Survey (version 8.7). QUT Key Survey is a straightforward questionnaire design software package made available to both staff and students at Queensland University of Technology (QUT). It is password protected and exports files into SPSS, Microsoft Excel, CSV and XML.

The content analysis of the interview data will be conducted on NVivo10. Similarly, the data identified in the written public submissions to the draft copy of the 2011-2020 Australian National Road Safety Strategy will be analysed through NVivo10.

The Statistical Package for the Social Sciences (SPSS) version 22 will also be widely used throughout the thesis to produce descriptive and inferential statistics. It will help to measure the variables in the two online questionnaires.

5.5 PROCEDURE AND TIMELINE

Much of the detail related to the procedures employed to investigate the qualitative and quantitative data gathered for this program of research can be found in the studies and the additional data analyses used to produce a descriptive model and a typology of coordinated road safety responses.

The studies in the present thesis do not appear in the same order these were published. This is partly due to the length of time required for data collection. The other reason for the differences between the publication dates and the order in which the papers appear in this thesis centres around the need to attend to feedback from peer-review rounds. As the editors required the revisions, greater attention was diverted to the papers under review than to the new studies.

5.6 STUDIES AND RESEARCH OBJECTIVES ADDRESSED

In this program of research, there are research papers and separate data analyses. The research papers (chapters Six, Seven, Eight and Nine) have been submitted to peer-reviewed journals for publication. In order to fully address the research aims and objectives, these research papers have been supplemented by further analyses. These additional analyses were also employed to tailor the evidence generating process in the present thesis to two research outcomes – i.e. a descriptive model and a typology. Figure 5.1 illustrates the flow of evidence across the chapters to generate the descriptive model. Accordingly, the failure of the relevant road safety literature to account for the emergence of coordinated responses has provided a rationale for the first two research papers (Chapters Six and Seven). The evidence derived from these research papers addresses the first research objective (RO1).

The evidence arising out of Chapter Six (Public Attitudes) shapes the policy context factors in the descriptive model. The output of the first two research papers (Chapters Six and Seven) represents a cross-section illustration (descriptive model) of a coordinated road safety response.

Chapter Eight outlines the development of the descriptive model (i.e. practical nature of coordinated responses) through statistical analyses performed on the data gathered in Chapter Seven (Adaptive Strategies).

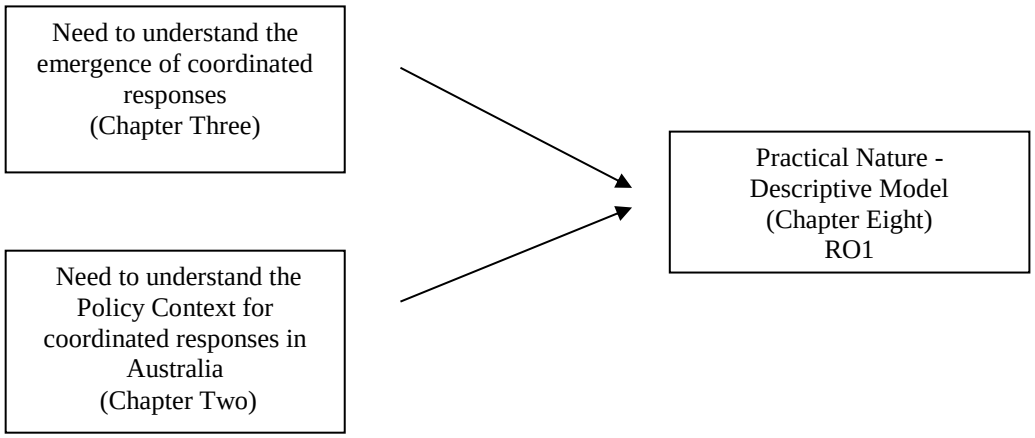


Figure 5.1. RO Input/Output from Chapters (Practical Nature of Coordinated Reponses)

The development of the conceptual framework (fig. 5.2) in the current program of research involves both generating a new theory and investigating the process in it which accounts for coordination. Accordingly, this layer of examination of the nature of coordinated road safety responses entails the reconceptualisation of PI (Chapter Nine) and the refinement of the concept in the new theory which describes coordination (Chapter Ten). The result of both chapters is a typology. This typology is arrived at from the examination of the underlying structure of the dimension or implementation

processes for coordination developed in Chapter Ten. It is also derived from the concepts employed in Chapter Eleven. Some of these concepts include centralisation (self-maintaining) and decentralisation (self-augmenting).

Furthermore, the conceptualisation of the typology is equally based upon the gaps identified in the literature (Chapter Three) – i.e. partially addressed isolated action and focus on individual agency performance. , the typology allows a theory to be generated about the factors contributing to optimal levels of coordination. It should provide a framework through which goals, agendas and priorities can be aligned/linked, thus comprehensively eliminating isolated action and a focus on a single agency performance.

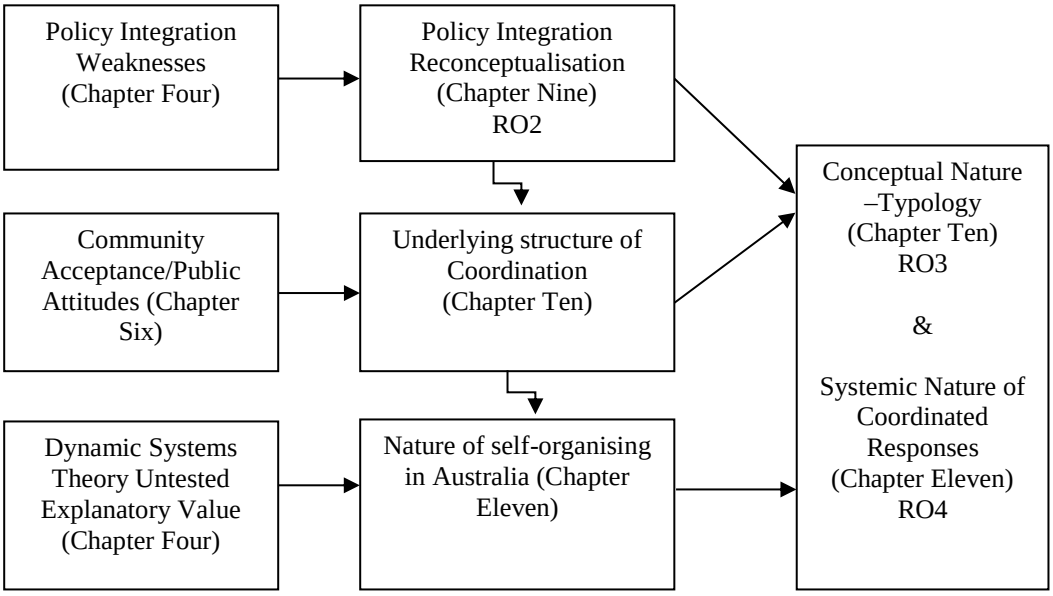


Figure 5.2: RO Input/Output from Chapters (Conceptual & Systemic Natures of Coordinated Responses)

Table 5.3 provides further information about the relationship amongst the components (i.e. parts, chapters, objectives, data collection and output) of the current

program of research. It maps the two parts against the chapters, objectives, data collection events and the respective outcomes/output. In this respect, there are three chapters in Part I. This first part describes the practical nature of coordinated road safety responses at a local level in Australia and some OECD countries. This description, which addresses RO1, will be obtained through three data collection events (see data collection for chapters Six, Seven and Eight in table 5.3). The output of these chapters will be variables, which will be used to build the descriptive model (Chapter Eight).

In Part II, three chapters will contribute to the design of a typology of the implementation process for coordination. These chapters (Nine, Ten and Eleven) will draw on data gathered in three separate events (see data collection for Part II in table 5.3). The results of these chapters will be variables, which will be used for the development and depiction of the typology (Chapter Ten).

Table 5.3: Overview of Research Program

Part	Chapter	Research Aim	Research Objective	Data Collection	Output
I	6	1	1	Public submissions to draft 2011-2020 Australian NRSS	Policy Context variables
	7	1	1	Semi-structured, ethnographic interviews & Self-administered, online questionnaire (OECD and non-OECD road safety coordinators)	Variables for descriptive model
	8	1	1	Additional data analyses from self-administered, online questionnaire (OECD and non-OECD road safety coordinators)	A descriptive model of coordinated responses
II	9	2	2	Written, professional submissions to draft 2011-2020 Australian NRSS	New principle for PI(coordination dimension for typology)
	10	2	4	Additional Data Analyses from Self-administered, online questionnaire (Australian road safety professional stakeholders)	System-based variables for typology
	11	2	3	Self-administered, online questionnaire (OECD and non-OECD road safety coordinators)	Typology of the new dimension of coordination developed in chapter 9

Both the literature review (Chapter Three) and the theoretical framework (Chapter Four) have assisted in the identification of the research aims for the present research program. Broadly speaking, these aims seek to investigate the practical, conceptual and systemic natures of coordinated road safety responses in order to understand the links across road safety countermeasures and the manner in which community buy-in can be secured. Framed as investigation pathways in this section, the three aspects of the nature of coordinated road safety responses allow a comprehensive scientific investigation of coordinated road safety responses to be conducted.

These three investigation pathways are outlined below.

Practical Nature

The practical nature of coordinated road safety countermeasures represents a description of the effort made to design coordinated responses at a local level. This is illustrated in three chapters – Six, Seven and Eight. Chapter Six explains public approval or community support. It also develops tools to measure public approval of road safety countermeasures. The second paper in this series investigating the practical nature of coordinated responses (Chapter Seven) outlines the strategies used to link countermeasures or programs. Chapter Eight depicts a graphical representation of the practical nature of coordinated responses in road safety at a local level.

Conceptual Nature

In Chapter Nine, the principle underpinning coordinated road safety responses (*Policy Integration*) within a government whole is reconceptualised. This reconceptualisation results in a new principle and seven implementation processes. One of these implementation processes is further investigated in Chapter Ten. This investigation enables the new implementation process to gain specificity, thus aiding its widespread adoption.

The conceptual nature of coordinated road safety responses helps to understand the underpinnings of the actions undertaken to link road safety countermeasures and secure community buy-in. This conceptualisation assists in examining the manner in which the

system parts (stakeholders and respective programs) interact recursively within the system.

Systemic Nature

The internal system interaction illustrated by the conceptual framework (see previous paragraph) does not explain the manner in which the system itself, as a government-professional stakeholder cluster, interacts with its outside environment in order to have inherent safety resilience through coordinated responses.

Chapter Eleven takes the examinations in this research program to a system level, transcending both the conceptual and practical levels. In this sense, the practical level represents the first and lowest point in the investigations. The second layer represents the conceptual nature whilst the third layer is systemic in nature. The relationship across these layers is one of influence and guidance. Whilst the actions executed at the practical layer (Chapters Six – Eight) are influenced and guided by the immediate conceptual framework (Chapter Nine), the nature of the latter is shaped by the manner in which it interacts with the top layer – i.e. systemic (Chapter Eleven). Therefore, an examination of both the practical and conceptual natures of coordinated responses benefits from an investigation of the systemic layer.

5.7 **ETHICS**

This research program has been approved by the QUT Human Research Ethics Committee. Its approval number is 1300000478.

5.8 CHAPTER SUMMARY

This chapter highlighted the need to supplement research questions with actual tools. This supplementation was justified on the grounds that research questions alone may be of limited practical application for this research program, whose underlying goals is to aid knowledge transfer about the emergence of grass-root coordinated road safety countermeasures. In this case, it is hoped that the development of a descriptive model and the evaluation of the explanatory properties of PI and DST can help to generate sufficient knowledge for countries to coordinate road safety countermeasures without the deficits identified in Chapter Three.

Additionally, the current chapter outlined the methodology employed in the research papers and additional analyses conducted in this thesis for the descriptive model, continua and the typology. Furthermore, this chapter describes the manner in which the three layers of investigation (practical, conceptual and systemic) influence and guide one another.

Chapter 6: Developing Public Attitude Monitoring Tools in Road Traffic Injury Prevention to Understand Shifts towards Moral Commitment

6.1 CHAPTER INTRODUCTORY COMMENTS

For road safety countermeasures to be fully coordinated and multi-pronged, these should enjoy public support and community engagement. This acceptance and involvement by the public in policy development is underpinned by attitudes. Therefore, it is imperative that these attitudes be examined in the context of the practical/procedural nature of coordinated, multi-pronged road safety responses.

This chapter holds significance to the present research program for two reasons. Firstly, it highlights the features of a potential challenge in obtaining community support for coordinated road safety responses. In this sense, it contributes to the first research aim. Secondly, the research paper in this chapter provides a description of public attitudes, which constitute a factor in road safety policy context. This variable allows a cultural dimension of road safety policy context to be understood.

This research paper has been submitted to the *Journal of Health Services Research & Policy* under the peer-reviewed stream. This multidisciplinary, peer-reviewed journal publishes research in the fields of Health and Safety.

The current research paper has been formatted in line with the Higher Degree Research Guidelines (Requirements for Presenting Theses), 2015 and the QUT Reference Guide, 2013 (Writing Your Thesis Using Word 2010 and End Note X6).

6.2 AUTHOR STATEMENT OF CONTRIBUTION

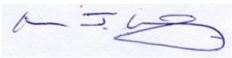
The authors listed below have certified* that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
5. they agree to the use of the publication in the student's thesis and its publication on the Australasian Research Online database consistent with any limitations set by publisher requirements.

In the case of this chapter:

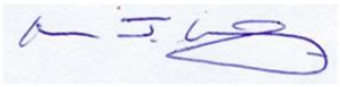
Publication title and date of publication or status: Developing public attitude monitoring tools in Road Traffic Injury Prevention to understand shifts towards moral commitment (submitted to *Journal of Health Services Research & Policy*)

Contributor	Statement of contribution*
Joao Canoquena	Collected data, conducted data analysis and wrote the manuscript
Signature 	

Date 9th March 2017	
Dr. Mark King * Signature  Date 9th March 2017	Aided the design of the research conceptual framework and provided editorial feedback on the manuscript as well as guidance in the selection of an appropriate peer-reviewed journal

Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Mark King		9th March 2017
Name	Signature	Date

6.3 PAPER ONE (AS SUBMITTED FOR PUBLICATION)

Canoquena, Joao Manuel da Costa & King, Mark (in Press) Developing Public Attitude Monitoring Tools in Road Traffic Injury Prevention to Understand Shifts towards Moral Commitment. *Journal of Health Services Research & Policy*

Abstract

Although community attitudes to road safety issues are collected and tracked in Australia through an annual survey and other mechanisms, these public opinions do not seem to have been placed along a tolerance-moral indignation continuum, which enables the authorities to understand the extent to which the public support for legislation, technical solutions or enforcement in Australia is shifting away from moral intolerance. This knowledge gap may exist because the tolerance-moral indignation continuum has not been previously examined to expand its categories. Therefore, this research paper employed the Grounded Theory Method and Meta-ethnography to develop two continua of public attitudes by examining the written 'public submissions' lodged with the former Australian Transport Council in early 2011 in response to the consultation request for the draft 2011-2020 Australian National Road Safety Strategy (draft 2011-2020 Australian NRSS). As a result, this paper identified ten categories of public attitudes towards road traffic injury prevention countermeasures, divided broadly into active,

negative, at one extreme, and active, positive, at the other. The active, negative public attitudes appeared to have the potential to disrupt road traffic injury prevention measures. The active, positive attitudes within the public segments with an interest in road trauma prevention could potentially mobilise a social consciousness towards compliance with and acceptance of road traffic injury prevention countermeasures.

The paper recommends ways to stall and reverse the trend in active, negative public attitudes.

Keywords: public approval; continuum; national road safety strategy; public consultation; coordinated responses.

6.4 Introductory Remarks

> The ability of the police to perform their duties is dependent upon the public approval of police actions. (Sir Robert Peel in Jiggins, 2011).

Car occupant injury in Australia accounted for nearly half (48.24%) of the 1,428 transport accidents which occurred in 2013 (Australian Bureau of Statistics, 2015b). Not surprisingly, Australia's attempts to modify road user risk behavior have focused on car-occupants and drivers. In this respect, Australia has employed compulsory seatbelt requirements, installation of red light and speed cameras, enforcement of the laws governing road use and public awareness of road safety (Australian Bureau of Statistics, 2015a). In actual fact, compulsory seatbelt wearing legislation has become a standard feature of road safety in Australia (Jiang *et. al*., 2015). In addition, random breath tests (RBTs), the chief drink driving enforcement strategy in Australia to deter and apprehend

drink drivers (Ferris *et. al.*., 2013; Armstrong *et. al.*., 2013; Freeman *et. al.*., 2013), have been widely employed in Australia (Jiang *et. al.*., 2015). In the State of Queensland, for instance, where there is a high level of exposure to random breath tests (Watson and Freeman, 2007), the calculated annualised average of random breath tests conducted between 2000 and 2011, stood at 3,189,307.8 per year.

These road user risk behavior modification measures may be of little effect unless there is moral commitment to them from the public in Australia. Moral commitment is underpinned by public approval. Public approval of police action (Jiggins, 2011) is a fundamental principle guiding the development of road strategies in Australia. In fact, the principles employed to develop the specific measures found in the National Road Safety Strategy (NRSS) for 2011-2020 in Australia highlight the significance of public attitudes. The first of these two principles for the choice of road safety strategies stipulates that the response or intervention should represent substantial benefit potential. In other words, the interventions found in the National Road Safety Strategy in Australia have been assessed on the extent to which there is evidence of the likelihood of these being effective in addressing identified crash risk issues. The second principle points to an Australian government's concern and appreciation of the value of public attitudes. This principle requires that there not be unfair inconvenience to the public as a result of the new interventions. This initial concern for public attitudes has, subsequently, been translated into community support in the communication about the strategy, which has followed its launch in 2011.

The significance of community support or public positive attitudes has been documented in the literature too. Firstly, Snortum (1990) examined the public approval

in the context of the enactment of and subsequent amendments to the British Road Safety Act 1967. Snortum's work unveiled key factors shaping public approval. These were said to be the media with '… strong moral overtones in their stories …' (Snortum, 1990, p. 489) and "powerful social forces" with their promotion of the consumption of alcohol (Snortum, 1990, p.480). Whilst Snortum (1990) noted the media as a key factor shaping public opinion, Tranter and Lowes (2005) highlighted the adverse impact of the legitimacy of motorsport messages. , Tranter and Lowes argued that motorsports glorified speed and alcohol consumption (2005). This glorification was said to undermine public health promotion (Tranter and Lowes, 2005). In other words, by conferring legitimacy to speeding and alcohol consumption, motorsports were thought to increase the likelihood of tolerance towards these two road traffic injury risk factors to rise.

Secondly, the rationale for securing public approval for road safety interventions has been echoed globally. Accordingly, the WHO has consistently recommended the need to secure public support in order to ensure effective law enforcement in road safety (WHO, 2009b; WHO, 2013). In this respect, Jiggins (2011) has explained that public support allows laws to work as a "wedge" incrementally driven between impulse and action.

Snortum (1990) identified two critical aspects of public approval, specifically: *fear of apprehension* and *moral commitment*. In this respect, citing research in Sweden and the USA, Snortum (1990) asserted that *moral agreement* with the law appeared to correlate more strongly with law-abiding behaviours than the risk of arrest.

This observation led to the identification of a continuum in public perception of risk factors. This range had *tolerance* of risk factors such as speed, at one extreme, and *moral indignation*, at the other. *Moral indignation* was said to be incited by the media through the intensity of publications (i.e. number of news items) around breaches committed by members of the establishment (people in responsible positions) (Snortum, 1990). In this case, public attitudes towards risk factors hardened or softened along this continuum (Snortum, 1990). Accordingly, public *tolerance* represented a perspective of indifference towards road traffic injury risk factors such as speed and alcohol consumption. *Tolerance* towards risk factors is further elucidated in Jiggins (2011). This view holds that when there is *tolerance* towards road traffic injury risk factors, people will tend to see it as a "normal" behaviour, becoming, therefore, reluctant to criminalise it (Jiggins, 2011).

Consequently, hardening the attitudes towards risk factors would represent a shift away from *tolerance* and a move towards *moral indignation* towards, for instance, promotional measures for speed (e.g. motorsport) and alcohol consumption (e.g. beer advertisement).

A second result of Snortum's (1990) observations was the identification of *moral commitment* as a catalyst for *compliance* with road safety countermeasures. Indeed, *moral commitment* was viewed as a precursor to law abiding behaviour.

Neither continuum developed by Snortum appears to have gained traction with the practices in Australia. Current practice in Australia to measure and monitor public attitudes represents an (mostly) annual survey of public attitudes towards road safety issues (*Survey of Community Attitudes to Road Safety*). This questionnaire, which elicits

opinions on risk factors, countermeasures and usage (e.g. sealt-belt), is employed to compare data related to public approval of road safety on a number of issues over a period of time. Conducted since 1986 (although not in every single year), the *Survey of Community Attitudes to Road Safety* is utilised as a barometer of public attitudes in Australian road safety management. Its results are reported as both percentages of participants with a certain attitude (i.e. 31% mention speed). For instance, on page v, the following main findings are reported:

> When asked to nominate the factor that most often leads to road crashes, 31% mention speed, 18% inattention/lack of concentration, 11% drink driving, 8% driver distraction/driving while on a mobile1 and 7% driver fatigue.

In addition, the survey reports whether or not there has been any change on the attitudes since the previous survey or a date further into the past (e.g. This outcome shows a decline from the 2011 result of 40%.) (See Department of Transport and Regional Services, 2005; Department of Infrastructure and Regional Development, 2014).

This traditional approach to the monitoring of public attitudes in Australia has limited application in the development of coordinated road safety countermeasures, in which the community plays an active role. It does so due to the fact that it is currently difficult to identify a state of public acceptance/approval or otherwise of countermeasures in road safety. Whether or not there is *moral commitment* in the public midst cannot be established from percentage values. In fact, it is rather challenging to understand the role of public approval in shaping road safety policy through the approach described in the previous paragraph (i.e. *Survey of Community Attitudes to*

Road Safety). Put otherwise, *moral commitment* as the catalyst for public compliance with road safety countermeasures cannot be currently established through an investigation of the rate of attitudinal change towards, for example, speed over a period of time. This monitoring approach (i.e. attitudinal change based on percentage value differences) fails to acknowledge a number of chief trends. On the one hand, it is likely to ignore small, yet significant changes towards *intolerance*. On the other hand, it is highly unlikely to inform policy design because of its inability to map a trend path in relation to attitudes towards countermeasures (as opposed to risk factors alone). Additionally, it may result in little deliberate effort to influence public attitudes towards a desirable state (i.e. *moral commitment* with countermeasures). , there needs to be a classification (i.e. categories) of the trend paths in the changes over a period of time. Most importantly, this set of categories can help to establish a path towards enhanced levels of community buy-in. This buy-in represents community acceptance of both legislation and enforcement where these are called for or some other form of countermeasure (i.e. technology or road user behaviour changing programs). Therefore, there is a need to investigate public attitudes towards road safety countermeasures in order to scientifically develop a community acceptance or approval monitoring tool for the Australian context. Such mechanism could be a continuum or continua of public attitudes.

6.5 METHODS

The previous section highlighted the deficits in establishing the presence of moral commitment. It also outlined the absence of a tool to monitor the shifts in moral commitment. Therefore, this study will investigate the following research questions:

given the importance of moral commitment in supporting legislation and enforcement, what practical tools can be developed to monitor it and its shifts (path trend)? What is the path trend in moral commitment within the Australian public with an interest in road safety?

In order to address these research questions, the present research paper will adopt the Grounded Theory Method. This methodology will enable the development of a public attitude continuum or continua, thus enabling a trend path in public attitude towards road safety countermeasures to be established.

6.5.1 Data Collection

The data examined in this study constituted the 'public submissions' lodged with the former Australian Transport Council in early 2011 in response to the draft 2011-2020 Australian National Road Safety Strategy (draft 2011-2020 Australian NRSS). These opinions were collected by the former Australian Transport Council (ATC). The consultation with the public occurred after the government Transport and Roads agencies had developed the policies. In other words, these were not co-developed with the public in Australia. In fact, the development of the strategies in the draft document represented the outcome of a vertically coordinated process, with Transport Ministers initially delegating the task of developing high level content for the strategy to the Heads of the Transport and Roads government agencies. These officials, subsequently, sought public consultation for a period slightly longer than two and a half months (1st December 2010 and 18th February 2011).

The public responses were solicited in two formats – online submissions and return mail. Grouped under eight Australian jurisdictions (six States and two Territories)

and an additional category called Unknown Jurisdiction, the 544 'public submissions' were obtained from the website of the Australian Department of Infrastructure and Transport. Subsequently, these 'public submissions' were imported into NVivo10 as PDF files.

6.5.2 Sample Characteristics

Out of 544 "public" submissions, this study generated (coded) 2309 NVivo10 relevant references (sentences or clauses). The average word count in the references was in excess of 161 words (table 6.1). The submissions not coded were deemed not to be relevant for reasons listed under Data Analysis.

Only 133 of the reference writers included self-identifying information such as the type of road user (table 6.1). In this respect, O*thers* included a teacher, a business person, an engineer, a pilot, a medical worker, a commuter, a journalist, a mobility scooter user, a courier, a bus passenger, a highway maintenance worker, and a retired local court magistrate. Whilst most would be regarded as members of the "public", the retired local court magistrate and many unidentified writers in the submissions from unknown jurisdictions may not have been completely outsiders to the government institutions. Therefore, this study will qualify the use of the word public with double, inverted commas.

Table 6.1: Sample Characteristics

Sample Characteristics	Frequency
"Public" Submissions (N)	
Analysed submissions	544
Coded submissions	483
NVivo10 References	2309

Word Count (Mean)	
"Public" Submissions	161
NVivo10 References	128
Self-Identified Writers (N) 133	
Drivers	74
Motorcyclists	26
Cyclists	12
Emergency Officers	9
Others	12

6.5.3 Data Analysis

To understand the "public" approval (or otherwise) of the approaches in the draft 2011-2020 Australian NRSS, two theory-generating techniques were employed, namely: the Grounded Theory Method (Pidgeon and Henwood, 1996) and Meta-ethnography (Noblit and Hare, 1988).

Grounded Theory Method

To begin with, the written 'public submissions' were read to identify units of meaning with an underlying attitude towards the draft 2011-2020 Australian NRSS. This examination excluded suggestions and accusations or criticism of other road users. In this respect, when the writer appeared to be merely making a suggestion (e.g. dob-in-hotlines, dashboard-mounted cameras, road safety as a mandatory school subject, reward schemes for compliant road users or increased policing) or commenting on other road users (e.g. cyclists vs motorists), the text was not included for further analysis.

As instances of an attitude towards a countermeasure were identified, these were placed under sets of words on the basis of proximity in meaning and intensity of attitude. These sets received no labels initially. This search for attitudes yielded a maximum of five sets of sentences and phrases as no further categories appeared to emerge.

Meta-Ethnography

Once the references (NVivo10) were grouped under each attitude category, a synthesis was developed of the underlying message across the sentences and phrases within a single category. This process began with the development of metaphors for each sentence/phrase under the categories or sets (see table 6.2).

Table 6.2: Metaphors for Sentences in Categories

Sentences	Metaphors
I suspect that if a proper scientific evaluation of the accident data were undertaken, that the reduction of fatalities over the years has little to do with regulation and more to do with improved safety technology in vehicles. [RFNC18]	Merits of regulation
It gives the appearance of nothing more than revenue raising [RFNC23]	Safety cameras as revenue raising
Remove the emphasis on SPEED being the culprit, that is a cop-out. [RFNC13]	Emphasis on speed as a cop-out
Is road safety the issue or is raising revenue the issue. [RFNC24]	Questionable issue (road safety vs revenue)
After decades of speed traps and other revenue raisers that have proven overseas to be ineffective- you want more. [RFNC4]	Merits of emphasis on speed

Accordingly, five sentences under one category (table 6.2) were compared and translated into one another with the aid of two queries, namely: *what metaphors (themes) are represented in these sentences; how do the attitudes to the metaphors (themes) compare to one another?* This construction of "interpretive explanations" (Noblit and Hare, 1988) modified *Reciprocal Translation Synthesis* (Hoblit and Hare, 1988) in one respect. Whilst *Reciprocal Translation Synthesis* (Noblit and Hare, 1988) grounds the comparison of similarities across accounts in the context of the accounts, the units of meaning in the current study limited this rationalisation for being briefly expressed opinions. Put otherwise, these brief views did not provide thick descriptions of contexts. In this respect, the fourth step in *Reciprocal Translation Synthesis* (Noblit and Hare, 1988) was replaced by an examination of contents of the sentences only.

The answers to the two aforementioned queries yielded the following continuum: cynicism – disbelief – refutation - resentment - defiance. These labels for the categories

represented a synthesis of each category. As such, cynicism, in this case, appeared to represent a degree of suspicion or scepticism rather than face-value acceptance. Disbelief, on the other hand, meant disagreement or simply not believing in the accuracy of what was reported or proposed. Refutation went a step further than disbelief. In this case, refutations appeared to be disbelief substantiated by evidence. Indignation reflected a degree of frustration. However, this dissatisfaction fell short of defiance for not evoking dissent.

Accordingly, as the initial syntheses depicted only disapproval, further examination was required to ascertain whether or not the stances expressed by the public also contained approval. In addition, one of the original ATC public consultation survey questions (i.e. question 4) justified the search for potential approval. This question was put to the "public" as follows: *what do you think is good about this draft strategy?*

This development of a positive continuum began with the identification of pairs of attitudinal codes or operators along a continuum. As a result, the negative operators were placed along a continuum from the least (*cynicism*) to the most negative attitudinal operator (*defiance*). This continuum allowed opposites (i.e. positive opinions) to be identified. Essential to this exercise was the need to ensure the increase in attitude intensity in one continuum was aligned with the paired attitude on the other continuum.

Distinguishing between one positive attitudinal operator and the next posed a range of difficulties. On the one hand, the dictionary (Oxford English Dictionary & Macquarie English Dictionary) definitions of these concepts or attitudinal operators did not appear to fully capture the nature of the paired opposites (e.g. *cynicism* vs *naiveté* or *disbelief* vs *trust*). In other words, the dictionary definitions did not depict the opposites

of the negative operators with the same level of intensity as that featured in the negative continuum. For instance, the Oxford English Dictionary defined *acceptance* as synonymous with *consent, agreement with an idea* or *belief in an idea* (2015). None of these synonyms for *acceptance* captured the absence of suspicion or cynicism with satisfactory clarity. On the other hand, the dictionary definitions lumped the attitudinal operators into the same categories as words meaning exactly the same (i.e. synonyms). In this respect, the boundaries amongst the attitudinal operators did not appear to exist. Whilst the negative continuum showed a range of attitudes from passive (i.e. *cynicism*, *disbelief* and *refutation*) to active negativity (i.e. *resentment* and *defiance*), the positive continuum (with definitions of the opposites of the negative attitudinal operators from dictionaries) did not seem to accommodate this set of broader categories. Therefore, an alternative approach to identifying opposites of the negative attitudinal operators in dictionaries was employed. Accordingly, the study defined positive attitudinal operators in a codebook (Guest and MacQueen, 2007), which can be found in table 6.3.

Table 6.3: Codebook for Positive Attitudinal Continuum

	Attitudinal Operators				
Code	*Dispassion* ➔	*Acceptance* ➔	*Belief* ➔	*Affirmation* ➔	*Compliance* ➔
Definition	Dispassionate opinion in favour of the draft or its strategies without characterisation i.e. no adjectives, often in response to a question eliciting positive comments	Unsuspecting endorsement, which denotes some interpretation	Generic praise with a degree of Confidence;	Specific praise with substantiation; defence of an idea	Conformity; concurrence, evoking a positive action
Exemplar	'the review of road construction and road maintenance' [RFNC922]	'Emphasis on improving roads' [RFNC200]	'The Draft National Strategy sounds good, hopeful and positive' [RFNC300]	'That the way licensing is coming under review is a good thing. I think that gaining a license is a PRIVILEGE not a RIGHT, and	'Expedite the strategy asap. I understand process has to happen however some measures could be implemented a lot sooner without the beaurocratic red tape.'

				making the person work harder with better driver training is a great idea.' [RFNC111]	[RFNC598]

Once a codebook was designed, a research assistant was trained in its use. The research assistant worked for the Centre for Research and Road Safety – Queensland, Australia (CARRS-Q). This research assistant and the authors used the codebook to further code the "public submissions." This time, the coding identified positive attitudes about risk and/or countermeasures.

The level of concordance or agreement between the two coders was subsequently established. This resulted in an overall ninety-four per cent agreement rate. The items for which agreement was not achieved were reviewed by the author. This forced the codebook to be expanded upon. This expansion saw the insertion of Included and Excluded cases (see table 6.4). Following this change to the codebook, the six per cent of items which had not received agreement were recoded. This coding process resulted in a hundred per cent agreement between the coders, thus affording the codebook inter-rater reliability.

Table 6.4: Codebook for Positive Attitudinal Continuum

	Attitudinal Operators				
Code	*Dispassion* ➔	*Acceptance* ➔	*Belief* ➔	*Affirmation* ➔	*Compliance* ➔
Definition	Dispassionate opinion in favour of the draft or its strategies without characterisation i.e. no adjectives, often in response to a question eliciting positive comments	Unsuspecting endorsement, which denotes some interpretation	Generic praise with a degree of Confidence;	Specific praise with substantiation; defense of an idea	Conformity; concurrence, evoking a positive action
Included	Answers to question	Endorsement of the	Expression of	Use of evidence to	Call for compliance

	4, which only list the 'good things about the strategy'	strategy in moderate terms	confidence in the potential of the strategy to succeed	support endorsement of the strategy	with the strategy
Excluded	Opinions with adjectives or indicators of intensity of opinion	Endorsement with a future outlook	Specific praise with no future outlook	Mere endorsement or praise without reference to evidence or attempt to convince	Endorsement without a call for compliance or passive endorsement
Exemplar	'the review of road construction and road maintenance' [RFNC922]	'Emphasis on improving roads' [RFNC200]	'The Draft National Strategy sounds good, hopeful and positive' [RFNC300]	'That the way licensing is coming under review is a good thing. I think that gaining a license is a PRIVILEGE not a RIGHT, and making the person work harder with better driver training is a great idea.' [RFNC111]	'Expedite the strategy asap. I understand process has to happen however some measures could be implemented a lot sooner without the beaurocratic red tape.' [RFNC598]

In summary, the analysis approach adopted in this study can be summarized in fig. 6.1 below. This figure can be viewed by zooming in (210%).

Figure 6.1: Data Analysis Techniques

6.6 RESULTS

6.6.1 Negative Attitudes

To refer to the opinions in the "public submissions", this section will use the NVivo10 reference number. The short form for reference, RFNC, will be adopted herein. In addition, it is worth noting that because the analyses were merely qualitative, the stances are not quantified. These are only said to appear to exist. The extent of their existence is beyond the scope of the current study.

Synthesis

The concepts surrounding speed evoked a wide range of negative attitudes. Speed was associated with speed cameras (or safety cameras) and revenue raising (table 6.5). In this respect, the association of the speed reduction measures with governments' potential *ulterior motives* was made along a continuum of negative attitudes, ranging from *cynicism* to *defiance* as illustrated in table 6.5. The *cynicism* identified in the references focused on both the role of regulation and the apparent lack of transparency. In this respect, there was scepticism in relation to the role of regulation in speed reduction (RFNC18), on the one hand.

On the other hand, there was the impression that issues other than speed were being ignored or deliberately glossed over (RFNC13). This call for a broader perspective resonated with some writers, albeit with different views on what that direction should be.

Some areas regarding newer vehicles and better driving education are covered. But they need to be the cornerstones of the campaign, not the alcohol, speed and telephone use. (RFNC331).

The over emphasis on speeding has meant other issues are ignored. (RFNC450).

Similarly, *suspicion* appeared to exist in relation to the actual motives behind the focus on speed reduction measures (RFNC24). Most importantly, the perceived simplistic nature of the strategies and the partial appreciation of the issues related to the strategies appeared to have given rise to *resentment* or *indignation*. Accordingly, there seemed to be some annoyance at the simplistic nature of the strategies in the draft 2011-2020 Australian NRSS (RFNC44).

There was *disbelief* at the prospect of success of the strategies in the draft due to the lack of novelty and clarity in the actual interventions (RFNC3; RFNC10). Likewise, there was distrust of the effects of speed reduction measures in the draft 2011-2020 Australian NRSS (RFNC14; RFNC43). These sentiments were justified on the perceived lack of evidence for the strategies in the draft (RFNC20). Additionally, the merits of speed reduction measures appeared to be rebutted or refuted (*refutation*) by some "public submissions." This *refutation* of the merits of safety cameras was justified on the grounds of relevant experiences elsewhere (RFNC5; RFNC6; RFNC28; RFNC49). In this case, safety camera experiments in the UK and other countries (mostly European) were cited as proof to challenge the merits of safety cameras in the draft of the 2011-2020 Australian NRSS (RFNC5; RFNC6: RFNC49).

Furthermore, there seemed to be a sentiment of *defiance* in the "public submissions." This perceived disobedience appeared to be sparked by an alleged government focus on both speed reduction measures and increase in legislation and enforcement. Specifically, there was a degree of *defiance* to both the focus on speed

reduction measures (RFNC7) and the perceived excess in legislation and strictness in enforcement (RFNC1725).

Continuum (Negative)

The sentences used to develop metaphors and the synthesis for the negative continuum presented above can be found in table 6.5. These sentences are herein quoted verbatim and represent only a sample. A much larger number of sentences were coded for the purpose of the current study. All other sentences left out expressed the same views as those listed in table 6.5.

Table 6.5: Exemplars of Public Attitudes along the Negative Attitudinal Continuum

CYNICISM	DISBELIEF	REFUTATION	INDIGNATION/RESENTMENT	DEFIANCE
I suspect that if a proper scientific evaluation of the accident data were undertaken, that the reduction of fatalities over the years has little to do with regulation and more to do with improved safety technology in vehicles. [RFNC18]	Almost everything on this draft is a proven failure as it is the same stuff that has been floating around for decades. It is a failure, otherwise you would not be doing this. Again [RFNC3]	Interestingly, many countries are dismantling their "safety" camera systems; because the evidence shows they do NOT reduce crash rates or "speeding". [RFNC49]	Enough of simplistic strategies aimed purely at revenue raising or that provide nice media soundbites but that don't actually work. [RFNC44]	over-legislation and strict enforcement of rules that people do not believe in only lead to dissent. [RFNC1725]
It gives the appearance of nothing more than revenue raising [RFNC23] Remove the emphasis on SPEED being the culprit, that is a cop-out. [RFNC13]	The cycling strategy is laughable at best, non-existant at worst. [RFNC10] I do not believe reducing speed limits is going to reduce deaths on our roads it will only increase revinue. [RFNC43]	As proven in the UK and elsewhere, speed cameras don't work [RFNC6] One has to question the interpretation of Australian speed statistics .... the roads [in Germany] with the highest or indeed no speed limits had by far the least fatalities. This is totally at odds with the draft conclusion that "reducing speeding leads to a reduction in crashes" [RFNC28]	As a member of the public I tire of your studies that 'prove' how dangerous it is to speed and how safe it is to spend 30% more time on the road than necessary, that 30% of course being added to the last hours of your journey when you are most fatigued, bored & disinterested. Best of luck with your strategy, we both have the same goals in mind, but I fear we will never agree! [RFNC34]	The fixation you seem to have with reducing speed is never going to be accepted by the public for as long as it is one of the best funding schemes. [RFNC7]
Is road safety the issue or is raising revenue the issue. [RFNC24]	Reducing urban speeds to 50km/h has caused nothing but confusion, frustration and has not contributed to improving the road tolls - it sure has contributed to improving the revenue from speed camera traps though !! [RFNC14]	How taking a photo (…"speed cameras can …reduce serious casualties… "pg 30), stops an event is mystifying to me. (There is no intervention). [RFNC49]		All that will be achieved by proposing this will be public backlash. [RFNC645]
After decades of speed traps and other revenue raisers that have proven overseas to be ineffective- you want more. [RFNC4]	There seems to be a number of initiative suggested in the draft with no corroborating evidence that they will actually reduce fatalities/serious casualties like the Intelligent Speed Adaption. [RFNC20]	When areas in the UK removed speed cameras there was no change in the road toll [RFNC5]		

6.6.2 Positive Attitudes

Synthesis

Dispassion was conceived, in the current study, as the first point along the positive continuum and addressed question four (i.e. what do you think is good about this draft strategy?) of the "public" submission form published by the former Australian Transport Council. The answers to this question were often dispassionate phrases, devoid of any characterisation (table 6.6), which listed specific features of the draft 2011-2020 Australian NRSS. In this respect, sections of the "public" appeared to dispassionately endorse safety ratings (5 star ANCAP), legislating vehicle safety features, the systematic nature of the draft and its inclusion of reward schemes. Additionally, the existence of a consultation process merited equal dispassionate endorsement.

Acceptance, in this study, was viewed as cynicism-stripped endorsement of the draft, which appeared to have been expressed in two significantly different manners. On the one hand, there was broad endorsement of the draft, which mostly found it to be '…great …' [RFNC113], '…fantastic …' [RFNC314] or simply '… well presented …' [RFNC283]. Likewise, the endorsement included a sense of personal satisfaction as manifested in the following statement: 'I am very greatly impressed with the Strategy' [RFNC733].

On the other hand, there was more specific *acceptance* of the draft 2011-2020 Australian NRSS. In this sense, there appeared to be unreserved support for specific issue inclusion (e.g. roads, fatigue effects, motorcycle black spot, car safety enhancements, staged licensing, driving practice opportunity improvements etc.), issue coverage or comprehensiveness and the appropriateness of the draft format (i.e. language clarity and information sufficiency) [RFNC97]. In addition, *acceptance* was also expressed towards the format of the draft 2011-2020 NRSS. In

this respect, the inclusion of scientific evidence or statistics was accepted as a positive feature of the draft 2011-2020 Australian NRSS. Most importantly, sections of the "public" in Australia welcomed the opportunity to comment and appeared to view this as a genuine attempt by the former Australian Transport Council to gain input from the community.

Belief was viewed in the current examination as the attitudinal operator separating the active attitudes (*affirmation* and *compliance*) from the more passive ones (*dispassion* and *acceptance*). , *belief* comments depicted a degree of confidence in the draft and its strategies rather than mere endorsement and *acceptance*. Furthermore, the expressions or opinions framed under *belief* were seen as having a future outlook. Accordingly, a group of respondents to the former Australian Transport Council's request for public comments believed that '… something positive [was being done] about our driver safety' [RFNC780]. Similarly, there appeared to be a *belief* that the draft would '… save lives' [RFNC129]. Most importantly, there seemed to be a *belief*, although qualified in one case, that the draft provided a framework for a future action plan [RFNC355].

Affirmation stood, in this research paper, in stark contrast to *refutation*. Whilst *refutation* was conceived as a negative reasoning approach, *affirmation* was positive and supportive of the draft 2011-2020 Australian NRSS. In this sense, it was viewed as specific endorsement of an aspect of the draft accompanied by some attempt at substantiating such endorsement. Accordingly, sections of the Australian "public" interested in road safety affirmed their support for the focus on the Safe System Approach (i.e. four pillars of safe roads, safe speed, safe drivers and safe people) and the flagged reduction of BAC limit in the draft. These supporting writers argued that the adoption of the Safe System Approach would '… help to break down the issue [s]' [RFNC359] and demonstrated a '… commitment to …' each pillar [RFNC844]. As for the

reduction in the blood alcohol concentration threshold, the justification rested upon the *belief* that it would '…decrease the percentage of people having fatalities …' and '… give people another reason not to drink' [RFNC239].

Much like *defiance*, *compliance* was, in this study, perceived as an active attitude, albeit a positive one. Accordingly, the references extracted from the "public submissions" were examined to identify calls for *compliance* or suggestions that the implementation of the strategy should be pursued. Despite iterative reviews of the submissions, this attitude, not unlike *defiance*, did not appear to feature prominently in the "public submissions." Nonetheless, a writer urged the adoption of the strategies in the draft, conceding the likelihood of delays, typical of official processes [RFNC598].

Continuum (Positive)

Some representative sample sentences for the aforementioned synthesis of the positive continuum can be found in table 6.6 below.

Table 6.6: Exemplars of Public Attitudes along the Positive Attitudinal Continuum

DISPASSION	ACCEPTANCE	BELIEF	AFFIRMATION	COMPLIANCE
Regulation to speed up the adoption of safety features in new vehicles. Lower speed limits for trucks, for safety and environmental benefits. [RFNC288]	The suggestion of positive reinforcement for good driving behaviour; the use of graduated advancement for new driver/riders as their experience increases; the use of wire rope dividers on high risk sections of road. [RFNC403]	The Draft Strategy sets out an action plan for helping to ensure further reductions in the road deaths and serious injuries. It contains a set of behavioural and design proposals that, if implemented, would clearly contribute to diminishing Australia's most serious public health problem. [RFNC355]	A major positive You have maintained a focus on four key areas - Safe roads, Safe speeds, Safe vehicles and Safe people. This contains the overall vision to four readily-recognisable, practical themes and demonstrates a commitment to each. [RFNC844]	Expedite the strategy asap. I understand process has to happen however some measures could be implemented a lot sooner without the beaurocratic red tape. [RFNC598]
Safer cars - encouraging 5 star ANCAP cars [RFNC209]	The paper does seek some good outcomes for heavy vehicles, motocycles and pedestrians. [RFNC609] In general I think the strategy is a good one and covers most of the areas that are needed to achieve the desired outcomes. [RFNC2188]	It's a step in the right direction [RFNC178] That we are doing something positive about our driver safety. [RFNC780]	I believe it would be better if the blood alcohol concentration (BAC) limit was reduced to .02, One of the reasons for this is, that it will decrease the percentage of people having fatalities and also, give people another reason not to drink [RFNC239]	
That this is happening and you have a community consultation process. [RFNC1002]	I congratulate the persons who have painstakingly put this together, it is excellent work... [RFNC782] Congratulations on what is a very comprehensive and thorough strategy document, expressed in practical language. [RFNC97] Congratulations to all concerned on the development of this strategy which takes many problems into account and seeks solutions. [RFNC658]	It is systematically based, aiming to bring the general public on board and it emphasises the role of personal responsibility. [RFNC110] it will save lives. it will save accidents and money and injury... [RFNC129]	The focus of the four critical elements of safe roads, safe speeds, safe drivers and safe people coupled with the treatments and measurements of success help to break down the issue. [RFNC359]	

Attitudinal Quadrants

Closer inspections of the attitudinal categories developed above revealed a distinct set of quadrants or broad categories of attitudes, namely: positive, active; positive, passive; negative, active; and negative, passive.

The active attitudes evoked action and mobilised a collect consciousness towards action (i.e. defiance or dissent, in the negative and compliance, in the positive continuum). The passive attitudes, on the other hand, represented opinions with little evidence of either substantiation or frustration.

In this respect, the active, positive attitudes represented one extreme of the typology (top left hand side). The other extreme included active, negative (bottom right hand side) stances towards risk and road safety responses (fig. 6.2).

Active Positive: *Compliance - Affirmation*	**Passive Positive**: *Dispassion - Acceptance - Belief*
Passive Negative: *Disbelief – Cynicism*	**Active Negative**: *Indignation – Refutation - Defiance*

Figure 6.2.: Public Attitude Quadrants

6.7 DISCUSSION

This research project focused primarily on public attitudes towards road safety countermeasures as presented to the public in draft form in 2011 in Australia. As a result, it has

unveiled some public concerns towards road safety countermeasures (as opposed to risk factors) and two attitudinal continua. Whilst the public in Australia appears to be concerned with the state of the road transport network, their attitudes towards the countermeasures featured in the 2011 Australian NRSS can be placed along two distinct continua – i.e. a negative and a positive. Each point along a continuum can be further classified as passive or active. In this respect, the public attitudes in Australia to road safety countermeasures seemed to range from *cynicism* (passive) to *defiance* (active) on the negative continuum. On the positive continuum, the attitudes of the public in Australia in 2011 varied from *dispassion* (passive) to *compliance* (active). , the active, negative attitudes towards countermeasures will see these being disrupted. The active, positive attitudes, on the other hand, are expected to generate a collective consciousness towards conformity with the law.

Above all, the issues towards which the public in Australian have an attitude have also been specifically distilled in the current research. In this case, the Australian public appears to be *defiant* towards perceived excesses in legislative reforms and strictness in enforcement. Conversely, there seems to be *scepticism* about the science underpinning the road safety responses in the draft Australian 2011-2020 NRSS.

6.7.1 Significance of the Findings

Common practice in the examination of public attitudes appears to be the identification of either percentage value change trends in public perceptions about road trauma risk factors or the often-neglected "populist perceptions." These attitudes tend not to shape policy development as these are viewed as the result of self-serving interest groups' advocacy. However, through the present study, public attitudes can now be viewed for what these actually represent – i.e. underlying support or otherwise for countermeasures in road safety, which can shift over time.

This shift can now be monitored through the tools developed herein, thus allowing road traffic injury prevention policy designers to engender measures to increase moral commitment. In fact, the continua developed in this research paper allow the monitoring of public endorsement (or otherwise) to be more effective. Being able to report increases (or otherwise) in *compliance* or *defiance* allows the effects of public policy upon road safety user attitudes to be closely monitored, thus allowing shifts to be either engineered or stimulated in a timely manner. Accordingly, the present study identified four quadrants in public attitudes. These help to map the shift in the support of the community towards road safety programs.

In brief, the present research has illustrated the complexity in mapping a path trend for a shift in public attitudes in Australia. This complexity arises from the fact that it has been herein revealed that the two attitudinal extremes of *defiance* and *compliance* are separated by eight other stances or attitude categories. This may justify the long length of time it takes to effect a shift in public attitude. For instance, the British Road Safety Act 1967 took 21 years to enjoy *moral commitment* from the public (Snortum, 1990). However, with the continua developed herein, it is less likely that such timeframe will be required for shift in public attitudes to occur.

Most importantly, it has been revealed that unlike previously thought (see Snortum, 1990), the difficulties in legislating and enforcing countermeasures may not arise from mere tolerance towards risk factors. It may emerge from the more active, negative attitudes towards the actual countermeasures such as *indignation*, *refutation* and *defiance*. These attitudes may be underpinned by more than views of risk factors. These may exist because of the lack of convincing hard scientific evidence, showing the effectiveness of the countermeasures and the absence of community engagement in policy development. Additionally, defiance may emerge in

circumstances where there is a perception of excess in legislation and stringency in enforcement measures.

6.7.2 Limitations

The first limitation of the present study in generalising its findings to the wider community in Australia refers to the nature of the "public" respondents. In most instances, both public surveys and community consultations in Australia tend to attract stakeholders with a strong view on a number of issues. These views may be formed in the course of interactions with government departments. In some instances, the views filtered through surveys and community forums are reflective of the relationship between these stakeholders and the government. These may not necessarily be independent, bias-free opinions, circumscribed to empirical realities, although the large number of respondents in the present study may have reduced some of the bias.

This study employs both text analysis techniques (Grounded Theory Method) and a qualitative synthesis method (Meta-ethnography through *Reciprocal Translation Synthesis*) to examine 544 written "public" submissions. Each one of these methodologies presents challenges in the minimisation of bias. In this case, the task of both generating points along an attitudinal continuum and the subsequent activity of assigning exemplars to these points are not entirely devoid of bias or subjectivity. To minimise both bias and subjectivity, this study adopted two techniques. Firstly, the positive attitudinal operators (points on the continuum) were defined in the text (not at an appendix). Secondly, a codebook was developed and actively used in the text. In addition, a second rater reviewed the assignment of exemplars to the attitudinal operators.

Furthermore, the adoption of the *Reciprocal Translation Synthesis* (Noblit and Hare, 1988) had to be altered in the current study. This alteration was due to the fact that the exemplars had

not emerged from thick contextual descriptions. In most instances, these appeared in short paragraphs or sentences. In this respect, the "interpretive explanations" generated from the NVivo10 references could not be grounded in a broader contexts as illustrated in Noblit and Hare's educational experiments (1988). Nonetheless, this limitation had little impact (if any) on the substantive nature of the findings. In fact, the absence of further context to the exemplars enabled the focus to center around generating understanding of (Noblit and Hare, 1988) the nature of public approval and the construction of a realistic framework for measuring public approval of road safety countermeasures.

Despite these limitations, the data analyses in the present paper have allowed theory building to occur with a relatively reasonable size sample. This development has also been methodologically rigorous and transparent, allowing it to be replicated.

6.8 CHAPTER CONCLUSION

This research paper addressed two research questions. The first aimed to develop practical tools to help monitor *moral commitment*. The second research question was intended to establish a path trend (changes or shifts) for moral commitment in those community stakeholders in Australia with an interest in road safety. As a result, the current study developed two continua of public attitudes to road safety countermeasures, which depicted ten attitudinal categories between a negative and a positive extreme. At the former, *defiance* was unveiled as an active attitude, which could result in disruptive advocacy against road safety countermeasures. At the latter end, *compliance* or *moral commitment* was identified in the present investigation as an active, positive attitude likely to encourage adherence to and support for road safety countermeasures.

Additionally, the present research paper identified public approval of the 2011-2020 Australian NRSS overall. This represented an endorsement of the broad framework, which can be used as a starting point for enhanced engagement with the public. Nonetheless, there were also negative public attitudes centred predominantly around *scepticism* and *disbelief*. These passive attitudinal operators must not be allowed to fester into more active states of negativity. Four ways to achieve a stall and a subsequent reversal in this respect include the road safety authorities adopting inclusiveness (consider specific needs of all road users), comprehensiveness (include micro [e.g. tailgating] and macro [e.g. speeding] risk factors), targeted measures (no blanket approaches) and scientific evidence (strong, convincing evidence widely publicised).

Future research may adopt the continua developed in the present study to measure public attitudes over an extended period of time. This can be accomplished by administering surveys which operationalise the categories in the continua. The interpretation of the results of these surveys can be conducted through the typology (quadrants) developed in this study. The results of these examinations should inform public policy design in road safety in relation to the likelihood or otherwise of public attitudes functioning as an aid to legislation and enforcement.

6.9 CHAPTER SUMMARY

The present chapter described the development of two tools, which can be used to measure public attitudes in Australia towards road safety responses. In addition, it highlighted the role of public attitudes (i.e. active, positive public attitudes) in supporting enforcement and impacting on road user behavior. Furthermore, the research paper in this chapter provided a rationale for the need for a shift in public attitudes in Australia towards active, positive attitudes.

Its findings revealed public support and concerns with some of the strategies employed in road safety in Australia. In fact, in the Australian policy context for road safety, public attitudes towards road safety countermeasures appear to be mixed. This variety in attitudes ranged from active, positive (at one extreme) to active, negative attitudes (at the other extreme).

The implications of this study are twofold. On the one hand, it develops practical tools to help understand the context in which coordinated road safety responses may emerge. On the other hand, it contributes to the development of the descriptive model of coordinated road safety countermeasures by stressing the need to consider community buy-in.

Chapter 7: Adaptive Nature of Coordinated Road Traffic Injury Prevention Responses in Some OECD Countries

7.1 INTRODUCTORY COMMENTS

The purpose of this chapter is to investigate coordinated road safety countermeasures in more detail. It examines the triggers for coordinated responses and the actions adopted to facilitate the emergence of these types of countermeasures, in which effort is coordinated across multiple programs. This chapter holds significant importance to the current thesis. It marks the beginning of the description of the steps involved in the development of multi-pronged road safety responses, which are coordinated at a local (implementation) level. Whilst the first research paper outlined a cultural feature of the policy context, this chapter provides specific information about the onset, continuation and sustainability of coordinated, multi-pronged road safety responses.

Furthermore, this chapter provides the variables which will be used to characterise coordinated, multi-pronged road safety countermeasures in chapter Eight.

This research paper has been published in the *Journal of Transport Geography* (*Impact Factor =2.6*). This peer-reviewed journal publishes (predominantly) research into transport and spatial change.

The current research paper has been formatted in line with the Higher Degree Research Guidelines (Requirements for Presenting Theses), 2015 and the QUT Reference Guide, 2013 (Writing Your Thesis Using Word 2010 and End Note X6).

7.2 AUTHOR STATEMENT OF CONTRIBUTION

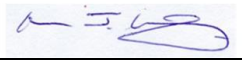
The authors listed below have certified* that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
5. they agree to the use of the publication in the student's thesis and its publication on the Australasian Research Online database consistent with any limitations set by publisher requirements.

In the case of this chapter:

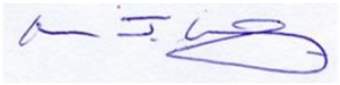
Publication title and date of publication or status: Adaptive Nature of Coordinated Road Traffic Injury Prevention Responses in Some OECD Countries

Contributor	Statement of contribution*
Joao Canoquena	Collected data, conducted data analysis and wrote the manuscript
Signature 	

Date 9th March 2017	
Dr. Mark King * Signature  Date 9th March 2017	Aided the design of the research conceptual framework and provided editorial feedback on the manuscript as well as guidance in the selection of an appropriate peer-reviewed journal

Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Mark King  9th March 2017

Name	Signature	Date

7.3 PAPER TWO (AS SUBMITTED FOR PUBLICATION)

Canoquena, Joao Manuel da Costa & King, Mark (2015) Adaptive nature of coordinated road traffic injury prevention responses in some OECD countries. Journal of Transport Geography, 46, pp. 81-88.

Abstract

This study examines the context of coordinated responses, triggers for coordinated responses, and preference for or choice of coordinating strategies in road traffic injury prevention at a local level in some OECD countries. This aim is achieved through a mixed-methodology. In this respect, 22 semi- structured interviews were conducted with road traffic injury prevention experts from five OECD countries. In addition, 31 professional road traffic injury prevention stakeholders from seven OECD nations completed a self-administered, online survey. It found that there was resource limitation and inter-dependence across actors within the context of road traffic injury prevention at a local level. Furthermore, this study unveiled the realization of

resource-dependency as a trigger for coordinated responses at a local level. Moreover, the present examination has revealed two coordinating strategies favored by experts in road traffic injury prevention – i.e. self-organising community groups, which are deemed to have a platform to deliver programs within communities, and the funding of community groups to forge partnerships. However, the present study did not appear to endorse other strategies such as the formalization of coordinated responses or a legal mandate to coordinate responses.

This study appears to suggest a need to manage coordinated responses from an adaptive perspective with interactions across road traffic injury prevention programs being forged on a mutual understanding of inter-dependency arising out of resource scarcity. In fact, the role of legislation and top-down national models in local level management of coordinated responses is likely to be one of identifying opportunities to interact with self-organised community groups and fund partnership-based road traffic injury prevention events.

Keywords: adaptive; coordination; coordinated response; road traffic injury prevention; local level

7.4 INTRODUCTION

Daily, over 3,000 people die on the roads, mostly in low and middle income countries (WHO, 2014). Yearly, 1.24 million people have died since 2007 on the world's roads (WHO, 2013). Globally, this number has not changed over the three years between 2007 and 2010 (WHO, 2013), despite an enormous amount of effort towards addressing road traffic injury risk factors, which has included targeted solutions (WHO, 2013).

Comparatively, steady declines in road traffic fatalities have been observed in OECD countries (WHO, 2013). Whilst high income countries experience road traffic death rates in the order of 8.7 per 100,000 population, middle income countries (the worst hit) have risk figures in excess of 20 per 100,000 population (WHO, 2013). In fact middle income countries bear the burden of 86% of the road traffic deaths (WHO, 2013). In Africa, the risk of dying from road traffic injuries has been put at 24.1 per 100,000 population, compared to Europe's 10.3 (WHO, 2013).

Progress in addressing road traffic injury risk factors has been attributed to coordinated, multisectoral preventability - raising responses to road traffic injuries (WHO, 2013; p.1). In fact, countries successfully managing road safety responses are simultaneously mobilizing effort in a wide range of fields, including legislation, road treatment, education and injury surveillance (WHO, 2013). This *package of measures* (Wegman *et. al.*, 2012) represents a systematic, multi-sectoral response or a coordinated response. , this coordinated action is aimed at addressing comprehensively all road traffic injury risk factors such as speed, non-use of seat-belts or helmets, drink and driving and inadequacy of post-crash care (WHO, 2013). Nevertheless, despite repeated calls by the WHO for low and middle income countries to learn from high

income countries' adoption of coordinated responses (Peden *et. al.*., 2004; WHO, 2009b; WHO, 2013) and the UN's recognition of a holistic and integrated approach to sustainable transport (UN, 2014), little is known about the context of coordinated responses in road traffic injury prevention at a local level. , there is no advice on how to achieve (Hull, 2005) coordinated road traffic injury prevention responses at a local/county level. Most importantly, although there is a conceptualization of factors underpinning coordination and integration of policy measures (Hull, 2005), there has been no research into coordinated responses from a practitioners' perspective in road traffic injury prevention.

Moreover, research into coordinated responses (Whetstone, 2001; Bennett et. al., 2006; Claiborne, 2006; Slaght & Hamilton, 2005; Dami et. al., 2009) has focused on the determinants and models of coordinated response in general. This body of research, although empirical and experimental, has not examined the context and triggers of coordinated responses as well as the preferences of road safety practitioners for coordinated strategies in some high income countries at a local level. Moreover, these studies have been undermined by some limitations. Firstly, this research from related fields has not focused on the nature of the factors which give rise to the need to coordinate. Instead, it has examined the outcomes of coordinated responses. Secondly, part of these studies have accessed secondary datasets, whose primary purpose was not that intended in the studies. Thirdly, some studies employed opportunity sample, which is often viewed as a weak sampling approach (Brady, 2006). Most importantly, the studies have shed little or no light on the underpinning factors which explain how certain societies are able to coordinate responses against risk factors in road traffic injury prevention whereas others fail abysmally at the same task.

This study examines the context of coordinated responses, triggers for coordinated responses, and road safety practitioners' preferences for or choice of coordinating strategies. In this vein, the key research questions in this paper are: what characterizes the context in which coordinated responses occur in road traffic injury prevention; what are the triggers for these coordinated responses; and what are the practitioners' preferences for or choice of coordinating strategies?

These questions hold considerable significance in the transfer of knowledge from highly successful road traffic injury prevention managing nations to others. Firstly, practitioners' descriptions of coordinated responses do not appear to have been unearthed in road traffic injury prevention at a county/municipal level. The significance of the focus on county/municipal level is justified on the fact that although countries enact laws and develop national level road safety strategies, their implementation and enforcement rests with county/municipal level health, enforcement and road safety agencies. There is, in this sense, no scientific understanding of how the practitioners in these agencies view coordinated responses in road traffic injury prevention. Without this appreciation, the transfer of critical knowledge may not be based on actionable details at the implementation or implementation phase. Secondly, knowledge of the features and underpinning factors of coordinated responses allows adoptees to make an informed decision as to the suitability of the strategies to their own contexts. Moreover, this investigation is highly likely to provide sufficient know-how for countries to adopt a recommendation consistently made by the WHO since 2004. Since the release of the World Report on the status of road traffic injury prevention globally in 2004, the WHO has maintained a consistent recommendation – i.e. that countries coordinate countermeasures to comprehensively address scientifically identified risk factors (Peden *et. al.*, 2004; WHO, 2009b; WHO, 2013).

In the sections ahead, a brief overview of the relevant literature is provided. This is followed by a description of the mixed-methods employed in the current study. The results are concisely presented before a discussion section, which is followed by concluding remarks.

7.5 LITERATURE REVIEW

Despite extensive search of the various databases and online journals over a year, no study was identified which specifically examined coordination or a coordinated response in road traffic injury prevention. Therefore, peer-reviewed research into institutional coordinated responses in other related fields was examined for inclusion in this literature review. To this end, the chief inclusion criterion was as follows: the studies needed to investigate coordinated responses in contexts where a social-outcome (as opposed to equity-driven setting such as a private corporation) was pursued such as crime reduction, health promotion or any coordinated responses directed towards social risk factors. Nonetheless, the findings in these studies will not be explored in this discussion due to the fact that the implication of such findings is of insubstantial consequence to the current research. Instead, focus in the review of the literature in this paper is placed upon the manner in which coordinated responses have been investigated in related social-outcome fields or inter-government agency domain. As a result, only five studies were deemed to meet the inclusion criterion (table 7.1).

Whilst the studies (table 7.1) selected for inclusion in this literature review differ slightly in objectives or foci, these scientific investigations appear to pertain mostly to the medical field, investigating coordination in General Care (Claiborne, 2006), Drug Rehabilitation (Bennett et. al., 2006), and Medical Emergency (Dami et. al., 2009). The second predominant field seems to be the Criminal Justice System, focusing mostly on Domestic Violence (Whetstone, 2001; Slaght

& Hamilton, 2005). Nonetheless, the findings in these studies will not be explored in this paper due to the fact that the implications of such findings are of insubstantial consequence to the current research questions. Instead, the focus in the review of the literature in this paper is placed upon the manner in which coordinated responses have been investigated in related social-outcome fields or inter-government agency domain.

Table 7.1: Literature Review Sample Characteristics

Author & Year	Research Object	Methods	Sample & Response Rate
Slaght & Hamilton, 2005	to determine what service linkages are in place; to identify those linkages that are critical to the coordination process; to identify barriers to effective coordination, and to assess whether these are effective in reducing recidivism	Face-to-face interviews were conducted using a semi-structured interview method; a content analysis of the interview data was conducted	two Family Violence Coordinating Councils No indication; sample characteristics not given statistically
Whetstone, 2001	To investigate the efficacy of a domestic violence coordinated response team pilot project, with police teaming up with victim advocates as first responders to domestic violence 'officer/advocate' team;	review of calls; experimental with officers teaming up with victim advocates and probation, correction and parole officers; pre-test, post-test with control and experimental jurisdictions plus interviews with clients; the evaluation of the experiment was done through domestic violence cases; calls and court dispositions	4000 domestic violence calls
Bennett *et. al..*, 2006	To examine high drug death rate in England and inter-agency communication	'practice note' which outlines a course of actions undertaken by British health authorities to respond to the rise in drug related deaths; Narrative description of institutional changes, which started with a baseline inquiry into drug related deaths, with the task of undertaking surveillance, quantifying substance misuse deaths and identifying modifiable risk factors and at target vulnerable and at risk groups; a retrospective study was also conducted to answer more specific questions related to drug use and service access;	British health authorities
Dami *et. al..*, 2009	To review the number of victims treated at the site and at the involved hospitals, as well as the logistics and dedicated structures	review of existing data	databases in the Emergency Medicals Services, the Health Authority of the State, the police and fire departments
Claiborne, 2006	To study the effectiveness of a bio -psychosocial care coordination model	randomly assigned, pre-post experimental design; ANOVA examinations	28 patients participated; 16 were assigned to the intervention group and 12 were assigned to the control group; Both groups received subsequent treatment as determined by physicians and patients. However, the intervention patients received additional social work care coordination services but the control group did not

As illustrated in table 7.1, the studies into institutional coordinated responses to social risk factors have focused primarily upon both determinants of coordination (Bennet *et. al.*., 2006; Slaght and Hamilton, 2005) and models of coordinated responses (Whetstone, 2001; Claiborne, 2006; Dami *et. al.*. 2009). These determinants were should be a joint philosophy (Slaght and Hamilton, 2005), information flow frequency (Dami *et. al.*, 2009), subsidiary communication modes (Dami *et. al.*, 2009), adequate work design (Dami *et. al.*, 2009), community empowerment (Whestone, 2001), informal information sharing (Whestone, 2001) and inter-personal communication (Whestone, 2001).

Despite the empirical and experimental nature of the aforementioned studies, these were not without limitations. In the case of the experimental studies (Whestone, 2001; Claiborne, 2006) the focus on the effects of coordinated responses did not allow much of the processes involved in generating coordinated responses to be examined. Additionally, the factors determining the need to coordinate do not appear to have received much attention. On the other hand, in the case (Dami *et. al.*., 2009) where a dataset examination was undertaken, the limitations referred to the fact that the data had been initially collected for a different purpose. In other words, the dataset primary purpose was other than to serve the aims of the study. Furthermore, the absence of triangulation in this study weakened the validity of the findings (Middlewood and Abbott, 2012).

The adoption of opportunity sampling in Slaght and Hamilton (2005) can be said to have limited the study ability to generalize its findings (Brady, 2006). Despite allowing access to 'covert groups', opportunity sampling is should be the weakest form of sample selection due to its weak external validity (Brady, 2006). Most importantly, the aforementioned studies do not particularise the examination of coordinated responses to a county/municipal level. Instead, these investigations appear to have unveiled outcome-based

features of coordinated responses, which do not have a focus on a county/municipal or local level.

7.6 METHODS

In order to examine the context, triggers and preferences for coordinating strategies adopted at a local level in road traffic injury prevention, the current study adopts a mixed-methodology. In this respect, the present paper undertakes qualitative data collection and analysis initially. Subsequently, the paper gathers and analyses quantitative data.

7.6.1 Qualitative Data Collection

The selection of the study participants was guided by two inclusion criteria, namely: a) previous participation in the management of road safety intervention coordination at a county/local/municipal level; and b) at least 5 years of such experience. The selection of the sample began with targeted e-mails forwarded to potential candidates in road safety offices within county authorities in all OECD countries. In addition, professional stakeholders named by the former Australian Transport Council (replaced in 2013 by the Transport and Infrastructure Council) in the review document of the draft Australian 2011-2020 National Road Safety Strategy were approached via e-mail and telephone to participate in this study. , convenience sampling techniques were adopted to recruit candidates into the qualitative study. In adopting this sampling approach, the authors made every attempt to widen the coverage of the population of interest by defining the population of interest through a sampling frame. This tool listed the names, occupational affiliations, years of road safety experience and contact details for Road Safety Officers, Local Council Transport Engineers, Road User Group Representatives, Traffic Safety Engineers, Professional Stakeholders (professionals with interest in road safety), Licensing Authority Workers and Highway Agency Representatives in OECD Countries. Through snowballing, additional members of

the population of interest were added to the sampling frame. These originated from responses to requests to supply the e-mail addresses of other eligible interview participants.

An interview guide was developed for the semi-structured interviews. This guide contained prompts and notes related to the flow of the probes. These prompts and notes moved from generic elicitations to more specific queries, allowing the interviewer to explore the coordinated responses experienced by the experts. In this respect, the interviews began with prompts about the experts' job roles and most recent coordinated programs. The investigation then moved on to specifics of the coordinated aspects, focusing particularly on the strategies adopted to bring about program interaction. The most common prompts employed to this end included: *how was this program coordinated with other programs? How and why was the need to coordinate with other programs identified? What were the success factors?*

Out of 56 road safety expert coordinators who received an e-mail invitation, 22 accepted to participate in the interviews (nearly 40% response rate). These interviewees came from Australia (15), Sweden (1), t the UK (1), New Zealand (2) and Finland (3). In fact, nearly two-thirds of the interview participants originated from Australia and worked as Administrators. On average, the interviewees had a road traffic injury prevention coordination experience of 18 years.

The interviews had an average duration of 35.4 minutes. These were audio-recorded with the consent of the interviewees. Only the relevant sections of the recordings were transcribed for further content analysis. This decision was guided by the prompts used throughout the interviews. In other words, only the specific answers to the prompts put to all respondents were transcribed.

7.6.2 Qualitative Data Analysis

The interview data were analysed through induction. Initially, units of meaning in the utterances were identified on the recording to extract themes. The identification of themes was assisted by a query, namely: *what is the interviewee doing in this context?* The context related to the program itself or the interaction across programs. In this sense, the question should establish the functional aspects of the interviewees' utterances. As such, respondents were initially should be *prioritizing safety audits, mitigating resource limitation etc.* These functional aspects became the themes. As themes were identified, relevant extracts (i.e. exemplars) were transcribed. To further refine the themes, the recordings were listened to a number of times to answer another query, specifically: *how does the interviewee view what he/she is doing in this program or in the interaction across programs?* Once refined, the themes were then grouped into broad categories. To generate cohesive syntheses, the exemplars were 'translated' into each other with the aid of *Reciprocal Translation* (cf. Noblit and Hare, 1988). The syntheses were then submitted to the interviewees for comments and synthesis accuracy verification. No changes were suggested by the interviewees who responded to the comment invitation.

The syntheses of the qualitative material identified two features of the context in which road traffic injury prevention programs were coordinated, namely: resource limitations and inter-dependence across stakeholders. Within this context, the interviewees were found to have adopted a wide range of coping coordinated responses to mitigate resource limitations. , these coping strategies should identify coordination opportunities in main areas of action, namely: Education, Promotion, Crash Data Analysis and Resource Management such as salaries and governance structures (table 7.2).

Table 7.2: Coping Road Traffic Coordinated Response at a County Level

	EDUCATION	PROMOTION	CRASH DATA ANALYSIS	RESOURCE MANAGEMENT
Advising			seeking industry input	
Advocating		seeking an independent voice for specific road users		sitting on advisory groups to influence decision making
Assisting	delivering equipment for others to undertake educational programs	enriching the value of police work		seeking assistance to lodge funding application
Reaching out	enlisting the support of schools to reach out to the youth	adopting ad hoc approaches		
Communicating		seeking face-to-face contact	bringing together stakeholders through meetings	serving as a clearing house
Complementing	Part-taking in educational programs with other groups	complementing enforcement with advertising and signage cross-promoting each other's work		
Funding	funding community groups to deliver educational initiatives			
Partnering		developing projects with other stakeholders to promote a particular transport mode	forming partnerships	seeking advice through partnership chairs developing close relationships with other stakeholders combining expertise to make measurement tools available for preventative initiatives such as having a breathalyzer calibrated by the police for the Salvation Army to use
Recruiting		relying on champions (*industry person*) within groups or sectors with unlimited enthusiasm		setting up groups to tackle crash data upward trends
Securing buy-in	recruiting stakeholders onboard to secure buy-in		organizing meetings with stakeholders	
Securing funding		working with others to get projects funded		sourcing salaries from insurance schemes job roles being attached to government institutions securing commitment by other stakeholders to invest in projects
Volunteering	Volunteering in school programs e.g. victim's story			

7.6.3 Quantitative Data Collection

Despite the array of coping strategies illustrated in table 7.2, the context of adoption of these strategies, the typical coping coordinated response and its triggers (origins) did not

transpire through the qualitative research. There was, therefore, a need to conduct further quantitative investigation. This pursuit started with the establishment of conceptual and operational definitions of the phenomenon under observation – i.e. the nature of coordinated responses. Conceptually, the context, triggers of and preferences for nature of the coordination of road traffic injury prevention programs at a local level was defined as adaptive, featuring a variety of resource-scarcity dependent attempts to join effort. To operationalize this concept this paper devised a self-administered, online survey comprising, initially, 10 statements. The short forms used in the survey for these statements were: *1) invaluable partners, 2) resource limitation realization, 3) resource dependence realization, 4) dependence-induced issue comprehensiveness, 5) hierarchical structure-induced linkages, 6) effective funding-induced linkages, 7) government funding critical linkage establishment role, 8) effective legal document-induced linkages, 9) job redesign critical linkage establishment role,* and *10) legally mandated linkages*. These statements were measured on five-point Likert Agree – Disagree (nominal) scales. The number of scale points was selected on the premise that the more scale points, the greater the amount of discrimination (Stopher, 2012) and effectiveness of the answers (Krosnick and Fabrigar, 1997). Put otherwise, short scales were thought not to provide useful information as long ones (Krosnick and Fabrigar, 1997).

The careful design of the survey also enhanced the likelihood of generating accurate, non-mechanical responses (Iarossi, 2006). For instance, episodic enumeration (Blair and Burton, 1987), which requires respondents to recall the specific behaviours, and events, and estimation questions (Iarossi, 2006), which demand the recall of event frequency, were avoided due to their potential to generate inaccurate information (Iarossi, 2006). Instead, a preference was given to opinion questions with an option (mid-point) to show no perception or opinion (Iarossi, 2006).

The self-administered, online survey link was distributed to those potential respondents on the sampling frame who had provided accurate e-mail addresses. Subsequently, at least three reminder e-mails were forwarded to those who had not completed the survey by then.

7.6.4 Quantitative Data Analysis

The quantitative examination of the survey data was guided by the following research questions: a) what is the typical coping strategy in the coordination of road traffic injury prevention responses; what are the triggers of coordinated responses; and what variables explain the choice of coping strategy in the coordination of road traffic injury prevention responses? The survey data were examined through descriptive analysis (frequency distribution and cross-tabulation, tested through Chi-square test which was set a priori at significance level of $p < .05$) in SPSS 21. Cross-tabulation examination was thought to be useful in enabling the researchers to investigate the relationship between the perceptions of the survey respondents and their characteristics such as occupation. Such investigation held significance to the current study due to the fact that it had a small sample size, on the one hand. On the other hand, its investigation of the relationship between professionals' choice of coping strategy to coordinate effort and country of residency helped to establish the representativeness of the survey takers' views. In this sense, it was hypothesized that if there was no relationship between country of residency and choice of coordinating strategy, the sample size limitation would be less accentuated, thus allowing the study to suggest a tendency relevant to the choice of coordinating road traffic injury prevention strategies in some OECD countries at a local level.

7.7 RESULTS

7.7.1 Survey Sample Characteristics

Out of 269 invited professional stakeholders, 31 completed the online survey. This represented a response rate of 11.5 per cent. The survey respondents came from Australia (16), Canada (5), Finland (2), New Zealand (2) and Sweden (1). Five survey takers did not indicate their place of residency.

By and large, the online survey respondents were male (61.3%), Australian (54%) drivers (58.1%). Vulnerable road users were represented in the sample by cyclists (9.7%), pedestrians (9.7%) and motorcyclists (12.9%). Of the total number of respondents, Administrators or professional stakeholders with the responsibility to manage projects and funding allocation represented one-quarter (25.8%) of the sample. Professionals (i.e. traffic engineers and other engineers) constituted more than a third (38.7%) of the sample. Researchers (9.7%), Community Workers (6.5%) and Administrative Workers (3.2%) comprised nearly one-fifth. Approximately one-sixth (16.1%) of the survey takers indicated their occupation to be other than the ones listed above. Additionally, the respondents' experience in coordinating road traffic injury prevention programs at local level ranged from 1 to 35 years, with nearly two-thirds (61.3%) indicating to be very familiar with the way coordinated road safety strategies were developed at a local level. Almost one-fifth (19.4%) of the survey takers reported being fairly familiar with the development of coordinated road safety strategies at a local level.

7.7.2 Coordinated Response Context

Table 7.3 captures the survey respondents' level of agreement and disagreement with statements related to *resource limitation realization* and *resource dependence realization.*

Joint work in road safety was thought to be initiated due to the realization of resource limitations (i.e. 'I don't have enough resources to do it alone') by more than two-thirds (67.7%) of the survey respondents. In fact, nearly three-quarters (74.2%) of the survey takers perceived a degree of inter-dependence across stakeholders in coordinated responses. These respondents agreed that linkages across road safety strategies were established because there was a realization amongst stakeholders of resource dependency (i.e. 'I don't have what you have' or 'I need what you have') at a local level.

Table 7.3: Degree of Agreement about Coordinated Response Context

Coordinated Response Context (n=31)	Degree of Agreement				
	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly Disagree %
Resource Limitations	29.0	38.7	9.7	9.7	12.9
Inter-dependence	9.7	64.5	9.7	6.5	9.7

7.7.3 Coordinated Response Context by Occupation

Through chi-square analyses, this study found that the perception of resource limitation as a trigger for joint work did not seem to be dependent upon the respondent's traits, except for occupation. In this respect, Professionals were ten times to twice as likely to agree with the statement that joint work in road safety was initiated as a result of the realization of resource limitations ("I don't have enough resources to do it alone") at a local level (table 7.4) as any other occupation [χ^2 (df.24) = 42.3, p<.05].

Table 7.4: Coordinated Response Context by Occupation

	Occupation						Total	
Resource limitations	Administrative worker	Administrator (i.e. project management, funding allocation etc.)	Community worker	Other	Professional (i.e.engineer)	Researcher		
Strongly agree	0	3	0	2	4	0	9	χ^2 (df.24)
Agree	1	2	0	2	6	1	12	= 42.3,
Neutral	0	1	2	0	0	0	3	p<.05
Disagree	0	1	0	1	1	0	3	
Strongly disagree	0	1	0	0	1	2	4	
Total	1	8	2	5	12	3	31	

7.7.4 Adaptive Strategies

Table 7.5 illustrates the survey respondents' level of agreement and disagreement with statements related to the typical (i.e. most distinctive or most likely to be adopted) adaptive strategies identified throughout the interviews.

The examination of the level of agreement around the typical coping (adaptive) strategy adopted by county level professional stakeholders in road traffic injury prevention revealed two strategies as being deemed typical whereas two others were not endorsed as such. In this respect, almost three-quarters (71%) of the professional stakeholders thought that community groups' ability to self-organize made them invaluable partners in reaching out to the community in a coordinated manner in road safety at a county level. Similarly, over seventy-four per cent of the survey participants viewed government funding for interest groups to coordinate county level programs as critical. This endorsement of both self-organizing and interest group linkage funding did not appear to extend to the formalization of coordinated

responses (only 25.8% endorsement) or legal mandates to coordinate (only 35.5% endorsement).

Table 7.5: Degree of Agreement about Adaptive Strategies

Adaptive Strategies (n=31)	*Rank*	Degree of Agreement: Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly Disagree %
▪ Self-organizing	2	48.4	22.6	16.1	6.5	6.5
▪ Hierarchical structure	5	16.1	35.5	19.4	25.8	3.2
▪ Funding interest groups	1	22.6	51.6	9.7	9.7	6.5
▪ Government funding	3	22.6	45.2	12.9	12.9	6.5
▪ Formalizing coordinated responses	7	3.2	22.6	48.4	19.4	6.5
▪ Redesigning workplace functions	4	29.0	38.7	29.0	3.2	0
▪ Legally mandated linkages	6	19.4	16.1	29.0	29.0	6.5

7.7.5 Choice of Adaptive Strategies by Survey Participant

An examination of the choice of all adaptive strategies (dependent variable) against occupation, familiarization with coordinated work, country of residency and road user groups (independent variables) did not reveal any relationship across these variables with the results showing Pearson Chi-Square greater than .05. Put otherwise, the choice of adaptive strategies does not seem to be dependent upon the country of origin within an OECD context, road user group, familiarity with coordinated work or occupation.

7.8 DISCUSSION

The present paper has qualitatively unveiled nearly 30 adaptive strategies adopted by road traffic injury prevention practitioners in some OECD countries to seek opportunities to mount a coordinated response. The context in which these adaptive coordinating strategies are pursued has been shown to comprise resource limitation and inter-dependence across

stakeholders. The trigger for coordinated responses in such context has been found to be the realization of resource-dependency. In addition, this study has quantitatively identified a level of endorsement for some adaptive strategies whilst unveiling a lack of sanction for other coping strategies.

Implications for Road Safety Management

Indeed, the findings endorse the adoption of self-organising groups and the funding of coordination processes such as partnerships. In contrast, these results reject the formalization of coordinated responses and legal mandates to coordinate responses. In this sense, this advice on how to achieve (Hull, 2005) coordinated responses at a local level supports the calls to reconnect road traffic injury prevention with communities through holism (May *et. al..*, 2008). In this sense, the endorsement of self-organising community groups points to a strategic option for road safety lead agencies. This strategic option may allow these government agencies to mount community-based travel behavior changes (May *et. al..*, 2008). , self-organising community groups are strategically positioned to deliver road use behavioral changing coordinated responses by their virtue of proximity and access to local knowledge. This is knowledge of community attitudes to risk factors such as speeding (May *et. al.*, 2008), community members' propensity to engage in risky road use behavior and informal moderators of behavior such as peer pressure, thus allowing road traffic injury prevention approaches to go beyond symptomatic, technical and physical solutions (May *et. al..*, 2008). Most importantly, the disapproval of legal mandates to coordinate and attempts to formalize coordinated road traffic injury prevention responses are also in line with the move away from technical solutions in road safety management (May *et. al..*, 2008). In this respect, this disapproval points to the need to allow approaches with the potential to account for broader issues (May *et. al..*, 2008) such as community attitudes to road traffic injury risk factors to be promoted. , the results of the current paper represent a step towards linking

policy and practice objectives, which are thought to be critical to reframing road safety management (May *et. al..*, 2011). By endorsing self-organising community groups and the funding of partnerships in the face of resource limitations and inter-dependencies, this study offers two avenues by which linkages across policy agendas can be established as both coping strategies have the potential to impact positively on issues beyond injury prevention such as community cohesion (May *et. al..*, 2011), human inactivity and cycle-based travel (Robert and Edwards, 2010, in Warwick-Booth, 2011).

Moreover, the endorsement, on the one hand, and the disapproval, on the other hand, enables a WHO recommendation to be implemented i.e. that countries coordinate countermeasures to comprehensively address scientifically identified risk factors (Peden *et. al..*, 2004; WHO, 2009b; WHO, 2013). In this sense, the pursuit of coordinated countermeasures is assisted by the knowledge of road traffic injury prevention practitioners' perceptions. , coordinated responses have been found to be adaptive in nature and emerge in a context of realization of resource limitations and appreciation of inter-dependency across stakeholders. This should discourage governments from adopting specialist approaches, which have little or no regards for the inter-dependency across stakeholders or lack the realization of resource scarcity to tackle road traffic risk factors alone through hierarchical structures, legal instruments and formal arrangements. In short, the current paper encourages governments to engender coordinated responses through joint working horizontally across stakeholders (Hull, 2005). Furthermore, the importance given by the road traffic injury prevention practitioners to self-organising reinforces a recommendation made by the United Nations. In its resolution *Improving Global Road Safety,* the United Nations (2014) called on countries to explore new and innovative funding modalities. In addition, it called upon nations to strengthen collaboration between Member States and civil society to build capacity and raise awareness in the field of road safety (United Nations, 2014).

Most significantly, the findings in the present paper related to the context of coordinated responses resonate with a relevant conceptualisation of integration. In Hull (2005), an integration ladder is generated. This analytical construct identifies integration of policy measures as the most difficult level or step to achieve (Hull, 2005). This step is underpinned by acknowledgement of interdependencies (Hull, 2005) across policy measures. This acknowledgement has been found in the current study to also engender coordinated responses. Moreover, this study expands this understanding by revealing the origins of the acknowledgement of interdependencies as being a realization of resource scarcity. In this sense, the findings in the present study appear to refute the reliance of the acknowledgement of interdependencies on legal and structural instruments as it is the case in Hull (2005). Put otherwise, interdependency acknowledgement appears to arise from a bottom-up realization (i.e. resource scarcity) rather than a top-down mandate (i.e. laws or governance structures).

Study Limitations

Fifty – three participants took part in the current study. Although much greater a sample size than other studies into coordinated responses (see Claiborne, 2006), it is relatively small. This poses a range of challenges, not least of which are potential lack of both representativeness and generalizability. In this respect, the target population may be thought not to be represented by the participants in the study. In addition, the results of the study may be viewed as not reflecting 'the reality' in OECD countries.

Nevertheless, representativeness and generalizability are not simply dependent upon the size of the sample. These features of scientific research may be impacted upon by the study design. In this sense, this study adopted a mixed-method approach with qualitative results feeding into the design of the quantitative questionnaire, thus affording data collection enhanced levels of reliability. The choice of both questions and measurement scales has been carefully thought out to maximize the collection of useful information. Furthermore, representativeness and generalizability may be influenced by the characteristics of the sample. In this vein, the worldly experience of the interviewees and survey participants can be said to have make them less likely to have extreme views, thus making them more likely to approximate the target population.

7.9 Chapter Conclusion

This study set out to answer some specific research questions related to the context of coordinated responses, the triggers for coordinated responses and practitioners' preferences for coordinated responses. In this respect, it found the existence of resource limitation and inter-dependence across actors within the context of road traffic injury prevention at a local level. Furthermore, this study unveiled the realization of resource-dependency as a trigger for coordinated responses at a local level. Last but not least, the present examination has revealed

two coordinating strategies favoured by experts in road traffic injury prevention – i.e. self-organising community groups, which are deemed to have a platform to deliver programs within communities, and the funding of community groups to forge partnerships.

However, this examination did not appear to endorse other strategies such as the formalization of coordinated responses or a legal mandate to coordinate responses. , this study points to a need to manage coordinated responses from an adaptive perspective with interactions across road traffic injury prevention programs being forged on a mutual understanding of inter-dependency arising out of resource scarcity. In fact, the role of legislation and top-down national models in local level management of coordinated responses is likely to be one of identifying opportunities to interact with self-organised community groups and fund partnership-based road traffic injury prevention events.

Nonetheless, the small sample of only 53 participants limits the ability of the present study to generalize its findings. Future, large scale examinations of coordinated traffic injury prevention responses will need to quantify the extent of endorsement of the coping coordinating strategies identified herein with a much larger sample. Additionally, research into coordinated responses in road traffic injury prevention will do well to explore the impact of legal mandates to coordinate such as the Integration Act 2010 in Victoria, Australia, upon the effectiveness of local level coordination.

7.10 CHAPTER SUMMARY

The research paper in this chapter examines the triggers of coordinated road safety responses and road safety coordinators' preferences for coordinated road safety strategies. Conducted through semi-structured, ethnographic interviews and a self-administered online survey, this study has found the triggers for coordinated road safety responses to be resource-scarcity and inter-dependence across road safety stakeholders.

Coordinated road safety responses (i.e. linkages across countermeasures) in Australia and some OECD countries appear to be commenced as a result of a realization of resource-scarcity. This realisation seems to be accompanied by an understanding of inter-dependence across stakeholders. Put otherwise, one reason why road safety coordinators seek linkages across programs is the fact that the resources to address road safety trauma are limited.

In these countries, partnerships with community groups and self-organised communities of practice appear to be the preferred way by which coordinated programs are delivered. In other words, the professionals in road safety coordination prefer emergent programs, which are delivered in partnership with the community and preferably by community-based self-organised groups. In this context, mandated strategies seem to be perceived as less effective than self-organised ones.

The implication of this evidence is twofold. On the one hand, this chapter outlines the initial steps in the descriptive model (research aim 1; research objective 1). It explains the onset, continuation and sustainability of coordinated responses. On the other hand, the evidence in this chapter allows the practical nature of coordinated road safety responses to be understood. This represents the existence of adaptive strategies to establish linkages across road safety countermeasures. In addition, it captures expert road safety coordinators' disapproval of the enactment of legislation to mandate the adoption of coordination. These experts did not approve the deployment of top-down, national strategies as frameworks for coordination either. , the practical nature of coordinated road safety responses appears to be represented by local level, adaptive strategies, which arise out of resource-limitations and the subsequent realisation of inter-dependence across stakeholders.

Chapter 8: A Descriptive Model for Coordinated Road Traffic Injury Prevention Responses

8.1 INTRODUCTORY COMMENTS

All previous chapters provide the variables used to produce the description in the present chapter of the manner in which road safety countermeasures are coordinated at a local level. These variables are herein analysed through descriptive statistics in order to build a descriptive model of a well-coordinated road safety countermeasure.

Whilst this chapter presents data analyses, it has not been designed for publication in peer-reviewed journals. It serves the thesis by addressing the first research aim and objective.

The current research paper has been formatted in line with the Higher Degree Research Guidelines (Requirements for Presenting Theses), 2015 and the QUT Reference Guide, 2013 (Writing Your Thesis Using Word 2010 and End Note X6).

8.2 RESEARCH CONCEPTUAL FRAMEWORK

8.2.1 Research Purpose

The purpose of the present chapter is to produce a descriptive model of a road trauma coordinated response. This represents the manner in which Australian and other professional road safety stakeholders in OECD countries perceive coordinated responses to be.

8.2.2 Features of Descriptive Models

Descriptive models have been employed to depict steps in a wide range of individual (Ward and Hudson, 1998; Cassar, 2003; Nower, 2006; Murdoch, 2012) and institutionally

coordinated actions (Stephenson, 2006). In these depictions, the common features of descriptive models include the existence of an onset of an act, a continuation of this act along with attempts to sustain it. In addition, the depictions share other commonalities such as contributing factors (both distal and proximal).

The onset of an act represents its inception. In this chapter, this beginning is viewed to be stimulated by triggers. The continuation of an act may occur when facilitative activities and contributing factors converge to galvanise action. In addition, an act can be sustained, if the factors contributing to its continuation do not cease to exist.

Distal factors represent broad phenomena (i.e. system-based, mindsets, ingrained perspectives etc.), which have a positive impact on the actions of actors in a coordinated effort. Proximal factors, on the other hand, represent those phenomena, which affect the actions of the coordinators directly. In addition, the descriptions of individual and institutionally coordinated action have illustrated the existence of a context, which is conducive to coordinated action.

8.2.3 Research Questions

To address the purpose of this chapter, three research questions have been designed. These research questions investigate the nature of the phenomenon (i.e. a coordinated road safety response), its contributing factors and its depiction. These queries are as follows: *what is the nature of the phenomenon under study (i.e. the type of countermeasure combination; its onset, continuation and sustainability); what are the contributing factors (distal and proximal) to the way the facets of the phenomenon (i.e. policy context, actions and actors) operate;* and *how could the phenomenon, its facets and contributing factors be depicted graphically?*

8.3 METHODS

8.3.1 Data Collection

Instrument

Two data collection events occurred for the purpose of this chapter. The first represented the self-administered online questionnaire in Chapter Seven. This online survey contained variables which described the manner in which coordinated road safety responses in road safety were commenced, continued and sustained. It also contained a number of variables which contributed distally and proximally to the onset of road safety coordinated responses. In order to conduct the data analyses for this chapter, this questionnaire was allowed to run further to capture a greater number of responses than the ones in Chapter Seven. In addition, it was extended to road safety coordinators in low and middle income countries identified through the websites of the lead agencies listed in the WHO's *Global Status Reports on Road Safety* (2013 and 2015) . This expansion of the cohort of survey takers beyond high income countries sshould enhance the generalisability of the findings.

Subsequently, a copy of the online questionnaire report was exported to SPSS 22 from a Queensland University of Technology statistical software package, KeySurvey (version 8.6).

Secondly, the interviews in Chapter Seven were also used to design the contents of the current chapter. These helped to establish the onset, continuation and sustainability of coordinated road safety responses.

Sample Characteristics

The characteristics of the interview sample are illustrated in Chapter Seven. These interviewees are herein identified through gender (Male or Female or M or F), country of

residence (first three letters), occupation and order in the interview. For instance, *F, Aus, Administrator, 11* was an Australian female administrator who was the 11th person to be interviewed. Gender is used to allow the reader to track the nuances of perspectives across gender, occupation and country of origin. It is worth noting that the views in this chapter may be influenced by each one of these traits.

Of the 558 road safety coordinators who received the invitation e-mail, only 76 (response rate of 13.6%) had completed the survey by 30th October 2015. The mean experience in coordinating road safety interventions of the 76 respondents was 10 years (with a mode of 5 years). Of these, nearly two-thirds (59%) indicated to be very familiar with the way in which coordination of road safety interventions was conducted at a local level. Just over a fifth (21.1%) of the respondents were fairly familiar with the manner in which road safety responses were coordinated at a local level (table 8.1).

As illustrated in table 8.1, just over a third (34.2%) of the respondents were Australian. The second largest group, the Canadian road safety stakeholders who completed the online survey accounted for less than a fifth (14.5%) of the survey takers. Just over a fifth (21%) of the survey respondents either resided in a country other (other) than the ones listed in table 8.1 or did not choose a country (missing value).

The online questionnaire takers were mostly professionals (32.9%) and administrators (22.4%), and identified themselves as being primarily drivers (61.8%) and pedestrians (11.8%).

Table 8.1: Sample Characteristics

Variables		N	%
Coordination Familiarisation	Fairly familiar	16	21.1
	Familiar	10	13.2
	Neutral	3	3.9
	Very familiar	45	59.2
	Very unfamiliar	1	1.3
	Missing	1	1.3
	Total	76	100.0
Country of Residency	Australia	26	34.2
	Brazil	1	1.3
	Canada	11	14.5
	Colombia	1	1.3
	Finland	2	2.6
	Ireland	1	1.3
	Kenya	1	1.3
	Malaysia	1	1.3
	Netherlands	1	1.3
	New Zealand	3	3.9
	Sweden	1	1.3
	Uganda	1	1.3
	UK	4	5.3
	Uruguay	1	1.3
	USA	2	2.6
	Zambia	2	2.6
	Zimbabwe	1	1.3
	Other	3	3.9
	Missing	13	17.1
	Total	76	100.0
Occupation	Administrative worker	3	3.9
	Administrator (i.e. project management, funding allocation etc.)	17	22.4
	Community worker	5	6.6
	Professional (i.e. engineer)	25	32.9
	Researcher	7	9.2
	Other	18	23.7
	Missing	1.	1.3
	Total	76	100.0
Road User Groups	Cyclist	5	6.6
	Driver	47	61.8
	Motorcyclist	8	10.5
	Pedestrian	9	11.8
	Scooter rider	1	1.3
	Other	5	6.6
	Missing	1	1.3
	Total	76	100.0

8.3.2 Data Analysis

In order to address the research questions, two types of statistical analyses were conducted on the quantitative data. Firstly, descriptive statistical techniques (i.e. frequency counts) were employed. These explored the respondents' perceptions in relation to the

triggers and factors enhancing the coordination of road safety responses. These measures enabled the identification of the key factors contributing to the initiation, continuation and sustainability of coordinated road safety responses. Secondly, the data analyses conducted in this chapter investigated the association between the choice of key factors and respondents' characteristics. This latter examination established the extent to which respondents' characteristics were associated with their preference for a trigger or coordination enhancing factor. These potential associations were examined through cross-tabulation, employing Chi-square tests and Fisher's Exact tests, with the significance level set at $p<.05$.

The interviews in the second research paper (Chapter Seven) were also used to build the descriptive model. In this respect, the onset, continuation and sustainability of coordinated responses were examined through the review of the interview recordings to identify workflows. This content analysis allowed the onset, continuation and sustainability of coordinated responses in road safety to be further understood as project-based processes with steps and stages. Indeed, the workflows identified through this examination were thshould illustrate attempts to start (triggers) coordinated responses in injury prevention, continue and sustain these responses.

The results of the aforementioned analyses are shown below. These results comprise the actual features of the descriptive model (i.e. the phenomenon or coordinated response with its three stages of onset, continuation and sustainability; the distal contributing factors illustrating the policy context, actions and actors; and the proximal contributing factors showing the policy context, actions and actors). The results also include a depiction of the descriptive model for coordinated road traffic injury prevention responses.

8.4 RESULTS

8.4.1 Features of a Descriptive Model of Coordinated Responses in Road Traffic Injury Prevention

8.4.1.1 The Phenomenon

The descriptive features of the phenomenon under study in this thesis, a coordinated road safety countermeasure, are initially outlined in Chapters Six and Seven. Chapter Six stresses community buy-in to obtain coordinated responses to road safety trauma factors. In this chapter, the role of active, positive public attitudes in aiding both legislation and enforcement is made apparent. In addition, this chapter (i.e. Six) outlines the detrimental effects of active, negative public attitudes in disrupting legislation and enforcement. The views of coordinated responses in road safety in this chapter are at a public or cultural level. At this level, there might be rejection of (i.e. defiance) or support for (i.e. compliance) road safety countermeasures. Where defiance prevails, the onset of coordinated road safety countermeasures involving the public can be expected to be challenging, featuring active disruptive behaviours. In this case, community buy-in is assumed not to have been secured. The countermeasures can be said not to be coordinated with the community or enjoying community support.

On the other hand, where compliance exists, the coordination of targeted road safety countermeasures can be thought to be facilitated, with public attitudes supporting legislation and enforcement through moral commitment. In this scenario, the road safety countermeasures which arise out of community engagement and feature public attitudes aiding legislation and enforcement can be deemed to be coordinated with the community. This characterisation of the phenomenon is further illustrated in Chapter Seven. This time,

the depiction of the coordinated road safety countermeasures focuses on professional interactions within a government government-professional stakeholder cluster (the government, administrative level). In this respect, coordinated road safety countermeasures feature inter-dependences across professional stakeholders. These inter-dependences arise out of the realisation of resource scarcity. In this adaptive setting, self-organising groups are funded to forge partnerships and engender multi-pronged responses to road traffic injury risks.

The aforementioned features of a coordinated road safety countermeasure are further refined in the sub-sections below.

8.4.1.1.1 Onset, Continuation & Sustainability of the Phenomenon

The twenty-two study respondents who participated in the interviews (Chapter Seven) reported having engaged in a wide range of mostly community-based programs. In some cases, the programs targeted school students, the elderly and drivers, with a wide variety of practical interventions. , respondents ' … organize traffic education for elderly drivers … [by going] to the clubs or places where they gather together … [teaching] them new rules … how to drive safely … how aging affects driving and how they can compensate those aging processes by … not driving during the dark, if their eyesight is not so good … to buy new and safe cars …' (F, Fin, Manager, 9). In this context in which specific knowledge needs of the road user groups are identified, road user groups are targeted at places of leisure.

A mechanism employed to create (onset) coordinated response at a local level was reported to be the funding of community groups. Indeed, in Australia, this funding of community groups by government institutions was in its third year in one jurisdiction. Funding more than 30 community groups, the Australian model had an annual budget of over $3.2 million or $1.80 per capita (in the State of Victoria, Australia, 2013). In other instances,

funding was said to be generated within partnerships. In this case, some stakeholders recounted participating in partnerships by covering the costs of joint road safety activities (F, Aus, Administrator, 11). , funding-dependence in these models seemed to drive much of the coordinated effort.

The critical significance of funding meant that the approach to coordination initiation or road safety response strategising did not comment with the idea that '…this is a project, let's do it … it is not how we do it … it's highly dependent on the opportunities that become available on a monthly basis … unless we have a budget, that job won't get done.' F, Aus, Administrator, 21

In this context of funding dependence and targeted approaches, there appeared to be some degree of clarity around the job of each partner (continuation)., '… [local Councils] promote safe behavior in the community [through media advertising]… and the Police do high visibility enforcement …' (F, Aus, Administrator, 11). In this case, the activities were coordinated so that one supported the other (continuation). In this sense, one partner '… would usually hold a … workshop prior to the learner log book run …' (F, Aus, Administrator, 12). In other cases, information sharing focused on the distribution of booklets, brochures and pamphlets (M, Aus, Recreation Officer, 15). This may have entailed commissioning professionals for the production of publications. In this case, a respondent reported having '… commissioned a motorcycle journalist to produce some advice on safe riding in groups …brochures about safe riding in groups … ' (M, Aus, Recreation Officer, 15).

However, this coordination based on cooperative relationships appeared not to always go without challenges. The barriers ranged from disparate perspectives to institutional constraints. In the latter case, data and financial limitations appeared to be fairly predominant.

In this sense, a respondent reported discrepancies across databases as an impediment to coordination. The '… [TAC, Police and Hospitals] realized the databases were covering different areas …' (M, Aus, Recreation Officer, 14). In other cases, the challenges seemed to pertain to work patterns and expectations, which were not clearly explained. In this case, the local authorities were perceived not to have "listened" to the stakeholders despite a lengthy consultation process. In fact, they ' ….were totally and utterly disappointed because … there were 48 initiatives in that road safety plan and only seven of them were appropriate for [a road user group]… we felt that although we had taken part in the process, we had been totally ignored …it did not represent the input we put in …' (M, Aus, Recreation Officer, 18).

Nonetheless, the respondents were forthcoming with ways to address barriers (conflict resolution, aiding sustainability). These included a combination of negotiation skills and deepening of understanding of each other's *cultures*. , barriers were thought to be able to be overcome through a united, logically framed voice, willingness to listen to the other parties, the identification of commonalities and the collective development of knowledge about the stakeholders' strengths, weaknesses and intended outcomes. In fact, having a holistic perspective was thought to be helpful. It was viewed as essential that all stakeholders acknowledged that '… road safety is everybody's business …' (F, Aus, Administrator, 11). Indeed, '… unless you have people interested in the issue, you won't get anywhere …' (M, Aus, Recreation Officer, 14).

Six local level coordinated response workflows (see Appendix H) were unveiled throughout the interviews (Chapter Seven). Typical of the actions carried out by the interviewees in all workflows was an attempt not to tackle road traffic injury prevention in isolation. In all workflows, there appeared to be a concerted effort to work together, which resulted from a perceived inter-dependency across stakeholders (onset). In addition, the

workflow models illustrate a wide range of start (onset), middle (continuation) and end activities (sustainability), with *issue identification* and *crash data examination* as the most common starting points for road traffic injury prevention coordinated responses at a local level in five OECD countries. These workflows were divergent, with autonomous social and professional networks interacting in an inter-institutional domain supported by facilitative processes.

The coordinated response workflow models outlined herein denoted a distributed (social) system, which was project-specific. In other words, the workflow models adopted in road traffic injury prevention at a local level were found to be diverse, interdependent and autonomous.

Most workflow models tended to have a rather horizontal coordination approach with issue appreciation central to all initial efforts (onset). In this sense, there appeared to be a greater emphasis on the appreciation of the holistic nature of the facets of the rising trends in crash data than the adoption of national directives to act in a coordinated response. Likewise, concerted attempts to seek buy-in and engagement of target groups (continuation) featured prominently in most workflow models. Surprisingly, only one workflow model (workflow model **7**) seemed to value the adoption of a coordinating device or a central person charged with the task of maintaining a constant and timely flow of communication across all stakeholders (continuation). Nonetheless, the interviewees emphasised the need not to skimp on communication, a facilitative activity (continuation).

Likewise, whist some workflow models featured reviews of the results of coordinated effort in terms of downward trends in risky behaviour (sustainability), there was, surprisingly, no attempt or reported attempt to evaluate the extent to which coordination was achieved effectively. In other words, the processes of mounting coordinated responses at a local level

did not appear to undergo an evaluation with the view to identifying areas for improvement. This may have been partly due to the focus on road safety performance indicators (see Wegman and Oppe, 2010) in all models. Equally, the absence of evaluation of coordination per se may have been partly because of the non-existence of oversight in all models. None of the models presented in this paper depict an oversight structure, except for model 6, which features a level of accountability (see Appendix H). In this respect, it appears as though local level coordinated responses are devoid of hierarchies and oversight (thus being horizontally oriented).

In summary, the onset of coordinated responses seems to represent project specific-triggers, with issue identification and crash data analysis featuring prominently. Continuation and sustainability of this type of road safety responses at a local level in Australia and some OECD countries hinge upon horizontal coordination, facilitative activities, ongoing communication, effective conflict resolution and a realist approach to evaluation.

The onset, continuation and sustainability of coordinated road safety responses occur because certain factors impact on three facets of these responses, namely: policy context, actions and actors. Each one of these facets is influenced or positively impacted upon by contributing factors (both distal and proximal). These contributing factors (found in the policy context, actions and actors) trigger, continue and sustain coordinated responses.

The following section presents the contributing factors to the onset, continuation and sustainability of coordinated road safety responses.

In some cases, the measures in the tables shown below have had to be ranked in order to identify the most significant factor in each one of the tables. To rank the factors, the values for Always, 2 (Very Often), Often and 4 (Quite Often) were lumped up into *Total Agreement*

(table 8.2). The factor with the highest *Total Agreement* was assigned the first ranking. This approach is herein used throughout the tables in this chapter.

8.4.1.2 Distal Contributing Factors

8.4.1.2.1 Policy Context

The respondents to the online survey were asked to agree or disagree with some statements pertaining to the road safety policy context in Australia and some OECD countries as described by various interviewees in Chapter Seven. These statements and the respective variables (inside brackets) were as follows: the community groups' ability to self-organize makes them invaluable partners in reaching out to the community in a coordinated manner in road safety at a local level (*self-organising*); joint work in road safety is initiated as a result of the realization of resource limitations (I don't have enough resources to do it alone') at a local level (*resource limitation*); hierarchical structures help to establish linkages (i.e. information sharing, cross-promotion, joint delivery, creating visibility for another program, spreading the word etc.) across road safety programs (*Hierarchies*); government funding for road safety intervention linkages (i.e. information sharing, cross-promotion, joint delivery etc.) has been effective in establishing these links across road safety programs (*government funding);* government funding is a critical condition for linkages (i.e. information sharing, cross-promotion, joint delivery, creating visibility for another program etc.) across road safety programs to be established (*critical funding*); legal documents are effective in establishing linkages across road safety programs at a local level (*legal documents*); re-designing workplace job roles to include the need to engage with stakeholders is critical to the success of linkages across road safety programs at a local level (*Job re-design*); and institutions should be mandated by law to establish linkages across road safety programs at a local level (*legal mandate*).

As shown in table 8.2, the main policy context feature in road safety which was said to contribute to the establishment of linkages across road safety programs was *self-organising*, with a total combined agreement (Agree plus Strongly Agree) of 72.4%. This was followed by *government funding* as a critical factor with the same combined total as the first one. The only difference between these two variables was the higher percentage of strongly agree received by the former. Whilst *government funding* was deemed to be critical to the establishment of the linkages, it was not found to be as effective (57.9%) as the other options. This was also true of the *legal mandates*. Less than half (48.7%) of the respondents agreed that *legal mandates* generated linkages across road safety programs at a local level (table 8.2).

Table 8.2: Factors Contributing to Ongoing Coordination at a local level (actions, distal)

				Degree of Agreement				
Variables	*N*	Rank	Total Agreement	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly Disagree %
▪ *Self-organising*	76	1	72.4	38.2	34.2	15.8	7.9	3.9
▪ *Government funding: critical*	76	2	72.4	25.0	47.4	11.8	11.8	3.9
▪ *Job re-design*	76	3	72.4	23.7	48.7	26.3	1.3	0
▪ *Hierarchies*	76	4	64.5	13.2	51.3	19.7	11.8	3.9
▪ *Government funding: effective*	76	5	57.9	14.5	43.4	19.7	15.8	6.6
▪ *Legal mandates*	76	6	48.7	25.0	23.7	31.6	14.5	5.3
▪ *Legal documents*	76	7	34.2	10.5	23.7	46.1	15.8	3.9

8.4.1.2.2 Actions

The respondents to the online, self-administered questionnaire (OECD road safety practitioners; see Chapter Seven) were asked to indicate the action (activity) -based factors contributing to coordination. These were the factors associated with activities or actual actions such as a realisation, an observation, consultation, advocacy, complaints and document publications which triggered coordination responses.

The question put to the survey takers in the form of an incomplete statement was, *coordinated work (joint work with other stakeholders) at a local level in road safety is often started because of ...* The respondents were given twenty-four options to choose one only from in order to complete the first half of the sentence.

Figure 8.1 illustrates the results of the frequency distribution analyses for the action-based contributing factors of coordination at a local level in some OECD countries. Out of twenty-four distal options put to the survey respondents, twenty were selected (fig.8.1). Just over a fifth of the survey takers (23.7%) thought coordination was often started at a local level because *of the realization that the problem was too big for a single stakeholder*. Slightly over a tenth (11.8%) of the survey participants believed that *the need to have community buy-in* was often the reason for stakeholders to coordinate road safety activities at a local level. An equal number of respondents (11.8%) believed that coordination was started at a local level due to *the fact that community-based institutions were best placed to influence road user behaviour but had limited funds*.

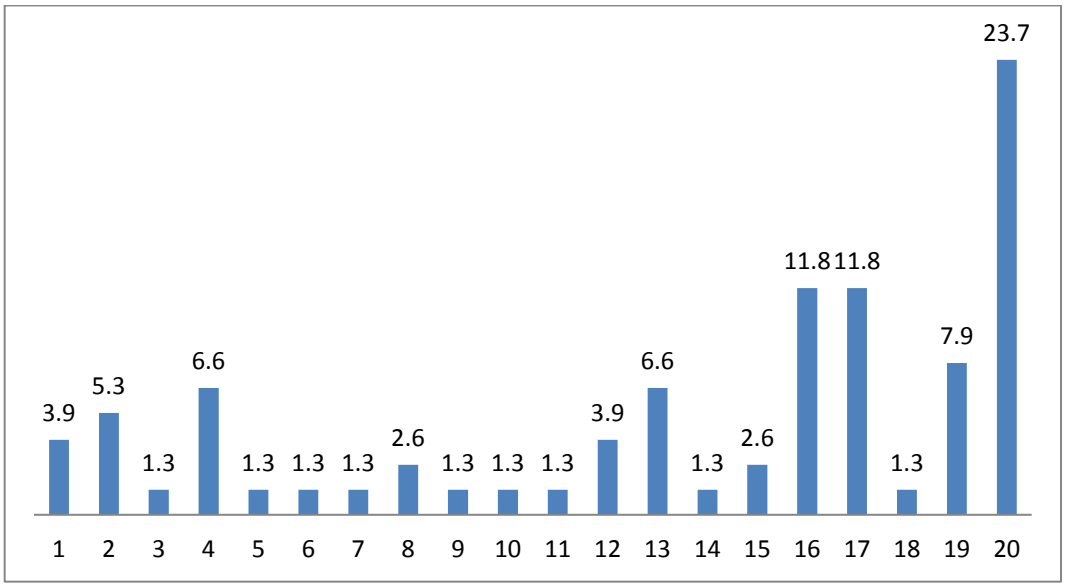


Figure 8.1. Factors Contributing to Ongoing Coordination at a Local Level (Policy Context, Distal)

1. A rise in crash data trends, which mobilises a constituency in the community; 2. A rise in crash data, which is widely publicized;3.A spike in crash data, which receives funding;4. Advocacy in the community;5. An emergent realization of the need to do more to reduce the road toll; 6. Community outcry over the apathy from government over the rise in road toll; 7. Community outcry over the personal stories or injury or fatality related to road trauma;8. Complaints from community groups about the lack of consultation;9. Crash data analysis showing increases in trends; 10. Funding allocation for partnership formation around road safety issues; 11. Inclusiveness of consultative processes between governments and community groups; 12. Information sharing across institutions and the community; 13. Information sharing across institutions, which identifies opportunities for joint work;14. Issues papers issued by government Departments; 15. National directives, orders or plans; 16. The fact that community-based institutions are best placed to influence behavior changes, but these have limited funds; 17. The need to have community buy-in; 18. The need to have industry buy-in; 19. The realization of the limitations in reaching out to the community on your own; 20. The realization that the problem is too big for a single stakeholder

8.4.1.2.3 Actors

The distal factors related to the *actors* are herein taken to be intergroup characteristics such as having stakeholders with altruistic attitudes, a willingness to share with others and the ability to meet informally. To quantitatively examine inter-group factors which secured ongoing coordination of road safety responses, the questionnaire used in the second research paper (Chapter Seven) included a relevant question for the survey takers. It asked the survey participants to complete the following sentence, *in partnerships, the one factor which secures ongoing coordinated work is ….* The respondents were given a pool of fifteen sentence endings to choose one from.

As shown in fig. 8.2 thirteen endings (SPSS22 does not show options not selected) were chosen by the survey respondents. For the benefit of brevity, only the top ten options selected by the respondents are listed in fig. 8.2.

Nearly a fifth (15.8%) of the respondents thought that *a keen interest in the issues at hand (*2) helped to secure coordination at a local level. An equal number of respondents (15.8%) indicated that *a willingness to share with others* (4) enhanced coordination at a local level.

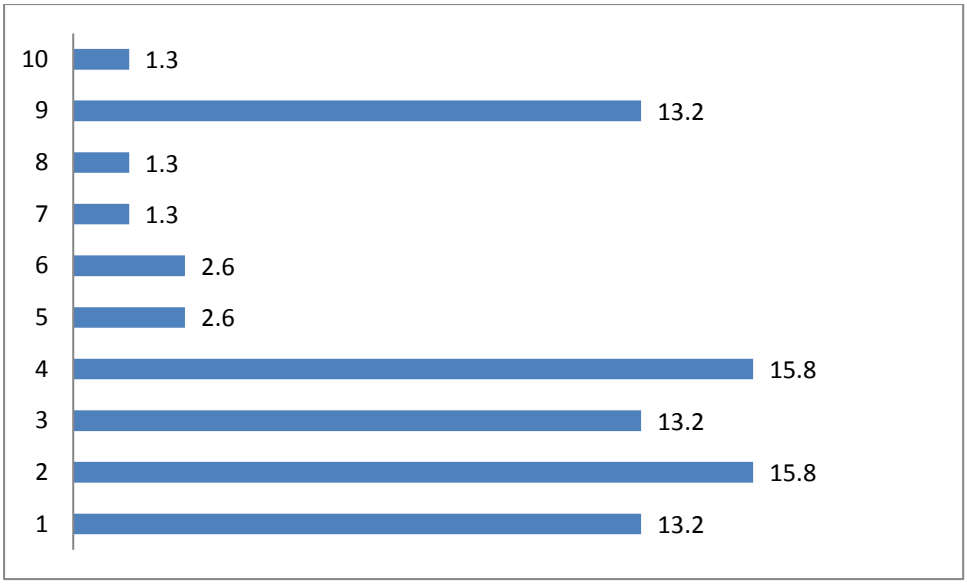


Figure 8.2. *Factors Contributing to Ongoing Coordination at a Local Level (Actors, distal)*

1. A keen interest in road safety; 2. A keen interest in the issues at hand; 3. A unified approach; 4. A willingness to share with others; 5. An altruistic attitude; 6. Not being a passenger; 7. The ability to meet formally; 8. The ability to meet informally; 9. The ability to understand each other; 10. The realisation of the amount one can contribute

8.4.1.3 Proximal Contributing Factors

8.4.1.3.1 Policy Context

Out of a total of 22 proximal factors shaping the policy context for the coordination of road safety responses at a local level, seven were selected by the survey takers (table 8.3). These factors were as follows (t*he variables are in brackets*): national plans for road safety (*national plans*); political leaders' contribution to road safety programs (*political leaders*); **c**ommunity groups' advocacy in road safety (*advocacy*); legislative mandates to work together such as the Transport Integration Act 2010 in Victoria, Australia, which requires that all decisions affecting the transport system (*legislation*); the comprehensiveness of crash data at a local level (*crash data comprehensiveness*); transparency of crash data at a local level (*crash data transparency*); and the insertion of community groups' suggestions in final drafts of road safety strategies (*community voice*).

Advocacy at the local level was thought to be the first proximal factor shaping the policy context relevant to the coordination of road safety responses (86.9% total agreement). A close second to *advocacy* was *crash data comprehensiveness* (86.8%).

The two factors least often found to enhance coordination at a local level were found to be *national plans* (65.8%) and *political leaders* (64.4%).

Table 8.3: Factors Contributing to Ongoing Coordination at a local level (policy context, proximal)

		Local Level Coordination Enhancement Frequency								
Variables	*N*	Always	2	Often	4	Sometimes	6	Rarely	Total*	Rank
▪ *National plans*	76	0	14.5	44.7	6.6	25	2.6	6.6	65.8	7
▪ *Political leaders*	76	0	19.7	32.9	11.8	22.4	5.3	7.9	64.4	6
▪ *Community voice*	76	0	23.7	31.6	19.7	17.1	6.6	1.3	75	5
▪ *Legislation*	76	0	13.2	38.2	23.7	9.2	7.9	7.9	75.1	4
▪ *Crash data transparency*	76	0	23.7	47.4	10.5	9.2	2.6	6.6	81.6	3
▪ *Crash data comprehensiveness*	76	0	23.7	51.3	11.8	7.9	0	5.3	86.8	2
▪ *Advocacy*	76	0	17.1	56.6	13.2	10.5	0	2.6	86.9	1

* total sum of Always, 2, Often and 4

8.4.1.3.2 Actions

The proximal factors influencing the actions in the coordination of road safety included sharing data across road safety stakeholders (*data sharing*); clear and concise communication amongst stakeholders in road safety (*communication quality*); frequent informal meetings amongst key road safety stakeholders (*informal meetings*); formal meetings amongst road safety stakeholders (*formal meetings*); e-mail updates between road safety stakeholders (*e-mail updates*); face-to-face communication amongst road safety stakeholders (*face-to-face*); human touch in the communication amongst road safety stakeholders (*human touch*); and the central/coordinating person or persons' ability to drive a road safety project, which involves

multiple stakeholders (*central person*). These factors were put to the survey respondents and measured on a 7-point Likert scale (Always to Rarely).

The results indicated that a *central person*'s ability to drive a road safety project with multiple stakeholders was thought to be the first proximal action factor (98.7%) enhancing local level coordinated effort (table 8.4). The use of clear and concise communication (*communication quality*) amongst stakeholders was rated second with a total frequency agreement of 97.4 per cent.

Table 8.4: Factors Contributing to Ongoing Coordination at a Local Level (actions, distal)

		Local Level Coordination Enhancement Frequency								
Variables	*N*	Always	2	Often	4	Sometimes	6	Rarely	Total*	Rank
▪ *Data sharing*	76	0	11.8	39.5	18.4	18.4	0	11.8	69.7	8
▪ *Informal meetings*	76	0	19.7	44.7	17.1	15.8	0	2.6	81.5	7
▪ *E-mail updates*	76	0	19.7	48.7	17.1	7.9	2.6	3.9	85.5	6
▪ *Human touch*	76	0	27.6	42.1	18.4	5.3	3.9	2.6	88.1	5
▪ *Formal meetings*	76	0	18.4	52.6	18.4	5.3	3.9	1.3	89.4	4
▪ *Face-to-face*	76	0	31.6	48.7	15.8	2.6	1.3	0	96.1	3
▪ *Communication quality*	76	0	31.6	56.6	9.2	2.6	0	0	97.4	2
▪ *Central person*	76	0	32.9	59.2	6.6	1.3	0	0	98.7	1

* total sum of Always, 2, Often and 4

8.4.1.3.3 Actors

From the interviews in the initial research paper (Chapter Six), the proximal factors influencing the actors in the coordination of road safety programs represented traits – i.e. knowledge and a range of skills. These included: knowledge of local realities on the part of road safety program organisers (*local knowledge*); willingness on the part of stakeholders to compromise within road safety programs which involve various stakeholders at a local level (*Compromise*); partner stakeholders' ability to understand the constraints of other road safety stakeholders in joint work (*Understanding*); knowledge of other stakeholders' internal systems and cultures in a joint road safety program (*Knowledgeable*); partner stakeholders' ability to think beyond crash data in road safety programs at a local level (*Beyond data*); partner stakeholders' ability to influence others within partnerships in road safety programs at a local level (*Influencing*);

Stakeholders' ability to influence others within partnerships in road safety programs at a local level (*influencing*) was deemed as the main trait (99.9%) of the actors in coordinated responses. Likewise, their ability to think beyond crash data in road safety programs at a local level was thought to be the second highest ranked distal factor with a combined score of 98.7 per cent.

Most importantly, all stakeholders' traits in table 8.5 below received scores above 89 per cent, indicating a strong endorsement for all actors' traits.

Table 8.5: Factors Contributing to Ongoing Coordination at a Local Level (actors, proximal)

		Local Level Coordination Enhancement Frequency								
Variables	*N*	Always	2	Often	4	Sometimes	6	Rarely	Total*	Rank
▪ *Compromise*	76	0	23.7	46.1	19.7	9.2	1.3	0	89.5	7
▪ *Knowledgeable*	76	0	21.1	44.7	23.7	10.5	0	0	89.5	6
▪ *Local knowledge*	76	0	25	53.9	13.2	7.9	0	0	92.1	5
▪ *Tenure*	76	0	30.3	50	13.2	6.6	0	0	93.5	4
▪ *Understanding*	76	0	26.3	52.6	15.8	5.3	0	0	94.7	3
▪ *Beyond data*	76	0	27.6	56.6	14.5	1.3	0	0	98.7	2
▪ *Influencing*	76	0	27.6	60.5	11.8	0	0	0	99.9	1

* total sum of Always, 2, Often and 4

8.4.2 Depiction of the Phenomenon & Discussion

From the description provided in the previous sub-section of typically well-coordinated, local level responses in road safety, a list of activities and outcomes can be drawn (table 8.6). These activities are expected to be conducted by different stakeholders (i.e. local government officials, community groups, local area Police commands, road safety officers, businesses, parents, road users etc.) involved in the coordination of road safety responses at a local (county) level. Scott-Parker (2016) provides a comprehensive list of such actors in relation to the young driver road safety system in Queensland, Australia. The South Australia Road Safety Action Plan 2013-2016 also illustrates a detailed list of road safety stakeholders (levels 3-6) involved in the delivery of the road safety program, although mostly at State (as opposed to local) level. In both cases (Scott-Parker, 2016 and South Australia Road Safety Action Plan, 2013-2016) none of the actors are identified as conducting all or most of the activities listed in table 8.6. In South Australia, the Department of Planning, Transport and Infrastructure is said to coordinate road safety activities. Its website describes this function merely as being 'working together.' In Scott-Parker *et. al.* (2016) the institutions and stakeholders (e.g. parents) conduct functions specific to the chain of services related to the

young driver road safety system such as issuing license, providing supervised driving lessons etc. Whether a stakeholder or various stakeholders are responsible for driving the realisation of the interdependence across stakeholders or issue identification through crash data examination (or any other onset, continuation or sustainability activity of the ideally coordinated response) is not discernible from any of the publications about the coordination responsibilities of the Department of Planning, Transport and Infrastructure in South Australia. Likewise, the institutions (especially at level 1) in Scott-Parker *et. al.* (2016) appear to perform one coordinated response onset activity – i.e. funding community groups and other institutions. However, all other coordinating activities listed in table 8.6 are not executed by any stakeholder in Scott-Parker *et. al.* (2016). There is, therefore, a need for coordinating responsibilities (roles based on the activities in table 8.6) to be assigned to institutions. This need for the assignment of clearly defined coordinating roles is illustrated in Scott-Parker *et. al.* (2016) where most actors "…were less certain of how to initiate and maintain such partnerships and/or collaborative efforts, particularly when there was much unknown about who is out there, and what is currently being done in the young driver space"(p. 93). To make the existing partially fragmented, silo-functioning chain of services (Scott-Parker *et. al.*, 2016) into a well-coordinated road safety response, which emphasises and evaluates the complementarity across activities, the activities in table 8.6 should be built into memoranda of understanding amongst coordinated response participating institutions. In this sense, Scott-Parker *et. al.* (2016) suggest that "transparency regarding who is an organisation, the role they play, and interactions (both direct and indirect) within the young driver road safety system (YDRSS) are a fundamental first step" (p.94).

Table 8.6: Coordinated Road Safety Response: Stages, Activities and Outcomes

Stages	Activities	Outcomes
1: **Onset**	Realisation of interdependence, emergent issue identification/appreciation and crash data examination through comprehensive consultative processes, funding community groups and other institutions, selection of targeted approaches in a process which acknowledges a wide range stakeholders and broad issues	Shared goals and objectives, wide-ranging priorities, broad perspective of road crashes, strategies and action plans
2: **Continuation**	clarify about the job of each partner in a continuum of services, seeking buy-in of target groups, central person and other stakeholders not skimping on communication with all stakeholders in a horizontal and vertical manner, cooperative relationships, complementarity across activities, facilitative activities, development of project-specific workflows (work together with other stakeholders through horizontal coordination approaches) through a distributed (social) system approach	Synergies across programs, shared responsibility, government-professional stakeholder cluster implementation and public approval
3: **Sustainability**	deepening of understanding of each other's culture, united and logically framed voice, effective conflict resolution (negotiation skills and knowledge deepening) and realist evaluation of coordination	Crash data reductions and strengthened program linkages

The depiction of a descriptive model can serve a wide range of purposes. In Stephenson (2006), the depiction of humanitarian coordination characterises a context. However, in Ward and Hudson (1998), the depiction is procedural, concerning mostly (although not uniquely, illustrating affective states as well) with the steps in a process.

Not surprisingly, the purpose differential equates to a wide range of depictions. Accordingly, Stephenson's (2006) descriptive model represents a context (or a dissection), illustrating factors contributing to coordination (e.g. strategic and operational) at both network and organizational levels, and a range of cyclical activities such as information sharing, learning dialogues and shared norms.

Ward and Hudson's (1998) descriptive model, on the other hand, illustrates a sequence with phases, events, states, factors influencing both affective states and actions, orientation and outcomes in a visually linear manner (although clearly annotated as not being a depiction of a process not amenable to backtracking).

In this respect, the purpose of the present description of coordinated responses is to depict the nature of coordinated responses in road traffic injury prevention within an inter-institutional domain (i.e. professional interactions), which seeks to secure community engagement as documented in Chapters Six (community engagement significance) and Seven (professional interactions).

Both Chapters Six and Seven along with the aforementioned analyses have yielded data more amenable to the descriptive model in Stephenson's (2006) than Ward and Hudson's (1998) descriptive models. This is justified on two main grounds. Firstly, the interviews with twenty-two OECD road safety coordinators yielded a diverse range of workflow descriptions. This diversity precludes the prescription of a universal workflow for engendering coordinated responses. Secondly, the workflows described by the interviewees were mostly project-specific, thus discouraging the reliance on steps or procedures. Furthermore, the interviews and online questionnaire contained a predominately Australian participation. This predominance of a single nationality may have introduced bias in the development of the understanding of coordinated responses towards Australian contexts, which may differ substantially to those of many other countries. Therefore, the present descriptive model (fig. 8.3) will depict a composite institutional context of coordinated responses.

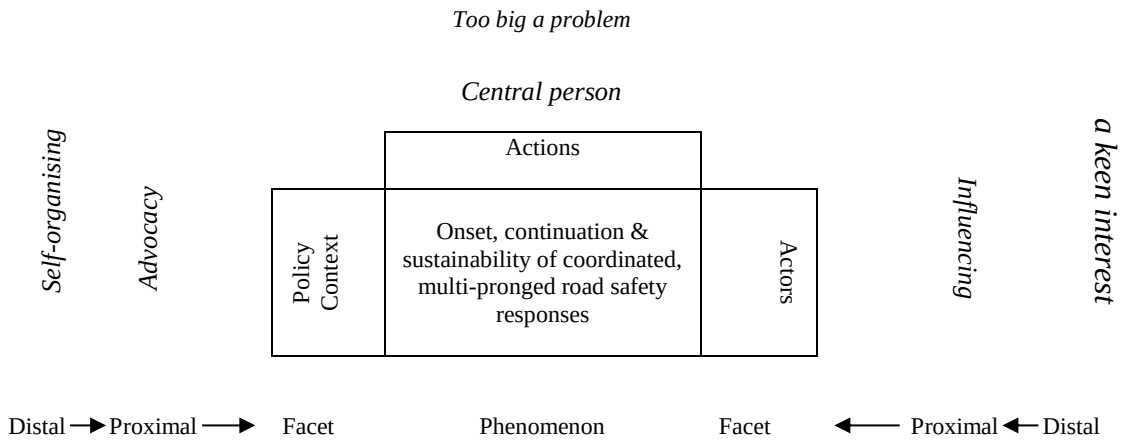


Figure 8.3. Descriptive Model of Coordinated Road Safety Responses

The model in figure 8.3 depicts a cross-section of an ideally-coordinated, local level road safety response (phenomenon) in Australia (predominantly) and some OECD countries. In this horizontally-oriented model, the phenomenon (i.e. a coordinated, multi-pronged road safety response or countermeasure) is described in three stages, namely: its onset (i.e. funding-dependent, stakeholder inter-dependence-based, project-specific trigger, with issue identification, crash data analyses), continuation (i.e. attempts to secure buy-in from target groups, not skimping on communication, central person, facilitative activities, complementarity across activities and concerted effort to work together) and sustainability (i.e. deepening of understanding of each other's culture, united and logically framed voice, effective conflict resolution and realist evaluation). This phenomenon (a coordinated, multi-pronged road safety response) occurs in a policy context (self-organising groups, government funding, advocacy and crash data comprehensiveness); comprises actions (realisation of the enormous scope of the problem for a single entity to tackle, central person driving projects); and is conducted by actors (with the ability to influence others and a keen interest in the issues at hand). These three facets of the phenomenon are influenced by distal factors, which, in turn, impact on more direct (proximal) variables. These factors are listed above in brackets

next to policy context, actions and actors. Both the distal and proximal factors contributing to the onset, continuation and sustainability of coordinated, multi-pronged road safety responses are further described below.

In summary, fig. 8.3 has allowed a definition of a coordinated response in road safety at a local level to be developed. A local level coordinated road safety response represents a community-supported, multi-pronged program driven by self-organised groups who are moderated by a local champion with an appreciation of the multi-faceted nature of road traffic crashes in an ever evolving ecology of social networks comprising inter-dependent, influential actors with a keen interest in local issues.

The following section provides further details about the six properties of an ideally coordinated response which impact on its three features/facets (policy context, actions and actors), namely: self-organising, advocacy, central person, too big a problem, keen interest and influencing.

Self-organising

Self-organising is herein viewed as a community asset. This ability to rally behind road safety issues in a non-mandated manner is perceived by professional stakeholders (Road Safety Officers at government agencies and other institutions) as a platform to both understand the needs of and access the target groups (e.g. unlicensed drivers, young drivers etc.) within a community. This is due to the local knowledge and close proximity self-organised groups tend to develop with target groups. This knowledge represents information about public attitudes and the tendency to engage in road user risk behaviour (May *et. al.*., 2008). Their proximity to target groups also enables self-organised groups to employ informal behavioural moderators such as peer-pressure (May *et. al.*., 2008).

Within the descriptive model herein developed, self-organising groups may work to help shift public attitudes, thus shaping the policy context. If successful, self-organising groups may secure compliance or moral commitment, an aid to legislation and enforcement. These voluntary (not-mandated by law) organisations in Australia are called community road safety groups and non-government organisations (NGOs). These distinctive groups (i.e. community groups and NGOs) in Australia include various State-based community road safety groups such as the South Australia-based ones (Barunga West Community Road Safety Group, Campbelltown Community Road Safety Group, Clare & Gilbert Valleys Community Road Safety Group etc.) and major Australian foundations (Australian Road Safety Foundation, Safer Australian Roads and Highways and Little Blue Dinosaur Foundation). These institutions collectively push for a safer road traffic system by advocating, educating and protecting road users. A major distinction across these self-organised institutions is funding-dependence. Whilst the community road safety groups tend to dependent vastly upon government funding, the foundations or NGOs have a much wider funding source, thus enabling them to have a much more independent voice in road safety.

Funding for these community road safety groups is provided by institutions with specific road safety responsibilities (NSW Centre for Road Safety), licensing institutions (VicRoads) and insurance schemes (TAC, in Victoria, Australia). Its levels vary across. In New South Wales (NSW), community groups receive up to $1.6 million (Australian Dollars) over four years (or $400,000/per annum). This represents less than a dollar (or 21 cents) per capita over four years in NSW (or 5 cents per capita per year). In Victoria, VicRoads funded (registered) community road safety groups to the tune of $1.6 million (Australian Dollars) in 2016-2017, representing $0.26 per capital per year in Victoria (using Australian Bureau of Statistics demographic information for 2014).

Self-organised groups in Australia are charged with the tasks/responsibilities of identifying solutions to local issues, helping to create a culture of road safety, informing the community, encouraging safer behaviours in the community, influencing decision makers to consider safety outcomes and taking action to create people-friendly streets and safer roads. These responsibilities align with the functions of self-organising in the present model of coordinated responses. These shape the policy context by shifting public road safety attitudes towards compliance and moral commitment. Indeed, work with self-organised groups also allows interventions to be culturally and contextually appropriate (Short, 2014).

However, the very low level of funding and the lack of official recognition of their role in shifting public opinion towards moral commitment (see Chapter Six) indicate that Australia does not appear to take the role of self-organising as a public health priority. Its chief approach to road safety seems to be no dissimilar to vertical programming (Johnston, 2010a), thus missing out on the opportunity to implement fundamental change to build an inherently safe transport system (Johnston, 2010a). Vertical programming is an approach to public health (e.g. fight against HIV/AIDS) which brings an enormous amount of technology and resources to bear on an issue, without making fundamental changes to the response capability or the system from a grass-roots perspectives (Johnston, 2010a). Its chief weakness is the fact that it tends to plateau not soon after some initial success. It is not sustainable. Worse still, when institutions bureaucratise a problem through intensive vertical investment (Johnston, 2010a) in fixing one of its components, these organisations lose the ability to be adaptive and change (Trist, 1977). In this sense, Bliss and Breen (2009) warning is critical. "A reliance on addressing [road safety] interventions alone will not suffice" (p. xvi). This view calls for a broadening of the agenda to ensure that institutional management functions are improved (Bliss and Breen, 2009). One such function for the Australia transport system is

the empowerment of self-organised groups and the prioritisation of role social networks in addressing road traffic trauma.

Advocacy

Advocacy in Australia is undertaken by self-organised institutions such as Pedal Power (Carruthers, 2010). Pedal Power is a Canberra-based cycling advocacy group. Its most recent campaign has been to push for a blanket 40 km/h speed limit across Canberra towns and group centres (Carruthers, 2010). It achieves this through social media campaigns and print material. Other self-organised (voluntary, not-for-profit) organisations in Australia with an advocacy role include the foundations cited above and incorporated institutions such as the Pedestrian Council of Australian (PCA). This institution (PCA) advocates for enhanced levels of pedestrian safety.

The issue with most self-organised institutions in Australia, especially those dependent on government funding, is the extent of their ability to advocate for change. Scott-Parker *et. al.* (2016) suggest that government funding and its guidelines tend to stifle advocacy. Those reliant upon government funding for day to day operation (i.e. Community Road Safety Groups) are less likely to have an independent voice, thus precluding them from advocating for improvements in the provision of government services at a local level.

The advocacy suggested by the coordinated model can be adversely affected by the stifling funding arrangements in Australia. This advocacy, which is shaped by self-organised groups' ability to influence public perceptions and engender moral commitment, should call for a continuity of service provision, including a rise in recurring funding. It should focus on ensuring that the various services provided to road user to render the system safe complement each other and address a broader agenda than simply deaths from crashes. This broader agenda should include the effects of private car dependence (Douglas et. al., 2011). Some of

the effects of car dominance (other than fatalities and injuries from crashes) include reduced physical activity, diabetes, respiratory diseases from air pollution and climate change (Douglas *et. al.*. 2011). Advocacy, in this sense, should ensure the road safety system in Australia does not lose control of safety (Scott-Parker, 2016), especially at a local, implementation level. It should call for a rise in active travel (Douglas *et. al.*., 2011) or cycle-based travel (Roberts and Edwards, 2010, in Warwick-Booth, 2011).

This type of advocacy which aims to modify the way in which safety is managed in Australia will target public administrators and politicians. As illustrated in Lyon (2013), advocacy may help politicians become more interested in road safety issues (an incremental improvement in Whitelegg's (1983) perspective). However, it tends not to influence implementation action (Lyon, 2013). Therefore, advocacy towards a coordinated road safety response in Australia, which aims to fix the system rather than the road user (Scott-Parker, 2016), will need to be a long term goal (Lyon, 2013). Its initial, fundamental step will be the removal of barriers to an independent voice of self-organised groups. Its long term goal will be that service provision does not lose control of safety (Scott-Parker, 2016) and all stakeholders including health professionals advocate for an inherently safe transport system (Breen, 2004), thus causing radical alteration in the structure of road traffic crashes (Whitelegg, 1983).

In fact, both Whitelegg (1983) and Trist (1983) alerted to a fundamental issue with road safety. The conceptualisation of road traffic crashes as representative of a failure of a component of a system, whose solution should focus on fixing such component (Whitelegg, 1983; Trist, 1983). The assumption in this paradigm is that the loosely defined system is well-designed (Whitelegg, 1983). In this respect, advocacy should have an independent voice to question the extent to which the provision of road safety services is well-coordinated and

defined as a cohesive system, which enjoys both continuity and sustainability. It should develop "learning networks" for the diffusion of information (Trist, 1977) about the status of the coordination of road safety services. It needs to call for the de-bureaucratisation of the management of safety in Australia and the broadening of the road safety agenda to include reductions in private car usage (Whitelegg, 1983) and the development of infrastructure for cycle-based travel (Roberts and Edwards, 2010; in Warwick-Booth, 2011).

Nevertheless, advocacy, as expressed herein, should not be confused with the activity of lobbyists, in the sense widely used (see car manufacturing industry lobby in Douglas *et. al.*., 2011). Advocacy, as intended here, develops a constituency for safety (Johnston, 2010b). It does not defend private interests.

Too big a problem

Whitelegg (1983) describes a road traffic accident (crash) as a serious problem. Its definition is thought to be that it "… is the result of several different factors in interaction and it is possible to view this situation as some kind of breakdown in a loosely defined system resulting from the failure of one or more components" (p.154). In Trist's nomenclature (1983), this type of problem is called a system of problems or meta-problems. Its issues are too extensive and too many-sided (Trist, 1983). This problem type, which contrasts with discrete problems (Trist, 1983) or individually separated problem, is beyond the capacity of single institutions to meet (Trist, 1983).

In the coordinated response model presented in fig. 8.3, this property (*too big a problem*) represents a realisation by road safety coordinators and other stakeholders that road traffic crashes are too multifaceted for a single entity to deal with. This understanding emerges through engagement with relevant stakeholders, including the public. The response to this issue is often provided within an inter-organisational domain (Trist, 1983). This

domain is managed by a referent organisation (Trist, 1977). Referent organisations (central person or institution) represent institutions to which member organisations are linked (Trist, 1977).

Central person

The model herein developed is a local level, implementation model. In Scott-Parker *et. al.* (2016), it sits between levels 4 and 6. It does not relate to the State or National levels, where a lead agency (see Chapter Two) is often the *central person*. In this respect, the role of lead agencies (Peden *et. al.*., 2004; Bliss and Breen, 2009) or referent organisations (Trist, 1977) is well documented in the literature. However, not much is known about the local level *central person*. In this regards, the Queensland-based work of Scott-Parker, Goode and Salmon (2015) and Scott-Parker *et. al.*. (2016) is pertinent. In a study which examined the various factors impacting upon young driver safety, these authors employed an actor map within Jens Rasmussen's risk management framework (1997) to depict the interrelationship amongst various road safety agents. Both studies concluded that there was often top-down vertical integration, with little bottom-up vertical integration, limited upward feedback loops and limited integration of actors at the bottom of the system (Scott-Parker, Goode and Salmon, 2015). In addition, there seemed to be unidirectional relationships at level 4 (technical and operational management), with level 5 (physical processes and actor activities) actors reporting no vertical integration with other institutions (Scott-Parker *et. al.*., 2016). In fact, the work of Ma, Hyder and Bishai (2010) has further identified a gap in the coordination of road safety activities. This has been said to be low level of social engagement (In fact, Ma, Hyder and Bishai, 2010).

These studies have called for change. Because actors were found to be spread across all six levels of the road transport system, a systems approach was called for (Scott-Parker,

Goode and Salmon, 2015). Furthermore, there was a need to delineate the relationship between actors; have transparency around the role of the various, interrelated actors; and adopt vertical integration, with lower levels feedback back to upper levels (Scott-Parker *et. al..*, 2016). An additional task in this local level inter-organisational space (organisational domain in Trist's words) was suggested by Trist (1977, 1983). This relates to the formation and development of the domain (the inter-organisational space). In this sense, the *central person* is expected to manage the domain (Trist, 1977). Critically, this person is charged with the task of ensuring that all member actors perceive the identity of the organisational domain (Trist, 1977). This is achieved through emergent appreciations of what is being done and what should be done (Trist, 1977). In addition, the *central person* should manage the chaos in the organisational domain through negotiated order (Trist, 1977). Negotiated order is said to be found in collaborations rather than competitions and, like network character, characterises an organisational domain (Trist, 1977). It is the process of rendering the organisational domain visible (Trist, 1977) and orderly through engagement with other actors/stakeholders.

The adoption of a *central person* or organisation to drive multifaceted, local level road safety projects represents a paradox at a local level. This is the level where there is no hierarchy or oversight in Australia local road safety programs and some OECD countries' county-based road traffic injury prevention activities. Therefore, the role of the *central person* should differ significantly from that of a lead agency. Whilst the lead agency is said to be effective through authoritative mandate and accountability (Peden *et. al..*, 2004; Bliss and Breen, 2009), a *central person* must enjoy the support and respect of all actors. The power and authority of this *central person* must be both *expert* and *referent* rather than *legitimate* (Lyngstad, 2015, p. 4). Expert power arises from the knowledge the *central person* is perceived to possess. This person or champion of road safety is respected for being

knowledgeable about road safety at a local level. Referent power comes from the ability of the *central person* being identified with by the network member actors (Lyngstad, 2015).

In this setting, the *central person* is a local champion (Ma, Hyder and Bishai, 2010; Aitken *et. al.*, 2013).

A keen interest

Due to the adaptive and emergent nature of coordinated responses (Chapter Seven), road safety coordinators should have a keen interest in the issues at hand. This implies the need to develop knowledge about specific, individual issues. In this sense, it is not sufficient to have a generic understanding of road traffic trauma causing factors. It is imperative to gain comprehensive familiarisation with the nuances of the issues at hand, including a broader perspective of the road transport system to include the impact of car dominance (Whitelegg, 1983).

Within the model presented in fig. 8.3, *a keen interest* underpins the approach of individuals or local champions, with the ability to influence others and mediate social engagement. This interaction moderated by a *central person* allows conflicts to be resolved and new forms of organisational domain identity (Trist, 1977) to emerge.

Influencing

Influencing denotes a skill. This is the ability to persuade others in road safety partnerships. In the context of the descriptive model, the actors closest to the coordination of road safety in Australia and some OECD countries tend to have the ability to sway competing interests in a context of scarce resources, thus highlighting the inter-dependence across stakeholders. These individuals have the ability to convince, persuade and motivate others through professional interactions. Whilst this influence is often geared towards promoting interventions (see Ma, Hyder and Bishai, 2010), the model shown in fig. 8.3 calls for an

ability to develop the organisational domain (Trist, 1977) by ensuring continuity and sustainability of coordinated action. This distinction is critical. The concept of influential actors is often used in the context of advocacy (for instance, Breen, 2004 and Scott-Parker *et. al..*, 2016). In Breen (2004), actors influencing the road safety system hold commercial interests; advocate for civil liberty protection; and advance trade liberalism, thus delaying the redesign of the transport system to make it inherently safe. Other influential actors are said to be health practitioners' associations, who advocate for legislative changes (e.g. the British Medical Association, the Casualty Surgeons Association, the Royal College of Surgeons, the British Paediatric Association, and the Child Accident Prevention Trust) (Breen, 2004). In Scott-Parker *et. al.*. (2016), influential actors are said to be government agencies and community groups with the ability to influence safety outcomes. However, the influence exerted by local champions called for by fig. 8.3 goes beyond advocacy for or against road safety interventions. It is the type of influence which builds interactions, trust and feedback loops. It enables member actors to vent out their anxieties (Whitelegg, 1983). In this sense, it represents the development of ecologies (Dougherty & Dunne, 2011; Andersson & Ford, 2016) within a web of local actors. Andersson & Ford (2016) offer a wealth of literature about the concept of organisational ecology, especially as it relates to the emergence, growth and survival of new forms of organising through social interactions.

8.5 DISCUSSION

8.5.1 Significance

The series of additional analyses conducted in this chapter has helped to develop a descriptive model of coordinated road safety responses as it applies to the policy contexts in

Australia and some OECD countries. The significance of the descriptive model herein developed is twofold. In one respect, the identification of the facets of the phenomenon (i.e. coordinated road safety responses) can help to devise evaluative tools. In this respect, the facets represent the aspects of coordinated responses in road safety to be evaluated. Accordingly, the evaluative tools would look at the context, the actions and the actors involved in the coordination of road traffic injury prevention countermeasures. The evaluation questions would cover the existence or otherwise of the proximal and distal factors. The extent to which the contributing factors in fig. 8.3 play a role in the onset, continuation and sustainability of coordinated responses can be measured on a wide range of scales (e.g. 1 – 10; much like the country profile in the Global Status Reports, with 10 denoting a very high prevalence). Each one of the contributing factors (proximal & distal) can be operationalised in a statement (i.e. *there is a keen interest in road safety on the part of all relevant stakeholders*).

On the other hand, the contributing factors (both distal and proximal) can be converted into evaluation questions, whose answers will determine the areas for improvement in order to obtain improved practical application of coordinated responses. In this vein, the context of coordination in road safety may be examined to establish whether or not and to what extent this context contains appropriate funding conditions to contribute positively for the onset, continuation and sustainability of coordinated responses. Likewise, this same context, if found not to offer adequate funding conditions, may be investigated for the extent to which resources are perceived to be limited. The premise in this case is that in those contexts where resources are limited, road safety stakeholders will turn to funding opportunities and develop adaptive strategies due to a realization of inter-dependence.

By the same token, the actions in a given road safety context may be the subject of evaluation to establish whether or not and to what extent these are influenced by a holistic and unified approach to crash data analysis. If the actions are not found to be guided by a holistic approach, the investigation may turn to the extent to which there is a perception of the need for buy-in by all stakeholders involved in the delivery of road safety countermeasures. Where there is little or no buy-in, the onset, continuation and sustainability of coordinated responses may not be conducted through a holistic approach and stakeholders will become indifferent.

Similarly, the actors in the descriptive model can be evaluated in the same manner as the context and the actions. In this respect, the actors such as government road safety officials, community workers, professional stakeholders and the community at large can be examined in order to develop an understanding of whether or not and the extent to which these hold a keen interest in road safety issues. This keen interest is expected to help widen the reach of the countermeasures to include all stakeholders and deepen each countermeasure to ensure blanket approaches are not adopted. This influence of keen interest upon the nature of coordinated responses is enhanced by the realisation of the fact that road traffic injury prevention is too big a problem for a single stakeholder to handle. Such influence is manifested in the engagement of a wide range of stakeholders, whose views help to widen the scope and deepen the specificity of the approaches adopted to engender coordinated responses and the nature of the responses themselves.

Whilst the model presented in fig. 8.3 can assist in the development of road safety responses, which are coordinated, its primary goal is the development of the organizational domain (Trist, 1977). It focuses on inter-organisational competence (Trist, 1983). This model is an institution building tool (Trist, 1983), which provides norms in the development of

ecologies of local level stakeholders. Its application is local (county-level). It is not a replacement for National or State (provincial) inter-ministerial frameworks. Instead, it is a local level quasi equivalent of inter-ministerial frameworks. Its description herein provided is expected to help add specificity to a loosely employed term – i.e. coordination at a local level. It renders the term "coordinated" more explicit and employable. In this sense, a road safety response or countermeasure can be said to be coordinated at a local level when it depicts the properties of the model presented in fig. 8.3. Likewise, an ecology of local stakeholders can be said to be well- coordinated, when these are able to create culturally appropriate programs with complementary activities; shape these programs and sustain them without losing control of safety or allowing conflict to stifle progress.

8.5.2 Limitations

The set of analyses in the present chapter is not without limitations. Firstly, the model described in this chapter may be perceived as rather normative. It is likely to be thought as normative for being built from opinions expressed by coordinators rather than empirical observations of the professionals interacting in a coordinated manner. As a normative model, it stipulates standards. Whilst these benchmarks may apply readily to Australia and similar OECD countries, these may not necessarily reflect other contexts.

Secondly, the model reflects the views of the interviewees and survey takers. In this sense, it represents the belief system (potentially biased towards the ideal) of the sample. This sample comprised professional stakeholders from mostly Australia and some OECD countries, although middle and low income country participants took part in the data collection.

8.6 Chapter Conclusion

This chapter developed a descriptive model of coordinated road safety strategies in Australia and some OECD countries. It outlined its building model, evaluative benefits and the manner in which its features can assist in the design of evaluative tools.

Whilst the facets and contributing factors unveiled in this chapter may not differ significantly across cultures, the actual phenomenon is highly likely to be amenable to cultural and contextual sensitivities. This is due to the fact that the workflows in the phenomenon tend to be project-specific. Additionally, its description has been derived from opinions of road safety coordinators. These views may have introduced a degree of bias towards an idealised scenario, thus necessitating further inquiries into its practical feasibility.

Furthermore, whilst coordinated planning, clear roles and a firm commitment to implementing plans (Peden *et. al..*, 2004) typify inter-ministerial frameworks' contexts, local level coordination features facilitative activities, ongoing communication, keen interest in road safety, the need for buy-in, concerted effort to work together, deepening of understanding of each other's circumstances, the use of negotiation skills to remove barriers, complementarity across activities, autonomy, horizontal coordination and a shared sense of accountability.

This conclusion suggests that there might be merits in pursuing 'loosely coupled' (Burke, 2014) approaches at a local level and/or throughout the implementation of road traffic injury prevention activities.

Future research would contribute to knowledge by employing the model in those circumstances found not to have cohesion of approach and knowledge gaps about each stakeholder role in a local level setting. This deployment should examine the ability of the

model to develop social cohesion and stimulate feedback looks both horizontally and vertically at a local level.

8.7 CHAPTER SUMMARY

This chapter utilises the data from the twenty-two interviews and its own to generate a description of a coordinated road safety response. It does so by considering the nature of a coordinated road safety response, its contributing factors and facets. In considering these aspects, this chapter provides an outline of the workflows employed to establish, continue and sustain coordinated responses in road safety at a local level. In addition, it characterises the coordination used at this policy domain (local, county) as horizontal (as opposed to hierarchical or vertical), which enables a holistic appreciation of the nuances of trends in road traffic crash data to occur. This type of coordination features concerted action to secure buy-in and engagement from target groups.

The findings in this chapter also revealed three stages of the development of coordinated responses. Initially, there appeared to be an attempt by road safety coordinators at a local level to establish coordinated responses (onset) through stakeholder engagement. This first step involved, in most instances, crash data examination with the view to identifying both trends and at risk groups. In it, the trigger for coordinated effort was found to be the *realisation that the problem was too big for a single stakeholder* to tackle. In fact, this realisation was assisted by the appreciation of the holistic nature of the facets of the rising trends in crash data. In this manner, these findings suggested that coordinated road safety responses emerged from stakeholder engagement and the manner in which they viewed road traffic crash data. Conversely, approaches with little local level stakeholder engagement and issue appreciation from a wide range of perspectives did not seem to be regarded as appropriate sources of coordinated responses. For instance, national road safety strategies did

not appear to trigger coordinated road safety responses at a local level. Indeed, the action found to trigger coordination at a local level was *self-organising*. This may be justified by the fact that the workflows examined in this chapter seemed to emphasise the need to seek buy-in and stakeholder engagement. This engagement would be best served by communities of practice being self-organised around key road trauma issues through *advocacy* such as liquor accords (i.e. groups of licensees or owners of pubs, hotels and bottle shops) who choose to serve alcohol responsibly and advocate for the safe use of alternative transport to driving home after a few drinks. Such advocacy may be viewed as stakeholders' ability to influence others within partnerships.

These findings hold significant value to the present program of research. Through the description of the workflows, the facets, contributing factors and steps involved in establishing, maintaining and sustaining coordinated responses at a local level, this chapter addresses the first research aim. It also provides the description of the model sought in the first of four research objectives.

More broadly speaking, this chapter allows the emergence of coordinated responses to be understood. It also identifies variables, which describe the practical nature of coordinated road safety responses in Australia, predominantly.

However, this chapter does not provide sufficient guidance in relation to the underpinnings of the actions carried out within the government-professional stakeholder cluster of government, which enable local level road safety coordination to occur. In this respect, it is imperative to investigate the conceptual nature of coordinated road safety responses in Australia and other comparable OECD countries.

Chapter 9: Reconceptualising Policy Integration in Road Safety Management

9.1 INTRODUCTORY COMMENTS

Previous research papers and data analyses (Chapters Six to Nine) in the present thesis defined the practical nature of coordinated road safety responses or countermeasures. This was described as comprising multi-pronged, adaptive responses developed in a policy context of mixed public attitudes, resource scarcity, inter-dependences amongst stakeholders, self-organising activities contributing towards advocacy, the realization that the road traffic trauma is too big a problem for a single stakeholder to handle creating centralization of effort and stakeholders' keen interest contributing to development of the ability to influence others.

This research paper differs from the previous ones on a chief premise. Whilst the previous research papers and data analyses identified the practical nature of coordinated responses in road safety in Australia and some OECD countries, the present study examines the theory which guides the development of these countermeasures. It explains the processes entered into by government agencies and the community to engender multi-pronged, adaptive coordinated road safety countermeasures or programs.

Furthermore, the present examination draws upon the conceptual weaknesses of the theory most commonly viewed as the guide for coordination – i.e. *PI* to develop its substitute theory. , this chapter represents a reconceptualisation of *Policy Integration.* Moreover, this study outlines practical examples for the utility of the new coordination-guiding principle and its processes. This development addresses the second research objective in this thesis.

This chapter holds substantial significance to the current thesis. In this respect, on the one hand, it marks the commencement of Part II. On the other hand, the findings in this

chapter allow the thesis to deliver its chief outcome – i.e. a theory, with the ability to improve the practical application of coordinated road safety responses. This outcome supports the second research aim.

This study has been published in the *Journal of Transport Policy* (see citation below). This peer-reviewed periodical publishes research into transport policy development. With an impact factor (*IF*) of 1.4, the *Journal of Transport Policy* has a wide readership in Transport. Of its many foci in Transport, Transport Safety is the most relevant to the coordination of road safety countermeasures.

The current research paper has been formatted in line with the Higher Degree Research Guidelines (Requirements for Presenting Theses), 2015 and the QUT Reference Guide, 2013 (Writing Your Thesis Using Word 2010 and End Note X6).

9.2 AUTHOR STATEMENT OF CONTRIBUTION

The authors listed below have certified* that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;

2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;

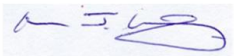
3. there are no other authors of the publication according to these criteria;

4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and

5. they agree to the use of the publication in the student's thesis and its publication on the Australasian Research Online database consistent with any limitations set by publisher requirements.

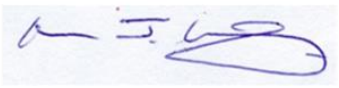
In the case of this chapter:

Publication title and date of publication or status: Reconceptualising Policy Integration in Road Safety Management

Contributor	Statement of contribution*
Joao Canoquena Signature  Date 9th March 2017	Collected data, conducted data analysis and wrote the manuscript
Dr. Mark King * Signature  Date 9th March 2017	Aided the design of the research conceptual framework and provided editorial feedback on the manuscript as well as guidance in the selection of an appropriate peer-reviewed journal

Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Mark King  9th March 2017

Name	Signature	Date

9.3 PAPER THREE (AS SUBMITTED FOR PUBLICATION)

Canoquena, Joao Manuel da Costa (2013) Reconceptualising PIin road safety management. *Transport Policy*, *25*, pp. 61-80.

Abstract

Unless sustained, coordinated action is generated in road safety, road traffic deaths are poised to rise from approximately 1.3 to 1.9 million a year by 2020 (Krug, 2012). To generate this harmonized response, road safety management agencies are being urged to adopt multisectoral collaboration (WHO, 2009b), which is achievable through the principle of policy integration. Yet policy integration, in its current hierarchical format, is marred by a

lack of universality of its interpretation, a failure to anticipate the complexity of coordinated effort, dearth of information about its design and the absence of a normative perspective to share responsibility. This paper addresses this ill-conception of PIby reconceptualizing it through a qualitative examination of 16 road safety stakeholders' written submissions, lodged with the Australian Transport Council in 2011. The resulting, new principle of policy integration, Participatory Deliberative Integration, provides a conceptual framework for the alignment of effort across stakeholders in transport, health, traffic law enforcement, relevant trades and the community. With the adoption of Participatory Deliberative Integration, road safety management agencies should secure the commitment of key stakeholders in the development and implementation of, amongst other policy measures, National Road Safety Strategies.

Keywords

policy integration; grounded theory method; reconceptualisation; road safety strategy; organisation design theory

9.4 INTRODUCTION

Road traffic deaths, which affect mostly vulnerable road users (WHO, 2009b), are poised to rise by almost sixty per cent by the end of the first three decades of the current century (Krug, 2012). More specifically, in 2004, road traffic deaths were the ninth leading cause of fatalities worldwide, causing in excess of 1.2 million fatal casualties (WHO, 2009b). Of these deaths, almost half were pedestrians, cyclists, motorcyclists and public transport passengers (WHO, 2009b). In the same year, road fatalities represented the second leading cause of deaths in the 1-14 age group, after lower respiratory infections (WHO, 2009b). By 2030, road fatalities are estimated to become the fifth leading cause of deaths across all age groups (WHO, 2009b).

In response to this rising road toll, the World Health Organization (WHO, 2009b) has identified close multisectoral collaboration, inter-alia, as an essential strategy to generate a coordinated response in road safety management. This cross sector action is expected to engender the adoption of a safe systems approach, which will enable countries to address the spiralling road fatalities (WHO, 2009b). This acknowledgement of the significant role of multisectoral collaboration in the fight against the rising road toll resonates with findings dating back to 2000. It was recognized then that road traffic crashes were caused by compound factors (Smith, 2000). It was equally acknowledged at the turn of the new millennium that the most adequate response to road traffic deaths would require a multiple-approach (Walker, 2000). Such endorsement of the merits of a multi-agency approach in road safety management has since enjoyed widespread acceptance (Elsig, 2004; Connor, 2005; Trim & Barak-Zai, 2008; Shuey, 2004). Outside the academic field, the appreciation of the value of multisectoral policy coordination appears to have gained high profile and political commitment. The House of Commons Transport Committee in Britain has encouraged greater integration of objectives across the British government departments (2008). Similarly, the First Global Ministerial Conference on Road Safety Declaration ('The Moscow Declaration') has advocated for links amongst planned activities (WHO, 2009a). This encouragement for policy interaction arises from observations of successful road traffic death reductions in countries with high levels of political commitment, the adoption of best practices in road safety management, and the close integration of societal actors, who align efforts to create a culture of safety (Krug, 2012).

In order for transport agencies to achieve close multisectoral collaboration across government sectors and the community, these need to adopt PI or the government-professional stakeholder cluster approach. PI is a principle (Nilsson, 2003; Soderberg, 2011; Mickwitz, 2007) by which cross-sectoral objectives (Mickwitz, 2007) and approaches

(Nilsson, 2003) interact. It represents the '… incorporation of specific public policy principles … into other public policies …' (Mickwitz, 2007, p.69). Its benefits are multiple and varied. PI increases rationality and effectiveness of policy making (Nilsson, 2003). It results in increased coherence and consistency of initiatives (Rayner, 2009), interconnectivity across policies (Hull, 2008) and their alignment with a single agenda (Stewart, 2006). In addition, PI allows the exploration of mutually beneficial cooperative opportunities (Nilsson, 2003), the realisation of efficiency gains (Rayner 2009), and improvements in public policy (Mickwitz, 2007). Furthermore, it can transform complex and confusing systems into user-friendly provisions by creating a single point of access for a multitude of social services, and widening professionals' control over a wide range of services (Leutz, 1999). The result of PI constitutes a comprehensive service delivery system (Keast *et. al..*, 2007). This comprehensiveness of service delivery is premised on the assumption that ' …a package of policy instruments can be significantly more effective than any one instrument taken alone,' (May *et. al..*, 2003, p. 159).

Nonetheless, policy integration, in its current hierarchical, politicized and centralized format, appears to be highly inadequate to materialize its benefits. For instance, in transport, this alignment of key actors around collectively appreciated priorities has failed to engender sufficient understanding of integration institutional structures (Hull, 2008). In addition, it has not mobilized key stakeholders, such as local authorities or private sector operators, around chief priorities (Hull, 2008). Some of these failures may have arisen as a result of the limited persuasive power of the champions of PI (Hull, 2008). Others have emerged due to insufficient staff time resources (Hull, 2008). Others still are the result of differences in administrative boundaries, which yield conflicting agendas (Hull, 2008). Furthermore, the absence of a normative perspective of shared responsibility may equally have stood in the way of joint-work (Hull 2008). Moreover, inadequacies in the adoption of PI may have also

resulted from the dearth of knowledge about its processes (Leutz, 1999; Connor, 2005; May *et. al.,* 2003) and the absence of agreement about its actual meaning (Nilsson & Eckerberg, 2009).

Most importantly, the shortfalls of the current format of PI may have originated from its flawed assumptions. In this sense, PI has been at odds with community values. Whilst the community values lives saved through road safety interventions, for instance, the champions of PI emphasise aggregate rate reductions, which are said to inform future interventions (Dann, 2009). Similarly, whilst transport agencies and local authorities may opt to employ behaviour-changing social advertising campaigns to secure community support for the enforcement of interventions related to speed or drink-driving, community resentment and despondency may be triggered instead. This is due to a lack of ethicality in these campaigns and poor knowledge of community sensitivities (Hasting, 2004). , PI has failed to achieve consistent goals due to some intractable analytical challenges such as goal rationalization and optimal instrument design (Rayner and Howlett, 2009). In other words, little is known about the aspects which contribute to optimal policy instrument design in PI (Rayner and Howlett, 2009). Needless to say, there are calls for the development of an action-guiding framework in PI (Keast *et. al..,* 2007). This framework should broaden policy development in order to transcend operational integration across services (May *et. al..,* 2003) and include a much wider range of stakeholders and structures than it is the case presently (Hull, 2008).

Whilst attempts have been made and failed to achieve optimal PI through layering (i.e. new policy stack up on top of old policy), drift (i.e. shifting interest in policy goals, without altering policy instruments) and other policy reform processes (Rayner and Howlett, 2009), no research has been conducted thus far to reconceptualize PI from a stakeholder perspective.

This paper aims to reconceptualize PI by qualitatively examining 16 written submissions lodged with the Australian Transport Council in 2011, throughout the development of the Australian 2011-2020 National Road Safety Strategy (NRSS). This first step in developing a new, cohesive body of knowledge about PI in road safety from a stakeholders' perspective focuses primarily on the integration of policy measures (cf. Hull, 2005, level 8) rather than physical and operational integration. Its chief outcome is the development of an action-guiding framework (i.e. a clearly defined principle and its implementation processes) for appropriate policy coordination in road safety management.

The upcoming seven sections provide further details about the limitations of policy integration, its reconceptualization methodology, and relevant implications for transport policy and research. Section 9.2 evaluates the existing flaws in the current conceptualisation of policy integration. Section 9.3 provides the research conceptual framework. Section 9.4 briefly outlines the adaptation of the grounded theory method and details the content analysis undertaken in the present study under *methods*. Section 9.5 succinctly lists the main findings. Section 9.6 (discussion) contextualises the new concept within the transport sector, and presents a framework for its application in road safety management. The last part, section 9.7 (conclusion), outlines the purpose of the paper, its chief findings and future research directions.

9.5 POLICY INTEGRATION

9.5.1 Definition

In inter-agency relationships, PI aims to incorporate policies from apparently disparate governmental institutions (Mickwitz, 2007). This harmonization of policies (Stewart, 2006) often emerges in response to periods of policy drift or a highly disorganized policy regime

(Rayner & Howlett, 2009), and a normative perspective of shared responsibility (Nilsson, 2003).

This principle of inter-sectoral working form (Hull, 2008) combines a range of transport policy interventions with social policy instruments (May *et. al.*., 2003). Such alignment of effort in road safety management, for example, sees transport, health and police authorities collaborating closely to generate a coordinated response to rising road traffic deaths (WHO, 2009b). It can equally manifest itself through the harmonization of terminology across sectors and data linkage (WHO, 2009b). In addition, PI can combine legislative frameworks with public awareness campaigns (WHO, 2009b). For instance, the enforcement of alcohol impairment laws (e.g. random breath testing) can be combined with publicity (Peden *et. al.*., 2004). These public awareness campaigns have the potential to secure a) public support for high visibility law enforcement activities, and b) a shared social norm for safety (Peden *et. al.*., 2004). This mobilization of road safety effort can result in increased levels of compliance with the law (Peden *et. al.*., 2004).

This '… joint working with other policy sections …' (Hull, 2008; p.102) denotes the integration of policies at two levels (Rayner & Howlett, 2009). Policy coordination (Mickwitz, 2007) operates at both the level of goals and policy instruments (Rayner & Howlett, 2009). At the latter dimension (i.e. interaction of policy instruments), it requires institutional structures which are conducive to multisectoral problem resolution (Rayner & Howlett, 2009). Such interaction of goals and policy instruments occurs as a result of increased funding allocation and the expansion of knowledge, perspectives and interests of the stakeholders involved (Leutz, 1999).

This paper focuses primarily upon the integration of policy instruments or measures. The most difficult of the forms of integration (cf. Hull, 2005 for *the ladder of integration*),

the integration of policy measures requires a match between ends and means (Rayner and Howlett, 2009), and interdependencies across sectors (Hull, 2005). It is achieved through a combination of fiscal, regulatory and other measures (Hull, 2005). In fact, it emerges as a result of the deployment of a full range of policy tools such as legislative frameworks, and financial and infrastructure provisions (Hull, 2005; Hull, 2008). It also originates from the development of 'soft measures' such as the increased understanding of professional cultures, the building up of trust and the forging of working relationships across sectors (Hull, 2005). The role of the government in this type of multi-governmental governance is that of facilitating, encouraging and regulating the interaction across policies (Stewart, 2006). In brief, governments create the legal, financial and policy frameworks for the interaction of policy measures (Hull, 2008).

9.5.2 Conceptual Limitations of Policy Integration

Whilst barriers to PI may inhibit the implementation of its processes, these obstacles can and have been removed in a range of instances (cf. de Cerreno, 2009; Elsig, 2004; Agranoff and McGuire, 2001; Tollefson, 2006; Page, 2004; Herdegen, 2008; Bergquist *et. al.*., 1995). Flawed assumptions in the conceptualization of policy integration, on the other hand, tend to be more pervasive than barriers. For instance, it is far more difficult to demystify the assumption that linkages by themselves secure PI (Perlman and Weatherley, 1986; Leutz, 1999) than to widen the persuasive power of the champions of PI(Hull, 2008). The WHO, much like the early calls for PI(Perlman and Weatherley, 1986), has demonstrated this pervasiveness by calling, on successive occasions since 2004, for data linkage as a form of aligning policies (cf. Peden *et. al.*., 2004; WHO, 2009a; WHO, 2009b) without ever delving into its universality of interpretation or resource intensity. Not surprisingly, the

interaction of objectives and interventions across sectors has remained rhetorical (Nilsson & Eckerberg, 2009).

The subsequent section expands on these rather neglected aspects of PI with the view to generating a thorough understanding of the extent of the flaws in the prevailing assumptions about policy integration.

9.5.2.1 **Failure to Transcend Policy Integration**

The gap between the aspiration for and the reality of integrated policies may remain vast (Hull, 2005) unless policy development in road safety is broadened. Traditionally, governments take a narrow approach in policy development, which tends to favour operational integration across services, failing to integrate infrastructure, management, regulation or pricing in transport or across sectors (May *et. al.*., 2003). Unless the agenda in road safety is widened to embrace much broader goals such as sustainable mobility, policy development will continue to fail to be conducted holistically (Hull, 2005). Such holism transcends the responsibility of a single sector (Hull, 2005). For instance, the reduction of car dependence can be broadened to embrace communities' desire for leading a more active lifestyle (Hull, 2005). In Victoria, Australia, this has been attempted with the introduction of the Transport Integration act 2010. This legislative framework expands, for the first time in Victoria, the scope of the State' transport laws beyond transport government agencies, on the basis of a triple bottom-line conceptualization, which includes economic, social and environmental considerations (Withington, 2011). However, this decision-making aiding instrument has been weakened by its limited conceptualisation and rather hard to enforce provisions. In fact, its implementation is said to be 'patchy', with decision makers producing 'cursory template responses' or ignoring the legislation altogether (Withington, 2011). Its non-coverage of all aspects of planning such as planning permits (Withington, 2011) restricts

its impact on planning behaviour to the burden of proof of having regard for the vision of an integrated transport system. The operational implications (Johnston, 2010b) of the Transport Integration Act 2010 in inter-agency functioning appear to be questionable (Withington, 2011).

Some of the simplest forms of PI include the combination or sharing of transport facilities such as bike racks on buses, combined mode schedules and joint webpages. These integrated transport systems are developed mostly through inter-agency activities amongst transport institutions. A case in point is transit coordination or seamless travel across transit systems, (Rivasplata, 2012). The outcome of this combined provision of services often fails to account for the full range of community needs. This is due to the fact that the recipients of the combined measures are not participants in the initial deliberations for the development of joint provision (Enders and Seekins, 2011). In this case, consultation with the policy recipients is conducted throughout the late stages of policy development to gain acceptability of draft plans (Banister, 2008). In addition, there is no framework to account for interrelationships across stakeholders (Basso, 2012).

9.5.2.2 **Dearth of Knowledge**

Knowledge of PI is often sketchy. For instance, little understanding exists of its design principles and processes (Leutz, 1999; Connor, 2005; May *et. al.*., 2003). More specifically, its working practices, in transport for instance, remain mostly uncharted (Hull 2008). In this sense, PI has failed on two levels. Firstly, it has not developed an understanding of the attributes of integration modes (Keast *et. al.*., 2007). Secondly, it has not adequately matched its processes and mechanisms with purposes and contexts (Rayner and Howlett, 2009). Moreover, it is not always easy to understand the orientation of the main actors in integrated effort (Keast *et. al.*., 2007; Leutz, 1999). This orientation may fall under either one of the

following two categories: cooperation and understanding (horizontal integration) or domination and conflict (vertical integration) (Leutz, 1999). Vertical integration is authority-driven whereas horizontal integration is relationship-oriented (Keast *et. al..*, 2007). In addition, the impact of incorporating policy instruments is hardly known (May *et. al..*, 2003). In transport, these instruments include infrastructure, management, regulation and pricing (May *et. al..*, 2003).

Research into PI has ignored institutional, organizational and implementation issues (May *et. al..*, 2003). This absence of evidence of good cases of successful PI may originate from the challenges in collecting before and after data of the implementation of PI(May *et. al..*, 2003). It may also emerge from the limitations of, in the case of the use of a model, the model to represent the reality of policy instrument integration (May *et. al..*, 2003).

Additionally, rationales and decision-making processes for the adoption of PI require enhanced clarity. For instance, stronger rationales for substituting existing programs with integrated ones to ensure fair accessibility should be more forthcoming (Leutz, 1999). Furthermore, there is a lack of information as to what to base decisions upon at the local level in situations where there is a national mandate to integrate (Leutz, 1999; Hull, 2005).

9.5.2.3 **Lack of Universality of Interpretation**

There is very little agreement on the actual meaning of PI (Nilsson & Eckerberg, 2009). In other words, a fragmentation of our understanding of PI is in evidence (Hull, 2005). This disparity in the interpretation of policy integration, which is exacerbated by the unclear nature of its practical application (Nilsson, 2003) may arise from the plurality of perspectives about PI processes (May *et. al..*, 2003). Put simply, PI processes such as cooperation, coordination and collaboration have not been 'unpacked' collaboratively (Keast *et. al..*, 2007). This process of interpreting PI from a range of perspectives should result in the harmonization of

the terminology related to PI (Keast *et. al.*., 2007) and the removal of existing ambiguities about its conceptualisation (Nilsson, 2003).

Furthermore, in this context of sparse, short-lived successful integration stories, a range of questions have been raised, namely: who should oversee the integration effort (Leutz, 1999)? What systems should be linked and at what level (Leutz, 1999)? Whilst the first question received its answer globally in 2004, in the early years of road safety advocacy, the latter interrogation remains unanswered in this current decade of action. In 2004, following a best practice investigation in road safety, the WHO recommended the creation of well-resourced, powerful lead agencies at the national level, charged with the task of coordinating road safety interventions through national road safety strategies (Peden *et. al.*., 2004). However, since then very little knowledge has been developed about the mechanisms, design principles, action-guiding frameworks, ethicality, practical applications or institutional requirements for PI in road safety.

9.6 RESEARCH CONCEPTUAL FRAMEWORK

9.6.1 Problem Statement

In the preceding section, a range of inadequacies are identified related to the conceptualisation of policy integration. These conceptual limitations of PI may impair its adoption as a guiding principle in the management of road safety multisectoral collaboration. Stated otherwise, there is a need to improve this theoretical concept (Thakker and Ward, 2010) of PI so as to enable road safety agencies to adopt its implementation process of close multisectoral collaboration.

9.6.2 Research Outline

The aim of this study is to improve the theoretical underpinning of close multisectoral collaboration by reconceptualising its chief principle of policy integration. This reconceptualization should herald a new concept, featuring the key aspects of a concept analysis, namely: a definition (with clear attributes), its dimensions (or indicators), illustrative case (model case), implementation processes (or enabling factors) and consequences (Wilson, 1963). Most importantly, the new concept should provide sufficient theoretical foundation to guide future research into road safety intervention interaction.

To this end, the main research questions in this study are as follows: *a) how do stakeholders with institutional knowledge of policy development in road safety perceive of the importance given to PI in the development of NRSS?; b) what conceptual framework (i.e. concept analysis) of PI can be developed from stakeholders' perspectives?; c) how does the new principle differ from the existing one?* and *d) how can this new principle be applied in transport policy development?*

Table 9.1 maps these research questions with the shortfalls of the current conceptualization of policy integration.

Table 9.1: Mapping Shortfalls with Research Questions

Current PI Shortfalls	Research Questions
• not encouraging and regulating the interaction across policies (Stewart, 2006)	a
• clarify the role of integration, at a local level, in the achievement of a broader, social outcome (Hull, 2005); provide sufficient advice about local synergies between policy streams, thus promoting organizational and policy sector integration (Hull, 2005)	b
• little agreement on the actual meaning of PI(Nilsson, 2009)	b
• no framework to account for interrelationships across stakeholders (Basso 2012)	b
• not always easy to understand the orientation of the main actors in integrated effort (Keast *et. al.*, 2007; Leutz, 1999)	b
• failure to emphasise the need to develop a 'new government-professional stakeholder cluster' in which interdependence rather than independence governs policy interaction (Keast *et. al..*, 2007)	b
• no understanding of the attributes of integration modes (Keast *et. al*., 2007)	b
• existing ambiguities about its conceptualisation (Nilsson, 2003).	b & c
• What systems should be linked and at what level (Leutz 1999)?	d

9.7 METHODS

9.7.1 Data Collection

In response to the Australian Transport Council's invitation for comments on the draft of the Australian 2011–2020 National Road Safety Strategy (NRSS), 137 stakeholders' written submissions were lodged by 18th February 2011. Of these lodgements, 16 (11.6%) were found to provide sufficient institutional and relational information related to PI in road safety management.

These generalist practitioners, who emphasized the pivotal role of communities in policy development, were thought to be likely to provide significantly rich process–based, non-technical details of the indicators of policy integration.

These data can be said to be representative of the perspectives about PI for two main reasons. Firstly, Australia's commitment to the Safe System Approach, not unlike much of the OECD member countries', has resulted in a shift in opinion towards a holistic approach to road safety (May *et. al..,* 2008). There is, in Australia, an understanding of *the synergies across agencies* (Johnston, 2010b). In fact, the '... synergies across the efforts of agencies are not only reasonably well understood but in many states are being overtly and explicitly managed ' (Johnston, 2010b, pp. 1178-1179) in Australia. Secondly, whilst the setting of data collection, Australia, abounds with opinions about the creation of the government-professional stakeholder cluster of government, the nature of expertise available is equally enlightening. Road safety experts with interest in child pedestrians and cyclists have been at the forefront of the calls for the development of a shared attitude to road safety. , the emerging road safety philosophies in Australia appear to have broadened beyond motorized transportation modes to embrace walking and cycling (May *et. al.,* 2008), making them ideal for qualitative research into the incorporation of policies across sectors.

The 16 written documents were downloaded from the website of the Australian Department of Infrastructure and Transport. No transcription of the full contents of the written stakeholder submissions was required. These expert opinions can be accessed through the link provided under Reference for the Australian Department of Infrastructure and Transport (2011).

9.7.2 Sample Characteristics

As illustrated in table 10.2, the stakeholder submissions originated predominantly from Victoria (31%), Australia. These 13-page submissions were written by mostly company managers (33%).

Appendix I provides further sample (source) details.

Table 9.2: Characteristics of the Written Stakeholder Submissions

	Stakeholder Submission Representativeness (Australia)						Document Length (in pages)		Authors	
State	NSW	ACT	VIC	SA	QLD	WA	Mean	13.2	Managers	33%
Absol. freq.	3	2	5	1	3	2	Mode	3,12	Officers	27%
Rel. freq.	18%	12%	31%	6%	18%	12%	Median	12	Academics	20%
									NS*	20%

* Not Stated

9.7.3 Data Analysis

The analysis of the 16 written stakeholder submissions is described below. Whilst 9.3.1 provides a description of the use of the grounded theory method and rationale for its adaptation, 9.3.2 details the examination of the written documents.

The examination of the data in the current study involved a cyclical, manual content analysis process, which was significantly based upon Pidgeon and Henwood's (1996) interpretation of the grounded theory method (GTM) and the application of latent coding in Kalof *et. al.*. (2008). However, the recursive sequence of analytical steps adopted in this study differed from Pidgeon and Henwood's (1996) approach in two significant ways. Firstly, unlike Pidgeon and Henwood (1996), this paper employed a concept matrix (also known as a concept chart) to provide sufficient concept coverage, and guide the segmentation of the texts, an approach which is similar to the use of a set of 'a priori themes,' (Binder, 2010). Secondly, this paper made the development of the new concepts far more explicit than Pidgeon and Henwood by employing nominalization (i.e. conversion of verbs into nouns), hierarchies of terms (i.e. higher-order terms or hypernyms) and tabulation (cf. tables 9.5-11).

An additional, noticeable difference between the grounded theory method approach adopted herein and elsewhere (cf. Ong, 2011) was the direction of data analysis. Whilst traditionally the grounded theory method, which is employed when little knowledge exists about an issue, generates theory from unstructured data, this study reconceptualised an

existing concept through the 'translation' of qualitative data. Put differently, the present study used a theory (organization design theory conceptualisation of strategy integration) to develop a new theory (a new concept of policy integration) by superimposing (overlaying) a concept matrix upon the data.

Figure 9.1 illustrates this innovative qualitative approach more succinctly.

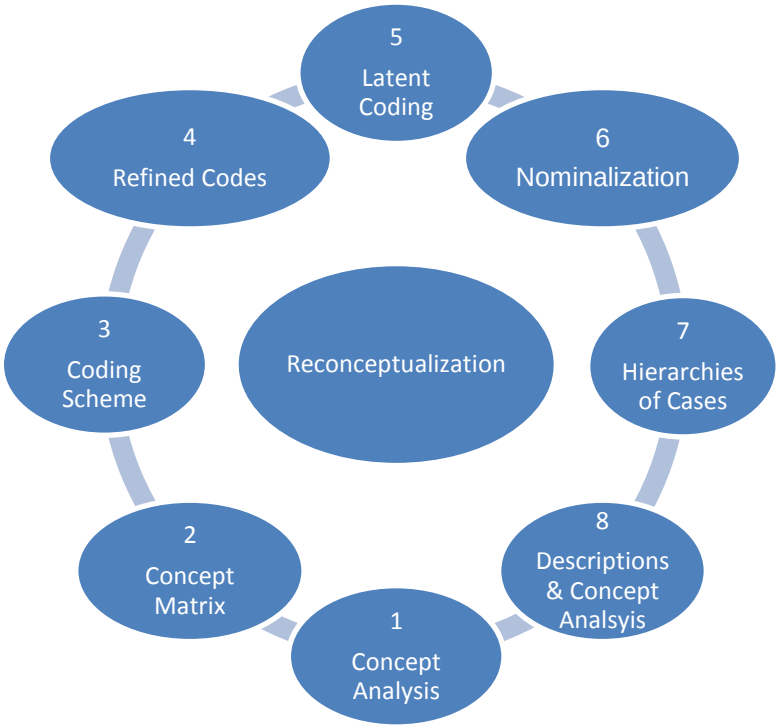


Figure 9.1. Study Methodology

9.7.3.1 **Content Analysis**

Due to the dearth of knowledge about PI design principles, implementation processes and mechanisms, its business-oriented version – strategy integration – was employed to create a concept matrix. To this end, an initial concept analysis of strategy integration was

conducted from an organization design perspective. Strategy integration dimensions can be viewed from, at least, two perspectives. In one school of thought, hierarchies, administrative or control systems and voluntary activities represent strategy integration dimensions (Litterer, 1965). This hierarchical approach epitomises the PI context in the transport agencies in a range of countries, including Britain, which is characterised by authority, status, supervision and administrative order (Hull, 2008). A different perspective, the Organization Design Theory (ODT), regards control, coordination and information sharing as strategy integration dimensions or implementation processes (Burton, 2006). The rationale for the adoption of the latter approach as a starting point for the reconceptualisation of PI is twofold. Firstly, ODT-oriented strategy integration provides a detailed coverage of the concept of incorporating strategies across departmental measures. Secondly, it can potentially generate a highly intuitive, relationship-driven form of integration.

A concept matrix was used to synthesise the key terms in strategy integration. This was achieved by defining each one of the indicators of strategy integration separately, identifying both defining features and antecedents or enablers. From the initial concept analysis (cf. Appendix J), each one of the three indicators of strategy integration (i.e. control, coordination and information sharing) was separately described. For instance, control was found to be implemented through mostly strategic control measures (i.e. targets and benchmarks), structures (i.e. reporting relationships) and culture (i.e. trust, commonality of beliefs and values). Coordination was found to be implemented through mutual adjustment (i.e. integrative device, fulfilment of identified needs) and social capital (i.e. positive social relationships, reciprocal goodwill). Information sharing, on the other hand, appeared to require a range of implementation processes, including, inter alia, value proposition, facilitating systems, regulating instruments and leadership commitment.

Once defined and described, these dimensions (e.g. control) and implementation processes (e.g. trust) were then diagrammatically depicted on a concept matrix (cf. Appendix J). Subsequently, the implementation processes were labelled as initial codes. A case in point is *mutual adjustment*, which became an initial code for coordination. Arranged in a table, which contained the initial codes and the respective descriptions (cf. Appendix K), these labels were examined for overlapping descriptions. Redundant codes were removed from further analysis. From the final list of initial codes and descriptions, a set of instructions (i.e. a coding scheme) was developed. Additional examination of the redundancies in the codes was conducted to arrive at mutually exclusive initial codes (i.e. refined codes).

The instructions (coding scheme) helped to identify relevant paragraphs or segments in the written stakeholder consultation submissions for further coding (cf. Appendix K). These segments were copied from the original written documents (cf. table 10.2, verbatim excerpt). The coding of the segments followed. Akin to the use of précis of data (Pidgeon and Henwood, 1996) and idiomatic translations (Noblit and Hare, 1988), latent coding (Kalof *et. al.*., 2008) was employed afterwards to 'translate' the segments identified through the use of the coding scheme. An exploratory query was used to code the relevant segments metaphorically, specifically: *what does the author intend to convey* (i.e. implied meaning as opposed to explicit, visible, literal meaning examined through open coding) *in this paragraph or segment* (or unit of meaning)?

This highly inductive content analysis technique (i.e. latent coding) was adopted to examine the implicit meaning inherent to the context of the texts (Hallström, 2002) in the stakeholder submissions. This 'translation' is depicted in Table 9.3.

Table 9.3: Example of Latent Coding

SOURCE	PAGES	VERBATIM EXCERPT	LATENT CODE
BISA	8-9	'The Bicycle Institute notes that Cycling Australia already has well credentialed adult learning programmes aimed at safe bicycle use that, given appropriate funding, could effectively and rapidly be 'rolled out' across Australia …'	Call for funding for educational programs

Before the coding of the selected segments or excerpts could proceed further, intra-coder reliability needed to be ascertained to validate the new, latent codes. To increase intra-coder reliability, the excerpts examined in this study were handled in two stages. Without referring to the excerpts, the researcher returned to the original documents to identify and record the page (i.e. pg) and paragraph (i.e. para) numbers for each code, five days after the first manual coding of the segments. This process entailed verifying the latent codes for accuracy in interpretation. Throughout this round of checks, no alteration of the initial coding seemed to be justified, indicating 100% agreement between the initial translations (latent coding) and the subsequent checks (segment location recording).

In order to further convert the latent codes (cf. Appendix L) into noun phrase, nominalisation was utilized. This conversion process entailed the retention of nouns (e.g. funding) and the removal of verbs and verb phrases (e.g. call for). The resulting noun phrases were labelled as illustrative cases. These cases (or summaries) illustrated the initial codes. For instance, in the example listed above in table 9.2, the latent code *call for funding for educational programs* partially illustrates an initial code i.e. leadership commitment to information sharing. However, as the illustrative cases were grouped under each initial code and interpreted closely (i.e. compared), it became apparent that the initial codes failed to capture the stakeholders' essence (i.e. implied meaning) as expressed in the excerpts. Accordingly, hierarchies of words (cf. figure 9.2) were employed to identify higher–order concepts within the illustrative cases. For example, *funding for educational programs* was

combined with other cases to yield a new higher-order code, namely, *action-inducing support*. Once the final codes had been obtained, these became the new coding scheme, which enabled the extraction of additional examples of illustrative cases from the data. These new cases allowed the description of each final code. This description was conducted through iterative comparisons amongst the written submissions to identify additional categories or illustrative cases. As new categories emerged, the final codes were tabulated to create a visual representation of the new conceptual framework.

With the comparison and tabulation of the data, it soon became apparent that the data could not yield additional instances of the illustrative cases (i.e. theoretical saturation had been achieved). Whilst final codes and illustrative cases helped to understand the new concept of PI implementation processes, these by themselves did not provide sufficient conceptual integration. Stated otherwise, a new concept, which encapsulated the essence of all the final codes combined, was required. By grouping all the final codes and developing an additional higher-order layer (i.e. hypernym), this study arrived at the apex of the pyramid. At this point, unlike traditional grounded theory method in which *theoretical narratives* are the ultimate outcome (Binder, 2010), strategy integration was converted or 'translated' into a new concept.

Fig. 9.2 depicts the use of hypernyms to generate new concepts.

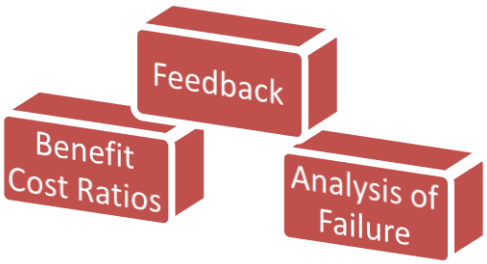


Figure 9.2. Hierarchy of Illustrative Cases

9.8 RESULTS

9.8.1 Stakeholders' Perceptions of the Importance Given to Policy Integration

This study unit of analysis has been a sample of the stakeholder comments lodged with the Australian Transport Council on the occasion of the review of the 2011-2020 National Road Safety Strategy (NRSS) draft. Whilst most stakeholders identified shortfalls in the vision, target setting, funding and clarity of roles and protocols, one stakeholder focused more specifically on the limitations of the draft in relation to policy integration. ACRS asserted that '…the draft lacks an integrated approach to road safety …' (p.2). It went on to state that '… scant attention has been given to intersectoral coordination …' (p.4). In other words, the NRSS draft depicted a '… lack of the government-professional stakeholder cluster approach …' (ACRS, p.4).

9.8.2 A New Principle of Policy Integration

9.8.3 Final Code

Seven new implementation processes have emerged from the qualitative examination of the 16 written stakeholder submissions. Table 9.4 lists the seven new integration implementation processes under Final Codes. For ease of reference, the numbers preceding the codes, which refer to the concept analysis, have been kept, allowing the subsequent results to be contextualized within the three indicators of strategy integration. Put simply, the prefixes represent *control* (1.1-1.3), *coordination* (2.1-2.2) and *information sharing* (3.1-3.6).

Table 9.4: Final Codes

INITIAL CODES	REFINED CODES	FINAL CODES
1.1 Structure	1.1 Culture	1.1 Sharing Attitude
1.2 Culture		
1.3 Strategic Control	1.2 Strategic Control	1.2 Reflective Accountability
2.1 Mutual Adjustment	2.1 Mutual Adjustment	2.1 Commitment to Engagement
2.2 Social Capital		
3.1 Value Proposition	3.1 Value Proposition in Information Sharing	3.1 Policy Embedment
3.2 Facilitating System		
3.3 Relationship Nature	3.2 Relationship Nature	3.2 Learning Attitude
3.4 Regulating Instruments	3.3 Information Sharing Regulating Instruments	
3.5 Professional Attributes		
3.6 Leadership Commitment	3.4 Leadership Commitment to Information Sharing	3.3 Information Sharing Clarity
		3.4 Action-Inducing Support

9.8.3.1 **Final Code Descriptions**

9.8.3.1.1 Sharing Attitude

A sharing attitude in road safety appears to focus on the 'moral premise' of a shared use attitude.

In addition, a sharing attitude removes the spirit of competition for space. It embraces a tolerant attitude towards all road users, promoting impartiality in the treatment of vulnerable road users and helping to develop a 'culture of safety'.

Table 9.5: Description of Sharing Attitude

Non – Competitive Spirit	Moral Obligation	Attitude Shift
' … requires a cultural shift away from competition for space to shared use.' AGF, pg 4	'Designing for shared use requires the prioritisation of vulnerable road users.' AGF, pg 4	'… culture of safety …' AGF, pg 14
'… safety for all …'AGF, pg 5	'Acknowledge the increased value of shared modality …' AGF pg4	'… a paradigm shift to a holistic road safety strategy …' CPF, pg 1
'… stress the value of all lives … ' AGF, pg 7		'… promote a culture of shared road usage …' AGF, pg 4
'Program campaigns … promotes an awareness … for the safe sharing of roads for all users…' AGF, pg 20		

9.8.3.1.2 Reflective Accountability

Reflective accountability seems to relate to a 'root and branch review' (or a thorough review) of the interaction across sectors and the establishment of 'intermediate outcome targets.' In addition, other 'non-safety benefits' need to form part of the accountability framework. It reflects the need for the targets to be specific, intermediate, relevant and reliable. In addition, reflective accountability strives to achieve consensus about the development of measures to benchmark performance. Furthermore, it promotes the adoption of approaches which enable experiential learning, such as learning from failure. It calls for the enforcement of accountability.

Table 9.6: Description of Reflective Accountability

Target Setting	Measurement Tools	Oversight
'Specific targets for casualty reduction be identified for people walking and bicycling on an exposure and absolute basis …' AGF, pg 8 'There is likely to be considerable benefit in setting some intermediate outcome targets …' ARRBG, pg 4 'It is unclear why the 30% target was selected …' ARRBG, pg 3 '… include a performance measure that identifies the extent to which 'fear of the road environment is deterring participation in walking, bicycling …' AGF, pg 14	'Adopt a nationally agreed Benefit Cost Ratio …'AGF, pg 4 '… establish a national BCR framework …' AGF, pg 19	' … carry out a 'root and branch' review …'AGF, pg 10 '…Australian Road Rules be reviewed and updated …' AGF, pg 19 '… a failure to anticipate these changes will render the NRSS modelling misleading and targets unachievable …' AGF, pg 11 '… a high level body or independent road safety commission be established …' CPF, pg 6 '… no analysis is provided as to why this target was not achieved …' ARRBG, pg 5

9.8.3.1.3 Commitment to Engagement

Commitment to engagement is achieved by having a 'strong focus' on communication with the community and championing the benefits of achievements. It includes acknowledging a remarkably wide range of stakeholders and developing support within the community for initiatives.

Table 9.7: Description of Commitment to Engagement

Forging Partnerships	Communication Strategy
'Work in partnership with community groups to deliver behaviour change program …'AGF, pg 4 ' … working with community organisations to develop support for speed control initiative …' AGF, pg 25 '… enforcement activities need to be accompanied by clearer initiatives aimed at engaging the community …' ARRBG, pg 6 'Acknowledgement of these organisational stakeholders will prompt further consultation on specific road safety measures …' ARRBG, pg 6	'… strong focus on improving the road safety for vulnerable road users …' AGF, pg 13 '… a comprehensive communication and marketing strategy focussed on community awareness …' ARRBG, pg 6 'A greater focus throughout the strategy document is suggested focussing on the need to communicate the benefits of road safety countermeasures to the community …' ARRBG, pg 6 '…a vision statement more in line with Safe System principles be presented …' ARRBG, pg 3 *'The savings achieved by the reduction in the general urban speed limit really need to be reported ...'* AECOM, page 2

9.8.3.1.4 Policy Embedment

Policy embedment concerns itself with linkages across data, principles, visions, rationales, global initiatives, technological developments and policy areas. Furthermore, it identifies gaps in knowledge and linkages.

Table 9.8: Description of Policy Embedment

Gap Identification	Linkages
'... gaps in the research is the correlation of medical data with crash and court data *... '* AECOM, pg 1 '… there are relatively few ITS technologies identified in the strategy …' ARRBG, pg 5 '… police data are unlikely to capture many of the serious crashes that occur …' AGF, pg 11 '… the strategy is silent in what future steps to take to reduce risk.' AECOM, pg 3	'The NRSS should be working, in cohesion with other strategic initiatives in health and the environment …' AGF, pg 7 ' …some reference be made to Australia's response to the global road safety crisis within the strategy …' ARRBG, pg 5 'The draft strategy does not appear to have adequate linkage to existing relevant strategies.' ARRBG, pg 5 '… synergies with other areas of transport and social policy are important …' ARRBG, pg 6

9.8.3.1.5 Learning Attitude

Learning attitudes recommend the adoption of knowledge–acquisition behaviours, which lead to in-depth appreciations of critical and pressing intervention requirements such as bicycle use, serious crashes, bicycle proficiency training, to cite but a few examples.

Table 9.9: Description of Learning Attitude

Trans-national Learning	Vicarious Learning	Scientific Learning
' … the approach being taken in the countries that lead the league tables in road safety and is arguably why Australia is falling off the pace …' AGF, pg 5 'It is instructive to review the targets set by the better performing SUN … countries …' AGF, pg 3 'OECD (2008) provides some valuable advice on this topic …' ARRBG, pg 4	'… the ATC needs a solid understanding of crash types, causes and contributing factors, vehicle involved and location …' AGF, pg 11	'… rates of bicycle use are not well understood …' AGF, pg 13 'Less driving leads to … much greater non-safety benefits …' CPF, pg 1 '… an increasing body of research supporting the effectiveness of bicycling proficiency training …' AGF, pg 22 [it is critical to understand that] 'Fear of road danger reduces mobility …' CPF, pg 2

9.8.3.1.6 Information Sharing Clarity

Information sharing clarity (ISC) refers to the provision of safeguards for the confident exchange of information. In addition, ISC helps to remove ambiguity from definitions, responsibilities and roles helps to enhance clarity.

Table 9.10: Description of Information Sharing Clarity

Safeguards	Clarity	Data Harmonization
'... it is suggested that overcoming privacy and legal issues to allow this research should be included in the strategy.' AECOM, pg 1	*'... better classify behavioural factors such as "exceeding the speed limit" and "speed excessive for the conditions" rather than the general topic of "speeding".* AECOM, pg 1 'The focus of the Draft NRSS also needs to be clarified …' AGF, pg 7 '… the strategy would benefit from a clearer statement/illustration of those principles and just what they mean …' ARRBG, pg 3 '… clarity is required on how serious injury will be defined and measured …' ARRBG, pg 4 '… the role of local government should be more clearly stated throughout the policy …' ARRBG, pg 6	**'Introduce research protocols …'** AGF, pg 4 'Introduce criteria …' AGF, pg 4 '…implement a common data collection policy …' AGF, pg 12 ' … need to establish this uniform reporting criteria be reinforced …' ARRBG, pg 4

9.8.3.1.7 Action-Inducing Support

Action–inducing support relates to funding allocation for training, education, research, infrastructure improvement and interventions such as lowering speeding and promoting mobility.

Table 9.11: Description of Action-Inducing Support

Budget Management	New Funding Opportunities	Infrastructure Management	Training Management
'Increase financial and institutional support of AustCycle …' AGF, pg 4 '… the budgets provided to support improvements in safety for those groups … should be increased…' AGF, pg 9 'Federal, State and Territory road safety agencies should have budgets and staffing commensurate with all the benefits of reducing road crashes.' CPF, pg 6	'The Australian Bicycle Council (ABC) be funded to support exposure studies …' AGF, pg 12 '… be commissioned to analyse vulnerable road user traffic …' AGF, pg 12	'… improve infrastructure for bicycling …' AGF, pg 13	[need for training] 'Australian drivers do not generally have the skills to safely share the road …' CPF, pg 4

9.8.3.2 **A New Conceptual Framework**

It has become clear that PI can be implemented through a range of both consultative and reflective processes (cf. fig. 9.3). These processes are presented herein in a conceptual framework. This conceptual framework is structured around Wilson's (1963) guide for concept analysis. Wilson (1963) suggests the development of defining attributes, dimensions (indicators), illustrative cases (i.e. model case, additional case, borderline case, contrary case and invented case), antecedents (enabling factors), consequences and empirical referents (or applied knowledge).

9.8.3.2.1 Dimensions of the New Concept

Unlike ODT conceptualization of strategy integration, in which three dimensions or indicators are identified, the new form of PI encompasses only two, namely: *participation*

and *deliberation*. In other words, control has given way to *deliberation*. Both coordination and information sharing have been 'translated' into *participation*.

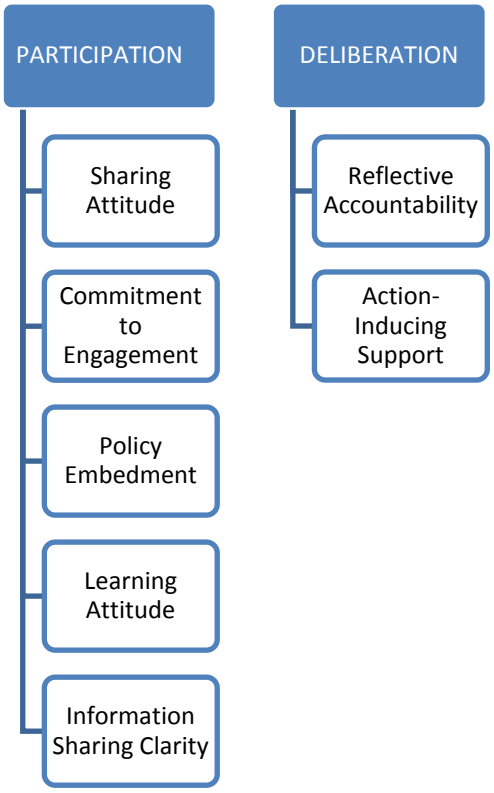


Figure 9.3. Dimensions of a New PI

9.8.3.2.2 Concept Matrix for PDI

The two newly developed indicators of PI can be implemented through seven processes. For each one of these implementation processes a range of activities (e.g. gap identification, forging partnerships, trans-national learning), instruments (e.g. safeguards, measurement tools) and goals (e.g. non-competitive spirit, clarity) are designed, implemented and monitored.

Tables 9.12 and 9.13 illustrate these implementation processes (e.g. sharing attitude, commitment to engagement, learning attitude) along with the respective goals, activities and instruments.

Table 9.12: Concept Matrix for Participatory Processes

Participatory Processes				
Sharing Attitude	**Commitment to Engagement**	**Policy Embedment**	**Learning Attitude**	**Information Sharing Clarity**
• Non – competitive spirit • Moral obligation • Attitude shift	• Forging partnerships • Communication strategy	• Gap identification • Linkages	• Trans-national learning • Vicarious learning • Scientific learning	• Safeguards • Clarity • Data harmonization

Table 9.13: Concept Matrix for Deliberative Processes

Deliberative Processes	
Action-Inducing Support	**Reflective Accountability**
• Budget management • New funding opportunities • Infrastructure management • Training management	• Target setting • Measurement tools • Oversight

9.8.4 New PI Concept

This study has unveiled two dimensions of integration, namely: *participation* and *deliberation*. *Participation* denotes five main activities. These are: sharing, engaging, embedding, learning and clarifying. *Participation* engenders the development of a culture of safety, a shared responsibility mindset and an acknowledgement of the value of all lives. It secures community acceptance and compliance.

Deliberation, on the other hand, means being able to support and be held accountable for relevant activities. It represents the adoption of far-sighted accountability procedures such as the use of trial projects, the allocation of funds for emerging needs, rewarding high achievers, conducting research into the impact of safety measures, remaining persuasive about accountability and being specific in the implementation of actions. In addition,

deliberation can be said to exist in integration processes which contain principles of cost-effectiveness analysis and criteria for inclusiveness in funding.

Participation and *deliberation* appear to be indicating two dimensions or indicators of integration which cannot be merged into a single concept. Each depicts complementary but distinct processes. These dimensions have been, therefore, retained as separate aspects of the new form of policy integration. Through the use of a hierarchy of two indicators of integration, *Participatory Deliberative Integration* has emerged, which is shown in figure 9.4.

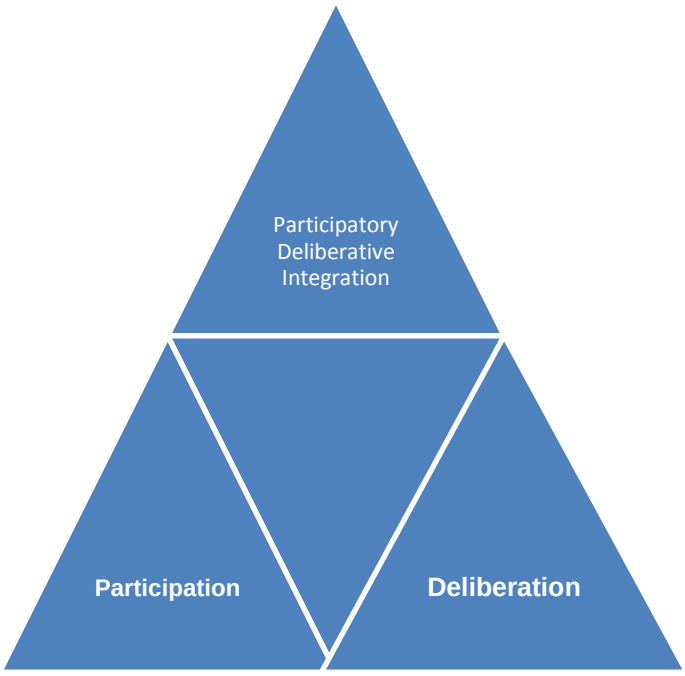


Figure 9.4. New PI Concept

9.8.5 Defining Attributes of Participatory Deliberative Integration (PDI)

Participatory Deliberative Integration (PDI) can be defined as a policy interaction principle, which creates a collective consciousness towards the need to work together, and share responsibility, knowledge and power.

PDI denotes:

1. a principle for policy interaction, whose indicators are participation and deliberation;
2. an outcome, which is a collective consciousness;
3. a recognition of the value of cooperation (i.e. a need to work together) and interdependence (i.e. dispersed knowledge and power, shared responsibility).

9.8.6 PDI Implementation Stages

In this new principle of policy instrument interaction, policy implementation is reliant upon the creation of a community movement towards the ownership of social outcomes (Odero, *et. al.*., 2003). In this perspective, transport agencies provide clarity, funding and the reinforcement of a central message. Governments and stakeholders, including the community, share responsibility, knowledge and power. The role of the PDI implementation processes such as information sharing clarity and shared attitude is to provide clear benchmarks against which integration is monitored. Put differently, a successful incorporation of policies (or policy coordination) must meet the descriptions of the dimensions of PDI outlined in subsection 9.5.3. For instance, for an alignment of effort across multiple sectors to be said to have information sharing clarity, it needs to provide safeguards for the confident exchange of information, removing ambiguity from definitions, responsibilities and roles.

PDI implementation can be achieved through 4 main stages, specifically: 1. Participatory Appreciation of Issues, 2. Participatory Appreciation of Options and Trade-offs, 3. Deliberative Delivery of Social Outcomes and 4. Reinforcement of a Central Message. The effectiveness of each one of these phases hinges on the generation of learning (i.e. adoption of best practices from science, other countries and industry), consultation (i.e. partnerships and communication), commitment to engagement and transparency (i.e. clarity, safeguards and harmonization).

These stages of Participatory Deliberative Integration are illustrated in figure 9.5.

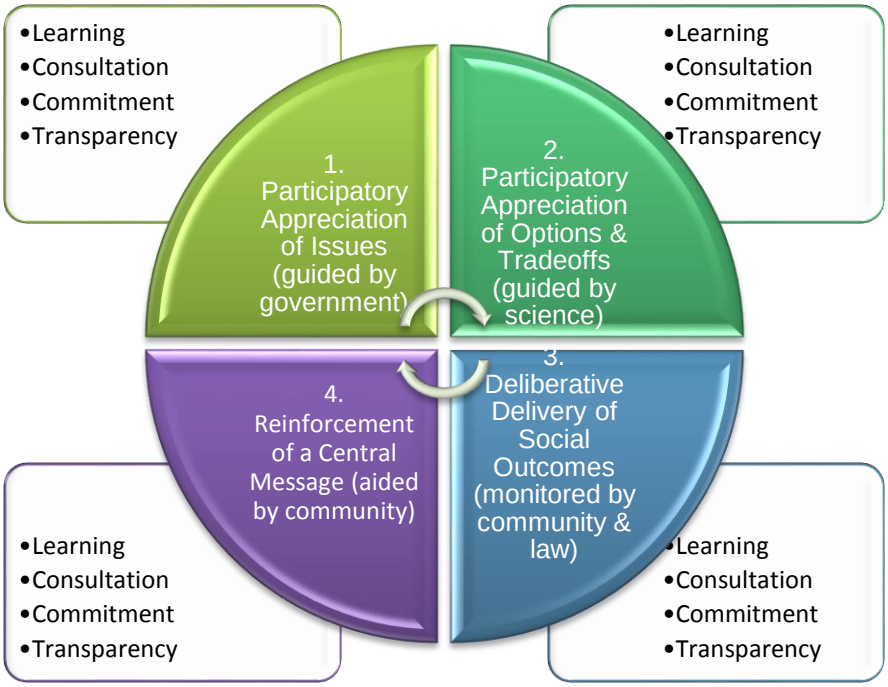


Figure 9.5. PDI Implementation Stages & Its Key Actors

9.8.6.1 **Participatory Appreciation of Issues**

This stage involves the following PDI implementation processes: learning attitude, information sharing clarity, policy embedment and commitment to engagement and sharing attitude. In it, the appreciation of local level societal challenges is conducted collectively

across a wide range of stakeholders including local councils, jurisdictional institutions, interest groups and the wider community. Through a collective process of issue prioritization, which is guided by the government, national objectives are generated and working mechanisms developed (e.g. protocols, safeguards for information sharing).

Throughout this stage communities are encouraged to help set direction for national agendas. Their participation is viewed as critical to the development of comprehensiveness in the appreciation of pressing issues.

9.8.6.2 **Participatory Appreciation of Options and Trade Off**

Whilst in the preceding stage the government provides the *glue* for issue identification and comprehensive understanding of a wide range of community-related facets of the issues, in this phase, science becomes the *guiding* force towards the potential, optimal solutions. This process of arriving at potential, optimal solutions is shaped by community sensitivities. Its implementation processes include information sharing, clarity, action-inducing support, reflective accountability, commitment to engagement and learning attitude. The resulting trade offs are subjected to community assessment. Negotiated returns on the social investment are agreed upon in the course of this stage. One such negotiated return may be agreed to be an aggregate reduction in road traffic deaths, which can be expressed as a fatality rate by 100,000 people. In this spirit, modelling, which considers a wide range of realities (e.g. budgetary constraints, policy enablers and obstacles) is undertaken to inform policy instrument delivery.

9.8.6.3 **Deliberative Delivery of Social Outcomes**

This first phase of policy implementation reverses the roles of the government and the community. In it, the community engages with policy by evaluating its implementation. The

government at a local level, on the other hand, delivers the outcomes from the optimal options modelled in the previous phase. This delivery is guided by clearly set targets and research feedback loops. Throughout this stage, the following PDI processes play a key role: reflective accountability, commitment to engagement and action-inducing support.

9.8.6.4 **Reinforcement of a Central Message**

The aim in this stage is twofold. On the one hand, it seeks to take stock of the implementation. On the other hand, it attempts to inform future development by championing achievements at a wide range of levels. Some of the activities undertaken in this step include: education, data sharing, accountability for funding, research, awareness events, data collection, data analysis, and evidence–driven attitude changing within the community. The PDI processes involved in the reinforcement of a central message are: reflective accountability, sharing attitude, information sharing clarity and policy embedment. Governments, local councils and the community play a critical role in this phase, which culminates with the publication of a wide range of achievements related to road safety, the environment and health.

9.8.7 Differences between the Existing and the New Principle of Policy Integration

Whilst control, coordination and information sharing deliver corporate outcomes, PDI indicators seem to offer a much wider range of outcomes (cf. table 9.14). In addition, it becomes apparent from table 9.14 that coordination from a road safety stakeholder's perspective is more than working together to solve problems. It represents communication and the championing of achievements. Furthermore, the execution of tasks in PDI requires a strong commitment to engagement.

Table 9.14: Outcome Comparison between ODTI and PDI

Organization design theory integration dimensions	Corporate outcomes	Participatory deliberative integration dimensions	Participatory Deliberative Integration Antecedents	Social, attitudinal, administrative, strategic and regulatory outcomes
Control	• Loyalty • Engagement • benchmarks	Deliberation	Reflective Accountability	• Intermediate, specific targets • Consensus • Performance benchmarks
		Participation	Learning Attitude	• Knowledge acquisition behaviors
			Sharing Attitude	• Shared use attitude • Non-competition spirit • Tolerant attitude
Coordination	• Problem solving capability		Commitment to Engagement	• Communication with communities • Championing achievements
		Deliberation	Action – Inducing support	• Funding allocation
Information Sharing	• Service integration through technology	Participation	Policy Embedment	• Widespread Linkages (data, vision etc)
			Information Sharing Clarity	• Identification of information gaps • Provision of safeguards • Clarification of roles, goals, definitions, responsibilities (in information exchange)

9.9 DISCUSSION

9.9.1 Application of the New Principle of Policy Integration

This qualitative study has developed a new principle for the incorporation of policies across transport sectors by manually examining approximately 208 pages of written stakeholder comments. These submissions were lodged with the Australian Transport Council by 18th February 2011 in response to a request to review a draft copy of Australia's 2011-2020 National Road Safety Strategy (NRSS).

Whilst the features of Participatory Deliberative Integration are explored in the previous section, its application becomes centre-stage in the present part of this paper.

9.9.1.1 Practical Application 1: National Road Safety Strategies

Presently in Australia, the development of an NRSS undergoes three main stages. Firstly, experts are engaged to consider road safety issues. Secondly, directions (supported by

modelling) are established. Thirdly, relevant stakeholders along with the public are invited to submit comments about a draft copy of the NRSS for a brief period (approximately 2 months) of consultations. This top down NRSS development approach failed to achieve its 2001-2010 40% fatality rate reduction target. Additionally, it does not account for a significant number of local road safety requirements. Not surprisingly, there are calls for an approach which acknowledges the uniqueness of jurisdictional challenges and their impact on the national road toll (Watson and King, 2009). In this sense, the NRSS approach would embrace both learning and adaptation to seize the opportunities arising out of failure (Watson and King, 2009). Likewise, with the adoption of PDI, the development of the NRSS in Australia can significantly redirect its efforts toward local conditions across the country. This community – centred approach is described in Appendix P. This approach follows the 4 PDI implementation stages in figure 5, namely: 1) participatory appreciation of issues, 2) participatory appreciation of options and trade-offs, 3) deliberative delivery of social outcomes, and 4) reinforcement of a central message. The procedure outlined in Appendix H for the development of a National Road Safety Strategy significantly modifies Mulder and Wegman's (2001) conceptualisation of policy development cycle for three reasons. Whilst the 8 phases in Mulder and Wegman (2001) appear to suggest a prior knowledge of the problem, PDI adopts a more organic approach to problem appreciation, in which its features become progressively clearer as consultation widens. This flexible conception of key issues is sufficiently documented in Trist (1983). Secondly, PDI, unlike the approach in Mulder and Wegman (2001), is premised upon a system thinking principle, which emphasises synergies, inter-dependability and shared responsibility. Thirdly, PDI is a cyclical (rather than a linear) implementation methodology, with recurrent events such as consultation, mutual adjustment, learning and accountability.

9.9.1.2 **Practical Application 2: Mix Mode Integrated Timetabling**

The current paper develops a principle, its indicators and enabling aspects or implementation processes. Whilst the principle, Participatory Deliberative Integration, guides the conceptual framework of policy interaction, its indicators, Participation and Deliberation, provide guidance for its implementation. The enablers, such as shared attitude, induce action by benchmarking performance. In an invented scenario, a transport agency charged with the coordination of a continuum of modal services, may adopt Participatory Deliberative Integration as its strategic principle. This public transit agency would devise action plans to increase participation and deliberation in its pursuit of incorporating the provision of services for one mobility mode (e.g. rail services) into another or others (e.g. bus services) through, for instance, mix mode integrated timetabling. Scheduling (e.g. vehicle and crew) would be undertaken in cooperation with all parties involved. In most cases, this does not involve the community. However, through PDI, community participation is essential in guiding action. The resulting integrated timetable should meet the needs of the operating agencies and the relevant community. In evaluating its timetabling procedures, this lead agency would adopt the enablers of PDI as benchmarks for the appropriateness of policy coordination. Some of the questions employed in the evaluation of the timetabling procedures might be: how clear were the information sharing protocols? How much commitment was there to engagement?

9.9.2 Limitations

The development of a guiding theory, as it is the case in this paper, can only inform practice, if its application withstands the rigours of external validity. Unless it is applied in a wide range of contexts, PDI defining features (cf. Risjort, 2009; Wilson, 1963) may not gain sufficient specificity to guide action in the incorporation of policies across multiple sectors.

To legitimate PDI as a valid tool in the incorporation of policies across sectors empirical research into its adoption is paramount.

Moreover, the fact that PDI has been developed from a small sample of road safety experts limits its generalizability.

9.10 CHAPTER CONCLUSION

This article has evaluated the adequacy of the current conceptualisation of PI through a review of the relevant literature. It has found it to lack a) an action-guiding framework, b) universality of interpretation and, inter alia, c) appreciation of community contextual factors and ethicality. To reconceptualize policy integration, this study examined 16 road safety stakeholders' written submissions through an adaptation of the grounded theory method. The resulting new concept, Participatory Deliberative Integration (PDI) is expected to assist road safety lead agencies with the alignment of efforts across sectors, including the community. For this alignment through PDI to occur, governments will need to commit funds for integration efforts and develop institutional mechanisms (such as laws, trained professionals and information sharing protocols) to enable the appropriate coordination of policies across sectors. In addition, funding allocation for PI must be conditioned upon the evaluation of the extent to which agencies integrate policy. This evaluation can be aided by the adoption of PDI implementation processes herein developed. In addition, PDI has the potential to ensure National Road Safety Strategies embrace the WHO recommendations for cross – sectoral collaboration. In this sense, the current '… scant attention [paid to] … intersectoral coordination …' (ACRS, p.4) stands a good prospect of being comprehensively addressed through the adoption of PDI.

Nonetheless, Participatory Deliberative Integration (PDI) will need to be empirically validated. PDI diffusion may depend on its external validity, as it is investigated in a broad range of road safety management settings. In addition, policy principles such as Participatory Deliberative Integration provide a guiding theory for policy instrument development and implementation (Mickwitz, 2007). Such development often follows a descriptive model, with a series of steps, and engages a range of actors. To further advance existing knowledge about Participatory Deliberative Integration its descriptive model (s) should be developed from empirical research. Descriptive models outline the steps, implementation mechanisms, mental processes and enabling factors involved in the execution of tasks. Moreover, empirical examinations of the operational impact (I. Johnston, 2010) upon the creation of the government-professional stakeholder cluster through PDI may prove equally enlightening.

Acknowledgements

This research project has seen the light of day thanks to the guidance and commitment of Dr. Mark King and Professor Barry Watson, from CARRS-Q. Dr. King's insightful recommendations have led directly to the development of the key objectives of the current study. Professor Barry Watson's editorial encouragement has added depth to the examination of the chief concepts.

I am equally indebted to Mr. Peter Pole. His editorial advice has allowed the writing of the current document to become substantially sharp.

9.11 CHAPTER SUMMARY

This ninth chapter identified a number of conceptual weaknesses in *Policy Integration, a principle* which was initially thought to explain the "government-professional stakeholder cluster" or the coordination, amongst other processes, of the agencies involved in road safety

management. These conceptual limitations were listed in this chapter and said to be likely to hinder the adoption of *PI*as a theory guiding the development of coordinated road safety responses. Accordingly, this chapter reconceptualised this theory. It generated a new theory for explaining the development of coordinated road safety responses. The resulting new principle (*Participatory Deliberative Integration*) was comprehensively described in this chapter. This description included its benefits (i.e. to enhance road safety agencies' ability to secure the commitment of relevant stakeholders in the development of responses), seven implementation processes and two practical case studies. In this theory building chapter (aided by the adoption of Grounded Theory Method), coordination was "translated" into *Commitment to Engagement*. This new process of bringing together a variety of stakeholders in order to deliver road safety programs in a coordinated manner was found to be stakeholder and community-oriented. In fact, it was found to entail the acknowledgement of a wide range of stakeholders and the development of support within the community for road safety initiatives through a communication strategy. Indeed, this new form of coordination was found to focus primarily on the role of the community in the coordination of road safety countermeasures. In effect, this implementation process of *Participatory Deliberative Integration* was said to emphasize the need to communicate with the community and champion the benefits of achievements.

As the first paper investigating the conceptual nature of coordinated responses, this paper has a number of implications to the present research program. Firstly, it accounts for the existence of a variety of views in Australia in relation to the countermeasures proposed in the draft copy of the 2011-2020 National Road Safety Strategy. In this sense, the populist views found in Chapter Seven may have been due to failures in the adoption of *Commitment to Engagement* in the development of the draft copy of the 2011-2020 National Road Safety Strategy in Australia. Put otherwise, the utility of the findings in this chapter represents the

ability to evaluate the development of road safety responses and the extent to which these are likely to have been developed in a coordinated manner, in which community buy-in has been secured. It can also help to formulate hypotheses. One such theory building approach may suggest that the greater the amount of *Commitment to Engagement*, the greater the level of community acceptance of road safety countermeasures there is. However, this hypothesis will need to be investigated elsewhere.

Secondly, the criticism levelled against the draft copy of the Australian National Road Safety Strategy for 2011-2020 by Jiggins (2011) can now be interpreted through *Participatory Deliberative Integration*. Jiggins (2011) failed the strategy for failing to provide a conceptual framework for synergies and linkages across programs. As a result of the findings in this chapter, this criticism can be more specifically interpreted. Accordingly, Jiggins (2011) appeared to have been noting a lack of *Commitment to Engagement* in the development of the strategy.

In short, this chapter initiates the development of the conceptual framework for the coordination of road safety countermeasures. In this sense, it partially addresses the first half of the second research aim in this thesis. For this research aim to be fully investigated, additional examination of *Commitment to Engagement* should be conducted. This investigation will see its underlying structure being described in order to identify its dimensions with scientific rigor.

Chapter 10: A Typology of Optimal Coordination: a Framework for Coordinated Road Safety Responses

10.1 INTRODUCTORY COMMENTS

In the previous chapter, *coordination* was reconceptualised into *Commitment to Engagement* (Canoquena, 2013). This new concept accounted for community active participation in the coordination of road safety countermeasures.

This active participation by the community can maximise the potential for securing community buy-in for road safety countermeasures. The nature of community attitudes which may lead to or disrupt the path towards buy-in is illustrated in Chapter 6. The research in Chapter 6 unveiled a range of public attitudes in Australia towards the road safety countermeasures included in the draft copy of the 2011-2020 Australian National Road Safety Strategy. These stances ranged from positive to negative. On the negative side, the opinions of the Australian public with an interest in road safety were found to vary from *cynicism* to *defiance* (Canoquena & King, in Press). The positive viewpoints covered a spectrum just as wide as the negative range. In this sense, the positive community standpoints went from *dispassion* to *compliance* (Canoquena & King, in Press).

Negative community attitudes towards road safety countermeasures, if left unaddressed, may disrupt the path towards securing community buy-in (Canoquena & King (in Press). In fact, these viewpoints may lead to advocacy for the disruption of road safety countermeasures, thus weakening the role of community attitudes in aiding legislation and enforcement (Canoquena & King, in Press).

Therefore, it is imperative to understand the underlying structure of the very concept which may help road safety managers to secure community active participation (Canoquena, 2013) or *compliance* (Canoquena & King, in Press). This way, the manner in which community negative attitudes can be shifted to positive viewpoints can be understood. Put otherwise, *Commitment to Engagement,* as a new process of engendering coordinated responses, needs to be refined. Its underlying structure needs to be examined. This refinement has the potential to enhance the external validity of *Commitment to Engagement* and its appeal for practical use. To this end, the underlying structure and utility of *Commitment to Engagement* should be investigated. An underlying structure of a concept identifies, clarifies and refines it (Fawcett, 1994). The identification, clarification and refinement of a concept allow its presence to be examined and measured (Henneman *et. al.*, 1995). This means defining relevant attributes or empirical indicators and criteria by which the concept can be judged to be in evidence in a given situation (Powers and Knapp, 2010). In fact, this line of inquiry allows an abstract representation of the phenomenon of interest to be generated (Avant, 2006).

Through this examination, the dimensions of *Commitment to Engagement* and factors loading upon these dimensions can be unveiled. These latent variables (dimensions) allow the concept under investigation to be identified and measured. Put it otherwise, it is through these dimensions that *Commitment to Engagement* can be described and evaluated.

Furthermore, the research paper in this chapter assesses the factors loading upon the dimensions to identify the variables with the highest predictive value. These variables are subsequently used to develop a typology of *Commitment to Engagement*.

The significance of the current chapter to this thesis is twofold. Firstly, this study addresses the second research aim. It does so by completing the description of the conceptual

framework (see chapter Ten) for coordinated road safety responses, which occur within the government-professional stakeholder cluster of government. Secondly, this chapter extends upon the research from the previous chapter. It distils the process in the previous chapter for coordination.

This chapter represents additional analyses on the data collected for the studies in the present research program. It has not been published as a separate research paper. This set of additional analyses address research objective 3, which is to *assess the utility and underlying structure of the new conceptual framework developed in Research Aim 2.*

The current research paper has been formatted in line with the Higher Degree Research Guidelines (Requirements for Presenting Theses), 2015 and the QUT Reference Guide, 2013 (Writing Your Thesis Using Word 2010 and End Note X6).

Section 10.2 provides a definition of *Commitment to Engagement*. In section 10.3, the methods of both data collection and analysis are illustrated. The results of this methodology are presented in 10.4. Section 10.5 discusses the results by reviewing and highlighting the significance of the results whilst acknowledging some methodological limitations. The conclusion is presented in 10.6. The final section, 10.7 summarises the chapter and provides a succinct discussion of the contribution of the chapter to the thesis.

10.2 COMMITMENT TO ENGAGEMENT

In Canoquena (2013), *Commitment to Engagement* involves acknowledging a wide range of stakeholders and developing support within the community for initiatives. In fact, this new process for engendering coordination is said to represent a '… strong focus on communication with the community …' (Canoquena, 2013, p. 69). It is also thought to represent a concerted effort to champion the benefits of achievements, whilst acknowledging

a wide range of stakeholders in road injury prevention (Canoquena, 2013).Put otherwise, *Commitment to Engagement* denotes actions intended to develop support within communities for road safety initiatives (Canoquena, 2013). , *Commitment to Engagement* is thought to be achieved in two manners – i.e. partnerships and a communication strategy. Both the forging of partnerships and the adoption of a communication strategy are said to have the potential to engender a culture of safety, a shared responsibility belief system and an acknowledgement of the value of all lives (Canoquena, 2013).

Table 10.1: Description of Commitment to Engagement

Forging Partnerships	Communication Strategy
'Work in partnership with community groups to deliver behaviour change program …'AGF, pg 4 ' … working with community organisations to develop support for speed control initiative …' AGF, pg 25 '… enforcement activities need to be accompanied by clearer initiatives aimed at engaging the community …' ARRBG, pg 6 'Acknowledgement of these organisational stakeholders will prompt further consultation on specific road safety measures …' ARRBG, pg 6	'… strong focus on improving the road safety for vulnerable road users …' AGF, pg 13 '… a comprehensive communication and marketing strategy focussed on community awareness …' ARRBG, pg 6 'A greater focus throughout the strategy document is suggested focussing on the need to communicate the benefits of road safety countermeasures to the community …' ARRBG, pg 6 '…a vision statement more in line with Safe System principles be presented …' ARRBG, pg 3 *'The savings achieved by the reduction in the general urban speed limit really need to be reported …'* AECOM, page 2

The description presented above of Commitment to Engagement can be further refined. Table 10.2 illustrates the synthesis of the variables presented in table 10.1. The new 9 variables in table 10.2 summarise the verbatim quotes in table 10.1.

Table 10.2: Description of variables for Commitment to Engagement

Illustrative Case (Forging Partnerships & Communication Strategy)	Variable	Definition
• Partnerships with community	• *Partnerships*	Having partnerships with the community in the delivery of programs, in which the community has a voice.
• Work with community organisations (support for initiatives)	• *Support*	Securing support for initiatives through factual information about road trauma contributing factors.
• Engagement activities alongside enforcement	• *Engagement*	Having enforcement officers engaging with the community to develop acceptance of enforcement.
• Stakeholder acknowledgement	• *Acknowledgement*	Acknowledging stakeholders through consultation.
• Focus on safety for vulnerable road users	• *Vulnerable*	Catering proportionally for all road users, including a focus on improving road safety for vulnerable road users.
• Comprehensive (community awareness)	• *Awareness*	Having a comprehensive public awareness strategy to inform the public of key risk factors.
• Communication of benefits	• *Benefits*	A need to communicate the benefits of strategies to the public.
• Vision aligned with Safe System	• *Best practices*	The adoption of best practices.
• Clear reporting of savings	• *Savings*	The reporting of the savings arising out of the financial commitment in delivering countermeasures.

Source: adapted from Canoquena, 2013

10.3 METHODS

In order to design the research conceptual framework for this chapter, two research questions are required. Accordingly, the first research question seeks to identify the model structure for *Commitment to Engagement*. This research question is as follows: *how many latent variables or model components are represented by the nine variables in table 10.2?*

Whilst the first question is likely to unveil a model structure for Commitment to Engagement, it will not discriminate across the variables in terms of predictive value. In other words, the utility of the variables will not transpire. Therefore, the second question will examine the predictive value of the variables in the new model. , this examination will

address the following research question: w*hat is the utility (predictive value) of the variables in the new model?*

10.3.1 Data Collection

Participants

To identify the survey respondents, a contact list was drawn out of the Australian Yellow Pages for all relevant stakeholders in Australia such as Road Safety Officers, Road User Group representatives, and community groups with an interest in road safety. Institutions which had lodged "professional stakeholder" submissions to the initial version of the 2011-2020 Australian NRSS were equally added to the sampling frame. These stakeholders were contacted, screened for familiarization with the 2011-2020 Australian NRSS, and invited to participate in the online survey. , these "professional stakeholders" received a telephone call, which was followed up by an e-mail invitation in those cases of accepted participation. The e-mail contained a link to the online *QUT Key Survey* questionnaire. The potential study participants were encouraged to refer other Australian road safety stakeholders to the study. This snowballing technique allowed additional professional stakeholders to be identified and subsequently contacted. Once the e-mail invitations were forwarded to potential survey participants, the response rate was monitored twice a week over the course of the data collection period (15th September 2014 to 29th March 2015).

Sample Characteristics

Of the 247 e-mail invitation recipients, 54 (21.8%) completed the online, self-administered questionnaire. Surprisingly, a respondent attempted the survey twice. Because the two entries differed significantly, both surveys were removed from further consideration.

Most respondents (23.1%) did not indicate the institution they worked for (table 10.2). In terms of the institutions the respondents worked for, motoring club members (15.4%), local council officials (13.5%) and academic bodies (11.5%) represented the largest groups of respondents. Nearly one quarter (23.1) of the survey takers worked for institutions other than the ones listed in table 10.3.

As for the respondents' job roles, just under a quarter (23.1%) of the respondents identified themselves as advocates. Almost a fifth (19.2) worked as researchers whereas nearly half (42%) did not identify their job roles.

Vulnerable road users represented just under a third (30.8%) of the participants. Drivers, on the other hand, represented over half of the sample (61.5%).

Table 10.3: Sample Characteristics

Variables		*N*	%
Institution (N=52)	Academic body	6	11.5
	Company/for profit organization	4	7.7
	Foundation/Charity	5	9.6
	Government department	4	7.7
	Individual	2	3.8
	Local council	7	13.5
	Motoring club	8	15.4
	Peak body/Industry association	4	7.7
	Other	12	23.1
Job role (N=52)	Advocate	12	23.1
	Law enforcer	1	1.9
	Policy adviser	2	3.8
	Policy analyst	2	3.8
	Policy developer	1	1.9
	Researcher	10	19.2
	Other	24	42
Road user (N=52)	Cyclist	4	7.7
	Driver	32	61.5
	Motorcyclist	11	21.2
	Pedestrian	1	1.9
	Other	4	7.7

10.3.2 Data Analysis

Modeling the data

Statistical Package for Social Sciences (SPSS) version 22 was employed to model the data represented by the nine variables in table 10.4.

Table 10.4: Variables for Commitment to Engagement

Illustrative Case (Forging Partnerships & Communication Strategy)	Variable	Definition	Questionnaire Statement	Initial Measurement
• Partnerships with community	• *Partnerships*	Having partnerships with the community in the delivery of programs, in which the community has a voice.	*There is community voice in strategy development in road safety.*	5-point Likert scale
• Work with community organisations (support for initiatives)	• *Support*	Securing support for initiatives through factual information about road trauma contributing factors.	*More factual information needs to be provided to the community about road trauma contributing factors.*	5-point Likert scale
• Engagement activities alongside enforcement	• *Engagement*	Having enforcement officers engaging with the community to develop acceptance of enforcement.	*The police are adequately trained to engage with the community on issues related to road safety.*	5-point Likert scale
• Stakeholder acknowledgement	• *Acknowledgement*	Acknowledging stakeholders through consultation.	*Community consultation should occur at the draft stages (i.e. after an Issues Paper is issued, not in the initial development stages) of road safety strategy development*	5-point Likert scale
• Focus on safety for vulnerable road users	• *Vulnerable*	Catering proportionally for all road users, including a focus on improving road safety for vulnerable road users.	*The Australia 2011-2020 NRSS caters proportionally for all road users, including vulnerable road users.*	5-point Likert scale
• Comprehensive (community awareness)	• *Awareness*	Having a comprehensive public awareness strategy to inform the public of key risk factors.	*There has been sufficient information made available to the public about speed and its crash causation likelihood*	5-point Likert scale
• Communication of benefits	• *Benefits*	A need to communicate the benefits of strategies to the public.	*The benefits of speed reduction measures have been widely publicised.*	5-point Likert scale
• Vision aligned with Safe System	• *Best practices*	The adoption of best practices.	*Australia has comprehensively adopted best practices from other OECD countries*	5-point Likert scale
• Clear reporting of savings	• *Savings*	The reporting of the savings arising out of the financial commitment in delivering countermeasures.	*More factual information such as expenditure needs to be made available to the public about the selection of road safety countermeasures.*	5-point Likert scale

Source: adapted from Canoquena, 2013

Initially, the nine variables in table 10.4 were recoded. Accordingly, the values 1, 2, 3, 4 and 5 replaced Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4) and Strongly Disagree (5).

Data symmetry was investigated through the Standard Error of skewness (table 10.5). As the values for skewness of six variables [*partnerships* (-.135); *engagement* (-.214); *acknowledge* (-1.316); *benefits* (-.524); and *best practices* (-.474)] fell outside the range -.66 to +.66 (i.e. 2x .330), skewness violation was assumed. Therefore, the Spearman coefficient was used to generate a correlation matrix (table 10.6).

Table 10.5: Data Distribution

	Illustrative Cases of FP & CS								
	Awareness (*N*=52)	Benefits (*N*=52)	Best practices (*N*=52)	Support (*N*=52)	Savings (*N*=52)	Partnerships (*N*=52)	Engagement (*N*=52)	Acknowledgement (*N*=52)	Vulnerable (*N*=52)
Mean	3.54	3.40	2.94	4.21	4.06	2.67	2.77	4.17	2.62
Median	4.00	4.00	3.00	4.00	4.00	3.00	3.00	4.00	3.00
Mode	4	4	4	4	4	2[a]	2	5	3
Std. Deviation	1.179	1.125	1.074	.750	.850	1.004	.962	.964	1.069
Skewness	-.879	-.524	-.474	-.662	-.910	-.135	.214	-1.316	-.163
Std. Error of Skewness	.330	.330	.330	.330	.330	.330	.330	.330	.330
Minimum	1	1	1	2	2	1	1	1	1
Maximum	5	5	5	5	5	4	5	5	4

a. Multiple modes exist. The smallest value is shown

Nonetheless, the variations were very small across the dataset (see standard deviation in table 10.5).

There was significantly strong correlation (table 10.6) between *awareness* and *benefits* (r=.57, p<.01). *Awareness* was also found to correlate significantly weakly with *engagement* (r=.28, p<.05). *Benefits* correlated significantly moderately with *best practices* (r=.32, p<.05), *partnerships* (r=.40, p<.01), *engagement* (r=.41, p<01), and *vulnerable* (r=.34, p<.05). *Best practices* correlated significantly moderately with *partnership* (r=.41, p<.01) and *engagement* (r=.45, p<.01); and significantly strongly with *vulnerable* (r=67, p<.01). *Support* correlated significantly moderately with *savings* (r=.48, p<.01). *Partnerships* correlated

significantly moderately with *engagement* (r=.37, *p*<.01) and *vulnerable* (*r*=.44, *p*<.01), *benefits* (*r*=.40, *p*<.01) and *best practices* (*r*=.41, *p*<.01). *Engagement* correlated significantly moderately with *vulnerable* (*r*=.45, *p*<.01), *benefits* (*r*=.41, *p*<.01), *best practices (r*=.45, *p*<.01) and *partnership* (*r*=.37, *p*<.01).

Table 10.6: Spearman Correlation Matrix

			Variables								
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Spearman's rho	*Awareness*	(1)		.574**	.237	-.077	-.011	.207	.281*	-.001	.229
	Benefits	(2)			.319*	.004	.009	.393**	.399**	.035	.336*
	Best practices	(3)				.033	-.096	.414**	.454**	-.234	.669**
	Support	(4)					.478**	.049	-.070	.053	-.038
	Savings	(5)						-.033	-.046	.015	-.132
	Partnerships	(6)							.365**	-.162	.438**
	Engagement	(7)								-.243	.446**
	Acknowledgement	(8)									-.267
	Vulnerable	(9)									-

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Both the fact that *acknowledgement* did not appear to correlate with any other variable and that there was some variation in the magnitude of the correlations appeared to support the need to examine the Scree Plot. In fact, the presence of both positive and negative correlation coefficients suggested the likelihood of the existence of a number of components. In this respect, the correlation coefficients clearly indicated that a set of variables correlated closely with one another but correlated differently to the other set, thus suggesting that there might be at least two constructs or components (Fabrigar and Wegener, 2012). Therefore, the examination of the model structure became essential. This was conducted through Principal Component Analysis (PCA). Principal component analysis (PCA) defines new variables or latent variables (Rencher, 2010). In addition, PCA allows the establishment of superfluous variables (Rencher, 2010) or variables which do not contribute to the principal components generated in the final model.

10.4 **RESULTS**

Examining the Model Structure

To assess the optimal number of factors, a scree plot analysis was conducted. This analysis yielded a 3-component structure. Subsequently, sampling adequacy was assessed through Kaiser-Meyer Olkin Measure and Bartlett's Test of Sphericity. At .70, the usefulness of the Principal Component Analysis was confirmed (table 10.7).

Table 10.7: KMO and Barlett's-Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.705
Bartlett's Test of Sphericity	Approx. Chi-Square	109.974
	df	36
	Sig.	.000

An examination of the Communalities identified that *benefits* had the most variance (at .81) with *partnerships* showing the lowest variance explained by the final PCA model. This final model comprised three components (latent variables) as illustrated in table 10.8 below under the total extraction sums of the squared loadings.

Table 10.8: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.023	33.587	33.587	3.023	33.587	33.587	2.804
2	1.504	1713	50.300	1.504	1713	50.300	1.477
3	1.126	12.512	62.812	1.126	12.512	62.812	1.656
4	.970	10.780	73.591				
5	.644	7.154	80.746				
6	.591	572	87.318				
7	.501	5.569	92.887				
8	.324	3.595	9482				
9	.317	3.518	100.000				

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

As shown in table 10.8, the eigenvalues for the three components were 3.0 (PC1), 1.5 (PC2) and 1.1 (PC3). To further interpret the principal component, an examination of the Pattern Matrix was conducted (table 10.9).

Table 10.9: Pattern Matrix

	Component		
	1	2	3
Awareness	.302	-.139	.627
Benefits	.301	.076	.796
Best practices	.828	-.001	-.020
Support	.030	.847	-.049
Savings	-.024	.840	.044
Partnerships	.573	.124	.212
Engagement	.667	-.073	.173
Acknowledgement	-.570	-.012	.565
Vulnerable	.811	-.021	.021

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 21 iterations.

The pattern matrix (table 10.9) appeared to clearly identify the variables loading upon each principal component. Accordingly, *best practices*, *partnerships*, *engagement* and *vulnerable* loaded on the first principal component. *Support* and *savings* loaded on the second principal component and *awareness*, *benefits* and *acknowledgement* loaded on the third principal component.

Examining the Utility of the Model

The utility of the new 3-component model was assessed on the extent to which it could be used to discriminate amongst outcomes. In order words, the extent to which the model was able to accurately predict the outcomes of the dependent variable was assessed. Accordingly, to classify the respondents into groups based on the outcomes of the dependent variable and identify whether or not there were differences amongst the three groups suggested by the Principal Component Analysis, Discriminant Analysis (Klecka, 1980; Huberty *et. al..*, 2006) was employed.

The nine variables explored in PCA were deemed as independent variables. The dependent variable was *trauma causes.* The survey question related to this variable asked respondents to agree or disagree (5-point Likert scale) with the statement, *the Australian 2011-2020 National Road Safety Strategy focuses proportionately on all relevant road trauma causes such as speed, alcohol, road quality, mobile use etc.* In fact, the Discriminant Analysis aimed to both predict group membership and clearly distinguish the three groups or constructs suggested in the PCA. Therefore, it was assessed whether or not the nine predictor variables could determine the outcomes for the dependent variable. This meant recoding the dependent variable to have only three levels of outcomes (as opposed to five levels of outcome) – i.e. agree (2), neutral (0) and disagree (1). This way, it could be determined which variables would differentiate the membership of the three potential outcomes.

Group statistics showed the mean scores for the three outcomes of the dependent variable. In this case, those survey respondents who selected the neutral (0) option for the dependent variable (*trauma causes*) either chose neutral or disagree in relation to most independent variables except *support*.

The tests of equality of group means indicated that not all independent variables discriminated significantly across the three levels of the dependent variable. In this sense, only *awareness* (*p=.04)*, *best practices* (*p*=.00), *partnerships* (*p*=.00), *engagement* (*p*=.04) and *vulnerable* (*p*=.00) discriminated across the three levels of the outcome variable. The independent variables *benefits* (*p*=.10), *support* (*p*=.74), *savings* (*p*=.73) and *acknowledgment* (*p*=.06) did not discriminate or indicate any significant differences across the three outcome variable groups. In this sense, the strongest predictors of perceptions about whether or not the Australian 2011-2020 National Road Safety Strategy focused proportionately on all road trauma causes were: *best practices*, *partnerships* and *vulnerable*.

Box's M analysis indicated that the significance was neither <.001 nor >.001, suggesting that the assumption of equal group variance had been met. In fact, the significance was equal to .001. A value <.001 could be limiting to the generalisability of the analysis.

The first two canonical discriminant functions were used in the subsequent analysis. Squared, canonical correlation coefficients represented the magnitude of the predictability of the predictor variables. In this sense, the first discriminant function (disagree) yielded a squared canonical correlation of .54 whereas the second (agree) resulted in a squared canonical correlation of only .10. In this sense, the predictor variables were predicting disagreement more accurately than agreement with the dependent variable.

In line with the eigenvalue analysis, the Wilks' Lambda analysis indicated that the model (a set of nine independent variables and three components) predicted significantly the outcome 1 (disagree) at $p<.01$, but not the outcome 2 (agree) at $p=.76$.

The standardised canonical discriminant function coefficients indicated that the following variables had the highest predictive value in relation to the first outcome (disagree): *vulnerable* (.54), *partnership* (.49), *best practice* (.40) and *awareness* (.35). In terms of the second outcome (agree), *acknowledgement* (.70) had the highest predictive value, followed by *vulnerable* (.42). All the other variables had no predictive ability (*awareness*), negative loading (*best practices* and *engagement*) or very low loading, which ranged from .13 to .30 (*benefits, support, savings and partnerships*).

The examination of the classification results indicated that the prediction of membership of the 0 group (neutral) was only 9.1 per cent accurate (table 10.10). The prediction of membership of the 1 group (disagree) was 75 per cent accurate whereas the membership of 2 group (agree) was 69 per cent accurate.

Table 10.10: Classification Results

			Predicted Group Membership			
		Trauma causes	0	1	2	Total
Original	Count	0	3	2	6	11
		1	0	11	1	12
		2	2	1	26	29
	%	0	27.3	18.2	54.5	100.0
		1	.0	91.7	8.3	100.0
		2	6.9	3.4	89.7	100.0
Cross-validated[b]	Count	0	1	3	7	11
		1	2	9	1	12
		2	4	5	20	29
	%	0	9.1	27.3	63.6	100.0
		1	16.7	75.0	8.3	100.0
		2	13.8	17.2	69.0	100.0

a. 76.9% of original grouped cases correctly classified.

b. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

c. 57.7% of cross-validated grouped cases correctly classified.

10.4.1 Latent Variables or Model Components

The findings in the present analysis point to three features of the conceptual framework for coordinated responses, namely: *indiscriminate engagement*, *transparent communication* and *widespread stakeholder recognition*. These are defined below (table 10.11).

Table 10.11: Dimensions of Commitment to Engagement (Coordination) in Injury Prevention

Dimension	Variable	Definition
Indiscriminate Engagement	• *Partnerships*	• Having partnerships with the community in the delivery of programs, in which the community has a voice.
	• *Engagement*	• Having enforcement officers engage with the community to develop acceptance of enforcement.
	• *Vulnerable*	• Catering proportionately for all road users, including a focus on improving road safety for vulnerable road users.
	• *Best practices*	• The adoption of best practices.
Transparent Communication	• *Support*	• Securing support for initiatives through factual information about road trauma contributing factors.
	• *Savings*	• The reporting of the savings arising out of the financial commitment in delivering countermeasures.
Widespread Stakeholder Recognition	• *Acknowledgement*	• Acknowledging stakeholders through consultation.
	• *Awareness*	• Having a comprehensive public awareness strategy to inform the public of key risk factors.
	• *Benefits*	• A need to communicate the benefits of strategies to the public.

Indeed, the component correlation matrix showed that there was no correlation across the principal factors, except for a weak correlation between the first and the third principal components (r=.19). Accordingly, a review of the variable definitions and the Pattern Matrix assisted in labelling the dimensions. The labels were derived by synthesizing both the definitions and the variable names (table 10.11).

10.4.2 Predictive Value of the Variables

To conceptualise the outcomes, the variables predicting the positive outcome (agree) will be herein used. Accordingly, *Commitment to Engagement* (CE) will be conceptualised as being achieved primarily through *acknowledgement* and *vulnerable* (fig. 10.1). This typology represents four quadrants, namely: optimal CE framework for coordination (high levels of coordination); sub-optimal CE framework for coordination (low levels of coordination – too centralised); sub-optimal CE framework (low levels of coordination – too narrowly defined

strategies); and Deficient CE framework for coordination (very low levels of coordination – *silo-thinking, fragmented, isolated action*).

Vulnerable Focus \ Acknowledgement	High	Low
High	Optimal CE framework for coordination - catering for all road users; acknowledging a wide range of stakeholders	Sub-optimal CE framework for coordination: catering for most road users; acknowledging a small group of stakeholders – too centralised
Low	Sub-optimal CE framework: catering for a small group of stakeholders; acknowledging some groups of stakeholders – too narrowly defined strategies	Deficient CE framework for coordination: catering only for a small number of road users; not acknowledging stakeholders outside government – isolated, partial solutions

Figure 10.1 Typology of CE Framework for Coordinated Responses

10.5 DISCUSSION

10.5.1 Review of the Findings

This chapter has unveiled a three component - model structure and two variables with the highest predictive values for *Commitment to Engagement*. The components of the model were found to be *indiscriminate engagement*, *transparent communication* and *widespread stakeholder recognition.* The two predictive variables, *acknowledgement* and *vulnerable* were featured in a typology. The highest point of this conceptual framework (typology) for coordination is thought to represent *acknowledgement* of a wide range of stakeholders and a focus on all road users, including *vulnerable* road users.

10.5.2 Significance of Findings

When the draft copy of the 2011-2020 National Road Safety Strategy was released in Australia in 2010, it was examined by professional stakeholders on the extent to which it

represented a framework for the establishment of linkages across injury prevention strategies. It was said to have missed the opportunity to provide a framework for coordination (Camkin, 2010). However, this assertion left a wide range of questions unanswered. For instance, it failed to specify the coordination framework features absent from the strategy. In this respect, the typology developed in this chapter provides the answers to the questions raised by Camkin's (2010) criticism of the draft copy of the 2011-2020 National Road Safety Strategy in Australia.

The draft 2011-2020 Australian NRSS will need to develop an understanding of the needs of all road users through *indiscriminate engagement*. In reality, what is required is a set of more proactive and socially inclusive road traffic injury prevention interventions, which enjoy strong government and community support (Bowers, 2011). Pro-action and inclusiveness, in this sense, can be achieved through continued engagement with road safety stakeholders (SCOTI, 2012). In fact, this need for ongoing stakeholder engagement is acknowledged in the Australian National Road Safety Strategy 2011-2020 through a pledge. It pledges to engage effectively with stakeholders (Australian Transport Council, 2011), and so it should, in an indiscriminate manner, without favouring some road users, stakeholders or risk factors. In this respect, the findings in this chapter make it clear that this pledge should be pursued as a priority. This pursuit can enhance the ability of the strategy to represent a national framework for coordinated responses as it secures community active participation in the development of road safety countermeasures (Canoquena, 2013).

Most importantly, *Commitment to Engagement*, as a concept, has been clarified and refined. Its presence can now be examined and measured (Henneman *et. al.*., 1995). In other words, its relevant attributes (Powers and Knapp, 2010) have been defined. In fact, the empirical indicators of *Commitment to Engagement* are now clear.

This refinement of Commitment to Engagement has allowed Commitment to Engagement to be said to exist in a given situation (Powers and Knapp, 2010). Accordingly, Commitment to Engagement is thought to exist when there is *indiscriminate engagement*, *transparent communication* and *widespread stakeholder recognition.* These terms have, in turn, been defined in table 10.9.

The abstract representation of *Commitment to Engagement* (Avant, 2006) is the typology developed above. In this case, the typology is suggested herein as an ideal tool to measure the extent to which road trauma reduction responses are optimally coordinated.

10.5.3 Limitations

Despite the various attempts to follow up on the initial telephone calls and three reminders, only 52 relevant stakeholders completed the online questionnaire. This represents a relatively small sample size. Nonetheless, the small sample size does not appear to have affected the sampling adequacy. In fact, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy confirmed the adequacy of the sample size (.70).

10.6 CHAPTER CONCLUSION

This paper aimed to develop an underlying structure of a conceptual framework for coordination, namely: *Commitment to Engagement*. As a result, it has identified a three-component model of this construct, comprising the following dimensions or principal components: *indiscriminate engagement*, *transparent communication* and *widespread stakeholder recognition*.

Additionally, this chapter unveiled a typology comprised by the two variables in Commitment to Engagement with the highest predictive value for positive outcomes. This

cohesive framework can be employed to evaluate the extent to which a national road safety strategy has the potential to serve as a framework for coordinated effort.

10.7 CHAPTER SUMMARY

This chapter developed the underlying structure of *Commitment to Engagement* through the use of principal component analyses. This was found to comprise three components as opposed to two previously identified in Chapter Nine. The first of these factors represented *indiscriminate engagement* (*best practices, partnerships, engagement* and *vulnerable*). The second factor was found to be *transparent communication*. This component of *Commitment to Engagement* encompassed *support* and *savings*. The third factor, *widespread stakeholder recognition*, entailed *benefits, awareness* and *acknowledgement*.

Furthermore, this chapter developed a typology of *Commitment to Engagement*. This typology used the variables loading on the three components to identify the variables with the highest predictive value. Accordingly, this chapter found *acknowledgment* (acknowledging stakeholders through consultation) and *vulnerable* (catering proportionally for all road users, including a focus on improving road safety for vulnerable road users) to have the highest predictive value. In this sense, *Commitment to Engagement* was thought to be optimal when these two variables were at their highest point. Consequently, Commitment to Engagement may yield more than just coordinated responses. Because it is premised on the garnering of support for road safety strategies through both stakeholder acknowledgement and a focus on all road users, it is highly likely to secure community buy-in. This may represent active, positive public attitudes such as *compliance* (Canoquena & King, in Press) or *moral commitment* (Snortum, 1991), which are described in Chapter Six.

Chapter 11: Perceptions of the Prevalence of Self-organising amongst Australian Road Safety Stakeholders: a Comparative Perspective

11.1 INTRODUCTORY COMMENTS

One of the weaknesses of PI has been said to have been its failure to take account of the context beyond social policy development (Dann, 2009). In other words, the interaction between the social policy development context (Dann, 2009) as a government-professional stakeholder cluster and its environment was not examined in policy integration. In fact, the gap in knowledge related to this chapter refers to the absence of scientific research into the interaction between the policy context in road safety as a government-professional stakeholder cluster, which generates coordinated responses, and its environment where community safety is jeopardised by the existence of road traffic crashes. Furthermore, little knowledge exists about the role of *self-organising* in this interaction. *Self-organising* refers to the work of non-mandated institutions (e.g. NGOs, think tanks, professional associations etc.). It also explains the interaction between a government-professional stakeholder cluster and its environment as elucidated by Cummings (1982).

This research paper represents the investigation in the present thesis into the explanatory value of the DST. It investigates the perceptions of road safety professional stakeholders about the prevalence or otherwise of some of the principles of the DST. These tenets explain the coordination of road safety countermeasures between the government-professional stakeholder cluster and its environment (crash data and community safety). Addressing the second research aim, the research paper in this chapter provides a system-

based perspective (outside the policy context in road safety) on the coordination of road safety countermeasures, in which the community co-designs coordinated responses.

It is an important chapter in the present research program. It addresses the third research objective. This is the goal of examining the explanatory value of a system theory in accounting for the systemic, societal variables, which exist beyond the politically charged policy setting.

The research paper contained herein was published as part of the proceedings of the Australasian College of Road Safety Conference (2015). This forum was convened by the Australasian College of Road Safety (ACRS). The ACRS is the peak body for road safety in the Australasian (within Oceania) region.

The current research paper has been formatted in line with the Higher Degree Research Guidelines (Requirements for Presenting Theses), 2015 and the QUT Reference Guide, 2013 (Writing Your Thesis Using Word 2010 and End Note X6).

11.2 AUTHOR STATEMENT OF CONTRIBUTION

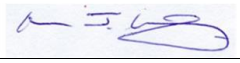
The authors listed below have certified* that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;

4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
5. they agree to the use of the publication in the student's thesis and its publication on the Australasian Research Online database consistent with any limitations set by publisher requirements.

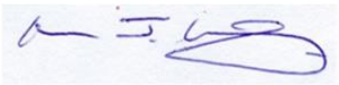
In the case of this chapter:

Publication title and date of publication or status: Perceptions of the Prevalence of Self-organising amongst Australian Road Safety Stakeholders: a Comparative Perspective

Contributor	Statement of contribution*
Joao Canoquena Signature  Date 9th March 2017	Collected data, conducted data analysis and wrote the manuscript
Dr. Mark King * Signature  Date 9th March 2017	Aided the design of the research conceptual framework and provided editorial feedback on the manuscript as well as guidance in the selection of an appropriate peer-reviewed journal

Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Mark King  9th March 2017

Name	Signature	Date

11.3 PAPER FOUR (AS SUBMITTED FOR PUBLICATION)

Canoquena, Joao Manuel da Costa & King, Mark (2015) Perceptions of the prevalence of self-organising amongst Australian road safety stakeholders: A comparative perspective. In*2015 Australasian Road Safety Conference*, 14 - 16 October 2015, Gold Coast, Qld.

Abstract

The Australian road traffic fatality rate is slowing down at a much lower rate than that of comparable high income countries. This slow rate of reduction may be attributable to a wide range of causes such as deficits in coordination and low community engagement. However, it may also be due to the absence of understanding of systems thinking in road safety in Australia. This exploratory study aimed to investigate the perceptions of Australian stakeholders about the prevalence of a principle of the DST, namely: self-organising. The

results pointed to a need to decentralize the road traffic injury prevention efforts in Australia through a range of self-organising principles and the adoption of emergent rather than deliberate strategies.

11.4 INTRODUCTION

The challenge in Australia road safety management is not its ability to head towards zero (see Corben *et. al..*, 2010; Gargett *et. al.*, 2011). The downward trajectory of fatality rates over the last forty-five years across all jurisdictions shows that Australia is heading closer to zero from a high of 30.4 road traffic fatalities per 100,000 in 1970 (OECD and ITF, 2013). Take the State of Western Australia, for instance. It has reduced its road toll in the last four decades by four-fold through the simultaneous deployment of evidence-based road safety measures and centralisation of effort (Dieter, 2011). Likewise, the Australian Capital Territory's fatality rate, at 3.40 (Australian Bureau of Statistics, 2010) is much closer to zero than any other jurisdiction. However, the challenge in Australia road safety management is the need to accelerate the rate of reduction of road traffic fatalities (Gargett *et. al.*, 2011). In fact, unless the rate of road traffic fatality reduction is accelerated in Australia, simple calculation shows that its largest State (Western Australia) will need (all things being equal) another 80 years to achieve a fatality rate of 0.52 per 100,000 population**.**

To avert this slow progress pattern and in some jurisdictions reverse the trend (McIntosh, 2013), Gargett *et. al.*. have called for trend breaking change (2011). Likewise, Dieter (2011) has proposed the notion of co-development of strategies and policies with enhanced levels of community engagement. Similarly, I. Johnston (2010) has called for a constituency for safety. Furthermore, May *et. al.*. (2008) have attributed the slow rate of reduction to the "culture of speed" in Australia. Most importantly, citing Dekker (2011) in a comparison of system models, Salmon *et. al.*. have concluded that in terms of systems

thinking, Australian road safety strategies tend to "… go 'down and in' rather than 'up and out' to understand and rectify road traffic crashes" (2015, p. 1834). The 'up' in this case represents "…Government, road authorities, road designers, societal norms, road design, road rules etc." (Salmon *et. al..*, 2015, p. 1834). The 'out' signifies a concern for factors other than 'frontline behaviour' or road users (Salmon *et. al..*, 2015, p. 1834). In the same vein, May *et. al..* (2008) have observed the fact that " … Australian public policy on road safety management remains constrained in its thinking, focusing on technical or engineering solutions or on narrow approaches to changing driver behaviour" (p. 395). Moreover, others have recommended a redesign of the Australian transport safety system (May *et. al..*, 2011). This redesign is said to be achieved through holistic thinking (May *et. al..* 2008).

Despite various attempts to hypothesise as to what may arrest the current rate reduction trend in Australia, little research has been conducted into the nature of the Australian adoption of a systems approach. Indeed, "… modern strategies do not include essential aspects of systems theory that describe relationships and interdependencies between key components." (Hughes *et. al..*, 2015, p. 271). In fact, it is not known how Australia fares against other comparable countries in terms of the adoption of theories which contribute to a dynamic, resilient and flexible system. One such theory is DST, which explains how self-organised systems build flexibility, resilience and dynamism.

11.4.1 DST: Self-organising

Self–organisation is made possible by experiential learning-oriented cultures (Zohar and Borkman, 1997). In these cultures, which thrive on knowledge, an executive consciousness is developed (Kayes and Kolb, 2005). This high level of team development represents collective growth (Knapp, 2010). Self-organising can be satisfactorily explained

through five dynamic systems principles, namely: *circular causality*, *continuity*, *empowerment*, *self-augmenting* and *self-maintaining*.

The emergence of orderliness (in this case the reduced likelihood of road traffic crashes) can occur as a result of a combination of *self-augmenting* (positive) and *self-maintaining* (negative) feedback processes (Lewis, 2005). Positive feedback, or self-augmenting, is the vehicle for the emergence of new forms or behaviours, as new elements in the system are mobilized causing amplification of change (Lewis, 2005). , in a society where very few self-organizing institutions exist, change may remain localized. Negative feedback, on the other hand, or self–maintaining, restores orderliness as individual elements relinquish independence and embed into the system (Lewis, 2005). Self-maintaining is typical of inter-agency work patterns in emergencies, when a central, lead agency takes over whilst others surrender some of their powers. , a system self-maintains when it centralizes under stress or as a contingency. In the Australian State of Western Australia, for instance, the adoption of self-maintaining was evident in the coordinating function attributed to the former Office of Road Safety (Dieter, 2011).

Continuity represents a system's ability to flexibly respond to stress with a repertoire of responses. This ability to bounce back emerges from the interaction of a system's underlying components (Rvachew and Bernhardt, 2010). In this sense, the simultaneous deployment of road safety interventions at various levels of society aids the maintenance of continuity.

Circular causality, as opposed to linear causality, identifies two parts of a system, which repeatedly impact upon each other, namely: a higher-order part (structures, hierarchies) and a lower-order part (processes, constituencies). A change in the higher order function alters the manner in which the lower-order parts of the same system function. In turn, this change in the lower-order interaction patterns gives rise to modifications in the way

the higher–order functions (Lewis, 2005). This mutual dependency of cause (e.g. changes in the local processes) and effect (e.g. alterations in the global structure) diminishes the influence of the environment on a system's direction (Küppers, 1999), rendering it resilient.

The sustainability of self-organising requires *empowerment* (delegation of power) (Laihonen, 2006). *Empowerment* can be achieved through a stage-approach which aims at equipping a team with the skills to self-organise.

Whilst these principles of self-organising are often employed in the design of dynamic systems, they have not been investigated in a context of road transport safety (Young and Salmon, 2015). Accordingly, it is pertinent to address the following research questions: *a) which principles of self-organising are more frequently perceived as prevalent in the Australian road safety context?; and b) how does this Australian perception contrast with the perceptions of other comparable stakeholders?*

11.5 METHODS

11.5.1 Instrument Design

From the literature on DST and its principle of self-organising, eleven statements were designed into an online, self-administered survey (Table 11.1). The statements in Table 11.1 were rated along a 7-point Likert scale from Always to Rarely.

Table 11.1: Description of Survey Variables

DST Concept	Proponent	Variable	Survey Statement
Experiential Learning	Zohar and Borkman, 1997	*Learning*	My community (i.e. clubs, schools, ethnic groups etc; not family or friends only) thrives in experiential learning, where its members are constantly looking for opportunities to learn from experience at a local level.
Executive Consciousness	Kayes and Kolb, 2005	*Advocacy*	My community has developed strong constituency (advocacy) for road safety issues at a local level

		Cohesion	My community is highly cohesive, with groups organizing around social issues at a local level.
		Interest Groups	There are a lot of interest groups in my community at a local level.
Voluntary Activities	Bacharach and Lawler, 1980	*Volunteering*	My community organises voluntary activities on a regular basis at a local level.
Self-Augmenting	Lewis, 2005	*Word Spread1*	My community is quick to spread the word about crash statistics.
		Word Spread2	When there are changes to the law or road rules, my community spreads the word very quickly about the changes.
Self-Maintaining		*Central Command*	If there is an emergency, there is a central command (either of local groups or local authorities) that is immediately formed at a local level.
Empowerment	Hut and Molleman, 1998	*Empowerment*	The local council may delegate the authority to organize behavior changing campaigns to road safety community groups at a local level.
Circular Causality	Googins and Rochlin, 2000	*Circular Causality*	If funding allocation is changed, the local Council interaction with community-based interest groups is altered with Council taking on the role of conducting behavior changing programs.
Continuity	Lewis, 2005	*Simultaneous*	In my country, road safety interventions (i.e. programs to reduce road traffic fatalities) are deployed at various levels (government, community, private sector etc.) simultaneously.

11.5.2 Sampling Techniques

Stratified sampling techniques were adopted in this study to identify the survey takers, including initial website search and snowballing to form a sampling frame, from which respondents were randomly selected. The inclusion criteria included job role related to road safety and familiarization with the coordination of road safety at a local level. In total, 558 e-mail invitations (with a link to the survey) were sent out to all the members of the sampling frame. Seventy-six (13.6% response rate) respondents completed the survey. Of these, nearly half (48.7%) were Australians (Table 11.2). Canadians represented the second largest group at 15.8 per cent.

Table 11.2: Sample Characteristics

Country of Residence	***N***	**%**
Australia	37	48.7
Brazil	1	1.3
Bulgaria	1	1.3
Canada	12	15.8
Colombia	1	1.3
Finland	3	3.9
Ireland	1	1.3
Kenya	1	1.3
Malaysia	1	1.3
Netherlands	1	1.3
New Zealand	3	3.9
Sweden	2	2.6
Uganda	1	1.3
UK	5	6.6
Uruguay	1	1.3
USA	2	2.6
Zambia	2	2.6
Zimbabwe	1	1.3
Total	76	100.0

The *Global Status Report on Road Safety 2013* (WHO, 2013) was used to group respondents other than Australians under three income levels – high, middle and low. Due to the low numbers for the last two income levels, the analyses will focus predominately on high income countries as these compare to Australia.

11.5.3 Data Analysis

Cross-tabulation examinations were conducted to investigate the perceived prevalence of self-organising across the three country income levels. Significance testing employed Fisher's Exact Tests with a significance level of .05.

11.6 **RESULTS**

This paper aimed to address two research questions. Firstly, it identified the principles of self-organising perceived by Australian stakeholders to be prevalent in the Australian road transport safety. In this respect, not one principle was thought to always be present (Table 11.3). *Continuity* (i.e. simultaneous deployment of road safety interventions at all levels) was most commonly selected as "Always" present, by nearly a quarter (24.3%) of the Australian survey takers. Furthermore, four principles were viewed as "Often" existing in Australian responses to road traffic crashes, namely: *experiential learning* (24.3%); *executive consciousness through advocacy* (21.6%); *executive consciousness through interest groups* (24.3%) and *self-maintaining through central command* (27%). In the case of the latter principle (self-maintaining through central command), almost half of the respondents (21.6% + 27.0%) perceived of it as existing with some frequency in Australian responses to road traffic crashes. However, two principles of self-organising did not seem to be perceived as being frequently observed in Australian responses to road traffic crashes. These were self-augmenting through the spread of a central message and empowerment through delegation (Table 11.3).

Table 11.3: Prevalence of the Principles of Self-organising

Variable (number of valid responses)	Percent selecting frequency of perceived prevalence			
	Always	Often	Sometimes	Rarely
Learning (*N*=25)	5.4	24.3	24.3	13.5
Advocacy (*N*=20)	10.8	21.6	16.2	5.4
Cohesion (*N*=17)	2.7	16.2	16.2	10.8
Interest Groups (*N*=21)	10.8	24.3	13.5	8.1
Word Spread1 (*N*=23)	2.7	18.9	18.9	21.6
Word Spread2 (*N*=24)	5.4	16.2	18.9	24.3
Central Command (*N*=26)	21.6	27.0	8.1	13.5
Empowerment (*N*=22)	5.4	18.9	8.1	27.0
Circular Causality (*N*=20)	2.7	13.5	21.6	16.2
Simultaneous (*N*=22)	24.3	16.2	10.8	8.1

Note: SPSS only outputs options selected by respondents (or options with values > 0). Frequency adverbs not selected by the respondents (or with values > 0) are not shown.

Secondly, this paper aimed to compare the perceptions of the Australian respondents to those of comparable stakeholders. In this regard, there were no significant differences (p <.05) between the Australian respondents and others on all but one principle of self-organising: only *self-maintaining through central command* (p = .02) appeared to set Australians apart. In this sense, Australian stakeholders were slightly more likely to perceive this principle to be "always" or "often" in evidence in the responses to road traffic crashes (Table 11.4) when compared to high income country respondents. Both Australian and high income country respondents seemed to perceive *self-maintaining through central command* far more often than middle and low income country survey takers, thus suggesting that this principle is typical of countries comparable to Australia.

Table 11.4: Central Command (frequency)

	Country of residency				
	Australia	High Income	Middle Income	Low Income	Total
Always	8	7	0	0	15
Often	10	5	0	1	16
Sometimes	3	4	3	2	12
Rarely	5	1	3	0	9
Unknown	11	12	1	0	24
Total	37	29	7	3	76

When asked how fast the setup of central command occurred in emergencies related to road traffic crashes in their communities (Table 11.5), the respondents from high income countries were slightly more likely than the Australians to perceive this to occur quickly ($p<.01$). Australians were twice as likely as high income country respondents to view the speed of the establishment of central command in road traffic crashes as slow.

Table 11.5: Central Command Setup (speed of adoption)

	Country of residency				
	Australia	High Income	Low Income	Middle Income	Total
Quickly	21	23	1	1	46
Neither	9	4	1	1	15
Slowly	7	2	1	5	15
Total	37	29	3	7	76

11.7 DISCUSSION

11.7.1 Significance

The results suggest that across the income divide for countries there are no significant statistical differences in the perceived application of DST constructs except for *self-maintaining through centralisation of command*. In this sense, the Australian road transport system is perceived to self-maintain slightly more than other comparable high income countries such as Sweden, Canada, the United Kingdom (UK), New Zealand, the Netherlands, Finland and Ireland. Given the State-based management of road safety in Australia, such centralisation presumably applies at State rather than national level. Importantly, the establishment of local level central command in Australia in response to a road traffic crash emergency does not seem to be perceived to be as quick as in other comparable countries.

It is equally apparent that the Australian respondents do not appear to perceive the Australian road transport system to self-augment or empower constituent system parts e.g. community groups. In this sense, it may be hypothesised that there might be little spread of a central message in road safety in Australia. The consequence of a lack of self-augmenting may include a reduced likelihood of the existence of public approval for system reforms, especially changes related to speed, alcohol, drugs and mobile telephone use (see Canoquena and King, under review). For this and other reasons such as high levels of distracted driving (Young and Salmon, 2015), the average car occupant fatalities (2007-2011) in Australia are amongst the highest in the OECD (OECD and ITF, 2013).

The road safety system in Australia appears to be too centralised, unlike other comparable countries. In the UK, for instance, innovative plans by associations such as TyreSafe typify executive consciousness of interest groups or communities of practice. Over holiday periods, TyreSafe, a knowledge-oriented institution reaches out to its members and issues warnings and advice. The emergent order constitutes the adherence by drivers to the counsel in the way of voluntary periodical checks of the air pressure and status of tyres.

The significance of these findings may be said to be twofold. Firstly, this new knowledge about the Australian road safety system has the potential to identify areas for improvement (Hughes *et. al.*., 2015). For instance, it is known that *continuity* alone can be responsible for 20-30% fatality rate reduction (Corben *et. al.*., 2010). In fact, Graham (2013) has attributed 50% of the reduction in the number of teenage drink-driving offences to a package of measures (i.e. continuity) in a country often compared to Australia - i.e. New Zealand. These interventions included regulatory changes, Police enforcement, mass media advertising, public attitude surveys and crash data reports (Graham, 2013). Nonetheless, less than half the respondents in this study perceived continuity to be prevalent in the Australian

context. Therefore, due to the effectiveness rate attributed to continuity, it should feature more prominently in Australian road safety management.

Likewise, given the fact that there is '… substantial rhetoric … about the desirability of active involvement of community members …' in traffic safety policy development (Howat *et. al.*., 2001, p. 267), it is surprising that nearly a quarter of the Australian respondents perceived self-augmenting to rarely be prevalent. Elsewhere, self-augmenting has been widespread (see Appendix).

Secondly, the results in this study point to the slow uptake of self-maintaining in Australia when it is most required (i.e. coordination of emergencies). Whilst McIntosh (2013) and Deller (2010) have identified deficits in the coordination of effort to explain the slow update of coordinated responses (i.e. self-maintaining), the issue with Australia does not appear to be the mere existence of deficits in coordination per se as these are unlikely to impact directly on fatality rates. Other issues may be at play. For instance, the fact that States and Territories manage and are accountable for road safety in Australia (Job and Cook, 2012) should make self-maintaining more effective in Australia. However, this does not seem to be the case because it has not generated an emergent order. In other words, self-maintaining in Australia is not restoring orderliness. This might be explained by the fact that Australia is adopting *deliberate* (hence the delay in the adoption of self-maintaining) as opposed to *emergent* strategies (Mintzberg and Waters, 1985). In this sense, intentions or goals ought not to direct the course of action (Mintzberg and Waters, 1985). Rather, the interaction between the environment and the parts of a system shape the course of action (Mintzberg and Waters, 1985). This means working more from an emergent order perspective as opposed to deliberately planned strategies.

Australia will need to adopt self-augmenting strategies to spread scientific knowledge about contributing risk factors to road traffic crashes within the community and empowerment of community groups to redesign its cultural arrangements (May *et. al.*., 2008; I. Johnston, 2010).

11.7.2 Limitations

This study is not without limitations. The relevant sample was relatively small (37 for Australia and 29 for high income countries). Future research should broaden the comparison and engage a larger number of respondents from both Australia and a much wider range of OECD countries, especially high performers such as Iceland and Germany (OECD and ITF, 2013). This comparison is useful to help explain the existence of the wide gap amongst OECD countries in terms of road traffic fatality rates from a systems thinking perspective (OECD and ITF, 2013).

Most importantly, the missing values in the Australian responses limited the ability of the study to be definitive in its generalisations about the Australian stakeholders, thus the use of tentative language in the discussion and conclusion.

11.8 Chapter Conclusion

Australia appears to be centralising road traffic injury prevention more than it needs to. Whilst the centralisation of command through a lead agency is often called for by the WHO and the United Nations (UN), adopting this inflexibly may not suit Australia as it wrestles with the need for grass-root cultural shifts to modify road user attitudes. In this sense, the Australian road transport system should be more flexible and dynamic so as to only quickly self-maintain when is required such as in road traffic crashes. When it does not need to self-maintain, it should self-augment and spread a core evidence-based message about injury

prevention; empower community groups; and allow local level structures to impact on and shape the course of action. , Australia will be best served by viewing the road transport system as one component of a much broader, dynamic and unpredictable system in its pursuit to arrest the slow rate of reduction in road traffic fatalities through attitudinal changes.

Greater gains in road traffic injury reduction may arise from decentralised yet coordinated responses to road traffic risk factors. This decentralisation within a coordinated framework will be achieved through a systems theory such as DST, which focuses on the interplay amongst the system components (Young and Salmon, 2015) and provides a holistic appraisal of the factors contributing to road traffic crashes (Scott-Parker *et. al.*., 2015).

Future research into the road transport system in Australia from a systems perspective should seek to identify actual gains in the adoption of the principles of self-organising. In this respect, it is pertinent to investigate the magnitude of the impact of self-maintaining, self-augmenting, circular causality or empowerment upon a country's ability to reduce its death toll.

11.9 CHAPTER SUMMARY

This chapter presented a published research paper, which investigated the potential explanatory value of DST to account for the interaction between the system studied in chapter Ten and its environment. Put otherwise, whilst chapter Ten looked at the system from within, the present chapter examined the same road safety policy context from a system-wide perspective. This investigative angle allowed the interaction between the government-professional stakeholder cluster and its environment in road safety to be understood. Accordingly, this chapter reiterated a relevant weakness in *PI* related to context beyond social policy development. In this respect, the reader was reminded of the fact that PI was said to

fail to account for the environment outside the inter-organisational domain (or government-professional stakeholder cluster of government).

This chapter achieved its purpose by investigating the perceptions of experienced road safety stakeholders in relation to one principle of DST– i.e. self-organising. It found that although the perception of the prevalence of the principle of organising in the Australian road safety system did not seem to be overwhelmingly held by a majority of survey respondents, some actual processes associated with self-organising were better perceived than others. Accordingly, the simultaneous deployment of road safety responses at a local level was thought to be prevalent in Australia's road safety management by just under a quarter of the respondents. A similar number of survey takers perceived four other self-organing principles to be often prevalent. These were said to be as follows: *experiential learning* (24.3%); *executive consciousness through advocacy* (21.6%); *executive consciousness through interest groups* (24.3%) and *self-maintaining through central command* (27%). Of these the use of a *central command* was found to be often deployed in Australia to address road traffic trauma by nearly a third of the survey respondents. In fact, when the values for *always* and *often* were combined for *central command,* it was found that almost half of the respondents thought it to be frequently utilised in Australia. Indeed, it appeared to be typically employed in Australia and other comparable countries. In fact, it was found that it was far more often used in Australia and other comparable countries than in middle and low income countries. However, Australia was perceived to both adopt and phase out *central command* more sluggishly than other comparable countries.

Most importantly, neither the *spread of a central message* nor *empowerment through delegation* was perceived to be frequently deployed in road safety management in Australia.

In brief, this chapter addresses the second research aim. It examines the systemic nature of coordinated responses and allows the interaction between the government-professional stakeholder cluster and its environment to be scrutinised more broadly. In addition, this chapter addresses the third research objective which is to *understand how a systems theory explains the broader system-based context for coordinated road traffic injury prevention responses.* This explanation has been herein illustrated through five self-organising principles, namely: experiential learning, executive consciousness, voluntary activities, self-augmenting, self-maintaining, empowerment, circular causality and continuity.

Chapter 12: General Discussion & Conclusion

12.1 INTRODUCTORY COMMENTS

This research program has produced a detailed description of coordinated road safety responses in Australia and some OECD countries (Chapters Six, Seven and Eight). In addition, it has developed a conceptual framework for coordinated responses in road safety, comprising a new principle of integration (Chapter Nine), the underlying structure of the implementation processes for coordination from this new principle of integration (Chapter Ten) and a typology for the evaluation of national road safety strategies as integrated frameworks for coordinated responses (Chapter Ten). Furthermore, this thesis has examined non-mandated coordination through a systems approach and the principle of self-organising within the Australian road safety context (Chapter Eleven).

This final chapter, initially, synthesises the evidence generated herein (12.2). Subsequently, it reviews the chief research aims and objectives as outlined in Chapter Five (12.3). In addition, this chapter provides details of the contribution the current program of research is expected to make to both theory and practice in road safety management (12.4 and 12.5). This contribution is contextualised within the variables outlined in Chapter Two. In this chapter, the road safety policy context in Australia was said to require improvement in its cultural indicators. The contributions also consider the conclusions in Chapter Four. One such conclusion was the need for the goal of road safety effort to be the development of inherent safety resilience through cultural strengthening rather than a narrowly defined aim of enhancing safety outcomes whilst maintaining mobility.

Moreover, this chapter outlines the strengths and limitations (12.6) of the methodology adopted throughout the present research program. At 12.7 the thesis suggests avenues for future research, which are followed by the thesis conclusions (12.8).

12.2 SYNTHESIS OF THE EVIDENCE

The research aims for the present program of research were to investigate the nature of coordinated road safety responses on three levels, namely: practical, conceptual and systemic. As illustrated in fig. 12.1, each one of these three conceptual layers provides guidance to the preceding one. Accordingly, the systemic nature explains the manner in which the conceptual nature of coordinated road safety responses interacts with its surroundings. The conceptual nature, in turn, provides guidance to understand the choices made at the practical level. For instance, the interaction-based activities adopted at a practical level can be said to potentially benefit from an understanding of the extent to which *Commitment to Engagement* can assist workflows commence, continue and remain sustained.

Depicted as a normative illustration of the ideally coordinated system, fig. 12.1 highlights the properties of the three conceptual layers. It sets out the attributes of a road transport system, which should render its safety inherently resilient. A system which continuously coordinates its countermeasures at all three levels in the manner described in fig. 12.1 is expected to have inherent safety resilience. It should amplify its safety resilience across the three layers shown in fig. 12.1.

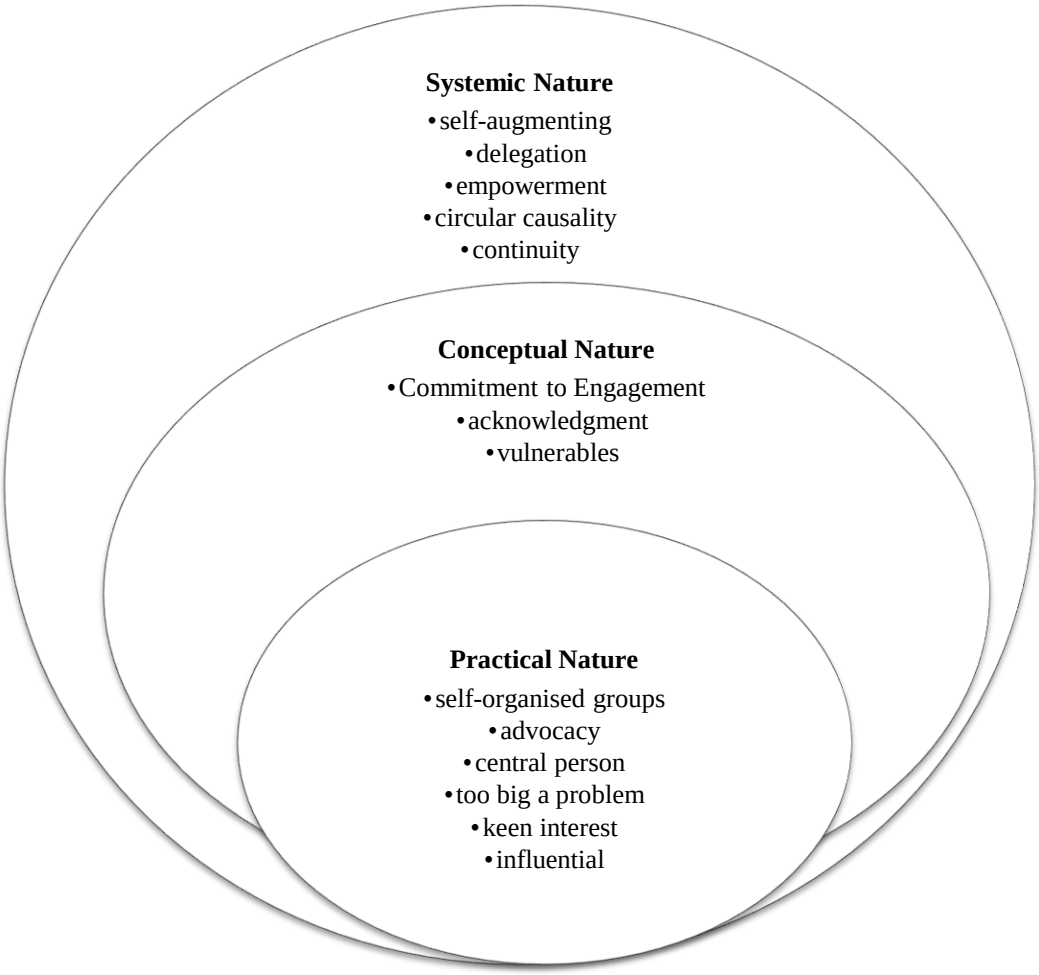


Figure 12.1Synthesis of the Thesis Evidence

Systemic nature

The systemic nature of coordinated responses in road safety represents the theory with the ability to account for the interaction between the government-professional stakeholder cluster and its environment. In this environment, both road traffic crashes and community safety become the priority. In addition, this is the layer at which the appointment of a lead agency to restore orderliness can be understood. Accordingly, the appointment of a lead agency represents one of five processes, which occur in the interaction between the government-professional stakeholder cluster and its environment. This process represents self-maintaining. Self-maintaining produces central command and centralisation. It does not cause the road transport system to self-augment, which is what Australia most needs. This represents the ability of the system to spread a central message and delegate responsibility for delivering targeted interventions to community-based institutions. It is also the approach which can dispel doubts and secure community buy-in, which is so desperately needed in Australia as demonstrated by the public opinions expressed in Chapter Six.

Another useful system-based process has been herein described as circular causality. It has the potential to help develop a culture around road safety. This grass-root process, if appropriately applied, should engender moral commitment as it empowers the community and allows communities to become ethically caring and responsible. Continuity should give both governments and communities the ability to respond to negative feedback from the environment (i.e. road traffic trauma) with a repertoire of coordinated responses.

Conceptual nature

At the theoretical level closer to one component of the system (i.e. the whole of government), the search for a policy which explained the coordination of road safety responses yielded *policy integration*. This theory represented an attempt to explain the

government-professional stakeholder cluster, in which agencies interacted vertically. However, this theory was found to have been ill-conceived. In order to translate *PI* into a theory which was devoid of the deficits in *PI* (see Chapter Three) and accounted for community buy-in, the present research program adopted the Grounded Theory Method. This data analysis methodology resulted in a new theory (*Participatory Deliberative Integration*), which was found to account more readily for the role of the community in policy development and coordination per se. This reconceptualisation translated coordination into *Commitment to Engagement*. *Commitment to Engagement* was found to denote an acknowledgement of a variety of stakeholders. In addition, it was conceived as being able to develop community support for road safety countermeasures. In this sense, *Commitment to Engagement* was viewed as focusing strongly on communicating with the community and championing the benefits of achievements. The optimisation of this process (i.e. Commitment to Engagement) was also found to be predicted by two variables – i.e. *acknowledgement* (of a wide group of stakeholders) and *vulnerable* (catering for all road users). In synthesis, coordination (Commitment to Engagement) is optimal when there are high levels of stakeholder acknowledgement and the measures cater for all road users.

Practical nature

The practical nature of coordinated road safety responses was also comprehensively described in this research program (Chapters Six, Seven and Eight). It was found to comprise a) misconceptions in the public perceptions, b) a need to measure shifts from compliance to defiance, c) adaptive responses at a local level, d) complementarity of activities, e) project-specific workflows, f) free from hierarchies and oversight, g) self-organised activities, h) funding for community groups because of the access to target groups, i) requiring a normative model and j) inter-dependent stakeholders keen on working together due to resource scarcity. The approach employed in these workflows was predominantly crash data-oriented. Accordingly, the local level road safety coordinators interviewed and surveyed in the present research program noted the identification of issues in road traffic crash data as a trigger for coordination. This would, subsequently, entail securing buy-in from the community for the resulting multi-pronged approach.

This practical layer was described in Chapter Eight. Its depiction illustrated the idealised work of self-organised groups with strong advocacy who were moderated by a local champion with a good understanding of the enormity of the issue of road traffic crashes and its facets and operated within an ecology of influential stakeholders who had a keen interest in all issues at hand.

12.3 REVIEW OF THE RESEARCH OBJECTIVES

Four research objectives guided the investigations in this thesis. These were as follows: *develop a descriptive model of local level coordinated responses in OECD countries* (RO1); *reconceptualise PI in order to provide a conceptual framework for coordinated responses* (RO2); *assess the utility and underlying structure of the new conceptual framework developed in Research objective 2* (RO3); and *understand how a systems theory explains the broader conceptual context for coordinated road traffic injury prevention responses* (RO4).

These research objectives are reviewed below.

12.3.1 A Descriptive Model of Local Level Coordinated Responses in OECD Countries

Chapters Six, Seven and Eight contribute to the development of the descriptive model. Depicted in Chapter Eight, the model comprises a phenomenon (a coordinated road safety countermeasure/response), three facets or features and both distal and proximal contributing factors.

Whilst the phenomenon, its workflows and policy context (public acceptance) are described in Chapters Six and Seven, Chapter Eight presented the statistical identification of the facets and contributing factors perceived by professional stakeholders most likely to operate in the model. This examination ranked the facets and factors, thus allowing the descriptive model to be construction to be rigorously developed.

The data in the current program suggested that a *unified consciousness* to work together served as an incentive to coordinate road safety strategies at a local level. This *unified consciousness* emerged when there was a realization of inter-dependence across stakeholders. In fact, having *a keen interest on the issues at hand* was viewed by the interviewees and the survey takers as critical to the coordination of road safety strategies at a local level. This keen

interest was equally thought to be aided by knowledge of the local realities. In addition, the realization of the multi-dimensional nature of road safety challenges facilitated interactions too. In this sense, the challenge was invariably seen as the road traffic trauma or risk behaviour having a wide range of underlying causes, which no single stakeholder could tackle comprehensively alone. This realization was also thought to explain the initiation of interactions across stakeholders in road safety. In this sense, the interactions across stakeholders occurred partly because they realized that the problem was "too big."

Typically, the professional stakeholders who participated in this research program sought not to address road safety injury risk factors in isolation. Instead, these stakeholders or local level road safety coordinators displayed a commitment to working together. In most cases, both the appreciation of issues and the examination of crash data brought stakeholders together and triggered coordinated work. However, this start was said to be guided by a focus on securing community buy-in. In fact, "buy-in" appeared to be a recurring theme across the data. This appears to be justified when one considers the need to move the community perception about road traffic risk behaviour from tolerance to intolerance, thus becoming more accepting of road safety interventions. This acceptance (compliance) represents the removal of populist beliefs and negative perceptions such as that of "revenue raising" often associated with speed management measures in Australia.

12.3.2 Reconceptualisation of Policy Integration

The reconceptualisation of PI in this research program arose from the weaknesses identified in this integration framework for the coordination of effort (Chapter Nine). The study in Chapter Nine reconceptualised PI into a new principle – *Participatory Deliberative Integration*, which was thought to provide a conceptual framework for the alignment of effort across stakeholders (i.e. coordinated responses). The key value system of Participatory

Deliberative Integration was found to represent stakeholder commitment to strategy implementation. This was thought to be achieved through seven implementation processes, one of which related directly to coordinated responses. This implementation process was referred to as *Commitment to Engagement*, which could be achieved through both a communication strategy such as the National Road Safety Strategy (Chapter Two) and activities to forge partnerships in the community such as the funding of community groups. These groups could then be charged with the task of delivering programs within targeted communities, especially those found through data surveillance to be most at risk. In this sense, apart from a value system, *Participatory Deliberative Integration* (PDI) was also found to comprise a strategy development tool. Encompassing four stages, the strategy development model in PDI was said to begin with the appreciation of local level societal challenges by a wide range of stakeholders collectively (*Participatory Appreciation of Issues*). Throughout this stage, communities were viewed as being encouraged to help set directions for national agendas, thus ensuring comprehensiveness in the appreciation of pressing issues. Guided by science, the following stage *(Participatory Appreciation of Options and Trade Offs*) aimed to achieve optimal solutions out of the various options under consideration. Community sensitivities shaped the selection of optimal solutions. In this respect, trade-offs were thought to be subject to community assessment. This involved negotiating aggregate returns, which were conceived as being informed by modelling (science). Guided by clearly set targets and feedback loops, *Deliberative Delivery of Social Outcomes* occurred next. In this phase, the community was expected to evaluate the implementation of the optimal solutions. Subsequently, the *Reinforcement of a Central Message* was said to be conducted. On the one hand, this deliberative phase was perceived as being intended to take stock of the implementation of optimal solutions. On the other hand, it

aimed to extract a central message from the implementation, thus allowing achievements to be championed at a wide range of levels.

12.3.3 Utility and Underlying Structure of the New Conceptual Framework for Coordination

This research objective was initially investigated through the identification of the number of latent variables underpinning *Commitment to Engagement* (CE) in Chapter Ten. It is north noting that CE is the outcome of the reconceptualization of coordination. In this sense, this thesis developed a new term for coordination – i.e. CE.

The investigation employed to address the objective at 12.3.3 identified variables representing *Commitment to Engagement* with a predictive value or able to discriminate outcomes of a dependent variable – i.e. trauma causes (see Chapter Ten). This dependent variable represented a survey question about the proportionate focus on all road traffic trauma causes. Through discriminant analysis, the nine variables (Chapter Ten) representing *Commitment to Engagement* were used as independent variables. This examination identified two variables as predictors of agreement, namely *acknowledgement* and *vulnerable*. Both were then deemed to predict the levels of *Commitment to Engagement*. High levels of both should yield high levels of *Commitment to Engagement* (or coordination).

12.3.4 Explaining the Broader Conceptual Context for Coordinated Road Traffic Injury Prevention Responses

The broader context for coordinated road traffic injury prevention responses can be said to be the policy context. This policy context comprises structures and culture (Wegman and Oppe, 2010). Whilst the structure is thought to represent a lead agency, a national road safety strategy and inter-ministerial frameworks, the culture can represent a government-

professional stakeholder cluster of political leadership, public approval and administrative practices. In fact, culture can also include the wider community and its non-mandated activities. In this sense, self-organising activities form part of community engagement with road safety. Accordingly, the present sub-section will review the research findings arising out of the present program of research which pertain to public approval and self-organising as features of the Australian road safety policy context.

The public attitudes about the draft 2011-2020 Australian National Road Safety Strategy were examined in Chapter Six. It was found that public approval of road safety measures in Australia was mixed. It ranged from *scepticism* to *defiance* along a negative continuum, on the one hand. On the other hand, there seemed to be *dispassion* at one extreme of the positive continuum and *compliance*, at the other, within the attitudes of the public in Australia. Furthermore, the study in Chapter Six also identified the existence of public approval for the concept of having a national strategy in Australia.

The public attitudes referred to above operate at a system level. This is the space between the government-professional stakeholder cluster and the community. In this space, community safety is paramount. Therefore, Chapter Eleven examined the perceptions of relevant professional stakeholders in relation to the interactions between the government-professional stakeholder cluster and its environment (community safety and crash data). This study supported the shift away from mandated, centralised approaches in the coordination of road safety responses in Australia. It critiqued the approach adopted in Australia where centralisation of road safety effort is slow and prolonged. This was said to inhibit the road safety system from self-augmenting, thus stopping innovative forms of addressing road traffic risk behavior from emerging.

Chapter Eleven suggested that countries which did not have road traffic fatalities as significant environmental pressures or stressors (i.e. most high income countries as illustrated by low road traffic fatality rates) should rethink the role of lead agencies. These agencies may need to allow the road safety system in their countries to self-augment (decentralise) rather than continue to self-maintain (centralise). Self-maintaining limitations were illustrated in Chapter Four. A system which continuously self-maintains fails to build inherent safety resilience as it is too preoccupied with the restoration of order (a typically temporary concern) to the detriment of a long term view of system safety.

12.4 CONTRIBUTION TO THEORY

Drawing a comparison between implementation as both evidence-based programming and an interaction-based process, Bax *et. al.*. (2010) explain the latter as representing coordination amongst mutually dependent actors which emphasises the interaction and negotiation within a network of stakeholders. This perspective is underpinned by both a bottom-up approach and the concept of policy network, which emphasises interdependence amongst stakeholders and the need for cooperation and coordination. Rigidity in the interaction-based approach stifles adaptation of policy (goals) to specific, local circumstances (Bax *et. al.*., 2010). The challenge in relation to the interaction-based approach, much like the evidence-based programming, lies in establishing the right policy context for its implementation. Secondly, it should engage more deeply with the public in order to change the prevailing perceptions of road safety as a private, individual issue (McAndrews, 2013).

In this sense, this thesis has provided evidence to suggest that Australia should transition from the first approach (evidence-based programming) to the interaction-oriented strategy (Bax *et. al.*., 2010). In this sense, the present program of research has allowed the concept of interaction-based strategy implementation to gain specificity (see Chapters Eight

and Eleven). Chapter Eleven suggests that the role of lead agencies as illustrated above requires flexibility in order for these institutions to adjust to different circumstances. In this sense, the WHO recommendations for the appointment of a lead agency (Chapter Two) with the mandate to coordinate efforts should discriminate between lead agencies in highly successful road safety managing nations (with marginal or reduced negative feedback – road traffic trauma) and those in less successful countries (with high rates of both road traffic crashes and casualties). The lead agencies in highly successful road safety managing nations should champion the concept of *Commitment to Engagement* and forge partnerships with self-organised institutions with a platform to influence road user behaviours. In these settings, emergent, innovative approaches should be aimed for. These new strategies will require an interaction-based process (Bax *et. al.*., 2010), as described in Chapter Eight.

Furthermore, this research program has reconceptualised policy integration. This reconceptualization has yielded a new theory, which supports interaction-based process (Bax *et. al.*., 2010) in which community buy-in is secured. *Participatory Deliberative Integration* also allows for the current approach in Australia of calling community consultation at policy review stages to be questioned (see the model for the development of NRSS in Chapter Nine). It calls for communities to be actively engaged as government partners.

Most importantly, DST has been found, through the current research program, to be useful in the management of road safety coordination. It does so by allowing the interactions between the government-professional stakeholder cluster (best understood now through the *Participatory Deliberative Integration*) and its environment (where community safety is paramount) to be understood. It also allowed the broadening of the agenda in road safety to be understood (Chapter Four). In this respect, the deployment of DST to understand the road safety system in Australia yielded the concept of inherent safety resilience. This is a long

term goal of the road safety system. It necessitates the deployment of coordination processes herein described as self-augmenting (decentralisation), circular causality and continuity.

12.5 CONTRIBUTION TO ROAD SAFETY POLICY & STRATEGY MANAGEMENT

Procedural changes have been over-used to resolve issues pertaining to system-wide fragmentation, lack of coordination or isolated action in road safety management. In most instances of rectification of fragmentation or isolated action, new structures (steering groups, rationalisation of responsibilities, lead agencies etc.) and procedures (alignment of effort around chief priorities, World Bank Country Capacity Review Checklist, harmonization of data management, accident reporting criterion standard guidelines etc.) are recommended.

Unless these changes engender a system redesign to fundamentally deal with the underlying issues which give rise to road traffic crashes (Johnston, 2010a), not much may be expected to change in road safety. In this sense, the focus on fixing the driver (Scott-Parker et. al., 2016) is narrowly defined and does little to address fundamental system issues. Some of these issues have been identified in Chapter Two. Other issues were found in both Chapters Three and Four. In essence, there is a focus on safety-outcomes, which leaves out the benefits of the synergies between road safety and environmental concerns; road safety and health issues; and road safety and independent culture. In fact, whilst the focus on safety outcomes may yield safety gains, it may not necessarily produce sustainable safety resilience benefits. These gains were said to be obtained through the adoption of DST and the aims of creating an ethic of care and responsibility (May *et. al.*, 2008), and a constituency around road safety (Johnston, 2010b).

This thesis contributes to the commencement of a system redesign in road safety management, which focuses on community acceptance, interactional factors bringing together stakeholders and local level policy design. This redesign is needed on a number of fronts. Firstly, the reconceptualisation presented in the present research program should see a move away from specialism in the development of road safety policies. This constrained thinking (i.e. specialism), which emphasizes the adoption of narrow approaches or mostly engineering roadway or vehicle modification approaches (May *et. al..*, 2008), was not supported by the interviewees or the online survey respondents' insistence on a holistic approach to the coordination of road traffic injury prevention responses. Secondly, the manner in which communities are reconnected with road safety (May *et. al..*, 2008) is illustrated in the current research program through the various coordination models adopted by the interviewees (Chapter Seven). These workflow models emphasise horizontal (as opposed to vertical, mandated) coordination. Horizontal coordination is akin to co-determination or collaborative federalism currently employed in Canadian public administration processes. It emphasises the inter-dependencies across stakeholders and views them as autonomous. In addition, these models support the principle of self-organising where community groups participate in road safety program delivery as partners of government agencies through funding agreements. These funding agreements ought not to stifle an independent voice, which demands safety.

This knowledge of a system redesign impacts upon the definition of the government-professional stakeholder cluster in road safety management, the role of lead agencies in road safety and the conceptual framework these government institutions should operate under. Accordingly, the government-professional stakeholder cluster concept has been redefined to emphasise both participation and deliberation. Furthermore, the concept of coordination is

now understood to mean *indiscriminate engagement*, *transparent communication* and *widespread stakeholder recognition*.

Most importantly, the new principle of *Participatory Deliberative Integration* should see enhanced levels of policy linkages and synergies across road safety stakeholders. This is so because it emphasises the appreciation of the issues at hand with a wide range of stakeholders. This widening of the stakeholder cohort is illustrated in the typology developed in the current thesis to move approaches towards optimal *Commitment to Engagement*, which yields linkages across road safety strategies and policies.

In addition, the present research program contributes to the design and development of national road safety strategies from a local level perspective by providing an integration framework (i.e. *Participatory Deliberative Integration* or PDI) and a coordination – engendering implementation process (i.e. *Commitment to Engagement*) under which road safety responses can be coordinated from the bottom up rather than from the top down. The practical aspects of this contribution will be further outlined below.

12.5.1 Enhancing the Policy Context in Australia for Road Safety

Chapter Two alludes to the premise that weaknesses in structure and culture of a country lead to failures in the management of road traffic trauma (Wegman and Oppe, 2010). Australia's road safety structures and culture do not appear to be equally strong. Whilst relatively effective structures (agencies and ministries, although not networks) exist, albeit constraint to the safety-based outcome perspective, the culture, especially the culture around safety (Johnston, 2010b) appears to be evolving at a much slower pace than desirable. This is reflected in the various calls for change. May *et. al.* (2008) called for a culture based on an

ethic of care and responsibility. McIntosh (2013) called for an independent voice. Others have called for the shift away from the glorification of speed and alcohol (Tranter and Lowes, 2005) or the car culture (Walker, Butland and Connel, 2000). The need to focus on the environmental impact of road traffic crashes by May and colleagues (2008) was echoed by Raftery, Kloeden & Royals (2014). Raftery, Kloeden & Royals (2014) asked further that road safety countermeasures consider the manner in which road users rationalize their behavior.

These calls for cultural change offer an opportunity for the application of the model developed in Chapter Eight. The changes point to the need for a more nuanced, broad approach (Johnston, 2010a) in road safety generation of countermeasures. This approach should be culture-based rather than structure-focused. In this sense, the descriptive model developed in Chapter Eight has the potential to strengthen the policy context in road safety in Australia by offering an instrument by which cultural change can occur. It can do so by allowing a grass-root constituency to develop around road traffic safety. The use of self-organised groups with strong advocacy, a local champion with a broad perspective on road traffic trauma moderating an ecology of influential individuals with a keen interest in the issues at hand can deliver this constituency (culture) for road traffic safety. This ecology of keen local level stakeholders will need to vertically coordinate local actions with resourceful local, State and National level stakeholders who will invest large sums of money in safe roadways and roadsides, mass transport means, cycling infrastructure, walking incentives, land-use planning for reduced private car dependency and healthier communities. These local, State and National level stakeholders will also champion the deployment of self-augmenting, circular causality and continuity coordinating activities in Australia.

12.5.2 Coping with Resource Scarcity

The WHO acknowledged that in low and middle income countries access to funding constitutes a challenge (Peden *et. al..*, 2004). In fact, in its *Global Status Report 2013*, the WHO noted that not all member countries funded their road traffic injury prevention strategies (WHO, 2013). This challenge has been shown in the current study to be addressed in two significant ways. Firstly, the present research program has illustrated a case of stakeholders participating in partnerships by bankrolling activities designed and delivered by other stakeholders. Secondly, one participant indicated that their salary was paid by an insurance scheme. These and other adaptive strategies (including fund raising) have enabled the study participants in the present research program to deliver road traffic injury prevention programs at a local level. In this sense, Chapter Seven has offered a range of adaptive strategies, which can help road safety coordinators cope with resource scarcity.

12.5.3 Redesigning Inter-Ministerial Frameworks

The inter-ministerial models reviewed by the present thesis (see 2.2.3) require reconceptualisation. This should see the structure of the models modified to accommodate input from a local level (Chapter Eight model). This input would not be mere advice or expertise as it is currently provided by referent and working groups. It would represent actionable, innovative output measures in the form of programs or policies (Wegman and Oppe, 2010).

Whilst the measures outlined by the WHO in relation to the functions, accountability and resourcefulness of lead agencies (see table 2.1) were national level based, the current research program has unveiled local level, implementation-based processes and a conceptual framework relevant to lead agencies and their policy development models. These implementation-based processes are expected to complement the inter-ministerial, national

level models currently in use. In this sense, the local level models should provide input into the inter-ministerial models in the form of scope (all road users), targets (across all road user behaviours, bearing in mind the inter-dependences across issues) and output measures (holistic programs, bearing in mind resource limitations and the sheer size of the issues at hand). The inter-ministerial models, in turn, will allow the examination of the feasibility of the activities, model cost-benefit for each output measure; and facilitate the provision of the support structures needed to implement the local level emergent activities (see PDI policy development model in Chapter Nine). This includes giving the local authorities and stakeholders the wider instruments (legal, economic, political and technical) for coordination (see Hull, 2008).

12.5.4 Designing National Road Safety Strategies

The current practice in Australia for the design of road safety strategies represents the release of white papers for a brief period of public consultation. These white papers are developed by government departments in consultation with working groups. In most instances, the working groups include both industry stakeholders and academics. Whilst resource-scarcity is widely acknowledged in this strategy development process (thus the use of cost-benefit analyses and modelling), neither issue inter-dependency nor issue dimensions are fully appreciated. These are often best understood from a bottom-up, grass-roots perspective.

In order to develop emergent strategies from a bottom-up, non-hierarchical perspective as suggested above, road safety managers should adopt the stages of *Participatory Deliberative Integration* (Chapter Nine). These implementation stages outline the manner in which the community can be brought into strategy development to aid the appreciation of

both the inter-dependency across issues and the sheer size of the issues, which preclude a single stakeholder from tackling them all alone.

12.5.5 Managing Road Safety Countermeasures

At present in Australia, public institutions such as NSW Centre for Road Safety (NSW, Australia), Transport Accident Commission (Victoria, Australia), VicRoads (Victoria, Australia) and Roads and Maritime Services (New South Wales, Australia) interact with local Councils (county administrators) and community road safety groups in a slightly different way. In New South Wales, the Centre for Road Safety provides funding to both local Councils (through RMS) and community groups (directly). In Victoria, TAC and VicRoads provide funding to community road safety groups (CRSGs).

This interaction between the NSW CRS and local Councils through the RMS is based upon the funding of local projects and support for State-wide campaigns. Some of the local projects include as child seat restraint checks, bike week events, workshops, industry-based forums and community-based activities. State-wide campaigns include enhanced enforcement, Plan B, an anti-drink driving campaign, and pedestrian safety awareness raising events and materials, amongst others.

The work conducted on behalf of the local Councils is the responsibility of Road Safety Officers (RSOs). These officers interact with a wide range of local stakeholders such as the Police (through, for instance, local traffic committees), road user groups (e.g. BUGs – Bicycle User Groups), liquor accords (owners of licensed premises organised in a local group), punters, shoppers, parents, driving instructors, business owners, community road safety groups, schools and other government department officials. This interaction between Road Safety Officers and local stakeholders aims to secure support for projects. These projects, in turn, are developed through an initial crash data analysis, consultation with local

stakeholders and anecdotal evidence. Some of these projects are outlined above. Others include demonstrations, seminars and media releases (not funded in New South Wales).

The community groups, on the other hand, interact with parents, schools, clubs, hotels, restaurants, bottle shops, business operators, the Police, road users and community members wishing to become road users. This interaction raises awareness of new legislation and encourages compliance with road rules. The genesis of the projects in this context (community groups) represents discussions with other members to identify relevant and current road safety issues.

Whilst all the project-generating and support activities carried out by the actors presented above are worthy of praise, there does not appear to exist an appreciation of the road traffic crash from a systems perspective (far beyond the safe systems approach; see DST and references to car dominance throughout the thesis). Instead, there seems to be a plethora of activity around a component of the system – i.e. the road user. This narrow perspective has two explanations. Firstly, the source of road safety projects is crash data analysis in Australia. This process is inherently flawed. If it is not accompanied by an ecological appreciation of the facets of the issues presented in crash data, the various nuances of the problem of road crashes are left unattended. In other words, crash data analysis is one of, at the very least, four processes required to be undertaken before the development of projects, namely: acknowledgement of a wide range of stakeholders in an emergent issue identification process, realisation of interdependence across stakeholders; selection of approaches from a pool of options based on the extent to which these have the potential of returning the best value for investment; and securing community buy-in. As shown in Chapter Six and the degree of misinformation and mistrust in the opinions in this chapter, the four processes listed above are not being undertaken in Australia. The result is the second reason for the narrowly

defined approach in Australia, which focuses on a single component of the system – i.e. the road user. This second reason represents the fact that the community has been conditioned to think of the road, the vehicle and the road user as the only components of the road transport system. This is evident in the main findings of the most recent *Survey of Community Attitudes to Road Safety*. Asked what most often led to road crashes, the Australian respondents listed speed, inattention/lack of concentration, drink driving, driver distraction/driving while on a mobile and driver fatigue (Department of Infrastructure and Regional Development, 2014). This focus on the driver may have constituted a bias of the survey itself. Out of the twenty-two options (excluding *Other* and *Don't Know*) given to the survey respondents, only five (22.7%) related to the components of the road transport system other than the driver. These response options referring to insufficient driver training, poor road design, road conditions/traffic congestion, vehicle design and too few police on road/lack of police enforcement. All other seventeen answer options related to the driver. These referred to speed, drink driving, drugs, impatience/aggressive behavior, inexperience, age (old), inattention, distraction, negligence, fatigue, disregard of road rules, ignorance of road rules, showing off, tail-gating and incompetence. None of the answer options for the reasons for road crashes related to the reduction of private car use (Whitelegg, 1983) or a need for a holistic approach, which encourages active transport options (May *et. al.*., 2008; May *et. al.*., 2011).

In this sense, the interactions reported above focus primarily on reducing the incidence of various types of crashes (car, light truck, heavy truck, motorcycle, pedal cycle etc.) and involvement of behavioural factors (i.e. alcohol, speeding, fatigue, inattention etc.) in crashes from a road user perspective. Apart from the narrowly defined target, there is no advocacy for system-wide change at a local level in Australia. In this sense, the local level constituency for safety is underdeveloped (Johnston, 2010b). This underdeveloped constituency for safety

denotes the lack of demand from the public for enhanced levels of safety across the system. This absence of demand for enhanced levels of safety across a continuum of road traffic services reinforces a reactive approach to road crashes, which identifies incidence and involvement of a single component of the system, removing it from the broader system of interrelated factors (car dominance, car culture, drinking culture, social norms, public approval, public health, economic and environment).

Nor is there any real delegation of power to the local level stakeholders, which enables them to develop their constituency for safety (Johnston, 2010b) and capacity to deliver road safety projects. In fact, the current system at a local level in Australia is not driven by self-organised groups with a strong advocacy capability or liberty. Local champions with a keen interest in local issues are not sufficiently influential in the two domains cited above (i.e. the one driven by Road Safety Officers and the other managed by community groups). A central person with an understanding of the multi-faceted nature of road traffic crashes does not moderate the interactions at a local level or develop this domain into a cohesive continuum of safety services.

The results of the existing, funding-based interactions represent incidental, too narrowly defined approaches to road traffic injury prevention which fail to reduce significantly the incidence and severity of road traffic crashes. These crashes, in regional New South Wales, tend to involve narrow, winding roads with high posted speed limits. On these roads, three crash movements occur frequently, namely: vehicles veering off the road (on straight roads and curves) and hitting objects; motorcyclists losing control on both straight roads and curves; and rear-end collisions in low posted speed zones, especially by light trucks. These regional centres also feature long stretches of roads linking urban areas, heavy truck corridors with short or no shoulders and low uptake of active transport options

such as walking and cycling. These system-wide issues which require fundamental system-wide changes are left unaddressed by the types of responses generated by the two frameworks (RMS -> RSO -> Projects and NSWCRS/VicRoads/TAC-> CRSGs -> Projects) presented above. These system-wide modifications include reducing private car usage (typical outcome of advocacy in Europe and North America), increasing active transport (typical outcome of advocacy in Europe and North America), reducing travel demand (typical of adequate land-use planning practiced in the best performing road safety nations in Europe), making roadways and roadside more forgiving of human error (the cornerstone of the Safe Systems approach) and targeting inactivity (typical outcome of advocacy and constituencies for safety in Europe and North America).

The two sets of interactions listed above contrast with the types of actions, actors and contexts required for the onset, continuation and sustainability of local level coordinated responses as outlined in this chapter. At the actors' level, there should be local champions with a keen interest in local issues (not just road safety) influencing the agenda for change. In the policy context where local governments (i.e. Road Safety Officers) interact with the communities, delegation of power should be passed on to self-organised groups with a strong advocacy capacity and who are not restricted by funding arrangements. Local champions with a good understanding of the multi-faceted nature of road traffic crashes should moderate the local level effort and build this ecology of stakeholders to control safety (which should be the chief goal of the local level effort). The responses at the local level in Australia should show evidence of the activities presented in table 8.6 above. These activities include realising interdependences across stakeholders, consulting with a wide range of stakeholders to allow the appreciation of the issues and facets of the issues to emerge, funding of community groups and other institutions (at levels commensurate with the effort needed for system-wide changes and not stifling an independent voice), selecting targeted approaches in a process

which acknowledges a wide range of stakeholders and broad issues, ensuring clarity of the job of each partner in a continuum of safety services (with complementary activities) etc. (see table 8.6). The ubiquitous approach of trend-priority or issue-priority should be replaced by a much more comprehensive engagement process of appreciation of the nuances of the road traffic crash issue. Its determinants should be revealed through wide consultation with all stakeholders before any actions are prioritised. Therefore, the new approach should not be crash-issues-priorities. Rather, it should be crashes – facets – determinants – key issues – pool of solution options – priorities (based on capability available) – long term perspective.

In this context, the role of the Road Safety Officers, local Council, NSW Centre for Road Safety, Roads and Maritime Services, TAC and VicRoads should be that of the provision of resources (e.g. comprehensive dataset on all sorts of transport options per household, measurement of rates of mobile telephone usage, seatbelt usage, ANCAP rated vehicle usage, availability of discounted protection gear for vulnerable road users, independent mobility maps, retrofitting stations for seatbelts and airbags etc.) and infrastructure (e.g. human error forgiving local roads, independent mobility-friendly land-use proposal approval, independent mobility paths, road side treatments, enhanced road way quality, safer shoulders, rumble strips, cycle ways etc.) for the delivery of safety responses. These officials and institutions could receive feedback from the local level stakeholders to improve the capacity of the domain to function as a conduit for coordinated responses.

12.5.6 Systems-Thinking

A contextual reason for establishing linkages from a system-perspective can be said to be resource-dependency. These linkages are created because one stakeholder has the resources. However, another stakeholder has a cost-effective access to the community, which will best benefit from the use of the resources. This reality was narrated in the Chapter Seven. In this study, local Councils in Australia forged partnerships with community groups to deliver road user behaviour- changing programs. In these cases, the local Council had the resources (e.g. funding) whilst the community groups had access to the target road users.

Additionally, the interviews also revealed a separate approach to systems-thinking. This was the road safety coordinators' ability to broaden their job role, a concept akin to job role space identification in Trist (1983). In this sense, there appeared to be a view that there should be an acknowledgement of a large group of stakeholders, and the ability to see beyond the immediate context and understand the government-professional stakeholder cluster system and its components (road users, roadways etc.), including the environment and the community. Coordinated responses appeared to result from a shared perception of the need to realize benefits beyond injury prevention. Accordingly, this program of research appeared to support an emphasis on road traffic injury as a public health threat rather than simply the result of risk behavior, a conceptualization, which is unlikely to mobilize effort across sectors.

Moreover, the appointment of a lead agency as one of the six WHO's recommendations to stabilise and reduce road traffic fatalities appears to have been better understood with the evidence from Chapter Eleven and the explanation in Chapter Four. This study examined the explanatory value of DST (mostly self-organising) in the context of the road safety management in Australia. The findings in this study suggested that countries like Australia,

where fatality rates have been stabilised, need to adopt innovative, emergent strategies to realise further gains in the reduction of road traffic fatalities. In this respect, the centralisation of effort may prove counter-productive. Chapter Four also supports this assertion. Centralisation restores orderliness. It is a restorative approach. It reacts to negative feedback (pressure arising out of increases in road traffic trauma). Accordingly, centralisation (self-maintaining) can deliver the first part of the WHO's request – i.e. stabilise. It may not help to accelerate the reduction of road traffic trauma as it does not build inherent safety resilience. Self-augmenting, circular causality and continuity build inherent safety resilience.

Australia should decentralise its road safety effort and adopt *Commitment to Engagement* implementation processes to encourage self-organised institutions to develop road safety strategies. In this sense, it is suggested that countries with rising road traffic fatalities adopt self-maintaining approaches (e.g. centralisation by a lead agency) whilst those with stable road traffic fatalities opt for self-augmenting strategies (i.e. decentralise through self-organising institutions) in order to further reduce or accelerate the reduction rate of road traffic fatalities.

Most significantly, Chapter Eleven provided further insight into the perceived ability for Australia to effectively manage the road safety environment outside the government-professional stakeholder cluster – i.e. community safety and road traffic crashes. This ability can be said to have been demonstrated through four variables used in Chapter Eleven, namely: *experiential learning*, *executive consciousness through advocacy*, *executive consciousness through interest groups* and *circular causality*. Accordingly, less than a quarter of the survey respondents in his study perceived these four principles to be either often or sometimes prevalent in the Australian road safety policy context. This result denoted a relatively low level of the ability for the road transport system in Australia to identify and

address coordination deficits through feedback loops. As a result, changes to the system could potentially be delayed, thus precluding gains in road traffic injury prevention from being made promptly.

12.6 STRENGTHS AND LIMITATIONS OF THE RESEARCH

The current program has a number of strengths. These strengths include the descriptive nature of the data, the use of data triangulation, explicit nature of the qualitative methods used, distributional properties of the variables, mixed methods of analysis and the employment of software for data analysis.

12.6.1 Strengths

Descriptive Data

This program of research aimed to develop two tools – a descriptive model of coordinated responses and a typology. The first of these two aims was adequately supported by the large amount of qualitative data gathered. These data represented over 10 hours of audio recordings, 16 written submissions by professional, Australian road safety stakeholders and 544 written, "public submissions" to the draft 2011-2020 Australian National Road Safety Strategy. In addition, the ordinal psychometrical measurement focus of the online, self-administered surveys helped to achieve the first aim of the program of research. In this sense, both surveys had mostly categorical variables. In this respect, the first of the two surveys comprised a total of 156 variables. Of these 131 (83.97%) were categorical and 25 (16.02%) were continuous.

Data Triangulation

The data for this research program originated from five different sources. These data represented 16 written documents (professional stakeholders), 22 semi-structured interviews,

31 online survey responses, 76 online survey responses and 544 written documents ("public submissions") from mostly unspecified road safety stakeholders. This data triangulation allowed the present program of research to gain in-depth appreciation of the personal perspectives of the target respondents.

Explicit Qualitative Method

An additional strength of the current program of research has been its use of explicit qualitative methods, along with tests of reliability. In all qualitative studies, the authors employed explicit qualitative methods such as coding schemes and codebooks. Furthermore, the use of intra-rater reliability and feedback loops afforded the qualitative studies appropriate methodological rigour. Moreover, in all qualitative studies latent coding was employed to unveil implied meaning. Latent coding is more sophisticated than open coding as it allows the researcher to investigate implied meaning.

Distributional Properties

The small sample size suited the purpose of the program of research and its numeric tools. Because the quantitative instruments (online surveys) focused on the characteristics of the sample rather than the ability to draw inferences about the broader population, the sample size had little effect on the program ability to achieve its aims. For instance, the survey about the Australian 2011-2020 NRSS, only had 1 continuous variable (2.7%) whereas the total number of categorical variables was 36 (97.2%).

Mixed Data Analysis Approaches

Chapter Seven illustrates a mixture of data analysis techniques. In this study, the approaches of *protocol analysis* (Green & Gilhooly, 1996) and *discourse analysis* or *latent coding* (Kalof et. al 2008) guided the various iterations of content analyses. Latent coding, as

opposed to open coding, seeks to unveil implied meaning (Kalof et. al 2008). Latent coding focuses on the unit of meaning and its context. It can be said to be the annotation (Kurasaki, 2000), as opposed to the transcription or segmentation (Green & Gillhooly, 1996), of textual material.

Whilst latent coding was used to identify and examine units of meaning, a synthesis technique in meta-ethnography was widely used throughout the studies to reduce the accounts. As the chief *concern* of the current thesis has been to unearth a deeper understanding (or *underlying coherence*), meta-ethnography (Noblit and Hare, 1988) served this purpose appropriately. This choice of synthesis approach resonates with other views of meta-ethnography. Campbell *et. al.*. (2003) views it as an enabler of interpretations of qualitative studies beyond their initial analyses. From Doyle's perspective, meta-ethnography offers a framework for synthesis and presents interpretive possibilities as an inquiry methodology (2003). This viewpoint enhances the meta-ethnographical methodology by replacing metaphors with key descriptors and retaining the language of the original textual units throughout analysis and synthesis (Doyle, 2003). As a result, the current thesis has been able to generate *substantive interpretations* (Noblit and Hare 1988) and achieve a higher level of *conceptual development* (Campbell *et. al..*, 2003). , it was thought that a mere aggregation of study participants' accounts would be insufficient to shed light on the complex concept of coordinated responses. It was deemed necessary to have a systematic approach to the synthesis of all accounts in addition to both thematic and content analyses. In this sense, the qualitative examinations saw a separate synthesis approach reinforce the thematic and/or content analyses.

Additionally, this program of research was driven by a rigorous review of the relevant literature into coordinated responses. This examination of the extant literature was guided and

purposeful (see critique of current approaches to coordination in road safety in Chapter Three). In this sense, there were clear, critical literature review queries (Claes, 2007). Furthermore, the purpose of the review questions guided the synthesis of the literature (Pawson *et. al.*., 2005). Moreover, the employment of aggregative synthesis where a summary of the literature was achieved through the pooling of the data (Dixon-Woods *et. al.*., 2007) was illustrated in the tabulation of the relevant studies in both the general literature review and the specific study sections. These tabulations led to the development of concepts with high explanatory values (Dixon-Woods *et. al.*., 2007).

Employment of Software Aids

The use of NVivo10 allowed the coding of the data to be systematic and meaningful. By developing nodes to examine the 544 written public submissions, this program of research minimized errors in the management of qualitative data. In addition, the use of NVivo10 allowed data visualization to be conducted more effectively, thus allowing queries to be formulated. As a result, more analytical themes and categories were drawn from the substantive qualitative data (Thomas *et. al.*., 2004).

12.6.2 Limitations

Nonetheless, the present program of research was not without some limitations. These pertained to the nature of the data, the statistical procedures permissible with the size of the sample and the sampling approaches feasible throughout the research period.

Relatively Small Sample Size

Despite a large number of e-mail invitations for the online surveys, a small group of highly experienced road traffic injury prevention professionals took part in this research

program. This relatively small group of survey takers may have limited the ability of the study findings to be viewed as representative.

Nonetheless, the validity of the findings may not have been jeopardised. The fact that there was universality in the opinions of road traffic injury prevention professionals who participated in the surveys may provide reassurance of potential representativeness of the opinions gathered in the present research program. Most importantly, the data gathered in this thesis were descriptive of the sample – i.e. Australian and some OECD participants.

Nature of the Data

The study variables were predominantly categorical (mean of both surveys = 90.63%), which limited the analysis to mostly descriptive statistics. In addition, where the variables were continuous (mean of both surveys = 9.37%), the distribution of the values could not be assumed to be normal, despite a small standard deviation (close to the mean). Furthermore, these quantitative data had missing values for some variables. These variables with missing values were not factored into the analyses, thus reducing the number of potential assessments or model iterations.

Statistical Procedures

Due to the small sample sizes in some studies, the analyses were confined mostly to the samples themselves. In this sense, descriptive statistics were used more frequently than inferential techniques throughout the program of research. This limited the generalisability of the findings. Put otherwise, caution needs to be exercised in generalising the findings of the data examined through descriptive statistics to the population (i.e. road safety actors or stakeholders, including the community beyond those represented in the studies in this research program).

To compensate for this limitation, exact tests of significance (Fisher's Exact Test) were employed whenever possible. This preference for exact (as opposed to approximate) tests allowed a great level of confidence in the results to be established.

Sampling

Although attempts were made to use probability sampling techniques, the difficulties in securing respondent participation meant that other techniques needed to be adopted. These included convenience and snowballing sampling techniques, which are inherently limited in affording every single member of the targeted population equal access to the studies. Furthermore, the fact that a large number of the study participants were Australian may have limited the generalisation of the findings to a broader context.

12.7 SUGGESTIONS FOR FUTURE RESEARCH

The chief limitation across all studies comprising this research program was the relatively small size of the samples. In addition, the present program of study was over-represented by Australian respondents. These two facts have limited the generalisability of the findings arising out of the present research program. Therefore, subsequent research into *Commitment to Engagement* may contribute to knowledge and policy development in road safety by widening the sample. This will enable the perceptions of the use and usefulness of the new concept to be measured from a wide range of perspectives.

Secondly, it is desirable to establish the extent to which the descriptions of coordinated responses as summarized in the descriptive model (Chapter Eight) have universal appeal. In this respect, it will be insightful to draw comparisons between the features of coordinated responses as outlined in this thesis and those adopted by countries outside the OECD.

Furthermore, the WHO reports continue to raise the need to engender coordinated responses in road safety whilst acknowledging disparities in terms of the adoption of coordination amongst its member countries. Therefore, investigations into the pervasiveness of silo-functioning in road safety may prove insightful. In this respect, it will be insightful to investigate the application of the typology for *Commitment to Engagement* developed in this research program to help road safety institutions shift away from isolated action.

Moreover, the adoption of the two continua for public approval developed in the current thesis should be investigated. This investigation should examine the level of public attitudes. This measurement should inform policy design in at least one significant manner. In those cases where public attitudes to road safety countermeasures are found to sit closer to the negative, active spectrum (i.e. defiance), attitude-based responses should be considered. These processes of designing attitude-focused approaches should be investigated scientifically. This investigation may allow a greater understanding of the impact of attitude-shifting strategies upon public attitudes.

12.8 Thesis Conclusion

This program of research initially identified a paucity of knowledge about the nature of coordinated road safety responses, especially at a local level. In addition, it unveiled the existence of little evidence in the extant literature of comprehensive approaches to address *isolated actions* and *a focus on individual agency performance*. Subsequently, it critiqued *PI* for failing to account for the broader societal context and provide detailed information about its processes.

Guided by four research objectives, this research program generated six tools for enhanced use of coordinated road safety responses – i.e. a descriptive model of a coordinated road safety response, two continua of public attitudes, a typology for ten categories of public attitudes towards road safety countermeasures; a model for the design of national road safety strategies; and a typology of optimal coordination.

Partnerships at a local level in Australia may be formed by anyone of the six contingencies described by Oliver (1990). In most instances, local Councils enter into funding arrangements with public agencies out of these contingencies, with *necessity, stability* and *efficiency* as the main partnership drivers. Often, these partnerships hinge on retribution with funding being conditioned on the fulfilment of obligations set out in binding agreements. The power in this case is legitimate (Lyngstad, 2015). The funding institution has legitimate power over the funding recipient. This relationship is no different to the one which currently exists between a funding institution (e.g. NSW Centre for Road Safety, VicRoads, TAC etc.) and community road safety groups. Rarely is the power in these partnerships referent or expert (Lyngstad, 2015). This power differential can be addressed by the new model of road safety coordinated responses (see Chapter Eight).

Of the three ways to integrate effort (i.e. 1. hierarchy, administrative or control systems and voluntary activities; 2. information sharing, coordination and control; and 3. commitment to engagement) the coordinated response suggested in fig. 8.3 is more amenable to the latter (i.e. commitment to engagement). It is worth noting that local level coordination tends not to have hierarchies or oversight. It is relationship intensive. Its management should aim to build an ecology of influential stakeholders keenly interested in maintaining the entire transport system intrinsically and intuitively safe and aligned with other social development needs.

The deployment of the descriptive model, the typologies (public attitudes and optimal *Commitment to Engagement*), the NRSS development model in *Participatory Deliberative*

Integration and the two continua of public attitudes should herald a system design in road safety management in Australia and some OECD countries. This system redesign in road safety management in Australia and some OECD countries should see communities brought in much earlier in policy development; communities seen as government partners rather than policy recipients; enhanced levels of empowerment and delegation; a widening of the acknowledgement of stakeholders and the focus on all road users; local plans feeding into national road safety strategies and inter-ministerial frameworks; political commitment being expressed through funding for coordination and *Commitment to Engagement* as represented by *indiscriminate stakeholder engagement* and a *transparent communication strategy*; and emergent, innovative strategies prevailing over planned, centralised policies.

Future research would expand on the current evidence and tools. This expansion should see the tools (i.e. the continua of public attitudes, the descriptive model, the NRSS development model and the typologies) herein developed trialed on a large scale to help adjust and/or calibrate them to relevant policy contexts. In addition, the evidence unveiled in this program of research should feed into large scale studies to help validate it externally. In this respect, it will be insightful to establish the extent to which the description of coordinated responses in Australia and some OECD countries compares to other countries. Accordingly, it will be professionally helpful to understand the gap (if any) across the income divide in terms of the extent to which *Commitment to Engagement*, as described herein, applies.

Bibliography

Aitken, M. E., Miller, B. K., Anderson, B. L., Swearingen, C. J., Monroe, K. W., Daniels, D., O•Neil, J., "Tres" Scherer, L.R., Hafner, J. and Mullins, S. H. (2013), Promoting Use of Booster Seats in Rural Areas Through Community Sports Programs. The Journal of Rural Health, 29: s70–s78. doi:10.1111/jrh.12000

Agranoff, R. & McGuire, M. (2001). Big questions in public network management. *Journal of Public Administration Research and Theory, 11*, 295-327.

Alexander, D. (2008). Emergency command systems and major earthquake disasters. *Journal of Seismology and Earthquake Engineering, 10*(3), 137.

Andersson, F. O., & Ford, M. R. (2016). Social entrepreneurship through an organizational ecology lens: Examining the emergence and evolution of the voucher school population in milwaukee. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations, 27*(4), 1760-1780. doi:10.1007/s11266-015-9576-0

Armstrong, K.A., Freeman, J. E., Barraclough, P., & Davey, J. (2013). Are more city dwellers caught drink driving than country folk? An analysis by random breath testing apprehension rates. In Proceedings of the 20th International Conference on Alcohol, Drugs and Traffic Safety, Brisbane Convention & Exhibition Centre, Brisbane, Queensland, Australia, pp. 56-61.

Assailly, J.P. (2004). The prevention of young driver's DWI (driving while intoxicated) and RWDI (riding with a driver under influence) in Europe: A social-sequential model. *Traffic Injury Prevention*, 5:237–240.

Australian Bureau of Statistics (2010). Year Book Australia, 2009-10. ABS, Australia.

Australian Bureau of Statistics (2015a). Causes of Death, Australia, 2013. [Available online from: http://www.abs.gov.au]

Australian Bureau of Statistics (2015b). 1370.0 - Measures of Australia's Progress, 2010. [available online from: http://www.abs.gov.au]

Australian Department of Infrastructure and Regional Development (2015). Road Safety [available from: https://infrastructure.gov.au/roads/safety/index.aspx]

Australian Department of Infrastructure and Transport (2011). Consultation on the Draft National Road Safety Strategy 2011-2020 [available from: http://www.infrastructure.gov.au/roads/safety/national_road_safety_strategy/stakeholder_submissions.aspx]

Australian Transport Council (2010). National Road Safety Action Plan – 2009 and 2010. ATC, Canberra [available from: http://www.atcouncil.gov.au/documents/pubs/ATC_actionplan0910.pdf]

Australian Transport Council (2011). National Road Safety Strategy 2011-2020. Available from: http://www.atcouncil.gov.au/documents/files/NRSS_2011_2020_20May11.pdf

Austroads (2002). Guidelines for Community Input in Setting Level of Service and Intervention Standards for Road Networks. Austroads Inc., Sydney.

Austroads (2006a). Guide to Road Safety Part 2: Road Safety Strategy and Evaluation. Austroads Inc, Sydney.

Austroads (2006b). Literature Review of Community Consultation Techniques Used by Road Agencies. Austroads Inc, Sydney.

Avant, K. C. (2006). *Concept Analysis* (2nd. ed). New York: Springer Publishing Company.

Bacharach, S.B. & Lawler, E.J. (1980). *Power and Politics in Organizations* (1st ed). Jossey-Bass Social and Behavioral Science Series.

Banister, D., 2008. The sustainable mobility paradigm. *Transport Policy, 15*(2), 73–80.

Barua, A. (2007). Enabling information sharing within organizations. *Information Technology and Management, 8*(1), 31.

Basso, L.J. (2012). Integrating congestion pricing, transit subsidies and mode choice. *Transportation Research. Part A, Policy and Practice*, *46*(6), 890.

Bax, C., De Jong, M. & Koppenjan, J. (2010). Implementing evidence-based policy in a network setting: Road safety policy in the Netherlands. *Public Administration, 88*(3), 871-884.

Beirness, D. & Marques, P. (2004). Alcohol ignition interlock programs. *Traffic Injury Prevention, 5*(3), 299-308.

Bennett, J., Stevens, G., Walker, A., Williams, H., Winter, A. & Hamilton-Deeley, V. (2006). A coordinated response to the high drug death rate in Brighton & Hove. *Probation Journal*, *53*(3), 265 – 277.

Bergquist, W., Betwee, J. & Meuel, D. (1995). *Building Strategic Relationships: How to Extend your Organization's Reach through Partnerships, Alliances and Joint Ventures*. Jossey-Bass, San Francisco, USA.

Bernhardt, B.M. (2010). Clinical implications of DST for phonological development. *American Journal of Speech-Language Pathology*, *19*(1), 34.

Biau, C., Dahou, K. & Homma, T. (2008). How to increase sound private investment in Africa's road infrastructure: building on country successes and OECD policy tools. NEPAD-OECD Africa Investment Initiative, Experts Roundtable (December 2008)

Binder, M. (2010). Using grounded theory method for theory building in operations management research. *International Journal of Operations & Production Management*, *30*(3), 232.

Blair, E. & Burton, S. (1987). Cognitive processes used by survey respondents to answer behavioral frequency questions. *The Journal of Consumer Research, 14*(2), 280-288.

Bliss, T. (2011). Meeting the management challenges of the Decade of Action for Road Safety. *IATSS Research* , *35*(2), 48.

Bliss, T. & Breen, J. (2009). Country guidelines for the conduct of road safety management capacity reviews and the specification of lead agency reforms, investment strategies, and safe system projects. Washington DC ; World Bank [available from: http://documents.worldbank.org/curated/en/2009/06/18398791]

Boin, A., Busuioc, M. & Groenleer, M. (2014). Building European Union capacity to manage transboundary crises : Network or lead-agency model? *Regulation and Governance, 8*(4), 418-436.

Bowers, D.N. (2011). Road safety: what needs to be done to further reduce Australia's national road trauma toll. *Transport Engineering in Australia*, *13*(1), 67.

Brady, A. (2006). Opportunity sampling, in Jupp, V. (ed.) *The SAGE Dictionary of Social Research Methods*. SAGE, California, 206-207

Breen, J. (2004). Road safety advocacy. *The BMJ*, *328*(7444), 888–890.

Bridgman, P. & Davis, G. (2000). *The Australian Policy Handbook* (2nd ed.). St Leonards, N.S.W: Allen & Unwin.

Brown, A.D. (2009). Measuring integration of cancer services to support performance improvement: The CSI survey. *Healthcare Policy*, *5*(1), 35.

Browne, G. (2008). Inter-professional partnerships in chronic illness care: a conceptual model for measuring partnership effectiveness. *International Journal of Integrated Care*, *8*(2).

Buchanan, D.A. & Huczynski, A. (1997), *Organizational Behaviour: An Introductory Text* (3rd ed). Prentice Hall, London.

Burke, W.W. (2014). Changing loosely coupled systems. *The Journal of Applied Behavioral Science, 50*(4), 423-444.

Burton, R.M. (2006). *Organization Design: The Evolving State-Of-The-Art.*

Cameron, D. & Simeon, R. (2002). Intergovernmental relations in Canada: The emergence of collaborative federalism. *Publius, 32*(2), 49-71.

Cameron, K. (2006). Relationships, layoffs, and organizational resilience, *The Journal of Applied Behavioral Science*, *42*(3), 300.

Camkin, H. (2010). It's crunch-time for a new National Road Safety Strategy. *Journal of the Australasian College of Road Safety, 21*(1), 20-25.

Campbell, R., Pound, P., Pope, C., Britten, N., Pill, R., Morgan, M. & Donovan, J. (2003). Evaluating meta-ethnography*:* a synthesis of qualitative research on lay experiences of diabetes and diabetes care . *Social Science & Medicine, 56*(4), 671.

Canoquena, J. & King, M. (2015). Adaptive nature of coordinated road traffic injury prevention responses in some OECD countries. *Journal of Transport Geography*, *46*, 81-88.

Canoquena, J.M.C. & King, M. (in Press). Developing public attitude monitoring tools in road traffic injury prevention to understand shifts towards moral commitment. *Journal of Health Services Research & Policy.*

Canoquena, J.M.C. (2013). Reconceptualising Policy Integration in road safety management, *Transport Policy, 25,* 51-80.

Cassar, E. (2003). A descriptive model of the homicide process. *Behaviour Change*, *20*(2), 76.

Carruthers, Ashley. The Politics of Cycling and Cycling Advocacy [online].Journal of the Australasian College of Road Safety, Vol. 21, No. 3, Aug 2010: 23-25. Availability:<http://search.informit.com.au.ezp01.library.qut.edu.au/documentSummary;dn=344673683948204;res=IELENG>ISSN: 1832-9497. [cited 02 Mar 17].

Christie, J.F. (2011). Mindbrain and play-literacy connections. *Journal of Early Childhood Literacy*, *11*(1), 73.

Claes, L. (2007). Learn to read and write systematic reviews: the Belgian Campbell Group. *Research on Social Work Practice*, *17*(6), 748.

Claiborne, N. (2006). Efficiency of a care coordination model: a randomized study with stroke patients, *Research on Social Work Practice*, *16*(1), 57- 66.

Cobbold, I. (2004). Third-generation balanced scorecard: evolution of an effective strategic control tool. *International Journal of Productivity and Performance Management*, *53*(7), 611.

Collins, L. (2004). Project PASCALEA – public and stakeholder consultation in developing high-profile corporate environmental strategy. *Corporate Social-Responsibility and Environmental Management*, *11*(2), 95.

Connor, B. (2005). Bicycle safety: reflection. *The Journal of Australasian College of Road Safety*, *16*(1), 11-14.

Corben, B. F., Logan, D. B., Fanciulli, L., Farley, R., & Cameron, I. (2010). Strengthening road safety strategy development 'Towards zero' 2008–2020 – Western Australia's experience. *Safety Science*, 48(9), 1085-1097.

Cross, D. (2000). Child pedestrian injury prevention project: student results. *Preventive Medicine*, *30*(3), 179.

Crowther, D. & Green, M. (2004). *Organizational Theory*. Chartered Institute of Personnel and Development, CIPD House, London

Croyle, R.T. (2008). Measuring collaboration and transdisciplinary integration in team science. *American Journal of Preventive Medicine*, *35*(2), S151.

Cummings, L.L. (Ed.), (1982). *Research in Organizational Behaviour*. JAI Press, Greenwich, CT.

Dami, F., Fuchs, V., Péclard, E., Potin, M., Vallotton, L. *et. al.*. (2009). Coordination of emergency medical services for a major road traffic accident on a Swiss suburban highway. *European Journal of Trauma and Emergency Surgery*, *35*(3), 265-270.

Dann, S., & Fry, M. (2009). Benchmarking road safety success: Issues to consider. *Australasian Marketing Journal*, *17*(4), 226-231.

Dawson, S. (1996). *Analysing Organizations*. 3rd ed. Macmillan Business, London, UK.

Dougherty, D., & Dunne, D. D. (2011). Organizing ecologies of complex innovation. *Organization Science*, *22*(5), 1214-1223. doi:10.1287/orsc.1100.0605

De Bot, K. (2007). A DST approach to second language acquisition. *Bilingualism*, 10 (1), 7.

De Cerreno, A.L.C. (2009). Integrated Transportation and Land Use Planning: Facilitating Coordination Across and Among Jurisdictions. Rudin Centre for Transportation Policy and Management, NY

Deller, J. (2010). Road safety community partnership in Queensland, Australia. Proceedings of the Institution of Civil Engineers, *Municipal Engineer, 163*(4), 225–232.

Department of Infrastructure and Regional Development (2014). Community Attitudes to Road Safety, 2013 Survey Report. Commonwealth of Australia.

Department of Transport and Regional Services (2005). Community attitudes to road safety: Community attitudes survey wave 18.

Dieter, F. (2011). Road safety 2.0: A case of transforming government's approach to road safety by engaging citizens through web 2.0. *Journal of Cases on Information Technology, 13*(3), 21-38.

Dixon-Woods, M., Booth, A. & Sutton, A.J. (2007). Synthesizing qualitative research: a review of published reports. *Qualitative Research, 7*(3), 375-422.

Doyle, L. H. (2003). Synthesis through meta-ethnography: Paradoxes, enhancements, and possibilities. *Qualitative Research, 3*(3), 321-344.

Douglas, M. J., Watkins, S. J., Gorman, D. R., & Higgins, M. (2011). Are cars the new tobacco? *Journal of Public Health, 33*(2), 160-169.

Elsig, K. (2004). A partnership approach to improving the global road safety crisis. *Development, 47*(3), 114-121.

Enders, A. & Seekins, T. (2011). Section 5310 Transportation State Management Plans: A baseline review. *Journal of Public Transportation, 14*(2).

Essner, U. (2008). A DST model of multilingualism and the role of metalinguistic awareness. *The Modern Language Journal, 92*(2), 270.

Estabrooks, C.A., Field, P.A. & Morse, J.M. (1994). Aggregating qualitative findings: An approach to theory development. *Qualitative Health Research, 4*, 503–511.

Etgar, M. (2008). A descriptive model of the consumer co-production process. *Journal of the Academy of Marketing Science, 36*(1), 97-108.

Fabrigar, L. R., & Wegener, D. T. (2012). *Exploratory Factor Analysis*. Oxford University Press, Oxford.

Fawcett, J. (1994). *Analysis and Evaluation of Conceptual Models of Nursing*. F.A.Davis, Philadelphia, PA.

Ferris, J., Mazerolle, L., King, M., Bates, L., Bennett, S. & Devaney, M. (2013). Random breath testing in Queensland and Western Australia: Examination of how the random breath testing rate influences alcohol related traffic crash rates. *Accident Analysis and Prevention, 60,* 181-8.

Finch, C.F. (2006). Governmental health agencies need to assume leadership in injury prevention. *Injury Prevention, 12*(1), 2.

Fink, R. (2008). Descriptive models of customer-supplier relationships in the electronics manufacturing industry. *Journal of Relationship Marketing, 7*(2), 177-196.

Freeman, J. & Rossi, J. (2012). Agency coordination in shared regulatory space. (III. Assessing Agency Coordination Instruments to Conclusion, p. 1180-1211), *Harvard Law Review, 125*(5), 1181.

Freeman, J., & Watson, B. (2007). Perceptions and experiences of random breath testing in Queensland and the self-reported deterrent impact on drunk driving. *Traffic Injury Prevention, 8*(1), 11-9.

Freeman, J., Armstrong, K., & Barraclough, P. (2013). Catching drink drivers in Queensland through random breath testing: What does the last decade of data tell us. Paper presented at 20th International Council on Alcohol, Drugs and Traffic Safety Conference, 25-28 August 2013, Brisbane Convention & Exhibition Centre, Brisbane, QLD.

Frost, C.J., Phillips, M.E., Tollefson, D. & Werstak, J. (2006). What we know about offenders who drive under the influence: Analysis of court case file reviews, *Accident Analysis and Prevention, 38,* 84–91.

Gargett, S., Connelly, L.B. & Nghiem, S. (2011). Are we there yet? Australian road safety targets and road traffic crash fatalities. *BMC Public Health, 11,*270.

Gillies, R.R., Shortell, S.M., Anderson, D.A., Mitchell, J.B. & Morgan, K.L. (1993). Conceptualizing and measuring integration: findings from the health systems integration study. *Hospital & Health Services Administration, 38* (4), 467.

Glouberman, S. (2001). Managing the care of health and the cure of disease - Part II: integration. *Health care management review, 26* (1), 70.

Gong, Y. (2008). Vicarious learning and inferential accuracy in adoption processes. The *Academy of Management Review, 33* (4), 846.

Googins B.K. & Rochlin, S.A. (2000). Creating the partnership society: understanding the rhetoric and reality of cross-sector partnerships. *Business and Society Review. 105*(1), 127–144.

Goold, M. (1991). Creating a strategic control-system. *Long Range Planning, 24*(3), 32.

Graham, P. (2013). Evaluating a package of interventions to improve young driver safety. *Journal of the Australasian College of Road Safety, 24*(4), 46-53.

Grant, B., Dollery, B., & Kortt, M. (2012). Local government and regional governance in Australia: History, theory and policy. *Public Policy, 7*(1), 1-6.

Gray, B. (2002). Mobilizing for pedestrian safety: an experiment in community action. *Injury Prevention, 8*(4), 264.

Green, C. and Gilhooly, K. (1996). Protocol Analysis: Practical Implementation. In Richardson, J.T.E. (ed.) *Handbook of Qualitative Research Methods for Psychology and the Social Sciences*. BPS Blackwell, NY.

Guest, G. & MacQueen, K.M. (2007). *Handbook for Team-Based Qualitative Research*. Retrieved from http://www.eblib.comd Qualitative Analysis.

Hallström, I. (2002). Observed parental needs during their child's hospitalization. *Journal of Pediatric Nursing*, *17*(2), 140.

Hastings, G., Stead, M., & Webb, J. (2004). Fear appeals in social marketing: Strategic and ethical reasons for concern, *Psychology & Marketing, 21*(11), 961-986.

Hazen, A. & Ehiri, J. E. (2006). Road traffic injuries: hidden epidemic in less developed countries. *Journal of the National Medical Association, 98*(1), 73-82.

Henneman, E. A., Lee, J. L. & Cohen, J. I. (1995). Collaboration: A concept analysis. *Journal of Advanced Nursing*,*21*(1), 103-109.

Herdegen, M. (2008). Legal challenges for Transatlantic economic integration. *Common Market Law Review, 45*, 1581-1609.

Horan, T. A. (2011). The dynamics of information collaboration: a case study of blended IT value propositions for health information exchange in disability determination. *Journal of the Association for Information Systems*, *12*(2), 189.

Horwath, J. (2007). Collaboration, integration and change in children's services: Critical issues and key ingredients. *Child Abuse & Neglect*, *31*(1), 55.

Hossain, L. (2009). Communications network centrality correlates to organisational coordination. *International Journal of Project Management*, *27*(8), 795.

House of Commons Transport Committee (2008). Ending the Scandal of Complacency: Road Safety Beyond 2010. UK Parliament House of Commons, London

House of Representative Standing Committee on Transport Safety (1986). Passenger Coach Safety. Australian Government Publishing Service, Canberra

Howard, E. & Breen, J. (2006). Country Report – Republic of Armenia: Review of Road Safety Management Capacity and Proposals for a Short to Long-Term Investment Strategy. World Bank.

Howat, P., Cross, D., Hall, M., Iredell, H., Stevenson, M., Gibbs, S., . . . Dillon, J. (2001). Community participation in road safety: Barriers and enablers. *Journal of Community Health, 26*(4), 257-270.

Huberty, C.J., , Olejnik, S. & Huberty, C.J. (2006). *Applied MANOVA and Discriminant Analysis*, 2nd edn, Wiley-Interscience, Hoboken, N.J.

Hughes, B. P., Anund, A. & Falkmer, T. (2015). System theory and safety models in Swedish, UK, Dutch and Australian road safety strategies. *Accident; Analysis and Prevention, 74*, 271-278.

Hughes, B. P., Newstead, S., Anund, A., Shu, C. C. & Falkmer, T. (2015). A review of models relevant to road safety. *Accident Analysis and Prevention, 74*, 250-270.

Hull, A. (2008). Policy integration: what will it take to achieve more sustainable transport solutions in cities? *Transport Policy,15*(2), 94-103.

Hull, A. (2005). Integrated transport planning in the UK: from concept to reality. *Journal of Transport Geography, 13*, 318-328

Human, B.A. (2010). Stakeholder consultation during the planning phase of scientific programs. *Marine Policy*, *34*(3), 645.

Hut, J. & Molleman, E. (1998). Empowerment and team development. *Team Performance Management*, *4*(2), 53.

Hyder, A.A., Allen, K.A., Di Pietro, G., Adriazola, C.A., Sobel, R., Larson, K. & Peden, M. (2012). Addressing the implementation gap in global road safety: exploring features of an effective response and introducing a 10-country program. *American Journal of Public Health*, *102*(6).

Iarossi, G. (2006). The Power of Survey Design: A User's Guide for Managing Surveys, Interpreting Results and Influencing Respondents. The World Bank, Washington, D.C.

Jiang, H., Livingston, M., & Room, R. (2015). Alcohol consumption and fatal injuries in Australia before and after major traffic safety initiatives: A time series analysis. *Alcoholism: Clinical and Experimental Research, 39*(1), 175-183.

Jiggins, S. (2011). How important is community support to the success of the national road safety strategy? *Journal of the Australasian College of Road Safety, 22*(4), 90-94.

Job, R., & Cook, R. (2012). The advantages of the National Road Safety Council as an independent national body promoting road safety in Australia. *Journal of the Australasian College of Road Safety, 23*(4), 55-61.

Johnston, B. D. (2010a). Road traffic injury prevention. *Injury Prevention 16*(1), 1-1.

Johnston., I.R. (2010b) Beyond ''best practice" road safety thinking and systems management – A case for culture change research. *Safety Science 48*, 1175–1181

Julibert, S. (2008). Employee attitudes to information sharing: a case study at the European Central Bank. *Records Management Journal, 18*(3), 194.

Kalof, L., Dan, A. & Dietz, T. (2008). *Essentials of Social Research*. Open University Press, Bershire, England

Kay, A. (2006). *The Dynamics of Public Policy : Theory and Evidence*. Edward Elgar Publishing Limited, Cheltenham.

Kayes, A.B., Kayes, D.C. & Kolb. D.A. (2005). Experiential learning in teams. *Simulation & Gaming, 36*(3), 330.

Keast, R., Brown, K. & Mandell, M. (2007). Getting the right mix: unpacking integration meanings and strategies. *International Public Management Journal, 10*(1), 9-25.

Kellinghusen, G. & Wubbenhorst, K. (1990). Strategic control for improved performanc. *Long Range Planning 23*(3), 30–40.

Kickert, W. (2007). *The Study of Public Management in Europe and the US: A Competitive Analysis of National Distinctiveness*. Routledge Studies in Public Management.

King Keenan, Elizabeth (2011). From bumps in the road to the edge of chaos: The nature of change in adults. *Journal of Social Work, 11*(3), 306.

Klecka, W.R. (1980). *Discriminant Analysis.* SAGE Publications Inc, Beverly Hills.

Knapp, R. (2010). Collective (team) learning process models: a conceptual review. *Human Resource Development Review*, *9*(3), 285.

Krosnick, J.A. & Fabrigar, L.R. (1997). Designing rating scales for effective measurement in surveys. In Lyberg *et. al.* (ed.) *Survey Measurement and Process Quality*. Wiley – Interscience, New York, 141-164.

Krug, E. (2012). Decade of Action for Road Safety 2011-2020. *Injury*, *43*(1), 6.

Küppers, G. (1999). Coping with uncertainty: New forms of knowledge production. *AI & Society*, *13*(1), 52.

Kurasaki, K. S. (2000). Intercoder reliability for validating conclusions drawn from open-ended interview data. *Field Methods, 12*(3), 179-194.

Lægreid, P. (2008). The challenge of coordination in central government organizations: the Norwegian case. *Public Organization Review*, *8*(2), 97.

Lafferty, W.M. (2003). Environmental policy integration: Towards an analytical framework. *Environmental Politics, 12*(3), 1.

Lagreid, P. & Rykkja, L. H. (2015). Organizing for "wicked problems" - analyzing coordination arrangements in two policy areas: Internal security and the welfare administration. *The International Journal of Public Sector Management*, *28*(6), 475.

Laihonen, H. (2006). Knowledge flows in self-organizing processes. *Journal of Knowledge Management*, *10*(4), 127.

Lake, G. (2010). Local government and road safety. *Journal of the Australasian College of Road Safety*, *21*(2), 17-19.

Lawrence, P. and Lorsch, J. (1968). *Organisation and Environment: Managing Differentiation and Integration*. Irwin, USA.

Lawrence, P.R & Lorsch, J.W. (1967). Differentiation and integration in complex organizations. .*Administrative Science Quarterly*, *12*(1), 1.

Leutz, W.N. (1999). Five laws for integrating medical and social services: lessons from the United States and the United Kingdom. *The Milbank Quarterly, 77*(1):77–110.

Leveson, N.G. (2009). Engineering a Safer World: System Safety for the 21st Century (or System Thinking Applied to Safety). Aeronautics and Astronautics and Engineering Systems Division, Massachusetts Institute of Techonology, USA.

Lewis, M.D. (2005). Bridging emotion theory and neurobiology through dynamic systems modelling. *The Behavioral and Brain Sciences*, *28*(2), 169.

Litterer, J.A. (1965). *The Analysis of Organizations*. John Wiley & Sons, New York

Luthans, F.; Welsh, D. H.B. & Taylor, L.A. (1988). A descriptive model of managerial effectiveness. *Group & Organization Management, 13*(2), 148.

Lyons, R. A., Kendrick, D., Towner, E. M. L., Coupland, C., Hayes, M., Christie, N., . . .

Macey, S. (2013). The advocacy for pedestrian safety study: Cluster randomised trial evaluating a political advocacy approach to reduce pedestrian injuries in deprived communities. *PLoS One*, *8*(4) doi:http://dx.doi.org.ezp01.library.qut.edu.au/10.1371/journal.pone.0060158

Lyngstad, I. (2015): Legitimate, expert and referent power in physical education, Sport, Education and Society, DOI: 10.1080/13573322.2015.1116442

Ma, S., Hyder, A., & Bishai, D. (2010). The political culture of road traffic crash control. *InjuryPrevention, 16*doi:http://dx.doi.org.ezp01.library.qut.edu.au/10.1136/ip.2010.029215.629

Macpherson, C.C. (2006). Healthcare development requires stakeholder consultation: palliative care in the Caribbean. *Cambridge Quarterly Journal of Healthcare Ethics*, *15*(3), 248.

Maddison, S. & Denniss, R. (2009). *An Introduction to Australian Public Policy: Theory and Practice*. Cambridge University Press, GB.

May, A.D., Jopson, A.F. & Matthews, B. (2003). Research challenges in urban transport policy. *Transport Policy,10*(3), 157-164

May, M., Tranter, P. J., & Warn, J. R. (2011). Progressing road safety through deep change and transformational leadership. *Journal of Transport Geography, 19*(6), 1423-1430.

May, M., Tranter, P.J. & Warn, J.R. (2008). Towards a holistic framework for road safety in Australia. *Journal of Transport Geography,16*(6), 395-405.

McAndrews, C. (2013). Road safety as a shared responsibility and a public problem in Swedish road safety policy. *Science, Technology, & Human Values, 38*(6), 749-772.

McIntosh, L. (2013). Road safety management in Australia: A call for more coordinated action. *Journal of the Australasian College of Road Safety, 24*(1), 63-71.

Mead, E., Baird, J., & Stark, C. (2014). Developing a lead agency model for the delivery of integrated health and social care. *International Journal of Integrated Care*, *14*(6).

Mickwitz, P. (2007). Evaluating policy integration. *Evaluation*, *13*(1), 68.

Middlewood, D. & Abbott, I. (2012). *Achieving Success with your Leadership Project*. Sage, UK

Miller, C. & McNicholl, A. (2003). Integrating children's services. Issues and practice. London: Office of Public Management.

Mintzberg, H. and Waters, J.A. (1985) Of strategies, deliberate and emergent. *Strategic Management Journal*, *6*, 257-272.

Mulder, J.A.G. & Wegman, F.C.M. (2001). A trail to a safer country. *ITE Journal*, *71*(2), 32.

Murdoch, S. (2012). A descriptive model of female violent offenders. *Psychiatry, Psychology, and Law*, *19* (3), 412.

Nævestad, T., & Bjørnskau, T. (2012). How can the safety culture perspective be applied to road traffic? *Transport Reviews, 32*(2), 139-154. doi:10.1080/01441647.2011.628131

Nordfjaern, T., Simsekoglu, O., Zavareh, M., Hezaveh, A., Mamdoohi, A., & Rundmo, T. (2014). Road traffic culture and personality traits related to traffic safety in turkish and iranian samples. *Safety Science, 66,* 36-46. doi:10.1016/j.ssci.2014.02.004

Nilsson, M. & Eckerberg, K. (2009). Environmental PolicyIntegration in practice: shaping institutions for learning. Earthscan, Sweden.

Nilsson, M. (2003). Framework for analysing environmental policy integration. *Journal of Environmental Policy & Planning* , *5*(4), 333.

Noblit, G.W. & Hare, R.D. (1988). *Meta-Ethnography: Synthesizing Qualitative Studies*. Sage University Paper series on Qualitative Research Methods, 11, California, Sage Publications

Nower, L. (2006). Impulsivity and pathological gambling: a descriptive model. *International Gambling Studies*, *6*(1), 61.

Odero, W., Khayesi, M. & Heda, P.M. (2003). Road traffic injuries in Kenya: Magnitude, causes and status of intervention. *Injury Control and Safety Promotion*, *10*(1-2), 53.

OECD, & ITF. (2013). Road safety annual report 2013 OECD Publishing.

Oliver, C. (1990). Determinants of interorganizational relationships: integration and future directions, *Academy of Management Review*, *15*(2), 241-265.

Ong, B.K. (2011). Grounded Theory Method (GTM) and the Abductive Research Strategy (ARS): A critical analysis of their differences. *International Journal of Social Research Methodology* , 1.

Organisation for Economic Cooperation and Development (2006). Country Report on Road Safety Performance. Joint OECD/ECMT Transport Research Centre, Geneva

Owen, S. (1995). The limits of co-ordination as a strategy, *International Journal of Educational Management*, *9*(3), 19.

Oxford English Dictionary (2015) www.oed.com

Page, S. (2004). Measuring accountability for results in inter-agency collaborative. *Public Administration Review*,*64*(5), 591-606.

Pahl-Wostl, C. (2005). Information, public empowerment, and the management of urban watersheds. *Environmental Modelling & Software: with Environment Data News*, *20*(4), p.457.

Papadimitriou, E., & Yannis, G. (2013). Is road safety management linked to road safety performance? *Accident Analysis and Prevention, 59*, 593-603.

Pawson, R., Greenhalph, T., Harvey, G. & Walshe, K. (2005). Realist review - a new method of systematic review designed for complex policy intervention. *Journal of Health Services Research & Policy, 10*, S21.

Peden, M. (2005). Global collaboration on road traffic injury prevention. *International Journal of Injury Control and Safety Promotion*, *12*(2), 85.

Peden, M., Scurfield, R., Sleet, D., Mohan, D., Hyder, A.A., Jarawan, E. & Mathers C. (Eds.) (2004). The World Report on Road Traffic Injury Prevention. (Geneva, World Health Organization).

Perlman, S.B. & Weatherley, R.A. (1986). Limits of the comprehensive services model: the case of adolescent pregnancy programs. *JPAM*, *5*(2), 326-339.

Philbin, S. (2008). Measuring the performance of research collaborations. *Measuring Business Excellence*, *12*(3), 16.

Pidgeon, N. & Henwood, K. (1996). Grounded theory: practical implementation. In Richardson, J.T.E. (ed.). *Handbook of Qualitative Research Methods for Psychology and the Social Sciences*. BPS Blackwell, NY.

Pink, G. (2006). Does systems integration affect continuity of mental health care? *Administration and Policy in Mental Health*, *33*(6), 705.

Powers, B. A., 1943, Knapp, T. R. & Ebrary, I. (2011). *Dictionary of Nursing Theory and Research* (4th ed.). Springer Pub Co., New York.

Radin Umar, R.S. (2009). Engaging policy makers in road safety research in Malaysia: A theoretical and contextual analysis. *Health Policy, 90*(1), 58.

Raftery, S., Kloeden, C., & Royals, J. (2014). Safer speeds: An evaluation of public

education materials. *Journal of the Australasian College of Road Safety*, *25*(1), 47-53.

Ratick, S.J. (2007). Trust, transactions, and information technologies in the U.S. logistics industry. *Economic Geography*, *83*(2), 159.

Rayner, J. & Howlett, M. (2009). Introduction: understanding integrated policy strategies and their evolution. *Policy and Society*, *28*(2), 99-109.

Richardson, S. (2006). Inter-agency information sharing in health and social care services: the role of professional culture, *The British Journal of Social Work*, *36*(4), 657.

Risjord, M., 2009. Rethinking concept analysis. *Journal of Advanced Nursing 65*(3), 684.

Rivasplata, C. (2012). Transit coordination in the U.S.: a survey of current practice. *Journal of Public Transportation*, *15*(1).

Rasmussen, J., 1997. Risk management in a dynamic society: a modelling problem. Saf. Sci. 27 (2/3), 183–213.

Salmon, P. M. & Lenné, M. G. (2015). Miles away or just around the corner? systems thinking in road safety research and practice. *Accident Analysis and Prevention, 74*, 243-249.

SCOTI (2012). Communique. Available from: http://www.transportinfrastructurecouncil.gov.au/communique/files/SCOTI_3rd_Communique_9_November_2012.pdf

Scott, J. L. (2005). An investigation of barriers to knowledge transfer, *Journal of Knowledge Management*, *9*(2), 75.

Scott-Parker, B., Goode, N. & Salmon, P. (2015). The driver, the road, the rules ... and the rest? A systems-based approach to young driver road safety. *Accident Analysis and Prevention*, *74*, 297-305.

Scott-Parker, B., Goode, N., Salmon, P. M., & Senserrick, T. (2016). Knowing me knowing you: Key players and their interactions within the young driver road safety system. *Safety Science, 88,* 88-96. doi:10.1016/j.ssci.2016.04.022

Short, Megan M. *et. al.*. "Interventions for motor vehicle crashes among indigenous communities: strategies to inform Canadian initiatives." Canadian Journal of Public Health, vol. 195, no. 4, 2014, p. e296+, Health Reference Center Academic

Shuey, R. (2004). The Safety Camera Partnership in Victoria – Key Success Factors to Achieve Road Trauma Reduction for Speed Related Collisions. *Year Book of the Australasian College of Road Safety.*

Slaght, E. and Hamilton, N. (2005). A coordinated response to intimate partner violence, *Journal of Community Practice, 13*(2), 45 - 59

Sleet, D. A. & Branche, C.M. (2004). Road safety is no accident, *Journal of Safety Research, 35*(2), 173-174.

Smith, K. (2000). Road safety: past, present and future. In Proceedings of the Australian Institute of Traffic Planning and Management International Conference, Gold Coast, Queensland, Australia, 69-84.

Snortum, J. R. (1990). Drinking-driving compliance in Great Britain: the role of law as a "threat" and as a "moral eye-opener," *Journal of Criminal Justice, 18,* 479-499.

Snyder, W.M. (2000). Communities of practice: the organizational frontier. *Harvard Business Review, 78*(1), 139.

Soderberg, C. (2011). Institutional conditions for multi-sector environmental PIin Swedish bioenergy policy. *Environmental Politics, 20* (4), 528.

Souder, W. E., Chakrabarti, A. K., Bonoma, T. V., Avery, R. V., & Cicchinelli R. D. (1997). An Exploratory Study of the Coordinating Mechanisms between R&D and Marketing as an Influence on the Innovation Process. Final Report to the National Science Foundation, Washington, D.C. NTIS Number PB-279-366.

Stephenson, M. (2006). Toward a descriptive model of humanitarian assistance coordination. *Voluntas: International Journal of Voluntary and Nonprofit Organizations,17*(1), 41-57.

Stewart, J. (2006). Perspectives on policy integration, *Environmental Politics, 15*(4), 666.

Stopher, P. (2012). *Collecting, Managing, and Assessing Data Using Sample Survey: A Primer*. Cambridge University Press, London

Styhre, A. (2002). The knowledge-intensive company and the economy of sharing: Rethinking utility and knowledge management. *Knowledge and Process Management, 9*(4), 228-36.

Summerhill, L. (1999). Patient and stakeholder consultation in healthcare. *Managing Service Quality, 9*(5), 327.

Swedish Road Administration (2006). Safe Traffic: Vision Zero on the Move. SRA

Thakker, J. & Ward, T. (2010). Relapse prevention: a critique and proposed reconceptualization, *Behaviour Change, 27*(3), 154-175.

The World Bank (2010). Country Classification. http://go.worldbank.org/K2CKM78CC0

Thomas, J. (2004). Integrating qualitative research with trials in systematic reviews. *BMJ, 328*(7446), 1010.

Thomson, A. M. (2007). Conceptualizing and measuring collaboration. *Journal of Public Administration Research and Theory, 19*(1), 23.

Tollefson, N. (2006). Measuring collaboration among grant partners. *The American Journal of Evaluation, 27*(3), 383.

Tranter, P. J. & Lowes, M.D. (2005). The place of motorsport in public health: an Australian perspective. *Health and Place, 11*(4).

Trim, A. & Barak-Zai, S. (2008). 40 Years of Road Casualty Reduction in the United Kingdom, *ITE Journal,78*(8), 16-18.

Trist, E. (1977). A concept of organizational ecology. *Australian Journal of Management, 2*(2), 161-175. doi:10.1177/031289627700200205

Trist, E. (1983). Referent organizations and the development of inter-organizational domains, *Human Relations*, *36*(3), 269.

Turner, J.E. (2006). Focusing on the complexity of emotion issues in academic learning: a dynamical component systems approach. *Educational Psychology Review*, *18*(4), 361.

United Nations (2014). Improving Global Road Safety, A/68/L.40.

Wagner, B. A. (2003). Learning and knowledge transfer in partnering: an empirical case study, *Journal of Knowledge Management*, *7*(2), 97.

Waldfogel, J. (1997). The new wave of service integration. *Social Services Review*, *37*, 463–484.

Walker, A. (2000). Community-based injury prevention interventions, *The Future of Children*, *10*(1), 83.

Walker, L., Butland, D., & Connell, R. W. (2000). Boys on the road: Masculinities, car culture, and road safety education. *The Journal of Men's Studies*, *8*(2), 153-169. doi:10.3149/jms.0802.153

Walsh, D., & Downe, S. (2005). Meta-synthesis method for qualitative research: A literature review. *Journal of Advanced Nursing, 50*(2), 204-211.

Walsh, F. (2003). Family resilience: A framework for clinical practice. *Family Process, 42*(1), 1.

Ward, T., & Hudson, S. M. (1998). The construction and development of theory in the sexual offending area: A metatheoretical framework. *Sexual Abuse: A Journal of Research and Treatment, 10*(1), 47-63.

Warwick-Booth, L. (2011). *The energy glut. the politics of fatness in an overheating world*. ABINGDON: ROUTLEDGE JOURNALS, TAYLOR & FRANCIS LTD. doi:10.1080/09581596.2010.544925

Watson, B. C. & King, M. J. (2009). Opportunities for enhancing the Australian National Road Safety Strategy. *Journal of the Australasian College of Road Safety*, *20*(3), 17-19.

Wegman, F (2012). Driving down the road toll by building a safe system. Government of South Australia.

Wegman, F. & Oppe, S. (2010). Benchmarking road safety performances of countries. *Safety Science, 48*, 1203–1211

Wegman, F., Vis, M., & Gitelman, V. (2009). A composite road safety performance index using the SUNflower approach. *ITE Journal*, *79*(8), 26.

Weiss, L. (2004). Coordination networks within and across organizations: a multi-level framework, *Journal of Management Studies, 41*(1), 127.

Wenger, E., & Snyder, W. (2000). *Communities of Practice: The Organizational Frontier*. Harvard Business School Publishing Corporation, Boston.

Whetstone, T.S. (2001). Measuring the impact of a domestic violence coordinated response team. *Policing*, *24*(3), 371 – 398.

White, L (2008). Connecting organizations: Developing the idea of network learning in inter-organizational settings. *Systems Research and Behavioral Science*, *25*(6), 701.

Whitelegg, J., (1983). Road safety: defeat, complicity and the bankruptcy of science. *Accident Analysis and Prevention*, *15*(2), 153–160.

WHO (2009a). Moscow Declaration, First Global Ministerial Conference on Road Safety: Time for Action. [available from: http://www.who.int/roadsafety/ministerial_conference/declaration_en.pdf]

WHO (2009b). Global Status Report on Road Safety: Time for Action. WHO, Geneva [available from: www.who.int/violence_injury_prevention/road_safety_stutus/2009]

WHO (2013). Global Status Report on Road Safety 2013. Geneva [available online at: http://www.who.int/violence_injury_prevention/road_safety_status/2013/en/]

WHO (2014). Violence and Injury Prevention. [Available online at: http://www.who.int/violence_injury_prevention/road_traffic/en/]

WHO (2015). Global status report on road safety, 2015. [available online: http://www.who.int/violence_injury_prevention/road_safety_status/2015/en/]

Wilson J. (1963). *Thinking with Concepts*. Cambridge University Press, London.

Withington, D. (2011). The Transport Integration Act: a major change for the transport portfolio, but why should planners take notice? *Planning News*, *37*(10), 16-17.

World Bank (2012). World Databank: Kenya, Available from: http://databank.worldbank.org/ddp/home.do?Step=3&id=4

Young, K.L. & Salmon, P.M. (2015). Sharing the responsibility for driver distraction across road transport systems: A systems approach to the management of distracted driving. *Accident Analysis and Prevention, 74*, 350-359.

Zohar, A. & Borkman, T. (1997). Emergent order and self-organization: A case study of Alcoholics Anonymous. *Nonprofit and Voluntary Sector Quarterly*, *26*(4), 527.

Appendices

Appendix A

Title: Information for Prospective Participants

Queensland University of Technology
Brisbane Australia

PARTICIPATE IN RESEARCH

Information for Prospective Participants

The following research activity has been reviewed via QUT arrangements for the conduct of research involving human participation. If you choose to participate, you will be provided with more detailed participant information, including who you can contact if you have any concerns.

A Descriptive Model of Road Safety Intervention Integration at a Local Level

Research Team Contacts

Principal Researcher:	Joao M.C. Canoquena, PhD Student
Supervision Team:	Dr Mark King and Professor Barry Watson Centre for Accident Research and Road Safety–Queensland (CARRS-Q) Queensland University of Technology (QUT)

Please contact the researcher team members to have any questions answered or if you require further information about the project.

What is the purpose of the research?

The purpose of this research is to develop a descriptive model of the interaction across road safety agencies at a local, municipal level.

Are you looking for people like me?

The research team is looking for experts in road safety, who work for counties, municipalities or local councils, with at least 5 years of coordination experience.

What will you ask me to do?

Your participation will involve 3 rounds of data collection taking approximately 30 minutes each over a period of 5 weeks. You will be:

a) Answering open-ended questions about your experience with the coordination/integration of road safety strategies.
b) Ranking and rating questionnaire statements.
c) Evaluating a graphic depiction of your coordinated effort.

Are there any risks for me in taking part?

The research team does not believe there are any risks or harm to you other than potential inconvenience.

It should be noted that if you do agree to participate, you can withdraw from participation at any time during the project without comment or penalty. Confidentiality of your identity is assured during this study.

You will not have to reveal personal details other than professional experience information such as

years in road safety intervention integration.

Are there any benefits for me in taking part?

It is expected that this project will benefit you directly through the feedback of the findings of the survey.

The common good arising out of this research project is the potential to help tackle the deficits identified by the WHO in relation to the integration of road safety interventions in close to 70% of its member countries.

Will I be compensated for my time?

To compensate you for your contribution should you choose to participate, the research team will provide you with a summary of the findings of the quantitative questionnaire.

Who is funding this research? (only include if the research is funded)

This research as an individual endeavour is not funded by any institution. It is part of a PhD thesis.

I am interested – what should I do next?

If you would like to participate in this study, please, confirm your interest in this research project and indicate a convenient time to receive the instructions for the survey by replying to the invitation e-mail forwarded to you by the principal researcher. Otherwise, contact the principal researcher at: costa.canoquena@student.qut.edu.au

You will be provided with further information to ensure that your decision and consent to participate is fully informed.

Thank You!

QUT Ethics Approval Number: 1300000478

Appendix B

Title: Participant Information for QUT Research Project

Queensland University of Technology Brisbane Australia	**PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT**

A Descriptive Model of Road Safety Intervention Integration at a Local Level

QUT Ethics Approval Number 1300000478

RESEARCH TEAM

Principal Researcher: Joao Canoquena, PhD student

Associate Researchers: Dr Mark King and Professor Barry Watson

Centre for Accident Research and Road Safety–Queensland (CARRS-Q) – Queensland University of Technology (QUT)

DESCRIPTION

This project is being undertaken as part of a PhD for Joao Canoquena.

The purpose of this project is to develop a descriptive model of how road safety agencies in OECD countries coordinate/integrate their strategies intended to reduce traffic fatalities at a local (county) level.

You are invited to participate in this project because you have worked in the coordination of local level (county or municipality) road safety interventions for 5 years in an OECD country.

PARTICIPATION

There are 3 rounds in this research project.

Initially, your participation will involve an audio recorded Skype interview that will take approximately 20-30 minutes of your time. This interview will not have fixed questions. It will have guiding questions. Some of these guiding questions include: a) What is the nature of local level integration of road safety interventions? and b) What mandates this integration?

The 2nd stage may occur just over a week later and requires you to rank and rate statements.

In the 3rd round, you will be asked to agree or disagree with a model which describes the way you coordinate road safety interventions at a local level. This should happen approximately a week later depending on the availability of all other participants.

Your participation in this project is entirely voluntary. If you agree to participate you do not have to complete any question(s) you are uncomfortable answering. Your decision to participate or not participate will in no way impact upon your current or future relationship with QUT or with associated external organisation. If you do agree to participate you can withdraw from the project at any time without comment or penalty. Any identifiable information already obtained from you will be destroyed.

EXPECTED BENEFITS

It is expected that this project will benefit you directly through the feedback of the findings of the survey.

The common good arising out of this research project is the potential to help tackle the deficits identified by the WHO in relation to the integration of road safety interventions in close to 70% of its member countries.

RISKS

There are no risks beyond the time of approximately 20-30 minutes per round associated with your participation in this project.

PRIVACY AND CONFIDENTIALITY

All comments and responses will be treated confidentially unless required by law. The names of individual persons are not required in any of the responses.

Whilst participation in this study is initially via a Skype-based interview, you may choose to forward written answers to the survey questions. These questions can be forwarded to you via e-mail. You can also ask to verify your comments and responses prior to the final round of the project. The responses and comments provided by you will be viewed by the principal and associate researchers.

Out of this study, 3-4 journal articles will be written up and submitted for publication. Once the journal articles are published, the data collected in this study will be destroyed.

CONSENT TO PARTICIPATE

To consent to your participation in this study, simply reply to the approach/invitation e-mail forwarded to you by the principal researcher.

QUESTIONS / FURTHER INFORMATION ABOUT THE PROJECT

If you have any questions or require further information, please contact the researchers below.

Joao Canoquena	Dr Mark King	Professor Barry Watson
costa.canoquena@student.qut.edu.au	07 3138 4546	07 3138 4955
	mark.king@qut.edu.au	b.watson@qut.edu.au

CONCERNS / COMPLAINTS REGARDING THE CONDUCT OF THE PROJECT

QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Unit on 07 3138 5123 or email ethicscontact@qut.edu.au. The QUT Research Ethics Unit is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.

Thank you for helping with this research project. Please keep this sheet for your information.

Appendix C

Title: Approach E-mail

Subject Title: Participate in a research study into Road Safety Intervention Integration at a Local Level

Dear Sir or Madam,

I am writing to invite you to participate in a Delphi study into road safety intervention integration at a local level. Your name was suggested to me as someone who might be interested in assisting with this research, either directly or indirectly

1. Definitions

a. Local level

Municipal, county or local council level; not national or provincial/state level

b. Descriptive Model

Graphic representation of a sequence of steps & contributing factors

c. Road Safety Intervention Integration

Coordination of road safety measures such as the simultaneous implementation of public education campaigns and drug testing

d. Delphi Study

A semi-structured interview, followed by the rating of statements and a final round of evaluation of the results

2. Aims

a. to develop a descriptive model of the integration of road safety interventions at a local level in high income countries
b. to share the descriptive model with low and middle income countries

3. Benefits of the study

a. improved expertise in low and middle income countries about road safety intervention integration
b. establishment of a framework for future research into road safety intervention integration at a local level

4. Inclusion Criteria

The survey participants must be:

a. local/municipal officials involved in the coordination of road safety
b. have been involved in road safety coordination/integration for at least 5 years

5. Exclusion Criteria

The survey participants must not be:

a. officials in a national road safety agency
b. individuals who have not participated in the administration of coordinated road safety interventions
c. those who have not been involved in road safety coordination for at least 5 years
d. researchers

6. My Affiliation

a. a PhD student with Queensland University of Technology (QUT, Australia)
b. student number: n7284578
c. enrolled with: the Centre for Accident Research and Road Safety – Queensland
d. supervisors: Dr. Mark King and Professor Barry Watson
e. previous publication: 'Reconceptualising Policy Integration in Road Safety Management,' in the Journal of Transport Policy

7. What you can do next

a. accept this invitation and suggest other participants or
b. reject this invitation and/or suggest other participants

Please, note that your participation in this study is both voluntary and confidential.

The data gathered throughout this study will be shared with my supervisory team only and will be stored in accordance with the QUT's storage guidelines. Upon the publication of the study report(s) in the form of a journal article or journal articles, the data will be destroyed.

In the event that you might not meet the inclusion criteria, I would very much appreciate it, if you could suggest other county employees, who might be willing to participate in this study.

Please view the attached participant information sheet for further details on the study and how to participate.

Please note that this study has been approved by the QUT Human Research Ethics Committee (approval number **1300000478**).
Many thanks for considering this request.

Warm regards,

PhD Scholar
Centre for Accident Research and Road Safety-Queensland (CARRS-Q)
Queensland University of Technology (QUT)
K Block
Victoria Park Road
Kelvin Grove 4059 (Brisbane)

Queensland, Australia
www.carrsq.qut.edu.au

Appendix D

Title: Interview Guide

A. Establishing Rapport *[aim to put the interviewee at ease]*

Hi, _____. Thank you so very much for accepting to participate in this research project. This is a rather informal, first round confidential conversation, which should only take approximately 20-30 minutes of your time. Is this ok? *[negotiate a timeframe]*. This interview is being taped. Is this alright? Can I get you to state your name and job role, please?

B. **Gaining Commitment & Engagement** *[engage in a casual conversation]*

, we are building a graphic representation of how the integration of road safety interventions takes place in high income countries. Your contribution to this project is significant in that it provides the study with 'expertly formed judgment.' Your evidence-based opinions will help us to build this model. My job is to learn from your road safety intervention integration empirical experience.

C. Opening Questions *[keep this brief]*

1. I take that you are a:
    a. local/municipal official involved in the coordination of road safety; and
    b. have been involved in road safety coordination/integration for at least 5 years

2. I would like to ask you to expand on your job role and experience with the coordination of road safety interventions. What has your job role entailed in relation to road safety interventions? *[only ask this question, if not enough information has been volunteered earlier on]*

D. Research Questions *[direct the interviewee through the 'terms of reference' in the literature review by using neutral prompts e.g. you mentioned, …, can you tell me more about …; stay neutral]*

The next set of generic questions explores your recollection of facts. Feel free to include your expert judgment at the end of each recollection.

1. If I could get you to explain how the policy programs in road safety interact at a local level.

2. I would like to invite you to tell me about your experience with successful integration/coordination of road safety intervention in your local area.

3. Tell me about a typical instance of initial, middle and final stages of successful road safety intervention integration where more than one intervention were combined and deployed simultaneously in your local area. *[explore the process (stages) in detail]*

4. I would now like to ask you to reflect upon your successful experiences with road safety intervention integration. Please, tell me what you identify as the critical success factors.

5. You mentioned, _____, can you tell me more about _____, please? *[help the interviewee explore specific aspects of their experience; keep the probe neutral; do not get too involved; ensure that events are used to back up judgments; elicit opinions on structures & culture, ask for final ideas]*

E. Closing Remarks *[ask for final remarks]*

Thank you so very much for your time. Let me explain what is expected to happen next. This round of interviews will lead to a set of statements. I will forward an e-mail to you in the weeks ahead to ask you to use a

scale and rate these statements. In the final round, I will get you to rate a descriptive model of the integration of road safety interventions in high income countries. Once again, thank you for your help.

Appendix E

This appendix represents a survey, which was used with OECD local level coordinators of road safety countermeasures. It provided data for Chapters 7, 8 and 11.

Due to formatting issues, this survey is available upon request. Please, contact the author for a copy of the survey.

Appendix F

This appendix represents a self-administered, online survey, which was used with Australian road safety professional stakeholders with knowledge of the 2011-2020 National Road Safety Strategy. It provided data for Chapter 10.

Due to formatting issues, this survey is available upon request. Please, contact the author for a copy of the survey.

Appendix G
Title: Lead Agencies in OECD Countries, 2015 (Chapter 2)

Table G.1: Lead Agencies in OECD Countries, 2015

OECD Country	Lead Agency	Operating Functions			Accountability		Resourcefulness		Fatality Rate (per 100,000 pop.)
		Has the authority to coordinate effort	Engages with the Community	Coordinates national effort	Publicly accountable for targets	In charge of NRSS	Funded lead agency	Funded activities	
Australia	Department of Infrastructure and Regional Development	Yes[2]	Not directly	Yes[2] although much of the actual work is conducted by the States	Yes	Yes[2]	Yes[1]	Insufficiently	5.4[1]
Austria	Federal Ministry for Transport, Innovation and Technology								5.4[1]
Belgium	The Inter-ministerial Committee for Road Safety								6.7[1]
Canada	Canadian Council of Motor Transport Administrators								6[1]
Chile	National Traffic Safety Commission (CONASET)								12.4[1]
Czech R.	Czech Government Council for Road Safety								6.1[1]
Denmark	No								3.5[1]
Estonia	Traffic Safety Department in Estonian Road Administration								7.0[1]
Finland	Ministry of Transport and Communications of Finland								4.8[1]
France	Interministerial Delegation for Road Safety								5.1[1]
Germany	Federal Ministry of Transport and Digital Infrastructure								4.3[1]

Greece	Interministerial Road Safety Committee								9.1[1]
Hungary	No								7.7[1]
Iceland	The Icelandic Transport Authority								4.6[1]
Ireland	Road Safety Authority								4.1[1]
Israel	Israel National Road Safety Authority								3.6[1]
Italy	Ministry of Transport - Directorate General Road Safety								6.1[1]
Japan	Central Traffic Safety Policy Council								4.7[1]
Korea (S)	Ministry of Land, Infrastructure and Transport								12[1]
Luxembourg	Ministry of Sustainable Development and Infrastructure								8.7[1]
Mexico	No								12.3[1]
Netherlands	Ministry of Infrastructure and the Environment								3.4[1]
N. Zealand	Land Transport Safety Team, Ministry of Transport								6[1]
Norway	The Norwegian Public Roads Administration						Yes[1]		3.8[1]
Poland	National Road Safety Council						Yes[1]		10.3[1]
Portugal	National Authority for Road Safety						Yes[1]		7.8[1]
Slovak R.	Road Safety Department, Ministry of Transport, Construction and Regional Development						Yes[1]		6.6[1]
Spain	Directorate General of						Yes[1]		3.7[1]

	Traffic								
Sweden	Swedish Transport Agency and Swedish Transport Administration						Yes[1]		2.8[1]
Switzerland	Federal Roads Office						Yes[1]		3.3[1]
Turkey	Road Traffic Safety Strategy Coordination Council and Road Traffic Safety Council						Yes[1]		8.9[1]
United K.	Department for Transport (Great Britain), Department of the Environment (Northern Ireland), Department for Economy, Science and Transport (Wales), Transport Scotland (Scotland)						Yes[1]		2.9[1]
U. States	National Highway Traffic Safety Administration (NHTSA)						Yes[1]		10.6[1]

2) Sources: WHO, 2015[1]; Australian Department of Infrastructure and Regional Development, 2015[2];

Appendix H

Title H.1: Workflows for Coordinating Road Traffic Injury Prevention Programs

(Chapter 7)

Workflow	Steps in workflow	Approach
[W.1]	Obtain the crash data ➔ work out the broad trends in the data ➔ identify stakeholders ➔ bring them in ➔look at the crash data ➔ drill down on the crash data➔ visualize success➔ explore solution options ➔ review stakeholder participation in the exploration of solutions ➔ work on participation, if needed ➔ mobilize resources to implement key strategies jointly ➔establish coordination by appointing a central person ➔ keep coordination going ➔ review stakeholder participation in joint work ➔ execute agreed tasks and produce preliminary results ➔ review preliminary results of the tasks with other stakeholders ➔ agree on further action, if needed	Crash data – driven action identification
[W.2]	Meetings are organized by the authorities to highlight identified issues with community advisors (i.e. road user associations) who contribute with ideas as to how issues can be addressed ➔ an issue paper is issued by the government agency ➔ consultation is organised with community advisors ➔ action is planned ➔ implementation of the actions is carried out and monitored	Consult, plan, execute & monitor
[W.3]	Conduct speed count, which forms part of an official report ➔ run meetings to discuss what the police operations are going to be ➔ work out what Council can do ➔ create an action plan ➔ implement the action plan ➔ check speed count (review variation: before vs after actions), which forms part of an official report	Speed count – based report
[W.4]	Identify the issues ➔start off with a project proposal ➔ discuss the proposal with key stakeholders ➔ run a pilot project with key stakeholders ➔ evaluate the pilot project ➔ roll it out	Issue – proposal demonstrations
[W.5]	Identify trends or patterns in the crash data ➔ identify any relevant road users who are vulnerable ➔ talk to the relevant group/s ➔ suggest some solution options ➔ secure the support and participation of representatives from the target group ➔ explain the rationale for each solution option ➔ secure buy-in from all stakeholders ➔ conduct frequent meetings to negotiate and moderate perceptions and points of view ➔ identify how each stakeholder will contribute ➔ nominate a person to be the contact person ➔ ensure everyone understands the big picture ➔ develop a project plan with various activities carried out by different stakeholders ➔ establish the link across activities ➔ organize the activities in a logical manner so that one enhances the other, based on the links identified earlier ➔ consult with all stakeholders regularly to ensure that the activities are being implemented as planned->increase communication, not skimping on information ➔ measure success with a larger group of stakeholders	Crash data trend & pattern-based project plans
[W.6]	A communication strategy from government officials, challenging participants to tackle a social issue would start off the process of coordination activities at a local level ➔ an issues paper, showing crash data rising trends and options to address the rising trends is issued with a brief period for consultation ➔ a draft of the strategies to address the rising trends is sent out for external consultation for a period of 28 days, followed by workshops and focus groups->funding is allocated for the strategies ➔ community groups and government agencies are assigned joint responsibilities for the implementation of the strategies ➔ operational plans are worked out between community groups and government agencies ➔ operational plan milestones are	Government challenge

	delivered	

Two of the workflows appeared to be driven by crash data (W.1 and W.5). However, these workflows differed in the nature of the interaction with crash data. Whilst in the first workflow the emphasis seemed to be placed on the trends in the data, the fifth workflow focused on the road users most impacted by the trends. Similarly, these two workflows differed in the engagement activities. Whilst the first workflow engaged with program coordinators to developed projects, the fifth targeted the actual groups over-represented in crash data. In this sense, the fifth workflow adopted a more direct approach, engaging those most affected by the trends in road traffic injury. Another pair of workflows worth comparing are workflows 2 and 6. In this set of workflows, a top-down approach is adopted. The difference between workflows, in this instance, appeared to be the extent of consultation. In the former case (i.e. W.2), the issues associated with the crash data seemed to be emergent rather than planned in advance and shown to the community for comments. In this sense, workflow 4 is pertinent. In this case, the gradual roll-out in the workflow 4 did not appear to be preceded by a period of consultation about the issues. Rather the consultation centered around the proposal to tackle previously identified issues. As indicated by some interviewees, this approach tended to be problematic as it was often viewed as being overwhelmingly accompanied by technical solution. In this sense, consultation tended to be viewed as a rubber stamping exercise.

The interviews also yielded additional insights into the nature of the workflows, the activities carried out within the workflows and the complementarity across these activities. These are briefly summarized below. Reference below to the survey respondents is denoted by the gender (i.e. M/F), country (first three letters of the country) of origin, occupation and interview order (i.e. 1-22).

A closer analysis of the workflows and the comments made by the interviewees appeared to indicate differences in the adoption of the workflows between local authorities (i.e. government agencies) and community groups. In this respect, local authorities and community groups involved in the delivery of road safety programs tended to differ in terms of predisposing factors for coordinated road safety responses. In this sense, some local authorities tended to adopt a strategic approach. , they '… do a plan … and … talk about what is the next step to take …' (F, Fin, Official, 19). This plan-oriented start to coordinated road safety responses may have had its origins outside the local authority sphere of power. Indeed, '… the [national] road authority contacts the county [with a plan]… we come all together and decide how we do this work …' (F, Fin, Official, 19). This strategic approach tended to, but did not uniquely, begin with plans and crash data analysis. In fact, at a local authority level '… the [crash] data itself is not [always] the starting point …' (F, Fin, Official, 19). In this setting, there was an attempt to strategize from the outset. Actually, some interview respondents reported strategizing as being about '...setting out and finding what the common goals are right from the beginning and setting out quite clear guidelines to what the working group's role is, what their purpose is, what the goal is, what the expected outcomes are … identifying desired outcomes … and having a way to quantify them … ' (F, Aus, Administrator, 5).

The work of community groups at a local level, on the other hand, seemed to begin in a much wider range of manners. In some cases, the need to educate the public may have brought together community organizations and local councils, in Australia, or municipal authorities, in Europe. In other cases, the decision by local authorities to support community-

based initiatives gave rise to coordinated work with community groups. This latter predisposing feature was prevalent in the delivery of road safety educational campaigns. Typically, the local authorities often made available to the community groups equipment and administrative assistance to facilitate the presentation of road safety educational programs to a large number of school pupils. In some of these presentations, there might be a previous crash survivor. In this sense, the genesis of coordination was pragmatic rather than strategic. Alternatively, coordinated road safety responses may have been triggered by a perception of value in linking activities. , there appeared to be a view amongst the interviewees that driver behavior could be influenced by the visibility of the coordination of activities (e.g. intensity in education campaigns indicated an eminent enforcement campaign). , there appeared to exist the need for there to be a sense of urgency around the data trends, which then led to action. , '… the initial thing is that everyone [is] in shock with the amount of crashes we've had, so there [is] a certain amount of buy-in by the mere fact that we've got do something …' (M, Aus, Administrator, 16). This sense of urgency was exacerbated by the realization of the potential for a ripple-effect arising out of the trends being observed.

As for the triggers of coordinated effort, crash data examination appeared to dominated. This examination of crash data may have led to the formation of a task force comprising various stakeholders such as a '… motorcycle safety group … the local Police … national parks and wildlife … ' (M, Aus, Recreation Officer, 15). In other cases, the next logical step from crash data examination was more formal and administrative. In this case, following speed count, an official report was produced. This report was then used to organize meetings in which the Police and the community groups explored options. At these forums, all stakeholders examined ways by which their capabilities could be brought to bear on the issues identified in the report. Subsequently, an action plan was devised, the evaluation of which centered around the extent to which speed count issues had been effectively addressed (M, Aus, Administrator, 13).

However, crash data examinations were not the only triggers of coordinated responses at a local level. In some cases, changes to the law led to the development of joint work activities. In this case, a typical sequence of events saw education campaigns conducted with the support and participation of the Police. These preceded enforcement of the new laws. , respondents explained that '…we've got new laws come in about the use of mobile phones whilst driving… that's an enforcement and legislative issue for the Police, but they have been working with us to do an education campaign at a local level to raise awareness of the new regulations and rules …' (F, Aus, Administrator, 5). An alternative stimulus for coordinated response action was a set of administrative obligations. These obligations represented, invariably, strategic and operational plans. , local level Administrators held '…a quarterly meeting with the key Police in [their] area … [where they] set what the direction for the next quarter is … so for this quarter, it's going to be mobile phones …' (F, Aus, Administrator, 5). An additional input into workflows represented a bottom-up strategic approach. In this instance, initially key stakeholders were interviewed to identify critical issues. These issues were then disseminated through workshops with other stakeholders to generate a comprehensive appreciation of the issues at hand. This appreciation of the multifaceted nature of the identified issues was aided by crash data analyses. The end result of both the consultation and the crash data examination was a 3-year strategic plan (F, Aus, Administrator, 12).

The activities in workflows appeared to be underpinned by efforts to simplify tasks. Indeed, throughout these activities and the complementarity across them (meeting → action plan), facilitative actions were constantly undertaken. These facilitative actions were found to be: *Communicating*, *Redefining Roles*, *Enhancing Involvement* and *Facilitating*

Sustainability. Much of the work or actual effort in coordinating road safety activities at a local level entailed communicating with other stakeholders. In this case, the richness of the information conveyed throughout the communication process was said to be critical. Put otherwise, successful communication was thought to occur when there was specific knowledge of the issues at hand. In addition, communication was thought to succeed when it was openly conducted, featuring respect and a sense of being listened to.

Apart from the richness of the information generated in the interaction amongst stakeholders, the nature of the communication was equally believed to be essential. In this sense, it was preferred that it be conducted face-to-face with minimum interference from technology. Indeed, there appeared to be a need to have a great deal of dialogue and generate a sense or perception on the part of the stakeholders that there, indeed, was open dialogue across stakeholders.

Furthermore, inclusiveness in the communication seemed to be rated highly by the interviewees. In this case, there seemed to be a perception of deficits in inclusiveness in the communication initiated and controlled by local authorities, with community groups requesting the removal of practices, which could potentially appear to be marginalizing some stakeholders.

It was thought to be helpful for coordinated road safety activities at a local level to have clearly defined roles. This clarity was believed to enhance cooperation across stakeholders. In this sense, there appeared to be a need to acknowledge that stakeholders united effort to *share the load*. However, the coming together of stakeholders was not thought to imply the loss of flexibility or independence. This need was justified on the ground that the nature of stakeholder involvement in the delivery of local level road safety programs was often stage-specific and may involve each stakeholder running their own stage (F, Aus, Administrator, 5). This mixture of clarity in job functions, flexibility, and independence around task execution was thought to be made possible through a holistic approach. Through it, stakeholders with technical expertise to cost projects out worked with those with social research knowledge to ensure the government-professional stakeholder cluster set of aspects of the road traffic injury risk factors was addressed.

Task execution was thought to be enhanced by commitment, cooperative relationships, and a sense of ownership (buy-in). Commitment was said to be needed to see ideas through, especially when these were solicited from other stakeholders. In this case, having a genuine interest in ensuring ideas could result in palpable outcomes was thought to be essential. This sincere concern for ensuring that outcomes reflected stakeholder input was thought to represent a real belief in the feasibility of the goals collectively set. Additionally, mutual respect and genuine commitment to cooperative outcomes were thought to be the hallmarks of a cooperative relationship amongst stakeholders. However, commitment and cooperative relationships appeared to be insufficient to galvanize workflows. It was thought that a sense of ownership and buy-in in the results were essential features of stakeholder involvement.

Appendix I

Title I.1: Latent Coding Source – Full Titles and Names (Chapter 9)

ABBREVIATION	FULL FORM
3MTSSD	3M Traffic Safety Systems Division
ACRS	Australasian College of Road Safety
AECOM	Architect, Engineering, Consulting, Operations & Management
AFMA	Australasian Fleet Managers Association
AGF	Amy Gillett Foundation, Bicycle NSW, Bicycle Transport Alliance WA, Cycling Australia, Cycling Promotion Fund, Retail Cycle Traders Association
ARRBG	Australian Road Research Board Group
BISA	The Bicycle Institute of SA
BQ	Bicycle Queensland
BTA (WA)	Bicycle Transport Alliance (WA)
CARRS-Q	Centre for Accident Research & Road Safety - Queensland
Carver 2011	Carver, Dr Alison - Centre for Physical Activity and Nutrition Research, Deakin University
CPF	Canberra Pedestrian Forum
CSA	CycleSafe, Armidale
Garrard 2011	Garrard, Dr Jan - Senior Lecturer in Public Health, Deakin University; and Active Transport Research and Evaluation Consultant
KIDSAFE	Kidsafe - The Child Accident Protection Foundation of Australia
PCA	Pedestrian Council of Australia

Appendix J
Title: Concept Matrix for Organisation Design Theory – Oriented Integration Dimensions (Chapter 9)

J.1 Concept Matrix for Control

Control indicators		
Culture	Structure	Strategic Control
beliefs & values (Dawson 1996) Informal network-based mechanisms (Lægreid 2008) vital tacit information (Weiss 2004)	reporting relationships (Dawson 1996)	Controllable strategic targets (Kellinghusen and Wubbenhorst 1990) Strategic control (Goold 1991)

J. 2 Concept Matrix for Coordination

Coordination Indicators	
Mutual Adjustment	Social Capital
Integrative device (Lawrence and Lorsch 1968) resolution of mutual problems (Lawrence and Lorsch 1968) fulfilment of identified needs (Owen 1995) commonality of beliefs and values (Glouberman 2001)	positive social relationships (Cameron 2006) reciprocal goodwill (Glouberman 2001)

J. 3 Concept Matrix for Information Sharing

Information Sharing Indicators					
Value Proposition	Facilitating Systems	Relationship Nature	Regulating Instruments	Professional Attributes	Leadership Commitment
efficiency improvement (Julibert 2008) reciprocal achievement (Horan 2011)	conventions (Julibert 2008) data anonymization (Richardson 2006)	interaction continuity (Barua 2007) new information access (White 2008) dense networks (White 2008)	laws, practice frameworks, statutory provisions and protocols (Richardson 2006) clear rules (Julibert 2008) culture agreements (Scott 2005)	Adequacy of training and support (Richardson 2006) Perception challenging training (Richardson 2006) Standardization of norms (Richardson 2006) Strong sharing culture (Julibert 2008) Mutually cooperative culture (Wagner 2003) Awareness of reciprocity, fairness & cooperativeness (Julibert 2008)	Information sharing technology acquisition (Julibert 2008) Positive sharing culture (Julibert 2008) Positive commitment (Wagner 2003) Shared leadership (Horan 2011)

Appendix K

Title: Coding Scheme (Chapter 9)

Table K.1 Coding Scheme for Control Dimension Antecedents

CODE	DESCRIPTION	INSTRUCTIONS
Feedback –Based Control	Concern for adequacy; encourage dependency & clarify expectations; remove rigidity	1. Look for references to feedback in the form of a concern for adequacy. 2. Search for a concern for the clarification of expectations and the removal of rigidity.
Cooperative Culture	Reputation; solidarity; trust; strong relational bonds	1. Look for mentions of strong relational bonds. 2. Search for reference to cooperative culture.
Strategic Control	Defined measurable & controllable targets e.g. milestones, levels of engagement, involvement & satisfaction	1. Identify mentions of benchmarks, milestones and targets. 2. Search for definitions of measurable and controllable targets.
Reporting relationships	Rules; roles; responsibilities; standardization of skills & knowledge	1. Identify mentions of rules, roles and responsibilities. 2. Search for references to the standardization of knowledge and skills.

Table K.2 Coding Scheme for Coordination Dimension Antecedents

CODE	DESCRIPTION	INSTRUCTIONS
Network Connectivity	Surrender of sovereignty; diffusion of power; wide cross section of stakeholders; engagement of stakeholders; clarity of membership; dominant leadership	1. Search for mentions of wide cross section of the stakeholders. 2. Identify references to stakeholder engagement, membership clarity and leadership dominance.
Self Coordination	Standardization of norm; mutual adjustment; commonality of beliefs & values; self – organizing; cooperative culture (mutual respect, understanding & trust); informal communication;	1. Search for mentions of commonality of beliefs and values. 2. Identify references to cooperative culture and informal communication.
Social Capital	Positive relationships (shared goals & knowledge); adaptive setting; reciprocal goodwill; expectations of moral commitment to the maintenance of relationships	1. Look for acknowledgement of the value of relationships. 2. Identify references to reciprocal goodwill and commitment to maintaining relationships.

Table K.3 Coding Scheme for Information Sharing Dimension Antecedents

CODE	DESCRIPTION	INSTRUCTIONS
Strong Pressure for	damning reports into inadequacy of	1. Study reference to the influence of

Information Sharing	information sharing	damning inquiries into information sharing. 2. Search for instances of strong pressure for enhancements in information sharing.
Value Proposition in Information Sharing	perception of value (e.g. willingness to share information); alignment of value proposition (e.g. reciprocal achievement)	1. Examine mentions of willingness to share information based on perception of value. 2. Search for references to reciprocal achievement through information sharing.
Information Sharing Facilitating System	system compatibility; degree of access to information exchange technology; information management systems (e.g. conventions); data anonymization	1. Search for mentions of system compatibility. 2. Identify references to information management systems.
Relationship Nature	continuity of relationships; network access to new information;	1. Identify references to the continuity of the relationship amongst stakeholders. 2. Look for mentions of the need for research input into stakeholder networks. 3. Identify statements related to the need to learn lessons from experiences outside the network of stakeholders.
Information Sharing Regulating Instrument	positive information sharing instruments (e.g. agreements, protocols, laws, clear rules, cultural agreements and statutory provisions)	1. Search for reference to clarity of definitions, rules and regulations. 2. Identify information sharing protocols, agreements and laws. 3. Look for requests to review information sharing protocols.
Professional Attributes	Professional development (e.g. adequacy of training); culture (e.g. strong sharing, cooperative culture); employee perception (e.g. reciprocity, fairness & cooperativeness)	1. Look for references to adequacy of training, strong sharing, cooperative culture, reciprocity, fairness and cooperativeness. 2. Identify mentions of expertise enhancement.
Leadership Commitment	acquisition of information sharing information technology; positive commitment; shared leadership; long term vision	1. Look for references to encouragement for information sharing through the purchase of or allocation of funds for information sharing technology. 2. Search for mentions of leadership commitment to information sharing.

Appendix L

Title: Code Refinement (Chapter 9)

Table: L.1 Code Refinement for Control Dimension Antecedents

CODE No.	INITIAL CODE	REFINED CODE
1.1	Feedback –Based Control	Delete: made redundant by 1.2
1.2	Cooperative Culture	1.1 Cooperative Culture
1.3	Strategic Control	1.2 Strategic Control
1.4	Reporting relationships	Delete: made redundant by 1.2

Table: L.2 Code Refinement for Coordination Dimension Antecedents

CODE No.	INITIAL CODE	REFINED CODE
2.1	Network Connectivity	2.1 Network Connectivity
2.2	Self -Coordination	Delete: made redundant by 2.1
2.3	Social Capital	Delete: made redundant by 2.1

Table: L.3 Code Refinement for Information Sharing Dimension Antecedents

CODE No.	INITIAL CODE	REFINED CODE
3.1	Strong Pressure for Information Sharing	Delete: it is retrospective & may not have widespread application
3.2	Value Proposition in Information Sharing	3.1 Value Proposition in Information Sharing
3.3	Information Sharing Facilitating System	Deleted: mandated accountability between community and government; it applies more readily to an enterprise setting
3.4	Relationship Nature	3.2 Relationship Nature
3.5	Information Sharing Regulating Instrument	3.3 Information Sharing Regulating Instrument
3.6	Professional Attributes	Delete: made redundant by 3.4 and 3.2
3.7	Leadership Commitment	Change code label: 3.4 Leadership Commitment to Information Sharing

Appendix M

Title: Results of Latent Coding (Chapter 9)

Table M.1: Latent Coding for Control Dimensions

CODE No.	INITIAL CODE	LOCATION	LATENT CODING	SOURCE
1.1	Culture	pg. 2 para 3:	call for sense of shared experience & shared awareness	BISA
		pg. 2 para 5:	call for the adoption of a shared responsibility mindset	3MTSSD
1.2	Strategic Control	pg. 7 para 2:	criticize the lack of analysis of failures e.g. unmet 2010 target	ARRBG
		pg. 17 para 3:	suggest the use of benefit cost ratios	AGF
		pg. 2 para 6:	criticize the draft for not being persuasive in terms of implementation or accountability	ACRS
		pg. 6 para 4:	praise the new NRSS for introducing performance monitoring and accountability	CARRS-Q

Table M.2: Latent Coding for Coordination Dimensions

CODE No.	INITIAL CODE	LOCATION	LATENT CODING	SOURCE
2.1	Mutual Adjustment	pg. 12 para 6:	urge government to work with community for behaviour changing interventions	AGF
		pg. 8 para 1:	call for comprehensive & long term community engagement processes	BISA
		pg. 1 para 3:	criticize the strategy for failing to create a community movement towards a shared vision of safety for all	BQ
		pg. 9 para 3:	call for wide spread advocacy and communication program to gain public support	Garrard 2011
		pg. 2 para 5:	ask for more consultation with industry	3MTSSD
		pg. 7 para 1:	suggest a vision underpinned by community values	ACRS

Table M.3: Latent Coding for Information Sharing Dimensions

CODE No.	INITIAL CODE	LOCATION	LATENT CODING	SOURCE
3.1	Value Proposition in Information Sharing	pg. 3 para 3:	suggest the inclusion of a rationale for the selection of policies to add credibility to the choices made	ACRS
		pg. 3 para 5:	criticize the scant attention given to linkages and synergies	ACRS
		pg. 7 para 1:	call for embedding the 'road safety message' into the curriculum	KIDSAFE
		pg. 6 para 3:	criticize previous strategy for not being linked to other national strategies and agendas	CARRS-Q
3.2	Relationship Nature	pg. 5 para 3:	cite ABS documentation of critical facts related to attitudes of child pedestrians and cyclists e.g. fear of road crashes	CPF
		pg. 2 para 1:	call for lessons to be learnt from other OECD countries in relation to the reduction in pedal cyclist injury	Garrard 2011
		pg. 2 para 3:	call for the adoption of legislation modelled on overseas experience e.g. Dutch – style liability laws	CSA
		pg. 13 para 1:	call for the adoption of a focus on peak cycling bodies to exchange expertise and experience	BISA
3.3	Information	pg. 12 para 1:	call for clarity in regulations related to power-assisted bicycles	BISA

	Sharing Regulating Instrument	pg. 1 para 4:	suggest the development of means to overcome privacy and legal issues to allow the correlation of medical, court and police data [safeguards]	AECOM
3.4	Leadership Commitment to Information Sharing	pg. 1 para 4:	call for government to encourage & support research and cooperation	3TSSD
		pg. 9 para 1:	Call for funding for educational programs	BISA
		pg. 1 para 9:	call for internet-based advice on road treatment programs & databases	CSA
		pg. 6 para 5:	imply the continued reinforcement of the 'road safety message' through education and resources for parents & children	KIDSAFE

Appendix N

Title: Illustrative Cases (Chapter 9)

Table N.2 Illustrative Cases: Control

CODE No.	INITIAL CODE	DESCRIPTION BEFORE THE STUDY	ILLUSTRATIVE CASES AFTER THE STUDY - Control
1.1	Cooperative Culture	Culture, represented by beliefs and values, provides the *glue* for both control and coordination (Dawson 1996). In other words, informal network-based mechanisms such as reputation, solidarity and trust contribute towards control and coordination (Lægreid 2008). These strong relational bonds allow vital tacit information to be circulated amongst relevant professionals (Weiss 2004). In fact, informal networks are essential supplements for formal structure (Pink 2006).	• sense of shared experience & shared awareness • a shared responsibility mindset
1.2	Strategic Control	Feedback – based strategic control, which combines planning and operational control, defines measureable and controllable strategic targets (Kellinghusen and Wubbenhorst 1990). These carefully planned strategic targets are translated into effective action through strategic control, a process which is said to equally consolidate learning (Goold 1991; Kellinghusen and Wubbenhorst 1990). In most cases, strategic controls represent milestones or non-financial measures such as the levels of employees' satisfaction, involvement and engagement (Goold 1991). These benchmarks can be illustrated by the use of the balanced scorecard, a performance management framework which aids decision making (Cobbold 2004).	• analysis of failures • benefit cost ratios • accountability • performance monitoring

Table: N.2 Illustrative Cases: Coordination

CODE No.	INITIAL CODE	DESCRIPTION BEFORE THE STUDY	ILLUSTRATIVE CASES AFTER THE STUDY - Coordination
2.1	Network Connectivity	On the other hand, an opposing view identifies the ability to create new role spaces as a determinant of coordinating capabilities (Trist 1983). In Trist's view, what is of significance for these generalist management - styled referent organizations is network connectivity (1983). This is obtained through a wide cross section of stakeholders engaged as constituent organizations (Trist 1983). These non-autocratic institutions regulate the stakeholders' activities at the domain level through mutual adjustment and interdependence (Trist 1983). Critical to the effectiveness of the referent organization is said to be the surrender of sovereignty and the diffusion of power (Trist 1983). In this case, the clarity of the membership of the stakeholders and a dominant leadership have the potential to enhance effort alignment (2011).	• work with community • community engagement processes • community movement towards a shared vision of safety for all • wide spread advocacy and communication program • consultation with industry • vision underpinned by community values

Table: N.3 Illustrative Cases: Information Sharing

CODE No.	INITIAL CODE	DESCRIPTION BEFORE THE STUDY	ILLUSTRATIVE CASES AFTER THE STUDY - Information Sharing
3.1	Value Proposition in Information Sharing	The adoption of information sharing behaviours may rest upon the perception of value in the information exchange activity and the alignment of value propositions. In the first instance, employees share information, if they conceive of it as an opportunity to improve efficiency (Julibert 2008). In the latter case, the alignment of the value proposition of partnering institutions determines the exchange of information, which is viewed as being of benefit for reciprocal achievement (Horan 2011).	• rationale for the selection of policies • linkages and synergies • embedding the 'road safety message' into the curriculum • linked to other national strategies and agendas
3.2	Relationship Nature	Although the continuity of interactions on a long term basis (Barua 2007) is seen to enhance the likelihood of information exchange, access to new information within these interactions is said to be essential (White 2008). In a dense network (where everyone knows everyone), whilst there might be some degree of information sharing, there might not be a channel for new information (White 2008). This information conduit is granted by sources outside the network (White 2008) whose relationship with the strong ties within the network may be rather transient..	• ABS documentation • lessons to be learnt • adoption of legislation modelled on overseas experience • peak bodies
3.3	Information Sharing Regulating Instrument	A range of instruments have been suggested in the literature to influence positive information sharing. Richardson (2006) has proposed the adoption of laws, practice frameworks, statutory provisions and protocols. Similarly, Julibert (2008) has recommended the use of clear rules. Scott (2005), on the other hand, advocates the use of culture agreements. These formal and informal instruments are expected to perform the functions of mandating, legislating collaborative practices (Richardson 2006) and imbuing confidence to share information (Julibert 2008). The regulatory purpose of these tools appears to be conceived of as a safeguard against attempts to preserve scripted behaviours which impair information sharing (Scott 2005).	• clarity • means to overcome privacy and legal issues [safeguards]
3.4	Leadership Commitment to Information Sharing	Support from management for information sharing can be exhibited in a number of ways. One such way is the acquisition of information sharing technology (Julibert 2008). This signal of endorsement for information exchange is thshould be evident in positive sharing cultures (Julibert 2008). Additionally, management may show approval of information exchange behaviours through positive commitment rooted in personal values (Wagner 2003). Furthermore, innovative forms of leadership are said to engender information exchange. In this respect, shared leadership is viewed as a positive influence on inter-organizational information exchange (Horan 2011). Likewise, management's future outlook appears to hold significance in the exchange of information. In this sense, long term vision is thshould engender ideal information exchange levels (Barua 2007).	• encourage & support research and cooperation • funding for educational programs • advice • reinforcement message

Appendix O

Title: Hierarchy of Terms (Chapter 9)

Table O.1 **Hierarchy of Terms: Control**

CODE No.	INITIAL CODE	ILLUSTRATIVE CASES	NEW CODE
1.1	Cooperative Culture	• sense of shared experience & shared awareness • a shared responsibility mindset	1.1 Sharing Attitude
1.2	Strategic Control	• analysis of failures • benefit cost ratios • accountability • performance monitoring	1.2 Reflective Accountability

Table O.2 **Hierarchy of Terms: Coordination**

CODE No.	INITIAL CODE	ILLUSTRATIVE CASES	NEW CODE
2.1	Network Connectivity	• work with community • community engagement processes • community movement towards a shared vision of safety for all • wide spread advocacy and communication program • consultation with industry • vision underpinned by community values	2.1 Commitment to Engagement

Table O.3 Hierarchy of Terms: Information Sharing

CODE No.	INITIAL CODE	ILLUSTRATIVE CASES	NEW CODE
3.1	Value Proposition in Information Sharing	• rationale for the selection of policies • linkages and synergies • embedding the 'road safety message' into the curriculum • linked to other national strategies and agendas	3.1 Policy Embedment
3.2	Relationship Nature	• ABS documentation • lessons to be learnt • adoption of legislation modelled on overseas	3.2 Learning Attitude

		experience • peak bodies	
3.3	Information Sharing Regulating Instrument	• clarity • means to overcome privacy and legal issues [safeguards]	3.3 Information Sharing Clarity
3.4	Leadership Commitment to Information Sharing	• encourage & support research and cooperation • funding for educational programs • advice • reinforcement message	3.4 Action-Inducing Support

Appendix P

Title: Development of an NRSS through PDI (Chapter 9)

Table P.1 Development of an NRSS through PDI

	Government Role	Community & Trade Stakeholder Role	PDI Implementation Processes	Activities Conducted
1. Participatory Appreciation of Issues	Provide capacity for local authorities to undertake road safety audits and collate data about relevant issues Provide a forum for wide, open consultation Legislate the establishment of a permanent lead agency Develop guidelines for harmonisation of data categorisation and collection Secure the commitment of all parties Access learning from overseas & local experiential learning Establish synergies across all areas of public administration	Organise into communities of practice Provide input related to local conditions Identify beliefs and attitudes Develop a central message Adjust assumptions and beliefs with scientific evidence Categorise issues e.g. vehicle occupant protection, human error, user behaviour, roadway safety etc Access experiential information from other jurisdictions and overseas Understand ROI	Learning Attitude Information Sharing Clarity Policy Embedment Commitment to Engagement Sharing Attitude	Appreciation of a wide range of issues at a local level Development of Road Safety principles Taxonomy of lead and lag issues Significant open participation Broadening of goals to create national objectives Working process agreements (commitment to reciprocal goodwill) Protocols and safeguards for information sharing Methodology for categorisation of issues
2.Participatory Appreciation of Options & Trade-offs	Establish terms of reference for modelling Engage experts in modelling of outcomes Provide guidelines for transparent dissemination of modelling methodologies Engage information communication specialists	Provide sensitivities and rationales to influence policy direction Establish consensus in relation to priorities Assess trade – offs Submit stakeholder comments to drafts of the NRSS Define acceptable returns on the social investment	Information Sharing Clarity Action – Inducing Support Reflective Accountability Commitment to Engagement Learning Attitude	Workshops to gauge the reactions to modelling results Development of objectives & a guiding vision Establishment of a number of alternative local solutions Information sharing communication fora Consultation for prioritising interventions
3.Deliberative Delivery of Social Outcomes	Adopt mean (average), ambitious targets based on local targets Provide funding Commission research	Mobilise a movement towards the achievement of the local targets	Reflective Accountability Commitment to Engagement Action – Inducing Support	National targets NRSS publication at the jurisdictional level (strategy owners) Communiqué at the top level endorsing NRSS

4.Reinforcement of a Central Message	Provide enforcement, education, data sharing safeguards Seek accountability for funding (i.e. ROI, C:B) Fund research & awareness events Build capacity for data collection and analysis	Provide information on the achievement of benchmarks Develop awareness events Seek accountability for policy implementation Help change attitudes	Reflective Accountability Sharing Attitude Information Sharing Clarity Policy Embedment	Reinforcement of a central message by all stakeholders (especially the government) Mutual adjustment of plans as these are frequently reviewed Publicity of a wide range of achievements

Appendix Q

Title: Code Book (supported initial deliberations for Chapters 6 and 10**)**

Contents

Definitions

Code *- to code is to label a text with the following: (forging partnerships)*
Independent Coder *- research officer, hired to provide preliminary coding*
Lift *- identify and copy/transcribe*
Relevant Text Extract *- words used by the writers of the submissions, which relate to either forging partnerships or communication strategy*
Writers *- submission authors*

Introduction

In 2010, the Australian Transport Council requested written submissions from the public about the draft copy of the Australian 2011-2020 National Road Safety Strategy. 544 members of the public in all states and territories responded. These written submissions will be preliminarily examined in this project.

This initial examination entails:

a) reading all 544 written submission;
b) highlighting, isolating and transcribing the text extracts related to the ATC's *commitment to engagement*;
c) listing identifying features next to the text extract (e.g. state & writer's information); and
d) creating a table of the sample characteristics.

Each one of these tasks is elaborated further in the section entitled Project Tasks.

The upcoming sections describe the project arrangements and its chief components such as aims and tasks (section 1). Section 2 provides some research guidance and includes frequently asked questions (FAQs). Section 3 sets out the expectations for

information sharing between the independent coder and the principal researcher. Section 4 outlines the negotiable project completion time frame of 2 to 4 weeks.

Section 1: Research Project Overview

This research project is estimated to take up to approximately 30 hours. It is expected to be undertaken by a single Research Officer, Ms Sara Hair. Ms Sara Hair will report directly to Mr Joao Canoquena, the principal researcher, on all matters related to the project tasks. Ms Sara Hair will liaise with Dr Mark King, the co-author, in relation to payments and employment matters.

The payment for the 30 hours is sourced from Mr Joao Canoquena's study allowance (i.e. PhD student funds). Dr Mark King will advise Ms Sara Hair further on how to get paid.

The 30 hours are, initially, expected to expire at the end of May. Both Ms Sara Hair and Mr Joao Canoquena, under the guidance of Dr Mark King, will negotiate a mutually agreeable timeframe (i.e. start & end dates).

For the purpose of due acknowledgement in the output of the current project, Ms Sara Hair is engaged as an independent coder. Her role is described in the project tasks listed below.

AIMS

The first aim of this project is to 'lift' as many relevant text extracts as possible from 544 written submissions. 'Lifting' means identifying and transcribing relevant text extracts. Secondly, this project also seeks to create a table of sample characteristics for the 544 written submissions.

OUTCOMES

This project has two main deliverables, namely:

1. a list of relevant text extracts with identifying features (i.e. state & writer's information); and
2. an accurate table of sample characteristics.

PROJECT TASKS

The overall job in this project is to identify relevant text extracts in 564 written public submissions. The text extracts must relate to the *commitment to engagement* (Canoquena, 2013) adopted by the Australian Transport Council, in particular, but more broadly, the Australian government. In order for the Research Officer to be able to 'lift' the text extracts relevant to the ATC and the government's *commitment to engagement*, a coding scheme has been developed.

A coding scheme is a set of instructions for labelling/coding text extracts. It can also be a set of descriptions of concepts. In this project, the coding scheme represents both brief descriptions of the key concepts and instructions for identifying and labelling the text extracts in the 544 written public submissions. This manual of instructions is described below.

Coding Scheme

Table 1 provides a description of *commitment to engagement* (Canoquena, 2013). This description will be used to help the Research Officer identify relevant text extracts from the 544 written submissions. In the table, the two indicators of commitment to engagement are said to be *forging partnerships* and *communication strategy.* Therefore, the job of the Research Officer is to highlight and transcribe (or simply copy & paste) the text sentences or paragraphs, which make reference to *forging partnerships* and/or *communication strategy.* This exercise is assisted by a set of instructions provided in this document.

Table 1: Description of Commitment to Engagement (PDI)

Forging partnerships	Communication strategy
'Work in partnership with community groups to deliver behaviour change programme' AGF, pg. 4	'Strong focus on improving the road safety for vulnerable road users' AGF, pg. 13
'Working with community organisations to develop support for speed control initiative' AGF, pg. 25	'A comprehensive communication and marketing strategy focussed on community awareness' ARRBG, pg. 6
'Enforcement activities need to be accompanied by clearer initiatives aimed at engaging the community' ARRBG, pg 6	'A greater focus throughout the strategy document is suggested focussing on the need to communicate the benefits of road safety countermeasures to the community' ARRBG, pg. 6
'Acknowledgement of these organisational stakeholders will prompt further Consultation on specific road safety measures' ARRBG, pg. 6	'A vision statement more in line with Safe System principles be presented' ARRBG, pg. 3
	'The savings achieved by the reduction in the general urban speed limit really need to be reported' AECOM, page 2

Source: Canoquena, 2013

Before the instructions are given, it is important to fully understand the two new concepts – *forging partnerships* and *communication strategy.*

Forging partnerships

Governments build partnerships with relevant stakeholders by working jointly with community groups. In addition, *forging partnerships* also means to link enforcement with community engagement activities. Furthermore, for governments to show that they are *forging partnerships*, these need to acknowledge a wide range of stakeholders and engage them in consultation (Canoquena, 2013).

To locate the references to the description provided above, look for mentions of:

- working in partnership (especially, but not uniquely, with the community and interest groups);
- linkages across activities/initiatives;
- acknowledgement of stakeholders; and
- consultation with stakeholders.

Communication strategy

This concept means an emphasis in the interaction between the government and the public on the improvement of road safety for vulnerable road users. In addition, it relates to the comprehensiveness of the communication strategy adopted by the government. Furthermore, references to the focus on community awareness are also about a government's *communication strategy.* Communication of the benefits of a

strategy to the community is equally about the *communication strategy* (Canoquena, 2013).

To locate the references to the description provided above, look for mentions of:

vulnerable road users;

- improvement of road safety for vulnerable road users;
- extent of comprehensiveness or otherwise of the communication between the Australian Transport Council or any other government Department with the community;
- community awareness;
- the need to inform the community; and
- the manner in which the benefits of a strategy are communicated to the community.

To facilitate the job of the independent coder, a sequence of tasks has been established. However, the independent coder may use a different sequence. It is only important that the descriptions and instructions listed above guide the 'lifting' of relevant text extracts.

Task 1: Read all 544 Written Submissions

The written submissions may be given as structured or 'unstructured' pieces. Structured pieces answer the five ATC's questions in a fixed sequence, with the answers appearing after the questions. This type of answer also includes those submissions, which do not contain all 5 questions. In other words, some writers elected to answer only some of the 5 questions.

The answers to question 5 tend to offer the richest material for this research project as these tend to relate to the communication strategy adopted to interact with communities by the ATC and government agencies. Question 3 is also enlightening. Here, the writer may indicate that there is a great deal in the National Road Safety

Strategy that is not clear. In this case, this is relevant to the current project. It refers to *community awareness.*

'Unstructured' answers represent a 'free' style text (e.g. Victoria; submission 0112), without questions. These are so called because despite their internal structure, the answers are not aligned with or sequenced in the same way as the five questions the Australian Transport Council sought answers for. These texts may be much harder to skim through. Careful reading is required when it comes to 'unstructured' answers. Particular attention must be paid to 'implicit' meaning. This represents ideas, which are not stated in the words, but are implied in the gist of the message.

After identifying the relevant extracts through skimming (general, quick reading) and scanning (detailed, slow reading) as indicated in the two preceding paragraphs, run a final search for keywords and read the text around the keywords more closely (i.e. scan it).

For 'forging partnerships' use:

- partnership or partner
- stakeholders
- acknowledgement
- acknowledg*

For 'communication strategy' use:

- vulnerable road users
- comprehensiv*
- communicat*
- inform*
- community
- benefits
- awareness

* represents a wild character, enabling the search engine to look for a wide range of word variations. For instance, *inform** will yield: informed, informing, informed etc.

Please, note that the two methods listed above (i.e. reading the text and running keyword searches) are not mutually exclusive. You must employ both.

Task 2: Highlight Relevant Text Extracts

Use the coding scheme provided above to identify relevant text extracts.

If using NVivo10, code/label the relevant text extracts as either 'forging partnerships' or 'communication strategy.' If using Word, simply highlight the relevant text extract and write (forging partnerships) immediately after the highlighted text extract. Highlighting means either using U from the function bar on Word or using the colour highlight ab (preferred).

Task 3: Isolate Relevant Text Extracts

Once tasks 1 and 2 are completed, the relevant text extracts must be removed from the rest of the written submissions. This can be achieved by deleting everything else around the relevant text extract. By so doing, the Research Officer will be able to keep only those text extracts, which have been deemed relevant to either *forging partnership* or *communication strategy.*

Task 4: Transcribe Relevant Text Extracts

If NVivo10 is used, this task will not be required. However, if Word is used, simply copy and paste the relevant text extracts from PDF (original) to a Word document. In some cases, transcription may be required. If this is the case, type up verbatim.

It is important to always transcribe 'units of meaning.' In other words, transcribe a full sentence or a full question rather than simply a phrase. A phrase does not have a verb and is often 2-3 words long.

Examples of sentences

> Give some credit to the majority of road users that they have played a part in the road trauma reduction and it is not all due to enforcement and safer cars. Do this by acknowledging that the speed on some roads is too high, but on others it is too low. Treat road users as intelligent people - do not reduce us all to controlling the lowest common denominator. [Victorian writer; no identifying writer's info]

Examples of phrases

> Give some credit to the majority of road users that they have played a part in the road trauma reduction and it is not all due to enforcement and safer cars. Do this by acknowledging that the speed on some roads is too high, but on others it is too low. Treat road users as intelligent people - do not reduce us all to controlling the lowest common denominator. [Victorian writer; no identifying writer's info]

Task 5: List the Identifying Features

This task requires close scanning (slow and careful) of the text to identify references such as:

I

I'm

I was

We

As a

Myself

Some examples from the submissions include:

- DO NOT MAKE 0.00 THE ALCOHOL LIMIT AS SINGLE PEOPLE SUCH AS MYSELF WHO HAVE BEEN DRIVING FOR 44 YEARS [Victoria; driver; 44 years of driving]
- As a driver instructor who teaches 16 and 17 year olds each year about 15% have extremely poor practical skills e.g. very poor steering, use of left foot on the brake … [Victoria; driver instructor]

In those cases where no reference is made to the person writing the submission, simply indicate 'no identifying writer's info.' Use […] immediately after the text extracts.

Task 6: Create a Table of the Sample Characteristics

This is a table about the relevant text extracts. It will ignore (leave out) the written submissions not used. In other words, the table of Sample Characteristics is only meant to reflect the information in the isolated text extracts. See an example below in table 2.

Only the full list of text extracts can inform the Research Officer as to what contents the table should have. For this reason, it will be best to wait until all relevant text extracts have been isolated before deciding on the contents of the sample table.

The illustrative example of a table of sample characteristics listed below is only a guide.

Table 2 Example of Sample Characteristics

	Stakeholder Submission Representativeness (Australia)						Document Length (in pages)		Authors	
State	NSW	ACT	VIC	SA	QLD	WA	Mean	13.2	Managers	33%
Absol. freq.	3	2	5	1	3	2	Mode	3,12	Officers	27%
Rel. freq.	18%	12%	31%	6%	18%	12%	Median	12	Academics	20%
									NS*	20%

* Not Stated

It is important to note that there might be more than one text extract from a single writer. If this is the case, care and caution must be exercised in reporting these occurrences. The total number of text extracts will not differ, independently of the sources of the extracts. Therefore, if 300 text extracts are isolated, 300 text extracts are reported. However, the total number of authors is reported to reflect the reality. If

only 250 wrote the 300 isolated text extracts, that is what gets reported. However, there will need to be an additional figure, which is the average number of text extracts per writer, which in this case is 1.2.

The length of the text extracts in words should be reported as should the State the pieces originated from.

In those cases where the writer cannot be identified, the abbreviation NS should be used with a legend added to the bottom of the table to indicate what this short form means. NS means *Not Stated*.

An additional category in this table of the sample characteristics may be the writer's road user group. This should capture the following items: driving instructor, cyclist, truck driver etc. If there are too many categories, these will need to be collapsed into broader groupings. For instance, if the ages of the writers can be identified in most cases and these are given as 25, 26, 27, 32, 41, 45 etc., age ranges must be used such as 25-35, 36- 46 etc.

PROJECT TIMELINES

There is a need for the Research Officer to establish the number of hours per week or day they can commit to this project. Given that its total number of hours is 30, the following Gantt chart can be used to track the progress of the project. However, it is expected that the Research Officer will forward an updated version of this timeframe with precise timelines to the principal researcher at their earliest convenience.

Table 3 Project Timelines

No	SPECIFIC PROJECT DUTIES	22.02.14	23.02.14				
1	Familiarize with the coding scheme.	1					
2	Trial the coding scheme with the principal researcher on 10 written submissions.		2				
3	Receive feedback from the principal researcher.		0.25				
4	Task 1 Read Written Submissions.						
5	Task 2 Highlight Relevant Text Extracts.						
6	Task 3 Isolated Relevant Text Extracts.						
7	Task 4 Transcribe Relevant Text Extracts.						
8	Task 5 List Identifying Features.						
9	Task 6 Create Sample Characteristics.						
10	Communicate the results.						

Legend: the numbers in the boxes/cells indicate hours

Note that some of the tasks listed above may be performed simultaneously. For instance, tasks 1 and 2 can be combined. You do not need to read and return to the texts to highlight. However, you may feel that you need to read the texts a few times. This is fairly normal in text analysis, especially when it involves coding it. Feel free to read the submissions as many times as you deem necessary.

The results can be communicated to the principal researcher in a number of ways, depending on the resources used for coding. If NVivo10 is used, the NVivo10 file in which the results are stored will need to be e-mailed over to the principal researcher.

If a Word file is used instead, this file is expected to be forwarded to the principal researcher via e-mail.

The sample table can be created on SPSS or simply on an Excel spreadsheet.

RESOURCES

The following resources are required for this project:
Mandatory (PDF files)

- Victoria_submission
- WA_submission
- Tasmania_submission
- SA_submission
- Queensland_submission
- NT_submission
- ACT_submission
- This manual (Independent Coder Instructions V. 2.0)

Optional (software package)

- NVivo10
- NVivo10 Manual – look up coding texts; or text analysis
- SPSS
- Word
- Excel

Section 2: Research Project Guide

ADDITIONAL ASSISTANCE

This is a fairly challenging project on many levels. However, the difficulties arising out of the complexity of the project should not impair progress. The Research Officer is encouraged to promptly contact the principal researcher via e-mail (preferably) to clarify any issues.

In addition, to guide the Research Officer, the principal researcher and the Research Officer will initially code 10 submissions from ACT 0050 – 0415, using the

instructions in this manual. This independent, simultaneous coding exercise will occur at a time and date of mutual agreement.

Once the Research Officer has familiarised herself very well with the two main concepts in this manual – *forging partnerships* and *communication strategy*, she should propose a start date to the principal researcher.

FREQUENTLY ASKED QUESTIONS

Why is this project being undertaken?

This project is a follow up program of research on a principle developed last year (2013) as part of the principal researcher's PhD thesis by publication. It expands on the principle of *Participatory Deliberative Integration* by using its indicators to show the usefulness of the principle. By being able to show that government departments' commitment to engagement can be gauged fairly reliably, it is hoped that improvements in the way governments engage with communities will follow.

Who is going to benefit from this kind of research work?

This project aims to investigate the way in which the public evaluates the ATC's commitment to engagement. It will help to create awareness of either strengths or weaknesses in government's engagement commitment. By providing a gauge of the government's commitment to engagement, this project will enable continuous improvement to occur in road safety management.

What is the job of the principal researcher and the co-author in the actual research?

Once the Research Officer has 'lifted' the relevant text extracts and created the sample characteristics, the principal researcher and the co-author will:
code 10 per cent of the 564 to check the agreement level with the first coder;
use Cohen Kappa to establish the inter-rater reliability;
re-label the relevant text extracts as units of meaning;
identify categories within the units of meaning;
compare the writers across the states and their perceptions;
write up the findings;
discuss the findings;
identify limitations of the research methodology;
draw conclusions; and
write up one or more journal article manuscripts.
The principal researcher is also tasked with the duty of supporting the Research Officer.

What labels am I expected to use on the relevant text extracts?

The Research Officer must only code the extracts as relating to either *forging partnership* or *communication strategy.*

What if there are no mentions of the two indicators listed above – i.e. *forging partnerships* and *communication strategy*?

This is highly unlikely as the principal researcher has already identified a number of references in the first 3 submissions from Victoria. Some of these references may be implicit. In other words, the stated words may not immediately relate to *forging partnerships* or *communication strategy.* However, on closer inspection, the reference may become apparent. Therefore, it is important to spend some time on the submissions, working out the gist of the ideas.

What happens, if a writer does not say anything about him or herself?

In this case, simply indicate: no identifying writer's information. Be sure to still mention the state, the word length etc. These details are used in the sample characteristics. One suggestion may be to include all the details in the code. A coded item would then look more or less like this:
(forge partnerships) [Victoria; male; truck driver; 34 years old; driving since 17; 25 words]
These details have been exaggerated to illustrate a point. This point is that each relevant text extract must be coded with sufficient information at the point of reading and highlighting. This is done as the extracts are identified. The tabulation of the data should occur at a later stage. Quite predictably, there will be a large number of missing items as different writers have chosen to disclose different personal information. Where there is a missing item, simply use the abbreviation NS.

Does the sample characteristics need to include the questions in the word count?

Because the sample characteristics refer to the relevant text extract, the questions are not necessary. The transcribed texts will not contain the questions as these will only be extracts.

How do I contact the principal researcher?

The principal researcher, Mr Joao M. Costa Canoquena (Costa), can be contacted on:

E costa.canoquena@student.qut.edu.au
T 0417173442

What if I get stuck?

Call the principal researcher. Alternatively, send him an e-mail.
Are all written submissions relevant to this project?

Not all written submissions contain relevant text extracts. However, all must be read carefully.

What is the latest I can finish this project by?

Ideally, this project should run over a 2-week period. The longest expected duration is one month. Nonetheless, the timeframe is negotiable. Because the principal researcher's new timelines have not been published yet, it is hard to indicate the time horizon in terms of the calendar year. Nevertheless, it would be ideal to complete the project by mid-April.

If I need an extension of the time, what do I do?
Send an e-mail to the principal researcher, cc-ing the co-author into it.

What if the 30 hours are insufficient?

This will need to be negotiated prior to additional hours being added to the project. The principal researcher and the co-author will need to be notified in writing well in advance

What is my hourly rate?

The co-author, Dr Mark King, is the best person to discuss the hourly rate with.

What tips can you offer me on completing this job?

Text analysis can be enjoyable. However, it can also be daunting. The best thing to do is to understand what exactly you are looking for. To do this, read the coding scheme in section 1. Familiarise yourself very well with the two main concepts (i.e. *forging partnerships* and *communication strategy*) before you read a text.
For instance, the following text may not appear to be related to either one of the terms.

> Speed cameras are nothing but revenue raising and as was proved in Vic when the cameras were shut down for 12 months they have ZERO effect on the road toll. [Victoria; no identifying writer's info]

However, on closer inspection, it can be inferred that the writer is voicing a concern over the benefits of an initiative. , it can be implied that they are not sold on the benefits of speed cameras. Therefore, this writer is referring to *communication strategy.*
Very often criticism in the comments is an indication of a relevant item. You only need to ask yourself: what is this about? What is this writer commenting about? In the example above, the words 'was proved' indicate some sort of position in an argument. This is a flag for closer inspection.
The best approach to adopt is, if in doubt, code/label it. The greater risk is not in having incorrectly coded items. It is in leaving relevant text extracts un-coded. Any incorrectly coded item will stand out throughout the subsequent examination by both the principal researcher and the co-author.

Section 3: Information Sharing with Principal Researcher

FREQUENCY

Ideally, it would help to receive frequent communication from the Research Officer. This could simply be a brief e-mail to indicate issues, progress and support requests. It is the job of the Research Officer to indicate the frequency of the communication, which is most convenient for her. However, there should be no period longer than 72 hours without any communication.

EXPECTED UPDATES

Within the first 5 hours of coding, the first Skype discussion should occur. At the half - way mark (approximately 15 hours into the project), a second Skype discussion should take place. The third Skype discussion may happen 5 hours before the end of the project. These timeframes can be altered by the Research Officer to suit her needs. The discussions do not need to be via Skype. This can also be conducted through e-mails or the telephone.

Section 4: Project Completion

The project is expected to take up to two weeks, with the maximum time span hoped to be no longer than 4 weeks. The hours worked in a week will depend entirely upon the Research Officer's availability. This schedule flexibility must be balanced against the benefits of continuity. Stated otherwise, long breaks between coding activities may have an adverse effect on the Research Officer's ability to be consistent.

Reference

Canoquena (2013) 'Reconceptualising Policy Integration in Road Safety Management,' Policy Transport, Volume 25, pp. 61 - 80