INSTITUTIONAL BARRIERS TO IMPROVING ROAD SAFETY IN INDONESIA: AN INVESTIGATION IN FOUR CITIES

by

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ABSTRACT

The number of accidents in 2010 has become a baseline for the Indonesian government to take action in order to reduce the number of road accident casualties. Despite a slightly decreasing trend in such accidents, the number of crashes on roads remains very high; therefore, there is a need to examine why the actions that have been developed and taken have not achieved the expected results. Correspondingly, research investigates whether institutional barriers prevent the achievement of road safety management in Indonesia. Furthermore, how road safety is understood and implemented in Indonesia, and whether there are considerations in terms of sustainability of any road safety plan undertaken by the Indonesian government need to be investigated. Given the above reasons, the research reported in this thesis seeks to study the needs by considering four cities in Indonesia.

The empirical data has revealed that the road safety management system in Indonesia has been carried out based on the National Road Safety Master Plan (RUNK). However, the implementation has encountered several obstacles, including lack of availability of funds, weak institutional support, weak government commitment, and weak coordination. All of these problems are more related to institutional aspects.

In addition, data from interviews in different institutions can provide insightful information as to how they realize road safety in different cities, along with how the institution in top-level government, which is associated with road safety, is knowledgable in conveying the rules of road safety to local governments in order to be understood easily. Moreover, the improvement of road safety at the institutional level can be done by improving collaboration between institutions, opening good communication related to road safety program planning and implementing monitoring and evaluation continuously. Therefore, special attention from various parties is needed in order to find solutions to improve road safety in Indonesia, especially institutions that are responsible based on pillar one to pillar five, as listed in the RUNK.

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LIST of ABBREVIATIONS

ADB	Asian Development Bank
AIS	Accident Information System
APBD	Regional Revenue and Expenditure Budget
APBN	State Revenue and Expenditure Budget
ASEAN	Association of South East Asia Nations
BGORTRANS	Transportation Coordination Agency
BDG	Bandung
BSTD	Land Transportation Facility Development
BSM	Black Spot Management
CAS	Crash Information and Analysis System
DED	Detailed Engineering Design
DGH	Directorate General Highways
DGHE	Directorate General of Higher Education
Dikyasa	Education and Engineering Unit
DoT	Department of Transportation
DPR	The House of Representatives
DPW	Department of Public Works
DoT	Department of Transportation
DoA	Decade of Action
F	Female
FDI	Full in-Depth Interview
FKKL	Traffic Communication Forum
GDP	Gross Domestic Product
GNI	Gross National Income
GRSF	Global Road Safety Facility
HICs	High Income Countries
iRAP	International Road Assessment Programme
IndII	Indonesia Infrastructure Initiative
INPF	Indonesian National Police Force
Inpres	Instructions of the President of the Republic of Indonesia

IRE	Institute of Road Engineering
IRSA	Indonesia Road Safety Award
IRSMS	Integrated Road Safety Management System
ISC	Information Sharing Clarity
ITS	Intelligent Transportation System
JKT	Jakarta
JDDC	Jakarta Defensive Driving Counsulting
Kamsel	Security and Safety
KLLAJ	Traffic Safety and Road Transportation
Korlantas	Traffic Coordinator
KTD	Land Transportation Safety
LHR	Average Daily Traffic
LMICs	Low-and Middle-Income Countries
M	Male
ME	Monitoring and Evaluation
MPW	Ministry of Public Works
MoT	Ministry of Transportation
MoU	Joint Agreement
NSM	Network Safety Management
NSPK	Norms of Work Implementation Standards
NTSC	National Transportation Safety Committee
PGK	Pangkalpinang
PJO	Street Lighting and People
PLM	Palembang
PM	Ministerial Regulation
RAD	Recording Accident Data
RHK	Vehicle Stop Space
RSU	Road Safety Unit
RSIA	Road Safety Impact Assessment
RSA	Road Safety Audit
RSI	Road Safety Inspection
RUNK LLAJ	National General Plan for Traffic Safety and Road Transportation

RUNK	National Road Safety Master Plan
Satpol PP	Civil Service Police Unit
SIRS	The Hospital Information System
SPIs	Safety Performance Indicators
SR	Safer Roads
SV	Safer Vehicles
SRU	Safer Road Users
TurBinBangWas	Arrangement, Development, Development and Supervision
UD	Un-Divided
ULFJ	Road Function Worthiness Test
UN	United Nation
VRUs	Vulnerable Road Users
WHO	World Health Organisation
WTN	Wahana Tata Nugraha

CHAPTER 1

INTRODUCTION

1.1 General

The growth of motorization affects road safety issues (Gwilliam, 2003; Susilo et al., 2007). Accidents on roads have numerous detrimental effects on road users. Chena et al. (2017) assert that 'road traffic collisions are a critical global problem in terms of their economic and health sector impacts.' Road safety issues rise in low- and middle-income countries (LMICs) with regard to a number of accidents (WHO, 2013a; WHO, 2018), particularly in urban areas (Mohan, 2004; Mohan, 2007; Elvik and Vaa, 2004; Elvik, 2010; Elvik, 2014). According to the World Bank, low- and middle-income countries are determined based on the national income per capita (World Bank Data Team, 2017). Low-income countries are defined as countries with a gross national income per capita (GNI) of $1,045 or less. Countries are categorized into middle-income economies when the GNI per capita is between $1,046 and $12,736 (www.theguardian.com; www.worldbank.org; World Bank, 2018). As one of the middle-income countries, Indonesia faces road safety matters, such as a large number of motorcyclists due to the increase of motor vehicle ownership and the growth of motorcycles per annum (Vaza, 2012; World Bank, 2005).

Generally, the percentages of traffic accidents in urban areas are higher than in rural areas (Elvik, 2014). A number of studies have found that accident rates tend to be high in urban areas, yet lower on all-purpose rural roads and motorways (Elvik, 2010). The World Health Organization (WHO) attests that nearly half of the 1.27 million casualties in road accidents worldwide every year consists of pedestrians, motorcycle users and pedal cycle users (Sutanto,

2009). In Indonesia, The National Police reported that road accidents in 2010 had caused 31,234 deaths (Widyastuti et al., 2016).

Traffic accidents are driven by complex aspects, such as road management safety, road users' behaviour and institutional barriers (Koppenjan and Groenewegen, 2005). Issues of road safety have gone unsolved in nearly every country due to many motorists on the roads (Elvik, 2010). Apparently, the number of countries that engages coordinated approaches to implement road safety management is still limited (Eusofe & Evdorides, 2017). The reasons for accidents on roads are as follows: '(a) the problem is widely tolerated and not regarded as a problem; (b) solving the problem involves overcoming social dilemmas, which means overcoming opposition to effective but unpopular measures; (c) the problem is, to a certain extent, caused by biological factors or factors related to human development that are difficult to influence; and (d) the physics of kinetic energy involved in accidents are such that they make the problem difficult to solve' (Elvik, 2010).

Based on the case study conducted by Persia et al. (2016), the open-ended response of the respondents reveals that the major challenges for effective road safety management are: (1) 'Lack of resources/tools: the cost is too large, and available tools and/or staff are not sufficient with respect to the effort needed; (2) Not recommended/imposed: there is no regulation recommending or biding the undertaking of a procedure; (3) Unfamiliar/Unknown: there is a lack of know-how about the method and data needed; (4) Data not available: the data needed to apply the procedure is not gathered or easily accessible; (5) Other: other reasons from the above mentioned; and (6) Not applied anyway/reason unknown: a specific reason has not been identified.' Furthermore, Persia et al. (2016) report that 'lack of resources or tools is the most commonly stated reason.' Clearly, traffic accidents are primarily caused by poor road safety

management. In Indonesia, for example, the number of roads equipped with traffic signs, road markings and traffic signal equipment is hardly to be found. Accordingly, the reported traffic accidents have caused severe injuries to the victims ranging from light to fatal injuries.

1.2 Institutional Aspects of Road Safety

Institutional aspects at the national level and local government have become issues not only in Indonesia (Indonesian Infrastructure Initiative, 2016; Sutanto, 2009; Widyastuti et al., 2016), but also in other countries, such as Poland and ASEAN countries (Chena et al., 2017; Chmielewski, 2016). Institutional aspects (Robinson, 2008) are related to coordination and responsibility among the institutions (WHO, 2013a; Brammer, Jackson, and Matten, 2012; Eusofe & Evdorides, 2017; Khan, Lockhart, and Bathurst, 2018). In fact, road safety management requires the institutional aspect to be considered (Bliss and Breen, 2013). Factors that influence the institutional aspect are the political will of the policy maker (Idris, 2005), road safety policy (Idris, 2005; Robinson, 2008; Hoque et al., 2012; WHO, 2013a), commitment and leadership (Robinson, 2008), coordination between institutions (WHO, 2013b), the roles and responsibilities of the organisation concerned (WHO, 2013b), and laws and regulations (WHO, 2013b). To sum up, the institutional aspects need to be considered (WHO, 2013b) and used as one of the aspects of road safety management assessment.

1.3 Road Safety Management in Indonesia

Indonesia has become one of the countries with the highest number of fatalities due to traffic accidents (Pranoto et al., 2017). The number of accidents tended to increase (Rostanti and Hafil, 2017) for slight and severe injuries and deaths between 2006 to 2012. In addition, automobile accidents caused more than 30,000 deaths on the roads during that period (Sitohang, www.unescap.org). Typically, road accidents become very serious problems (Jusuf,

Nurprasetio, and Prihutama, 2017; Chena et al., (2017)). In 2014, for example, the Indonesian Police reported that approximately 28,000 fatalities happened. This number is higher compared to those in Singapore (4.8) and Australia (5.2). Conclusively, a good understanding of the problem is expected in order to improve road safety (Jusuf, Nurprasetio, and Prihutama, 2017).

As a matter of fact, traffic accidents in Indonesia occur because of some fundamental reasons, and are not merely caused by engineering problems. A steady increase of population growth, poor service of public transport, and driver behaviour become significant causes of traffic accidents. Most of the big cities in Indonesia face similar issues in traffic safety management; thus, the resolution of traffic accidents should be regarded as a prime concern. It follows that collaboration among the institutions are required in order to find effective approaches to solve these issues.

In Indonesia, information on accident victims on the road and the causes of road crashes are not 100% reported. Indonesian Infrastructure Initiative (2016) reports that 35% of severe injuries and deaths occur every year on provincial roads, 28% on local (regency) roads, 7% on village roads, and 30% on national roads. Typically, accidents on roads have occurred by approximately 75% due to traffic composition whereas there is no difference between motorised and non-motorised vehicles (Kidokoro and Kubota, 1997). Based on Sutanto's (2009) study in three provinces in Indonesia (Jakarta, Jambi and West Java), accidents in these three cities were caused by 'inherent fundamental problems of an imbalance between the supply and demand of traffic systems.' Moreover, Widyastuti et al. (2016) state that the roads that are Undivided (UD) create head-on collisions between vehicles, and this type of crash has become the most prevalent in both Surabaya and Sidoarjo, two cities in East Java Province, Indonesia. These

cases prove that road safety management has become one of the factors that triggers accident occurrences on roads.

Typically, Indonesia encounters problems in the data storage system. In this century, having a good data storage system with IT as the platform can accelerate the data collection of road accident casualties, and can be used as a good concept of human safety (Chmielewski, 2016). Therefore, road safety in Indonesia must be in accordance and comply with the procedures of good road safety management, including data management.

As reported by Indonesian Infrastructure Initiative (2016), the Indonesian government has been seriously concerned about the issues of road safety management, and since 2013, the Indonesian government has issued regulations and designed programs in order to improve road safety management. However, despite this, a lot of research reveals that national roads in big cities in Indonesia are at high risk for traffic accidents, not to mention the roads at regional and local levels. Therefore, the researcher conducted a case study in four big cities in Indonesia, namely, Pangkalpinang, located in Bangka Belitung Province, Palembang, located in South Sumatera Province, Bandung, located in West Java and Jakarta, located in DKI Jakarta. The tittle of the study is 'Institutional Barriers to Improving Road Safety in Indonesia: An investigation in four cities.'

1.4 Problem Definition

The number of accidents in 2010 have become a baseline for the Indonesian government to take action to reduce the number of road accident casualties. During the 2016 – 2020 period, the Indonesian government has targeted to reduce the number of accidents by 50% (Korlantas Polri). The Indonesian government launched the Decade of Action (DoA) for Road Safety Indonesia in 2011 by the Vice President of the Republic of Indonesia in Jakarta. The vision of

the DoA is to make Indonesia the role model in road safety coordination in Southeast Asia (Sitohang, www.unescap.org). It is expected that an effective road safety institution supported by an accurate information system can be established in order to conform to the provision of road facilities with quality standards.

Furthermore, Indonesia takes certain actions to improve road safety (Korlantas Polri; Rostanti and Hafil, 2017) through action programmes, such as a road safety campaign (Widyastuti et al. 2016), which focuses on speed limits (Coconuts Jakarta, 2017). As reported by the WHO, fatal accidents increase by 20% when the vehicle speed has exceeded 60 km/h (Coconuts Jakarta, 2017). Accordingly, the Indonesian Ministry of Transportation has developed a number of policies as the main priority for speed limits, especially in school zones and potential accident locations.

Another action to reduce accidents is to apply the Integrated Road Safety Management System (IRSMS), along with the Crash information and Analysis System (CAS). The CAS is aimed not only to define the number of casualties and crashes set out previously, but also to record all needed crash details, location and information in order to develop a solution and identify potential crash locations (Ryder, Gahr, and Dahlinger, 2016). These suggest that new policies are developed to regulate the roadworthiness of public transport vehicles and the requirements for drivers (Coconuts Jakarta, 2017).

Despite a slight decreasing trend in accidents, the number of crashes on roads remains very high (Rostanti and Hafil, 2017). There is a need, therefore, to examine why the actions developed and taken have not achieved the expected results. Correspondingly, research investigates whether institutional barriers prevent the achievement of road safety management in Indonesia. Furthermore, how road safety is understood and implemented in Indonesia and whether there

are considerations in terms of sustainability of any road safety plan undertaken by the Indonesian government need to be investigated. Given the above reasons, the research reported in this thesis seeks to study the needs by considering four cities in Indonesia.

1.5 Aim and Objectives

The aim of this thesis is to improve road safety in Indonesia by focusing on institutional issues and associated barriers, using four cities as case studies. The objectives of this research are:

1. To assess the current status of road safety management in Indonesia in a systematic manner.
2. To identify the main factors that affect road safety at the institutional level.
3. To examine casualty data and its impact on road safety at the institutional level.
4. To compare implementation barriers to road safety management by using case studies.
5. To explore how improvements could be made in order to deliver a safe road transport system at the institutional level.

1.6 Layout of the Thesis

In order to achieve the objectives detailed in section 1.3, this thesis is structured as follows:
Chapter 1 consists of research background, problem definition, aim and objectives, and thesis scope and structure.

In Chapter 2, the concept of road safety is examined in detail. This chapter begins by exploring the concept of the road safety management system, including its weaknesses. Institutional barriers regarding road safety are elaborated on in this chapter. In addition, sustainable safety, a safe system approach, including its elements, and the role of data and its analysis are discussed.

In Chapter 3, the methods that were employed in this study are described. This chapter begins with the overall aim and themes of road safety issues, which leads to the selection of a case study method and a full in-depth interview. Furthermore, the sampling method and data collection and analysis are discussed thoroughly, along with the conclusion.

The current status of road safety management in Indonesia will be discussed further in Chapter 4. This chapter presents several related studies that have been carried out across Indonesia. Moreover, the level of road safety across Indonesia is also discussed.

Chapter 5 presents the empirical data. In this research, the analysis of institutional barriers in Indonesia will be based on three themes: Engineering, Institutional, and Economic. In addition, the comparison by using case studies in four cities, along with the improvement for road safety at the institutional level will be demonstrated.

In Chapter 6, the accident data and its impact on road safety at the institutional level are explained in detail. Accident factors and the system for recording and storing accident data are also analysed.

In Chapter 7, the key findings and contributions of the study are presented as well as limitations. Recommendations for further research are also be presented here.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review is organised as follows: The first section reviews the main principles applied in road safety management. The second section summarises the weaknesses of the road safety management system. The third section elaborates institutional barriers for implementing road safety. The forth section reviews sustainable safety in urban areas, and then the safe system approach is summarised in section five. Finally, the sixth section discusses the role of data and its analysis related to road safety management.

2.2 Road Safety Management

Road safety management influences the safety of road performance and road users greatly. As Hughes et al. (2015) state, 'more than 1.2 million people die worldwide as a result of road traffic crashes and some 50 million are injured per annum', road safety management critically contributes to the safety of road users as well as the accessibility of the transpotation movement. As a systematic process, effective road safety management needs to be supported by the availability of working management system models for jurisdication and organisation, which then helps address the Decade's goals (OECD). In addition, the progression of Intelligent Transportation System (ITS) supports the sustainable safety. As stated by Oskarbski (2017), 'automation of incident management helps to reduce the time of a rescue operation as well as the normalization of the flow of traffic after completing a rescue operation, which also reduces the risk of secondary accidents and contributes to reducing their severity.'

2.2.1 Management Concept of Road Safety

In countries with the safest road networks, the characteristics of their road safety management share some common entities, such as better safety outcomes, a systematic approach to intervention and a better institution (OECD). The management tools, jurisdication, and road safety approaches that are related to the conduct of road safety management must comply with one another. Consequently, the decision makers and related institutions that hold mandates to share responsiblilities for designing, maintaining and evaluating road management safety must have knowledge and skills on the effective management of road safety based on theories and practices as these become the grounded platforms for designing and implementing road safety management. In fact, road safety management should be underpinned based on successful practices while the failures of road safety management from the experiences stored in the databases could increase the authorities' awareness of ineffective road safety management and plans.

There are many theoritical frameworks and approaches that can be used to generate effective road safety management, such as the 'SUNflower' pyramid, which describes road safety management systems in terms of a five-level hierarchy: (i) structure and culture, (ii) programmes and measures, (iii) 'intermediate outcomes' – safety performance indicators (SPIs), (iv) final outcomes – fatalities and injuries, and (v) social costs (Papadimitriou and Yannis, 2013). A study conducted by Papadimitriou and Yannis (2013) on the relationship between road safety management and road safety performance at the country level in 30 European countries reveals that road safety managements are structured according to three gauges, namely, 'vision and strategy', 'budget, evaluation and reporting', and 'measurement of road user attitudes and behaviours.'

In order to avoid accidents and reduce the number of traffic crashes, road infrastuctures must comply with the overall safety performance standards. Therefore, strategies and approaches to decrease the number of road traffic accidents and injuries need to be undertaken by complying with various areas, such as 'other modes of transport' (Helmreich and Merritt, 1998) as cited in Hughes et al. (2015).

Hughes et al. (2015) state that 'well-constructed models encourage effective strategies to improve road safety.' Oskarbski (2017) furthermore states that ITS resources can be used to support cooperation between emergency and preventive services with traffic control. Research by Oskarbski (2017) shows that the integration of new ITS services in the integrated transport management system on national roads in cities in Poland enable the process of storing data in the database, which then allows the data to be analyzed, and new strategies can be designed.

Furthermore, Hughes et al. (2016) emphasize that road safety management should be built on the system theory and the findings of research and practice, and 'properly implemented and evaluated.' Hughes et al. (2016) furthermore add that the conduct of safety mangement needs the participation and contribution of individual people, government agencies, companies, industry associations, interest groups and others who are correlated to the implementation of road safety management. In order to have effective and comprehensive safety management, the characteristics of models used for safety strategy and road safety policy tools must be thoroughly evaluated and incorporated. As described by Hughes et al. (2016), road safety strategy policy tools function as the practices undertaken by the government in order to minimize the number of road traumas, and they refer to 'policy measures, instruments, countermeasures, interventions, actions, responses and other terms.'

Furthermore, Hughes et al. (2016) define road safety strategy as ‘a combination of policy tools which are applied, although different road safety strategies describe the policy tools differently, or apply them according to different perspectives, such as whichever are the primary focuses.’ Research by Hughes et al (2016), which was conducted based on the nature of models used for safety strategy and road safety policy tools in literature has revealed that road safety components consist of transport and land context, economic context, social context, natural environment, human context, vehicles, crash response and safety management.

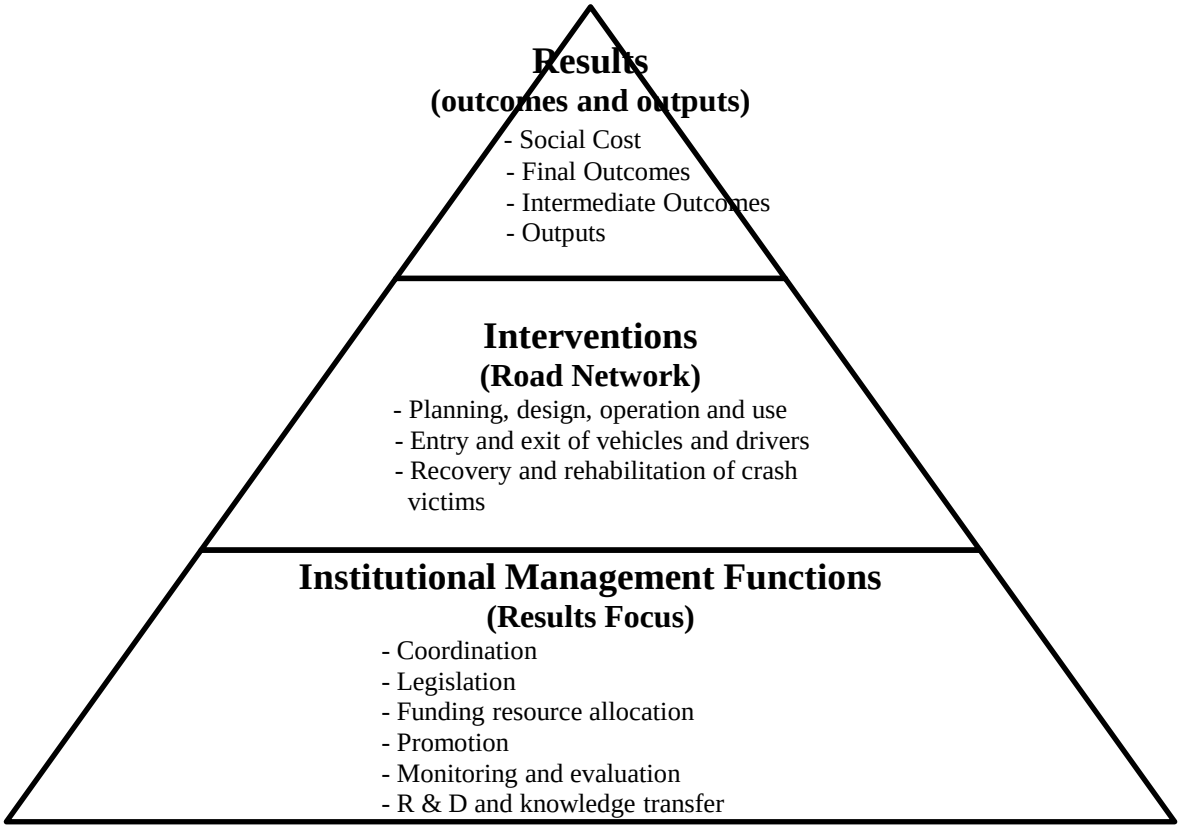


Figure 2.1 The Road Safety Management System
Source: adopted from https://roadsafety.piarc.org; Koornstra et al., 2002; Bliss, 2004)

Hughes et al. (2016) add that road safety strategies are highly emphasized in ‘disincentives’, referring to ‘regulation, enforcement, penalties and sanction’; ‘influence’, ensuring ‘driver competency, leadership, integration, implementation and participation, standards, guidelines,

behaviour change, skills, expertise, capability, professional practice, industry change, competition, consumer choice, innovation and research; and ‘incentives, referring to ‘financial incentives, pricing, subsidies, funding and investment to improve roads.’ In addition, there are three critical components that contribute significantly to the road safety management system: institutional management functions, interventions, and results (https://roadsafety.piarc.org). These three components are illustrated in Figure 2.1 above.

Based on the given figure, the first component is institutional management. Institutional management functions include ‘coordination, legislation, funding and resource allocation, promotion, monitoring and evaluation, reserach and development and knowledge transfer’ (Koornstra et al., 2002; Bliss, 2004). Institutional management functions concern a strategic orientation that is in line with all actual and potential interventions, analyse the achievement regularly, and initiate a performance management framework for delivering interventions and outcomes. Institutional management functions define the level of safety in terms of vision, goals, objectives, and targets (GRSF, 2009a).

The second component of the road safety management system is a system-wide intervention. Intervention typically addresses ‘the planning, design, operation and use of the road network, the products and services used within intervention, the conditions under which vehicles and road users can safely use intervention, and the safe recovery and rehabilitation of crash victims.’ (https://roadsafety.piarc.org). Intervention should be based on the standardized procedures alligning with the regulations, so that the safety of the road users from multiculcural backgrounds is highly prioritized. In addition, intervention should put a lot of effort into decreasing and eliminating road traffic accidents, the number of road traffic victims and any fatalities that bring calamity to road users. The fact reveals that countries implementing

standards and appropriate road safety interventions have reduced the number of road traffic accidents successfully.

In order to set up well-established road safety interventions, protocols and rules should be constructed under the theories, approaches and best practices that have been conducted by other countries that have succesfully applied road safety management; thus, reaching the targets and outcomes. Based on the report by PIARC, the strategies for intervention should be established based on 'safety-conscious planning and proactive safety engineering design, encouraging the use of safer modes and safer routes, safe separation/safe integration of mixed road use, managing speeds to crash-protection levels, providing crash-protective roadsides and vehicles, deterring dangerous behaviour and ensuring compliance with key safety by social marketing, and increased highly-visible police enforcement using camera technologies and other means; thus, providing proven driver assistance safety technologies in vehicles in order to help drivers keep speed limits, wear seat belts, avoid excessive alcohol, and manage risk via vehicle standards/designs and driver standards' (https://roadsafety.piarc.org). ITS resources can be used to support cooperation between emergency and preventive services with traffic control (Oskarbski, 2017).

The final component of the road safety management system concerns 'the measurement of results and their expressions as targets in terms of final outcomes, intermediate outcomes, and outputs' (Bliss, 2004). Targets are defined as the outcomes and goals that provide safety to all road users, which allign with the rules and protocols legalized by government, related agencies and stockholders who have a shared responsibility in road safety management. The parameter of safety is formulated and influenced by the interventions – the most appropriate and reliable intervention – addressed by govermental institutions, related agencies and stockholders.

However, studies show that selecting and applying the most appropriate and reliable road safety measures require scientific framework and studies. The appropriateness of measures demands evaluation and scientific methods so that the outcomes and safety can be achieved as the targets. Moreover, research finding by Laiou et al. (2017) reveal that the evaluation of the measures are to the extent that the safety contribution affects have become a high priority in more than 50% of stakeholders in almost all countries in Southeast European regions.

According to the EC-funded DACOTA research project, 'the most fragile element of road safety management in Eropean countries are policy implementation, funding and the lack of knowledge-based road safety policymaking' (Alfonsi et al., 2016). Sufficient fund allocations fabricate the theoretical frameworks to be created and implemented, so that effective road management systems can be built. The United Kingdom, Israel, Latvia, Italy, Swittzerland and France have successfully reduced the number of road traffic accidents. Based on the DACOTA report, these countries have seriously allocated the funding for road safety management. Meanwhile, Beligium, Austria and The Netherlands did not estimate the budget for road safety (Alfonsi et al., 2016). In addition, many LMICs have not estimated a sufficient budget for the design and implementation of road safety management.

A study by Alfonsi et al. (2016) has revealed that 'a general literature review and a desk analysis confirm that quantitative funding data for RSM is scarcely available with the exception of the global financial provisions for some national Road Safety Plans when adopted.' The funding policy and the goals targetting a high priority on road safety management seem to be contradictive. Many countries have to face the fact that the policy on road safety management allocates a low budget for road safety management implementation.

2.3 Weaknesses of the Road Safety Management System

Road safety management applied in LMICs encounter barriers that often occur because those countries lack the leadership of targetted strategies and road safety management system platforms, both at national and regional levels. Consequently, these cause failures to meet the global standards of effective road safety management systems. Additionally, the coordinations among the related governmental agencies run ineffectively and cause 'legislation to be fragmented' (WHO, 2013b), 'insufficient funding and poorly targeted promotional efforts narrowly directed, monitoring and evaluation systems ill-developed, and knowledge transfer limited' (GRSF, 2009a; 2013).

The biggest challenge for those countries and the international development on road management systems is how to successfully enact countries in the world to perform standard road safety management under the Global Plans' recommendations. These challenges also include the following queries: 'How to build road safety management capacity through institutional reforms; how to accelerate knowledge transfer and leapfrog previous paradigms; how to scale up investment; and how to increase international cooperation and development aid sustainably.' (https://roadsafety.piarc.org). From the queries above, it is obvious that sustainable development and mantainance of road safety management systems demand coordination among the government, governmental institutions and related agencies as well as stockholders who have shared responsibility.

In addition, it must be supported by strong infrastructures and transportation. Public awareness of their safety on the roads should be built because the road users' behaviors contribute greatly to road traffic despite the availability of safe road system management and strong infrastructures. A study conducted by Gichaga (2017) in Kenya has revealed that most of the

road users in the Northern Corridor of Kenya 'have not been exposed to education or training on road safety.' This research states that drivers' behaviors on roads have caused road traffic accidents. As suggested by Bliss and Breen (2013), it is urgent to follow and obey the Global Plans' Recommendation in order to hinder these complications.

2.4 Institutional Barriers

Road safety management requires well-established strategies, approaches and plans as noted by ASSET (2011): 'road safety is a complex and complicated domain and requires a holistic and dialectic approach for understanding the involved interactions and interlinked processes for reaching the best results of measures.' Furthermore, as mentioned by Eusofe and Evdorides (2017), since road safety has become the responsibility of the government, governmental institutions, all related agencies, and stakeholders, as well as citizens, then all of the related and involved components should engage actively in following and implementing the safest road safety management established by the authorities. It is clearly seen that road safety management requires well-established strategies, approaches and plans. In order to achieve these targets, several issues need to be allocated and solved, such as 'coordination and management of regulations, actions and techniques, funding for road safety, supervision and enforcement, addressing the lack of awareness among road users, determining accident-prone spots and sections, and addressing poor driver and vehicle standards, insufficient accident data and information, and inadequate research' (ASSET, 2011).

Many LMICs put these shared responsibilities solely on particular agencies and governmental institutions, which impedes reaching the targeted goals of the most effective and safest road management systems. In addition, even though the number of road crashes over the past decades has decreased, especially in developed countries as they follow effective, well-planned and

integrated approaches to road safety management, this does not apply to LMICs, which generally are not supported with strong infrastructures. Consequently, poor infrastructures bring negative effects on the economic sector and add more burden to the LMICs. As stated by Eusofe and Evdorides (2017), 'the impacts of poor road safety on societies and economies around the world result in an annual loss of Gross Domestic Product (GDP).'

2.4.1 Lack of Policy Integration

Research conducted by Wegman et al. (2015) on ex-post and ex-ante evaluation of both individual interventions and intervention packages in road safety strategies as well as transferability (external validity) in Western Australia, the Netherlands, Sweden and Switzerland, which all use similar aproaches and tools, revealed that policymaking and political decisions are significantly correlated to the results of analysis and research. The obstacles in designing and implementing the policy integration, which, in fact, can be altered and have been excluded, impede the implementation of road management safety and its processes (Elsig, 2010; Agranoff and McGuire, 2001; Herdegen, 2008).

In order to conduct effective road management safety, the parties and institutions that share responsibilities should all cooperate and incorporate 'multisectoral collaboration' (WHO, 2009). As a result of this, good and mutual understanding among the related institutions would be built; thus, avoiding misconception. However, as Perlman and Weatherley (1986) and Leutz (1999) emphasize, it is more challenging to make clear understanding of the misconception and perspectives that are related to fixed policy integration rather than to 'widen the persuasive power of the champions of policy integration' (Hull, 2005; Eriksson, (2016). Government, related institutions and agencies need to make road users understand and obey road safety rules. Moreover, as the innovation and development in road traffic management evolves, along with

the development of science and technology as suggested by Gichaga (2017), governments need to ‘implement regular checks to ensure that drivers, pedestrians, and other road users adhere to the Road Safety Rules and Regulations.’

Furthermore, as stated by Nilsson and Eckerberg (2009), ‘interaction of objectives and interventions across sectors has remained rhetorical’, and this prevents issues of misunderstanding the role and function of policy integration. As Canoquena (2013) states, the fallacious presumptions of policy integration abandon clear comprehension of what actions need to be taken to solve the issues; therefore, in order to initiate this, multisectoral collboration (WHO, 2009), which is achievable through the principles of policy integration need to be considered into the practices. Unfortunately, the fact indicates that mutual understanding towards the shared responsibilities on the definition and implication of policy integration often does not happen, and this inflicts serious impacts on the road safety management system and its implementation.

Regarding this, the new principle of policy integration, Participatory Deliberative Integration, can function as one of the solutions because Participatory Deliberative Integration offers robust structures to the conceptual framework for the alignment of effort across the parties and agencies under the transport, health, traffic law enforcement department and relevant economic and public sectors. The application of Participatory Deliberative Integration allot the related agencies and relevant departments to have shared responsibilities on road safety management. Thus, it enables them to colloborate and have committed understanding about the normatives, procedures and targets in the implementation of National Road Safety Strategies and Mix-Mode Integrated Timetabling (Canoquena, 2013).

In countries where agencies are interrelated, policy integration attempts to unite various governmental institutions and agencies to share responsibilities and build robust collaboration among them (Mickwitz and Kivimaa, 2007). The shared responsibilities structured in the policy integration (Thacher and Rein, 2004; Cejudo and Michel, 2015) have come to the surface regarding policy movement and tremendous government policy (Nilsson, 2005). These interrelated governmental agencies or departments (Hull, 2005) incorporate a variety of the movement strategy involvement with public policy tools (May, Tranter, and Warn, 2011). It is expected that the policy of road safety management among the interrelated agencies 'will generate a coordinated response to rising road traffic deaths' (WHO, 2009). In addition, the collaboration and shared responsibilities in policy integration will accelerate public awareness of the importance of 'law enforcement and shared social norms for safety' (Peden et al., 2004).

2.4.2 Government Boundaries

Even though the approaches and strategies of road safety management and systems have been broadening tremendously, the facts that many developed countries have successfully implemented effective road safety management at the national and regional levels in their territories, and that some countries have also reduced and minimized the number of traffic crashes on the roads, there are many countries that still face these issues. These breach occurences, in fact, can be solved as stated by May, Tranter, and Warn (2011), if the policy on the road safety management and system is developed and combined. In order to achieve the global standards that meet effective road safety management, a theoretical framework and successful practices should become the foundation for government in evaluating and revising new policies, so that it will contribute greatly to the advantages of road users and other life

sectors. As emphasized by Hull (2005), implementing the changes of road management safety cannot be put solely on a particular component or element.

2.4.3 Lack of Knowledge

Optimised road safety management systems can be achieved when those who get involved in the policy integration and decision making have sufficient knowledge of the theoritical framework and practices of effective road safety management, approaches, systems and strategies that meet the global standards. Lots of studies have revealed how developed countries have successfully applied effective road safety management in their territories. When the decision makers of the policy integration lack knowledge of how to achieve optimised road safety management systems, the issues arising from the misconceptions and the inappropriate intervention of the road systems will remain unsolved, as stated by Leutz (1999), and May, Tranter, and Warn (2011). The issues exist in road safety management because of lack of knowledge and information of the theoritical framework in road safety management principles and mantainance.

In fact, there are two main reasons that hinder optimized policy integration. Firstly, the concept of 'integration mode' has not been fully understood (Keast, Brown, and Mandell, 2007), and secondly, the adaptation or adoption of policy integration is not harmonized with the procedures and environment (Rayner and Howlett, 2009 as cited in Canoquena, 2013). Leutz (1999), and May, Jopson, and Matthew (2003) state that the adoption of policy integration cannot be well understood when the human resources who are responsible for planning and implementing road safety management do not have sufficient knowledge of how road safety management should be proceeded. Bliss and Breen (2009) add that misconception of the theoritical framework of

road safety management could occur because the human resources do not have similar perspectives with the theoritical framework.

2.4.4 Lack of Standards, Guidelines and Tools

Standards, guidelines and tools are the components of policy integration required to achieve effective road safety management; therefore, these three componenets must be well established. They also must convey consistent interpretation, meaning and delivery of policies that function as fundamental frameworks that structure the established practices and management. Standards, guidelines and tools must show linkages that harmonize with policy integration. Even with the development of a theorical framewok and effective practices of road safety management, unfortunately, there are still many LMICs that do not have standards, guidelines and tools of road safety management and policy integration.

Some countries establish standards, guidelines and tools by adopting standards, guidelines and tools from other countries without investigating the theoritical background and effective fundamental framework and principles for road safety management and policy integration. The scientific reasons that underlie the backgrounds for the policy making the standards, guidelines and tools have not been reviewed scientificially or throughly.

As the theoritical framework and approaches in road safety management and policy integration have been developing tremendously, a need to update policies and procedures regarding standards, guidelines and tools should become the agenda in conducting optimized road safety management and policy integration. As stated previously, the road safety management theories, models and approaches are changing and enhance the safest and the most efficient road safety management, which then urges the policymakers to improve and modernize integration policies, including the regulations, protocols, procedures and systems. In addition, ‘this

includes the need to update standards, guidelines and tools' (https://roadsafety.piarc.org). Similarly, as stated by Oskarbski (2017), 'traffic management and emergency systems on the road, using, among others, automatic detection, video surveillance, communication technologies and institutional solutions improve the organization of the work of various departments involved in traffic and safety management.'

2.4.5 Lack of Coordination

In LMICs, related agencies and institutions that are directly and indirectly linked with road safety management have boundaries that impede the coordination among them. Some of the agencies or departments do not have a vivid understanding of their responsibilities because the standards, guidelines and tools may contain biased instructions and information. As stated by Leutz (1999) and Hull (2005), '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.'

Some of the standards, guidelines and tools do not specify the correlation and shared responsibilities among the related agencies, departments, and government. May, Tranter, and Warn (2011) reveal that research that investigates the coordination in road sfatey management reveals that policy integrations have not been concerned with 'institutional, organisational and implementation issues.' In fact, coordinations through policy integration among any related agencies, local authorities, communities and government support the achievement of the optimized and effective road safety management because 'combining the safety benefits with those from asset improvement can often lead to better project viability' (https://roadsafety.piarc.org).

Integration among the interrelated agencies has various forms. Leutz (1999) introduces two models, namely, 'cooperation and understanding (horizontal integration) or domination and

conflict.' Keast, Brown, and Mandell (2007) define 'vertical integration as authority-driven whereas horizontal integration is relationship-oriented.' Oskarbski (2017) adds that 'basic functions of institutional management included coordination, legislation, financing and provision of resources, promotion and communication, monitoring and evaluation, research, and development and knowledge transfer.'

2.4.6 Lack of Interpretation

In 2004, the WHO advocated the need for 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). Responding to this, 'a conceptual framework for the integration of objectives at the national level has been developed in road safety management' (Bliss and Breen, 2013; Bliss, 2011 as cited in Canoquena, 2013). Institutional management function, specific action (interventions) and outcomes must be correlated in order to have road safety (Oskarbski, 2017). Therefore, 'Commitment to Engagement (CE) is achieved by having a strong focus on communication with the community and championing the benefits of achievements' (Canoquena, 2013). When comprehensive conceptual frameworks have vivid meanings and interpretations, then communication keeps going, presumptions that tend to cause fallacy can be hindered and the global standards of effective road safety management can be achieved. In accordance with this, Hughes, Annund and Falkmer (2016) state that a 'comprehensive conceptual framework has the potential to guide the development of road safety strategies to ensure they are complete, effective and efficient.'

2.4.7 Information Sharing Clarity

Canoquena (2013) defines Information Sharing Clarity (ISC) as 'the provision of safeguards for the confident exchange of information.' ISC gives adequate clarity of roles and shared responsibilities that enable collaboration and encourage optimized performance conducted by any related agencies in road safety management and policy integration. The clarity of roles and responsibilities of each related agency in road safety management and policy integration should be clearly explained and characterized. By doing this, as Canoquena (2013) states, 'ISC helps to remove ambiguity from definitions, responsibilities and roles, which, in turn, enhances clarity.'

Furthermore, optimized road safety management at the institutional level can be well-established and effectively implemented when 'legislation, coordination, promotion, monitoring and evaluation, and research and development through knowledge sharing' exist (Eusofe and Evdorides, 2017) as described in Figure 2.2 below.

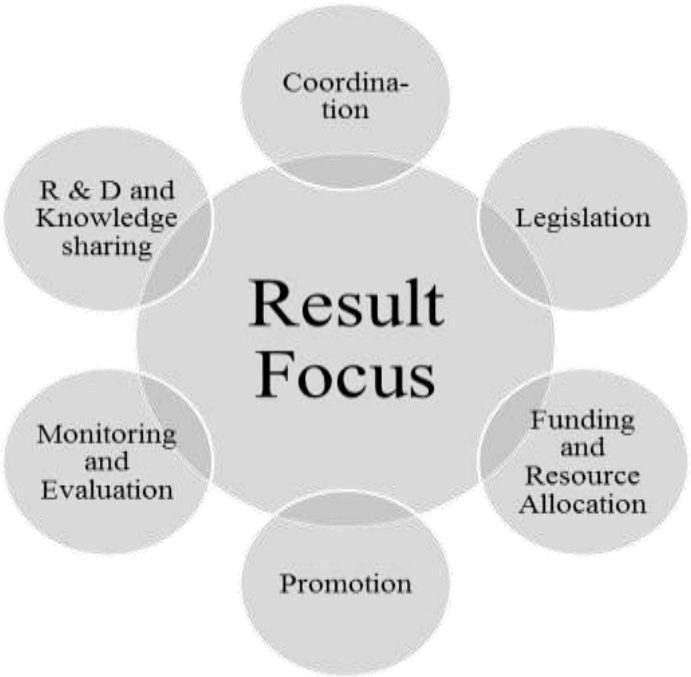


Figure 2.2 Institutional Management Functions
Source: Bliss and Breen, 2013; Eusofe and Evdorides, 2017

2.5 Sustainable Safety

One of the factors imposing road accidents is the condition of road infrastructure (WHO, 2013a). Therefore, the awareness of road safety has become WHO's priority since the number of road traffic accidents have been high (WHO, 2009), along with the high number of deaths and injuries that lead to fatalities in LMICs (iRAP, 2011). For example, in the states of India, the largest number of road deaths occur each year in Andhra Pradesh (Mohan, 2004). Road traffic accidents have also become a major issue in the public health sector in Bangladesh (iRAP, 2013), where 36% of people who died on the roads were under the age of 25 years and 51% of fatal crashes were experienced by pedestrians (iRAP, 2013).

Related to this issue, sustainable safety has become a high priority in all countries, including in LMICs. The definitions of sustainable safety have improved with the increase of awareness of protecting the road users' safety, along with implications that ineffective and unstandaridized road safety management bring to life sectors.

2.6 Safe System Approach

Safe-system thinking involves a view of the road transport system and the interactions among roads and roadsides, travel speeds, vehicles and road users. It is an inclusive approach that caters to all groups using the road system and recognises that people will always make mistakes that might result in road crashes, but the system should be forgiving of errors and those crashes should not result in death or serious injury (Muir et al., 2018).

The systematic approach provides a framework for identifying and analysing the interactions between elements of the road transport system, including its use and the associated crash and crash outcome risks (Howard, 2004).

The safe system builds upon a framework of the key road safety elements and their linkages (Howard, 2004). These elements and linkages are shown in Figure 2.3.

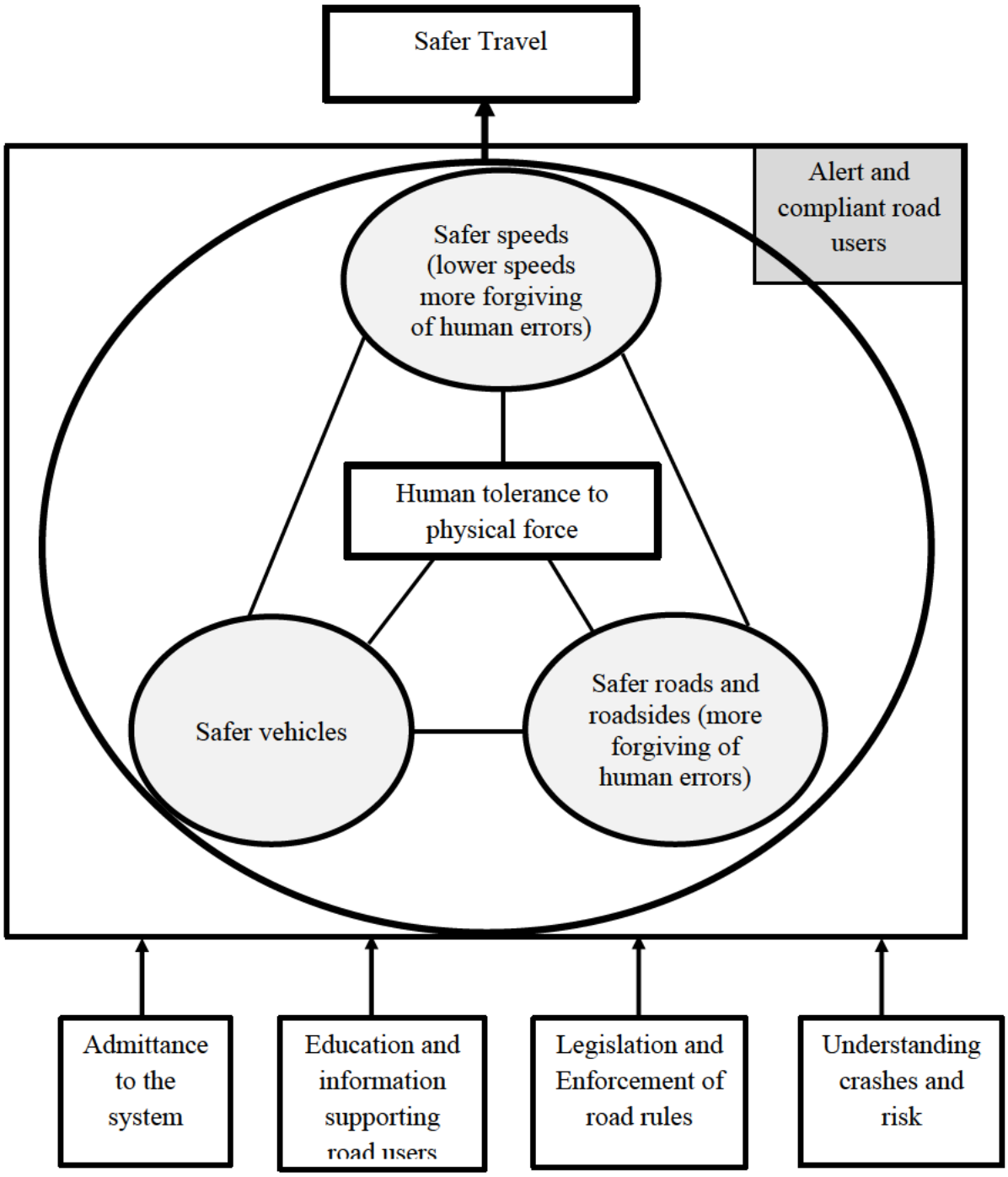


Figure 2.3 Safe System Approach
Source: Howard, 2004.

The most powerful and challenging concept within the safe system approach is that road users who are alert and fully compliant with road rules should not lose their life as a result of a crash on the road (Howard, 2004). However, it also anticipates that there are many other system designers – beyond the road and vehicle engineers – who impact on the use of the network and who also carry the major responsibility for these safer, survivable outcomes (Howard, 2004).

The safe system approach requires that the road transport system is to be designed on the premise that accidents are going to happen (even with a focus on prevention) and designed, structured and operated based on limiting external forces in any crash to a level that the human body can withstand, so that collisions do not result in death or very seriously impaired health (Howard, 2004).

Safe system approaches should be applied in road safety management, as stated by Oskarbski (2017), and traffic crashes and accidents reduce the level of transport system reliability and safety (Oskarbski, 2017). Hughes et al. (2015) elaborate that safe system approach can be 'described by principles, characteristics, processes or constituent parts.' Therefore, the safe system approach 'builds upon the groundbreaking road safety efforts of the Netherlands and Sweden' (https://roadsafety.piarc.org).

2.6.1 Netherlands Sustainable Safety

According to Wegman and Aarts (2006), the principles and isntructions of safe systems on the road safety management (The Dutch Sustainable Safety Vision) is important for the establishment of road safety management and implementation. These principles are constructed from the scientific theories and research methods that are structured through diciplines, including psychology, biomechanics and traffic engineering and are presented in Table 2.1 below.

Table 2.1 Sustainable Safety Principles

Sustainable Safety Principle	Description
'Functionality of roads'	'Single function of roads as either through roads, distributor roads, or access roads in a hierarchically structured road network'.
'Homogeneity of mass and/or speed and direction'	'Equality in speed, direction, and mass at medium and high speeds'.
'Predictability of road course and road user behaviour by a recognisable road design'	'Road environment and road user behaviour that support road user expectations through consistency and continuity in road design'.
'Forgiveness of the environment and road users'	'Injury limitation through a forgiving road environment and anticipation of road user behaviour'.
'State of awareness by the road user'	'Ability to assess one's task capability to handle the driving task'.

Source: Adopted from https://roadsafety.piarc.org

2.6.2 Sweden's Vision Zero.

According to Kristianssen, et al. (2018), Vision Zero in Sweden is based on the policies for road safety, including applicable road design and speed limits (Johansson, 2009). PIARC reports that 'the combination of infrastructure safety features, vehicle safety features and travel speed(s) of crash-involved vehicles determines the impact forces that humans are subjected to in any crash' (https://roadsafety.piarc.org). From this, it is obvious that the safe system approach in Sweden puts efforts to eliminate fatal injuries. It can be concluded that the safe system approach should be built on the safety principles. In order to achieve this goal, 'legislative and enforcement strategies that achieve widespread user compliance with road rules and laws are necessary, along with strategies that deter the entry and exit arrangements of users and vehicles to the road system' (https://roadsafety.piarc.org).

According to PIARC, the principles of the safe system approach are founded on consideration and responses to fatalities in road traffic accidents, including the number of injured and killed people in road traffic accidents (https://roadsafety.piarc.org). PIARC furthermore emphasizes the needs of empowering countries in the world to set up the UN Decade of Action for Road Safety, strong governmental role models that involve all of the life sectors, and the colloborations among the agencies and policymakers for conducting the shared responsiblities.

2.7 Elements of the Safe System Approach

The high-speed roads have caused road traffic accidents that threathen the life of the driver and road users who are on the road at the location of the accident (Ghicaga, 2017). This tells us how unsafe infrastructures can contribute to road crashes. Therefore, the safe system approach should engage safe roads and roadsides, safe speeds, safe vehicles, and safe road users. Those five elements should be supported by 'emergency medical management for post-crash care (the fifth UN Decade of Action pillar; understanding of crashes on the network, which requires good data to enable risks across sections of the network to be accurately identified; control of admittance (entry and exit) of drivers to/from the road transport system (licencing arrangements, including graduated licencing arrangements); effective legislation and systems, enforcement and justice system support; and educating and informing the public.' (https//roadsafety.piarc.org). It is obvious that the safe system approach can be achieved when the elements mentioned above are fulfilled in order to prevent road traffic accidents, giving the solution, emergency help and support when road traffic accidents occur.

2.7.1 Safe Speeds

Elvik and Vaa (2004) state that speed has been a factor that causes road traffic accidents. Gichaga (2017) states that in Great Lakes Countries of the Democratic Republic of Congo

(Burundi, Rwanda, and Uganda), the high number of crashes from the Mombasa Port, Kenya, are caused by the driver factor. Elvik and Vaa (2004) furthermore add the effects that speed brings have caused deaths and fatal injuries, and therefore, regulation that determines and arranges speed on roads should be well constructed. Presented in Table 2.2 (Elvik and Vaa, 2004) is how a change in speed influences a change in accidents.

Table 2.2 Change in accidents resulting from a change in speed

	Relative change (%) in the number of accidents					
Change in speed (%)	-15%	-10%	-5%	+5%	+10%	+15%
Fatalities	-52	-38	-21	+25	+54	+88
Serious injuries	-39	-27	-14	+16	+33	+52
Slight injuries	-22	-15	-7	+8	+15	+23
All injured road users	-35	-25	-13	+14	+29	+46
Fatal accidents	-44	-32	-17	+19	+41	+65
Serious-injury accidents	-32	-22	-12	+12	+25	+40
Slight-injury accidents	-18	-12	-6	+6	+12	+18
All injury accidents	-28	-19	-10	+10	+21	+32
Property-damage-only accidents	-15	-10	-5	+5	+10	+15

Source: adapted from Elvik and Vaa (2004)

From Table 2.2., it is obvious that fatal crash outcomes occurr because of the crash types, which are mostly affected by speed variation. As seen in the above table, small changes in speed (+5%) are associated with very large changes in the number of road crash fatalities (+25%).

2.8 The Role of Data and its Analysis

A report issued by The Indonesian National Police stated that every hour, about three to four people die from road crashes in Indonesia, with the total number of deaths reaching 31,234 people (Widyastuti, et al., 2016). From this, the Indonesian government and the agencies that

hold shared responsibilities on road traffic management in Indonesia take actions in order to reduce the number of road traffic accidents and provide safety for road users. This illustrates how the availability and realibility of the databases and research findings related to traffic, especially on the road safety and road traffic accidents (Chmielewski, 2016) support the planning and implementation of well-established road safety management.

The databases give strong foundations and principles of statistics data that can be used to plan and design the road insfrastructure and road safety that LMICs can adapt and adopt depending on the context and the characteristics of their environment. For instance, after conducting a study in the Northern Corridor of Kenya, Gichaga (2017) suggests that 'road geometric design should avoid black spots wherever possible; road design should address the various elements that contribute to over-speeding through measures, such as traffic signs, road markings, bumps, pedestrian ways and crossings, and animal crossings. Road safety barriers should be provided as necessary, especially where there are bridges and culverts, bus-laybys for public transport vehicles should be provided in order to accommodate bus stops without obstructing traffic flow on the highway, and the use of recyclable plastic signs should be adopted in order to reduce vandalism.'

By using the databases, the policymakers on road safety management plan their strategies on transport infrastructure, road signage and marking and/or data on traffic incidents, accidents and, in selected cases, collisions. These databases can be accessed by the authorities and used for legal actions related to the obligatory roads' registry and annual statistics transmitted to the General Directorate for National Roads and Motorways. As stated by Chmielewski (2016), data related to road traffic accidents should be stored by all road authorities. ITS service should be integrated for the effectiveness and efficiency of data storage. Research by Oskarbski (2017)

shows that the integration of new ITS services in integrated transport management systems on national roads in the cities of Poland enables the process of storing data in the database, which then allows the data to be analyzed and new strategies to be designed. With this, as stated by Oskarbski (2017), ITS resources can be used to support cooperation between emergency and preventive services with traffic control.

Databases stored by traffic authorities and related agencies that hold shared responsibilities for the road safety management, implementation, supervision, and evaluation can function as the statistics data source for investigating the effectiveness and efficiency of road safety management systems, models, approaches and strategies. For example, research conducted by Papadimitriou and Yannis (2013) has investigated the influence of the 'SUNflower' pyramid application on the basis of data for 30 European countries. By using Categorical Principal Component Analysis upon the responses of a dedicated road safety management questionnaire, jointly created and dispatched by the ETSC/PIN group and the 'DACOTA' research project, the quasi-Poisson models and Beta regression models are developed for linking road safety management indicators and other indicators, and the analysis results are formulated in 'vision and strategy', 'budget, evaluation and reporting', and 'measurement of road user attitudes and behaviours.' This research reveals that the statistical correlation between the road safety management indicator and final outcomes cannot be linked automatically. However, Papadimitriou and Yannis (2013) emphasize that 'a statistical relationship was found between road safety management and 'intermediate' outcomes, which were, in turn, found to affect 'final' outcomes, confirming the SUNflower approach on the consecutive effect of each layer.'

Furthermore, databases give the possibility for authorities to find factors imposing road traffic issues as well as the solutions on a praticular time based on the good and best practices of road

safety management. Research by Gichaga (2017) shows that the number of crash victims on the road in the Northern Corridor of Kenya has decreased from 988 among drivers in 2003 to 643 in 2012 because of road improvement. As a matter of fact, studies finding the results of applying policy instruments on road safety management are hardly known (May, Tranter, and Warn, 2011). However, in transport, these instruments include infrastructure, management, rules and costing (May, Tranter, and Warn, 2011), which can be recorded, analyzed and re-investigated because the data can be obtained from several inter-agencies that are responsible for road management safety and road infrastructure development. The existence of infrastructures can also be investigated and observed as long as there are no changes or new developments in the infrastructures.

Fundamentally, research that investigates policy integration has not been concerned with 'institutional, organisational and implementation issues' (May, Jopson, and Matthew, 2003 as cited in Canoquena, 2013). Databases obtained from the accident occurence reports at provincial and national levels and even the international level also provide knowledge and valuable information to establish new standards, policies, infrastructure and transportation solutions of newly designed road traffic management. On the contrary, the absence of databases or poor database storage can hinder the authorities in taking legal action and finding the best solution for road safety management and policies. Research reveals that often, databases lack the details of traffic crashes, as stated by Chmielewski (2016), and numerous chronologies of road traffic accidents lack detailed information on the locations of the crashes and the traffic victims.

In order to prevent losing the data, the records of road traffic accidents, and the information concerning the enviroment and conditions where crashes took place, they should be reported.

As mentioned previously, the availaibility of the reliability and credibility of the data should be built on the accuracy of the parameter. PIARC (https://roadsafety.piarc.org) states that credible safety data should fulfill the following factors: 1) the availability of road safety data systems; 2) well-established guidance for data accuracy; 3) identification of road safety issues, problem analyses, strategies, solutions, and supervision; 4) critical safety data; 5) crashes and injuries on high-risk networks for countries that lack data; 6) comprehensive instructions for data systems of road traffic accidents; 7) assessment for the risky networks; and 8) integrated data information from a variety of sources. When data on road safety management is supported by high reliability and credibility, the databases on traffic accidents can be used by the authorities to build safe transport infrastructure, road signage and marking, and reduce or eliminate road traffic accidents.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The aim of this chapter is to present the methodology employed in this study. It will also contribute to the literature on studying institutional barriers, especially in the context of road safety management. The main body of this chapter will be divided into nine parts.

The first part will introduce the steps in general taken during the conduct of the research to answer the objectives of research. The second part will explain the road safety problems commonly found in developing countries, and after that, the aims of the research will be discussed. The third part will discuss grouping road safety issues. The fourth and fifth parts will provide reasons for selecting case studies and full in-depth interviews in this study. The sixth part will provide a thorough discussion about the sampling method procedures employed in this study. It will outline the selected cities in Indonesia for investigation and the chosen government institutions included in the interviews, and it includes a discussion on selected participants to be interviewed. The seventh part will elaborate data collection procedures. It will describe the ethical considerations and interview processes, and it includes procedures of accident data collection. The eighth part will discuss the data analysis procedures. The final (ninth part) of this chapter will present the conclusion.

3.2 Overall Aims

The issue of road safety (World Bank, 2002; Peden et al., 2004) is of concern worlwide, especially in developing countries (Khademi and Choupani, 2018; Symons et al. 2019; Wegman, 2017), including Indonesia (Smith, 2011; Rustijan and Adelwin, 2011). Examples of

road safety issues faced in developing countries include a weak institutional management system of road safety (Khademi and Choupani, 2018), high accident rates that cause death and serious injuries (Symons, et al. 2019; Wegman, 2017), lack of regulations for implementing road safety (Persia et al. 2016), and lack of funding support for planning the action programmes (Alfonsi, et al., 2016).

However, this study highlights the issues of road safety encountered in institutional barriers, especially in big cities in Indonesia, which were considered as representative terms of the road safety conditions likely to be found in developing countries. This study identified the implementation of road safety issues encountered at the national and local level by the government, including the barriers at the institutional level.

Resolving issues of road safety is closely related to road safety management. Road safety management is a system that improves road safety quality, which involves economic, institutional, and engineering aspects. Road safety management systems are undertaken by institutions of road safety concerning coordination among them, so they may acquire an assessment of the level of road safety conditions in the road network they are responsible for. The Indonesian government has applied a road safety management system by using Integrated Road Safety Management System (IRSMS) (Korlantas IRSMS) to improve the quality of road safety. However, the government still encounters some obstacles, namely, limitations of human resources, the availability of data, lack of institutional responsibility, and government regulation. Therefore, the results of the implementation of road safety are still far from the government's expectations (Rustijan and Adelwin, 2011).

The availability of data was related to the data-management system. Moreover, institutional responsibility was associated with assignment placement and coordination among institutions.

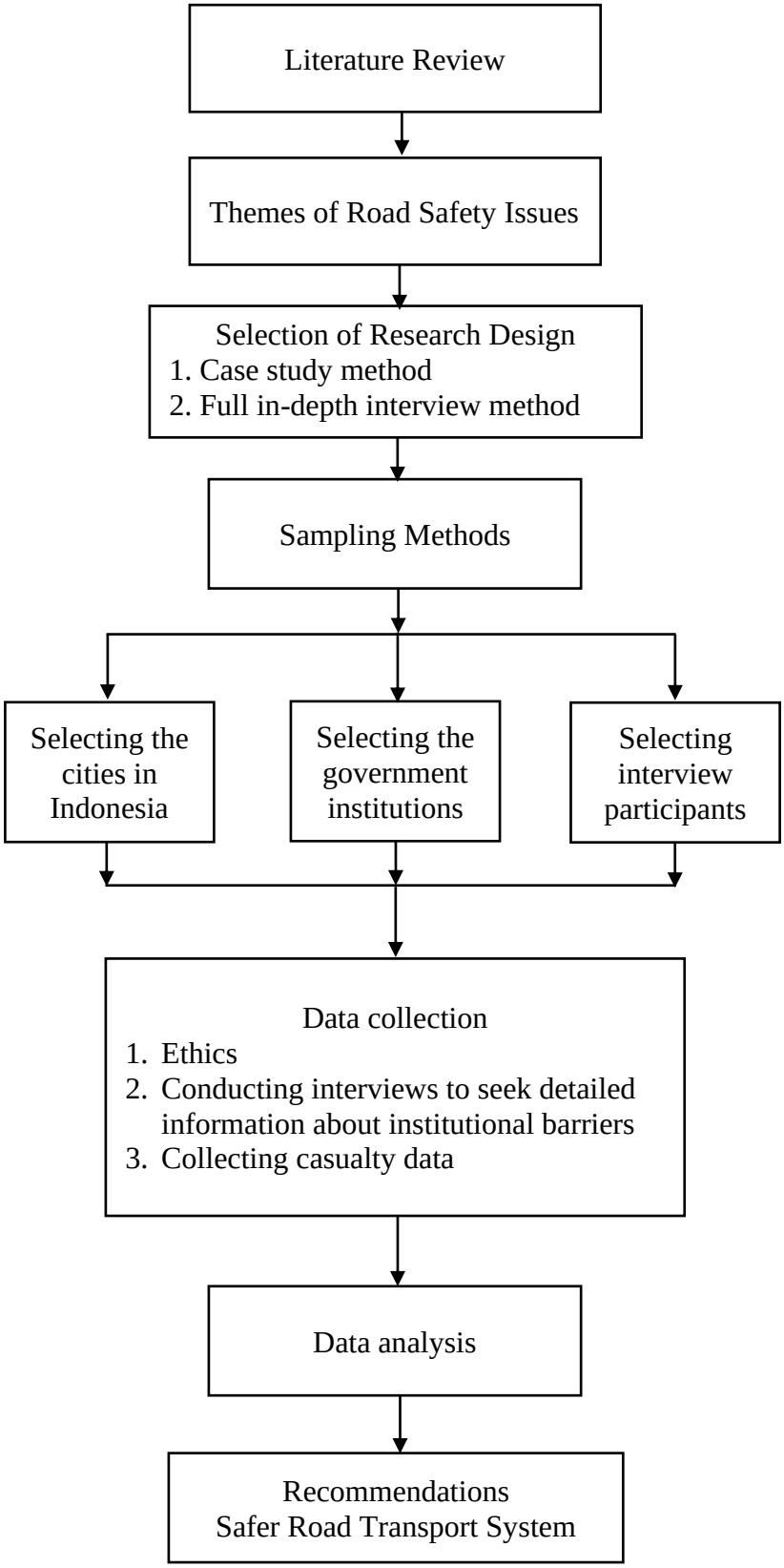


Figure 3.1 Summary Research Methodology

In addition, government regulations were also involved with road safety policy. Therefore, it was necessary to find out the road safety problems in Indonesia in the areas indicated above with regard to a systematic definition of sustainability.

To this end, the overall aim of this research was to improve road safety in Indonesia by focusing on institutional issues and associate's barriers using four cities as case studies.

To this effect, the research followed the procedure shown in Figure 3.1. The procedures consisted of six steps: (i) definition of road safety themes; (ii) selection of research design; (iii) sampling methods; (iv) data collection; (v) data analysis; and (vi) recommendations for a safer road transport system at the national and local levels. These are elaborated in the following sections below.

3.3 Themes of Road Safety Issues

The road safety issues are categorized into three themes: engineering, institutional, and economic. The engineering issues are commonly encountered in developing countries (Mcllroy et al. 2019; Behnood, 2018). The availability of funding (Persia et al. 2016) is important for dealing with road safety issues. In addition, the funding is considered as an economic issue. The coordination between institutions (Peden, et al. 2004; WHO, 2013b) plays an important role in supporting road safety implementation. Further, the coordination is also related to the institutional issues; therefore, the categorization of road safety issues should consider the aforementioned aspects.

This research considered the following themes of road safety issues:

1. **Engineering issues**. Engineering aspects (Hoque et al. 2010; Robinson 2008) are important because they affect the data and consequently any road safety assessment is based on it.

This engineering problem is prevalent in developing countries (Wegman, 2017). A sustainable implementation of road safety may also be influenced by those engineering aspects (Munier, 2005). Factors that affect the engineering aspects are data availability (Robinson, 2008; Idris, 2005), updated and collected data (Robinson, 2008), early road design (Hoque et al., 2012; WHO, 2013a), and data quality. Therefore, the researcher felt that it was necessary to investigate the engineering issues in government institutions in Indonesia with regard to improving road safety.

2. **Economic issues**. Economic aspects (Robinson, 2008) are related to the availability of funding for the implementation of road safety assessments (Alfonsi, et al., 2016). If the availability of funds (Alfonsi, et al. 2016) does not support the road safety programme, then the implementation of road safety will be hampered. The economic aspects play an important role in sustainability (WHO, 1987; Alfonsi, et al., 2016; Munier, 2005). In addition, factors affecting the economic aspect are availability of maintenance budget (Hoque et al. 2012; Neilson, 2013; Robinson, 2008), funding sources (Idris, 2005), and allocation of funds (WHO, 2013b). Therefore, the researcher felt that it was necessary to examine the economic issues in government institutions in Indonesia regarding the improvement of road safety.
3. **Institutional issues**. Institutional aspects (Robinson, 2008; Khademi and Choupani, 2018) are related to coordination and responsibility among institutions (WHO, 2013a; Rőhring and Gailing, 2005; Koppenjan and Groenewegen, 2005; Hodgson, 2006), achievement of road safety targets (Idris, 2005), road safety policy (Idris, 2005; Robinson, 2008; Hoque et al., 2012; WHO, 2013a), commitment and leadership (Robinson, 2008), unskilled and inexperienced officers (Robinson, 2008), and lack of laws and regulations (WHO, 2013b).

Therefore, the researcher believed that it was necessary to examine the institutional issues in government institutions in Indonesia in order to improve road safety.

3.4 The Selection of the Case Study Method Design

This research employed a case study design to investigate the institutional barriers in Indonesia and to improve road safety with particular attention to the government institutions at national and local levels. In line with the definition of case study stated by Yin (2003, p. 13), a case study is a strategy to investigate a real-life phenomenon and to analyse it in-depth. In addition, according to Bryman (2012, p. 66), a case study also entails the detailed and intensive analysis of a single case, and also concerns the complexity and particular nature of a case itself (Stake, 1995). The most common use of the term 'case' associates the case study with the location, such as a community or an organization. The emphasis tends to be upon an intensive examination of the setting (Bryman, 2012, p. 67).

According to de Vaus (2001, p. 220), it is essential to differentiate between cases as being complete and cases that require various levels or components. Moreover, de Vaus (2001, p. 221) argues that a well-designed case study requires gathering information from many levels or components in order to attain more understanding of the entire case. The implementation of road safety in Indonesia involves diverse components or government institutions. Therefore, the researcher selected the case study method in this study since it was a more appropriate design to investigate the recent status of the implementation of road safety in Indonesia. In addition, this research involved the use of casualty data by government institutions in planning action programs to reduce road traffic accidents. The challenges encountered in implementing road safety are also investigated.

3.5 The Selection of the Full In-Depth Interview

A full in-depth interview (FDI) is conducted to collect the qualitative data. One primary advantage of the interview is its adaptability. An interview response can be developed and clarified during the interview process (Bell, 2005, p. 157). Interviews can also produce rich information to be inquired (Bell, 2005, p. 157). However, interviews also have limitations. Interviews are time-consuming and are highly subjective since there is a probability of bias when a researcher analyses the responses or when interviewees respond to the questions (Bell, 2005, p. 158).

The aim of the FDI is to capture barriers in each institution in terms of implementing road safety. Therefore, the procedure involved in this research consisted of several steps ranging from (1) preparation, (e.g., asking permission from the head of each institution); (2) sending a notification regarding conducting the interview; (3) selecting participants; and (4) carrying out the interview and collecting the data. The detailed fully in-depth interview survey method is discussed below.

3.5.1 Full In-depth Interview Method Online

Before selecting the FDI method, some choices were taken into consideration. First of all, the researcher gathered information about government institutions related to road safety in which the notification letter would be sent to the institution by email. The institutions' data and their contact persons' email address were obtained from the researcher's colleagues who were working in the institution. Then, the number of samples was determined based on the officer's position required for further analysis and on the number of variables involved in this research. A FDI offers some advantages, particularly to gain detailed information, perceptions and opinions (www.evalued.bcu.ac.uk; Boyce and Neale, 2006), and to give the interviewee more space to

develop individual points of view forthrightly (https://nusaresearch.com). In addition, the FDI method was chosen in this research because this research focused on the situation in the institution regarding road safety. A FDI enables researchers to ask more detailed questions to the respondents (www.hardwickresearch.com). Moreover, the questions formulated in a FDI are open-ended questions, and like Bryman (2012) said, open-ended questions give convenience for the respondents. Interviews can be conducted online or face to face.

After conducting observations and discussions with the experts at Road Safety Institutions, namely at the Institution of Road Engineering in Bandung (the Director of Road Safety Program and staff in Traffic Engineering Department), the Department of Public Works in Palembang (Head of Highway Engineering Planning), and the Department of Public Works in Pangkalpinang (Head of Highway Engineering), the researcher did not conduct the online interview. The limitations of using the online interview were identified and the most prominent was the potential for a low response rate, which is an impediment in any online interview. Online interview surveys, especially when conducted in Indonesia, are less preferred because of the issues over access to the internet and problems with internet speeds. Moreover, as stated by Janghorban, Roudsari, and Taghipour (2014), the advantages of online in-depth interviews are reducing barriers in conducting face-to-face interviews, such as it being time consuming, having financial limitations, and the geographical spread. They argued that online in-depth interviews lead to more weaknesses in collecting data.

Therefore, in this study, the researcher decided that a face-to-face FDI was seen as being more appropriate than an online interview. The sample was selected based on cluster as the results were expected to be generalised more easily. When using an online FDI, the lower response rates are expected to be improved by using this method. In terms of representativeness, higher

response rates are generally better than a larger sample size. This method can also reduce the possibility of missing data caused by participants who do not provide proper answers either because they do not follow the instructions or they have difficulty answering the interview questions. In the face-to-face FDI, participants can ask for guidance in order to understand the questions.

Moreover, since this research also weighed aspects about knowledge of road safety, the researcher felt that the face-to-face method was more effective as participants would answer the questions without looking up their answers. On the contrary, the likelihood of participants searching for the answers might happen with the online method (Opdenakker, 2006).

3.6 Sampling Method

The study used a three-stage sampling procedure to select participants to be interviewed. Firstly, it selected four cities in Indonesia for investigation. Purposive sampling as suggested by Bryman (2012, p. 418) was used in the design of sampling, ensuring that those samples were relevant to the research questions. Four cities were purposely sampled from 34 provinces in Indonesia. Secondly, the study selected government institutions to be interviewed. After selecting the twelve institutions of government to be involved in the interviews, seventeen participants were selected to be interviewed.

An important aspect to be considered in this research concerns the role of the researcher as an insider. Robson (2002) defines an 'insider' as "a researcher who conducts a study that is directly concerned with the setting in which they work." The researcher was an employee of the Provincial Department of Public Works of Bangka Belitung Archipelago and was assigned at the Highways Division. Therefore, the researcher was familiar with road design, construction, and maintenance in the Department of Public Works at the local level. This is one of the benefits

as an insider. As Griffiths (1985, p. 211) says, insiders have a better initial understanding of the setting because they know the context.

Another advantage of being an insider is that the researcher has already known several government officers from the Ministry of Public Works, the Directorate General of Highways, the Institute of Road Engineering, and the Provincial Department of Public Works of Bangka Belitung Archipelago who would get involved in the research. However, the researcher has tried to keep distance from the participants and explained to those participants that this research is not related to the status of the researcher as the former employee of the government and previous role. As Kanuha (2000, p. 442) argues, the most critical aspect of the insider's role is the need to distance himself from the project and the participants.

In addition, Mercer (2007, p. 6) says that access is more easily granted to the insider researcher; however, this did not happen in this study. The researcher had to follow the normal procedure to get accident data, to meet participants, and to interview the participants. It was more difficult and time consuming to get interviews from the Municipal Police of Bandung and the Municipal Police of Pangkalpinang. Arranging the schedule of the interviews with government officials also took a lot of time and energy, especially when negotiating with layers of gatekeepers. The researcher also could not recruit several participants who had been targeted for the research, such as officials from the State Police of Indonesia and the Municipal Department of Public Works of Bandung because they were on duty outside the city and did not provide an alternative replacement.

3.6.1 Selecting the Cities in Indonesia for Investigation

Five general criteria were used in selecting the four cities in Indonesia for investigation, which aimed to provide a representative sample of line cities, researcher's convenience to reach locations, high accident rates, ease of access to data, and researcher's familiarization with location, along with functioning as the provincial capital.

It should be noted that a city selected for this study does not necessarily have all of these five characteristics.

The rationales for using these five criteria in selecting the cities are as follows.

1. Ease of reaching locations. The locations of cities investigated in this study are accessible to the researcher, especially via air transportation. This study chose cities located in the islands of Java and the islands of Sumatra because they are located in affordable locations from the location where the researcher lived.
2. High accident rate. Cities that have high accident rates indicate that road safety problems exist. As stated by the Director of Land Transportation Safety at the Ministry of Transportation (Hotma Simanjuntak), DKI Jakarta is in the highest position in the number of accidents while West Java is in third place with high accident rates (Parno, 2011). The high number of accidents in West Java is also revealed in the research conducted by Saputra (2017).
3. Ease of access to data. In order to obtain data, an access point is needed based on the applicable procedures and personal closeness as a shortcut to facilitate data access. In this study, the researcher used both types of methods to access data in cities that would be investigated, both based on procedures and personal closeness.
4. Familiarization with locations. The researcher felt that familiarization with locations

was very important because it could save time in conducting investigations. The researcher had worked in Pangkalpinang for five years; therefore, she was familiar with this city. The researcher also chose the city of Palembang as she had studied in this city for five years at the undergraduate level. In addition, the cities of Bandung and Jakarta were selected because the researcher had lived in the city of Bandung for two years during her postgraduate studies and she was often assigned by her superiors to participate in activities in Jakarta. Since the researcher had lived in several of these cities for a long period of time, she was more familiar with the four cities.

5. Serves as the provincial capital. The cities chosen in this study are the provincial capitals. Jakarta is the capital city of Indonesia as well as the special city of the Special Capital Region of Jakarta, DKI Jakarta Province. Bandung is the capital city of West Java Province, Palembang is the capital city of South Sumatera Province, and Pangkalpinang is the capital city of Bangka Belitung Islands Province. In addition, these selected cities are categorised into metropolitan cities (Jakarta), big cities (Bandung and Palembang) and a small city (Pangkalpinang).

By using the above five criteria, the researcher selected these four cities in her research: Jakarta, Bandung, Palembang, and Pangkalpinang. Table 3.1 provides a summary of all four selected cities and their corresponding criteria.

Table 3.1 Cities Selected for Investigation

No.	Criteria	Cities			
		JKT	BDG	PLM	PGK
1.	Ease of reaching locations		✔	✔	✔
2.	High accident rate	✔	✔		
3.	Ease of access to data	✔	✔	✔	✔
4.	Familiarization with locations		✔	✔	✔
5.	Serves as the provincial capital	✔	✔	✔	✔

*Note: JKT - Jakarta; BDG - Bandung; PLM - Palembang; PGK - Pangkalpinang.

3.6.2 Selecting the Government Institutions for the Interviews

The study aimed to examine three government institutions in each city. At first, the researcher planned to interview twelve government institutions for her research. However, there were two institutions that did not respond to the interview request letter, namely the Indonesian National Police (State Police of Indonesia) and the Public Works Office of Bandung City. In order to deal with this situation, the author contacted the Public Works Office of West Java Province to ask for their willingness to be interviewed. The head of the institution agreed to be interviewed. In fact, the Head of the Public Works Department of West Java recommended his two subordinates: the head of technical division and the head of road planning division. Similarly, when the reasercher asked to interview the head of Public Works Department in Palembang City, the officials at the Palembang City Public Works Department also recommended that the researcher interview the officials at the Public Works Department of South Sumatera Province. The Transportation Department and the Public Works Department of Bangka Belitung Islands Province as well as the Pangkalpinang Police recommended that the researcher interview the three agencies at the Bangka Belitung Islands Provincial level. The Ministry of Public Works oversees the Directorate General of Highways and the Institute of Road Engineering, both of which would be interviewed. The researcher did not get data access directly to the National Police; however, the researcher could still access accident data from the agency's official website, https://www.korlantas-irsms.info.

The Ministry of Public Works (Directorate General of Highway Engineering) was chosen because it plays a very important role at the central level as road safety policymaking and regulations. In addition, this ministry is also responsible for safer roads. The Ministry of

Transportation was opted as it is also involved in road safety implementation. This research selected the Police Department due to their responsibility for law enforcement of road safety.

Four general criteria were used in selecting the government institutions as a representative sample at the local and national levels: the institution for safer roads, the institution for safer vehicles, the institution for safer road users, and the institution for recording accident data. It should be noted that an institution selected for this study does not necessarily have all these four characteristics.

The rationales for using these four criteria in selecting the institutions of government are as follows:

1. The institution for safer roads. This institution is responsible for providing safe road infrastructure through improvement at the planning, design, construction and operational stages of the road. In addition, this institution is responsible for data collection of road attributes. There are seven institutions chosen in this study: Directorate General of Highways (Ministry of Public Works), Institute of Road Engineering (Ministry of Public Works), the Provincial Department of Public Works of West Java, the Municipal Department of Public Works of Palembang, the Provincial Department of Public Works of South Sumatera, the Municipal Department of Public Works of Pangkalpinang, and the Provincial Department of Public Works of Bangka Belitung Archipelago.
2. The institution for safer vehicles. This institution is responsible for ensuring that every vehicle used on the road meets safety standards. This institution is also responsible for data collection of road signs. This research selected five institutions: Directorate General of Land Transportation (Ministry of Transportation), the Municipal Department

of Transportation of Bandung, the Municipal Department of Transportation of Palembang, the municipal of Department of Transportation of Pangkalpinang, and the Provincial Department of Transportation of Bangka Belitung Archipelago.

3. The institution for safer road users. This institution is responsible for law enforcement against traffic violations, improving behaviour and increasing road users' awareness of traffic. This research selected four institutions: the Municipal Police of Bandung, the Municipal Police of Palembang, the Municipal Police of Pangkalpinang, and the Provincial Police of Bangka Belitung Archipelago.
4. The institution for recording accident data. These institutions are responsible for recording the incidence of accidents experienced by road users. The chosen institutions are the same as the aforementioned institutions in point 3.

By using the above four criteria, this research selected sixteen government institutions to be included in the interview process. Table 3.2 provides a summary of all sixteen government institutions and their corresponding criteria.

Table 3.2 Government institutions selected for interviews

No.	Government Institution	Responsibility Criteria			
		SR	SV	SRU	RAD
1.	Directorate General of Highways (Ministry of Public Works)	✔			
2.	Institute of Road Engineering (Ministry of Public Works)	✔			
3.	Directorate General of Land Transportation (Ministry of Transportation)		✔		
4.	The Provincial Department of Public Works of West Java	✔			
5.	The Municipal Department of Public Works of Palembang	✔			

*Note: SR - safer roads; SV - safer vehicles; SRU - safer road users; RAD - recording accident data.

Table 3.2 Government institutions selected for interviews

No.	Government Institution	Responsibility Criteria			
		SR	SV	SRU	RAD
6.	The Provincial Department of Public Works of South Sumatera	✔			
7.	The Municipal Department of Public Works of Pangkalpinang	✔			
8.	The Provincial Department of Public Works of Bangka Belitung Archipelago	✔			
9.	The Municipal Department of Transportation of Bandung		✔		
10.	The Municipal Department of Transportation of Palembang		✔		
11.	The municipal Department of Transportation of Pangkalpinang		✔		
12.	The Provincial Department of Transportation of Bangka Belitung Archipelago		✔		
13.	The Municipal Police of Bandung			✔	✔
14.	The Municipal Police of Palembang			✔	✔
15.	The Municipal Police of Pangkalpinang			✔	✔
16.	The Provincial Police of Bangka Belitung Archipelago			✔	✔

*Note: SR - safer roads; SV - safer vehicles; SRU - safer road users; RAD - recording accident data.

3.6.3 Selecting Interview Participants

In this research, the participants who would be interviewed were those who held responsibilities for road safety at government institutions, national and local levels, and who were experts at road safety. This is because in the government institution, officer positions are only offered to those who have a high level of knowledge or skills.

After selecting sixteen institutions to be included in the research, the next step was to select government officials to be interviewed from those institutions. In order to investigate the institutional barriers for implementing road safety, the study aimed to select government

officials from a range of departments/directorates within those institutions that represent the role of their institutions in the practice of road safety.

Table 3.3 provides the list of participants from each institution selected for this research. In the Ministry of Public Works, two participants were selected: one officer from the Directorate (Directorate General of Highways) and one officer from the Institute of Road Engineering (IRE). As discussed earlier in Chapter 3, the Directorate General of Highways is the key institution that has responsibility for applying safer roads. The Road Safety Unit (RSU), under the auspices of this directorate, represent directorates that manage the safer roads process for a particular agency. The RSU was also selected because it had the responsibility of conducting monitoring and evaluation for road safety. One division was chosen in the study from the Institute of Road Engineering (IRE). The divisions' name was Road Safety Research, which had to conduct research about road safety implementation. Finally, the study also aimed to obtain views from the officers of government institutions regarding the improvements for road safety at the institutional level.

Table 3.3 Selecting Interview Participants

Government Institution	Level of institution	Directorate/Department/Unit/Division	Total
The Ministry of Public Works (MPW)	National	• Directorate General of Highways (Road Safety Unit) • Institute of Road Engineering (Road Safety Research)	1 1
The Ministry of Transportation (MoT)	National	• Directorate General of Land Transportation (Cultivated Land Transportation Safety Unit)	1
The Provincial Department of Public Works (DPW) of West Java	Local	• Road Engineering Division • Road Maintenance Division	1 1

Source: Author's research

Table 3.3 Selecting Interview Participants

Government Institution	Level of institution	Directorate/Department/Unit/Division	Total
The Municipal Department of Transportation (DoT) of Bandung	Local	• Traffic Division	1
The Municipal Police of Bandung	Local	• Traffic and Education Division	1
The Municipal of Department of Public Works of Palembang	Local	• Road Planning Division	1
The Municipal of Department of Transportation of Palembang	Local	• Transportation Planning and Programming Division	1
The Municipal Police of Palembang	Local	• Police Department of Palembang City	1
The Provincial DPW of South Sumatera	Local	• Document Preparation Division	1
The Provincial DPW of Bangka Belitung Archipelago	Local	• Highways Division	1
The Provincial DoT of Bangka Belitung Archipelago	Local	• Traffic Division	1
The Provincial Police of Bangka Belitung Archipelago	Local	• Law Enforcement and Traffic Division	1
The Municipal DPW of Pangkalpinang	Local	• Highways Division	1
The Municipal DoT of Pangkalpinang	Local	• Land Transportation Division	1
The Municipal Police of Pangkalpinang	Local	• Accidents Unit	1
Total			17

Source: Author's research

3.7 Data Collection

Data collection aims to gather data from the sample relevant to answering the study's aims (Bryman, 2012, p. 14). This study employed two different data collection procedures:

conducting interviews and collecting accident data. The interview process and the accident data collection were conducted concurrently.

This study relied upon primary and secondary data. Primary data was obtained through interviews whereas secondary data was gathered from relevant sources, including books, journals, policy documents (Yin, 1994), official websites, media reports, and research reports, along with working papers related to road safety management systems, such as planning, designing, applying, and monitoring from organisations. The WHO and the World Bank were also included as secondary data.

This study was fully funded by the Directorate General of Higher Education (DGHE), Ministry of Research, Technology and Higher Education of the Republic of Indonesia.

3.7.1 Ethics

Research should be undertaken ethically in order to reduce the risk and harm that might result from the study itself (Thomas, 2013). According to Bryman (2012, p. 135), the researcher should be concerned about the main ethical considerations, such as ‘danger to participant’, ‘informed consent’, ‘invasion of privacy’, and ‘deception’. The researcher should ensure that participants of the study are aware of their involvement in the study, and ensure the confidentiality and protection of the data obtained from the study (Thomas, 2013).

Research that involves data collection methods, such as interviews from or about people generally requires ethical approval (Denscombe, 2014, p. 307). The ethical review form of the research was submitted and reviewed by the Ethical Review Committee of the University of Birmingham, and the Science, Technology, Engineering and Mathematics Ethical Review Committee of the University of Birmingham before the interview was conducted. The research

was granted ethical approval with reference number ERN_14-1175. All relevant requirements complied with the University's Code of Practice for Research.

3.7.1.1 Data Protection

Data obtained in this study was preserved in compliance with University of Birmingham Code of Practice for Research 2013-2014. All data was collected by taking notes and was stored in a locked storage and kept safely. All the electronic data, including the transcripts of interviews, were kept on the researcher's personal laptop and protected securely with a password that was only known to the researcher.

3.7.1.2 Acquiring Participant Consent

Prior to data collection, all participants were provided with consent forms and participant information sheets comprising information about the research, such as its purpose and its expected outcomes, anonymity, privacy, data confidentiality, and data protection. The consent form also explained how the data would be used and stored, including any potential risk and danger. Participants were given the opportunity to read the contents of the consent form and then sign if they agreed to participate. The other important data was preserved by the researcher to be archived in the locked storage (see Appendix 4-7*).*

3.7.1.3 Privacy and Confidentiality

The researcher has the responsibility to ensure the privacy and confidentiality of all the research subjects and data. All data would be used and reported for research purposes only. In recording the results, all personal data of participants remained private and did not become visible in the report.

Confidentiality means that there is no identifier who will be revealed (Frey and Oishi, 1995; Kvale, 1996; Weiss, 1994). Ensuring that the participants' confidentiality is protected is difficult, especially in face-to-face interviews where participants are aware that the interviewer knows their identities and charcteristics. These characteristics may include name, address, telephone number, and personal appearance. The participants' willingness to reveal information may hinge on their level of confidence that their identity will not be revealed.

For confidentiality purposes, the participants were informed that all information given is confidential, and it is more appropriate to state that confidentiality will be protected rather than anonymised (Oishi, 2003; Merton, Fiske, and Kendall, 1990; Oppenheim, 1992; Frey and Oishi, 1995; Kvale, 1996).

3.7.2 Interviews Instrument

The questions measure three issues of road safety, i.e., institutional, engineering, and economic. Open-ended types were selected for several reasons, including practicality when processing the interview, the possibility of obtaining the detailed issues, and the convenience of interviewees in answering questions (Bryman, 2012). The questions focused broadly on (1) knowledge of officers about road safety; (2) action in implementing road safety; (3) data storage; (4) coordination between institutions; and (3) availability of funds. The questions were detailed in full in Appendices 2 and 3 (in both Indonesian and in English).

3.7.3 Conducting Interviews

The researcher sent a request letter to each head of institution to assign officials that had responsibility in road safety to be interviewed for this research. In order to fulfil the procedure for conducting interviews with each selected government institution, the letter was sent to each

institution in early February 2015. The letter was supplemented by a summary of the project, the reasons why the institution were selected for the study, the list of targeted departments/directorates/divisions in the institutions, and the research information sheet for participants.

In practice, the researcher only got responses from several institutions. Consequently, they did not assign officials to be interviewed. The researcher tracked the request letter for interview in each institution to ensure that it was received by the right officer. According to Bryman (2012, p. 151), obtaining access for research is a matter of negotiation. Therefore, in order to conduct this research, negotiation is also needed between the two parties (the researcher and government officials at the institution). Although several institutions of the government did not give a response to the letter, they had actually decided to be involved in the research and each head of institution internally had instructed their inferior to perform the letter.

After the researcher obtained access for interviews, most participants were approached by phone and WhatsApp messaging. In addition, the researcher came to visit the office of institutions of government to make arrangements with the assigned officers for the interviews. Furthermore, the appointment schedule meeting plan arrangement between the researcher and the participant for the interviews took time, especially for negotiating an agreement of the time and the place of the meeting.

Different arrangements were made to gain access to the Ministry of Public Works and the Ministry of Transportation. The researcher used her personal contacts to reach them. The officers of these ministries were busy in preparing programs for the action of 2015; therefore, the researcher only managed to persuade one officer for each ministry (directorate/department) to be interviewed.

Table 3.4 The Distribution of the participants

Government Institution	Directorate /Department/Unit/Division	Position	Gender	Number of participants
The Ministry of Public Works (MPW)	• Directorate General of Highways (Road Safety Unit) • Institute of Road Engineering (Road Safety Research)	Technical officer Director	M M	1 1
The Ministry of Transportation (MoT)	• Directorate General of Land Transportation (Cultivated Land Transportation Safety Unit)	Head	M	1
The Provincial Department of Public Works (DPW) of West Java	• Road Engineering Division • Road Maintenance Division	Head Head	M M	1 1
The Municipal Department of Transportation (DoT) of Bandung	• Traffic Division	Head	M	1
The Municipal Police of Bandung	• Traffic and Education Division	Head	M	1
The Municipal Department of Public Works of Palembang	• Road Planning Division	Head	F	1
The Municipal Department of Transportation of Palembang	• Transportation Planning and Programming Division	Head	M	1
The Municipal Police of Palembang	• Police Department of Palembang City	Head	M	1
The Provincial DPW of South Sumatera	• Document Preparation Division	Head	M	1
The Provincial DPW of Bangka Belitung Archipelago	• Highways Division	Head	M	1
The Provincial DoT of Bangka Belitung Archipelago	• Traffic Division	Technical officer	M	1
The Provincial Police of Bangka Belitung Archipelago	• Law Enforcement and Traffic Division	Head	M	1
The Municipal DPW of Pangkalpinang	• Highways Division	Head	M	1
The Municipal DoT of Pangkalpinang	• Land Transportation Division	Head	M	1
The Municipal Police of Pangkalpinang	• Accidents Unit	Head	M	1
Total				***17***

Source: Author's research

*Note: M - Male; F - Female

Table 3.4 shows the distribution of the participants in this study. In total, there were 17 participants: 16 males and 1 female. From the fifteen institutions of government, most of the interview participants held senior positions in their institutions. Two participants (11.76%) were at the upper-management level (director/head of department), thirteen participants (76.48%) were at the middle-management level (head of division), and two participants (11.76%) were at the lower-management level (technical officer).

An in-depth interview with the face-to-face method was conducted with each selected participant in Bandung, Indonesia between the 4th and the 6th of March 2015; in Pangkalpinang, between the 10th and the 13th of March 2015; in Palembang, between the 17th and the 19th of March 2015; and in Jakarta, Indonesia, between the 30th and the 31st of March 2015. Most interviews were performed at the office of each interviewee during working hours. One interview with a government official from the Directorate General of Highways was conducted on a very late afternoon after that official attended a meeting there. One interview with a government official from the Municipal Department of Transportation of Pangkalpinang was conducted at his office, but after normal office hours (after 4 p.m., Western Indonesian Time) because he was very busy at that time.

The researcher asked questions to the participants based on a list of questions that covered three main issues: institutional, engineering, and economic. The three aspects of the problem are obstacles faced by the government in implementing road safety and planning action programs to reduce accident rates. The questions were open-ended, which meant that the participants were allowed to express their experiences, opinions, and feelings about the barriers of road safety implementation, accuracy of accident data, and completeness of road attribute data.

During the interviews, the researcher improvised the questions to clarify interview questions so that participants understood what the questions meant.

Before the interviews started, the researcher provided the information sheet to participants. The participants read the information sheet so that they could clearly understand the research being carried out as a whole. The researcher gave the opportunity to participants to ask questions about her research before signing a consent form. Furthermore, the researcher requested permission from the interviewee to tape-record the entire interview, but they did not permit the researcher for recording; therefore, the researcher used note-taking methods during the interview process. In addition, the interviewees were allowed to stop the interview at any time if they did not feel comfortable. All the interview responses were written on the researcher's log. Each interview took about 60 minutes on average. The shortest time was 30 minutes and the longest time took approximately 120 minutes. All of the participants' answers during the interview were then transcribed for further analysis.

In order to protect the privacy of the participants, the researcher used pseudonyms in reporting the research findings. The researcher used 'number' as codes for each participant in order to facilitate re-checking the analysis. For instance, 'interviewee 1' referred to the first participant to be interviewed, and 'interviewee 9' referred to the ninth participant, and so forth. All of the interview records were kept safely by the researcher.

The interviewees were interviewed after official permission from the considered institution where the research was carried out had been gained. At this stage, the confidentiality agreement was mentioned and participants were made aware of their rights and the purposes of the research and data that would be collected. Participants were asked to sign an informed

consent form that clearly outlined the confidentiality agreement and the participants' right to withdraw from the research before the interview began.

A list of questions was used as a guide for the interviews (see Appendix 2-3). All interviews were conducted in Indonesian and were transcribed verbatim, and the data obtained was analysed in English.

Concerning the objectives of the research, the questions in the interviews were categorised into three issues:

1. The barriers of institutional aspects from government institutions as mentioned above for implementing road safety.
2. The barriers of engineering aspects from government institutions for carrying out the action of road safety.
3. The barriers of economic aspects from government institutions for managing road safety funding.

Interviewers were provided with a permit letter from the university and information sheets about the survey to convince the potential participants about the legality of the interview. An appointment to conduct the interview was arranged with those who were willing to take part in it. Interviews were held in the location agreed by the potential participants, such as inside or outside of the office.

3.7.4 Collecting Accident Data

Accident data was used to examine the relationship between road attributes conditions and accident occurances. Secondly, accident data was used to examine the extent of accident handling actions taken to reduce the accident rate in Indonesia. This research used accident data

for 2009 through 2014. Accident data was collected from the Department of Public Works and the Police in the three cities. Accident data collection was carried out simultaneously during the interview process.

The research used accident data from the police department to support the statements of interviewees, such as the cause of the accident, the location of frequent accidents and the severity of the accident victims. Accident data was obtained from the agency in manual form from 2009 through 2014, so it needed to be processed and recalculated using the Excel program. However, the reality found during the investigative process carried out by researchers was that not all police had data from 2009 through 2014. The police that did not have complete data during this period were the Pangkalpinang police and the Bandung police. Accident data in Jakarta could not be obtained because the researcher did not get a response from the letter sent; therefore, researchers only focused on three cities (Bandung, Palembang, and Pangkalpinang) for the results of the accident data analysis obtained.

3.8 Data Analysis Method

The process of data analysis in this study consisted of four stages, namely, data preparation, initial data scrutiny, data analysis, and data presentation. Data collected from interviews was analysed separately using thematic analysis.

Interview results were transcribed and analysed using thematic analysis. Bryman (2012, p. 717) defines thematic analysis as '*a term used in connection with the analysis of qualitative data to refer to the extraction of key themes in one's data'*. The theme is also a matter that needs to be considered in data analysis because the theme is expected to be able to answer the purpose of the research conducted. This is also in line with the opinion of Braun and Clarke (2006, p. 82) who say that themes need to be taken into account so that they can capture an important matter

related to a research question. Therefore, determining the theme for analysing is very necessary because this research uses the thematic analysis method.

Creswell and Clark (2011) described that the process of data analysis starts by scrutinizing all the data available, then scrupulously reading the whole transcript. The next step is to demonstrate data reduction by selecting the parts according to the theme of the road safety issue and then placing them into a classified theme and giving them a label in the form of a code (coding).

The steps to analyse the data in this study are presented in the following Figure 3.2.

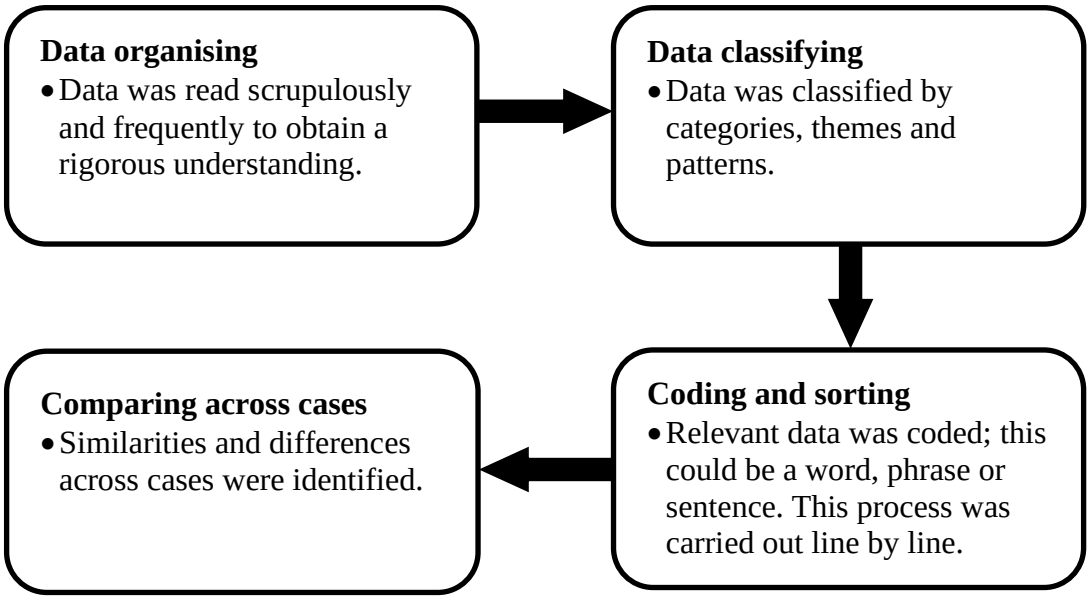


Figure 3.2. The stage of data analysis
Source: Adapted from Marshall and Rossman (2006); and Matthews and Ross (2010)

In this study, once transcribed, the raw data gained from interviews totalled 128 pages (at a one point line space) or 36,288 words. Data familiarisation is foremost, so the note-taking data was read several times in order to ensure accurate transcription. Then, the transcription itself was re-read and re-checked in order to obtain a thorough understanding. The next step was data

reduction, which was shown in order to make the data more manageable and this involved selecting the parts that related to the research topic. Initial themes were identified and the relevant data was categorised or labelled in the form of codes. The next stage required grouping the data in accordance with themes. The final step covered summarising or synthesising the data.

The interviewees' responses were analysed via thematic analysis and were presented based on three themes in the following chapters.

1. The results of the interviews that relate to the current status of road safety management in Indonesia are presented in Chapter 4.
2. The results of the interviews that relate to the main factors that affect road safety at the institutional level are presented in Chapter 5.
3. The results of the interviews that relate to the casualty data and its impact on road safety at the institutional level are presented in Chapter 6.
4. The results of the interviews that relate to the implementation barriers to road safety management in Bandung, Palembang, and Pangkalpinang by government institutions are presented in Chapter 5.

The results of the analysis are reported based on the relevant research objectives in Chapters 4, 5, 6, and 7.

3.9 Conclusion

This chapter elaborated the methodology used in this study. It started by offering a brief discussion of overall aims in the study. This was followed by a discussion on the themes of road safety issues, selected research design, the sampling method, the chosen study design, data

sources, sampling methods, data collection procedures and the data analysis method. The ethical considerations were also discussed in this study. In addition, this chapter described the challenges dealt with during the process of data collection, and ultimately, there was deliberation on the data collection process.

In Indonesia, in particular, the topic of institutional barriers is still limited, especially in studies focusing on government institutions related with implementing road safety. According to the author's knowledge, there is still limited studies of institutional barriers regarding road safety at the national and local level in Indonesia that used interviews as the one attained in this study. This chapter will contribute to knowledge about conducting more comprehensive studies of institutional barriers, especially amongst government institutions to improve road safety.

One of the limitations of this research is that it has only included government institutions from four cities in Indonesia. This is for two reasons: first, because of the ease of access. Second, Jakarta is the capital of Indonesia and represents as the national level. Moreover, Bandung, Palembang, and Pangkalpinang represent cities from different regions; Java Island, Sumatera Island, and Bangka Belitung Islands, respectively. In addition, these three cities are at local levels. The research could be duplicated with a larger sample of government institutions from other cities in Indonesia if there was sufficient funding. Another limitation is related to data analysis as it does not include statistical analysis; therefore, it is suggested to carry out the statistical analysis in future research.

The next three chapters will discuss the findings from the research.

CHAPTER 4

THE CURRENT STATUS OF ROAD SAFETY MANAGEMENT IN INDONESIA

4.1 Overview of Accidents in Indonesia

In general, in several low- and middle-income countries (LMIC), the number of deaths has increased (Wegman, 2017; WHO, 2013a) by 90 percent (Wegman, 2017) from 2007 to 2013 (WHO, 2013a). However, in some developed countries (High Income Countries), there has been a decline in the number of deaths (Wegman, 2017). This is due to an increase in awareness of road users, an increase in the quality of road infrastructure, and also an increase in safer vehicles (WHO, 2013a). Therefore, the World Health Organization declares that traffic accidents are among the highest triggering deaths in the world (WHO, 2013a).

Accident rates in Indonesia are still relatively high both at the ASEAN and global levels (LLAJ Directorate, 2004, http://korlantas-irsms.info/national_masterplan). The number of accident victims is increasing every year. This number is seen from National Traffic Police statistics showing that more than 32,000 people were killed on roads in Indonesia in 2011. Traffic accidents have a negative impact on the national economy because they reduce the value of the Gross National Income by 3.1 percent (220 trillion rupiahs (http://korlantas-irsms.info/national_masterplan). In addition, the latest accident data shows that the number of fatalities every year is around 38,279. This figure shows that for every 100,000 people from 250 million out of Indonesia's population, there are 15 people who have accidents resulting in death every day, while minor injuries were 125,000, but the number of fatalities did not reflect the actual number because there were estimated to be accident incidents that were not reported by the victims (Takdir, 2017). Furthermore, most cities in Indonesia had accident rates, including high accident rates, both in small towns and in big cities. This is evidenced by the

increasing number of road accident victims each year and most victims are of productive age (Jati, 2012). Therefore, Indonesia needs to pay special attention in reducing the fatality rate of accident victims (Direktorat LLAJ, 2004).

One of the factors causing accidents that occur in Indonesia is the condition of road infrastructure (Dewi and Nurhayati, 2016). Some road networks in Indonesia do not meet the quality standards set by the government (Mulyono, Kushari, and Gunawan, 2009) in terms of geometric aspects, including driver visibility, road shoulder elevation and curve radius (Dewi and Nurhayati, 2016). In Indonesia, accidents most often occur on urban roads, which are caused by poor road conditions. This data can be seen in Table 4.1 and Table 4.2 below.

Table 4.1 Traffic Accident Data in Indonesia Based on Road Status

No.	Description	Number of Accidents Year 2013	%
1.	National road	27037	27.0%
2.	Provincial road	29971	29.9%
3.	**Municipal road**	**36225**	**36.2%**
4.	Village road	6873	6,9%
	Jumlah	100106	100

Source: Adopted from: Kepolisian Republik Indonesia, cited in Direktur Pembinaan Keselamatan, 2018.

Table 4.2 Conditions and Length of Roads in Indonesia

Road Status	Length of road (Km)	Road Condition Steady		Road Condition Unsteady	
		(Km)	(%)	(Km)	(%)
National road	38245	35376.625	92.50%	2868.375	7.50%
Provincial road	47666	33540	70.36%	14126	29.64%
Municipal road	**394228.5**	**233411.5**	**59.21%**	**160825.32**	**40.79%**

Sumber: Adopted from: Kementerian Pekerjaan Umum dan perumahan Rakyat, cited in Direktur Pembinaan Keselamatan, 2018.

4.2 Government Regulations related to Road Safety

The implementation of road safety requires government regulations to support the implementation of the program so that it can run well. First is Law 22 of 2009 concerning road traffic and transportation. Basically, the road transportation safety program refers to Law Number 22 of 2009, which includes the implementation of road safety programs as well as the implementation of road transportation safety programs carried out by the government, regional governments, legal entities and the community (Jati, 2012; Dewi and Nurhayati, 2016).

In accordance with Law 22 (2009), the traffic police are responsible for road and traffic safety, including collection, monitoring, processing and presentation of traffic and road transportation data as well as law enforcement (http://korlantas-irsms.info/national_masterplan). Therefore, reliable accident data depends on the police as the original source in accordance with applicable regulations.

In addition, there are instructions of the President of the Republic of Indonesia (Inpres) Number 4, year 2013 concerning the Decade of Action for the Road Safety Program (http://korlantas-irsms.info/masterplan). This regulation was issued to support the implementation of road safety action programs and reduce the number of accidents in Indonesia so as to achieve the desired target (reducing 80% of accidents by 2035).

Furthermore, there is also PP No. 37 of 2017 concerning the safety of LLAJ and Perdirjen No. SK. 407 / Aj. 401 / DRJD / 2018 concerning Technical Guidelines for Controlling Road Traffic at Potential Accidental Locations at a level crossing. Both of these regulations are output from the Dit. BinKes (2018) in compiling norms of work implementation standards (NSPK) for road safety.

PP Number 37 of 2017 only regulates traffic safety and road transportation. The scope of this government regulation regulates the National General Plan for Traffic Safety and Road Transportation (RUNK LLAJ), the implementation and the control of the implementation of the RUNK LLAJ, which is carried out in a coordinated manner in the forum of the Road Traffic and Transport Forum using traffic safety and road transport management, obligations of public transport companies, which consist of a public transportation company safety management system and a means of providing information on traffic accidents, and monitoring traffic safety and road transportation.

The RUNK LLAJ arrangement is intended as a reference for all stakeholders so that the traffic safety and road transport programs complement and synergize, allowing the implementation of the LLAJ RUNK to be carried out in a coordinated manner and ensuring the implementation of traffic safety and road transport programs. Afterward, traffic management and road transport activities will be carried out consisting of the achievement of targets and desired outcomes set out in the RUNK LLAJ, direct action to realize safety, and the support of the functions needed to take direct action in achieving the goals.

Other government regulations are Ministerial Regulation (PM) No. 111 of 2015 concerning Procedures for Establishing Speed Limits, Bimtek Speed Management in several cities in Indonesia, and the development / implementation of speed limits in several roads in Central and East Java provinces. This regulation aims to establish vehicle speed limits in order to reduce accident rates due to speed violations.

Overall, Indonesia has moved towards the right direction for road safety in accordance with applicable legal regulations. In addition, the strategy to achieve the desired road safety targets is also clear and has begun to be applied in all regions in Indonesia (IRF examiner, 2015). At

the very least, in order to apply road safety in Indonesia, there is a clear legal umbrella, although achieving road safety targets requires a lengthy process and time.

4.3 Responsible Party

Based on the RUNK Road, there are five institutions responsible for implementing road safety called pillars. These five pillars are responsible for ensuring that all aspects of the implementation of road safety are handled properly. At the national level, road safety aspects are grouped into five pillars, which are a simplification of the 14 sectors that affect road safety management (Rusyanto, 2011). The responsibilities of the five pillars based on the RUNK Jalan are as follows:

‘Pillar-1: Road Safety Management is responsible for encouraging coordination among stakeholders and creating sectoral partnerships to ensure the effectiveness and sustainability of the development and planning of road safety strategies at the national level, including setting targets for achieving road safety and evaluating to ensure road safety has been implemented effectively and efficiently’.

‘Pillar-2: Safer Roads is responsible for providing safe road infrastructure by making improvements at the planning, design, construction and operational stages of the road, so that the road infrastructure provided is capable of reducing and accommodating errors from road users’.

‘Pillar-3: Safer Vehicles is responsible for ensuring that every vehicle used on the road has high safety standards, so as to minimise accidents caused by vehicle systems that are not operating properly. In addition, vehicles must also be able to protect users and people involved in accidents from getting in a worse condition’.

‘Pillar-4: Safer Road Users is responsible for improving the behaviour of road users by developing comprehensive programs, including improving law enforcement and education’.

‘Pillar-5: Post-Crash Response is responsible for improving the handling of post-accident emergency responses by increasing the ability of relevant stakeholders, both in terms of the emergency response system and the handling of casualties, including carrying out long-term rehabilitation’.

4.4 Road Safety Implementation Strategy

The spirit of declaration of the Decade of Action for Road Safety 2011-2020 is in line with the mandate of Law (Law) Number 22 of 2009 concerning road traffic and transportation, especially Article 203 for the preparation of a National Road Safety Master Plan (RUNK) plan. The government of Indonesia compiled a long-term (25-year) road RUNK and declared a Prayer that would be part of the RUNK Jalan’ material. In order to fulfill the United Nations Prayer for Road Safety program, the first ten years of the Road RUNK have been established as the Republic of Indonesia Road Safety Decade 2011-2020 program (RUNK Jalan).

The preparation of the RUNK Jalan aims to provide guidance / guidance for policymakers so that they can plan and implement road safety management in a coordinated and harmonious manner. In addition, the Road RUNK is a reference for local governments to describe the steps for handling road safety in their area (RUNK Jalan).

The long-term target is to reduce the fatality rate of traffic accident victims by 80% in the year 2035 based on 2010 data measured and based on the fatality rate per 10,000 vehicles, referred to as the fatality index per 10,000 vehicles. In 2035, the desired fatality index is 0.79. The long-term target for the implementation of Indonesia’s road safety will be achieved on an ongoing basis as a 5-year target as shown in Table 4.3 (RUNK Jalan).

Table 4.3 Targets for Declining Mortality Rates

Period	Target	Fatality index per 10,000 vehicles
2010 (baseline)	0%	3.93
2011-2015	20%	3.14
2016-2020	50%	1.96
2021-2025	65%	1.37
2026-2030	75%	0.98
2031-2035	80%	0.79

Source: Adopted from: RUNK Jalan

The long-term target of the 2011-2035 National Road Safety Master Plan (RUNK) is to reduce fatality rates by 80% by 2035. A clear strategy is needed in order to achieve the road safety targets; therefore, the Indonesian government refers to the RUNK Jalan. The general safety plan and safety action plan carried out by the Directorate General of Land Transportation (2018) can be seen in Figures 4.1 and 4.2 below.

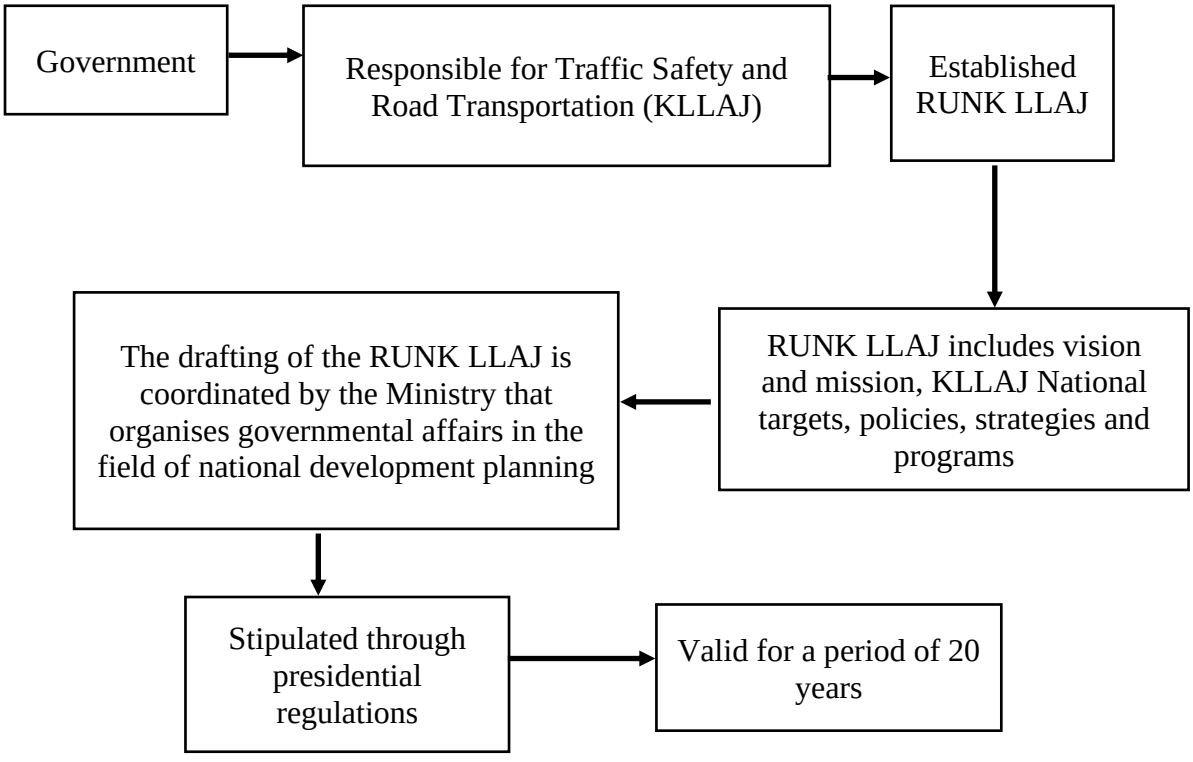


Figure 4.1 Procedure for establishing a road safety program
Source: Direktur Pembinaan Keselamatan, 2018

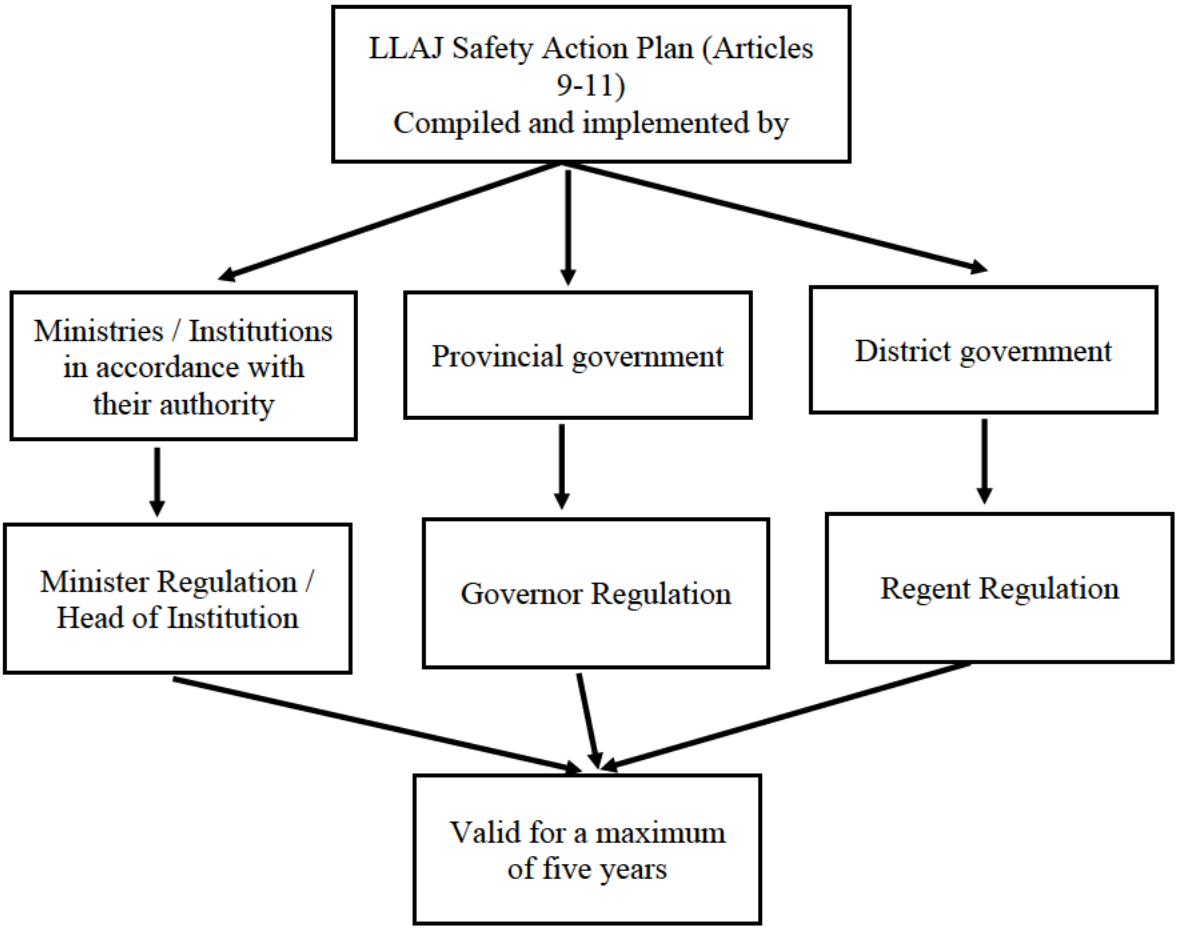


Figure 4.2 Procedure for Implementing Priority Programs

Source: Direktur Pembinaan Keselamatan, 2018.

Road RUNK stipulates that the strategy to achieve road safety targets includes three aspects: first, aligning direction and commitment, where the implementation of road safety is through the application of orchestral principles that coordinates the five pillars inclusively. Second, the implementation of road safety uses a cost efficiency approach through curative and preventive measures in the framework of victim handling, injury prevention and accident prevention. Third, the road safety system approach is able to accommodate human error and human body vulnerability to ensure that traffic accidents do not result in death or serious injury.

The Asian Development Bank (ADB) report in 2004 explained that one of the weaknesses of the implementation of road safety in Indonesia was poor coordination and management (ADB, 2004 cited in Road RUNK). Coordination is the key to success in achieving road safety in a country. Therefore, the focus of the government is to ensure the implementation of road safety as a shared responsibility that must be carried out in harmony and coordinated by applying the principles of the orchestra (RUNK Jalan).

4.5 Funding Allocation

The United Nations currently continues to encourage the creation of good governance in the management of road safety by proposing a "UN Road Safety Fund" obtained from the voluntary contributions of member states to support the implementation of the Global Plan for the Decade of Action 2011-2020 in the field of road safety. The proposal has been outlined in the UN-SMU Resolution No. 70 / 260, which was adopted on 15 April 2016 and became one of the priorities given by the United Nations to the UN Secretary General for further elaboration by the UN Secretary General's Special Envoy for Road Safety. The discussion of the idea of funding will continue and, at the same time, will test how far the seriousness of the UN member states is in unravelling the complexity of the issue of road safety (Takdir, 2017).

There are two types of funding allocation sources, namely, the state budget (APBN) and the regional budget (APBD). APBD is a source of funding at the regional level while the APBN is a source of funding from the central government. Local governments can obtain additional funding allocations from the central government by following the applicable procedures. The regional government proposes additional funds to the central government (the Ministry of Transportation) through existing mechanisms, where the mechanism and procedures are only as a guide, while in its implementation, the deciding budget approval is the negotiation process.

The central government usually sees the seriousness of the regional parties in making work programs by checking the program directly in the field while the local government provides an explanation regarding the program (Jati, 2012).

4.6 Implementation of the Road Safety Program

Implementing the road safety program involves many parties from different institutions, in other words, it is multi-sectoral (Koppenjan and Groenewegen, 2005). The implementation of the program requires good cooperation and coordination between institutions so that the results to be achieved are on target. The communication and commitment of institutions are also needed in the implementation of the road safety program.

In general, the concept of implementing the road safety program actions in Indonesia is divided into two categories, namely, proactive and reactive (RUNK Jalan). The 'proactive' action is more oriented towards preventing or avoiding accidents while the 'reactive' action is more oriented towards improving the road. Road safety programs that are included as 'proactive' are Road Safety Impact Assessment (RSIA), Road Safety Audits (RSAs), and Road Safety Inspection (RSI). Furthermore, the 'reactive' action groups are black spot management (BSM) and network safety management (NSM). Some provinces have conducted road safety audits on several roads, such as in the Pintura route of Batang Regency (Mulyono, Kushari, and Gunawan, 2009), and the Ahmad Yani road section Surabaya (Indriastuti, Fauziah, and Priyanto, 2011).

Looking at the road safety conditions that are still worrying, Adira Insurance, one of the largest insurance companies in Indonesia, has a campaign program called 'I Want To Get Home Safely'. This program aims to invite all levels of society, both the government, NGOs, the private sector, and various other parties to always care about road safety in order to reduce the

number of accidents in Indonesia. One of the activities in the campaign was the Indonesia Road Safety Award (IRSA) event. This IRSA program is an appreciation program for the best cities and districts that have implemented programs related to road safety. The spirit of the IRSA program is to provide support to city and district governments to continue working toward implementing the pillars of road safety in their government environment so as to create road traffic safety (Bowo, 2016).

Road transportation safety programs come in various forms. The 2007 “Road Transportation Safety National Week” and the 2008 “Road Safety II National Week” had the theme of safety is our responsibility. After 2011, they also carried out routine activities with the theme of ‘Decade of Action on Road Safety in Indonesia 2011-2020’, which in 2012, specifically in Central Java, 10 provinces were selected to run the central government program. The ten provinces were North Sumatra, Jambi, Riau Islands, Bengkulu, Central Java, Central Kalimantan, South Kalimantan, Gorontalo, Maluku and Papua (Jati, 2012).

4.7 Monitoring and Evaluation for the Road Safety Program

In almost all cities in Indonesia, monitoring and evaluation (ME) of the road safety program that has been implemented is still lacking attention. This is caused by the absence of the ME program in the agency and limited funding. Cases like this have been encountered by researchers in several government institutions in the cities of Bandung, Palembang, and Pangkalpinang. However, all Departments of Public Works in Indonesia have ME programs to evaluate the implementation of programs that have been carried out. The ME program is also useful for finding obstacles encountered during the implementation of the road safety program (Jati, 2012).

The evaluation definition by Dun (1999) states that ‘evaluation is a process that produces knowledge that is relevant to the policy about the mismatch between the expected policy performance of the product produced’. Evaluations not only produce conclusions about how far the problem has been resolved, but also rely on clarification and criticism of the values that underlie the policy, helping in the adjustment and reformulation of a problem (Jati, 2012).

Furthermore, the Director of Safety Guidance (2018) said that supervision of the implementation of the road safety program was carried out by auditing traffic safety and road transportation, inspecting the implementation of the program, and monitoring the progress of the program.

Actually, government agencies conduct ME on road safety programs (for example, the ministry of public works), but often, the results of evaluations carried out and recommendations given by the ME team are ignored by the relevant agencies. This shows the institutions’ indifferences to the results of monitoring and evaluation conducted, even though these results are very important for providing input to improve the level of road safety (Interviwee 17, 2015).

4.8 Problems in Applying Road Safety

The serious road safety problems that are faced in almost all countries have moved the United Nations to spark the Decade of Action for Road Safety with the aim of reducing the number of casualties due to traffic accidents until 2020 (Takdir, 2017). The implementation of this action requires a strong political commitment from UN member countries, including Indonesia (Takdir, 2017).

The application of road safety in Indonesia is inseparable from the applicable policies. The formulation of policies should aim to minimise the impact of accidents, but in reality, this is

still difficult for policymakers to do (Takdir, 2017). In addition, the implementation of the road safety program often clashes with various interests between Institutions (Jati, 2012). For this reason, it is necessary to negotiate in a forum so that friction between interests can be avoided. In addition, a weak information technology system can also hamper the implementation of road safety; for example, the implementation of a safety program in the North Coast of Pekalongan. The Pekalongan government conducts deliberations through traffic forums and road transportation consisting of the police, the public works department, the transportation department, and transportation business organizations.

The management of the road transportation safety program in the Pantura Line is considered quite good, seeing cooperation from various parties in order to be able to synergize well in terms of institutions and programs. The role of agencies related to the management of safety programs in the Pekalongan Pantura Line has been going well (Jati, 2012).

On the other hand, the Directorate General of Road Traffic and Transport (2004) divides road safety issues into three categories, namely, problems in the field of road infrastructure, institutions and human resources. Problems in the field of road infrastructure include many damaged road conditions, poor traffic management, lack of handling of accident-prone areas, and a minimal number of road signs. Issues encountered in the institutional field are lack of coordination among safety advisory agencies, lack of institutional support, and weak law enforcement. Furthermore, the problem encountered in the field of human resources is the lack of awareness of road users about the importance of safety.

Moreover, problems often encountered in the application of road safety include the use of technology to support road safety information systems (Koppenjan and Groenewegen, 2005). However, not all government agencies in Indonesia have adequate technology systems to store

the required road safety information. Researchers obtained this data when conducting interviews with officials in several government agencies. Data collection systems (both data retrieval and storage) have not used the online system, especially at the local level. Therefore, the use of technology for road safety information systems is needed in order to avoid losing important data, and also for the sustainability of information.

In addition, political will is one of the obstacles faced in implementing road safety. From observations made by researchers in the City of Pangkalpinang, often, the application of road safety fails because there is no political will from the government. This condition is also strengthened by the arguments noted by Wegman (2017) that almost all members of low- and middle-income countries experience road safety problems, namely, ‘a lack of leadership, a lack of political priority, a lack of funding, and a lack of expertise’. Therefore, in the future, the government will begin to consider the political aspects in order to support the implementation of road safety.

According to Jusri, the founder of Jakarta Defensive Driving Consulting (JDDC), the high number of traffic accidents in Indonesia is due to lack of education and weak law enforcement. Jusri exemplified that the burden on the police in the education sector was too large. On the contrary, in the Presidential Instruction of the Republic of Indonesia Number 4 of 2013 concerning the Decade of the Road Safety Action Program, the orderly education of traffic is under the authority of all provincial and district municipal governments as well as twelve ministries, including the Ministry of Education and Culture. Jusri noted that Presidential Instruction Number 4 of 2013 had not been implemented properly; therefore, it is necessary to have active government agencies involved in providing orderly education of traffic (Rudi, 2017).

Indonesia not only experiences road safety problems, but Romania also faces similar problems in implementing road safety programs (Tisca, et al., 2016). According to Tisca, et al. (2016), road safety issues in Romania include ‘coordination between units with responsibilities in spatial planning and development road planning and administration, closer coordination between the road administration and the police, lack of technical staff specialising in traffic safety, and the traditional road design for high-speed movement’.

As stipulated in the pillars of the RUNK (National Road Safety Master Plan), along with seeing the real conditions on the ground, the quality of safety in Indonesia requires a common perception of all parties concerned in an effort to succeed the program that has been set (Ditgakkum Korlantas POLRI, 2018).

4.9 Conclusion

This chapter describes the current status of road safety management in Indonesia. The conditions described include an overall picture of accidents in Indonesia, applicable government regulations, responsible parties, road safety implementation strategies, funding allocation, implementation of road safety programs, monitoring and evaluation, and problems in implementing road safety. Road safety management in Indonesia has been running by referring to applicable regulations and is in line with the World Safety Program (United Nations). However, in its implementation, it still faces several obstacles that need special attention from various parties in order to find solutions to improve road safety in Indonesia.

CHAPTER 5

INSTITUTIONAL BARRIERS IN INDONESIA

5.1 Introduction

This chapter reports findings: (1) the identifications of the main factors that affect road safety at institutional levels; (2) the comparison of the case studies implementation barriers to road safety management; and (3) the exploration of how improvemens could be made to deliver a safe road transport system at the institutional level. This chapter will be divided into four sections. Section one is introduction. Section two will discusss institutional barriers in four cities in Indonesia from engineering, institutional and economic aspects, respectively. Section three will describe the comparison of institutional barriers in four cities in Indonesia. Section four will summarize the institutional barriers in Indonesia.

5.2 Institutional Barriers based on Interviews

In this section, institutional barriers are based on interviews that are seen from three aspects of the problem, namely, engineering, institutional, and economic. Interviews were conducted at the national level (Jakarta) and at the local level (Bandung, Palembang and Pangkalpinang). The findings of the interview are described below.

5.2.1 Engineering Aspect

In this study, the researcher investigated the institutional barriers from the engineering aspect through the use of eight questions. Each of the questions can be seen in Appendix 2. The eight questions asked concerned the interviewees' perspectives and knowledge based on the theoritical framework and best practices that they had already experienced. The eight questions

tested knowledge about policy targets, familiarity with iRAP (the International Road Assessment Program), the needs of road safety, locations of potential accidents, conformity between road design with road safety standards, provision for VRU (Vulnerable Road User) facilities, monitoring and evaluation, and road sign provisions.

In order to interview the officials of the Department for Transport in the four cities, the researcher had to pass quite a long bureaucracy. The researcher submitted an official permission letter for data collection on the researcher's university institution letterhead acknowledging the department's consent and permission for the interview of the Head of Department for Transport and other related institutions.

5.2.1.1 Policy Targets

The first question the researcher asked the interviewees was whether the interviewees' institutions have policy targets. Out of 17 interviewees that the researcher met, only one (1) interviewee said that their institution does not have policy targets regarding road safety management. Interviewee 1 answered that they do not have any policy target for road safety. Interviewee 2 (Pangkalpinang, Bangka Belitung Province) explained that the target of the Department for Transport is to provide all traffic facilities/infrastructures, such as road signs and traffic lights in general, cheap and reliable public transportation and Bus Rapid Transit (BRT). Interviewee 3 (Pangkalpinang, Bangka Belitung Province) stated that the target to be achieved in general is to increase the amount of road safety, especially traffic awareness and increasing the safety of road users so that the number of accidents will decrease. Therefore, the police need to take preventive actions, such as providing safety socializing to schools, from junior high to tertiary levels, community organizations, urban villages and students. The

campaign is carried out by using the lecture method. This Traffic Law campaign program has been carried out every day.

Interviewee 4 (Pangkalpinang, Bangka Belitung Province) explained that the target to be achieved by the Public Works Agency of the Bangka Belitung Islands Province is providing good road conditions based on Minimum Service Standards based on the instructions by the Minister of Public Works Decree of 2010, especially the needs of providing road widths and complementary road buildings. According to interviewee 5 (Transportation Agency, Pangkalpinang, Bangka Belitung Province), even though the regional regulations of provinces that support this target policy are not available, the Ministry of Transportation already has policy targets related to road safety. Interviewee 5 added that the concrete steps related to road safety taken by the Transportation Agency of the Bangka Belitung Islands Province include providing information to schools with the main target of school-age children, and awarding exemplary driver awards. Interviewee 5 (Transportation Agency, Pangkalpinang, Bangka Belitung Province) explained that the policy targetted by the Provincial Transportation Agency in Bangka Belitung Province is to achieve zero accidents. Therefore, the Transportation Agency has installed traffic safety equipment, such as traffic lights, road markings, ribbon combiners, warning lights and road safety fences (guard rails) on road infrastructure so that it can reduce accident fatality rates.

Similarly, interviewee 6 (Pangkalpinang, Bangka Belitung Province) explained that, in general, the target policy to be achieved by the police is to reduce the number of traffic accidents. However, the policy target emphasizes enforcing traffic violations. Furthermore, interviewee 7 (Bandung City, West Java) said that the policy targets of their institution are to conduct policy management, namely, Indonesia Road Safety Infrastructure Management and to issue

guidelines and instructions for road safety audits. Similar to the policy targetted in Bangka Belitung Province, interviewee 8 (Bandung City, West Java) said that the Transportation Agency in Bandung City has a policy target of achieving zero accidents. The zero-accident target is reducing the number of accidents to 0%. According to interviewee 8, in order to support the achievement of this target, the Bandung City Transportation Agency provides facilities and infrastructure, whereas the Department of Public Works for Highways is concentrating on road conditions. Next, interviewee 8 explained that the supervision of driving licenses needs to be carried out by the police. Providing street lighting is the responsibility of the Bandung City Parks Service, and the transportation agency itself is responsible for providing signs and markers as well as lights and guardrail traffic.

The researcher could not get the interviewee's answer because interviewee 9 (Bandung City, West Java) did not come to meet the researcher. The researcher had texted and called for appointments but interviewee 9 did not respond. Interviewee 10 (Bandung City, West Java) said that the policy target of the Province of West Java is to provide roads with sustainable safety. Interviewee 11 (Palembang City, South Sumatera) explained the policy programmes, which have been implemented by the traffic department in order to reduce accident rates on urban roads in their province, known as the RSPA (Road Safety Partnership Action) program. The RSPA program includes the school program where students help with traffic on school roads with the supervision of police and the schools. The police go to schools/campuses and traffic order areas.

Furthermore, interviewee 12 (Palembang City, South Sumatera) explained that the Palembang City Public Works and Public Works Agency do not have policy targets because the urban road planning in Palembang City has not taken safety as the top priority for urban roads. Interviewee

12 (Palembang City, South Sumatera) said that the width of the urban road is only four to five meters. The principles used by the Planning Department of Public Works in planning urban roads are to prioritize the availability of roads connecting centers of activities and to facilitate people to travel within the city. Interviewee 13 (Palembang City, South Sumatera) said that the policy targets of the Department of Transportation in their agency are in accordance with the article on road safety contained in Law No. 22, 2009 concerning Road Traffic and Transportation.

Furthermore, interviewee 14 (Palembang City, South Sumatera) said that the Palembang City targeted a 50% reduction in the number of accidents in 2014 and this target has been reached by the police. Interviewee 15 (Palembang City, South Sumatera) added that the target to be achieved by the Public Works Agency of Bina Marga refers to the RUNK. Similarly, interviewee 16 (DKI Jakarta) explained that the Ministry of Transportation's target policy refers to RUNK 2011–2035, namely, an 80% accident reduction, and Decades of 2011–2020 action, namely, a 50% accident reduction. On the other hand, interviewee 17 (DKI Jakarta) said that safe roads are the target of the Ministry of Public Works Sub-Department of Environmental Engineering and road safety.

5.2.1.2 Familiarity with the International Road Assessment Program (iRAP)

When asked about the International Road Assessment Program (iRAP), out of 17 interviewees, only one (1) interviewee was familiar with the iRAP, namely, interviewee 17 from DKI Jakarta. The other interviewees admitted that they were unfamiliar with the iRAP and it was the first time for them to hear the term. Interviewee 1 (Pangkalpinang, Bangka Belitung Province) asked the researcher what iRAP was, and the researcher then explained to him that iRAP is a tool used to assess road safety. Interviewee 17 (DKI Jakarta) admitted that if iRAP is applied on the

streets of Indonesia, then it would likely produce a small star rating score. This means that the roads have a very low level of safety. Therefore, he added that the Ministry of Public Works implement the Road Function Eligibility Test for road safety assessment. The assessment is qualitative because it is only a road condition checklist, whereas the iRAP assessment system is quantitative and uses a star rating scoring system. Interviewee 17 said that officials in the Ministry of Public Works had already discussed the application of iRAP for road safety assessment in Indonesia, but the results were not clear.

Interviewee 17 explained some of the obstacles to implementing iRAP in Indonesia. First, almost all road conditions in Indonesia are categorized as eligible for conditional functions, including national roads. Second, the data collection system in Indonesia is still not good. Third, the coordination system between institutions related to road safety still needs to be addressed. Lastly, there is the possibility that roads in Indonesia might not meet safety standards. On the other hand, interviewee 17 explained an example of the assessment system using the Road Function Eligibility Test implemented in Indonesia. If there are ten Road Function Eligibility Test assessment indicators, then nine of the ten indicators would be considered worthy while one indicator would be judged to be ineligible; therefore, the final result of the Road Function Eligibility Test assessment would not be feasible. Furthermore, interviewee 17 added that the Road Function Eligibility Test assessment system is actually unfair because only one indicator of the assessment is not feasible, causing the final results of the assessment to be unfit. However, there are other factors that can be used as consideration for evaluation. The Road Function Eligibility Test assessment system might still be improved by using a better system. Perhaps the Road Function Eligibility Test assessment system could adopt the assessment system used by iRAP for road safety assessment.

5.2.1.3 The Need for Road Safety

When the researcher asked what aspects needed to be concerned for the road safety, interviewee 1 (Pangkalpinang, Bangka Belitung Province) explained that road safety needs road signs, structuring the road networks, and traffic management. He said that in order to structure the road networks and traffic management, the Department of Public Works in Pangkalpinang has coordinated with the Department of Transportation. He further added that road accident cases occur due to the characteristics of the road users. Furthermore, interviewee 2 (Pangkalpinang, Bangka Belitung Province) said that they need to increase public awareness of the importance of road safety and increase the number of traffic lights. Furthermore, interviewee 2 added that the Department for Transport target is to provide as much as 90% of the total facilities needed to support road safety.

Interviewee 3 (Pangkalpinang, Bangka Belitung Province) said that road safety needs collaboration of all parties and between government institutions, such as the Public Works Agency and the Transportation Agency. Interviewee 4 (Pangkalpinang, Bangka Belitung Province) explained that road safety should include Minimum Service Standards, road safety rules and road support facilities because all roads have not been equipped with road support facilities, such as road signs, street lighting, marking, and road crossings. Interviewee 5 (Transportation Agency, Pangkalpinang, Bangka Belitung Province) stated that road safety needs to establish a rule for the speed limit with the priority motto of surviving. Interviewee 6 (Pangkalpinang, Bangka Belitung Province) could not answer the interview question because he did not really understand the needs of safety.

Interviewee 7 (Bandung, West Java) said that the willingness of institutions to implement road safety and manuals or equipment for road safety data collection are the important elements that

need to be fulfilled for the establishment of road safety. According to Interviewee 8 (Bandung, West Java), the needs for road safety include providing information on road safety needs as early as possible, so that the public will be aware of safety, and this needs the support of the local government. The next is launching a 1000-helmet program in order to evoke public awareness about the advantages of using a helmet when riding mtorcycles. Interviewee 9 (Bandung, West Java) and interviewee 15 (Palembang, South Sumatera) did not answer this question. According to interviewee 10 (Bandung, West Java), in order to establish road safety, skillful human resouces in the field of road safety is needed, along with rules about road safety, the availability of road complementary buildings, and experts in the field of road safety. Interviewee 12 (Palembang, South Sumatera) said that fulfilling the requirements for road conditions should become the foundational factor in order to set up road safety. However, interviewee 12 did not specify what conditions need to be fulfilled for road conditions. According to interviewee 13 (Palembang, South Sumatera), the road safety establishment needs to equip roads with road signs, road markings, and traffic lights as well as discipline road users.

Furthermore, according to interviewee 14 (Palembang, South Sumatera), the need for road safety should include physical road user readiness, vehicle readiness and road user compliance with rules. Interviewee 16 (DKI Jakarta) believed that road safety requires government commitment, so that it can create good road safety management. Interviewee 17 (DKI Jakarta) stated that road safety requires human resources who have expertise in the field of road safety and the commitment of the national and regional governments to implement road safety policies.

5.2.1.4 The Locations for Potential Accidents

Regarding the locations of potential accidents, interviewee 1 (Pangkalpinang, Bangka Belitung Province) stated that the locations with the most significant effect/risk of the occurrence of accidents are at the points of intersections. He added that traffic management also influences road traffic accidents at the intersections. As told by inteviewee 1, road accident cases happen at unsignalized intersections because of the road users' behaviours, especially motorists who often disobey the traffic rules. Interviewee 2 (Pangkalpinang, Bangka Belitung Province) added that the risky locations for accident occurrence are mostly due to the presence of parking along the road. Interviewee 3 (Pangkalpinang, Bangka Belitung Province) explained that several locations are prone to accidents; for example, on Jalan Sudirman Pangkalpinang (Pengkalpinang, Bangka Belitung Province), especially in the Selindung area in front of Graha Loka Housing. They happen because this site is not supported by road signs and other warning signs. Furthermore, the second factor that causes accidents in this area is due to road users' behaviours, especially when they enter the housing complex and become impatient with other road users not reducing their speeds. According to interviewee 4 (Pangkalpinang, Bangka Belitung Province), factors that can cause accidents are imposed by vertical and horizontal alignments, median road (separation), the behaviour of road users themselves, the existence of U-Turn areas that causes many violations, and intersections.

According to interviewee 5 (Transportation Agency, Pangkalpinang, Bangka Belitung Province), interviewee 14 (Palembang City, South Sumatera), and interviewee 15 (Palembang City, South Sumatera), intersections that have the potential to cause accidents, including fatal accidents, are mostly due to the road users' behaviours. Similarly, interviewee 16 (DKI Jakarta) added that the roads that are most at risk for accidents are arterial roads and intersections.

Supporting interviewee 5, 14, 15 and 16 (DKI Jakarta), interviewee 7 (Bandung, West Java) believed that urban roads and intersections have a high risk for accidents, especially at unsignalized intersections. The potential for accidents here is due to the many conflicts that occur in unsignalized intersections, the geometry of the intersections themselves, and the behaviour of road users. Besides that, interviewee 7 (Bandung, West Java) added that there is a possibility that accidents occur due to road hierarchy. However, according to interviewee 7, there is no accident data to support his assumption. Interviewee 8 (Bandung, West Java) said that Soekarno Hatta street is a risky area for accidents. This street is quite wide, with limited facilities for road users, especially for pedestrians and motorcyclists. There are no pedestrian bridges or zebra crossings available. In addition, the use of land along Jalan Soekarno-Hatta is not in accordance with its designation. Interviewee 10 (Bandung, West Java) said that roads with slopes or derivatives as well as straight road conditions with more than 500 meters in length are very dangerous, especially for heavy vehicles. Interviewee 10 added that inter-urban roads, such as Subang – Bandung highway, with a length of 800 meters is at a very high risk for accidents. On the contrary, interviewee 12 (Palembang City, South Sumatera) believed that urban roads have no risk of accidents because the road is located in a residential area. Interviewee 13 (Palembang City, South Sumatera) explained that accident occurrences on urban roads can happen because road users do not have traffic discipline and the roads are not euipped with road signs.

Interviewee 14 (Palembang, South Sumatera) explained that more accidents are prone to occur at intersections as compared to roads. In addition, the cause of such an accident could be due to a large number of heavy vehicles that pass as well as damaged road conditions. On the contrary, interviewee 15 (Palembang, South Sumatera) explained that the dominant factors causing accidents are human factors due to a lack of awareness about the importance of safety whereas

accidents caused by road infrastructure are very small in percentage. However, interviewee 15 admitted that the accident data that supports this statement is not available. Interviewee 15 also explained that the factors causing the accidents is the presence of side barriers, such as street vendors and parking in inapproprate places. Interviewee 16 (DKI Jakarta) emphasized how road hierarchy imposes potential accidents. Moreover, the behaviour of road users, such as having no awareness of their own safety, fatigue and drowsiness, travelling at high speeds, the influence of liquor and also not using a helmet or a seat belt contribute to road traffic accidents. Interviewee 16 argued that there is no influence between the completeness of a road and an accident-prone location.

5.2.1.5 Conformity of Road Design with Road Safety Standards

Next, the researcher wanted to investigate whether road design has conformed with road safety standards. Interviewee 1 (Public Works Department/Pangkalpinang, Bangka Belitung Province) admitted that the urban road designs in Pangkalpinang City have not yet been concerned with the safety factor. Also, the road pavement structures in urban areas have not considered the road safety factors. Moreover, for a long time, road designs have not concidered road safety risks. Contrastively, according to interviewee 2 (Pangkalpinang, Bangka Belitung Province), safety factors have been considered in road design in Pangkalpinang. For example, the installations of road signs that already exist at this time have already met the needs; however, interviewee 2 critisizes the risk factors that have not been considered in the previous road design. Interviewee 3 (Pangkalpinang, Bangka Belitung province) admitted that, so far, the placement of road signs in Pangkalpinang has not paid any attention to road safety standards. Similiar to interviewee 2, both interviewee 3 and interviewee 4 (Pangkalpinang, Bangka

Belitung Province) said that the risk factors related to road safety in Pangkalpinang had not been considered in the previous road design nor were they in line with road safety standards.

Interviewee 4 added that for now, road safety standards have not been a priority for consideration in designing the overall roads in Pangkalpinang. For example, Detailed Engineering Design (DED) only pays attention to road alignment both vertically and horizontally. Interviewee 4 explained that the factors that lead to road safety standards have not been a priority for consideration in road design for two reasons. Firstly, there is a problem with land acquisition on the left and right sides of the road, and secondly, several problems arise concerning road safety because they conflict with social problems. Interviewee 5 (Transportation Agency, Pangkalpinang, Bangka Belitung Province) stated that road design in Pangkalpinang City does not conform with the provisions of safety whereas interviewee 6 (Law Enforcement Section/Traffic Agency / Pangkalpinang, Bangka Belitung Province) did not share his ideas on this issue.

According to interviewee 7 (Road Safety Program Section, Institute of Road Engineering, Bandung, West Java), road design in Bandung City is in line with road safety standards. For example, road design in the city of Bandung has considered safety, especially for speed limits. However, interviewee 7 admitted that the risk factors associated with road safety had not been considered in the previous road design. Interviewee 7 mentioned that nowadays, link-node is always considered on the road network map. Furthermore, according to interviewee 8 (Transportation Agency, Bandung, West Java), road designs in Bandung City have not considered the safety aspect; however, risk factors have been considered previously in road planning. Similarly, interviewee 10 (Public Works Agency, Bandung, West Java) acclaimed that road design in Bandung City has considered safety factors, especially in terms of road

geometry. He also mentioned that the Technical Department at the Public Works Department of Highways has considered risk factors in the initial planning of the road because the authority that is responsible for road infrastructure design in West Java Province is the Technical Planning Sector. Interviewee 11 (Traffic Unit Sector/Police, Bandung, West Java) asserts that road design is still not in line with safety. He mentioned that this can be seen from inadequate road signs, easily damaged roads when floods come, and narrow road width, even for the national road itself.

According to interviewee 12 (Planning Section/Public Works Agency, Palembang, South Sumatera), in Palembang City, South Sumatera, road design has not met road safety standards because safety is not the top priority in road planning whereas interviewee 13 (Planning Section/Transportation Agency, Palembang, South Sumatera) remarked that road design must be concerned with safety standards. Interviewee 14 (Police Agency, Palembang, South Sumatera) was convinced that road design is sufficient to meet road safety standards; however, he admitted that there is a particular road design that is not in accordance with the volume of traffic passing on the road, for example, the road located near the Charitas Hospital, Palembang City. Interviewee 15 (Document Planning Section/Public Works Agency, Palembang, South Sumatera) acclaimed that during all of this time, the road design has followed the stipulated road design requirements; however, he argued that risk factors have not been considered in road design.

Interviewee 16 (Public Transportation Section/Trasnportation Agency, DKI Jakarta) was convinced that on general urban roads in DKI Jakarta, the design has considered safety risk factors, including the placement and installation of signs and pedestrian facilities. On the other hand, interviewee 17 (Environmental Engineering and Road Safety Division/Ministry of Public

Works, DKI Jakarta) argued that the road design that meets the road safety standards is still not widely implemented, especially at the local level, such as small towns in other provinces. Therefore, interviewee 17 insisted that the government needs to consider it in the future. Interviewee 17 furthermore suggested that two approaches can be employed for safety, namely, the Proactive Approach, an approach based on the Audit and Roadworthiness Test, and the Reactive Approach with a focus on blackspot data.

5.2.1.6 Provision for VRUs (Vulnareable Road Users) Facilities

In this study, the researcher also investigates whether there is availability of provisions for vulnerable road users (VRUs) facilities. In Bahasa Indonesia, vulnerable road users are defined as ‘pengguna jalan yang rentan’.

Interviewee 1 (Public Works Agency, Pangkalpinang, Bangka Belitung) and interviewee 3 (Traffic Section, Police, Pangkalpinang, Bangka Belitung) explained that the number of facilities for vulnerable road users (VRUs) is still low. The available facilities for the VRUs nowadays are not equipped with road signs and markings and the utilisation of this facility is not maximised. For example, pedestrians can step out onto the road with a single hand stretched out towards the drivers or motorists. Interviewee 1 also added that the construction of pedestrian crossing facilities have not considered the safety factor for road users. Contrastively, interviewee 2 (Transportation Agency, Pangkalpinang, Bangka Belitung) is not familiar with the term. Then, the researcher explained to interviewee 2 that Vulnerable Road Users (VRUs) are motorists, pedestrians, and bicyclists. After hearing the researcher’s explanation, interviewee 2 said that there is already a regulation of facilities for VRUs in accordance with institutional technical guidelines. However, he admitted that the technical rules regarding pedestrians has not existed until now. Interviewee 2 then stated that the Local Government in

Pangkalpinang City has ordered relevant agencies to provide facilities for road users, especially motorcyclists and pedestrians. He explained that the constraint or challenges in implementing the provision of VRU facilities is land availability. Therefore, he insisted that real action has to be taken by the administrative district of Pangkalpinang.

Interviewee 3 (Traffic Section, Police, Pangkalpinang, Bangka Belitung) explained that the condition of the existing facilities for VRUs is still inadequate. For example, pedestrian crossings (zebra crossings) are not equipped with warning signs and other guidance signs, and the existing zebra crossing markers have faded. Besides that, interviewee 3 criticised that most pedestrians in Pangkalpinang cross the roads without paying attention to the provided road signs. Interviewee 4 (Public Works Agency, Pangkalpinang, Bangka Belitung) explained that the Public Works Agency of Bangka Belitung Islands Province for Highways only provides road facilities, such as sidewalks. He insisted that provision of pavement facilities has been implemented. Next, interviewee 5 (Planning Section/Transportation Agency, Pangkalpinang, Bangka Belitung) explained that the provision for vulnerable road users facilities has been partially fulfilled; however, there are some problems regarding this issue. One of the crucial factors is the provision of land. Interviewee 6 (Law Enforcement/Traffic Agency, Pangkalpinang, Bangka Belitung) could not answer this question.

According to interviewee 7 (Road Safety Program/Institute of Road Engineering, Bandung, West Java), the provision of VRU facilities in Bandung City does not exist, but the guidelines for VRU facillities have been made. For example, IRE has created a pilot project for RHK (Vehicle Stop Space). RHK is intended for two-wheeled vehicles, especially motorbikes. This RHK is placed at the intersection as a red marker. The outcome of this RHK pilot project shows that it is effective enough to parse conflict at each intersection. The approach to the RHK

(Vehicle Stop Space) concept design is to use conflict methods by describing the conflicts that occur at the intersection. According to interviewee 8 (Transportation Agency, Bandung, West Java), the provision of VRU facilities already has rules based on Indonesian Minister of Transportation Regulation No. 13 of 2014, issued by the Ministry of Transportation, Directorate of Roads for Land Transportation in 2014. Interviewee 10 (Public Works Agency, Bandung, West Java) asserted that the provision of VRU facilities already has its own rules set by law and with the decision and rules issued by the Ministry of Transportation. Interviewee 11 (Traffic Agency, Bandung, West Java) added that facilities for vulnerable road users in Bandung City are still not feasible. He gave examples as follows: 1) For pedestrians, where bridge crossings are less feasible, less numerous and less accommodating. The available bridge crossing design is too high and the angle is too sharp; thus, it is dangerous for people, esecially children, old people and those who are not in good health. In fact, the road design should comply with Law Number 22 of 2009. 2) For motorcyclists, a special line for two-wheeled vehicles and a slow lane is available but only on Soekarno-Hatta Road. In other words, the provision of special lanes for two-wheeled vehicles is still very limited. 3) For bicyclists, new facilities are available in the form of special lanes on Jalan Merdeka and Jalan Perintis; however, the availability of special lines for bicyclists is still very limited.

Interviewee 12 (Planning Section of Public Works Agency, Palembang, South Sumatera) asserted that provisions for vulnerable road user facilities already have regulations, both in the form of Laws, Ministerial Decrees and Ministerial Regulations. Interviewee 13 (Planning Section/Transportation Agency, Palembang, South Sumatera) explained that the Transportation Agency has provided and implemented bicycle lanes, especially around Benteng Kuto Besak, Palembang City, although other locations are not equipped with bicycle lanes. In addition, the Transportation Agency has also provided sidewalk facilities for pedestrians in Palembang.

Interviewee 14 (Police Agency, Palembang) acclaimed that the provision for vulnerabe road users has been properly implemented. For example, bus stop facilities, sidewalks and motorbike markers are available in Palembang City. Interviewee 15 (Document Preparation Section/Public Works Agency, Palembang, South Sumatera) said that regulations that control the provision of vulnerable road user facilities are available. Furthermore, interviewee 15 said that although the existing vulnerable road user legislation is available, the regional regulations concerning the provision of space for vulnerable road user facilities are not available yet; therefore, the provision should be made by the regional government. In fact, according to interviewee 15, the Public Works Agency of Highways of South Sumatra Province has submitted a proposal to make a regulation on VRU facilities to regional governments; however, the proposal has not been responded by the local government until now.

Interviewee 16 (Public Transportation Section/Ministry of Transportation, DKI Jakarta) affirmed that VRU facilities in DKI Jakarta have already been available, especially for pedestrians and bicyclists. In fact, interviewee 16 insisted that provision facilities for pedestrians and bicyclists are good, but law enforcement still needs to be improved. Special bicycle lines are still very limited. Next, interviewee 16 added that special motorcycle lanes have already been implemented in cities in Indonesia; however, as told by interviewee 16, the regulations or provisions regarding special motorcycle lanes are not stated in detail. Interviewee 17 (Environmental Engineering and Road Safety Division/Ministry of Public Works, DKI Jakarta) critisized that even though the facilities' regulations, especially for pedestrians, are complete, there is no implementation conducted. In addition, interviewee 17 presumed that the facilities for motorcycles in DKI Jakarta have not been made clear and are binding the regulations. Therefore, further study for its application needs to be undertaken.

5.2.1.7 Monitoring and Evaluation

The researcher asked how the monitoring and evaluation of road safety is conducted. According to interviewee 1 (Public Works Agency, Pangkalpinang, Bangka Belitung Province), monitoring and evaluation have been conducted. He explained that the Public Works Agency of Pangkalpinang City has determined the divisions that should be responsible for carrying out the activity; meanwhile, the road monitoring activity is the responsibility of the vision of The Facility and Infrastructure Planning and Evaluation Program, PPSK. In other words, the Public Works Agency of Pangkalpinang City has an internal unit that is responsible for monitoring and evaluating road infrastructure while Bappeda (regional planning and development agency) for the administrative district of Pangkalpinang has an external responsibility for monitoring and evaluation. Interviewee 2 (Transportation Agency, Pangkalpinang, Bangka Belitung) explained that the Transportation Agency in Pangkalpinang City conducts traffic facility maintenance four quarters per year. Interviewee 3 (Traffic Section/Police, Pangkalpinang, Bangka Belitung) explained that the police agency, especially the traffic unit section, carries out monitoring and evaluation per quarter per year. This quarterly activity is carried out in collaboration among the institutions, but interviewee 3 did not explain which institutions get involved in monitoring and evaluation, even though the researcher asked interviewee 3 to mention the institutions. Interviewee 3 then added that the traffic unit section conducts monitoring and evaluation every month. This monthly monitoring and evaluation is carried out at each police station in the city (for internal monitoring and evaluation, which is related to the activities that have been carried out).

Furthermore, interviewee 4 (Public Works Agency, Pangkalpinang, Bangka Belitung) explained that monitoring and evaluation carried out throughout the year is addressed to

provincial road conditions that are at risk for accidents. Interviewee 5 (Planning Section/Transportation Agency, Pangkalpinang, Bangka Belitung) explained that monitoring and evaluation could be conducted if there are reports from community and police. Interviewee 5 added that monitoring and evaluation is usually done at a minimum per quarter, especially for monitoring and evaluating road sign conditions. Meanwhile, relating to this question, interviewee 6 (Law Enforcement/Traffic Agency, Pangkalpinang, Bangka Belitung) could not share his idea because he was not aware of the issue.

According to interviewee 7, monitoring and evaluation is not inherent in the Institute of Research Engineering (IRE) because IRE is a body that focuses on research only. The output of the research results revealed by IRE is in the form of implementation guidelines for road safety in Bandung, West Java. Interviewee 8 said that monitoring is carried out every day, especially in the parking area. In fact, it is reinforced by the Mayor's Decree. The Mayor's Decree is formed by a joint team consisting of the Transportation Agency, the Police Agency, SATPOL PP and TNI (Indonesian Army). This is an action against violators against traffic rules and regulation. Bandung City usually conducts monitoring and evaluation five times in one week. Interviewee 10 stated that the Public Works Agency of Highways monitors and evaluates periodically, three times a year. He added that this activity is usually done quarterly. Interviewee 10 also provided information that the new Road Function Eligibility activity, formed in 2014, only carries out Road Function Elligibility Certification. Furthermore, interviewee 11 said that the police conduct monitoring and evaluation once a month by having field surveys.

In Palembang City, interviewee 12 explained that the Public Works Agency of Highways does not conduct monitoring and evaluation of the work that has been done. This condition is due to

a lack of knowledge from the engineers that the agency has. Furthermore, interviewee 13 affirmed that the Transportation Agency monitors, checks and evaluates road signs every day. Interviewee 14 said that the police conduct evaluation and monitoring on road safety every month. Interviewee 14 added that in 2015, the Police Agency in Palembang City, Polrestabes Palembang launched the Traffic Management Control (TMC) Program, namely, the installation of cameras at 22 points on national roads in Palembang City. Contrastively, interviewee 14 admitted that the Public Works Agency of Highways has never conducted monitoring and evaluation on the activities that have been carried out.

In DKI Jakarta, interviewee 16 said that the Indonesian Ministry of Transportation always conducts audits on the conditions of road buildings, including road signs and road markings. Besides that, interviewee 16 added that the Ministry of Transportation has its own section for monitoring and evaluation under the auspices of the Directorate of Land Transportation Safety. Interviewee 17 added that monitoring and evaluation implementation activities are still lacking, even though human resources are sufficient. Interviewee 17 explained that eleven National Road Implementation Centers under the auspices of the Ministry of Public Works conduct monitoring and evaluation (Monev) at least once a year. Monev activities are carried out for two days where the first day is an interview program and the second day is a field survey. Interviewee 17 added that the results of monitoring and evaluation of safety emphasis on work sites are still qualitative in nature, whereas safety key performance indicators have not yet become a priority assessment within the Ministry of Public Works.

5.2.1.8 Employment of Road Sign Provisions

The researcher investigated how the interviewees employ road sign provisions in their cities. Interviewee 1 explained that the provision of road signs is available in the Department of

Transportation. The Public Works Agency of Pangkalpinang City has no responsibility for the procurement and provision of road signs because it has become the authority of the Department of Transportation, Pangkalpinang City. Interviewee 1 also explained that the Traffic and Road Transport Act of 2009 number 22 also regulates the road signs. Furthermore, interviewee 2 said that the provisions for road sign has been regulated in the Decree of Indonesian Ministry of Transportation number 61 of 1993 concerning Signs for Road Traffic. Interviewee 2 added that the Local Government of Pangkalpinang City also issued a regional regulation Number 17 of 2004 on the installation of signs, road markings, and zebra crossings. Interviwee 3 responded that the roads' lack of road signs and road sign utilization are still not optimal.

Interviewee 4 said that the road sign provision is the responsibility of the Transportation Agency. Intrviewee 5 informed that the Provincial Transportation Service employs road sign provisions based on the Director General of Land Relations Regulation Number SK 7234 / AJ.401 / DRJD / 2013 concerning Technical Guidelines for Road Equipment. Interviewee 6 could not answer this question.

In Bandung City, interviewee 7 said that there is already a regulation for road sign provision. This regulation can be seen in the Ministerial Decree of Transportation or Minister of Regulation of Transportation. Interviewee 8 explained that the Transportation Agency applies road sign provisions based on rules issued by the Ministry of Transportation and also the Law. Interviewee 10 confirmed that the road sign provision has rules; however, interviewee 11 admitted that the availability of road signs was still lacking.

In Palembang City, interviewee 12 asserted that in order to enforce the road sign provision, it is necessary to coordinate with the Department of Transportation. Interviewee 12 also added that the road sign provision in Palembang City has fulfilled the specified criteria. Furthermore,

interviewee 13 and interviewee 15 reported that there has been a Decree of the Minister of Transportation concerning road sign provision, and interviewee 14 insisted that the road sign provision in Palembang is in accordance with the applicable rules. Interviewee 14 also provided information that the Traffic Forum has been formed in Palembang with the Mayor's Decree. The Traffic Forum membership consists of police, the local government, the Public Works Department of Highways, the Transportation Agency, the Health Office, and the Automotive Community and Organda. The Traffic Forum holds a meeting every month. Interviewee 14 acclaimed that so far, the Traffic Forum has been running effectively.

Similirly, in DKI Jakarta, interviewees 16 and 17 affirmed that the road sign provision is regulated in the law and in ministerial regulations and ministerial decrees.

5.2.2 Institutional Aspect

5.2.2.1 Institution's Responsibility for Road Safety

The researcher furthermore investigated the institution's responsibility for road safety. In Pangkalpinang, interviewee 1 responded that the Public Works Agency is responsible for the safety of road infrastructure. The Transportation Agency is responsible for the procurement of road complementary facilities, such as providing pedestrian crossings, provision of road signs and road markings. In addition, Bappeda is responsible for regional planning and development. Interviewee 2 affirmed that the five institutions responsible for road safety consist of the Transportation Agency, (responsible for vehicle safety (safer vehicles)), the Public Works Agency of Highways, which is responsible for road infrastructure (safer roads), the Industry and Trade Agency, which is responsible for vehicle production, the Department of Health and Services, Raharja, which is responsible for assistance to victims of accidents and post-accident handling, and the police, which are responsible for the regulation, enforcement and security of

traffic. Interviewee 2 furthermore added that these five agencies need to have good coordination. Interviewee 2 also explained that, in fact, the safety factor has been mentioned in the Traffic and Road Transport Act No. 22 of 2009.

Interviewee 3 stated that it is difficult to mention institutions that are specifically holding particular responsibilities; however, he affirmed that road signs and traffic flow become the responsibility of the Department of Transportation. Interviewee 4 confirmed that the Public Works Agency for Highways is only responsible for road safety. According to interviewee 4, institutions that are responsible for road safety have been stated in Law Number 22 of 2009. According to interviewee 5, there are five institutions responsible for road safety: 1. The Public Works Agency, which is responsible for road infrastructure; 2. The Transportation Agency, which is responsible for vehicle; 3. Ministry of Research and Technology, which is responsible for the technology used for vehicles; 4. The Ministry of Commerce, which is responsible for the product of marketed vehicles; and 5. The police, which are responsible for securing traffic and law enforcement.

According to interviewee 7, in Bandung City, institutions that are responsible for road safety consist of Bappenas and Menristek, which are responsible for the field of safety management (safer management), along with the Ministry of Public Works, which is responsible for safer roads in the local government (at the local level) and at the national level. Based on interviewee 8, institutions that are responsible for road safety include the police, which are responsible for law enforcement of violations committed by road users, Garden Service, which is responsible for street lighting (PJO = Street Lighting and People), the Department of Transportation, which is responsible for the provision of road signs and markers, the Public Works Agency of Highways, which is responsible for overall road conditions ranging from geometry to road

pavement, and Satpol PP (Civil Service Police Unit), which are responsible for assisting the police in law enforcement against traffic violations. According to interviewee 10, the institutions that are responsible for road safety consist of The Public Works Agency of Highways, which is responsible for road infrastructure; The Transportation Agency, which is responsible for facilities that are on the road; and the police, which are responsible for law enforcement for traffic violations. According to interviewee 11, the police are responsible for law enforcement, so that they can reduce the number of accidents. Interviewee 11 also explained the plan to establish a Traffic Forum.

Interviewee 12 could not answer the research question about the institution's responsibility for road safety in Palembang. Interviewee 13 explained that the Transportation Agency is responsible for the completeness of road signs and markers. Interviewee 14 confirmed that the institution's responsibility for road safety referred to the RUNK, which consists of of five pillars. The police are the fourth pillar that must be responsible for road user safety. Interviewee 15 informed that The Public Works Agency of Highways is responsible for road infrastructure safety.

In DKI Jakarta, interviewee 16 asserted that the institution that is responsible for road infrastructure safety refers to the 2011-2035 RUNK. The Ministry of Transportation is responsible for safer vehicles with attention to the crew and the safety of the driver of the vehicle (public transportation). Interviewee 17 explained that based on RUNK, there are twelve institutions that are responsible for safety; for example, The Ministry of Public Works and The Ministry of Transportation. Furthermore, interviewee 17 emphasized that the application of road safety needs to be supported by local governments in a disciplined way in order to commit. Interviewee 17 also explained that The Ministry of Public Works and The Ministry of

Transportation have separate units that focus on road safety. The Ministry of Transportation has a Directorate of Land Transportation Safety (KTD), which is held by officials of echelon two, whereas The Ministry of Public Works does not have a special road safety directorate, but only has a Road Safety Unit, which is held by officials of echelon IV. Interviewee 17 asserted that The Ministry of Public Works needs to make the Road Infrastructure Safety Directorate run their agenda succesfully. Interviewee 17 also added that The Ministry of Public Works has a TURBINBANGWAS Program (Arrangement, Development, and Supervision) aimed at provinces with funding sourced from the APBD.

5.2.2.2 Availability of Road Safety Units

The next question that the researcher investigated was the availability of road safety units. Interviewees 1, 4 and 5 responded to this question, saying that the Public Works Agency of Pangkalpinang City does not have a road safety unit or a safety audit team. In addition, interviewee 1 added that the provisions related to road safety, especially in the case of road design, have not been fully adhered to by the relevant institutions. Interviewee 1 suggested that there should be a field or a separate unit that takes care of road safety in the Public Works Agency of Pangkalpinang City, such as Road Safety and a Road Safety Unit. Furthermore, interviewee 2 informed that there should be a part or a unit responsible for road safety in one institution, but he did not explain the reasons for it. Interviewee 3 said that in the police, the unit that plays the role in road safety is the investigator's part and the Dikyasa section (Education and Engineering Section). Interviewee 4 admitted that The Public Works Agency of the Bangka Belitung Province does not have its own road safety unit. Besides that, interviewee 4 added that there are no separate institutions responsible for road safety at the provincial level. Interviewee 5 believed that there needed to be a separate road safety unit at the

Transportation Agency; for example, they need to provide safety under the Traffic Department. Interviewee 5 added that the parties that are responsible for road safety and the institution are separated.

In Bandung, interviewee 8 explained that the Transportation Agency of Bandung City, especially the Traffic Division, does not have its own safety unit. He believed that it was necessary to make a road safety unit on its own. At the national level, there is already the Directorate of Land Transportation Safety (KTD) at the Ministry of Transportation under the Directorate General of Land Transportation. However, interviewee 10 stated that road safety units were not needed within the Public Works Agency of Highways because interviewee 10 believed that the existing conditions are felt to be sufficient. Next, interviewee 11 said that the existence of a road safety unit is needed in one agency.

Interviewee 13 believed that road safety units have been formed. This unit is named the National Transportation Safety Committee (NTSC). Interviewee 14 believed that the police agency in Pelembang, Polrestabes Palembang has an Education and Engineering Unit (Dikyasa) with a focus on safety issues while the South Sumatra Regional Police has Kamsel Subdit (Security and Safety), which also focuses on safety issues. Interviewee 15 informed that for the local level, there is no institution that has road safety units separately; however, at the national level, The Ministry of Public Works already has its own road safety unit.

In DKI Jakarta, interviewee 16 insisted that the RUNK has established institutions that are responsible for safety separately. Next, interviewee 16 explained that at the national level (ministry), a separate unit is formed to deal with road safety issues. For example, The Ministry of Transportation has a Directorate of Land Transportation Safety (KTD), which is divided into several sub-directorates of safety, namely, safety management, safety promotion and

partnership, developing public transport safety and audit and safety inspection. Interviewee 16 informed that the organisational structure of the Ministry of Transportation could be seen clearly on the official website (http://hubdat.dephub.go.id/struktur-organisasiktd).

Furthermore, interviewee 16 asserted that the Ministry of Public Works does not have a special directorate for road safety; however, the Ministry of Public Works has a road safety unit that is under the auspices of the Directorate General of Highways. Under the Directorate General of Highways, there is the Directorate of Technical Development, which is divided into five sub-directorates, namely, road techniques, bridge techniques; environmental engineering and road safety, freeway techniques and urban roads, and the procurement of land. Interviewee 16 mentioned that the sub-directorate of Environmental and Road Safety Engineering is divided into two sections, namely, the environmental engineering section and the natural disaster mitigation and road safety section. Interviewee 16 added that the Indonesian National Police has a Korlantas (Traffic Coordinator) section, which is responsible for the smooth flow of traffic and the recording of accidents. Korlantas is also responsible for law enforcement for violators of applicable traffic regulations. In addition, interviewee 17 explained that the Ministry of Public Works had a sub-department of Environmental Engineering and Road Safety.

5.2.2.3 What the Road Safety Unit is Looking For

When the researcher asked what the road safety unit is looking for, interviewees 1, 3, 4, 13 and 15 could not answer the question. Interviewee 2 answered that the road safety unit expects road users to safely arrive at their destinations and that they obey the traffic rules. Interviewee 4 said that he could not answer this question because there is no separate road safety unit available in Pangkalpinang. According to interviewees 5 and 7, what is needed in

implementing road safety is a commitment from the government and good cooperation for action in road safety.

Interviewee 10 stated that road safety units require government commitment to make policies related to road safety and comply with the rules that have been made. He believed that the most important thing in road safety units is good coordination and communication between institutions in the field of road safety. Meanwhile, interviewee 12 answered that the road safety unit requires information on urban road safety, including technical instructions for implementing road safety assessment. Interviewee 14 said that it is necessary to reform the coordination system among institutions related to road safety. Besides government commitment, interviewee 16 said that road safety units require road safety assessment standards. For example, the Ministry of Transportation needs an assessment standard for safer vehicles aimed at vehicle entrepreneurs and the vehicle industry itself. Besides that, interviewee 16 believed that road safety units require a study of the safer vehicle needs and an implementation of recommendations for improving accident rates. Interviewee 17 stated that the road safety unit focuses on reducing accident rates. In DKI Jakarta, the target to be achieved is a 50% accident reduction, referring to RUNK. Therefore, interviewee 17 concluded that the Directorate General of Highways of the Ministry of Public Works focuses on human resources with both a proactive and a reactive approach.

5.2.2.4 Coordination among the Institutions in terms of Road Safety

Regarding the question on how to coordinate with other institutions, the researcher found that coordination among the institutions should be strengthened and structured. According to interviewee 1, coordination among institutions (Public Works Department, Transportation Department, and Police) has been running well, but still needs coordination improvements.

Interviewee 2 replied that inter-institutional coordination that is closely related to road safety at this time consists of the Department for Transport and the Public Works and Police Department; however, the coordination among them is still not good. Interviewee 3 admitted that coordination between institutions has not gone well, even though it is mentioned in article 23 of Law No. 22 of 2009. Interviewee 2 did not explain how far the coordination has gone so far. Like interviewee 1, interviewee 4 explained that there is already coordination between institutions regarding road safety; however, the coordination still needs to be increased. Furthermore, interviewee 4 provided information that there is already a Traffic Communication Forum (FKLL) at the provincial level, consisting of members from the police, the Transportation Agency, and the Public Works Agency. This forum also forms a team that functions as an assessment team if needed to investigate road traffic accidents. The assessment team members for this accident investigation consists of more than 10 people. Membership of the assessment team is seen from structural positions in agencies related to road safety. The initial formation of the FKLL accident investigation team at the provincial level in 2012 was chaired by the regional police. In Bangka Belitung, the Traffic Communication Forum meets twice a year. According to interviewee 5, coordination between institutions in terms of road safety has been going well, but is still not optimal, especially between the Transportation Agency and the Public Works and Police Service in terms of traffic control and accident data usage.

In Bandung City, interviewee 7 claimed that the coordination between institutions in terms of road safety has been quite good so far. However, there are still many weaknesses among coordination between institutions regarding road safety. Interviewee 7 explained that the coordination that has been carried out so far still has some weaknesses, known as triple L (3L), namely, lack of data and lack of coordination. Therefore, according to interviewee 7,

implementing the iRAP system will have obstacles related to the command line and coordination. For example, in other foreign countries, the command line is top down while the command line in Indonesia is bottom up. Similarly, according to interviewee 8, coordination between institutions in Bandung City related to road safety is fairly good. Interviewee 8 explained that in Bandung City, the BGORTRANS (Transportation Coordination Agency) of the City of Bandung has been formed. This forum does not have a specific schedule for meetings; however, meetings are conducted depending on needs. This BGORTRANS has been running from 1995 until now. In 2011, it was proposed for the formation of an FGD - LLAJ Forum, but there has been no follow-up from the Bandung City Government until now.

On the contrary, interviewee 10 admitted that coordination between institutions related to road safety in Bandung City has not been going well so far. However, according to interviewee 10, this does not mean that the coordination that has been running so far is fairly poor. For this reason, he added that further coaching is needed for coordination. Interviewee 10 believed that lack of coordination damages the road conditions. For example, according to interviewee 10, Cirebon City as a coal port, and the city of Bandung has many factories. Both cities are passed by a lot of heavy vehicles. This then becomes one of the factors that causes damaged roads. In fact, this situation is closely related to government policies in the city. Another thing related to this issue is whether the initial planning of roads in the city of Cirebon and the city of Bandung has taken into account the conditions of economic development in both cities. In addition, this problem is also triggered by political and power problems in the city. Interviewees 11, 12 and 13 admitted that the coordination that currently exists has not gone well. Interviewee 12 explained that coordination between institutions related to road safety was not going well.

Interviewee 13 said that coordination between agencies had not gone well. On the contrary, interviewees 14, 15 and 16 agreed that coordination between institutions related to road safety has gone well. However, interviewee 15 suggested that coordination still needs to be improved; for example, coordination between the Ministry of Public Works with the police.

Furthermore, interviewee 17 acclaimed that coordination between institutions related to road safety has been going pretty well at the national level.

5.2.2.5 The Policymakers for Road Safety

This research reveals many perspectives on the policymakers for road safety. Interviewee 1 mentioned that the Public Works Agency of Pangkalpinang City does not make policies/decisions related to road safety. According to interviewee 1, the policy for urban road safety does not exist. Interviewee 1 also added that the policymaker at the regional level is held by the Governor and the Minister whereas the President becomes the policymaker at the national level. The Public Works Department of Pangkalpinang City is only the implementer of the policies made. Interviewee 2 explained that the policymakers or the decision makers for urban road safety are in institutions at the central level, in this case, the Ministry of Transportation of the Republic of Indonesia. Meanwhile, the Department for Transport located at the regional level only functions as implementers of policies or decisions that have been mandated at the central level. Interviewee 3 could not answer this question. Interviewee 4 explained that the policymakers of road safety at the central level are held by the Ministry of Public Works, not at the regional level. Furthermore, interviewee 5 said that the Regional Government Regulations related to road safety are made by the Governor through the Head of the Department of Transportation.

Interviewee 7 said that the policymakers for road safety are at the level of ministries, both in the transportation and public works departments. The policies are in the form of Ministerial Decrees and Ministerial Regulations. Besides the Minister, the government has made a policy for road safety at a higher level by issuing a law. According to interviewee 8, the policymakers for safety decisions or policies for urban roads are at the central level; meanwhile, at the local level, they are only executors. The decisions and policies that have been made are then strengthened by the Regional Regulation of the Mayor, and, of course, it should not contradict with the Decree of the Ministry of Transportation. Interviewee 10 said that the policymakers for urban road safety are at the Ministry of Public Works. The Ministry of Public Works structures the criteria needed for assessment and includes technical guidelines for the implementation of road safety in the field. Interviewee 11 added that the police do not make policies or decisions in the field of road safety because they are only operational implementers. Here, interviewee 10 emphasized that there would be no road safety policy from the police.

Interviewee 12 said that the policymakers for road safety policy is the government, in this case, the Ministry of Public Works. Interviewee 13 argued that the policy for road safety is made by the Ministry of Transportation. Interviewee 13 explained that the NTSC has been formed in Palembang City, and he was one of the representatives from Palembang. The NTSC team assesses completeness related to safety in the event of an accident in a large category. Interviewee 14 mentioned that the police do not make policies for road safety. Interviewee 15 said that the central government at the national level makes road safety policies, i.e., the Ministry of Public Works and the Ministry of Transportation.

Interviewee 16 confirmed that the Ministry of Public Works makes a safety policy for road infrastructure while the Ministry of Transportation makes safety policies for vehicles.

Interviewee 16 added that policymaking refers to the road laws as outlined in the form of Ministerial Decrees and Ministerial Regulations. In other words, interviewee 16 felt convinced that road safety policymakers are at the central government (the president and the ministers) and regional leaders (governors, mayors and regents). The roles of policies at the local level must support policies that have been made at the central level. Interviewee 17 affirmed that the road safety policy related to infrastructure regulation is made by the Ministry of Public Works while the policy related to vehicles is made by the Ministry of Transportation. Interviewee 17 also added that the Union of the Minister of Public Works and Transportation related to road safety is still made separately, but, in fact, has the same goal, safety.

5.2.2.6 Measuring Road Safety in Urban Areas

Interviewee 1 said that maintaining the condition of urban roads needs to include the construction and maintenance of roads and bridges. Interviewee 2 admitted that until the time he was interviewed, there had been no measurement of road safety on the roads of Pangkalpinang. Interviewees 3 and 4 explained that so far, there has never been a measurement of urban road safety. On the other hand, interviewee 5 informed that road safety measurement on urban roads could use road infrastructure indicators. However, the use of these indicators has not been maximised. Interviewee 6 could not answer this question.

In Bandung City, interviewee 7 explained that the road safety on urban roads can be measured by the reduced rate of accidents that have occurred. This is in line with the Decade of Road Safety Vision, which began in 2010, namely, the zero-accident program. According to interviewee 8, for measuring road safety on urban roads, it is necessary to comply with road safety technical guidelines. However, there are no technical guidelines for road safety, whereas technical instructions for flight safety have been in existence. According to interviewee 10, road

safety measurements use indicators in accordance with Eligible Road Functions. The indicators used can be seen in technical assessment requirements of the Eligible Road Functions. Interviewee 11 stated that road safety measurements on urban roads are carried out by field observations and checking directly at the scene of an accident.

In Palembang City, interviewees 12 and 14 admitted that so far, there has never been an assessment of urban road safety. Interviewee 13 could not answer questions about how to measure road safety on urban roads. Interviewee 15 asserted that so far, the Public Works Agency of Highways has never carried out road safety measurements. According to interviewee 16, the indicator used to measure safety on urban roads is the reduced rate of accidents that occur on these roads. Interviewee 17 informed that safety measurements on urban roads in DKI Jakarta are still carried out qualitatively by referring to the road function worthiness test form.

5.2.2.7 Recording Data of Road Safety

Interviewee 1 explained that there is no road-safety-related database in the Department for Transport in the administrative district of Pangkalpinang City. The Department for Transport only has LHR (Average Daily Traffic) data obtained from survey results on traffic only. Interviewee 2 mentioned that data length and width of urban roads in Pangkalpinang can be obtained from the Public Works Agency of Highways in Pangkalpinang City. Furthermore, interviewee 3 informed that accident data has been online for the past five years through the IRSMS (Integrated Road Safety Management System). However, according to interviewee 3, the process of recording accident data is still done manually by using paper. Interviewee 3 also added that the data length and width of a road can be checked at the Public Works Agency of Highways of Pangkalpinang City. Interviewee 4 explained that the Public Works Agency already has a database of road surface conditions, such as severe damage, minor damage,

moderate damage, and good condition; however, this database is not updated every year due to limited funds. Data collection is also still manual, not systematic and integrated. Interviewee 4 provided data on the length and width of the road in Pangkalpinang City in the form of soft files to the researcher. Next, interviewee 5 affirmed that the Provincial Transportation Agency is developing a road infrastructure database. For databases, the length and width of roads can be obtained from the Public Works Agency of Highways. Interviewee 6 could not answer this question.

Interviewee 7 explained that data collection on road safety still needs to be improved. Interviewee 7 added that there are two types of data collection systems that have been carried out so far, namely, unconventional and conventional. Unconventional systems use Hawkeye 2000 tools and the resulting data is more thorough, accurate and valid whereas the conventional system is a manual system that uses the checklist form or surveyor noting the conditions in the field. For national roads, data collection has been carried out with both conventional and nonconventional systems. Data on road length and width can be obtained at the Ministry of Public Works while road accident data that often occurs due to accidents can be obtained from the police. Interviewee 8 admitted that there is no record of data related to urban road safety at the Bandung City Transportation Agency. From the insurance agency, the data collection system can be seen from insurance claims while the police already have a data collection system for accident data. Furthermore, interviewee 8 added that data on the length and width of roads, including data on road conditions, can be obtained from the Public Works Agency of Highways. Interviewee 10 argued that the Public Works Agency of Highways does not have a good database related to road safety; however, the road and bridge maintenance sub-offices already have a road condition database for maintenance activities. Interviewee 10 added that police-recorded accident data is based on the required categories. If needed, accident data from the

police can be matched with road condition data from the Public Works Agency of Highways. Interviewee 11 explained that recording accident data is still done manually because there is no special form for conducting direct surveys. Furthermore, from the manual recording, the data is entered online into the IRSMS (Integrated Road Safety Management System). In addition, interviewee 11 acclaimed that data on the length and width of roads can be obtained from the Public Works Agency of Highways.

In Palembang City, interviewee 12 argued that the recording of data related to road safety is only data on road conditions. Road conditions are recorded, including the length and width of roads, the level of damage, and the type of pavement. Furthermore, interviewee 12 explained that updating the database of urban road conditions cannot be scheduled because it is dependent on available funding. For example, the last road condition was recorded in 2006 and the data was only updated in 2014. In order to update the database, the Public Works Agency of Highways uses the services of a planning consultant. Interviewee 13 confirmed that the data related to urban road safety is well documented and the data on the length and width of the road can be obtained from the Public Works Agency of the Highways of Palembang City. Interviewee 14 explained that the recording of accident data is done manually by using a special form from the police. Furthermore, the data is transferred to the online system. Interviewee 14 informed that data on the length and width of urban roads can be obtained from the Public Works Agency of the Highways of Palembang City. Interviewee 15 admitted that the Public Works Agency of Highways only conducts data collection on the condition of provincial roads, even though data updates are carried out every year. Data on provincial road conditions is based on the level of road damage, length and width of the provincial road. Data collection is prioritized on functional roads only.

In DKI Jakarta, interviewee 16 confirmed that the road safety database is not good. The record of road safety data is adjusted to DED (Detailed Engineering Design). Besides that, interviewee 16 added that the Ministry of Transportation still lacks skilled road safety engineering staff. Interviewee 16 said that data on road length and width can be obtained at the Ministry of Public Works. Interviewee 17 insisted that the Ministry of Public Works records manually in the form of reports. Interviewee 17 suggested that for the future, there would be a need to reform the data recording system at the Ministry of Public Works. In 2013 data recording was still done manually; however, in 2014, the Ministry of Public Works began compiling data online, although it has not been well integrated.

5.2.2.8 Maintainance of the Conditions of Urban Roads

Interviewee 1 asserted that there needs to be construction and maintenance of roads and bridges in order to maintain the condition of urban roads. Interviewee 2 stated that the competent party to perform maintenance of urban road conditions is the Public Works Agency of Highways while the Transportation Agency is responsible for the maintenance of road signs. Interviewee 3 said that the question of how to maintain urban road conditions was more accurately answered by the Public Works Agency of Highways. It is not right if the police answer this question. Interviewee 4 explained that in order to maintain the condition of urban roads, there needs to be the following: 1) handling damaged road surface conditions based on the existing database of road surface conditions. This database of road surface conditions is also taken into consideration to make road maintenance budget. 2) road maintenance for the condition of urban roads is carried out routinely and is self-managed every year. Interviewee 5 informed that PPTK and the team conduct a re-survey of the conditions of the existing signs in order to maintain the condition of road signs that have been installed.

Interviewee 7 could not answer this question because the institution where interviewee 7 works focuses more on research, not the implementer in the field. Interviewee 8 asserted that the Transportation Agency carries out maintenance on the conditions for signs and road markings in Bandung City every year. In addition, an evaluation of the existing signs and road markings is carried out, including the number of signs needed. For zebra crossings and road markings, maintenance is carried out one to two times a year. Interviewee 10 explained that in order to maintain the condition of urban roads, the Public Works Agency of Highways conducts road maintenance quarterly. Interviewee 11 suggested that the question of how to maintain road conditions should not be intended for the police. However, interviewee 10 argued that it is more suitable to be asked to the Public Works Agency of Highways and the Transportation Agency.

Interviewee 12 informed that the Road and Bridge Maintenance Section of the Highways & Water Resource Development (PSDA) Agency is responsible for the maintenance of urban road conditions in Palembang City. Urban road maintenance activities are carried out every year.

Interviewee 13 added that the maintenance of urban road conditions should be asked to the Public Works Agency of Highways in Palembang City. Interviewee 14 acclaimed that the Public Works Agency of Highways is more competent in answering questions about road maintenance. Interviewee 15 argued that the Public Works Agency of Highways in the Field of Road and Bridge Maintenance is responsible for maintaining road conditions. He added that there are two types of road maintenance, namely, periodic and routine maintenance. Road maintenance is carried out based on the level of damage to the road.

In DKI Jakarta, interviewee 16 argued that the Ministry of Transportation is not responsible for maintaining urban road conditions. The task is the responsibility of the Ministry of Public Works. Interviewee 16 explained that the Ministry of Transportation supervises road signs, such

as road sign conditions and maintenance of road signs. Interviewee 17 explained a number of ways undertaken by the Ministry of Public Works to maintain road conditions. They are as the following: 1) Routine maintenance is carried out every year; 2) Periodic maintenance is carried out every five years with the aim of increasing the life of the road. Public Work Regulation Number 13 of 2011 regulates road maintenance; 3) Reconstruction is carried out if the condition of road damage is severe; and 4) The overall handling of the road.

5.2.2.9 Overcoming Hazardous Locations

Interviewee 1 explained that overcoming an accident-prone location is done by coordinating with the police, but interviewee 1 did not further clarify the actions taken by the Public Works Agency to cope with accident-prone locations. Interviewee 2 explained that in order to overcome an accident-prone location, the Transportation Agency provides the installation of 'facilities' only for the road signs. Interviewee 3 asserted that collaboration is carried out in order to investigate accident events and provide recommendations for handling hazardous locations. Interviewee 4 explained that the Public Works Agency sub-sector related to roads improves the condition of road infrastructure by focusing on improving road conditions. Interviewee 5 informed that cross-check conditions in the field are carried out by referring to police reports and surveys carried out by the Transportation Agency. Interviewee 7 explained that in order to overcome accident-prone locations, IRE could conduct field investigations and analyze and provide treatment recommendations as to what could be done to overcome the hazardous location.

Furthermore, interviewee 7 suggested using an Integrated Road Safety Management System (IRSMS) with a good accident database in Palembang City. The National Police Headquarters then would provide accident data reports to the Ministry of Public Works and the Ministry of

Transportation, if needed. Accoding to Interviewee 8, dealing with locations that are prone to accidents can be done by installing signs. Interviewee 10 explained that overcoming accident-prone locations is done by identifying blackspots in collaboration with the police. Interviewee 11 explained that the police makes a report on the location and submits it to the Transportation and Public Works Agency in order to overcome accident-prone locations, and reports whether the cause of the accident is related to the installation of signs or road conditions. However, interviewee 11 admitted that so far, sometimes, the reports submitted by the police to the Public Works Agency of Highways and the Transportation Agency are not responded to. In fact, sometimes, the installation of road signs does not match the accident-prone location points made by the police.

Interviewee 12 did not answer the question about how to overcome hazardous locations. He said that this is the police's responsibility. Interviewee 13 explained that installing signs can overcome the hazardous location issues. Interviewee 14 added that the police need to conduct counseling to the community through campaigns and banners about safety. Safety counseling is also carried out in schools and in colleges, and it is done to reduce accidents. Interviewee 15 said that dealing with accident-prone locations requires coordination with other institutions. The agencies and related institutions that are responsible for road safety need to conduct investigations and make appropriate solutions for their handling.

In DKI Jakarta, interviewee 16 explained that the Ministry of Transportation overcomes hazardous locations by installing accident signs and increasing supervision of hazardous locations by collaborating with the police. Furthermore, the Ministry of Transportation delivers information related to hazardous locations to the Ministry of Public Works in order to improve road infrastructure. Interviewee 16 added that a team needs to be formed before investigating a

hazardous location. The team would consist of the Ministry of Transportation, the Ministry of Public Works and the Police. According to interviewee 17, the Ministry of Public Works can conduct a direct investigation into the field to address accident-prone locations.

5.2.2.10 Taking Account of Accident Occurences

All of the interviewees assert that the police agency is responsible for recording road traffic accident occurences. Interviewee 3 asserted that recording accident events is done manually by taking photos as documentation and also filling out forms from the police. If the suspect (who caused the accident) dies, SP3, the Declaration of Termination of Investigation is issued as stated in article 77 of the Criminal Code. Police must complete the P21 file (complete file submission) in order to process accident events to court. Next, interviewee 3 explained that police members are required to record the incidence of accidents, which involves at least two people, but so far, it has been carried out by one person due to continual limited human resources. The minimum number of two people needed is one person recording the incident and one other person sketching the scene. Currently, there are six officials in the road traffic accident unit. Next, according to interviewee 5, cross-checking conditions in the field by the police needs to be carried out and surveys need to be carried out by the Transportation Agency. Interviewee 11 asserted that recording accident events is still done manually (paper-based) without standard safety forms. According to interviewee 16, this form format is only a data checklist.

5.2.2.11 Speed Limits on Urban Roads and Law Enforcement

Interviewee 1 affirmed that speed limits have not been applied on Pangkalpinang urban roads, and law enforcement of speed limit violators has not been implemented yet due to the lack of availability of speed limit signs on urban roads and, as a result, road users are not aware of the

speed limit specified for urban roads. Interviewee 2 stated that there is no application of speed limits or law enforcement efforts. This is because the installation of speed limits is still very limited for urban roads. Signal speed limits are only installed on national roads within Pangkalpinang City. Interviewee 3 said that law enforcement against speed limit violators has not been implemented yet due to limited human resources and lack of awareness of motorists. According to interviewee 4, speed limits are still not applied on urban roads. In addition, there is still a limited number of speed limit signs installed on urban roads. In other words, interviewee 4 emphasized that the implementation of this speed limit has not been implemented, including the punishment for speed limit violators. According to interviewee 4, punishment will be given by the police if the vehicle speed has exceeded 60 km/hour. All of the interviewees critisize that there has been no enforcement of speed limits or law enforcement on violations committed by road users. However, interviewee 7 argued that the police have stepped up to enforce the law for speed limit violators. Interviewee 8 stated that it is very difficult to impose speed limits and enforce the law. For example, speed limits for urban roads are between 20 and 40 km/hr, but from the House of Representatives (DPR), the Transportation Agency in Bandung City mandates to increase the speed limit, so they will implement the speed limit provisions even if they do not get support from the government, in this case, Bandung City. Interviewee 10 asserted that the police are responsible for law enforcement while the Transportation Agency is responsible for implementing speed limit signs. Interviewee 11 explained that law enforcement in traffic is carried out in two ways: 1) by giving a reprimand, and 2) by giving a ticket, where the users of two-wheeled vehicles are the most ticketed due to the violations they commit. Interviewee 12 said that a speed limit has not been imposed on the urban roads in Palembang City. As for law enforcement, the speed limit is the police's responsibility. On the contrary, interviewee 13 from the Palembang City Transportation Agency admitted that the

speed limit has been implemented well, including law enforcement for violations committed by road users.

All the interviewees agree that enforcing speed limit regulations on urban roads is still very difficult due to the limited installation of the number of speed limit signs on urban roads (interviewee 16). In addition, the application of punishment for violations committed by road users is still lacking (interviewee 16). Interviewee 17 stated that the Ministry of Transportation sets the speed limit based on Government Regulation Number 79 of 2013 while law enforcement against speed limit violations is carried out by the police.

5.2.2.12 Dealing with Road Safety Issues and Reducing Accidents in Urban Areas

Interviewee 1 did not answer this question whereas interviewee 2 explained that the actions taken by the Pangkalpinang City Transportation Agency to reduce the accident rate does not show significant results because the action only provides the traffic signs in accident-prone locations. Interviewee 3 asserted that the actions taken to reduce the number of accidents should include guidance on road safety to children, appealing to the public about the importance of road safety, and advertising in newspapers/television/electronic media/billboards regarding road safety and road safety education for children. Interviewee 3 revealed that the actions taken have already resulted in a decrease in the number of accidents in Pangkalpinang City. Interviewee 4 explained that the Highways sub-sector of the Provincial Public Works Agency has taken the following action to reduce the number of accidents in urban areas: almost all road surface conditions under the authority of the Highways sub-sector are in good condition. The definition of road surface conditions in good condition is that there are no holes or that they have a small number of holes. If there are holes, they should be closed on the road surface. According to the information obtained from interviewee 5, the Transportation Agency makes

efforts to improve the condition of the installed signs and complete road infrastructure in order to reduce the number of accidents. However, the Transportation Agency has not paid attention to the facility needs for road users, such as pedestrians, motorcyclists and bicyclists.

Interviewee 8 explained that the Transportation Agency has applied the following actions to overcome urban road safety problems and reduce accident rates: 1) Condensing operations for vehicles parked in any place; 2) Controlling the use of helmets; and 3) Tightening the rules for issuing driving licences for motorcyclists and car drivers. These activities are carried out by coordinating with the police and Satpol PP (the Civil Service Police Unit). Interviewee 8 also discussed other programs carried out by Bandung City Transportation Agency related to traffic management, namely, 1) Making priority intersections, 2) Merging a two-way road in one direction, and 3) Using public transportation. In fact, interviewee 8 affirmed that the Transportation Agency has provided subsidies for public transport. In addition, the Transportation Agency also has a Monday and Thursday program, which is held to give Damri free public transportation service in which all passengers do not have to pay for the two days. This program is held once a year, and in 2013, this program was held independently. However, in 2014, the Transportation Agency collaborated with Podomoro companies to implement this free Damri program service. Interviewee 8 added that through the BSTD (Land Transportation Facility Development) Division of the Land Transportation Directorate of the Ministry of Transportation, the Bandung City Transportation Agency receives vehicles for free. In 2015, it was approved to receive 45 vehicles, and in 2016, Bandung City received 110 vehicles.

Interviewee 10 felt convinced that overcoming the problem of urban road safety requires coordination with other agencies (Police and Transportation). In fact, interviewee 10 said that the Public Works Agency of Highways has carried out maintenance of road infrastructure,

including repairing or improving road conditions. Interviewee 11 said that the police take action to reduce the level of accidents, such as giving socialization to the community to increase awareness and discipline concerning traffic on the highway. The implemented program is known as the RSPA Program (Road Safety Partnership Action).

Interviewee 12 could not answer the question because interviewee 12 did not understand the road safety issue. Interviewee 13 informed that the Transportation Agency in Palembang City is not responsible for addressing road safety issues, it is the police that have the duty and responsibility to resolve such issues. Interviewee 14 stated that the police overcome road safety issues, such as accidents by educating schools and colleges and installing safety billboards. Interviewee 15 answered questions about what actions are carried out by the Public Works Agency of Highways to address road safety issues. Interviewee 16 explained that the Ministry of Transportation has several programs to overcome road safety problems and reduce accident rates, namely, 1) Information about safety by using banners or billboards; 2) Audit and safety inspections on urban roads routinely; 3) A safety workshop; and 4) The choice of an exemplary driver as an effort to reduce the accident rate. Interviewee 17 asserted that coordination among institutions is needed to overcome the problem of road safety and reduce the number of accidents.

5.2.2.13 Assessing Road Safety

Interviewees 1, 2, 3, 4 and 5 insisted that there is no safety assessment on urban roads in Pangkalpinang. Interviewee 1 explained that this is because the management often clashes with licensing issues (bureaucracy). Interviewee 2 insisted that the behavior of road users has the potential of affecting the performance of road safety and has become one of the factors causing accidents. Interviewee 1 added that the management planning for road safety has not yet

considered the aspect of sustainability; therefore, the effectiveness of road safety assessment could not be measured. Interviewee 3 revealed that there are two factors used by the police to measure the level of safety: 1) the number of traffic accidents (lakalantas), and 2) the behaviour of road users. Next, interviewee 3 added that the police hold regular operations in order to assess the passing order. Interviewee 4 critisized that the assessment of road safety is still not done because there are no rules that require it to be enforced. In addition, the road safety assessment policy has not been carried out maximally. In fact, according to interviewee 5, the Ministry of Transportation organizes the Wahana Tata Nugraha (WTN) Program. This WTN is an assessment in the field of transportation, including safety for road users and also the condition of road infrastructure. WTN data is available at the Provincial Transportation Agency. The Bangka Belitung Islands Province has participated in the WTN since 2012.

Interviewee 7 informed that so far, the assessment of urban road safety in Indonesia is still carried out by using the Road Function Worthy Test. Interviewee 7 explained that three types of road safety measurement methods can be used: 1) the iRAP system, 2) the Road Function Worthiness Test (ULFJ), and 3) the Audit Road Safety. Interviewee 7 felt the measurements that have been made on road safety could be said to have been effective; however, it still needs improvement. According to interviewee 10, Bandung City still uses the Road Worthiness Test to assess road safety using indicators on technical requirements. Road safety assessment is carried out by auditing road safety and forming an assessment team first. Interviewee 10 explained that there are two factors that affect the effective implementation of the Road Worthiness Test (ULFJ), namely, 1) the understanding of road safety itself by all parties involved in the assessment of road safety, and 2) The availabilty of funds to support Road Worthiness Test (ULFJ) activities.

Interviewee 17 asserted that so far, the road safety assessment still uses the functional fit test format while road inspections are carried out in order to check ownership of the road. Besides that, interviewee 17 said that the implementation of the Road Worthiness Test has been operating, but the fulfillment of its recommendations have not yet been carried out. Interviewee 17 added that so far, the road safety measurements carried out by the Ministry of Public Works have not been effective.

5.2.3 Economic Aspect

5.2.3.1 Allocating Funds for Road Safety

Interviewee 1 stated that there is no special funding allocation for road safety. Available funds are allocated for road maintenance and construction activities. In addition, interviewee 2 informed that the budget allocation of Pangkalpinang City Transportation Fund is taken from the Pangkalpinang City Revenue and Expenditure Budget (APBD) every year. He mentioned that this budget is the budget as a whole, not the budget for road safety.

Interviewee 3 said that the budget for police activities was obtained from the government. In addition, there is also a budget for safety, even though the amount is very limited. The allocation of funds for the investigation related to safety is very minimal. Funding is obtained from the government. The budget is for the needs of the police of Pangkalpinang as a whole. Interviewee 3 also added that the road safety budget is still attached to other units.

Interviewee 4 explained that the source of funds for the Public Works Agency's Highways budget was obtained from a pure APBD, and the amount of funds obtained depends on the proposal for funding that is tailored to the needs and available budget.

According to Interviewee 5, the allocation of funds depends on the DPRDs approval of the budget proposal submitted by the Transportation Agency and the availability of funds. Besides that, interviewee 5 added that funds for safety raids amounted to 40% of the total procurement.

Interviewee 12 asserted that the Public Works Agency of Highways has a road maintenance program, which is carried out for six months. Budget funds for road maintenance are available every year regularly. The available maintenance funds were less than 10% and were usually only allocated for patching activities.

5.2.3.2 Obtaining the Funding for Road Safety

Interviewee 1 said that the Pangkalpinang Municipal Public Works Agency obtains funds from the local government through the regional budget (APBD). Interviewee 2 replied that the budget funds in the Transportation Agency, especially land transportation, was consistently obtained from the local government through APBD every year. For example, the overall budget for the Administrtaive District of Pangkalpinang City for the Transportation Agency from the APBD was approximately 4 billion rupiah, but the allocation of funds for land transportation was only 17 million rupiah.

Interviewee 3 said that the budget for road safety is obtained from the government. Interviewee 4 said that the Public Works Agency budget was obtained from a pure APBD. The amount of funds obtained depends on the proposal for funding and the availability of funds. According to interviewee 5, the budget for funds is obtained from the regional government through the APBD.

5.2.3.3 Consistency in Road Safety Funding

Interviewee 1 stated that the funds obtained by the Pangkalpinang City Public Works Agency are consistent every year; however, these funds are the funds required by the Public Works Agency as a whole (funds for road maintenance, road construction, and road planning), but not funds for road safety. This is because there is no special item for road safety funding.

Interviewee 2 explained that the Pangkalpinang City Transportation Agency gets funds from APBD of Pangkalpinang City consistently every year. These funds are the entire fund for the needs of the transportation agency. Moreover, interviewee 3 explained that the budget for road safety was obtained consistently every year from the government; however, the size of the budget depends on the submission of funds submitted and the approval of the government. Then, interviewee 4 said that the funds obtained from the Regional Budget were given consistently every year to the Provincial Public Works Agency.

Also, interviewee 5 explained that the budget for the Transportation Agency sourced from the APBD was obtained annually.

5.2.3.4 Percentages of Total Budget to Providing Funds for Urban Road Safety

Interviewee 1 **s**aid that the budget of funds allocated for road maintenance is approximately 10% of the total funds obtained by the Public Works Agency. There is no special budget for road safety because road safety items are still considered to be attached to road maintenance.

Interviewee 2 replied that the allocation of funds for road safety had not been there specifically because it was still attached to other activities, such as procuring road signs. Interviewee 2 also added that, in general, budget funds obtained from the GDP (Gross Domestic Product) was difficult to suppress.

Interviewee 3 said that it was difficult to budget the funds provided by the government to the police; however, in general, the budget for the allocation of road safety is still very small in value. Interviewee 3 also hoped that the government could increase the amount of the budget for road safety.

Interviewee 4 said that the issue of the size of the budget is very sensitive. He also added that it was difficult to fund funds for urban road safety. In addition, interviewee 5 said that he could not streamline the availability of funds for road safety.

5.2.2.5 Funding for Maintainance

Interviewee 1 said that there is availability of funds for maintenance of road infrastructure. Interviewee 2 explained that the Transportation Agency did not have funds for maintenance. It was precisely the Public Works Agency, particularly the Highways that had the budget for road maintenance. Furthermore, interviewee 2 said that there was no budget in the Agency for Transport for the maintenance of road signs on urban roads.

Interviewee 3 said that there were no funds for infrastructure maintenance in the police because the police were more involved in non-physical activities for road safety, namely, improving the behaviour of road users so that they were aware of traffic safety. Interviewee 3 explained that the Public Works Agency in the Highways sector has a budget for maintenance of road infrastructure.

Interviewee 4 said that there already are available funds for road maintenance because the Public Works Agency already has a separate unit that focuses on maintaining roads and bridges. Furthermore, interviewee 5 said that funds for maintenance of road infrastructure were allocated at the Public Works Agency.

5.2.2.6 Management of Funding

Interviewee 1 stated that there is no allocation of funds due to the absence of the road safety unit in the Public Works Agency of Pangkalpinang City; therefore, Interviewee 1 also could not answer the question of how to manage funding for road safety. Interviewee 1 explained that the current condition is that road safety items are still attached to other road activities, such as maintenance and road design. Then, interviewee 2 stated that since there was no funds for road safety, then there was no need for fund management to be done.

Interviewee 3 could not answer the question of how to manage the funds because there is no special road safety fund, so no funds are needed. In addition, interviewee 4 stated that there is no budget available specifically for road safety because the budget is inherent in other jobs; for example, in the field of planning, construction and maintenance of roads. The former interviewee, interviewee 5, gave the same answer, explaining that there were no special funds for road safety, so the management of the funds did not exist.

5.3 The Comparison of Institutional Barriers in Four Cities in Indonesia

From the results of the interviews conducted, it was found that there were a number of similar problems faced at both the national and local levels regarding the implementation of road safety. The similarities faced include limited funding for the implementation of the road safety program both from funding sources and from budget allocations (economic issues). Furthermore, the resemblances in engineering and institutional issues faced by both levels include the limitations of road safety experts, the suitability of road design to the application of road safety standards and the availability of road safety facilities for vulnerable road users.

Furthermore, it was found that institutional issues were most frequently encountered in the field. An important note from the results of the interview is the still weak coordination between related institutions, the weak commitment of the government in supporting the implementation of road safety and the achievement of safety targets that are still lacking. In addition, limitations in the delivery of information from the national level to the local level related to road safety were also found, even though this was denied by interviewees at the national level.

On the other hand, the difference found in the results of the interview is the division of responsibilities related to road safety in each institution. In addition, the phrase ‘the person in the right place’ is also often ignored by institutional leaders at the local level. This was found by the author during interviews in four cities (Jakarta, Bandung, Palembang and Pangalpinang).

5.4 Conclusion

Overall, institutional barriers are still major obstacles that are often faced by almost all government agencies related to road safety at both the national and local levels.

CHAPTER 6

CASUALTY DATA AND ITS IMPACT ON ROAD SAFETY AT THE INSTITUTIONAL LEVEL

6.1 Introduction

This chapter discusses casualty data and its impact on road safety at the institutional level. The discussion is divided into seven sections, namely, data source, the roles and responsibilities of the police, the Integrated Road Safety Management System (IRSMS) and AIS, factors causing accidents in Indonesia, the data collection system, the benefit of casualty data, and a comparison of casualty data in four case studies.

6.2 Data Source

In Indonesia, casualty data is obtained by the police, both at the local and national levels. From the data obtained, it was found that there are still differences in the method of recording casualty data. In some cities, it is still done manually (by the police in Pangkalpinang and Palembang) while in other cities, it is done online (Bandung and Jakarta).

At the national level, the Indonesian police have developed an integrated accident data information system known as the Integrated Road Safety Management System (IRSMS). This system was launched in 2013, and can be used by all parties by using the link https://www.korlantas-irsms.info/about. However, in reality, after researchers accessed the data in the link, it was found that there were still some deficiencies related to accident data that were presented statistically. Presentation of casualty data is done as a whole, not based on the type of accident that occurred. For example, what type of head-on accident occurred, how many victims died, how many were seriously injured and how many had minor injuries cannot be

known with certainty, even though the data is important because it can be a reference for certain institutions to find the right solution.

Recording and reporting causes of death indicate that the recording is not in accordance with the provisions of ICD-10. The Hospital Information System (SIRS) online report does not yet have a special format available to record causes of death for patients who die in hospitals (Djaja, et al., 2016). According to a study conducted by Djaja (2016), it was revealed that the traffic police had already made a joint agreement (MoU) with Ministry of Transportation and Jasa Rahardja (the Insurance Agency), but there was no MoU with the Ministry of Health. In the case of an accident, the traffic police only record parts or sides of the colliding vehicle, but the type of vehicle is not described in detail according to ICD-10 (Djaja, et al., 2016).

6.3. The Roles and Responsibilities of the Police

The police have a large role and responsibility related to safer road users in Indonesia. Based on the RUNK Jalan and Korlantas, the police carry out the following missions (http://korlantas-irsms.info/vision_mission):

1. 'Confirms commitment to work together to realize the vision of medium-term and long-term goals in the field of road traffic safety to all road traffic safety partners, the Ministries and Agencies, the Provincial Government, the City and County, and the Non-governmental Institute for the entire community'.

2. 'Provides a framework for safety programs implemented by the traffic police and partner institutions across partners throughout Indonesia that will support the achievement of the national traffic safety vision'.

3. ‘Supports other strategies developed by the stakeholders in the field of road traffic safety, the entire police partners and the general public in line with the RUNK’.

4. ‘Assisting to achieve the targets in other areas that are directly or indirectly related to the quality of road traffic safety, including Economic Efficiency, Environmental Sustainability, Equity National Development and Social Welfare’.

Therefore, the police play an important role in the law enforcement process in order to achieve safety targets in accordance with the RUNK.

6.4 Integrated Road Safety Management System (IRSMS) and AIS

This site provides static safety information, including the number of accidents and casualties. All road safety information in Indonesia can be accessed through the link https://www.korlantas-irsms.info/about. To use accident information, see Figure 6.1 below.

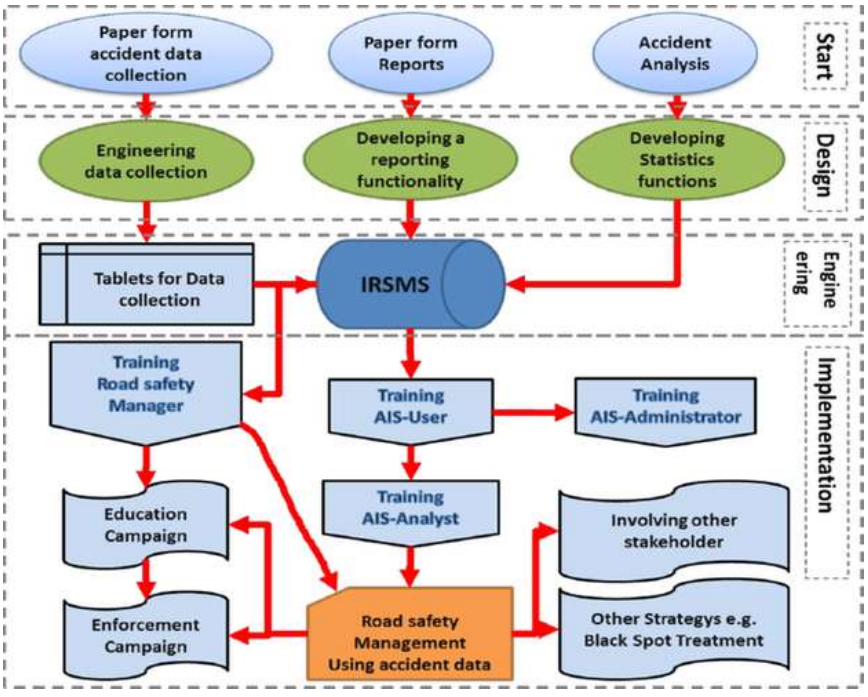


Figure 6.1 The use of accident data information
Source: http://korlantas-irsms.info/irsms_ais

According to Korlantas, the 'Integrated Road Safety Management System (IRSMS) includes the development of a crash database as well as integrated analysis of the road system. The establishment of procedures for sustainable development of the Indonesian National Traffic Police Corps (INTPC) personnel is a key achievement. The IRSMS is designed to provide accident data that is valid, reliable and verifiable. Information about the state of the accident is the basis for all interventions targeting road safety' (http://korlantas-irsms.info/irsms_ais).

6.5 Factors Causing Accidents in Indonesia

In general, the causes of accidents are divided into three groups: road, vehicle and human infrastructure (Djaja, et al., 2016; Saputra, 2017; Wedagama and Dissanayake, 2010). Road infrastructure factors (Saputra, 2017) are namely, damaged road conditions (Djaja, et al., 2016), unavailability of road markings and signs (Djaja, et al., 2016; Indriastuti, Fauziah, and Priyanto, 2011), geometric mismatches in paths (Djaja, et al., 2016; Weekly, Barrell, and McCarthy, 2016), and lack of street lighting (Djaja, et al., 2016).

The Korlantas argued that the main factor in traffic accidents lies in motorists (human error) who lack compliance with traffic rules. The observance is related to the Education factor as early as possible. Disobedience of road users requires supervision by the police. In Indonesia, police personnel who monitor road users are still lacking. The available staff of one policeman oversees 20 kilometers of road (Djaja, et al., 2016). In addition, human factors include lack of competence of officers in the field, low discipline of drivers in traffic, and lack of firmness of officers in the field of drivers who commit violations (Saputra, 2017).

In addition, there are special factors, namely, the existence of regulations / policies that are not appropriate (Jusuf, Saputra, 2017; Nurprasetio and Prihutama, 2017). Furthermore, management factors that influence it are lack of coordination between regulators and law

enforcement officials, lack of institutional support and inadequate road transportation accident information systems (Saputra, 2017).

6.6 Data Collection System

Among the ASEAN countries, Indonesia is still considered to be less serious about handling road safety. This is evidenced by the high number of fatalities in Indonesia. Some fundamental things that have not been handled well are the accident data collection system, road safety audits, control and supervision systems, and the presence of false perceptions from some communities and decision makers (LLAJ Directorate, 2004).

6.7 The Benefit of Casualty Data

Casualty data can be used as a basis for assessing road safety levels (Weekly, Barrell, and McCarthy, 2016; Mwebese, et al. 2018). In addition, casualty data can help policymakers make decisions (Jusuf, Nurprasetio, and Prihutama, 2017). However, the quality of casualty data (OECD, 2012; Wegman, 2017) also influences the analysis made to improve road safety. Therefore, using the available data requires a good understanding of it (Wegman, et al., 2015; Wegman, 2017) so that it is not misused.

6.8 Comparison of Casualty Data in Four Case Studies

Accident data from the police department was taken per period from three to five years. For instance, in Bandung, the complete data of the accident began from 2012 to 2014 due to changes in the area of authority and revamping the database. The accident data is very detailed in indicators compared with data in Palembang and Pangkalpinang, even though both cities started a five-year period from 2010 until 2014.

Police departments from different cities have different indicators that are used to take account of an accident. In Bandung, accident data consists of sixteen indicators: (1) technology factors, such as mobile phones and gadgets; (2) natural factors; (3) road factors; (4) driver factors; (5) single accidents; (6) hit-and-run accidents; (7) prominent accidents; (8) the level of function of the road; (9) the status of the road; (10) the type of land use; (11) the type of occupation; (12) the number of casualties; (13) the type of vehicles; (14) the age group; (15) the type of accident; and (16) location of the occurrence.

On the other hand, in Palembang, the police department divides indicators for accident data into eight categories, namely, (1) the type of occupation; (2) the number of casualties; (3) the type of vehicles; (4) the level of education; (5) the age group; (6) the time of occurrence; (7) the location of the occurrence; and (8) the type of accident. However, in Pangkalpinang, indicators of an accident consist of the number of casualties and the type of accident. Blackspot data or the location of the occurrence in Pangkalpinang is not detailed like it is in Palembang and Bandung.

Briefly, recording indicators of data on accidents in these four cities are not the same. However, among those cities, there are two indicators that are similar, particularly the number of casualties and the type of accident. Moreover, between Bandung and Palembang, the indicators that are the same are the type of occupation, the type of vehicle, the age group, and the location of the occurrence. The actual data on accidents in Jakarta could not be obtained because the contacted person did not provide a response answer.

Data from interviews in different institutions can give insight information as to how they realize road safety in different cities and also how the institution in top-level government, which is

associated with road safety, is knowledgable in order to convey the rules of road safety to the local government in a way that it can be understood easily.

CHAPTER 7

CONCLUSION AND RECOMMENDATION

7.1 Conclusion

Several conclusions can be drawn from the research that has been done, as below:

1. The Road Safety Management System in Indonesia has been carried out based on the National Road Safety Master Plan (RUNK). However, the implementation has still encountered several obstacles, including lack of availability of funds, weak institutional support, weak government commitment, and weak coordination. All of these problems are more related to institutional aspects.
2. There are three main factors that influence the application of road safety at the institutional level, namely, engineering, institutional, and economic. Of these three factors, the most important role in the implementation of road safety is the institutional aspect because it involves relations between institutions, including communication, coordination and commitment. However, the engineering and economic aspects also play an important part in achieving road safety targets as expected.
3. The quality of casualty data can affect the policies taken by decision makers. Inaccurate data results in inappropriate policies while good quality data can be used to assess the level of road safety so as to improve the quality of road safety.
4. Data from interviews in different institutions can give insight information as to how they realize road safety in different cities and also how institutions in top-level government, which is associated with road safety, are knowledgable of the data in order to convey the rules of road safety to local governments in a way that would be understood easily.

5. Improvement of road safety at the institutional level can be done by improving collaboration between institutions, opening good communication related to road safety program planning and implementing monitoring and evaluation continuously.

7.2 Recommendation

Recommendations that can be given to improve road safety at the institutional level in Indonesia include:

1. Special attention needed from various parties in order to find solutions to improve road safety in Indonesia, especially institutions that are responsible based on pillar 1 to pillar 5, as listed in the RUNK.
2. Being decisive in law enforcement concerning violations committed by road users, in this case, the police exercising an important role.

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APPENDICES

Appendix 1. Sources of Casualty Data

The study used the casualty data from the following sources:

No.	Data	The Municipal Police of Bandung	The Municipal Police of Palembang	The Municipal Police of Pangkalpinang
1.	Accident due to lack of availability of road attributes.	Data recorded from 2012-2014. Data is not updated every year. However, from the available data, it can be seen that there is a correlation between accidents that occur in the absence or lack of quality road attributes.	The Palembang police do not have this data.	The Pangkalpinang police does not have this data.
2.	Location of the accident based on the function of the road.	Data owned by Bandung police from 2012-2014. The accident occurred in four locations based on the function of the road, namely arterial roads, collector roads, local roads, and residential streets.	This data is not in the Palembang police.	The Pangkalpinang police does not have this data.
3.	Location of the accident is based on road status.	The accident data was recorded in Bandung police from 2012-2014. The status of these roads includes national roads, provincial roads, urban roads, and rural roads.	This data is not found in the Palembang police.	There is no data obtained in the Pangkalpinang police.
4.	The number of accidents that occur based on the type of land use.	This data was recorded in Bandung police from 2012-2014. Bandung police divided six land use categories that often occur accidents, namely: 1. Modern shopping centre 2. Residence 3. Traditional Market 4. Tourism 5. Recreation 6. Unknown	Data not found in Palembang police.	Data not found in Pangkalpinang police.
5.	Accident based on the severity of the casualty.	This data was recorded in Bandung police	This data was recorded in Palembang police from	This data is also recorded in the

		from 2012 - 2014. The severity of the casualties was divided into three groups, namely: fatal, serious injury, and slight injury.	2010 - 2014. The police divided into four categories, namely: fatal, serious injury, slight injury, and serious damage.	Pangkalpinang police from 2009 - 2014. The police are divided into three groups, namely: fatal, serious injury, and slight injury.
6.	Accidents that occur based on the type of vehicle.	Data recorded in Bandung police from 2012 - 2014. The police divided the types of vehicles into five categories, namely: motorcycle, passenger car, freight car, bus, and special vehicle.	This data was recorded in the Palembang police from 2010 - 2014. The Palembang police divided the types of vehicles into six categories, including motorcycle, public bus, non-public bus, public passenger car, non-public passenger car, and public freight car.	Data not found in Pangkalpinang police.
7.	Accidents are based on the age group of casualties.	This data was recorded in Bandung police from 2012 - 2014. The police divided six casualty age groups: 0-9 years, 10-15 years, 16-30 years, 31-40 years, 41-50 years, and over 51 years.	The Palembang police recorded this data from 2010 - 2014. It divided the age of casualties into six groups: 5-15 years, 16-20 years, 21-30 years, 31-40 years, 41-50 years, and 51-70 years.	Data not found in Pangkalpinang police.
8.	Classification of accidents based on the type of crash.	The Bandung police recorded this data from 2012-2014. The type of crash is divided into nine categories, namely run-off-road, head-on, rear-end, head-side, sideswipe, consecutive, vehicle-pedestrian, vehicle-animal, and others.	The Palembang police recorded this data from 2010 - 2014 and grouped this data into five categories: head-on, rear-end, sideswipe, hit-and-run, and run-off-road.	The Pangkalpinang police recorded this data from 2009 - 2014 and divided this data into four groups, namely head-on, rear-end, head-side, and sideswipe.
9.	Accidents are based on the time of the incident.	Data not available in Bandung police.	The police recorded this data from 2010 - 2014. The police recorded the time of the accident every two hours starting at 6:00 a.m. morning (Western Indonesian Time) and ending at 2:00 a m. in the morning.	Data not available at Pangkalpinang police.

Appendix 2. Interview Guide (English version)

No.	Question
A.	General questions
1.	Name of organisation
2.	Name of participant
3.	Position/Division
4.	Number of years employed in this division
5.	Please describe your roles in the implementation of road safety process
B.	Engineering Issues
1.	Do you have policy targets?
2.	Are you familiar with iRAP (International Road Assessment Program)?
3.	What do you think about the need for road safety?
4.	Do you know where the locations of potential accidents are?
5.	Do you think that the roads design has conformed to the road safety standard?
6.	Do you have the provision for VRUs (Vulnerable Road Users) facilities?
7.	How do you carry out monitoring and evaluation?
8.	How do you employ road signs provisions?
C.	Institutional Issues
9.	What is your opinion concerning the institution's responsibility for road safety?
10.	Do you have road safety units? If yes, do they separate from the institution?
11.	In your opinion, what is the road safety unit looking for?
12.	How do you coordinate with other institutions in terms of road safety?
13.	Who makes the policy for road safety?
14.	In your opinion, how do you measure road safety on urban roads?
15.	How do you record data related to road safety?
16.	How do you maintain the conditions of urban roads?
17.	How do you overcome a hazardous location?
18.	How do you take account of accident occurrences?
19.	How do you apply a speed limit and law enforcement on urban roads?
20.	What do you propose to deal with road safety issues and reduce the number of accidents in urban areas?
21.	How do you assess road safety?
D.	Economic Issues
22.	How do you allocate the funds for road safety?
23.	How do you obtain the funding for road safety?
24.	Is it consistent to obtain road safety funding?
25.	What percentage from the total budget provides funds for urban road safety?
26.	Do you have funding for maintenance?
27.	How do you manage the funds?

Appendix 3. Interview Guide (Indonesian version)

No.	Pertanyaan
A.	Pertanyaan umum
1.	Nama organisasi
2.	Nama peserta
3.	Jabatan/ Divisi
4.	Berapa lama bekerja pada divisi
5.	Jelaskan peran Anda dalam proses implementasi keselamatan jalan
B.	Masalah yang terkait dengan aspek teknis
1.	Apakah Anda memiliki target kebijakan?
2.	Apakah Anda familiar dengan iRAP (Program Penilaian Jalan Internasional)?
3.	Apa pendapat Anda tentang perlunya keselamatan jalan?
4.	Apakah Anda tahu dimana lokasi yang berpotensi terjadi kecelakaan?
5.	Apakah menurut pendapat Anda desain jalan sudah sesuai dengan standar keselamatan jalan?
6.	Apakah Anda memiliki ketentuan untuk fasilitas bagi pengguna jalan yang rentan?
7.	Bagaimana Anda melakukan pemantauan dan evaluasi?
8.	Bagaimana Anda memberlakukan ketentuan rambu jalan?
C.	Masalah yang terkait dengan aspek institusi
9.	Apa pendapat Anda tentang tanggung jawab lembaga terhadap keselamatan jalan?
10.	Apakah Anda memiliki unit keselamatan jalan? Jika ya, apakah unit tersebut terpisah dari institusi?
11.	Menurut Anda, apa yang dicari pada keselamatan jalan?
12.	Bagaimana Anda berkoordinasi dengan Lembaga lain dalam hal keselamatan jalan?
13.	Siapa yang membuat kebijakan untuk keselamatan jalan?
14.	Menurut Anda, bagaimana cara mengukur keselamatan pada jalan perkotaan?
15.	Bagaimana cara merekam data yang terkait dengan keselamatan jalan?
16.	Bagaimana menjaga kondisi jalan kota?
17.	Bagaimana cara mengatasi lokasi berbahaya?
18.	Bagaimana cara mencatat kejadian kecelakaan?
19.	Bagaimana cara menerapkan batas kecepatan pada jalan perkotaan dan penegakan hukumnya?
20.	Apa yang Anda lakukan untuk menangani masalah keselamatan jalan dan mengurangi kecelakaan di daerah perkotaan?
21.	Bagaimana Anda menilai keselamatan jalan?
D.	Masalah yang terkait dengan aspek ekonomi (pendanaan)
22.	Bagaimana Anda mengalokasikan dana untuk keselamatan jalan?
23.	Bagaimana cara mendapatkan dana untuk keselamatan jalan?
24.	Apakah pendanaan untuk keselamatan jalan diperoleh secara konsisten?
25.	Berapa persen dari total anggaran untuk penyediaan dana keselamatan jalan perkotaan?
26.	Apakah Anda memiliki dana untuk pemeliharaan?
27.	Bagaimana cara mengelola dana keselamatan jalan?

Appendix 4. Participant Consent Form (English version)

INTERVIEW
Consent to Participate in a Research Study

1. The study

Title	:	Institutional Barriers to Improving Road Safety in Indonesia: an investigation in three cities
Researcher	:	Desy Yofianti
Lead Supervisors	:	Dr. Harry Evdorides
Co-Supervisor	:	Dr. Michael Burrow

2. Signature of agreement

No.	Agreement	Check list
1.	I confirm that I have read and understand the information about the project of 'Institutional barriers to improving in Indonesia: an investigation in three cities' as provided in the Information Sheet.	☐
2.	I have been given the opportunity to ask questions about the research project and my participation.	☐
3.	I understand that my participation is voluntary and without coercion from any party.	☐
4.	I can withdraw within one week after participation without giving any reasons and that I will not be penalised for withdrawing	☐
5.	The procedures regarding confidentiality have been clearly explained (i.e. pseudonyms of data) to me.	☐
6.	The use of the data in research has been explained to me.	☐
7.	I allow my pseudonym personal data to be kept for 10 years.	☐
8.	I agree to take part in this study and sign this consent form	☐

Source (with some modification):
https://intranet.birmingham.ac.uk/finance/documents/public/GuidanceandConsentForm.pdf
http://www.ncl.ac.uk/res/research/ethics_governance/ethics/toolkit/consent/consent_form_example.doc

_____ _____
Signature of PARTICIPANT above printed name Date

Desy Yofianti _____
Signature of RESEARCHER above printed name Date

Appendix 5. Participant Consent Form (Indonesian version)

WAWANCARA
Lembar Persetujuan Peserta

1. Penelitian

Judul : Institutional Barriers to Improving Road Safety in Indonesia: an investigation in three cities
Peneliti : Desy Yofianti
Dosen Pembimbing : 1. Dr. Harry Evdorides
2. Dr. Michael Burrow

2. Tanda tangan persetujuan

Saya yang bertanda tangan di bawah ini menyetujui hal-hal sebagai berikut: (*berilah tanda pada kotak yang tersedia*)

No.	Persetujuan	Checklist
1.	Saya mengkonfirmasi bahwa saya telah membaca dan memahami informasi tentang studi 'Institutional barriers to improving in Indonesia: an investigation in three cities 'seperti yang disediakan dalam lembar informasi.	☐
2.	Saya telah diberikan kesempatan untuk bertanya mengenai partisipasi dan hal yang terkait dengan studi ini.	☐
3.	Saya secara sukarela setuju untuk berpartisipasi dalam studi ini dan tanpa paksaan dari pihak mana pun.	☐
4.	Saya dapat membatalkan keterlibatan saya sebagai partisipan dengan jangka waktu maksimal seminggu setelah partisipasi saya ini selesai tanpa alasan apapun dan untuk ini saya tidak akan mendapatkan penalty ataupun masalah di kemudian hari.	☐
5.	Prosedur mengenai kerahasiaan data telah dijelaskan secara rinci kepada saya (misalnya penggunaan nama samaran data).	☐
6.	Penggunaan data dalam penelitian telah dijelaskan kepada saya.	☐
7.	Saya memberikan ijin penggunaan data dengan menggunakan nama samaran untuk disimpan selama 10 tahun.	☐
8.	Saya setuju untuk berpartisipasi dalam penelitian ini dan menandatangani formulir persetujuan ini.	☐

Sumber (dengan beberapa modifikasi):
https://intranet.birmingham.ac.uk/finance/documents/public/GuidanceandConsentForm.pdf
http://www.ncl.ac.uk/res/research/ethics_governance/ethics/toolkit/consent/consent_form_example.doc

_____ _____
Tanda tangan PESERTA berikut nama jelas Tanggal

Desy Yofianti _____
Tanda tangan PENELITI berikut nama jelas Tanggal

Appendix 6. Participant Information Sheet (English version)

INTERVIEW
Participant Information Sheet

The Study
Title : Institutional Barriers to Improving Road Safety in Indonesia: an investigation in three cities
Researcher : Desy Yofianti
Lead Supervisor : Dr. Harry Evdorides
Co-Supervisor : Dr. Michael Burrow

You are asked to participate in this study conducted in partial fulfilment of the requirements in PhD in Civil Engineering Department for Desy Yofianti. In order to help you to decide, this information sheet outlines why the research is being done and what it will involve. Please read the following sections carefully and feel free to ask for clarifications or questions.

1. Who is conducting and funding the research?
The research will be carried out by Desy Yofianti. She was raised in Sungailiat, Bangka Belitung Province, Indonesia. Desy is a staff at Bangka Belitung University (UBB), Indonesia, and at the moment she is continuing her doctoral study at Department of Civil Engineering, School of Engineering, University of Birmingham, the United Kingdom. This study involves in-depth interview. In conducting the interviews, this study is funded by Directorate General of Higher Education (DGHE), Ministry of Research, Technology and Higher Education of the Republic of Indonesia.

2. What is the research about?
The purpose of this study is to improve road safety in Indonesia by focusing on institutional issues and associate's barriers using three cities as case studies. According to ASSET (2011), road safety is:

> '*Road safety is a complex and complicated domain and requires a holistic and dialectic approach for understanding the involved interactions and interlinked processes for reaching the best results of measures. Therefore, road safety management requires well-established strategies, approaches and plans. To achieve these targets, several issues need to be allocated and solved, such as 'coordination and management of regulations, actions and techniques; funding for road safety; supervision and enforcement; lack of awareness among road users; accident-prone spots and sections; poor driver and vehicle standards; insufficient accident data and information; and inadequate researches.*'

The fact that many LMICs put these shared responsibilities solely on particular agencies and governmental institutions impede the reaching of targeted goals of the most effective and safest road management system. In addition, even though the number of road crashes over the past decades has decreased especially in developed countries as they follow effective, well-planned and integrated approaches to road safety management, this does not apply to LMICs which generally are not supported, for example, with strong infrastructures. To this end, the overall aim of this research was to improve road safety in Indonesia by focusing on institutional issues

and associate's barriers using three cities as case studies. Therefore, the researcher believed that it was necessary to examine the institutional issues in government institutions in Indonesia in order to improving road safety.

3. Who are the participants
Participants of the study is officers of government institutions in Jakarta, Bandung, Palembang, and Pangkalpinang, Indonesia.

4. What will happen if I take part and what is involved?
If you agree to take part in the study, interview, of at most 60-120 minutes, will be scheduled. All discussions will be audio-recorded. If you do not wish such recording to take place or you do not want any part of the process being recorded, please let the researcher know before or during the interview process at any point you wish. You will also have the right to withdraw up to one week after the data collection – please contact me at the above email address.

5. What are the risks involved?
It is estimated that there is no potential risk in this study.
If you feel uncomfortable with a question, you can skip that question or withdraw from the study altogether. If you decide to quit at any time before you have finished the interview, your answers will NOT be used.

6. **What can I benefit from the study?**
You may not directly benefit from participating in this research. However, the expected outcomes of this study will help to identify what aspects should be improved in road safety management system, especially government institutions. This study will contribute new institutional barriers in the area of road safety, that is a picture of road safety issues focussing on government institutions in Indonesia and a recommendation for improving road safety management in Indonesia.

7. Confidentiality and Anonymity
Your responses will be kept completely confidential. Your identity will remain pseudonym and information about you will be properly coded. You will be assigned an interviewee number, and only the interviewee number will appear with your interview responses. Only the researcher (and authorised personnel involved in the study) that will see your interview responses.

8.Data Protection and archiving
All data arising from interview are treated as confidential. The personal data will only be accessible to the researcher and authorised personnel involved in the study; and will be kept in a locked storage. All files stored in the personal laptop, where data will be analysed, will be password and encryption protected. All data that obtained in this study will only be used for the research purposes and relevant further research.

9. Research dissemination
A major written output of the study is PhD thesis. The study may also be presented in academic conferences and be published in academic journals, and or other relevant publication.

10. Who has reviewed the study?
The study has clearance from the Ethics Committee at the University of Birmingham.

For further information and other concerns, please contact:
Desy Yofianti
Email: [redacted]

You can also contact the Academic Supervisor of the study as below:
Dr. Harry Evdorides
Lecturer
College of Engineering and Physical Science
School of Civil Engineering
Edgbaston
Birmingham B15 2TT
United Kingdom
[redacted]
Email: [redacted]

Thank you for participating in this research.

Appendix 7. Participant Information Sheet (Indonesian version)

WAWANCARA
Lembar Informasi Peserta

Penelitian

Judul	:	Institutional Barriers to Improving Road Safety in Indonesia: an investigation in three cities
Peneliti	:	Desy Yofianti
Lead Supervisor	:	Dr. Harry Evdorides
Co-Supervisor	:	Dr. Michael Burrow

Anda diminta untuk berpartisipasi dalam studi ini yang diselenggarakan sebagai bagian dari riset studi doctoral di bidang Teknik Sipil University of Birmingham atas nama Desy Yofianti. Lembar informasi ini disediakan untuk memberi penjelasan mengenai studi ini dan tingkat keterlibatan yang diharapkan dari partisipan. Mohon dibaca dengan seksama lembar informasi berikut ini dan silahkan ajukan pertanyaan jika ada yang kurang dipahami.

1. Penyelengara dan Pendanaan Studi

Studi ini dilaksanakan secara individu oleh Desy Yofianti, dibesarkan di Sungailiat, Provinsi Bangka Belitung, Indonesia. Desy adalah juga seorang staf pengajar di Universitas Bangka Belitung (UBB), Indonesia. Saat ini Irni sedang menempuh studi doctoral di Civil Engineering Department, School of Engineering, University of Birmingham, United Kingdom (UK) dengan pembiayaan/sponsor penuh dari Direktorat Jenderal Pendidikan Tinggi (DIKTI), Kementerian Riset, Teknologi, dan Pendidikan Tinggi, Indonesia.

2. Ruang lingkup studi

Tujuan dari studi ini adalah untuk meningkatkan keselamatan jalan di Indonesia dengan berfokus pada masalah kelembagaan dan hambatan rekanan yang menggunakan tiga kota sebagai studi kasus. Menurut ASSET (2011), keselamatan jalan adalah:

> '*Keselamatan jalan adalah domain yang kompleks dan rumit dan membutuhkan pendekatan holistik dan dialektik untuk memahami interaksi yang terlibat dan proses yang saling terkait. Oleh karena itu, manajemen keselamatan jalan memerlukan strategi, pendekatan, dan rencana yang baik. Untuk mencapai target ini, beberapa masalah perlu diidentifikasi dan dipecahkan, seperti 'koordinasi dan manajemen regulasi, tindakan penanganan secara teknik; pendanaan untuk keselamatan jalan; pengawasan dan penegakan hukum; kurangnya kesadaran pengguna jalan terhadap pentingnya keselamatan; lokasi yang berpotensi terjadi kecelakaan; lemahnya standar keselamatan bagi pengemudi dan kendaraan yang digunakan; informasi kecelakaan yang tidak memadai; dan masih kurangnya penelitian tentang keselamatan jalan.* '

Fakta bahwa banyak LMIC menempatkan tanggung jawab bersama ini semata-mata pada lembaga dan lembaga pemerintah tertentu menghalangi pencapaian sasaran yang ditargetkan dari sistem manajemen jalan yang paling efektif dan paling aman. Selain itu, meskipun jumlah kecelakaan lalu lintas selama beberapa dekade terakhir telah menurun terutama di negara-

negara maju karena mereka mengikuti pendekatan yang efektif, terencana dan terintegrasi untuk manajemen keselamatan jalan, ini tidak berlaku untuk LMIC yang umumnya tidak didukung, misalnya , dengan infrastruktur yang kuat. Untuk tujuan ini, tujuan keseluruhan dari penelitian ini adalah untuk meningkatkan keselamatan jalan di Indonesia dengan berfokus pada masalah kelembagaan dan hambatan rekanan yang menggunakan tiga kota sebagai studi kasus. Oleh karena itu, peneliti percaya bahwa perlu untuk memeriksa masalah kelembagaan di lembaga pemerintah di Indonesia untuk meningkatkan keselamatan jalan.

3. Partisipan

Partisipan dalam penelitian ini adalah pejabat lembaga pemerintah di Jakarta, Bandung, Palembang, dan Pangkalpinang, Indonesia.

4. Tingkat keterlibatan peserta

Partisipan yang telah setuju mengikuti interview ini akan diwawancara selama 60-120 menit. Seluruh jalannya proses interview akan direkam dengan alat perekam suara/*recorder* yang telah disiapkan sebelumnya. Jika partisipan menolak untuk direkam maka dapat menyampaikan keberatannya tersebut kepada peneliti kapan saja sebelum/selama kegiatan berlangsung. Partisipan juga memiliki hak untuk mundur dari keterlibatannya dalam interview ini hingga satu minggu setelah interview yang diikuti selesai. Untuk itu silahkan menghubungi peneliti di alamat yang telah tertera.

5. Potensi Risiko

Studi ini diperkirakan tidak memiliki risiko yang berpotensi membahayakan pihak-pihak yang terlibat. Jika Anda merasa tidak nyaman dengan pertanyaan yang diajukan, Anda dapat melewatkan pertanyaan itu atau menarik diri dari proses wawancara. Jika Anda memutuskan untuk berhenti kapan saja sebelum menyelesaikan wawancara, jawaban Anda TIDAK akan digunakan.

6. Manfaat Keterlibatan dalam penelitian ini

Anda mungkin tidak mendapat manfaat langsung dari berpartisipasi dalam penelitian ini. Namun, hasil yang diharapkan dari penelitian ini akan membantu mengidentifikasi aspek apa yang harus ditingkatkan dalam sistem manajemen keselamatan jalan, terutama dalam lembaga pemerintah. Studi ini akan memberikan kontribusi baru terhadap hambatan kelembagaan di bidang keselamatan jalan, yaitu gambaran masalah keselamatan jalan yang berfokus pada lembaga pemerintah di Indonesia dan rekomendasi untuk meningkatkan manajemen keselamatan jalan di Indonesia.

7. Privasi dan kerahasiaan

Respons Anda akan dijaga sepenuhnya rahasia. Identitas peserta akan tetap dijaga kerahasiaannya (nama samaran/kode). Tidak akan dimunculkan kutipan langsung dengan identitas peserta. Hanya peneliti (dan personel resmi yang terlibat dalam penelitian ini) yang dapat melihat respon wawancara Anda.

8. Proteksi data dan pengarsipan

Semua data yang muncul dari kegiatan wawancara ini akan dijaga kerahasiaannya. Hanya peneliti seorang diri yang dapat mengakses semua data dan semua data tersebut akan disimpan di dalam tempat terkunci yang aman. Semua file elektronik akan dilindungi dengan password dan kode.

9. Diseminasi studi

Keluaran utama dari studi ini adalah thesis doctoral. Hasil dari studi ini juga kemungkinan akan dipresentasikan dalam konferensi akademik dan dipublikasikan dalam jurnal akademik. Atau publikasi lain yang relevan.

10. Reviewer Studi

Studi ini telah memperoleh persetujuan dari Komisi Etik Universitas Birmingham, UK.

Untuk informasi lebih lanjut dapat menghubungi:
Desy Yofianti
Email: [redacted]

Atau dapat juga menghubungi pembimbing akademik peneliti di bawah ini:
Dr. Harry Evdorides
Lecturer
College of Engineering and Physical Science
School of Civil Engineering
Edgbaston
Birmingham B15 2TT
United Kingdom
[redacted]
Email: [redacted]

Terima kasih atas partisipasi dan kerjasamanya.

Appendix 8. Sample of the Interview Results

Name of Interviewee : Interviewee 1

Position : An Official of the Public Work Agency

Date of Interview : March 10, 2015

Location : Pangkalpinang, Bangka Belitung Province

Interview Questions	Interviewee's Responses
Overview	After the researcher introduced herself to the interviewee and explained the aim of the research, even though I had not asked the interview questions, the interviewee spontaneously explained that they did not have any data composition on traffic, except for the inventory data of urban road conditions. The urban roads were short and there were many road links. He promised to send me the data via email.
1. Do you have policy targets?	When the researcher asked whether or not their department had the policy target, he answered that they did not have any policy target for the road safety.
2. Are you familiar with the iRAP (International Road Assessment Program)?	He was also unfamiliar with the iRAP (International Road Assessment Program) and it was the first time for him to hear the term. Interviewee 1 then asked me what IRAP was. I explained to him that iRAP is a tool used to assess road safety. He then continued that in order to assess road safety, you need to consider the roads' condition, such as whether its surface is damaged or not, the quality of the roads' drainage, and the types of road surfaces, i.e., paved or unpaved.
3. What do you think about the need for road safety?	The researcher then asked interviewee 1's opinion of the need for road safety. Interviewee 1 explained that road safety includes road signs, structuring road networks, and traffic management. He said that the Department of Public Works in Pangkalpinang has coordinated with the Department of Transport in order to structure road networks and implement traffic management. He further added that road accident cases have occurred due to the characteristics of the roads' users.
4. Do you know where the locations of potential accidents are?	Regarding the locations of potential accidents, interviewee 1 said that the location with the most significant effect/risk on the occurrence of accidents are at the points of intersection node. He added that was also

	dependent on traffic management at these intersections. He also said that the road accident cases have happened at non-signaled intersections as the behaviours of road users, especially motorists, disobey the traffic rules. According to interviewee 1, there were four traffic-accident-prone areas in Pangkalpinang City, namely: 1) the intersection DKT, which is located on Ahmad Yani Road, 2) Jamik Mosque intersection, 3) Semabung Intersection, and 4) Ramayana Intersection. Furthermore, interviewee 1added that the accidents at these four intersections were caused by incomplete road facilities, such as road signs, road line marks, and pedestrian crossing facilities. In addition, there were no separation paths for motorcycle users. The data of risky road accident locations, along with *the traffic accident data*, could be obtained at Pangkalpinang Constabulary. Traffic accidents were not caused by vehicular speed, but were caused by the negligence of road users themselves. Most road users, especially motorcycle users, were less disciplined in traffic rules and safety. *PN: Interviewee 1 did not explain as to what extent the severity of injuries were on casualties or victims in accident-prone locations.*
5. Do you think that the roads' design has conformed to the road safety standard?	Interviewee 1 admitted that the urban road designs had not yet been concerned with safety. On the other hand, the road pavement structures in urban areas has considered road safety factors. However, for a long time, the designs of roads have not been in accordance with safety and risk. Interviewee 1 further explained that the locations with frequent occurrences of accidents were the intersection nodes. The causes were lack of awareness about traffic safety, lack of street lighting (power outages that happened due to PLN (the national electric company in Indonesia) shutting down the power), less traffic light functioning at signaled intersections, and lack of road signs. The stakeholder involvements included Dinas Perhubungan (Department of Transport), Dinas Pekerjaan Umum (Department of Public Works), and Bappeda (Regional Planning and Development Agency). *Personal Note*: *Interviewee 1's response did not fully answer the question. He was probably not concerned with the road regulations or even if there has been any regulation or provision of road safety standards applied in the road design. During the interview concerning the*

	responses provided by Interviewee 1, the researcher concluded that road designs in urban areas have not yet fulfilled the road safety standard.
6. Do you have the provision for VRUs (Vulnerable Road Users) facilities?	Interviewee 1 explained that the facilities for vulnerable road users (VRUs) were felt to be very lacking in terms of numbers. The available facilities for the VRUs nowadays are not equipped with road signs and markings, and the utilisation of this facility was not maximised. For example, pedestrians could step out onto the road with a single hand stretched out towards the drivers or motorists. Interviewee 1 also added that the construction of pedestrian crossing facilities did not consider the safety factor for road users. In addition, the behavioural factors of road users affected the safety of the road users themselves. *PN: The author asked Interviewee 1 whether the Public Works Agency of Pangkalpinang City had provisions for facilities for vulnerable road users, but from the responses given, it seemed that Interviewee 1 did not understand the given questions.*
7. How do you carry out monitoring and evaluation?	According to interviewee 1, monitoring and evaluation had been conducted. He explained that for this activity, the Public Works Agency of Pangkalpinang City had determined the divisions that were responsible for carrying out the activity. Meanwhile, the road monitoring activity was the responsibility of the vision of PPSPK (The Facility and Infrastructure Planning and Evaluation Program). In other words, the Public Works Agency of Pangkalpinang City has an internal unit that is responsible for monitoring and evaluating the infrastructure of roads. Bappeda (Regional Planning and Development Agency for the Administrative District of Pangkalpinang) had an external responsibility for monitoring and evaluation. *PN: Interviewee 1 did not explain further what he meant by internal and external responsibility.*
8. How do you employ road sign provisions?	Interviewee 1 explained that the provision of road signs was available at the Department of Transportation; however, the Public Works Agency for the Administrative District of Pangkalpinang had no responsibility for the procurement and provision of road signs because it had become the authority of the Department of Transportation in Pangkalpinang City.

9. What is your opinion concerning the institution's responsibility for road safety?	According to interviewee 1, there was already a division of institutions responsible for road safety. The Public Works Agency was responsible for the safety of road infrastructure. The Department of Transportation was responsible for the procurement of complementary facilities for roads, such as providing pedestrian crossings, road signs and road markings. Meanwhile, Bappeda (Badan Perencanaan dan Pembangunan Daerah) was responsible for regional planning and development.
10. Do you have road safety units? If yes, do they separate from the institution?	Interviewee 1 said that the Public Works Agency of Pangkalpinang City did not yet have road safety units. Furthermore, interviewee 1 explained that there was no safety audit team. In addition, the provisions related to road safety, especially in the case of road design, had not been fully adhered by the relevant institutions. Interviewee 1 suggested there had to be a field or a separate unit that took care of road safety in the Public Works Agency in Pangkalpinang City, such as Road Safety and a Road Safety Unit.
11. In your opinion, what is the road safety unit looking for?	When the author asked this question, interviewee 1 could not answer. *PN: It seemed that interviewee 1 was not yet familiar with road safety, so he appeared to be confused to answer. This possibility was also related to the statement he gave earlier that they had not received any information regarding road safety from the Public Works Agency.*
12. How do you coordinate with other institutions in terms of road safety?	According to interviewee 1, coordination between road-safety-related institutions (Public Works Agency, Transportation Agencyt, and Police) have gone well but still needed improvement. *PN:* *The author had tried several times to ask interviewee 1 the same question, but the answer given still remained the same. Therefore, the question, 'How do you coordinate with other institutions,' was not answered.*
13. Who makes the policy for road safety?	Interviewee 1 mentioned that the Public Works Agency in Pangkalpinang City did not make policies / decisions related to road safety. According to his knowledge, the

	policy for urban road safety did not exist. Interviewee 1 also added that policy making was the responsibility of the Governor at the regional level and the Minister and the President at the national level. The Public Works Department of Pangkalpinang City only implemens the policies that are made.
14. In your opinion, how do you measure road safety on urban roads?	According to interviewee 1, there had never been a road safety assessment. In addition, interviewee 1 explained the road maintenance undertaken by the Public Works Department. The Public Works Department conducted road maintenance by looking at the level of road damage. Furthermore, he explained that there were two types of road maintenance, namely, routine maintenance and periodic maintenance. Routine maintenance was done if the damage level of the road was less than 10% while periodic maintenance was done if the damage level of the road was greater than 10%, where the percentage restriction for periodic maintenance was 10% to 20%. Road improvements were made when the damage level of the road was greater than 20%. Interviewee 1 also explained that road maintenance was routinely and periodically adapted according to the availability of funds.
15. How do you record data related to road safety?	Interviewee 1 said that the recording of data related to road safety was still not good. He also added that the management of data collection for urban road conditions in Pangkalpinang was not organized well. Data storage was still in the form of printout (hard copy). According to his experience, data can be stored well within three years; however, if it is more than three years, the data becomes lost. Although the data collection process done so far was good, it still needs to be recorded in data storage. Interviewee 1 said that the Agency of Public Works in Pangkalpinang City already had data on urban road conditions in the form of soft files. The data consisted of road length, road width, and type of road damage. The author had time to ask if the road condition data was always updated, and interviewee 1 replied that the data had not been updated. They were still using the old data because updating the data requires funds and the Agency of Public Works did not have the funds allocated for it.

	The researcher requested data on road conditions owned by the Agency of Public Works of Pangkalpinang as presented by interviewee 1, and he said that the data would be sent via email. However, the data was not given by interviewee 1 as promised. The researcher contacted him by phone as well as via email several times in order to inquire about the data in question, but no one responded.
16. How do you maintain the conditions of urban roads?	Interviewee 1 replied that construction and maintenance of roads and bridges need to be done in order to maintain the condition of urban roads. *PN: It seemed that the answer given by Interviewee 1 was not in line with the given question.*
17. How do you overcome a hazardous location?	Interviewee 1 explained that overcoming an accident-prone location is done by coordinating with the police. However, interviewee 1 did not not further clarify the actions taken by the Public Works Agency to cope with accident-prone locations.
18. How do you take an account of accident occurrences?	Interviewee 1 responded that accidents were recorded by the police.
19. How do you apply a speed limit and law enforcement on urban roads?	Interviewee 1 said that a speed limit had not been applied on urban roads in Pangkalpinang, and law enforcement of speed limit violators had not yet been implemented. This was due to the lack of availability of speed limit signs on urban roads; thus, road users were not aware of the speed limit specified for urban roads.
20. How do you propose to deal with road safety issues and reduce the number of accidents in urban areas?	Interviewee 1 did not answer this question. *PN: Apparently, the interviewee was confused and ignorant of the given question, and even though it was changed into a different sentence, it still had the same meaning.*
21. How do you assess road safety?	Interviewee 1 said that there was no safety assessment on urban roads in Pangkalpinang.

	Interviewee 1 added that the aspect of sustainability had not been included in the management planning road safety. Interviewee 1 also explained his perspective from another point of view. He admitted that management often collided with licensing issues (bureaucracy). For example, for new settlements or new housing, the issue that arose was the synchronisation among the settlements. Furthermore, it was said that the problem faced by the Public Works Department in Pangkalpinang City was new road construction due to technical reasons. According to interviewee 1, the elements that needed to be done were: ▪ Improve the urban road database ▪ Conduct an LHR data survey for each urban road segment Interviewee 1 argued that they needed consultants in order to compile an urban road database, and the urban road database would need to be updated every year because they are always adding road lanes with a minimum of 20 KM. According to interviewee 1, the road performance was influenced by the function of the road itself. In addition, other factors that greatly affected road performance were policy factors. Interviewee 1 said that only time would prove how much influence this policy brought. Interviewee 1 also said that there had been no implementation of road safety assessment in the urban roads of Pangkalpinang City. He added that they have not received any invitation for workshops, meetings or conferences related to urban road safety until now (the time of the interview). Interviewee 1 could not answer whether or not the road safety assessment had been running effectively because there had never been an assessment of urban road safety in Pangkalpinang City.
22. How do you allocate the funds for road safety?	Interviewee 1 said that there was no special funding allocation for road safety. Available funds were allocated for road maintenance and construction activities.

23. How do you obtain the funding for road safety?	Interviewee 1 said that the Public Works Agency and the Administrative District of Pangkalpinang obtained funds from the local government through the regional budget (APBD).
24. Is it consistent to obtain road safety funding?	Interviewee 1 said that the funds obtained by the Public Works Agency in Pangkalpinang City were consistent every year. However, these funds were the funds required by the Public Works Agency as a whole (funds for road maintenance, road construction, and road planning), but no funds were allocated for road safety. This was because there was no special item for road safety funding.
25. What percentage from the total budget provides funds for urban road safety?	Interviewee 1 said that the budget of funds allocated for road maintenance was approximately 10% of the total funds obtained by the Public Works Agency. There was no special budget for road safety because road safety items were still considered to be attached to road maintenance.
26. Do you have funding for maintenance?	Interviewee 1 firmly said that there was availability of funds for maintenance of road infrastructure.
27. How do you manage the funds?	Interviewee 1 said that due to the absence of a road safety unit in the Public Works Agency in Pangkalpinang City, there was no allocation of funds; thus, interviewee 1 also could not answer the question concerning how to manage funding for road safety. Interviewee 1 explained that currently, road safety items were still attached to other road activities, such as maintenance and road design.

Name of Interviewee : Interviewee 2

Position : An Official of the Transportation Agency

Date of Interview : March 12, 2015

Location : Pangkalpinang, Bangka Belitung Province

Interview Questions	Interviewee's Responses
Overview	In order to interview the officials of Pangkalpinang's Department of Transportation in Pangkalpinang City, the researcher had to pass quite a long bureaucracy. The researcher submitted an official permission letter for data collection on the researchers' university institution letterhead acknowledging the departments' *consent* and *permission* for the interview of the Head of the Department of Transportation in Pangkalpinang City. Then, one of the administrative staff of the department informed the researcher that she could not do the interview as she did not have a letter of recommendation from Bappeda (Regional Planning and Development Agency) for the administrative district of Pangkapinang. Therefore, the researcher first wrote a permission letter to conduct research as requested by the Department of Transportation. The researcher went to Bappeda to get the recommendation letter, and it took three days to get it. After that, the researcher met the head of the Department of Transportation to get a permission letter to conduct the interview research. Subsequently, the Head of the Department of Transportation provided the researcher with a recommendation letter and referred the interview to the head division of Land Transportation. The researcher made an appointment for the interview with interviewee 2 at 10 a.m.; however, they met in the afternoon after working hours at 4 p.m.
1. Do you have policy targets?	The researcher asked interviewee 2 if the Department of Transportation had a policy target. Interviewee 2 explained that the target for the Department of Transportation was to provide all traffic facilities/infrastructures, such as road signs and traffic lights in general. In addition, the Department of Transportation planned to provide cheap and reliable public transportation. Another target to be reached by the Pangkalpinang City Transportation Department was to provide Bus Rapid Transit (BRT). *PN: The word 'handal', the informal form of 'andal', is often used by government officials in formal meetings to show the targets they want to achieve; however, the term 'handal' is not clear and not easy to be measured, assessed or defined. According to the Indonesian*

	Dictionary, the word 'andal' means "can be trusted, and contribute the same result to repeated testing and experiment." (https://kbbi.kemdikbud.go.id/entri/andal).
2. Are you familiar with iRAP (the International Road Assessment Program)?	The researcher asked interviewee 2 if he knew what iRAP was and interviewee 2 replied that he did not know. Indeed, he said it was the first time for him to hear that term. The researcher then explained that iRAP is a tool for assessing road safety.
3. What do you think about the need for road safety?	When the researcher asked what aspects needed to be considered for road safety, interviewee 2 said that they needed to increase public awareness of the importance of road safety and increase the number of traffic lights. Furthermore, interviewee 2 added that the Department of Transportation targeted to provide facilities as much as 90% of the total need to support road safety.
4. Do you know where the locations of potential accidents are?	He answered that he knew the risky locations/areas for accident occurrence. They were: 1. Along the National Road Section (Sudirman Street and Jamik Mosque Street). 2. The intersection of Mentok Street. 3. The intersection of Ramayana. 4. The intersection of Jamik Mosque. 5. The intersection of Sudirman Street. Interviewee 2 added that the accident occurrences at these sites were mostly due to the presence of parked cars along the road. According to interviewee 2, the data on risky road accident locations could be obtained at the Pangkalpinang C*onstabulary*. Therefore, interviewee 2 recommended that every road in Pangkalpinang City should prohibit parking along the roadways of two- and four-wheeled vehicles. In fact, he said that the Department of Transportation had made efforts to discipline parking along the roadways, such as imposing a parking ban for vehicles along Syafrie Rahman Road (National Road in front of Suzuya, which was once used to be a shopping area) at certain hours, like at 4 to 8 p.m. However, in practice, he admitted that it was very difficult to conduct as it collided with the policy of the Administrative District of Pangkalpinang. Interviewee 2 also added that the implementation of existing regulations was still not maximised. He said that the accident data related to the road hierarchy had to be obtained from the Pangkalpinang *Constabulary*.

	However, according to interviewee 2, the data did not exist at the Pangkalpinang Constabulary. Interviewee 2 explained that the implementation of a speed limit was only applied on the national road, in this case, in Pangkalpinang City because the national road in Pangkalpinang City was considered as a risky road for accident occurrence. Meanwhile, on urban roads in the administrative district of Pangkapinang, there was no speed limit implementation because the traffic lights were not yet installed as they should be. The installation of the traffic lights were dependent on the availability of the budget funds at the Department of Transportation, he further added. Furthermore, Interviewee 2 could not say how far the severity of the casualties were caused by the accidents.
5. Do you think that road design has conformed with road safety standards?	According to interviewee 2, safety factors had been considered in road design. For example, the installation of road signs, which already existed at this time, had already met the needs; however, Interviewee 2 said that risk factors had not been considered in the previous road design.
6. Do you have the provision for VRUs (Vulnerable Road Users) facilities?	The researcher then asked interviewee 2 whether they had any provisions for Vulnerable Road Users (VRUs) in Bahasa Indonesia, which is defined as 'pengguna jalan yang rentan'. Interviewee 2 was not familiar with the term. Then, the researcher explained to interviewee 2 that Vulnerable Road Users (VRUs) were motorists, pedestrians, and bicyclists. After hearing the researcher's explanation, interviewee 2 answered that there was already a regulation of facilities for VRUs in accordance with institutional technical guidelines; however, he added that the rules regarding pedestrians had not existed until now. Interviewee 2 then stated that the Local Government (Pemerintahan daerah/Pemda) of Pangkalpinang City had ordered the relevant agencies to provide facilities for road users, especially motorcyclists and pedestrians. He admitted that the constraint or challenge that arose in implementing the provision of VRU facilities was the land availability. Next, he said the real action that had been done by the administrative district of Pangkalpinang that was related to the provision of facilities for road users was designing

	a motorcycle lane for motorcycle riders in the Integrated Office of Air Itam Complex since 2013.
7. How do you carry out monitoring and evaluation?	Interviewee 2 explained that the Department of Transportation in Pangkalpinang City conducted traffic facilities maintenance four quarters per year; however, Interviewee 2 mentioned some problems faced by the Department of Transportation mainly were: 1. Lack of coordination between the Transportation Agency and the Public Works Agency of Highways, regarding sidewalks. 2. Lack of coordination between the Transportation Agency with the Public Works Agency of Highways related to the installation of road markings and zebra crossings.
8. How do you employ road sign provisions?	Interviewee 2 replied that the provisions on road signs had been regulated in the Decree of Indonesian Ministry of Transportation number 61 of 1993 concerning Signs for Road Traffic. In addition, Interviewee 2 explained that Traffic and the Road Transport Act 2009 number 22 also regulated the road signs. Interviewee 2 added that the local government of Pangkalpinang City also issued a regional regulation (Perda) No. 17 of 2004 on the installation of signs, road markings and zebra crossings. *PN: The researcher also found other Pangkalpinang City Regulations concerning the procedures for implementing road markings, traffic signs and traffic signal equipment, which is the regulation number 5 of 2006 on Road Markings, Traffic Signs and Road Traffic Giver Tools in Pangkalpinang City.* *The chapters and articles of the regulation number 5 of 2006 concerning the road marking conditions are as follows:* *Chapter II on the provisions of the road markings, traffic signs and traffic signal equipment article 2:* *1. Road markings, traffic signs and traffic signal equipment placed on the road shall be on public roads;* *2. Road markings, traffic signs and traffic signals applying to traffic shall be in accordance with the directions;* *3. The provisions of the territory and/or limit of the signs as referred to in article 2 are as follows:*

	a. *Prohibition traffic signs placed on the road shall be within the frontier of 15 meters to the left and right of the location where the prohibition traffic signs are located and shall be equipped with an additional board stating a certain distance;* b. *Prohibition traffic signs placed at the beginning of the road shall apply to the entire length of the road, to the boundary of the sign and / or to the crossroads that intersect the road.* *Article 3: Road markings, traffic signs and priority traffic signal equipment are placed and installed on roads prone to traffic security, orderliness and smoothness.*
9. What is your opinion about the institution's responsibility for road safety?	According to interviewee 2, five institutions to be responsible for road safety were: 1. Department of Transportation, which was responsible for vehicle safety (safer vehicles). 2. Department of Public Works of Highways, which was responsible for the road infrastructure (safer roads). 3. Department of Industry and Trade, which was responsible for vehicle production. 4. Department of Health, Jasa Raharja, which was responsible for assistance to victims of accidents and post-accident handling. 5. The police, which was responsible for the regulation, enforcement and security of traffic. Interviewee 2 also added that the five agencies needed to have good coordination. Interviewee 2 also explained that the safety factor had been mentioned in the Traffic and Road Transport Act No. 22 of 2009. Interviewee 2 explained that the Department of Transportation in Pangkalpinang City had four areas as follows: 1. Land Transportation Division, consisting of two section chiefs, namely, a section chief for Engineering and Traffic Management, and a section chief for 'Bina Usaha', which manages associations for public transportation services and vehicle feasible tests. 2. Sea Transportation Division.

	3. Telematic Division. 4. Informatics Division. *PN: There are differences in the term 'Department of Transportation' in Pangkalpinang City. This is because the policy of the central government related to the names of departments in the local government is dependent on the needs of each province or district. In other words, every local government is granted autonomy to name the departments and agencies for transport within their jurisdiction. For example: The Administrative District of Pangkalpinang named the Department of Transportation as "Department of Transportation and Telecommunication of Pangkalpinang City". On the other hand, the city of Bandung and Palembang named the Department for Transportation as the Department of Transportation.* *For uniformity when analysing the interview results, the researcher uses the same name "Department of Transportation" as "Department for Transportation", so the readers can understand it more practically.*
10. Do you have road safety units? If yes, do they separate from the institution?	When interviewee 2 was asked this question by the author, at first, interviewee 2 replied, "there should be" a part or a unit responsible for road safety in one institution. However, interviewee 2 said that for that time, there was no need for road safety units or units within an institution, without him explaining the reasons. *PN: The researcher was confused with the answer given by interviewee 2 because it seemed that there was no firmness. Firstly, he answered that there was a need, then suddenly, he said that it was unnecessary.* *The answer to this question given by interviewee 2 did not meet the researchers' expected answer, but when viewed from interviewee 2's answer, from question no. 9 about the divisions and units available in the Department of Transportation in the Administrative District of Pangkalpinang, it seems that the Department of Transportation did not have its own road safety unit.*
11. In your opinion, what is the road safety unit looking for?	Interviewee 2's opinion on this question was that the road safety unit was hoping that road users could safely arrive at their destinations and that road users could obey the traffic rules.

	PN: The writer concluded that safety was required for road users or for the road itself.
12. How do you coordinate with other institutions in terms of road safety?	According to interviewee 2, inter-institutional coordination was closely related to road safety at that time, specifically, the Department of Transportation, Public Works and Police Department were still not good. However, interviewee 2 did not explain how far the coordination had gone.
13. Who makes the policy for road safety?	Interviewee 2 said that the policy or decision for urban road safety was on institutions at the national level, in this case, the Ministry of Transportation of the Republic of Indonesia. The Department of Transportation located at the regional level only functioned as implementers of policies or decisions that had been determined at the central level.
14. In your opinion, how do you measure road safety on urban roads?	According to interviewee 2, until the time he was interviewed, there had been no measurement of road safety on the roads of Pangkalpinang.
15. How do you record data related to road safety?	Interviewee 2 said that there was no road-safety-related database in the Department of Transportation in the administrative district of Pangkalpinang City. The Department of Transportation only had LHR (Average Daily Traffic) data obtained from survey results on traffic only. Furthermore, interviewee 2 mentioned that data length and width of urban roads in Pangkalpinang could be obtained from the Public Works Agency of Highways in Pangkalpinang City. *PN: Interviewee 2 also provided the LHR data in the form of printout (hard copy) to the researcher.*
16. How do you maintain the conditions of urban roads?	According to interviewee 2, the competent party to perform maintenance of urban road conditions is the Public Works Agency of Highways while the Department of Transportation is responsible for the maintenance of road signs. *PN: Interviewee 2 did not mention how the maintenance of the road signs had to be done.*
17.	Interviewee 2 explained that the activity done by the Department of Transportation to overcome an accident-

How do you overcome a hazardous location?	prone location was just installing “facilities” and road signs.
18. How do you take account of an accident occurrence?	According to interviewee 2, accidents are recorded by the police.
19. How do you apply a speed limit and law enforcement on urban roads?	Interviewee 2 said that there was no application of a speed limit, and also, law enforcement efforts had not been done. This was because the installation of a speed limit was still very limited for urban roads. Signal speed limits were only installed on national roads that were within the city of Pangkalpinang.
20. How do you deal with road safety issues and reducing accidents in urban areas?	Interviewee 2 explained that the actions taken by the Pangkalpinang City Transportation Agency to reduce the accident rate did not show significant results. The action was only providing traffic signs in the location of accident-prone areas. *PN: The researcher believed that there should be real action taken and that it should be reevaluated. Inadequate outcomes of these actions may be caused by a lack of coordination among related institutions. The Department of Transportation, the Public Works Department and the police must be coordinated in solving accident cases and reducing the number of accidents. Thus, the researcher got the impression that each institution probably runs independently in handling accident cases.*
21. How do you assess road safety?	Interviewee 2 said that so far, there had been no assessment of urban road safety in Pangkalpinang City. Furthermore, interviewee 2 said that the behaviour of road users had the potential to affect the performance of road safety. Interviewee 2 added the existence of convex mirrors or careful warning signs that served to help the visibility of road users was still less available, which could also be one of the factors causing accidents. The management planning for road safety had not yet considered the aspect of sustainability, as expressed by interviewee 2 to the researcher. The implementation of road safety assessment on urban roads in Pangkalpinang did not exist, as stated by interviewee 2; therefore, the effectiveness of road safety assessment could not be measured.

22. How do you allocate the funds for road safety?	Interviewee 2 said that the budget allocation of the Pangkalpinang City Transportation Fund was derived from the Pangkalpinang City Revenue and Expenditure Budget (APBD) every year. He mentioned that this budget was the budget as a whole, not the budget for road safety because this fund item did not exist. *PN: The researcher concluded that there was no allocation of funds for road safety.*
23. How do you obtain funding for road safety?	Interviewee 2 said that the budget funds in the Department for Transport, especially Land Transportation, was consistently obtained from the local government through APBD every year. For example: the overall budget for the Administrative District of Pangkalpinang City for the Transportation Department from the APBD was approximately 4 billion rupiah, but the allocation of funds for Land Transportation was only 17 million rupiah. *PN: When viewed from the amount of funds mentioned by interviewee 2, the percentage of funds for Land Transportation needs is still relatively small. It can be concluded that the budget constraints of funds is one cause of the lack of provision of road signs on urban roads in Pangkalpinang.*
24. Is it consistent to obtain road safety funding?	Interviewee 2 explained that the Pangkalpinang City Transportation Department gets funds from APBD of Pangkalpinang City consistently every year. These funds are the entire fund for the needs of the Transportation Department.
25. What percentage from the total budget provides funds for urban road safety?	Interviewee 2 said that the allocation of funds for road safety had not been there specifically because it was still attached to other activities, such as procuring road signs. Interviewee 2 also added that, in general, budget funds obtained from the GDP (Gross Domestic Product) were difficult to be suppressed.
26. Do you have funding for maintenance?	Interviewee 2 explained that the Department of Transportation did not have funding for maintenance. It was precisely the Department of Public Works, especially the Field of Highways, that had the budget for road maintenance. Furthermore, interviewee 2 said that there

	was no budget in the Department of Transportation for the maintenance of road signs on urban roads.
27. How do you manage the funds?	Interviewee 2 said since there were no funds for road safety, there was no fund management done.