YANGON UNIVERSITY OF ECONOMICS

MASTER OF PUBLIC ADMINISTRATION PROGRAMME

THE BEHAVIOR OF BUS DRIVERS IN INTER-REGIONAL PRIVATE SECTOR TRANSPORTATION

(Case study: Yangon-Mandalay Highway)

HLAING ZAW HTUN

EMPA – 11 (16th Batch)

DECEMBER, 2019

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(Case study: Yangon-Mandalay Highway)

A thesis submitted in partial fulfillment of the requirements for the degree of

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Supervised by

Dr. Tin Tin Wai

Professor/ Head

Department of Applied Economics

Yangon University of Economics

Submitted by

Hlaing Zaw Htun

Roll No - 11

EMPA – 16th Batch

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This is to certify that this thesis entitled **"The behavior of bus drivers in Inter-regional private sector transportation (case study: Yangon-Mandalay highway)"**, submitted as partial fulfilment towards the requirements for the degree of Master of Public Administration has been accepted by the Board of Examiners.

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   Associate Professor (Retd.)

   Department of Applied Economics (Examiner)

   Yangon University of Economics

5. Dr. Su Su Myat

   Professor

   Department of Applied Economics

   Yangon University of Economics (Examiner)

DECEMBER, 2019

ABSTRACT

Road safety issues are an essential agenda for developing countries, and the situation has become worsened, particularly in Myanmar. Road traffic accidents and its injuries have been concerning as one of the threats of the Nation's Economy, globally. It was mentioned that "Driver's driving behavior" is one of the root causes affecting those accidents in international reports and literature. So, this study aimed to illustrate the inter-regional passenger transportation and road safety status in Myanmar and to analyze the Knowledge, Attitude, and Practices accepted by Private Sector Bus Drivers (PSBDs). With the hypothesis that road accidents are resulting due to lack of knowledge, negative attitudes, and risky practices of drivers towards traffic rules and road safety awareness, the questionnaires are constructed, and the survey was conducted. The survey questions are built into four sections. Section-A consisted of assessing PSBD's characteristics and demographics, Section-B, C, and D is asking on respondent's Knowledge, Attitude, and Practices accordingly with national rules and regulations of previsioned Laws. A total number of 160 bus drivers who are using the Yangon-Mandalay Highway are randomly selected for data collection in this study. Data are mainly based on primary data, and the survey questionnaire is designed by focusing on the behavior of PSBDs in terms of knowledge, attitudes, and practice towards road safety traffic regulations of Myanmar. The study explore that many of PSBDs who using Yangon – Mandalay Highway road in Myanmar have safety knowledge, the moderate mindset at attitude, and some good driving practices, by this study. The study finds that the majority of drivers have met accidents during their driving lives, too. Also find that the private driving schools for PSBD were not being monitored or evaluated by the government and that there was no standard curriculum for all driving schools in Myanmar. Finally, the implementation of effective and standard intervention programs is suggested to increase the driver's behavior, which is a significant cause of road accidents and injuries.

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LIST OF ABBREVIATIONS

ASEAN	Association of South East Asian Nations
ADB	Asia Development Bank
BAC	Blood Alcohol Limit
CBTA	Cross-border Transport Agreement
CSR	Corporate Social Responsibility
DAS	Driver Anger Scale
DBQ	Driver Behavior Questionnaire
DOA	Decade of Action
DSI	Driving Skills Inventory
GDP	Gross Domestic Product
GMS	Greater Mekong Subregion
ICT	Information and Communication Technology
IRTAD	International Traffic Safety Data and Analysis Group
IRU	International Road Union
ITF	International Transport Forum
ITWF	International Transport Worker Federation
JV	Joint Venture Company
KAP	Knowledge,Attitude,Practice
KII	Key Informant Interview
LMIC	Lower Middle-Income Countries
LMIE	Lower Middle-Income Economy
MDB	Multilateral Development Banks
MDY	Mandalay Region
MoHA	Ministry of Home Affairs
MoTC	Ministry of Transport and Communications
NRSAP	National Road Safety Action Plan
NRSC	National Road Safety Council
OECD	Organisation for Economic Co-operation and Development
PSBC	Private Sector Bus Company
PSBD	Private Sector Bus Driver
RTAD	Road Transport Administration Department
RTA	Road Traffic Accidents

RTI	Road Traffic Injuries
R&D	Research and Development
SDG	Sustainable Development Goals
TIRF	Traffic Injury Research Foundation
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
USD	United State Dollars
WHO	World Health Organization
YGN	Yangon Region
YRTA	Yangon Region Transport Authority

CHAPTER 1
INTRODUCTION

1.1 Rationale of the Study

Public Transportation is the most important role in the economic development of every country in the world. In the modes of the public transport sector (In-Land, water, railway, and air), Road transportation is the primary and most important in Myanmar. The private sector has been in the In-Land passenger transportation industry since after the independence of Myanmar up to now. And this sector has been promptly improved into a high-competitive market started from (2010) to now, due to the democratic reforms and market-orientated economic reform of the Union of the Republic of Myanmar.

Along with sectoral development, it is seen that the public policymakers are trying to develop both of quality and quantity of the road network and public transportation in Myanmar. The inter-regional road network and International-linked road networks are developed accordingly with the demands of all stakeholders. At the same time, road traffic accidents and crashes became the great concerned area of both the public and its administrators.

In 2011, it was estimated that more than 75,000 people died in road crashes in ASEAN countries and many more sustained long-term injuries. Improving road safety outcomes in ASEAN is not only important for the welfare and economic benefit of the populations of these countries but given the proportion of the world's population that lives in ASEAN, it will strongly influence whether the aims of the United Nations Decade of Action for Road Safety and the Sustainable Development Goals are reached (ASEAN, 2016).

By the information obtained from public bus transportation companies at In-land Transport Association of Myanmar, it is realized that there are a lot of impacts on the socio-economic conditions of people by the Road Traffic Accidents which cause countless. But it can be reduced if there is the right acting of preventive and corrective measures, which are in place. And all stakeholders, who are taking part in In-land Transport Association, commonly agree that the human factor is 90% out of many

causes effected by the Road Traffic Crashes and Injuries. Thus, it is assumed that the right solution to prevent human error is to make the PSBDs' to have more skills and awareness against Road Safety to perform their occupational and road safety practices. To improve their current awareness behavior and skill effectively, it is essential to assess their existing level of knowledge, attitude, and practices. So, these are the motivations thoughts that led this study to find out more detail information for relevance.

1.2 Objectives of the Study

The objectives of this study are;

a) To illustrate the inter-regional passenger transportation and road safety practices in Myanmar, and.

b) To analyze the knowledge, attitude and practices behavior accepted by Private Sector Bus Drivers (PSBDs) of private bus companies using Yangon-Mandalay Highway Road.

1.3 Method of Study

This study is descriptive research (cross-sectional study). It uses both quantitative and qualitative approaches. Data are both primary data and secondary data. 160 sample of the targeted population of 1600 drivers was collected during primary data collection. During collecting the primary data, it is acquired by a self-administered or face-to-face interviewing survey method. Key Informant Interviews to The National Road Safety Council (NRSC), Highway Police Force, and Myanmar Traffic Police (MPF) and directors of the Ministry of Construction was conducted to grab their hypothesis against human factors caused in the Road Traffic Safety. Moreover, the secondary data utilized in this study are exposed by the Administration Department of In-land Road Transport, published and unpublished texts, venture reports issued by Private Sector Bus Companies, other reports concerned with relevant departmental authorities, gathering previous relevant research papers from libraries and asset focuses as desk review and the Internet. Furthermore, the validation is done by conducting Key Informants Interviews with related individual stakeholders.

1.4 Scope and Limitations of the Study

The study only focuses on the targeted populations of 1600 PSBDs from the private sector bus companies who were running on Yangon-Mandalay Highway Road for long-distance travel, in May and June of the year 2019, even though 300,000 licensed drivers are eligible to drive the bus. The state-owned bus companies and Tatmadaw bus companies are omitted in the study. The cargo transportation sector and its drivers were out of scope in this study. The answer reflected by respondents might be influenced by their fatigue and recent emotions. Only a few officials from Highway Police Force, Yangon Traffic Police Force, and Road Department of Ministry of Transportation and Communication were met for Key Informant Interview.

1.5 Organization of the Study

This study is organized into five chapters. Chapter one present the introduction, which describes the rationale, objectives, method of study, scope and limitations, and organization of the study. Chapter two presents about the role of government in Public Transport, the global bus and transportation market, road safety development, the global burden of road traffic, review on previous studies and conceptual framework of the study. Chapter three mentions inter-regional passenger transportation in Myanmar. Chapter four describes the survey analysis on Knowledge, Attitude, and Practices of the PSBDs on Yangon-Mandalay High-Way Road. Finally, findings and recommendations are presented in Chapter five.

CHAPTER 2
LITERATURE REVIEW

2.1 The Role of Government in Public Transport

The role of government in transport provision the state has historically played a significant role in both transport infrastructure and transport services supply. There might be many reasons why the market may fail to supply transport infrastructure and services, including their excellent public characteristics, high sunk costs limiting competition, and low levels of sufficient demand. Experience in many low-income countries is, however, that state provision of transport services is economically unsustainable. Transport parastatals operate inefficiently, making large losses, and funds for routine maintenance of transport infrastructure cannot be met from recurrent expenditure allocations to the sector. At the same time, poor infrastructure policies and inefficient provision absorb scarce fiscal resources putting upward pressure on the government's budget deficit. This undermines macroeconomic stability, ultimately damaging the prospects for growth and hence the enabling environment for poverty reduction (Booth, 2000).

The Impacts of Market Failure and Government Interventions are Predominantly Regressive. Transport externalities, such as vehicle emissions and traffic accidents, appear to harm the poor more than the rich. However, the evidence is limited, and more systematic studies are needed. Government regulations, such as barriers to entry for the informal sector to urban transport markets and imposition of service standards, seriously remove viable opportunities for the provision and use of affordable services by the poor. Land-use zoning may create barriers to residential location choice. Relaxation of these constraints may enable locational adjustment and thereby reduce transport costs, especially for the poor (Gannon & Liu, 1997).

The 1990s saw the introduction of new thinking on the government's role in the transport sector, reflecting the "Washington consensus" of the time. The opinion was that the supply of transport infrastructure services should wherever possible be shifted from the government to the private sector (Booth, 2000).

2.1.1 The Concept of Public Transportation

Few public transport debates come to terms with the questions of what constitutes public transport, of what is it for, and exactly how it differs from private transport, individual transport, and collective transport. For some engaged in these debates, public transport is supported because of its contribution to net social welfare or to the welfare of segments of society; public transport is therefore held as being in the public interest. Although this proposition is most certainly true as a generalization, it reduces the understanding of public transport to essentially an expression of social values and suffers from being considered as purely subjective when tackling questions such as when and where public transport is to be preferred over its alternatives (Glover, 2014).

Classical economics has traditionally explained the role of public transport as being necessary because free markets cannot be efficient and effective in providing a transport system. Public transport is necessarily provided by states because of the market failures arising from transport being a collective good, having costs and benefits that can't be captured by markets (i.e., externalities), and because of the problems of monopoly and associated potential abuse of market power (Glover, 2014).

Public Transportation, especially in In-Land transportation, is operated by the private sector rather than as the state-owned operators nowadays. But to avoid the risk and to reduce the public externalities, the governments are still taking the role of regulators around the world, today.

2.1.2 The Definition of Passenger Transportation

Passenger Transportation is the movement of people with their luggage from one location to another. Hence, transportation is said to be a subset of logistics activities. Logistics is the management of the flow of things between the point of consumption in order to meet the requirements of customers or corporations. Logistics is defined as that the part of supply chain management that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods and services and related information from the point of origin to point of consumption in order to meet customer's requirement. Passenger transport refers to the total movement of passengers using inland transport on a given network. Data are expressed in million passenger-kilometers, which represents the transport of a passenger for one kilometer. Components for road and rail are available (OECD, 2018).

Most long-distance trips begin in one metropolitan region and end in another less than 500 miles away. These interregional trips account for approximately three-quarters of all long-distance travel (R.Menzies, 2016)

Passenger transportation has its nature differently against Cargo Transportation. But nowadays, it might be mixed in ground-operations so that the regulations on cross-border transportation have to be modified accordingly with the nature and income statue of those countries.

2.2 The Global Bus and Transportation Market

In the dictionary meaning, a bus is a large and long motor vehicle designed to carries many passengers on it that goes down on the road (in the city or in-land road) almost every day with a specific schedule. Oxford dictionary meaning of "Bus" is a large road vehicle that carries passengers, especially one that travels along a fixed route and regularly stops to let people get on and off. Buses can have a capacity of up to 300 passengers. The most common type of bus is the single-deck rigid bus, with larger loads carried by double-decker and articulated buses, and smaller loads carried by midi-buses and mini-buses. The coaches are for longer-distance services. Many types of buses, such as city transit buses and inter-city coaches, charge a fare. Other types, such as elementary or secondary school buses or shuttle buses within a post-secondary education campus, do not charge a fare.

Buses may be used for scheduled bus transport, scheduled coach transport, school transport, private hire, or tourism; promotional buses may be used for political campaigns and others are privately operated for a wide range of purposes, including rock and pop band tour vehicles. As with the rest of the automotive industry, into the 20th century, bus manufacturing increasingly became globalized, with manufacturers producing buses far from their intended market to exploit labor and material cost advantages. As with the cars, new models are often exhibited by manufacturers at prestigious industry shows to gain new orders. A Coach bus costs ranged between US$ 120,000 to US$450,000. China is the largest coach buses manufacturer among the regions of global, North America, Europe and Japan (Hook 2017).

Vehicle fleet routing and timetable setting are essential to the enhancement of an inter-city bus carrier's operating cost, profit, level of service and competitiveness in the market. In past research the average passenger demand has usually served as input

in the production of the final fleet routes and timetables, meaning that stochastic disturbances arising from variations in daily passenger demand in actual operations are neglected. (Yan, Chi, & Tang, 2006). So, it shows that this industry needs to be developed by ICT technology. The recent proliferation of intercity express bus services illustrates the changes that have been taking place in interregional travel and by extension, the un-certainties that decision makers face when considering investments in long-lived transportation infrastructure, such as high-speed railways (R.Menzies, 2016).

During the 1990s, the nation's intercity bus industry was in the midst of a long-term decline in ridership. Today, the industry has been rejuvenated by bus companies providing nonstop service between the downtowns of major cities. The express bus appears to have filled a void in the low-fare and shorter-haul interregional market. The services accommodate mostly solo travelers who lack access to automobiles, find driving too expensive or a car unnecessary at the destination, or want to make enjoyable or productive use of travel time through the onboard amenities and the uninterrupted use of portable electronic devices (R.Menzies, 2016).

Public officials noticing this renaissance may question the need for capital-intensive transportation investments to compete with the low-cost private buses. Or they may view this development as indicative of more people seeking transportation alternatives to the automobile, and thus as a signal for investing in other options, such as intercity train service and priority access lanes and terminals for intercity buses (R.Menzies, 2016).

Nowadays, the intercity or inter-regional private sector bus transportation takes place of the major role of driving forces to improve economic stability to get its growth. It can help to ensure that the development of the country's economy by means of stimulating dependent industries such as hotel and tourism, engineering services, job safety of labor forces and so forth.

2.3 Road Safety Development

As road safety has become a serious concern to the world, which takes more than 3500 lives a day, United Nations (UN) General Assembly (GA) resolution 64/2551 of March 2010 has proclaimed 2011 – 2020 the Decade of Action (DOA) for road safety. At present, low- and middle-income countries (LMIC) account for over 90% of total road traffic deaths. It is forecasted that road injury would be the seventh leading cause of death by 2030, and it is already the number one cause of death for people between 15 and 29. The DOA aims to stabilize the increasing trend of then to further reduce the forecasted global road fatalities by 2020 (Wegman, 2017).

2015,May 2016 the United Nations General Assembly adopted the Resolution A/RES/70/260, where the member states committed to sustainable development in respective countries, the region and the world. This resolution followed on from several earlier resolutions and declarations, such as the Brasilia Declaration (2015) and ASEAN Declarations. A series of Sustainable Development Goals (SDG) were adopted, and road safety is specifically addressed under UN, SDG 3 (asking for ensuring healthy lives and promote well-being for all at all ages) and 11 (to make cities and human settlements inclusive, safe, resilient and sustainable) (UN, undated). Under such, a target of halving the number of death and serious injury by 2020 was set, and by 2030 provide access for all special those in vulnerable situation, to safe, affordable, accessible and sustainable transport systems. The UN is actively coordinating and collaborating with its partners (See Appendix II) to ensure the global road safety development as their one of priority.

2.3.1 Non-Government Organizations contributing Road Safety

According to political economic systems, the private sector movements are important to improve the road traffic safety. Some of the significant INGOs are -

(1) International Road Transport Union (IRU) is an independent, democratic international organisation active in over 100 countries**.** Active members are non-profit-making organizations that represent a sector of road transport, or a specific category within passenger or goods transport, at national level.

(2) The International Transport Workers' Federation (ITF**)** is a democratic, affiliate-led federation recognised as the world's leading transport authority. We fight passionately to improve working lives, connecting trade unions from 147

countries that may otherwise be isolated and helping their members to secure rights, equality and justice.

In March 2010, the UN General Assembly proclaimed 2011–2020 the Decade of Action for Road Safety, with a global goal of stabilizing and then reducing the forecasted level of global road fatalities by increasing activities conducted at national, regional, and global levels. The United Nations Road Safety Collaboration was established as a follow-up to the General Assembly recognizing a need for a multi-sector response and coordination between international organizations, governments, NGOs, foundations, and private sector entities to coordinate effective responses. The Alliance was established in 2011 by NGO members of the United Nations Road Safety Collaboration and is organized and registered under Swiss law (OECD,2018) . (See also the Appendix II).

2.4 The Global Burden of Road Traffic Injuries

The number of road traffic deaths continues to rise steadily, reaching 1.35 million in 2016. However, the rate of death relative to the size of the world's population has remained constant. When considered in the context of the increasing global population and rapid motorization that has taken place over the same period, this suggests that existing road safety efforts may have mitigated the situation from getting worse. However, it also indicates that progress to realize Sustainable Development Goal (SDG) target 3.6 – which calls for a 50% reduction in the number of road traffic deaths by 2020 – remains far from sufficient (WHO, 2018).

Road traffic Accidents price in many countries 3% of their GDP. More than half of all road traffic deaths are among vulnerable road users: pedestrians, cyclists, and motorcyclists. 93% of the world's fatalities on the roads occur in low- and middle-income countries, even though these countries have approximately 60% of the world's vehicles.

Road traffic injuries cause considerable economic losses to individuals, their families, and to nations as a whole. These losses arise from the cost of treatment as well as lost productivity for those killed or disabled by their injuries, and for family members who need to take time off work or school to care for the injured. Road traffic crashes cost most countries 3% of their gross domestic product (Abbasi, 2002).

Safe mobility is a critical element for both urban and rural communities and indeed, people think of safe mobility as a basic human need and even a human right

(ADB, 1998). Increasingly, the global transport political agenda is focusing on the provision of safe mobility choices, within its overall aim of achieving sustainable and resilient transport solutions. Road traffic accidents (RTAs), however, are still the ninth leading cause of death worldwide, and estimated to be the fifth by the year 2020, with traffic crashes being an emerging concern in the global South, where 91% of road fatalities occur.

2.5 Review on previous studies

With the understanding of that the passenger transportation is the major role of both hard and soft infrastructure of economy and the road traffic injuries can badly impact the development of the economy, the role of PSBDs who are most important caused to the road traffic incidents has to be monitored effectively. Then only, the correct way of both of regulatory bodies and PSBC will have to emphasis on improvement of their control measures to taking care of road safety. By this assumption, the behavior of the existing PSBDs needed to examine by KAP model used in this study.

Achieving safe mobility is based on the successful integration of both behavioral and physical elements. However, behavioral aspects are considered the most significant contributing factors to RTAs. On average, 90% of road accidents are attributed to human factors, rather than technical or mechanical failures (Mohamed, 2017).

Some experts argued that, although several contributing factors influence road accidents, behavioral factors constitute the lion's share in accident involvement. He highlighted evidence on significant relationships between attitudes, behavior, and road accidents. (Ian Glendon, 2014)

Researchers have increasingly focused on human factors in building public information campaigns and other interventions that are aimed at promoting traffic safety. Consequently, in developing the conceptual framework for this study, three themes were considered, which are frequently highlighted in the literature. These include (1) attitudes influencing driving behavior, (2) actual driving behaviors and the different classifications of driving behaviors, and (3) socio-economic and demographic variables that influence driving behaviors (Plankermann, 2013).

Ulleberg, in year 2003, used three scales to measure driving behaviors: speeding, rule violations, and self-assertiveness. In year 2004, study conducted by

Iversen on risk-taking attitudes and risky driving behaviors, she developed seven dimensions to measure risk behavior in traffic, including violation of traffic rules/speeding, reckless driving/fun riding, not using seat belts, cautious/ watchful driving, drinking and driving, attentiveness towards children in traffic, and driving below speed limits. Although these studies have established a profound theoretical platform for different driving behavior categories, it could be argued that the unique characteristics of each context add another dimension in the process of classifying driving behavior (Ismail, 2015).

Demographic and socioeconomic variables can be influence driving behavior; such as age have on driving behavior. Another important demographic dimension that affects driving behavior is gender. It is argued that in general, male drivers are at greater risk for road accidents, at least among the population of young drivers (Mohamed, 2017).

Recent studies in the United Kingdom (UK) and United States (US) have shown that in about (95) percent of recorded accidents, driver error was a contributory factor in some form or other. It is, therefore, vital that the human factor is addressed in tackling the problems of road safety. Fundamental to this is an efficient driver testing and training regime. This regime must not only be efficient and cost-effective, but just as important, it must have public confidence. Regrettably, at the moment, it must be said that the systems in some countries are obviously failing on all three counts (ADB, 1998).

It is readily appreciated that driver testing and training are only a small part of a whole series of initiatives necessary to solve the road safety problem. Driver testing and training procedures are inadequate in many countries in the Asian and Pacific region and, with the rapid pace of motorization, urgent remedial measures are required to improve the situation. The state has a responsibility to ensure that only safe, competent drivers are allowed on roads. The majority of driver training is used only to prepare a candidate for the driving test and therefore the standard of the driving test will determine the extent and quality of driver training. In order to improve driver training, the quality of driving instructors must also be improved and monitored and, in each country, a recommended syllabus for learner drivers should be introduced (ADB, 1998).

Regarding with awareness program, its suggested that Driver education and the use of a driver's handbook can be maximized to teach the meaning of traffic signs as

well as rationalizing over the use of seat belts and why we are not allowed to speed more than it is allowed in the traffic rules and regulations. And the vehicle environment significantly influences the behavior of driver in the road traffic. By estimating environmental factors like the friction, conclusions about the state of the site around the accident can be drawn (A.M Yahia, 2017).

2.5.1 Road Traffic Accidents and Driver Behaviors

There are many reasons that can cause Road Traffic Accidents. But for academic learning, it can be classified into Human, Environment, Road, and Vehicle. In this study, the categories of causes will be organized into drivers, environment, road condition and vehicle to be more sufficient since this study has its limit.

According to world bank analytical report, key finding on the global road traffic injuries are mentioned as Socioeconomic status of global road traffic accident happened more than 90% of road traffic deaths occur in low- and middle-income countries. Road traffic injury death rates are highest in the African region. Even within high-income countries, people from lower socioeconomic backgrounds are more likely to be involved in road traffic crashes. Age: Road traffic injuries are the leading cause of death for children and young adults aged 5-29 years. Sex: From a young age, males are more likely to be involved in road traffic crashes than females. About three quarters (73%) of all road traffic deaths occur among young males under the age of 25 years who are almost 3 times as likely to be killed in a road traffic crash as young females. (World Bank, 2017)

2.5.2 Human Error and Driver Behavior as Major Risk factor

To accommodate human error, the Safe System approach is used to analyze road safety aims to ensure a safe transport system for all road users. Such an approach takes into account people's vulnerability to serious injuries in road traffic crashes and recognizes that the system should be designed to be forgiving of human error. The cornerstones of this approach are safe roads and roadsides, safe speeds, safe vehicles, and safe road users, all of which must be addressed in order to eliminate fatal crashes and reduce serious injuries (Peck, 2009).

The relation between attitudes regarding road traffic regulations and their effect on traffic crashes and found that safer attitudes towards traffic regulations were associated with decreased involvement in traffic crashes. Attitudes indirectly or directly

influence behavior in almost every social interaction, such as driving (Mohamed, 2017). Attitudes are ‘‘tendencies to evaluate an entity with some degree of favor or disfavor, ordinarily expressed in cognitive, affective and behavioral responses”. In other words, there are three components that affect and are affected by attitudes, including beliefs (cognition), feelings (affect), and behaviors. Drivers may have a favorable or unfavorable attitude toward driving safety, which indeed affects their driving behaviors.

Three main driving behavior measures have been frequently highlighted in the literature: The Driver Anger Scale (DAS), the Driving Skills Inventory (DSI), and the Manchester Driver Behavior Questionnaire (DBQ) (Sullman, 2013)..

First, the Driver Anger Scale devised by Deffenbacher, Oetting, and Lynch in year 1994, it consists of (14) driving situations in which participants are required to identify their degree of anger associated with each situation on a (5) point scale. A multidimensional version (33) situations of DAS has been also utilized to overcome the issues of age ranges identified on the short version (Sullman, 2013).

Second, the Driving Skill Inventory pioneered by Lajunen and Summala in year 1995, utilizes 20 measures of safety skills. The DSI mainly investigates two sets of skills related to driving behavior—driving skills and safety skills—through self-reporting of 20 attributes.

Third, the Manchester Driver Behavior Questionnaire devised by Reason, Manstead, Stradling, Baxter, and Campbell in year1990, which is considered the most frequent method for measuring driving behavior of road users , consists of 51 statements of various behavioral aspects, each self-reported on a 6-point scale of frequency. The DBQ has identified three categories of driving behavior: violations, errors, and lapses. Violations are defined as deliberate deviation from safe driving practice, while errors consist of actions that are not planed or intended. The lapses are more focused on memory (Sullman, 2013).

Speeding, Driving under the influence of alcohol and any psychoactive substance or drug, Nonuse of motorcycle helmets, seat-belts, and child restraints , Distracted driving, Drivers using mobile phones, Unsafe road infrastructure, Unsafe vehicles, Inadequate post-crash care, Inadequate law enforcement of traffic laws are the common factors of road traffic accidents and crashes. These factors are causing the road accidents and using as the basics measures for road safety policy makers. Among these factors, it is very clear that the human error such like as speeding, Driving under the

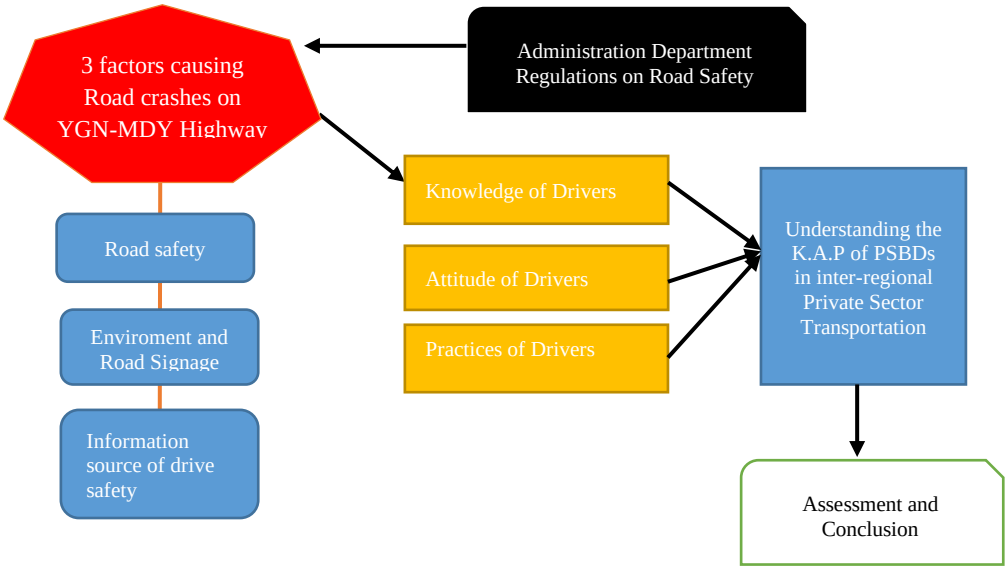
influence of alcohol and any psychoactive substance or drug, nonuse of seat belt, distracted driving, driver using mobile phone are the most significant causes of RTAs. (Mohamed, 2017)

And thus, in this study, the research questions will be designed to describe the behavior of PSBDs by examining their K.A.P based on the risk factors identified by the focal agency of UN road safety movement,(Peck, 2009) .

2.6 Conceptual Framework of the Study

All of the key stakeholders in passenger transportation and the previous studies realized that human factors were the major cause of all road traffic accidents. By this hypothesis, the behavior of the BSPD those who are running on Yangon-Mandalay Highway should be observed by analyzing with KAP approach which stating the three attributes; the road safety awareness and the knowledge towards road safety rules and regulations, the attitudes towards the safely mobilization, the practices of drivers governed by their characteristics on road safety. And by realizing the current behavior of the PSBDs in the analytical method, believing that it will help to recommend the right control measures to prevent the RTAs. So, the conceptual framework of this study can be shaped as below in figure (2.1).

Figure (2.1) The Conceptual Framework of the Study



Source: Own Compiled Conceptual Framework (2019) based on Previous Literatures

CHAPTER 3
INTER-REGIONAL PASSENGER TRANSPORTATION IN MYANMAR

3.1 Status of Transport Infrastructure in Myanmar

Myanmar national transport system and infrastructure lags behind ASEAN standards. 60% of Highway road and railway lines is in poor condition. 20 millions of people has no basic road access (Forum & Pdr, 2017) . In this sector, US$ 40 to 60 billion investment needs for the period of 2016-2030. The national transportation master plan was formulated in December 2012 and completed in 2014 by assistance of JICA. MOTC serves as the focal point for coordination and cooperation with various Ministries in implementation of master plan (JICA, 2014) .

According to the masterplan, the prioritized initiatives until 2030 are (1) Reduce transport costs by 30%, (2) Raise GDP by 13%, (3) Provide basic road assess to 10 millions more people and (4) Save people's live (Thet Zaw Win ,2018). In this study, it will be helpful to reflect the reality and factual considerable for making those initiatives achieved.

According to the geographical positioning, in very near future, Myanmar has to involved in the cross-border trade and transportation by using the road network linked within the related regions. And hence the national level road safety management capacity has to be challenged.

The Yangon-Mandalay Highway Road is the key strategic element of the Myanmar National Highway network and also of the regional road network as shown in Table (3.1) Regional Highway Network and (3.2) is describing about GMS Economic Corridor.

Table (3.1) Regional Highway Network

Asian Highway Network		
No.	Section	Length (km)
AH1	Myawaddy – Phayagyi – Yangon – Meiktila – Mandalay- Tamu	1665
AH2	Tachileik- Kengtung-Meiktila-Mandalay-Tamu	807
AH3	Mongla- Kengtung	93
AH14	Muse-Lashio-Mandalay	453
ASEAN Highway Network		
No.	Section	Length (km)
AH1	Myawaddy - Phayagyi - Yangon - Meiktila - Mandalay – Tamu	1,665
AH2	Tachileik - Kengtung - Meiktila - Mandalay – Tamu	807
AH3	Mongla – Kengtung	93
AH14	Muse - Lashio – Mandalay	453
AH111	Thibaw – Loilem	239
AH112	Thaton – Mawlamyine - Thanbyuzayat – Ye – Dawei – Lehnya - Khamaukgyi, Lehnya - Khong Loy	1,145
AH123	Dawei - Maesameekhee Pass	141
GMS Highway Network		
No.	Section	Length (km)
	Tachilek – Kengtung- Mailar (overlap with AH2 and AH3)	257
	Lashio – Muse (overlap with AH14)	176
	Kengtung – Loinlin –Thibaw- Lashio (overlap with AH2, AH14 and AH111)	666
Tri-Partite Highway Route		
	Tamu - Kalaywa - Chaungma - Lingadaw - Pakokku - Theegone - Naypyitaw - Phayagyi - Thaton - Hpaan – Myawaddy	1,285

Source: Department of Public Works, Ministry of Construction (MOC) (2015)

Table 3.2 GMS Economic Corridor

Corridor Name	Section	Myanmar Included?
North-South Corridor	Kunming – Bangkok	Yes
East-West Corridor	Mawlamyine – Danang	Yes
Southern Corridor	Dawei – Quy Nhan/Vung Tau	Yes
Northern Corridor	Gangheng – Tamu	Yes
Western Corridor	Tamu – Mawlamyine	Yes
Central Corridor	Kunming- Sihanoukville / Sattahip	No
Eastern Corridor	Kunming – Ho Chi Minh City	No
Southern Coastal Corridor	Bangkok – Nam Can	No
Northeastern Corridor	Nanning – Bangkok – Laem Chabang	No

Source: Asia Development Bank (2015)

3.2 Inter-Regional Passenger Transportation in Myanmar

In Myanmar, there can be described as passenger and cargo transportation in an inter-regional mode of delivery. Up to the 1990s, the transportation system, rules and regulations, and transport vehicles were not so developed. So, it is hard to segregate between cargo and passenger delivery.

But, starting in 2010, Vehicles importation was liberalized and it is lead to a dramatic increase in the population of vehicles. It impacted a lot in public transportation, road safety and administration work for authorities. The road transportation increases year by year, “vulnerable road users”: passengers, pedestrians, cyclists and but the rate of road crashes also increases with it. Road accidents are not the only normal threat of the developing countries, where the rate of road economic losses representing between 1to 3 % of annual crashes is more than the critical limit.

In Myanmar, inter-regional in-land public transportation is managed and developed by the registered operators which are the public companies under Tatmadaw, JVCs with government and private companies. It leads too hard to synchronize

managed by union level and sometimes no one is responsible, except the driver, for road crash. Also, make statistical data inconsistency.

Inter-Regional Passenger Transportation industry of Myanmar is growing through on its road network locally which are (KyawMyint, 2014) ;

a) The Yangon-Pyay route is considered the best highway in Myanmar. It was funded by the Japanese government.
b) The Pyay-Magway Road is a continuation of the road mentioned above. It runs on the east bank of the Irrawaddy River and continues to Bagan via Yenanchaung, the major oil drilling town in central Myanmar.
c) Mandalay to Lashio and Muse road is another decent highway.
d) Yangon and Mandalay road is 695-km highway connection. The road passes through Bago, Taungoo, Pyinmana, Naypyidaw, and Meikhtila and is the main commercial link. This is a two-lane highway for the most part but turns into four-lanes near Yangon and Mandalay. Currently, six-lane sections are being constructed.
e) The Western Union Highway connects towns and cities west of the Irrawaddy River. It is considered the worst highway in the country. In some places, it is simply a dirt road(KyawMyint, 2014).

The Yangon-Mandalay Highway road is the most useful and most of the personal and public are using congestive. Especially in the duration of public holidays of Myanmar. The Highway-Police Force was organized because of the special requirement of this road.

The Highway Police Department was created on 20 May 2012 to ensure the safe and smooth flow of traffic and passengers along the Yangon-Mandalay expressway, which has a total length of 366 miles and three furlongs. The department's functions and responsibilities also include initiating road safety measures, accident investigation and traffic rules enforcement, proactive policing and law enforcement, emergency response, traffic security and maintenance of roads and bridges along the road, which passes through four regions, nine districts, 16 townships, and 156 villages. (See also Appendix- V). In order to ensure the rule of law and safety of road users, the Highway Police Force was formed with four offices, including the commanding officer's office, 16 police stations set up every 23 miles and 40 police outposts set up every nine miles along the road. Likewise, fleets of patrol cars and motorbikes, administrative vehicles,

ambulances and cranes are also available 24 hours a day for passenger buses and private cars running on the road to be deployed while preventing crimes of any sort, including rock-throwing and setting up traps that cause cars to skid off the road to be robbed (KhinMaungHtwe,2018).

Myanmar's bus transport business has increased rapidly in recent years. From 2008 to 2011, buses accounted for more than 90% of passenger trips. Moreover, both the number of registered buses, bus operators and bus passengers has increased sharply, increasing by more than 10 times between 2008 and 2011 (See Appendix VII). The increase of registered buses is not distributed evenly across the country, with more than half of registered in Yangon.

Table (3.3) Number of Passengers by Transport Mode (million trips)

Mode	**2008**		**2009**		**2010**		**2011**	
Road	1,632	94%	1,997	95%	1,294	93%	1,233	93%
Rail	75	4%	72	3%	69	5%	67	5%
River	27	2%	27	1%	28	2%	23	2%
Air	1	0%	1	0%	1	0%	1	0%
Total	1,735	100%	2,097	100%	1,392	100%	1,324	100%

Source: TPD/RTAD,MR,IWT,DCA (http://www/ajtpweb.org/)

As shown in Table (3.3), it can be easily recognizing the important role of the road transportation in Myanmar.

Table (3.4) Number of Fixed Route Bus Operators

Years	2008	2009	2010	2011
Number of Fixed Route Bus Operators	1,582	1,129	13,873	16,044

Source: TPD (http://www.ajtpweb/.org/)

According to Table (3.4), the number of fixed-route bus operators reached 16,044 in 2011. After that period, it can be realized that very much rate of increase will be reflected by the democratic governance system up to 2019.

The busiest bus routes are found on five intercity routes, namely: Yangon to/from Nay Pyi Taw (87 buses per day in both directions), Yangon to/from Mandalay

(77 buses per day), Yangon to/from Mawlamyine (47 buses per day), Yangon to/from Hpa-an (45 buses per day) and Yangon to/from Hinthada (35 buses per day). Additionally, many buses travel between other major cities.

The intercity buses travel to all capital cities in the 14 states and regions. These also travel to major cross border cities, including Myawaddy (6 buses per day to/from Yangon), Muse (4 buses to/from Yangon/Mandalay) and Tamu (5 buses to/from Yangon/Mandalay).

Table (3.5), Daily Service Frequency of Intercity Buses by Distance Range.

Distance Range (Miles)	Service Frequently per day (No.)	Composition
0-100	220	18%
100-200	438	36%
200-300	211	17%
300-400	100	8%
400-500	162	13%
500-600	12	1%
600-700	28	3%
>700	35	3%
Total	1,206	100%

Source : JICA Study Team, based on Myanmar Travels and Tours Directory 2013

The daily service frequency of Intercity (Inter-Regional) buses by distance can be categorized as shown Table (3.5). And also all transport industrial details of Myanmar was shown on AJTP official website as cited (AJTP, 2019).

3.3 Inter-Regional Transportation and Two Major Cities of Myanmar

Yangon used to be a city of buses. It has more than 5 million people, with a high population density in the inner city. Its transport system is characterized by (i) a well-developed radial road network supporting the inner city, but with gaps in the new suburbs; (ii) a very narrow secondary road network; (iii) a private-public bus transport system which has kept a market share of more than 50% and (iv) an outdated railway system of about 50 kilometers (km) which only caters to 1% of trips and operates at a

loss. Motorcycles, bicycles, and trishaws are banned in the Yangon city limits, which is uncommon in Southeast Asia. Until 2012, importation of cars was limited, so that buses were the only alternative (ADB,2016).

The Yangon Road Transport Authority (YRTA) was found in 2016 to manage not only for the city bus transport but also the Yangon based Inter-Regional passenger transportation, by neglecting the law of Yangon Region Private Vehicle Ownership (Private Transportation) Law (2014). Under YRTA, a branch, YRTA (Highway) was set up to control the inter-regional passenger transportation.

Mandalay used to be a city of bicycles, it is now a city of motorcycles. It has 1.2 million people (1.7 million including the Mandalay district), with moderate density throughout the city and large unused lands nearby. One million two-wheelers account for more than 90% of trips. While bicycles are still commonly seen, motorcycles are now twice as many and may account for 70% of trips. Car ownership is progressing but from a very low base. Buses are used by less than 3% of people and slowly losing what remains of their market share. Bus efficiency is low. While a typical bus in Yangon does 10 daily trips and carries 400 people a day, similar buses in Mandalay do only three trips and carry only 120 people at a time (ADB,2016). Mandalay Private Road Transportation Committee was found and governed by Yangon Region Private Vehicle Ownership (Private Transportation) Law (2012).

According to existing practice, the PSBC has to deal with both of the authorities from two destinations cities to access the passenger transportation licenses. In this study, the interviewee was chosen from the private sector PSBCs registered as based in Yangon and Mandalay Regions. (See also Appendix - VI).

3.4 Legal framework and Status of Road Transportation sector

As a global family member, the country, The Union of the Republic of Myanmar also on her move to promote the preventive and corrective measures towards Road Safety and its consequences. In-Land Road Transportation mode in Myanmar uses the different types of the vehicles such as Passenger Cars, Light duty trucks, Heavy duty trucks, Buses (Coaches) and Others. The urban public mass transport system is developed in commercial city Yangon only.

Registration and Regulation system is as follow for respective type of business license

a) Bus Operation License; Bus operators must hold an Operation B License, which is provided by the Transport Planning Department, MRT and is valid for

only one year. MRT's Road Transport Administration Department inspects and registers these vehicles and bus operators must submit their license applications at the central government or through one of the 48 region offices.

b) Bus Route and Services; The regional authorities, in consultation with the Bus Control Committee, issue approvals to bus operators for routes and services. There is no restriction regarding trip limits on routes for intercity bus operation.

c) Bus Fares; Intercity bus fares are strictly controlled by the central government. The distance-based fare is applied to all intercity bus services, which permits fares of 20 Kyats per mile for non-air-conditioned bus and 24 Kyats for air-conditioned bus service. A different distance-based rate is charges for bus service in mountainous areas, which charges 40 Kyats per mile.

d) Control of Bus Services; The intercity bus service is monitored by the Regional Bus Control Committee at the terminals in Yangon, Mandalay and Nay Pyi Taw. While the Committee monitors bus service frequency and inspects the condition of the bus, there is less control on the intercity bus service by the authorities/committees (JICA, 2014).

3.4.1 Legal framework on road safety and transportation

Myanmar has been updated her legislative measures towards Road Safety inlined with democratic movement. In 2015, The Motor vehicle Law has been stated as Pyidaungsu Hluttaw Law No. 55/2015. It is provided to attain the objectives: (a) For the safe driving of motor vehicles in public areas through registration according to official rules and regulations. (b) To provide driving licenses for driving particular types of motorized vehicles after qualification checks. (c) For the easy flow of road users and the protection against road risks and vehicle perils. To avoid traffic congestion and to use high technology transportation systems efficiently to implement protection against road risks and vehicle perils. (e) To reduce environmental pollution caused by motor vehicles (Pyidaungsu Hlutaw, 2015),

1989 Motor Vehicle Rules: The Ministry of Transport and Communications made this rule by Notification (No. 1/89). This rule is exercising under the practicing of Motor Vehicle Law (2015) (RTAD, 2019).

The Highways Law (The State Peace and Development Council Law No. 8/2000) was enacted by the State Peace and Development Council on 17.11.2000. Such law has been applied as the existing law. The Ministry of Construction carried out to amend the facts which are no longer suitable for the existing situation and required to be amended, among the provisions of the original law. It was discussed at the various levels of Hluttaw and adopted. Then, it was signed, approved and published by the President of the Union, on 24.7.2014, as the Pyidaungsu Hluttaw Law No. 33 of 2014. The amendment Law in the second time has been announced in 27.11.2015. And accordingly, the PSBDs has to follow the Highways law. (See Appendix III).

The Multimodal Transport Law was provided as Pyidaungsu Hluttaw Law No.3 in 2014 to regulate both of all modes of private and public sector transportation. The panel Code 1861 governed those who committed offenses in actions of breaching the laws.

3.4.2 ASEAN and Myanmar Road Safety Strategy

Aligning with UN Decade of Action 2011-2020 numerous strategies have developed at regional and at national levels. The Panel recommends that Myanmar could study several of these strategies and good practice manuals to identify relevant opportunities applicable to the country. This is an activity next to implementing actions that have been announced in the Road Safety Action Plan (2014). By learning from other countries, Myanmar will speed up positive developments and perform better and make more progress in a shorter period than these countries did in the past. But Myanmar cannot simply copy effective strategies from elsewhere, because they generally need to be tailored to the local context.

The ASEAN Regional Road Safety Strategy has detailed out specific aspects that required actions. They are; Harmonization of standards, road rules and legislation, Capacity building, Knowledge development through research and evaluation, and Monitoring and reporting progress.

3.4.3 Joining international agreements for road safety

To develop the road safety control measure, The Republic of the Union of Myanmar is actively collaborating with regional partners mentioned below;

- **a)** GMS Cross Border Transport Agreement
- **b)** ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAF)

c) ASEAN Framework Agreement on the Facilitation of Inter-State Transport (AFAFIST)

d) ASEAN Framework Agreement on the Facilitation of Cross Border Transport of Passengers by Road Vehicles (ASEAN CBTP)

3.4.4 Road Traffic safety institution structure

As often the case in lower middle-income countries, the institutional setting for Myanmar transport is fragmented and characterized by overlaps and duplications. The main agencies are the following:

a) National Road Safety Council chaired by Vice President and highest committee to supervise the road safety of Myanmar.

b) Yangon Road Transportation Authority (YRTA), which is in charge of issuing license for inter-regional Bus Transportation Business.

c) Ministry of Transport and Communications (MOTC), which oversees the Myanmar Railways and the Road Transport Administration Department and has legal responsibilities regarding public transport licensing for Bus and drivers.

d) Ministry of Construction, which is in charge of national and state highways but, in practice, does not prioritize the Yangon region; and

e) Ministry of Home Affairs, which oversees the traffic police. ADB(2016)

3.4.5 National Statistical Trend of Road Accidents in Myanmar

The figures showing in Table (3.6) are shown that the trend of the accidents rate in Myanmar was increasing dramatically.

Table. 3.6 National Statistical Trend of Road Accidents in Myanmar

Year	Registered Vehicles	Road Length (km)	Number of accidents	Fatality index			
				Death (No.)	Injury (No.)	Per 10,000 Vehicles	Per 100,000 Population
2001	445167	69732	4478	1207	6938	27.11	2.36
2002	461692	73843	4908	1247	8706	27.01	2.39
2003	476350	78266	5375	1308	9195	27.46	2.50
2004	960341	90713	5915	1373	10452	13.25	2.39
2005	978522	92859	5886	1331	10484	13.6	2.45
2006	991566	104058	6778	1362	11385	13.73	2.46
2007	1024372	111737	6939	1638	12358	14.91	1.65
2008	1997358	125355	6483	1778	11558	8.90	3.04
2009	2067839	127942	7535	1845	13180	8.92	3.13
2010	2298677	130050	7985	2264	14130	9.85	3.82
2011	2331663	142395	8568	2495	15316	10.70	4.16
2012	3699109	150221	9339	2653	15720	7.17	4.42
2013	4016757	164969	13912	3721	23378	9.26	5.72
2014	4907591	103953	14997	4313	24932	8.79	6.50
2015	5385175	112546	15676	4420	25964	8.21	8.42

Source : RTAD (2015)

By analyzing table (3.6), from the year 2001 to the year 2015, within 15 years of history, the car increasing rate is progressively high. Subsequently, road traffic accidents are also increasing significantly.

According to official data, there has been a dramatic increase in the number of vehicles on the Yangon-Mandalay Expressway, with 3,096,921 vehicles in 2012, 3,755,948 in 2013, 4,574,081 in 2014 and 5,454,894 in 2015. With the dramatic increase in the number of vehicles, there has been an increasing number of road accidents reported every year, triggered by several factors, including the condition of the vehicles and drivers' negligence. The Highway Police Force maintains that it has responded to every major car crash on the expressway in a timely and effective manner, including one involving a Land Cruiser that claimed five lives and left two injured in 2012; a bus crash caused by a drowsy driver that killed 11 passengers and injured 16 in 2013; a passenger bus-saloon collision in which all six people in the car were killed in

2014; and an accident in which a passenger bus overturned, killing nine people and injuring 25 in 2015. Apart from emergency services, the Highway Police also responded to various other incidents, including vehicle breakdowns, tire punctures, fuel shortages and health matters in 2015 (KhinMaungHtwe,2018).

Myanmar is still the least losing among the Asia-Pacific region in terms of the percentage of its GDP. It seems to be no risk, but if it is realized in terms of monetary value, such millions of US Dollars are not a small amount for the least developing country like Myanmar. Since she is a lower-middle-income economy with a GNI per capita of US$1,210 in 2017 (World Bank, 2014). And also, it should be count on the social consequences such as the disability, losing working force, per-capital GDP and so on. It is realizing that the increasing rate of road deaths is increasing most in the Lower-Middle income economy. (See also Appendix- VIII (a),(b).)

3.4.5.1 The Road Accidents on Yangon-Mandalay Highway

According to the reports from RTAD, for the period of January to August of 2019, (11,007) cases of road crash or accidents were reported and (17,040) were wounded and **(**3602) were dead during those accidents. Compare with nationwide accidents, total (354) accidents were happened on the YGN-MDY Highway Road and caused (665) wounded and (66) Deaths. It is presenting 3% of total accidents were happened on that road. There was no specific data about the accidents happened by or to PSBs. But not less than 50% of the cases were happened to or by PSBs (NRSC,2018). The yearly reported RTAs on this road can be seen as shown in table (3.8). (See also Appendix-VII)

Table 3.8 Road Accidents Statistics on Highway Roads of Myanmar

Years	Number of traffic accidents	Number of traffic accident casualties (dead)	Number of traffic accident casualties (injuries)
	Case/ Count	Count	Person
2005	5,755	1,283	9,565
2006	6,778	1,362	9,620
2007	6,939	1,638	13,354
2008	7,204	1,853	13,067
2009	8,461	2,173	12,803
2010	9,020	2,461	14,700
2011	10,123	2,796	16,013
2012	11,675	3,422	17,080
2013	13,912	3,721	19,684
2014	14,997	4,313	23,378
2015	15,859	4,375	26,630
2016	17,384	4,887	27,763
2017	18,171	5,250	29,144
Total	152,183	40,828	243,253

Source : (AJTP,2018)

Road accidents may be defined as a disaster, associated with major health problems, negative socio-economic growth. There are increasing numbers of road accidents in Myanmar especially in the Rangoon-Naypyidaw-Mandalay highway which mainly connects upper Myanmar and the lower Myanmar. The high number of road accidents along this road is indicative of a nationwide worsening of Myanmar's road safety record. According to official statistics, during the three years from 2012(May 20) to 2015(June 23), over (963) highway accidents have claimed the lives of over (394) victims. If a road accident is to have happened, it is not a form of temporary loss. It is indeed a permanent and very great loss to the victims' families and society. For example, even in small injuries from road accidents, people have to spend lots of medical fees mostly from their own income and family's money. As for the case of serious injuries and death, the scenarios of loss become greater. For example, that person's human physical and intellectual energy cannot be utilized fully or at all and

this can negatively affect the income generation of that person and to his family. In addition, society has to invest in a person since the time of schoolings and fees and the victims' contribution and workforce can be lost for the society when accidents occur (NRSC,2018).

Even though It is hard to accept that the officially reported road accident deaths have to be increased in future, this forecast was mentioned in their study of road safety of Myanmar (Wegman, 2017). The possibility situation for the Year 2020 up to 2025 is shown in Table 3.9 which is about Possible Trend of Officially Reported Road Deaths in Myanmar.

Table 3.10 Possible Trend of Officially Reported Road Deaths in Myanmar

No.	Year	Road Deaths (No.)	Remark
1	2008	1,853	Actual
2	2016	4,688	Actual
3	2020	9,000	Forecasting
4	2025	15,000	Forecasting

Source: FIA, Road Safety in Myanmar (2017)

3.4.5.2 Causes behind the Highway Road Traffic Accidents

Even though, the reasons for the accidents may include various defaults of drivers, mechanical failure of vehicles, poor quality of the road, and bad weather, most of the road accidents are caused by various defaults of the drivers such as incompetence in driving skill, driver's judgment errors and violation of traffic rule, ignorance, and carelessness in driving, etc. Increased import of more vehicles in recent years is one of the sources of being incompetence in driving skills. Some drivers started on the job as bus conductors (Spare) and progressed to drivers after a few years. They rely on the driving skills learned on the job but have never received any driving training on safe driving. Some accidents are due to the mechanical failure of the vehicles. All drivers are not aware of proper vehicle maintenance. Another problem is that some imported vehicles are not fit for concrete highway road. Some accidents happen because of the poor quality of roads. According to engineers involved in the project of this road, it was poorly funded and quickly built-in 2005 at the time of former military regime and few road safety measures were put in place as the transport link to the new political capital

had to be completed quickly on orders of military commanders (MyoThandarKyaw, 2016).

Another assumption was coming out during the fifth meeting of NRSC. The chairperson of NRSC mentioned that there were 4.01 million licensed cars when the National Road Safety Action Plan (2014-2020) was initiated but that number had risen to 7.29 million as of February 2019. There was mentioned that an increase in operating vehicles and traffic accidents were naturally linked and coupled with the fact that 98.02 percent of accidents were caused by human error, the need was greater than ever for road safety and adherence to traffic rules .

Therefore, by analyzing the behavior of the PSBDs in this study, it can be assessed the current level of Knowledge, Attitudes, and Practices toward the road safety of the PSBD who operating on the YGN-MDY highway road. It wishes all stakeholders in this industry will understand the level of KAP towards road safety and realize more on how to improve bus drivers to eliminate the root causes of RTAs in the passenger transportation industry of Myanmar, effectively.

CHAPTER 4
SURVEY ANALYSIS

4.1 Survey Profile

This survey was conducted on Yangon-Mandalay Highway of Myanmar, which is linked between the two Major Cities of high populated Regions of The Republic of the Union of Myanmar. This section is also a part of the Asia Highway (AH1 and AH2), which connected to India in the northern-west of Myanmar and Thailand in the southern-east of Myanmar. This expressway was inaugurated by the Ministry of Construction and the Directorate of Military Engineering of the Ministry of Defense on 29 December 2010. The road has three tracks that Yangon–Naypyidaw Track is 202 miles (325 km), Naypyidaw–Mandalay track is 149 miles (240 km) and Mandalay (Saga-in)–Mandalay (Tagundaing) track is 13.5 Miles (21.7). The road is constructed two-way (4 Lanes), and the speed limit is 100 km/h (60 mph). The survey was conducted during May and June of 2019.

According to RTAD data on their web site, the Total population of the drivers who eligible to drive the PSB in Myanmar reach 743,950 according to the RTAD report July 2019 (RTAD, 2019). According to the private PSBC data, about 250 Bus Lines (PSBC) registered as based in Yangon and Mandalay, and they transport passengers by using Yangon – Mandalay Highway. Those PSBCs recruited 2,500 (estimated) PSBDs to operate their Buses. Among them, 1653 PSBDs were used the Yangon-Mandalay road during May and June of the Year 2019. The survey was conducted the three points of Yangon – Mandalay National Highway 115 Miles point, 220 Miles Point, and Saga Inn Roundabout, 352 Miles point. (See also Appendix- IV).

4.2 Survey Design

There was more than 27,000 bus registered in Myanmar and used for passenger transport by three major players which are private, Tatmadaw (Myanmar Economic Holding Limited) and government joint ventures. About 8000 buses out of them are using for Inter-Regional passenger transportation. About One thousand six hundred

buses were registered as Yangon Based liners, and 800 buses were registered as Mandalay Based. In this sector of industry in Myanmar, the register number of vehicles and real running vehicles may vary due to the lack of monitoring and control system from concerned authority. The registered number of bus and actual among them 1600 PSB have transported the passenger by using YGN-MDY highway road during May and June of 2019. Time for the survey was constrained. Getting data from occupied drivers was a genuine test as far as time and persistence on their part.

The survey was designed to have 160 respondents, which is 10%of the targeted population size of those who used YGN-MDY Highway during May and June of Year 2019. A quantitative research method was applied for this survey by using well-structured questionnaires, including respondent's profile in Part (A), testing for Knowledge Part (B), about attitude in Part (C), and about PSBDs normal practices in their daily operations Part (D). Data collection for this survey was carried out during May and June 2019. The collected data was run by SPSS, and the descriptive method was used for analyzing results. (See Also Appendix – I(a),I(b),I(c))

4.3 Survey Results

The survey findings are analyzed and shown as characteristics of respondents (PSBDs), knowledge, attitude, and practice of the respondents as following-

4.3.1 Demographic Profile of Respondents

A total of 160 of PSBDs were involved in this study. The questionnaire used for this survey can be seen in Appendix I(a). The findings of the respondent's demographic profiles were presented in Table 4.1.

Table 4. 1 Demographic Profiles of Respondents

Sr. No.	Particular	Number of Respondents	Percent
		160	100%
Gender			
1	Male	160	100%
Age			
1	26-35 years	30	19%
2	36-45 years	80	50%
3	46-60 years	47	29%
4	Above 60 years	3	2%
Marital Status			
1	Single	19	12%
2	Married	141	88%
Education			
1	Middle Passed	123	77%
2	High Passed	35	22%
3	Bachelor	2	1%

Source: Survey data, 2019

By Table (4.1), gender analysis shows that of the male composition, and there is no female composition, in this study of the behavior of respondents in the inter-regional passenger transportation industry. In inter-regional passenger transportation, there will be no women drivers, although there have few women drivers in inter-state public transport service in Myanmar.

In their age analysis, Table (4.1) shows that 80 out of a total of 160 respondents with an age range between 36-45 years is highest with 50%. The second most participants or 47 numbers of respondents with an age range between 46-60 years is 29%, followed by 30 respondents with age range 26-35 years, with 19%. The least composition of respondents is found as age range over 60 years, with only 2%, in this study. The study shows that 81% of inter-regional public transport bus drivers are with age above 36 years old.

In the analysis, the marital status of respondents are also asked whether they have married or not. By the Table, the marital status of inter-regional public bus

transport PSBDs are showing that 19 respondents are single status with 12%, and 141 respondents are married with 88%. By the survey, most of the inter-regional PSBDs are found as had already married status.

In the analysis on their education level, Table (4.1) shows that of the (123) respondents who had passed the middle education level, 35 respondents who had passed high school education level, and (2) respondents had possessed bachelor degrees. In terms of percent, respondents who have finished middle education level have the most composition with (77%), and the respondents who're education level at high school graduate is composed with second-most position and very few are found as graduate level. By this analysis, respondents are found as under the high school graduate level, who could not be able to join university.

4.3.2 Characteristics of Respondents

Total (160) of respondents were also asked to find out their characteristics in this study. The findings of respondents' characteristics were presented in Table 4.2, as follows-

Table 4. 2 Driving Characteristics of Respondents

Sr. No.	Particular	Number of Respondents	Percent
		160	100%
Type of license holding now			
1	E	160	100%
Age of getting driving license achieved			
2	Above 20years	160	100%
Did you attend government Bus driving school?			
2	No.	160	100%
Did you attend private Bus driving school?			
1	Yes	69	43%
2	No	91	57%
If Yes, how long?			
1	Less than 3 months	69	100%
	Total	69	100%
Number of years as a PSBDs			
1	Less than 5 years	33	21%
2	6-10 years	80	50%
3	Above 11 years	47	29%

Source: Survey data, 2019

By Table 4.2, it shows that all the respondents must have holding E level license. This E Level driving license can only be applied for the license B and D holders with 5-year experiences. For that arrangement, all respondents are at a minimum of six years of their driving experiences.

For the analysis of the age of receiving driving licenses, Table shows that not all the people did not receive under the age of 20 years, although license can be applied at the age of 18 years old. They first have to start to apply training license for at least six months. Regarding the analysis of their driving training schools, whether they have been owned by the government or private driving centers, the study finds that they have attended private-owned driving training, and they have never attended government-owned training schools.

The study is further done on their period of attending driving training schools. Most of the drivers or 77% are found as attending for 3 to 6 months when they are in learning driving training to pass the government driving test program. Few of them have taken for above (6) months to receive a driving license.

In the analysis of becoming a PSBD level, respondents are asked to answer the question of how long it takes to become a PSBS. By Table (4.2), only the (21%) of total respondents have less than (5) years of becoming as PSB drivers. The majority of (79%) of respondents have already been experiencing over (5) years as becoming PSBDs. The composition of the majority of PSBD with long years of working experience is hoping to yield more correct answers on that survey questions.

4.3.3 Current Driving Status of Respondents

After knowing of their driving training and license application characteristics, it assessed if then made to understand their current driving experiences, which are analyzed. Respondents are asked whether they have ever had traffic accidents if they have met any traffic accidents; there had no injuries/deaths or with injuries or both. They are also asked whether they have met any accident within the last 24 months for the more understanding that PSB drivers would have awareness behavior on the danger from accidental carcasses.

They are also asked that the highway police are catching to who are driving over the limit speed. And lastly, to understand their nature of employment and they are whether driving fixed vehicles or rotation of vehicles or as reserved for a substitute driver. Result from that analysis, the results of the respondents' driving status were presented in Table 4.3, as follows.

Table 4.3 Current Driving Status of Respondents

Sr. No.	Particular	Number of Respondents	Percent
		160	100%
Have you ever had Road Traffic Accident ?			
1	Yes	98	61%
2	No	62	39%
If Yes, what was their conditions?			
1	Without injuries/death(s)	86	88%
2	With injuries	12	12%
	Total	98	100%
Have you had any accidents in the last 24 months ?			
1	Yes	6	4%
2	No	154	96%
If Yes, How many times?			
1	Less than 2	6	100%
Highway Police caught by overspeed in the last 24 months?			
1	No	160	100%
Type of Job			
1	Permanent	34	21%
2	Periodically Contract	126	79%
Nature of Driving			
1	Fixed Vehicle	130	81%
2	Rotation	30	19%

Source: Survey data, 2019

By the table, it shows that 98 out of 160 respondents or the majority of 61% have met accidents during their driving live. Only 39% of respondents do not face any accidents. Further, this total of 98 respondents who have met with accidents is asked what consequences happened. Only a few or 12% out of 98 had accidents with injuries and for the most respondents with 88% that they had faced without injuries/death(s) although they had met with accidents. Meeting of accidents for their driving life, the

analysis on the accidents within 24 months is stating that only 4% had accidents, and the rest 96% had no accidents in these periods. They are responding that they have met only one time during these 24 months and seem to be more careful driving in the last 24 months after they had accidents in previous years.

By the type of their job status, only 34 or 21% out of total 160 have been employed as permanents jobs in their bus companies. Most of 126 of total respondents are employed as periodically contract workers. In the inter-regional passenger transportation industry, most of the drivers are earning with periodically contract fees; that is, they are earning by-trip that they have driven.

When they are serving in a bus company, their nature of the driving job is accompanying in managing fixed or assigned vehicles, and few of them or 19% have to rotate driving of the vehicles because they are not assigned fixed vehicles. However, no one has assigned as a reserve driver for the substitute to permanent drivers when they take leave or absent.

4.3.4 Knowledge on Road Safety

After studying their driving characteristics in previous and present experiences, the next step is to test their knowledge of road safety in the bus transportation industry. During survey, the questions about knowledge of the respondents toward safety was accessed by the use of their understanding of most risky for road safety, their knowledge of the meaning of road signages, their knowledge of information source at drive safely, which all are analyzed to find out their public bus transport knowledge and findings are mentioned as below.

4.3.4.1 Understanding of Most Risky for Road Safety

In the analysis of the public bus transport knowledge, the first question is about their understanding of the riskiest road conditions, which can cause the unsafety of passengers on the bus. See Appendix I(b). The findings by their understanding of most risky for road safety were summarized in Table 4.4.

Table 4. 4 Understanding of Most Risky for Road Safety

Sr. No.	How do you think the following is most risky for Road Safety?	Frequency	Percent
1	Bad Driving Practice	38	24%
2	Lack of Knowledge of Traffic Rules	64	40%
3	Working Attitude	11	7%
4	Weather	21	13%
5	Road Condition	26	16%
	Total	160	100%

Source: Survey data, 2019

Regarding the above driving knowledge and practices which are concerning most risky for road safety, only 24% describe that bad driving practices would be most risky for road-safety. They believe that PSBDs should behave good driving practices to reduce risks for road safety. Among them, many respondent drivers or 40% majority of respondents describe that lack of knowledge of the traffic rules is most risky for road safety.

Few of them are believing that their working attitude would also relate to the risk of road safety, and some are believing that the weather conditions would affect road safety. Respondents believe that 16% or third most risky to road safety is the cause of the road conditions. Although Yangon to Mandalay expressway was constructed targeting for high-speed bus road, all the vehicles are passing on the concrete road more than that tar road. The lack of maintenance are found as solar automatic lighting poles along the express bus roadside, beside the bridges, and the cracks of concrete floor, rainwater which is on the road for encouraging slips, unrelated curve and worn position of slope for turning, which all finally tend to be more road accidents to injure the passengers as for the careless drivers. These are the knowledge about public bus transport driver's understanding at most risky for road safety.

4.3.4.2 Knowledge of the Meaning of Road Signages

The findings of understanding about road signage and road landmarks were summarized in Table 4.5. For each of the statements below, respondents are asked to indicate the extent of their agreement or disagreement on eleven statements by

placing a tick (√) in the appropriate column that "TRUE" or FALSE." See in Appendix I(b).

Table 4. 5 Knowledge of Road Signage

Particular	Extent of Knowledge	Total Respondents	%
		160	100%
In a two-way road the broken line may be crossed over to make a turn. A ("Hair Pin" turn) "U" turn may also be made.	TRUE	160	100%
No walking, standing or cycling shall be done on this line.	TRUE	69	43%
	FALSE	91	57%
Parallel lines shall not be crossed over at all. Hair Pin turns, and straddle driving are prohibited.	TRUE	160	100%
Is this pedestrian cross line?	TRUE	160	100%
Where there are pedestrians crossing the road, the vehicle shall stop at a distance of at least **(5)** meters (16ft, 6 ins) from the crossing line	TRUE	47	29%
	FALSE	113	71%
White/red zebra roadside posts shall be erected at the places such as roadsides where there are steep banks and at road curves and bends that	TRUE	160	100%
Sign showing ending point of High-way Road	TRUE	160	100%
Road is under maintenance?	TRUE	160	100%
Speed Limit 60 Miles?	TRUE	160	100%
Slippery Road?	TRUE	90	56%
	FALSE	70	44%

Source: Survey data, 2019

On the analysis on the road sign in a two-way road, the broken line in the middle of the road, whether it may be crossed over to make a turn or not. All the respondents answer easily by their recommendation a turn from that broken lines, which can make "Hair Pin" turn or "U" turn be made by signaling car light.

Further, their knowledge about people on this line is asked whether it is True or False that people in that line who should not walk or standing or cycling shall not be done. The majority of 57% of respondents responded this manner would be "False" as people should not be, whereas 69 number of 43% agree that people have the right to stand or walk or cycling shall be done. Regarding the study on that of respondents' knowledge shows that the majority is unclear knowledge on those issues.

Regarding the parallel lines in the middle of the road shall not be crossed over at all: Hair Pin turns, and straddle driving is prohibited. By the result of respondent answers, all drivers are found as well understanding at they are prohibited from turning when the parallel lines are placing in the middle of the road. This sign is commonly found while crossing on the bridges, the slope of the road, allow for high-speed driving, and over 30-degree curve turning-position of the road, which are very dangerous and easy to be accidents.

Regarding the question about the pedestrian cross line, the study finds that all the respondents' agreeable on that of road laws' approval for people who can make pedestrian on that of cross-line signages on the busy roads. All the respondents are reminded by the road committee to slow down the speed of the bus and must wait while people are crossing that cross-lines road signage.

When asking their knowledge about which distance they have to stop their bus far from the pedestrian crossing line, as set road administration rules, when there are pedestrians crossing the road, the vehicle shall stop at a distance of at least (5) meters (16ft, six ins). By the table, respondents' knowledge is found as very weak to understand to stop the bus at which meter distance with the showing result of 71%. This highlights one of the weak points to have a detailed understanding of road regulations, although they know to stop at pedestrian crossing lines.

Because of the dangers of a bus stopping in the bent or curved on the bus-lane, respondents' options are asked whether "White/red zebra roadside posts shall be erected at the places such as roadsides where there are steep banks and at road curves and bends that may cause danger." By the table, all the respondents are stating they are agreeable to create white/red zebra roadside posts in the area of the curves. It shows their high safety knowledge on the danger at curve and bent area.

By their knowledge on road sign analysis, the further survey is done on the options of the road signs which are showing ending point of High-way Road, road sign placing for the area where the road is under maintenance, and road signs to limit of the speed not to over (60) miles per hour. By the survey, all are found as agreeable to place these road signs so that respondents would have more careful in this dangerous zonal area to save their passengers. However, table shows (44%) of the respondents are found as an unclear sign for slippery road conditions while they are driving on that Yangon – Mandalay Highway.

4.3.4.3 Knowledge of Information Source at Drive Safely

The findings on understanding about the importance of the matters or the source of information for drive safety were summarized in Table (4.5). For each of the statements below, respondents are also asked to indicate the extent of their agreement or disagreement by placing a tick (●). See Appendix I(b) in the appropriate column.

Table 4. 6 Knowledge of Information Source at Drive Safely

Particulate	Extent of Knowledge	Total respondents	Percent
		160	100%
The most dangerous (accident happened) areas or milestones on YGN-MDY Express Way are (Mindfulness of the Milestones)	15/58/172/233	77	48%
	23/64/256/335	63	39%
	6/39/100/300	20	13%
License (C) can perform the Bus-Helper (Spare Job) too.	Yes	160	100%
The PSB Speed Limit on YGN-MDY express way is (100 km/h).	No	160	100%
Use right rear signal light to let the other overtake me	Yes	160	100%
The panel code – (279) can sanction up to 2 years terms of prison	do not know exactly	160	100%
The emergency number to call Ambulance of MOHS is 192	Yes	37	23%
	do not know exactly	123	77%
The penalty against driving without license is (30,000 Ks)	Yes	66	41%
	do not know exactly	94	59%
Dagonite to SagarInn Toll Gate is allowed for Motorbike and it is not identified as High-way Road	Yes	154	96%
	No	6	4%
The new hotline to call for emergency is 1886	Yes	143	89%
	do not know exactly	17	11%
According to existing regulations against anti-drunk-driving : BAC limit is (0.07g/dl).	do not know exactly	160	100%

Source: Survey data, 2019

By the Table (4.6), (13%) of respondents are having knowledge of information source at drive safety to that of milestones of 6/39/100/300, in that frequent car

accidents would happen. However, for the majority of (48%) of respondents are having knowledge of information source at drive safety to that of milestones of 15/58/172/233, and the second most source at drive safety is at 23/64/256/335 milestone.

As for the highway express bus travel, they need bus helpers to help them during the long journey to drive more safely. The researcher would like to check their knowledge of the license holders of spare-(helpers) persons. Concerned with that kind of license, all the respondents are found as knowing very well on the requirement of C License for that helper or spare personal. In actual, all respondents are found knowledge of road administration department instruction as well on the helpers who must have C type or Helper license.

Further, respondents are asked the road administration instruction on the Speed Limit on YGN-MDY Highway, which is (100 km/h). From that question, all the respondents are saying "No" condition because of recent road administration's new instruction to reduce to 90 km/hr. They can be assumed as in-touch with newly issued road administration laws.

For the wrong signal of the signal light showing for overtaking other buses, the researcher also checks their knowledge with the question of the use right rear signal light to let the other overtake them. Concerning that overtaking permission signal light, all have found as well-knowledge on how to show signal light to other buses to overtaking to them. This statement also highlights the respondents following the instruction of road administration department regulation in that case, as well.

However, when they are asked to the road administration panel code - (279) can sanction up to 2 years terms of prison. They honestly reply that they do not know precisely the definition of status laws. They know in public speaking, and they could not be able to understand the code definition, which will be referred to as what specific case.

In the case of the emergency case in Yangon – Mandalay road, there are the hotline numbers set by the road traffic police department and some NGO organizations. For that, respondents are asked that they know the emergency number to call Ambulance of MOHS is (192). By the Table, most or (123) out of (160) respondents are found as they do not exactly know which the phone contact number was is.

All the drivers must have a valid license and must have carry along with driving any vehicles. On the analysis of the penalty against driving without a license is whether 30,000 Ks or not. By the analysis, it is found that 59% or 94 out of 160 do not know

exactly the penalty fee is. They seem to negotiate with police officers for the exchange of small cases, and thus, some of the respondents would know the exact penalty fee is 30,000 kyat.

In the defining highway expressway in Myanmar, not all the cars and trucks, especially for motorcycles, which are not allowed to pass through the express way. However, the researcher would like to check the respondents' knowledge on that of the "Dagonite to SagarInn that this toll gate is allowed for Motorbike," and it is not identified as High-way Road. Almost all respondents have agreed that the portion between "Dagonite to SagarInn," which takes part as Yangon – Mandalay Express Way, which is allowed motorcycles and not taken part as highway road. For the weakness in government bodies' inspections, driving motorcycles on that part become the culture, and most of the drivers' wrong acknowledgment as the Highway would be ended at SagarInn Toll Gate.

The study on the respondents ' knowledge regarding to the new hotline to call for emergency source at drive safely, which is 1886 or not. As for the drivers' knowledge, only (11%) out of total 160 did not know the new hotline connection. By the survey, respondents' knowledge on the emergency number to call Ambulance on (192) would be confused with (199), whereas, they can be found as very familiars with the new hotline number (1886).

In the analysis of their knowledge according to existing regulations against anti-drunk-driving: respondents are asked whether the BAC limit is (0.07g/dl). For the questions, all the respondents are replying to that of the answer that they do not know exactly how the content limitation is. In conclusion to this study at the respondent's knowledge of information source at drive safely is found as moderate level awareness, and they are found as needed to have more sources of drive safety while they are using Yangon – Mandalay Highway.

4.3.5 Working and Driving Attitudes

The findings of respondents' agreeable level at the extent to which working and driving attitudes were summarized in Table (4.7).

Table 4. 7 Working and Driving Attitudes

Sr	Characteristics	Mean	Standard deviation
	Affect (How I feel about it), Behavior tendency, Knowledge about likely consequences of behavior		
1	I am satisfied with my pay as a driver	3.19	0.54
2	I am comfortable with the number of hours I work per day	3.36	0.53
3	I am satisfied by the condition of the vehicle I drive	3.43	0.53
4	Road conditions are good enough for my driving.	3.30	0.52
5	Passengers behave according to my expectations	3.52	0.55
6	My employer treats me fairly.	3.46	0.55
7	Other road users behave responsively on the road	3.56	0.55
8	I have enough space to rest for fatigue recovery on bus.	3.00	0.61
9	I am angry if other bus brutally take over me	3.55	0.53
10	I always wear seat belt while driving	5.00	-
11	I agree that it's safe to drive under the speed limit.	4.21	0.73
12	Left-handed drive is safer than Right-handed	4.35	0.73
13	The traffic officers play a big role in reducing Road traffic accidents	3.89	0.70
14	The traffic officers take no bribes	3.03	0.58
15	Traffic officers apply the law the same way for everyone. (No favors)	3.80	0.82
16	The traffic officers are always available when needed to help with some traffic problem.	4.51	0.64
17	Traffic officers act promptly in case of problems on the road	4.72	0.56
18	Never pick the black passenger and cargo on the High-way	3.78	0.65
19	Taking care of healthy life behaviors	4.24	0.53
20	Have regular religious activities	4.67	0.51
	Overall mean	3.83	

Source: Survey data, 2019

In this analysis, there are (20) statements that are used to rate current respondents' working and attitudes by the use of a Five-point Likert Scale measurement of 1=strongly disagreed, 2=disagreed, 3=Neutral, 4=Agree, and 5=strongly agree. See in Appendix I(c) The summary findings on showed the higher mean value of (3.83), and thus, most of the respondents are found as working and driving with some positive attitudes, to the pay received, treatment with employers, feels some comfortable working hours although they are day and night driving, following the discipline in wearing seat belt while driving, safe to drive under the speed limit, in left-handed drive, even higher perception upon the highway traffic polices for their prompt response.

By the detail information showing on Table (4.7), the highest working and driving attitudes were found at their wearing of the seat belt while driving. However, wearing seat-belt while driving is not only for drivers, but also for the highway bus travelers. Although passenger drivers are wearing seat belts, they have forgotten to remind passengers to wear seat-belt as well.

The second highest working - driving attitude is found as on the traffic officers prompt response in case of problems on the road by observing the higher mean value of (4.72). Respondents are found as higher admiration on that of the highway traffic officers because they are always available when needed to help with some traffic problems, and thus, they are rating on the higher mean value of (4.51). When they are relying on the highway traffic police officers, they have higher positive attitudes on that of the traffic officers who will play a big role in reducing road traffic accidents by its calculated higher mean value of (3.89).

The calculated higher mean value (3.80) is also found as the respondents agreeable to that of the Traffic officers who apply the law the same way for everyone. (No favors to everyone; however, its mean value is less than (4), and thus, there have some weaknesses on the action taken by the highway police officers.). For that reason, their answers to the question of the traffic officers take no bribes is (3.03), is indicating that there have some bribes of highway police officers.

Further, the higher mean value of (4.67) on that of having regular religious activities means that of their beliefs on traditional religious affairs before departure from a bus gate. It is flowering, burning essence, and candles, and so on. As for the knowledge on that of the safety life, respondents are having behavior on taking care of a healthy life for its obtained higher mean value of (4.24).

Respondents are also voting the higher mean value (4.21) in that of their option on it is safe to drive under the speed limit. They also believe that the left-handed drive is safer than right-handed driving with a mean value of (4.35). From that of left-hand driving, they receive knowledge about the likely consequences of behavior that bus passengers can safely take-off and take-on to the bus.

For the positive attitude, respondents are important to be watched for their passengers to their lives as well as their properties. For security matters, respondents should not pick up the black passengers on the way of travel. By the analysis of that of their behavior, the study shows that of some higher mean value of (3.78), indicating that they are caring of their passengers on never picking up the black passenger and cargo on the High-way with, whereas, some are practicing that matters.

Living by highway bus driving is not too comfortable for them to refresh for the next day morning. However, respondents are found as used to their life with some comfort to the number of work hours per day with the calculated mean value of (3.36). Respondents are also agreed on that the lack of having enough space to rest for fatigue recovery on the bus with the calculated mean value of (3.00). They are earning by driving in highway expressway, and they are found as difficulties in recovering for fatigue along with their buses for their responsibility of management.

Relating to their behavior while working, they may feel angry if other buses brutally take over to their buses with the received mean value of (3.55). That negative attitude would cause unsafe driving and result in harmful to the passengers on board. All respondents are suggested to have to be patient to the other buses' taking over to their buses by showing signal light and moving to the righter side of the road for the ease of the speed buss to take over to them.

For driving safety to a destination, the vehicle condition is an important factor. All the highway buses are traveling day-to-day and nigh-to-night. They prefer their vehicle to be in good condition. Regarding their satisfaction level by the condition of the vehicle that they are driving, the received mean value (3.43) is indicating that respondents have some satisfactory level to their current highway express buses.

When Yangon -Mandalay Highway has opened, there are thousands of vehicles using that Highway road to travel one place to another place. With the higher in many drivers in the same express bus-Lane, respondent's option is asked to rate the level of responsiveness of other road users, the result of (3.56) higher mean value is indicating that respondents agree to that of the other users' behavior with some responsibility on

the road. On the other hand, toll gate authorities are very strict about the use of highway roads for some types of vehicles.

During the traveling time, the safety of bus travelers totally relies on the highway bus driver. When the survey is done, it is found that passengers behave according to my expectations by its obtained mean value (3.52).

It is an important factor of an employee staying longer to an organization relating worker-employer relationship. In this study, most respondents are found as some positive attitude on their owners for their fair treatment with the calculated higher mean value of (3.46).

Respondents are also found some positive attitudes on the road conditions are good enough for driving. However, the received mean value (3.30) is not much higher; respondents prefer to improve highway bus maintenance and to upgrade to some level. The current highway was constructed by concrete materials. It causes shorten Life-Span of Car-tyre. There are many defaults of road designs, lack of painted lines, lack of reflection lights, and, thus, Highway users prefer to improve current highway road conditions.

4.3.6 Driving Practices

Driving public express buses are very different from driving other commercial vehicles such as taxi and small trucks as well as cargo containers. To have more understanding on public buses driving. To understand and that all the respondents are asked to answer their agreeable level by the use of a Five-point Likert scale of 1=strongly disagreed, 2= disagreed, 3= could not decide, 4= agreed and 5= strongly agreed. See in Appendix I(d).The findings of respondents' agreeable level at the extent to which working and driving attitudes were summarized in Table (4.8).

Table 4. 8 Driving Practices

Sr. No.	Characteristics	Mean	Standard deviation
1	Tailgating	2.77	0.68
2	Speeding	3.09	0.54
3	Using a phone while driving	2.85	0.67
4	Failing to indicate correctly	2.59	0.61
5	Risky overtaking or racing	2.54	0.71
6	Hogging the right lane	4.31	0.71
7	Bad actions at the traffic lights	2.24	0.76
8	Last minute or excessive braking	2.36	0.75
9	Breaching roundabouts rules	1.83	0.72
10	Hard curving or turning	2.00	0.87
11	Chewing betel and spitting while driving	2.37	0.71
12	Watching displays or screens while Driving	2.32	0.69
13	Drinking something while driving	2.38	0.66
14	Alcoholic driving	1.71	0.76
15	Overtake from wrong side?	2.28	0.75
16	Without checking Tire Status before start driving	1.59	0.68
17	Driving with ignorance of vehicle regular maintenance	1.88	0.69
18	Don’t use head-light when visibility is low.	2.38	0.84
19	Don’t use navigator’s or helper’s assistant	1.76	0.67
20	Overconfident on self-endurance on fatigue	2.07	0.78
21	Strongly supervised passengers to fasten seat belt on board	1.59	0.68
22	Regular check to be with emergency equipment for passenger before departure	1.59	0.68

Source: Survey data, 2019

The first question is made on their driving practice as tailgating behind other buses. The received mean value (2.77) is indicating that they are not always tailgating behind other buses. However, they do not deny it totally. They are found as sometimes tailgating behind other buses.

Yangon – Mandalay highway is for driving in speedy. However, road administration set rules for not speeding over a specified mile rate aiming for the safety of the people who are using on that road. For that allowable to drive at some speed, respondents are asked how much they have speeding driving practices. Regarding driving with speed, the received mean value (3.09) is also indicating that they have sometimes driven with over-speed.

During the driving, calling and receiving phone calls is dangerous not only for the driver also for the passengers on board. Whatever the traffic polices are prohibiting not to use the phone while driving the bus, most driving people are using its practices. Respondents are also asked how much they are using phone service while driving. The study finds that respondents are using the phone only for sometimes. Their response shows that if the phone ring, they speak in short-to-the-point to protecting the bus in danger.

Regarding driving as the position of risky overtaking or racing, respondents are asked how fast they race with others. However, the mean score (2.54) is indicating that they all are in a good position of overtaking and not always risky overtaking or racing. Also, they are strongly agreed that they are hogging the right lane with received higher mean score (4.31). As for the adverse actions at the traffic lights, that means unnecessary high forelight opposite and annoy to respondents who are hogging in the left lane for its lower mean value of (2.24).

Regarding the slowing down the bus speed, respondents usually take to be smooth stopping. However, some cannot be able to smooth slowdown speed. Instead, they are undertaken sudden breaking practices. From that manner, survey finding shows that lower mean score of (2.36) for last-minute or excessive braking, whereas, this mean value is also indicating that respondents may behave last minute and excessive braking practices, in different situations.

Regarding following the current traffic rules, respondent drivers are asked that in which degree they breach roundabouts or traffic cycle rules, study finds they show the lower mean score (1.83), indicating they disagreed on the rules of that breaching roundabout. As for the question on their behavior of hard curving or turning, the received mean value (2.00) is indicating they had few practices in case of emergency. In common, respondents, as well as many car drivers, are chewing betel and spitting while driving. Becoming of PSBDs, most of PSBC is banned this chewing betel while driving. In this study, the received mean value (2.37) is indicating that they follow most

of the time not to chew betel while driving. In the study on their behavior of watching displays or screens while driving, survey result of the mean value (2.32) is stating that they are not watching dashboard for almost of the time and they only look at some time. While asking for the drinking something while driving, survey findings of the mean value (2.38) is indicating that they do not totally deny and they drink only at the time of thirsty while driving the bus. For the responded answer on alcoholic driving, survey finding of the mean value (1.71) shows that very little drinking behavior while driving because some of the advanced techno-bus cannot be able to start the engine when the driver is drunk.

The study upon the driver behavior at overtaking from the wrong side, the received mean value (2.28) is indicating that they may behave sometimes. Before bus departs, drivers are checking all the water levels, oil levels, temperature, which are showing on the car dashboard. As for the tire, drivers are needed to go outside for an inspection of air condition. Survey finding for that behavior of inspection on tire status, the mean value (1.59) is indicating that they disagreed in that manner without checking before start driving.

For all types of vehicles, there have set standards for maintenance schedules in accordance with total kilometer driven. As for the public transport bus companies, they may forget to look at maintenance schedules for each bus. In the question of driving with ignorance of regular vehicle maintenance, the received mean value (1.88) is indicating that they almost follow the maintenance rules. Another reason is if they had any careless for maintenance, they afraid of delaying on the highway road during repair time, and their brand name would decrease among regular customers.

For drive safely, their driving practices regarding the use of head-light when visibility is low, receiving mean value is indicating that of the use of head-light when visibility is low on the Highway road. Another related question is that of the helpful of the navigator's or helper's assistant; the received mean value is also indicating they have the practices of using the help of the helper's assistant. Respondents acknowledge the critical role of their helper's assistant while driving on the road.

For the public bus driving services, almost all respondents are serving day-to-day, night-to-night bus route. It is difficult for regular recreation for them. For those driving practices, respondents are asked what they are overconfident on self-endurance on fatigue. By the analysis, the received mean value (2.07) is indicating that they do

not feel overconfident on self-endurance on fatigue. They are found as demanding for relaxation to relieve fatigue.

Seat-belt is very strict by road administration for the safety of not only the driver but also for passengers on board. For that reason, the researcher would like to know their law enforcement practices that they strongly supervised passengers to fasten the seat belt on board. However, the received mean value (1.59) is indicating that of the very weak in supervising to fasten seat belts at the passengers. In some cases, the seat belt is damage on the bus.

For every express highway bus, there is the standard rule to have emergency equipment like breaking hammer, fire extinguishers, first aid kid, consumable spare parts, and so on. For that bus driver's pre-plan practices, the researcher would like to know their behavior of regular check to be with emergency equipment for the passenger before departure. The received mean value (1.59) is also indicating that of the weakness of emergency equipment to be in the car.

The analysis on the respondent's practices before departing, onboarding, and after boarding, survey findings showed that most respondents are found as caring activities such as tailgating behind the front car, speeding over the limit set by road administration department, practices on the using a phone while driving, failing to indicate correctly, risky overtaking or racing to other bus, hogging the right lane driving, caring bad actions at the traffic lights, last-minute or excessive braking, breaching roundabouts rules, and hard curving or turning which cause dangerous for safety of passengers.

Bus drivers are also good practicing by abstaining from the activities such as chewing betel and spitting while driving, frequent watching displays or screens while driving, drinking something while driving, alcoholic driving, overtaking from the wrong side, without checking tire status before start driving, driving with ignorance of regular vehicle maintenance, and many other driving practices. Many of the respondents are found as having safety knowledge, the moderate mindset at attitude, and some good driving practices, by the study.

CHAPTER 5
CONCLUSION

5.1 Findings

The study explored that many professional drivers who are using the Ygn-Mdy Highway road in Myanmar had inadequate knowledge, less positive attitudes, and risky practices towards traffic regulations. Implementation of effective and standard intervention programs may increase the driver's knowledge, positive attitudes, and safe practices towards traffic rules and road safety awareness. Few studies have been conducted on the incidence and factors which contribute to road traffic collisions in Myanmar.

Emphasis had also been given to the primary data generation and allied aspects such as the construction of the data gathering instrument (questionnaire), content management, sampling, execution, testing, and refinement of the instrument for getting hold of the quality data which ultimately determines the quality of the study. To fill this gap in knowledge, we conducted knowledge, attitudes, and practice (KAP) study among drivers on Yangon- Mandalay Highway to assess their behavior towards road safety in the Inter-Regional Bus Transportation Industry.

In this study, respondents' characteristics, includes studying gender position, age range, marital status, education level of public service bus drivers. In the gender of respondents, there is no female composition because of the current traditional behavior of public bus drivers in the inter-regional passenger transportation industry and, there are no or very few women drivers in inter-Regional public transport service in Myanmar. In their age analysis, the study finds out that most of the respondents are with age above 36 years old. The marital status of respondents is also asked whether they have married or not. By the survey, most of the respondents are found as had already married status. In the analysis on their education level, most respondents have finished middle education level, and few respondents have education levels at high school graduates, and very few are found at the graduate level. By this analysis, inter-regional public bus drivers are found as high school graduates' level, who could not be able to join a university.

Characteristics of public bus drivers are also asked that which type of license is holding now, age of getting driving license achieved, experience at government bus driving school, and how long, experiences at private training school, and how long. By the survey, it finds out that all the public bus drivers must have holding E level license because this E Level driving license can only be applied for the license. All respondent's experiences are fond of a minimum of six years of their driving experiences.

For the analysis of the age of receiving driving licenses, it finds out all the people did not receive under the age of 20 years. Regarding the analysis of their driving training schools, whether they have been owned by the government or private driving center, the study finds that they have attended private-owned driving training, and they have never attended government-owned training schools. Their period of attending driving training schools is also showing that most of the drivers have to attend for 3 to 6 months in learning driving training to pass the test of the government driving program. Few of them have taken for above six months to revive the driving license. Becoming a PSB driver, the study finds that few respondents have less than five years of becoming as PSB drivers. The majority of bus drivers have already been experiencing over five years as becoming PSB Transport drivers, and thus, the study is hoping to yield more correct answers on that survey questions.

The study assessed that the majority of drivers had met accidents during their driving live. Only a few do not face any accidents. Furthermore, these drivers who have met with accidents are found consequences with injuries and for the most respondents had faced without injuries/death(s) although they had met with accidents. The study can conclude that living in a public service transport bus is near-miss of risk every day. However, current drivers have met only one time last 24 months ago and seem to be more careful driving in the last 24 months ago after they had accidents in previous years.

By the nature of the type of job status, very few have been found as permanents jobs, and most are employed as periodically contract workers. That is, they are earning with periodically contract fees. That is, they are earning by-trip that they have driven. Most of them are accompanying in managing fixed or assigned vehicles, and few men have to rotate driving of the vehicles because they are not assigned fixed vehicles. There are no result drivers in their industry.

Regarding their belief on the knowledge and practices which are concerning risky for road safety, the study finds that bus driver behavior at good driving practices

to reduce risks for road safety and the majority of respondents describe that lack of knowledge of the traffic rules increases risky for road safety. Regarding their working attitude, some are believing that the weather conditions would affect road safety. Some believe that road conditions causing risky road safety. Although Yangon to Mandalay expressway was targeting for high-speed bus road, bus drivers are believing that there is lack of maintenance in the area, especially, maintenance of solar lighting poles, painted direction lines insides and middle, unrelated curve and worn position of slope for turning, which all finally tend to be more road accidents to injure the passengers as for the careless drivers. These are the knowledge about public bus transport driver's understanding at most risky for road safety.

Regarding the drivers' knowledge on the road signages, the study finds out that all the drivers respondents answer easily on most of the signage by their recommendation. However, some are lack of knowledge, for example, in the turn-line, people in that line who should not walk, or standing or cycling shall not be done or shall be. The majority of bus drivers' knowledge shows that the majority is unclear knowledge on these issues. Drivers are also found as a lack of knowledge about bus stops before road signs of the pedestrians crossing-line, at which distance where they have to stop. They also lack stopping in the bent or curved on the bus-Lane. Public bus drivers are found as an unclear sign for slippery road conditions while they are driving on that Yangon – Mandalay Highway express road.

It regards the knowledge of information source at drive safely to that of milestones at where frequent accidents happen in that of 6/39/100/300 milestones, to that of milestones of 15/58/172/233, and at 23/64/256/335. In this study, it is found that bus drivers are most aware of the milestones at 6/39/100/300 than the two others. Regarding the license of helper on board, all the bus drivers are found as knowing very well on the requirement of C License for that helper or spare personal. Further, bus drivers are also found as knowing driving buses with a speed of 90 km/h(new rules) instead of 100 km/hr. They can be assumed as in-touch with newly issued road administration laws. However, when they are asked to the road administration panel code - (279) can sanction up to 2 years terms of prison. They honestly reply that they do not know exactly the definition of status laws. Bus drivers' knowledge of that of an emergency case on the express road, most bus drivers, are found as they do not exactly know which one the phone contact number was is.

The study on the bus drivers' knowledge regarding the new hotline to call for emergency source at drive safely, which is 1886 or not. The study finds out as very familiars with the new hotline number 1886. In the analysis of their knowledge according to existing regulations against anti-drunk-driving: respondents do not know exactly how the content limitation is. In conclusion, the bus driver's knowledge of information source at drive safely is found as moderate level awareness, and they are found as needed to have more sources of drive safety while they are using Yangon – Mandalay Express road.

Regarding to the driving attitudes, summary findings on showed most highway bus drivers are found as working and driving with some positive attitudes, to the pay received, treatment with employers, feels some comfortable working hours although they are day and night driving, following the discipline in wearing seat belt while driving, safe to drive under the speed limit, in left-handed drive, even higher perception upon the highway traffic polices for their prompt response. The highest working and driving attitudes were found at their wearing of the seat belt while driving. However, they have forgotten to remind passengers to wear the seat belt as well. The second highest working and driving attitudes are found as on the traffic officers' prompt response in case of problems on the road.

They are also found as heavily relied on traditional religious affairs before departure from a bus gate. The other positive driving attitudes are also found in the area of safe to drive under the speed limit, from that of left-hand driving, to look after their passengers to their lives as well as their properties. Living by highway bus driving is not too comfortable for them to refresh for the next day morning. However, highway bus drivers are found as a positive attitude in their life with the working hours per day and on the lack of having enough space to rest for fatigue recovery on a bus. Regarding the bus driver's attitude on that the other users' behavior with some responsibility on the road, they are found out having of some satisfactory level, i.e., other drivers are driving following disciplines set by road authorities, whereas, they are found as over speed in common. It is an important factor of an employee staying longer to an organization relating worker-employer relationship. In this study, most bus drivers are found as some positive attitude toward their owners. Highway bus drivers are also found as fairly positive attitudes on the road conditions are good enough for driving and hoping for improvement soon.

Regarding the driving practices from this knowledge and attitudes, further survey is made to understand whether good practice or not. Regarding driving practice as tailgating behind other buses, they are answering that they are not always tailgating behind other buses, but for some time. Regarding road administration set rules for not speeding over a specified mile rate, the survey found they have sometimes broken the rules that they drive with some speed. Regarding the phone calling and receiving behavior onboard, the study finds that highway bus drivers are using the phone only for sometimes.

Regarding driving as the position of risky overtaking or racing, the study finds that they all are not overtaking and not always risky overtaking or racing. Also, they are strongly agreed that they are hogging the right lane. Regarding the slowing down practice to stop the bus speed, bus drivers normally take to be smooth stopping, in common. They are not practicing last minute or excessive braking. However, it may change in different situations. Regarding the practice of following the current traffic rules, the result is indicating that they do not breach roundabouts rules.

Having well knowledge of the dangerous activities while driving, their driving behavior in practical is analyzed. Asking on their hard curving driving practice, chewing betel and spitting while driving, watching displays or screens while driving, drinking something while driving, driver behavior at overtaking from wrong side, survey results are showing that they follow the rules in most of the time and on alcoholic driving, survey shows that very little drinking behavior while driving.

Another good practice is also found in the manner of without checking before start driving, and they may not forget to look at maintenance schedules for each bus.

Regarding the use of head-light when visibility is low, the study finds that of the use of head-light when visibility is low on the express road. For relying on a helper, the study finds that bus drivers are most using helpers' assistants better than navigator's assist. Regarding their recreation practice, they are found as demanding for relaxation to relieve fatigue. Regarding the knowledge of seat belt, the study finds out that, they know seat belt is very strict by road administration for the safety of not only the driver but also for passengers on board. However, bus drivers are found as weak in supervision to their passengers to fasten the seat belt on board. They are found as forgetting to repair some damage seat belts. Other weaknesses of the bus driver practices are in the practices to fulfill to have emergency equipment like breaking hammer, fire extinguishers, first aid kid, consumable spare parts, emergency exit doors, and so on.

For that bus driver's pre-plan practices, the researcher would like to know their behavior of regular check to be with emergency equipment for the passenger before departure. The received very low mean value is indicating that of the weakness of emergency equipment to be in the car.

5.2 Recommendations

In this section, the recommendations raised from an analytical approach by this study are mentioning.

For safety at the highway express road, the road administration department set out road safety rules and regulations to follow by the drivers who are using it on that road. On the other hand, the drivers who are working in the public bus transportation sector are found as well as experiences for the government limitation in the driving experiences. For having driving experiences, they all seem to be knowledgeable about road safety rules and regulations. And thus, the researcher would like to recommend some practices and would like to suggest some areas to improve after the findings of this study, as shown above.

Regarding the demographic factor, the educational background of all most all the drivers are low, it could be suggested that Government and road administration departments should issue rules and regulations with simple language and illustrated pictures as possible. It would be more helpful to the drivers if administrators are using pictures regarding road safety rules to follow them. Regarding the lower education level of that industry, it is still needed to deploy educated drivers for raising customer satisfaction levels in the public transportation sector. Another way to increase customer service is to increase in technology at MRT transport with auto-drive railway road like other neighborhood countries. In gender, the composition is also stating that only the male gender can have a chance for employment. Existing road infrastructure also prohibits female gender for a chance of employment in that industry.

Regarding the characteristics of public bus drivers, it is recommended to the government for limitation of driving license in age with regards to driving experience (years). Regarding the analysis of their driving training schools, it could be suggested to the government to extend driving practice centers itself. People are found as facing many difficulties for practicing driving unless the involvement of Government or local authorities. All the drivers at present have to rely on privately owned driving centers in metro cities in Myanmar.

Regarding the driving experiences regarding traffic accidents, it is suggested to all the drivers to have more safety awareness and knowledge while they are living as public passenger drivers. Since there are few accidents by the respondents during the last 2 years ago, it could recommend current public drivers to maintain knowledge on a safe drive along the road.

For its non-education level in common, they are also found as less chance to appoint as permanent employees at their organization. As suggested earlier, only the educated employee involvement in that sector would enhance more customer services, while there will be growing numbers of permanent positions, and their career would be more secure than ever before.

Regarding their beliefs on the knowledge concerning risky for road safety, it is recommended that bus driver behavior at good driving practices would be the better to reduce risks for road safety than that of the lack of knowledge of the traffic rules and the weather conditions.

Although Yangon to Mandalay express road is a Highway, bus drivers are recommended by Road Authority to carefully drive because of the lack of maintenance in road facilities such as solar lighting poles, painted direction lines, reflection plates, unrelated curve and worn position of slope for turning. Even though, careless drivers have been getting accidents caused by improper road facilities.

Regarding the public bus drivers' knowledge on the road signages, the study finds out that all the drivers can answer easily on most of the signage by their recommendation. However, it could be recommended that bus drivers should be evaluated in re-examination at their road safety knowledge because the majority of bus drivers' knowledge is still unclear sign for slippery road conditions while they are driving on that Yangon – Mandalay Highway express road. The study reflects the natural behavior of bus drivers and helps the realization process to set the policies, regulations and standard procedures to prevent Road Traffic Safety issues in Myanmar so that it is hoped to diminish the loss of the working-age individuals due to road traffic accidents which can cause socio-economics problems.

To be concluded, in reality, in all counts and proven analysis on the passenger transportation showing that Myanmar has a lot of things still needed to be fulfilled to have a nationwide effective Road Safety System. Also, this study endeavors to distinguish the preparation requirements for government authorities and agencies who responded to safeguard the road safety and managing the Yangon-Mandalay Highway

effectively. With the deepest wish and contribution to the development of Myanmar, here, the study on the behavior of private sector bus drivers in Inter-Regional passenger transportation in Myanmar has concluded and ended.

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Appendix- I(a)

Survey for The Thesis of Master of Public Administration

The behavior of PSBDs in Inter-regional passenger transportation

(Case study: Yangon-Mandalay Highway)

SECTION A: PERSONAL PROFILE (Answer by shading ○ to ●)

1. Sex - ○ *Male* ○ *Female*
2. Age - ○ ≤ *25* ○ *26* ≤ ≥ *35* ○ *36* ≤≥ *45* ○ *46* ≤≥ *60* ○*60* ≤
3. Marital Status - ○ *Single* ○ *Married*
4. Education -

   ○ *Under Primary* ○ *Primary Passed* ○ *Middle Passed* ○ *High Passed* ○ *Bachler*
5. Type of license holding now - ○ D, ဃ ○ E , c ○ F , ဓ
6. Age of getting driving license achieved. - ○ ≤ *20* ○ *20* ≤
7. Did you attend government Bus driving school? - ○ *Yes* ○ *No*

   If Yes, How Long ?- ○< *3 months* ○ *3*< >*6 months* ○ >*6 months*
8. Did you attend private Bus driving school? - ○ *Yes* ○ *No*

   If Yes, How Long ? - ○< *3 months* ○ *3*< >*6 months* ○ >*6 months*
9. Number of years as a PSB driver -○ < *5* ○ *6* < > *10* ○ > *11*
10. Have you ever had Road Traffic Accident ? - ○ *Yes* ○ *No*

    If yes, what was their nature? -

    ○ *Without injuries/death(s)* ○ *With injuries* ○ *With death(s)* ○ *With injuries and death (s)*
11. Have you had any accidents in the last 24 months ? -○ *Yes* ○ *No*

    If Yes, How Many ? -

    ○ *None* ○ *Less Than 2* ○ *3 to 5* ○ *6 to 8* ○ *More Than 9*
12. Highway Police caught by overspeed in the last 24 months? - ○ *Yes* ○ *No*
13. Type of Job ○ *Part Time* ○ *Permanent* ○ *Periodically Contract*
14. Nature of Driving ○ *Fixed Vehicle* ○ *Rotation* ○ *Reserved for Substitute*

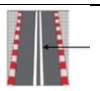
Appendix- I(b)

SECTION B: KNOWLEDGE (Answer by making O to ●) ☐■

1. How do you think the following is most risky for Road Safety?

O *Bad Driving Practice*	O *Knowledge of Traffic Rules*	O *Working Attitude*	O *Weather*	O *Road Condition*

2. For each of the statements below, please indicate the extent of your agreement or disagreement by placing a tick (●) in the appropriate column.

STATEMENT	Signs	*True*	*False*
a. In a two-way road the broken line may be crossed over to make a turn. A ("Hair Pin" turn) "U" turn may also be made.		O	O
b. No walking, standing or cycling shall be done on this line.		O	O
c. Parallel lines shall not be crossed over at all. Hair Pin turns, and straddle driving are prohibited.		O	O
d. Is this pedestrian crossline ?		O	O
e. Where there are pedestrians crossing the road, the vehicle shall stop at a distance of at least **(5)** meters (16ft, 6 ins) from the crossing line.		O	O
f. White/red zebra roadside posts shall be erected at the places such as roadsides where there are steep banks and at road curves and bends that may cause danger.		O	O
g. Sign showing ending point of High-way Road.		O	O
h. Road is under maintenance?		O	O
i. Speed Limit 60 Miles ?		O	O
j. Slippery Road ?		O	O
k. Passing Prohibited ?		O	O

3. The most dangerous (accident happened) areas or milestones on YGN-MDY Express Way are

O *15/58/172/233* O *23/64/256/335* O *6/39/100/300*

4. License (C) can perform the Bus-Helper (Spare Job) too. O *Yes* O *No*
5. The PSB Speed Limit on YGN-MDY express way is (100 km/h). O *Yes* O *No*
6. Use right rear signal light to let the other overtake me. O *Yes* O *No*
7. The panel code – (279) can sanction up to 2 years terms of prison. O *Yes* O *No*
8. The emergency number to call Ambulance of MOHS is 192. O *Yes* O *No*
9. The penalty against driving without license is (30000 Ks). O *Yes* O *No*

10. Dagontine to Sagarinn Toll Gate is allowed for Motorbike and it is not identified as High-way Road.

Yes *No*

11. The new hotline to call for emergency is 1886. *Yes* *No*

12. According to existing regulations against anti-drunk-driving : BAC limit is (0.07g/dl).

Yes *No*

Appendix- I(c)

SECTION C: WORKING & DRIVING ATTITUDES

For each of the statements below, please indicate the extent of your agreement or disagreement by placing a tick (●) in the appropriate column.

Strongly Agree (SA), Agree (A), Uncertain (U), Disagree (D) Strongly Disagree (SD)

Statement	(5) SA	(4) A	(3) U	(2) D	(1) SD
1. *I am satisfied with my pay as a driver.*	O	O	O	O	O
2. *I am comfortable with the number of hours I work per day.*	O	O	O	O	O
3. *I am satisfied by the condition of the vehicle I drive.*	O	O	O	O	O
4. *Road conditions are good enough for my driving.*	O	O	O	O	O
5. *Passengers behave according to my expectations.*	O	O	O	O	O
6. *My employer treats me fairly.*	O	O	O	O	O
7. *Other road users behave responsively on the road.*	O	O	O	O	O
8. *I have enough space to rest for fatigue recovery on bus.*	O	O	O	O	O
9. *I am angry if other bus brutally take over me.*	O	O	O	O	O
10. *I always wear seat belt while driving.*	O	O	O	O	O
11. *I agree that it's safe to drive under the speed limit.*	O	O	O	O	O
12. *Left handed drive is safer than Right handed.*	O	O	O	O	O
13. *The traffic officers play a big role in reducing Road traffic accidents.*	O	O	O	O	O
14. *The traffic officers take no bribes*	O	O	O	O	O
15. *Traffic officers apply the law the same way for everyone. (No favors)*	O	O	O	O	O
16. *The traffic officers are always available when needed to help with some traffic problem.*	O	O	O	O	O
17. *Traffic officers act promptly in case of problems on the road.*	O	O	O	O	O
18. *Never pick the black passenger and cargo on the High-way.*	O	O	O	O	O
19. *Taking care of healthy life behaviors.*	O	O	O	O	O
20. *Have regular religious activities.*	O	O	O	O	O

Appendix- I(d)

SECTION **D**: DRIVING PRACTICES (Answer by making ☐ ○ to ■ ●)

1. Do you engage in the following practices while driving? For each of the statement below on traffic law enforcement officers (Highway Police Force), Please indicate by a tick (●) whether you ***Always, Frequently, Often, Rarely*** and ***Never***.

Operating Practices	1 A	2 F	3 O	4 R	5 N
1. Tailgating.	○	○	○	○	○
2. Speeding.	○	○	○	○	○
3. Using a phone while driving.	○	○	○	○	○
4. Failing to indicate correctly.	○	○	○	○	○
5. Risky overtaking or racing.	○	○	○	○	○
6. Hogging the right lane.	○	○	○	○	○
7. Bad actions at the traffic lights.	○	○	○	○	○
8. Last minute or excessive braking	○	○	○	○	○
9. Breaching roundabouts rules.	○	○	○	○	○
10. Hard curving or turning.	○	○	○	○	○
11. Chewing betel and spitting while driving	○	○	○	○	○
12. Watching displays or screens while Driving	○	○	○	○	○
13. Drinking something while driving	○	○	○	○	○
14. Alcoholic driving	○	○	○	○	○
15. Overtake from wrong side?	○	○	○	○	○
16. Without checking Tire Status before start driving.	○	○	○	○	○
17. Driving with ignorance of vehicle regular maintenance.	○	○	○	○	○
18. Don't use head-light when visibility is low.	○	○	○	○	○
19. *Don't use navigator's or helper's assistant.*	○	○	○	○	○
20. Overconfident on self-endurance on fatigue.	○	○	○	○	○
21. Strongly supervised passengers to fasten seat belt on board.	○	○	○	○	○
22. Regular check to be with emergency equipment for passenger before departure.	○	○	○	○	○

Appendix- II

UN Road Safety Collaboration Partners

1.1 UN organizations or specialized agencies

Coordinators

- WHO

UN Regional Commissions:

- UNECA
- UNECE
- UNECLAC
- UNESCAP
- UNESCWA

1.2 International agencies

- Asian Development Bank
- European Commission - Directorate-General for Energy and Transport
- Inter-American Development Bank
- International Labour Organization
- International Telecommunications Union (ITU)
- International Organization for Standardization
- Joint Transport Reseach Centre of the OECD and the International Transport Forum
- UNHCR
- UNICEF
- UNITAR
- World Bank

1.3 Governments

- Australia: NSW Centre for Road Safety
- France Ministry of Transport
- Mexican Ministry of Health
- Morocco: National Committee for Prevention of Traffic Accidents (CNPAC)
- Netherlands Ministry of Transport
- Nigeria Federal Road Safety Corps
- Norwegian Ministry of Transport & Communication
- Oman Ministry of Foreign Affairs
- Qatar: Ministry of Interior

- Russian Federation Ministry of Interior
- South Africa: Ministry of Transport
- South Africa: Road Traffic Infringement Agency
- Spain: Dirección General de Tráfico
- Swedish Transport Administration
- Transport Canada
- United Arab Emirates: Abu Dhabi Department of Transport
- United Arab Emirates: Abu Dhabi Municipality
- United Kingdom: Highways England
- United States Department of State
- United States Department of Transport - National Highway Traffic Safety Administration
- US Centers for Disease Control & Prevention - National Center for Injury Prevention & Control
- US Centers for Disease Control & Prevention - National Institute for Occupational Safety and Health

1.4 Foundations/centres

- Abertis Foundation
- Australasian College of Road Safety (ACRS)
- Australian Road Research Board
- EMBARQ: The WRI Center for Sustainable Transport
- FIA Foundation
- Fundación MAPFRE
- International Road Assessment Programme (iRAP)
- Johns Hopkins International Injury Research Unit (JHIIRU)
- Milken Institute School of Public Health (GWSPH)
- Observatorio Iberoamericano de Seguridad Vial (OISEVI)
- The George Institute for Global Health Australia
- Towards Zero Foundation (TYF)
- Transport and Road Safety (TARS) Research, University of New South Wales
- UK Transport Research Laboratory
- UMTRI
- UPS Foundation
- VIAS Institute (former Belgian Road Safety Institute (BRSI))

1.5 NGOs

- AMEND
- Asia Injury Prevention Foundation
- Association for Safe International Road Travel
- BRAKE
- Child Injury Prevention Alliance (CIPA)
- CITA - International Motor Vehicle Inspection Committee
- China Automotive Technology and Research Center (CATARC)
- EASST - Eastern Alliance for Safe and Sustainable Transport
- European Federation of Road Traffic Victims
- Federación Iberoamericana de Asociaciones de Víctimas contra la Violencia Vial (FICVI)
- Fédération Internationale de Motocyclisme (FIM)
- Federation of European Motorcyclists' Associations
- FIRE AID - Aid and International Development
- FISITA
- Fundacion Gonzalo Rodriguez
- Global Alliance of NGOs for Road Safety
- Global NCAP
- Global Road Safety Partnership
- gTKP
- Handicap International
- Institute of Road Traffic Education
- International Federation of Pedestrians
- International Federation of Red Cross and Red Crescent Societies
- International Road Federation
- International Road Transport Union (IRU)
- International Road Victims’ Partnership (IRVP)
- La Prévention Routière Internationale PRI
- Laser International
- Make Roads Safe
- Road Traffic Injuries Research Network
- Roadsafe
- Safekids Worldwide

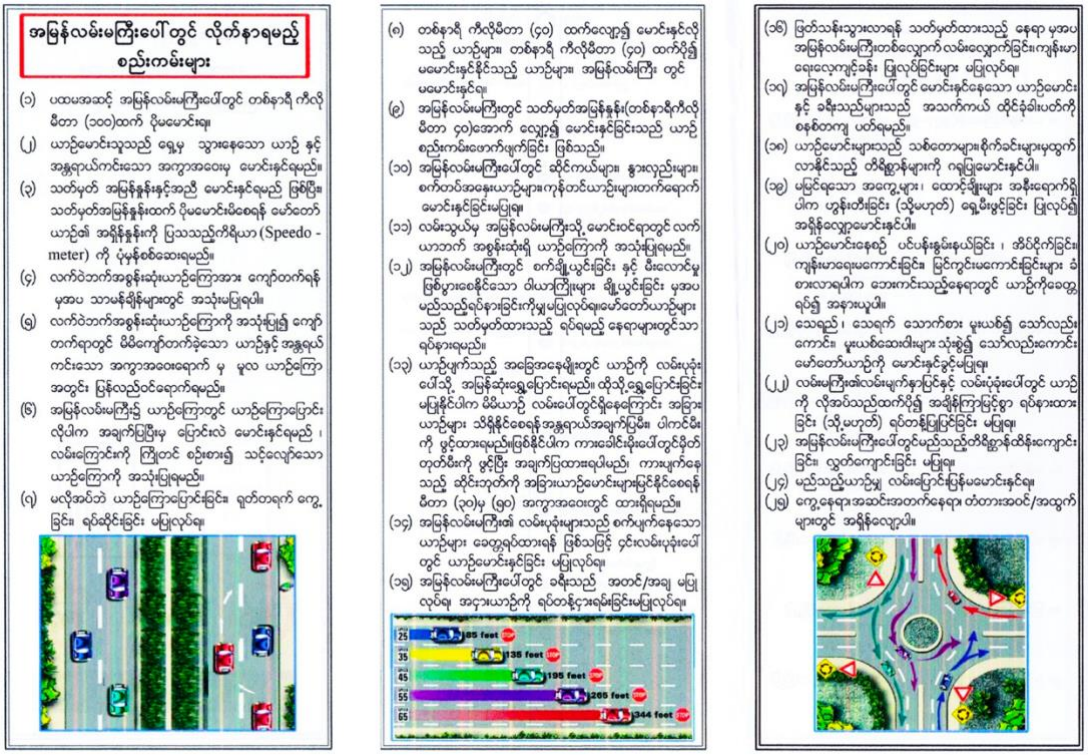
- World Rescue Organization (WRO)
- World Road Association (PIARC)
- YOURS: Youth for Road Safety

1.6 Private sector

- BHP Billiton
- Fédération Internationale de l'Automobile (FIA)
- Fedex Global Citizenship
- Groupe Michelin
- Johnson & Johnson
- NETS
- International Motorcycle Manufacturers Association

Appendix – III

The Do(s) and Don't(s) for PSBD on YGN-MDY Highway (By-Law)



အမြန်လမ်းမကြီးပေါ်တွင် လိုက်နာရမည့် စည်းကမ်းများ

(၁) ပထမအဆင့် အမြန်လမ်းမကြီးပေါ်တွင် တစ်နာရီ ကီလိုမီတာ (၁၀၀)ထက် ပိုမောင်းရ။

(၂) ယာဉ်မောင်းသူသည် ရှေ့မှ သွားနေသော ယာဉ် နှင့် အန္တရာယ်ကင်းသော အကွာအဝေးမှ မောင်းနှင်ရမည်။

(၃) သတ်မှတ် အမြန်နှုန်းနှင့်အညီ မောင်းနှင်ရမည် ဖြစ်ပြီး သတ်မှတ်အမြန်နှုန်းထက် ပိုမောင်းမိစေရန် မော်တော်ယာဉ်၏ အရှိန်နှုန်းကို ပြသသည့်ကိရိယာ (Speedo - meter) ကို ပုံမှန်စစ်ဆေးရမည်။

(၄) လက်ဝဲဘက်အစွန်းဆုံးယာဉ်ကြောအား ကျော်တက်ရန် မှအပ သာမန်ချိန်များတွင် အသုံးမပြုရပါ။

(၅) လက်ဝဲဘက်အစွန်းဆုံးယာဉ်ကြောကို အသုံးပြု၍ ကျော်တက်ရာတွင် မိမိကျော်တက်ခဲ့သော ယာဉ်နှင့် အန္တရယ်ကင်းသော အကွာအဝေးရောက် မှ မူလ ယာဉ်ကြော အတွင်း ပြန်လည်ဝင်ရောက်ရမည်။

(၆) အမြန်လမ်းမကြီးရှိ ယာဉ်ကြောတွင် ယာဉ်ကြောပြောင်း လိုပါက အချက်ပြပြီးမှ ပြောင်းလဲ မောင်းနှင်ရမည်၊ လမ်းကြောင်းကို ကြိုတင် စဉ်းစား၍ သင့်လျော်သော ယာဉ်ကြောကို အသုံးပြုရမည်။

(၇) မလိုအပ်ဘဲ ယာဉ်ကြောပြောင်းခြင်း၊ ရုတ်တရက် ကွေ့ခြင်း၊ ရပ်ဆိုင်းခြင်း မပြုလုပ်ရ။

(၈) တစ်နာရီ ကီလိုမီတာ (၄၀) ထက်လျော့၍ မောင်းနှင်လို သည့် ယာဉ်များ၊ တစ်နာရီ ကီလိုမီတာ (၄၀) ထက်ပို၍ မမောင်းနှင်နိုင်သည့် ယာဉ်များ၊ အမြန်လမ်းကြီး တွင် မမောင်းနှင်ရ။

(၉) အမြန်လမ်းမကြီးတွင် သတ်မှတ်အမြန်နှုန်း(တစ်နာရီကီလို မီတာ ၄၀)အောက် လျော့၍ မောင်းနှင်ခြင်းသည် ယာဉ် စည်းကမ်းဖောက်ဖျက်ခြင်း ဖြစ်သည်။

(၁၀) အမြန်လမ်းမကြီးပေါ်တွင် ဆိုင်ကယ်များ၊ နွားလှည်းများ၊ စက်တပ်အနေးယာဉ်များ၊ကုန်တင်ယာဉ်များ၊တက်ရောက် မောင်းနှင်ခြင်းမပြုရ။

(၁၁) လမ်းသွယ်မှ အမြန်လမ်းမကြီးသို့ မောင်းဝင်ရာတွင် လက် ယာဘက် အစွန်းဆုံးရှိ ယာဉ်ကြောကို အသုံးပြုရမည်။

(၁၂) အမြန်လမ်းမကြီးတွင် စက်ချိုးယွင်းခြင်း နှင့် မီးလောင်မှု ဖြစ်ပွားစေနိုင်သော ဝါယာကြိုးများ ချိုးယွင်းခြင်း မှအပ မည်သည့်ရပ်နားခြင်းကိုမျှမပြုလုပ်ရ၊မော်တော်ယာဉ်များ သည် သတ်မှတ်ထားသည့် ရပ်ရမည့် နေရာများတွင်သာ ရပ်နားရမည်။

(၁၃) ယာဉ်ဖျက်သည့် အခြေအနေမျိုးတွင် ယာဉ်ကို လမ်းပုံး ပေါ်သို့ အမြန်ဆုံးရွှေ့ပြောင်းရမည်။ ထိုသို့ရွှေ့ပြောင်းခြင်း မပြုနိုင်ပါက မိမိယာဉ် လမ်းပေါ်တွင်ရှိနေကြောင်း အခြား ယာဉ်များ သိရှိနိုင်စေရန် အန္တရာယ်အချက်ပြမီး ပါကင်မီး ကို ဖွင့်ထားရမည်။ဖြစ်နိုင်ပါက ကားခေါင်းမိုးပေါ်တွင်မိုတ် တုတ်မီးကို ဖွင့်ပြီး အချက်ပြထားရပါမည်၊ ကားဖျက်နေ သည့် ဆိုင်းဘုတ်ကို အခြားယာဉ်မောင်းများမြင်နိုင်စေရန် မီတာ (၃၀)မှ (၅၀) အကွာအဝေးတွင် ထားရှိရမည်။

(၁၄) အမြန်လမ်းမကြီး၏ လမ်းပုံးများသည် စက်ဖျက်နေသော ယာဉ်များ ခေတ္တရပ်ထားရန် ဖြစ်သဖြင့် ၎င်းလမ်းပုံးပေါ် တွင် ယာဉ်မောင်းနှင်ခြင်း မပြုလုပ်ရ။

(၁၅) အမြန်လမ်းမကြီးပေါ်တွင် ခရီးသည် အတင်/အချ မပြု လုပ်ရ၊ အငှားယာဉ်ကို ရပ်တန့်ငှားရမ်းခြင်းမပြုလုပ်ရ။

(၁၆) ဖြတ်သန်းသွားလာရန် သတ်မှတ်ထားသည့် နေရာ မှအပ အမြန်လမ်းမကြီးတစ်လျှောက်လမ်းလျှောက်ခြင်း၊ကျန်းမာ ရေးလေ့ကျင့်ခန်း ပြုလုပ်ခြင်းများ မပြုလုပ်ရ။

(၁၇) အမြန်လမ်းမကြီးပေါ်တွင် မောင်းနှင်နေသော ယာဉ်မောင်း နှင့် ခရီးသည်များသည် အသက်ကယ် ထိုင်ခုံခါးပတ်ကို စနစ်တကျ ပတ်ရမည်။

(၁၈) ယာဉ်မောင်းများသည် သစ်တောများ၊စိုက်ခင်းများမှထွက် လာနိုင်သည့် တိရိစ္ဆာန်များကို ဂရုပြုမောင်းနှင်ပါ။

(၁၉) မပြင်ရသော အကွေ့များ၊ ထောင့်ချိုးများ အနီးရောက်ပို ပါက ဟွန်းတီးခြင်း (သို့မဟုတ်) ရှေ့မီးမှုတ်ခြင်း ပြုလုပ်၍ အရှိန်လျော့မောင်းနှင်ပါ။

(၂၀) ယာဉ်မောင်းနေရာ၌ ပင်ပန်းနွမ်းနယ်ခြင်း ၊ အိပ်ငိုက်ခြင်း၊ ကျန်းမာရေးမကောင်းခြင်း၊ ပြင်ကွင်းမကောင်းခြင်းများ ဝံ စားလာရပါက ဘေးကင်းသည့်နေရာတွင် ယာဉ်ကိုခေတ္တ ရပ်၍ အနားယူပါ။

(၂၁) သေရည်၊ သေရက် သောက်စား မူးယစ်၍ သော်လည်း၊ ကောင်း မူးယစ်ဆေးဝါးများ သုံးစွဲ၍ သော်လည်းကောင်း မော်တော်ယာဉ်ကို မောင်းနှင်ခွင့်မပြုရ။

(၂၂) လမ်းမကြီးအလမ်းမျက်နှာပြင်နှင့် လမ်းပုံခုံးပေါ်တွင် ယာဉ် ကို လိုအပ်သည်ထက်ပို၍ အချိန်ကြာမြင့်စွာ ရပ်နားထား ခြင်း (သို့မဟုတ်) ရပ်တန့်ပြုခြင်း မပြုရ။

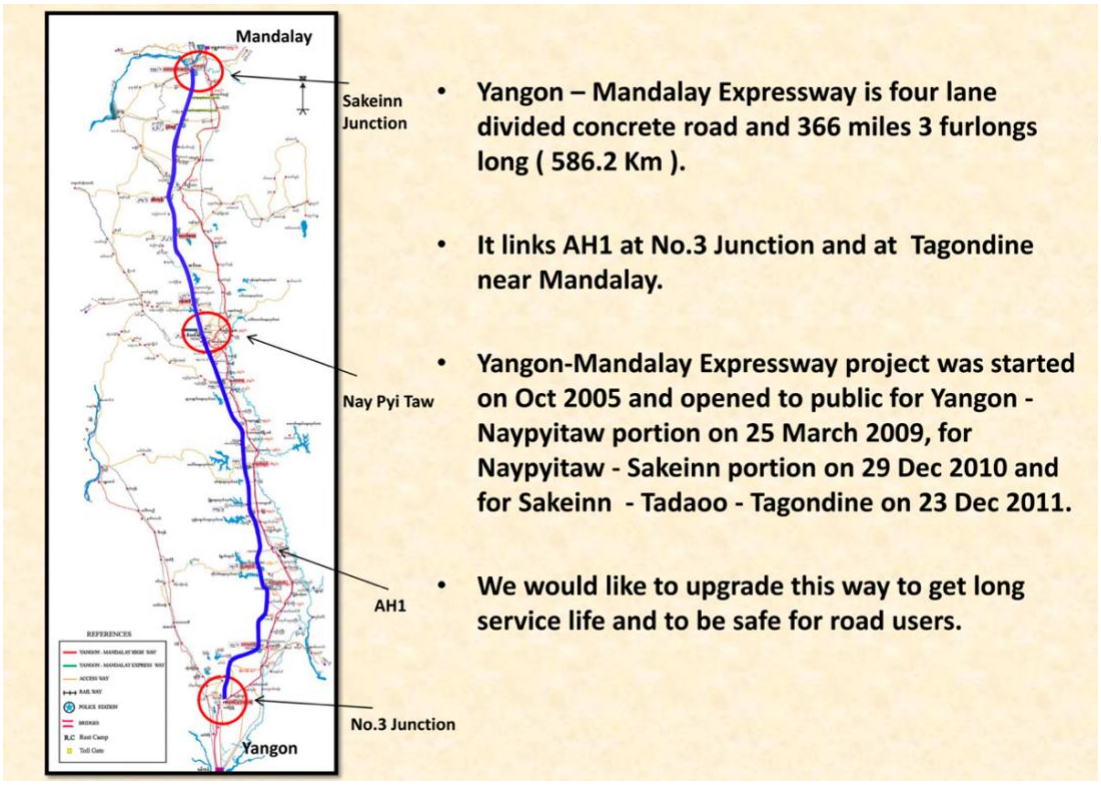
(၂၃) အမြန်လမ်းမကြီးပေါ်တွင်မည်သည့်ကိရိယာနှင်ထိန်းကျောင်း ခြင်း၊ လွှတ်ကျောင်းခြင်း မပြုရ။

(၂၄) မည်သည့်ယာဉ်မျှ လမ်းပြောင်းပြန်မမောင်းနှင်ရ။

(၂၅) ကွေ့ရေးနေရာအဆင်းအတက်နေရာ တံတားအဝင်/အထွက် များတွင် အရှိန်လျော့ပါ။

Source : YeMinZaw(2013) ***Public Works , Ministry of Construction***

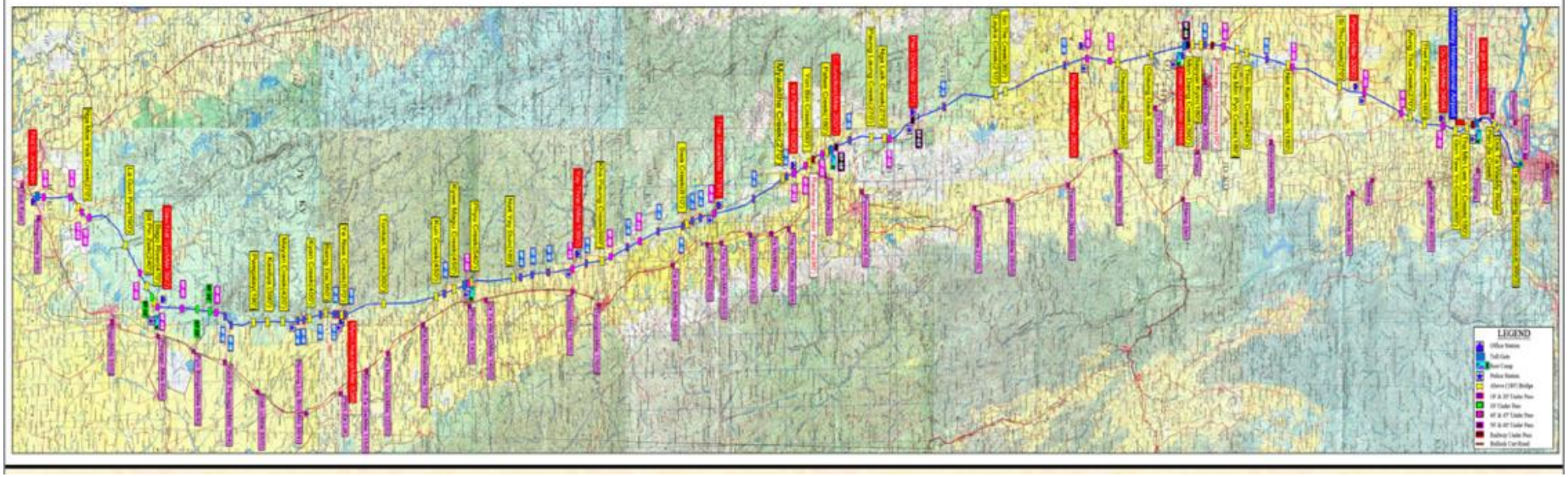
Yangon-Mandalay Highway Map and Facts



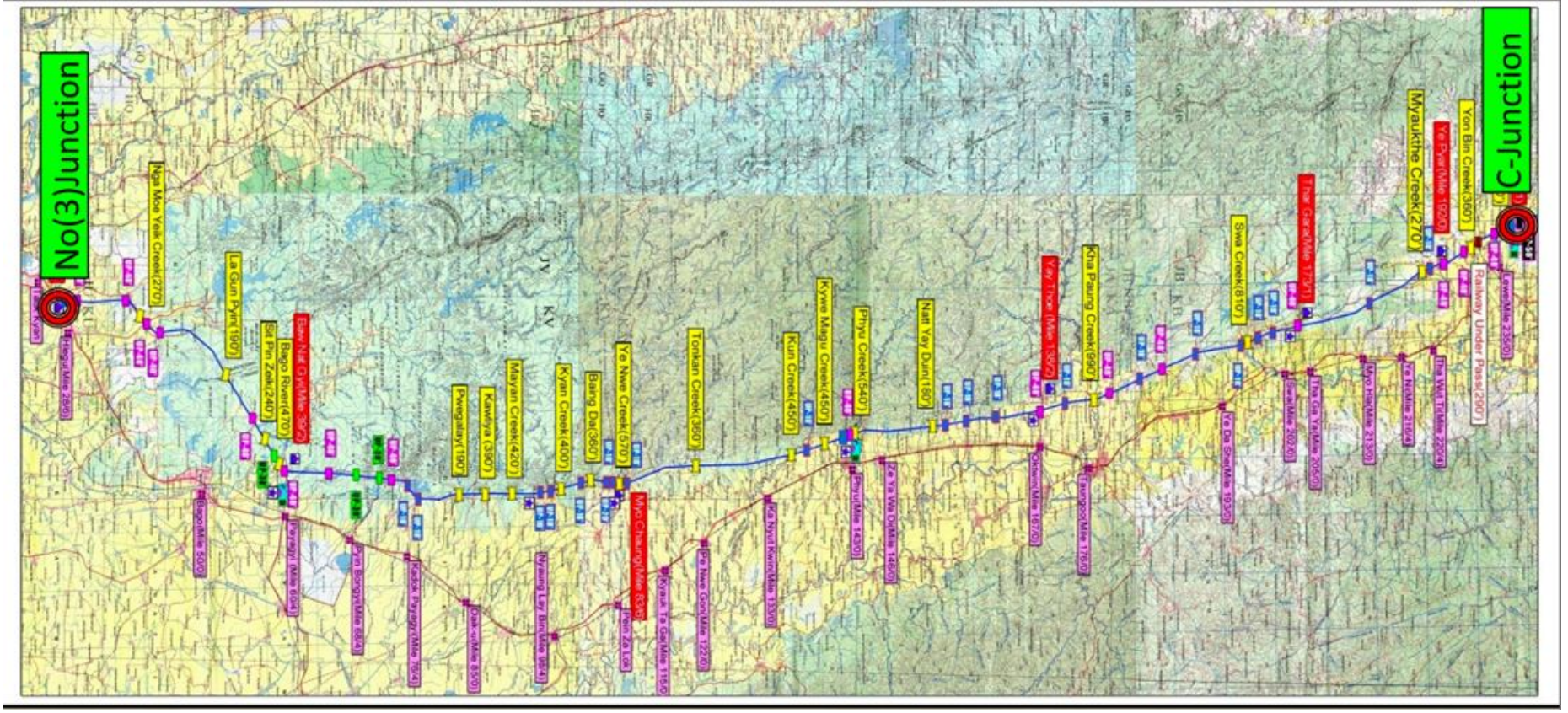
Source : YeMinZaw(2013) ***Public Works , Ministry of Construction***

Appendix – IV

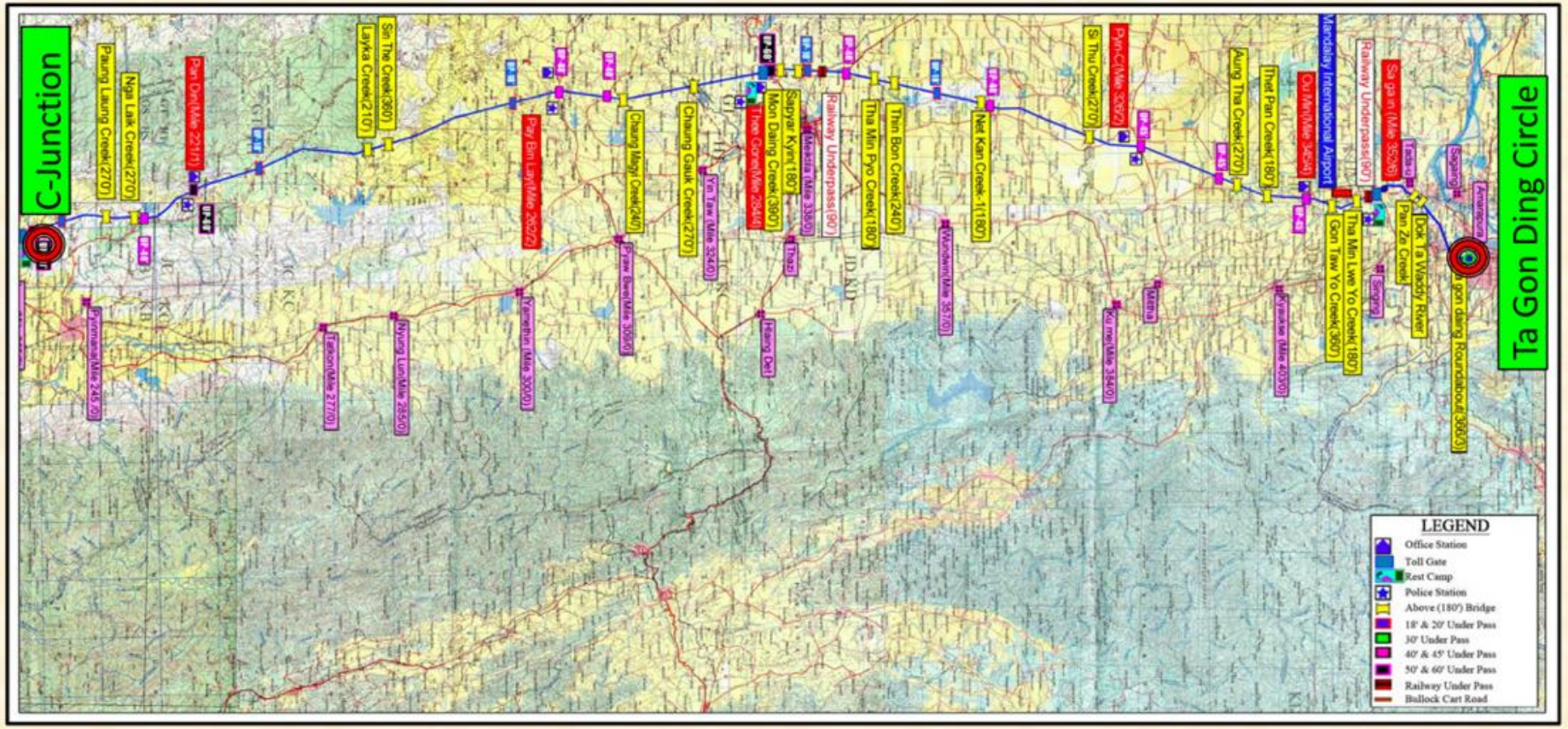
Yangon - Mandalay Express-way
From No.(3)-Junction
To Ta Gon Daing Circle(366/3 Mile)



Yangon-Mandalay Express-way
From No(3)-Junction To Nay Pyi Taw(C-Junction)

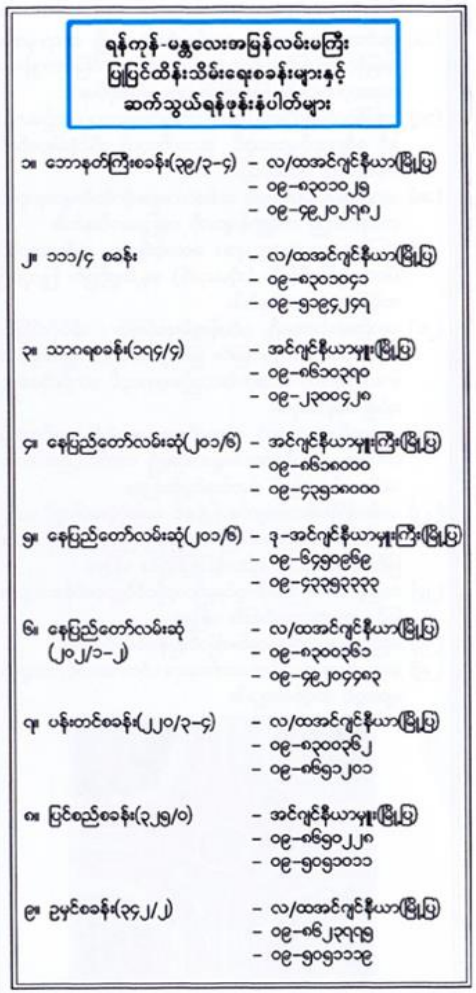


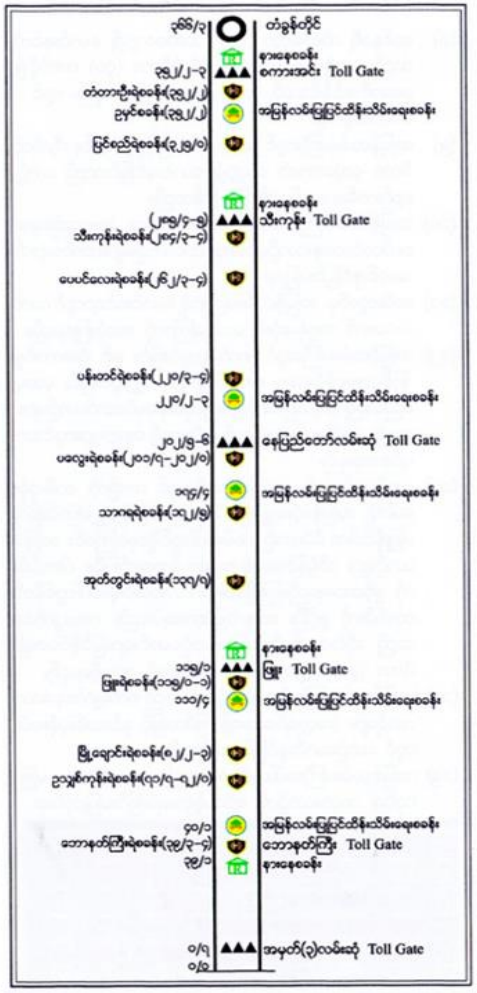
Yangon-Mandalay Express-way
From Nay Pyi Taw(C-Junction)
To Mandalay (Ta Gon Ding Circle)



Appendix – V

Yangon- Mandalay Highway Police Stations Map

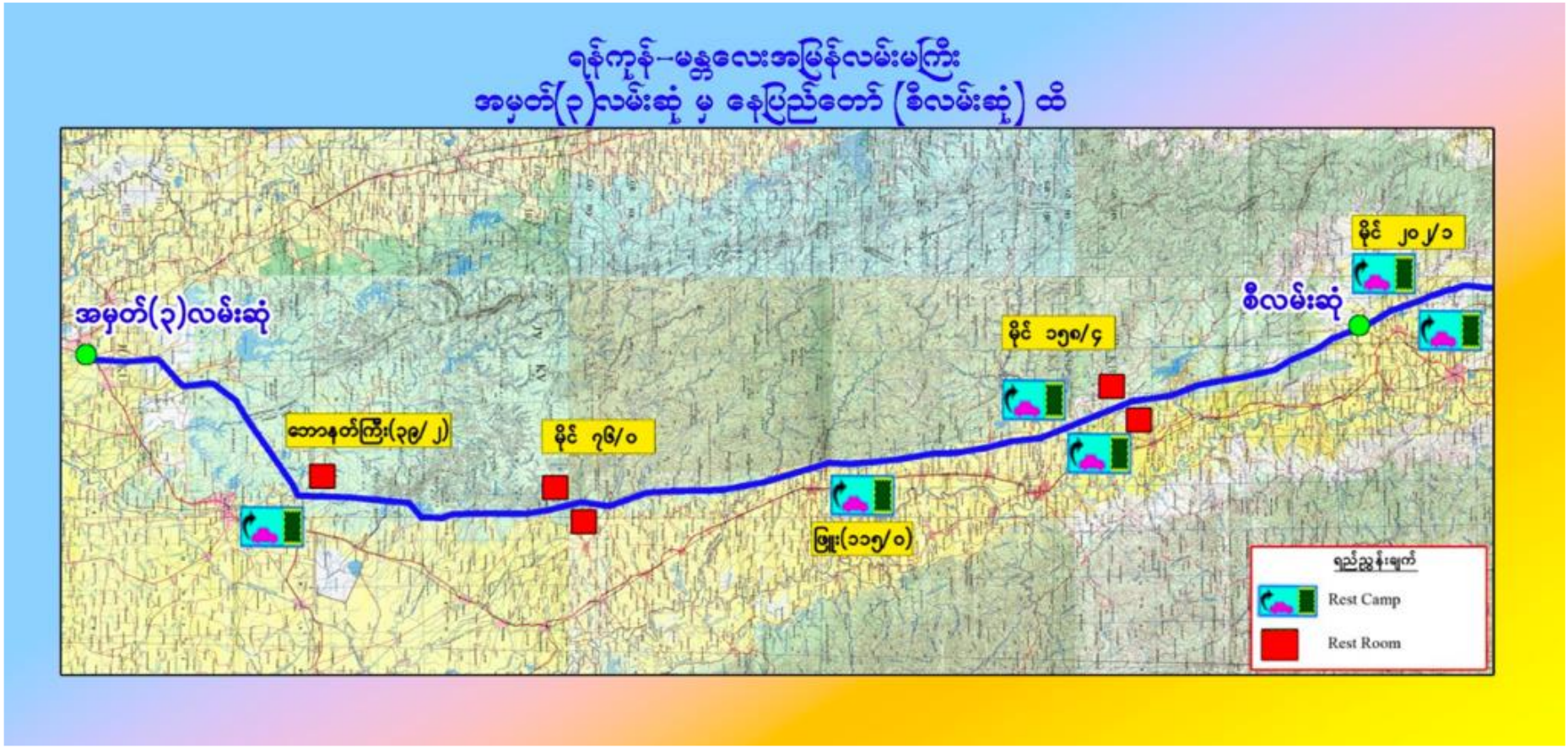




Source; Public Works, Ministry of Construction

Appendix – VI

Rest camps and Rest Room on Yangon-Mandalay Highway Road



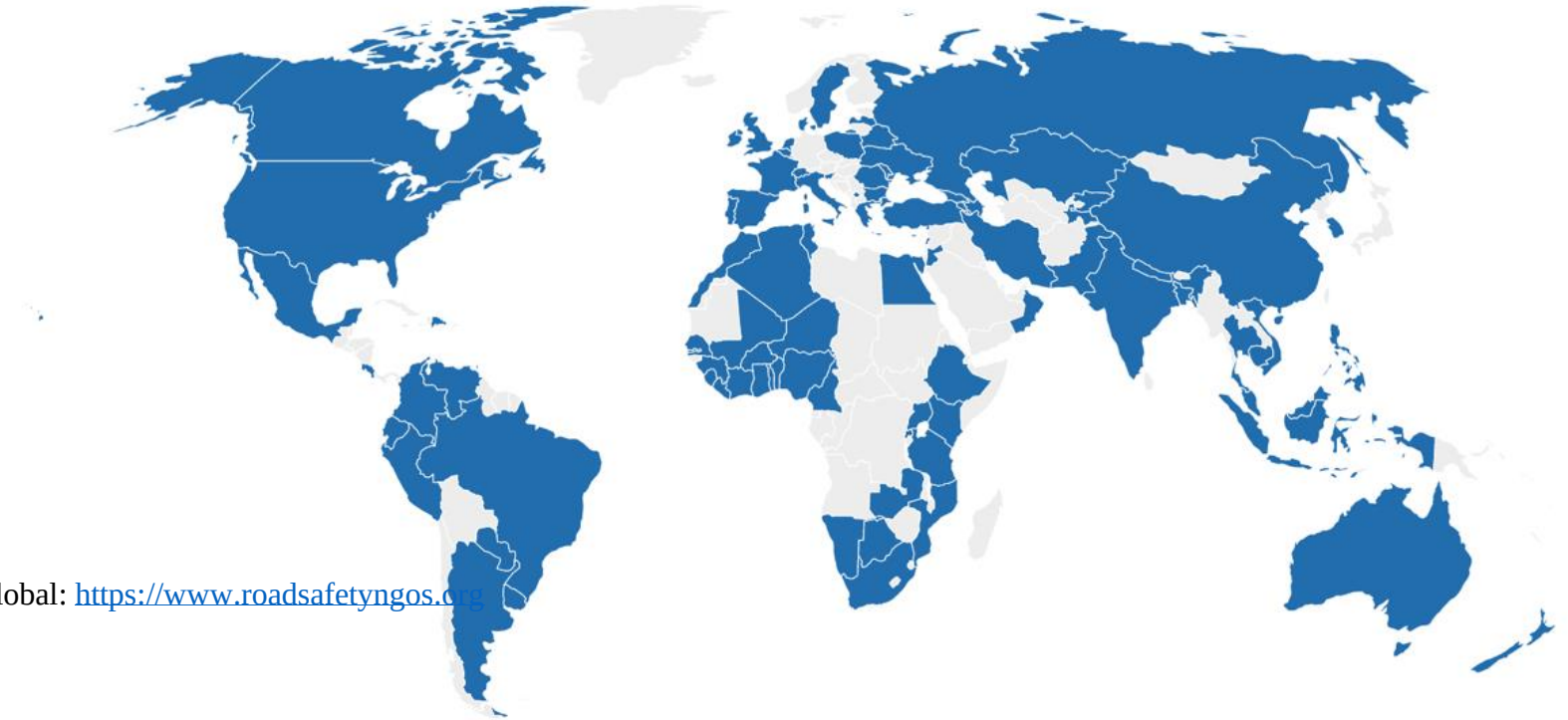
Source: Public Works, Ministry of Construction

Rest camps and Rest Room on Yangon-Mandalay Highway Road **Appendix – VI (Contd.)**

Source: Public Works, Ministry of Construction

Appendix – VI

Global Alliance of NGOs for Road Safety



Source: Global: https://www.roadsafetyngos.org

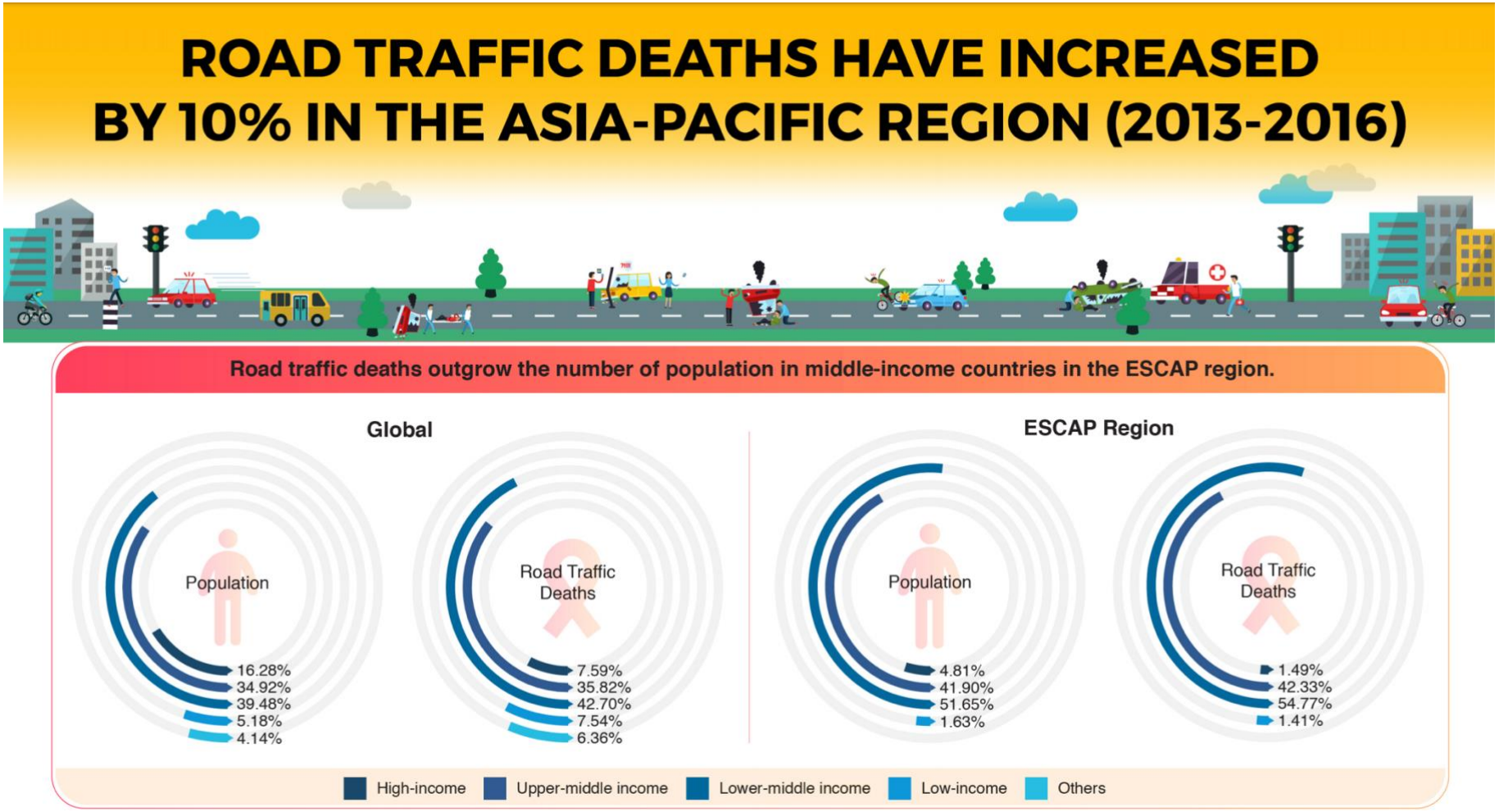
Appendix - VII

Road Transport of Myanmar

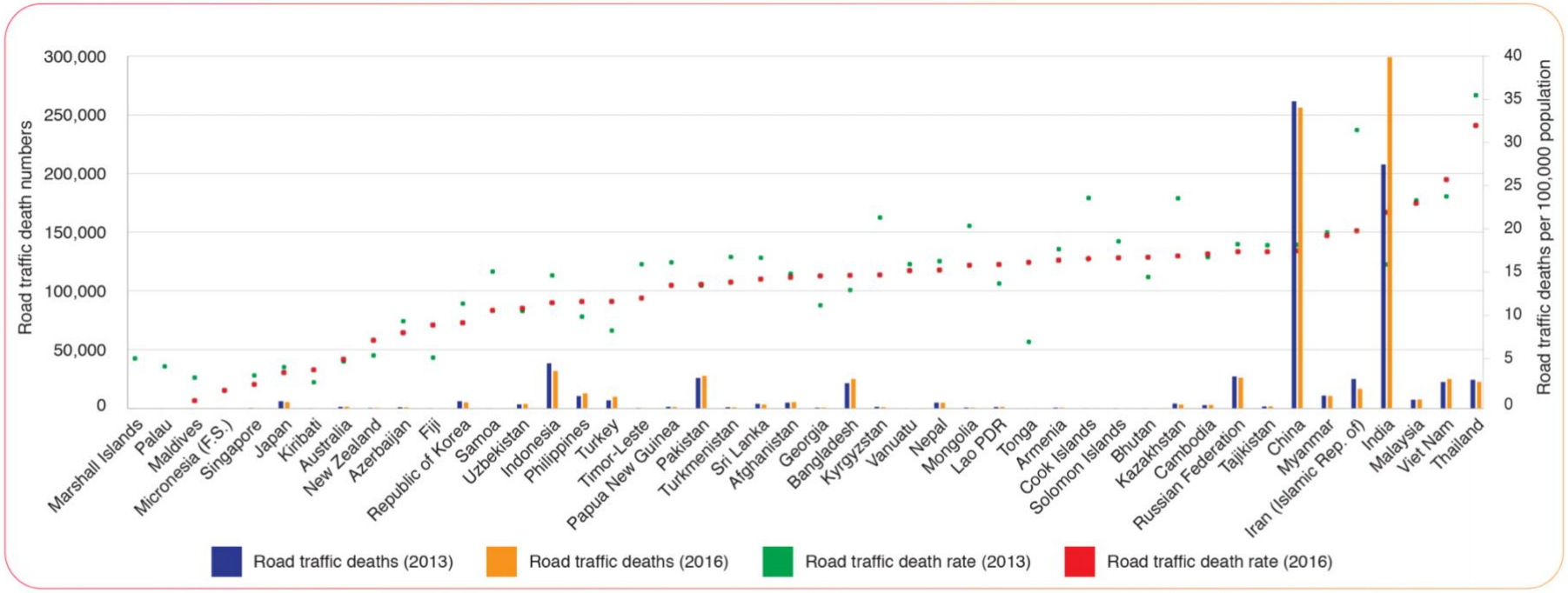
Code	Indicator nam	Actual definition used/ difference from the suggested definition	Unit/scale of measurement	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
A.	Road infrastructure																
1	Total road length		kilometer	90,700	92,900	104,100	111,700	125,400	127,900	136,749	150,816	151,298	164,969	165,723	147,822	164,028	164,377
2	Length of paved road		Kilometer	22,153	22,830	23,955	24,670	25,553	26,333	28,569	33,014	32,535	39,076	38,423	37,119	37,663	39,497
3	Ratio of paved road to total road length		Percent	24.40%	24.60%	23.00%	22.10%	20.40%	20.60%	20.90%	21.90%	21.50%	23.70%	23.10%	25.10%	22.90%	24.00%
4	Total length of expressways		Kilometer	-	-	-	-	-	323.6	587	666.36	587	587	589.62	589.62	589.62	589.62
B.	Road transport equipment																
5	Total number of registered road motor vehicles		Thousand	960	979	992	1,024	1,994	2,068	2,299	2,354	3,614	4,017	4,908	5,385	6,126	6,801.00
6	Number of registered passenger cars		Thousand	186	193	200	214	230	243	260	263	282	360	411	448	489	
7	Number of taxis or taxicabs		Thousand	38	39	38	38	28	27	28	28	41	56	75.7	90.2	97.3	113
8	Number of registered trucks		Thousand	53	54.5	55.4	56.9	58.5	60.3	64	67.2	70.6	110.7	168.9	238.7	295.8	
9	Total number of registered buses		Thousand	18	18	18.6	19.3	19.6	19.8	20.7	20.1	19.5	21	24	25.4	26.9	
10	Number of public buses		Thousand	15	15	16	17	29	25	28	25	23	24	83.1	29.2	32.5	33
11	Total number of registered motorcycles		Thousand	638	640	646	655	1,609	1,674	1,881	1,934	3,153	3,419	4,162	4,505	5,123	
C.	Road transport measurement																
12	Total number of road passengers		Thousand		38,885	40,257	40,657	1,631,886	1,166,358	1,294,129	1,232,993	1,084,808	1,038,918	1,459,119	1,030,094	1,023,288	1,079,318
13	Number of taxi passengers (million)		Million	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col
14	Number of public bus passengers		Thousand		38,885	40,257	40,657	1,647,623	1,150,006	1,303,175	1,238,726	1,056,338	1,015,241	1,810,697	1,146,070	1,062,596	1,558,890
15	Road passenger-kilometer		Million passenger-km		2,329	2,381	2,464	18,303	26,215	28,385	28,389	65,584	22,016	33,872	44,888	37,379	50,160
16	Total operational mileage of public buses		Million kilometer		18.4	18.5	18.9	20,794.40	7,756.50	3,759.40	3,137.70	2,859.30	3,898.80	10,219.20	16,221.60	30,194.10	31,296.30
17	Freight		Thousand ton		2,289	2,377	2,395	22,733	30,474	20,664	22,532	25,528	19,755	19,925	42,902	59,984	61,375
18	Freight-kilometer		Million ton-kilometer	393,597	421,198	448,693	478,848	1,128,224	2,320,487	2,206,485	2,897,187	3,854,383	3,505,256	4,520,082	4,529,167	6,044,536	962,743
D.	Others (enterprises, logistics & economic performance)																
19	Number of trucking companies		Company					638	527	546	729	800	801	797	809	809	830
20	Number of domestic forwarders		Company					644	716	734	906	849	865	844	855	858	880
21	Number of warehouse companies		Company	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col
22	Number of fixed route bus operators		Company					1,582	1,129	1,184	1,560	1,651	1,815	1,972	2,137	2,725	2,919
23	Total number of new driving licenses issued for automobiles		License	116,473	123,812	113,755	103,377	102,637	104,030	83,504	93,131	130,079	155,395	208,488	237,401	374,643	316,573
24	Total number of new licenses issued for motorcycles		License	261,635	156,727	167,569	121,418	297,913	224,319	158,151	129,228	186,444	232,830	330,672	265,567	892,478	391,368
25	Total domestic freight volume by road		Thousand tons					20,317	34,991	20,560	16,026	14,644	17,330	19,718	23,501	24,553	28,273
26	Total domestic freight movement by road		Million tons-km	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	
27	Total import cargo by road		Thousand ton					457	1,105	1,076	3,153	4,629	3,643	3,762	5,586	4,438	4,721
28	Total export cargo by road		Thousand ton	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	N/Col	
E.	Road traffic accident																
29	Number of traffic accidents		Case/ Count	5,905	5,755	6,778	6,939	7,204	8,461	9,020	10,123	11,675	13,912	14,997	15,859	17,384	18,171
30	Number of traffic accident casualties (dead)		Count	1,294	1,283	1,362	1,638	1,853	2,173	2,461	2,796	3,422	3,721	4,313	4,375	4,887	5,250
31	Number of traffic accident casualties (injuries)		Person	10,452	9,565	9,620	13,354	13,067	12,803	14,700	16,013	17,080	19,684	23,378	26,630	27,763	29,144

Source (AJTP, n.d.)

Appendix – VIII(a)



Appendix – VIII(b)



Global Status Report on Road Safety 2015 and 2018 by the World Health Organization (WHO)
https://www.who.int/violence_injury_prevention/road_safety_status/2015/en/
https://www.who.int/violence_injury_prevention/road_safety_status/2018/en/
Visit ESCAP Transport Division Website: www.unescap.org/our-work/transport

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Source : ESCAP-2017