Research Report 2009
Project No: A-08/ 001

ATRANS
ASIAN TRANSPORTATION RESEARCH SOCIETY

Behavioral Study of Local Three Wheel Motor vehicle Skylab and Sidecar in Urban Area of Khon Kaen Province

November 2009

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Research
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ASIAN TRANSPORTATION RESEARCH SOCIETY

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November, 2009

Printed in Thailand

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Title : **Behavioral Study of Local Three Wheel Motor vehicle Skylab and Sidecar in Urban Area of Khon Kaen Province**

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Funding: **Asia Transportation Research Society: ATRANS**

Abstract

Background: Road traffic accident are increasing to be the major cause of global population injuries and death both in urban and rural areas including local road and local vehicle.

Method: Survey research for behavioral study of local three wheel motor vehicle skylab and sidecar in Khon Kaen province Thailand. Participants were drivers 250 persons divided to Skylab 150 persons and Sidecar 150 persons and passengers who using skylab and sidecar 250 persons including. Government officer such as policeman transportation officer and academic expert. Data were collected by questionnaire and guideline interview. Data collection both quantitative and qualitative data. Content analysis for qualitative data and descriptive statistics for quantitative data were used for.

Research Results:
Cause of using Skylab & Sidecar was Large enough, easy to parking, not strictly from policeman, not expensive, suitable, convenient and could earn money.
Problem of using were traffic jam, illegal, limited location for service, no license non standard, motor pollution, loud and slowly.
Safety Behavior of Driver were most of driver use helmet, high speed, traffic rule respect, no license, no practice and no checking before driving.
Passenger's Satisfaction were found that convenient, comfortable, save, easy for using, fast, large, cheap, safety and high capacity transportation in the communities.
Policy formulation the government should concern about registration, legal, standard, queuing, surveillance and alleviation, license, insurance and driver training.

Keywords: Behavioral, Three Wheel Motor vehicle, Skylab, Sidecar Khon Kaen Province

Acknowledgements

This research was successfully completed with the kind assistance from everyone who joined this research.

I would like to express my deepest gratefulness to Dr.Tuenjai Fukuda, and Asst.Prof.Dr.Sittha Jaensirisak for their valuable advice and suggestions on this research.

I wish to thank drivers and passengers both Skylab and Sidecar motor vehicle owner who good respond and cooperation for this research.

Finally, I wish to thank Asian Transportation Research Society for kindly patronage and valuable academic support including budget as well as valuable assistant.

I extend my sincere gratitude to my colleague and ATRANS members, who gave me valuable guidance, consultation, mental support and help for this research.

Chulaporn Sota
(Project Leader)

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List of Abbreviations

DALYS..... Disability Adjusted Life Years
GDF..... The Global Drug Facility
GNP..... Gross National Product
MPH..... Ministry of Public Health
TDRI..... Thailand Development Research Institute
WHO..... World Health Organization

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CHAPTER 1 INTRODUCTION

1. Introduction

Accidents in developing countries are higher by 10 – 40 times than in developed countries. It can be said that traffic accident is serious problem for along time until right now. Although the government try to motivate and campaign especially in the important occasion. Traffic accident still outstanding problem and effect to the people both in urban and rural area.

Traffic accidents are a serious problem in Thailand in every province. This leads to Public Health, economic and social problems. The number of people are killed on road traffic accident each year approximately to 13,000 while the number of injured could be as 1 million In the years 2003 and 2004 there were 65,932 and 86,528 accidents, with 46,035 and 80,305 injuries as well as 11,252 and 13,836 deaths and increased died to 13,996 and injured 973,104 in 2006. (Ministry of Public Health, Thailand, 2006) Mostly impact group appear in labor 37.9% student 18.6-19.9% and other 15 %. In 2006 TDRI estimated economic lose about 106,994 -115, 337 million baht or 2-3% of GDP (MPH Thailand, 2007)

Traffic accidents have been the third cause of death since 1969 until now. The trend of traffic accidents is increasing rapidly. Although the Thai governor alert to implemented to tackle traffic problem.

Motorcycle is the most traffic accident cause and injured the people for along time including in the present also. Because motorcycle is low price, convenient using, furthermore the owner of motorcycle try to use motorcycle effectively by construct the tow beside motorcycle for carrying something and passengers in nearby their home town, such as in khon kaen province. We can see three wheel motor vehicle generally in urban area, although it's illegal vehicle.

Three wheel motor vehicle especially sidecar is a vehicle which conducted tow in the right or left side of motorcycle, 1 meter square , add fix other 1 wheel for carrying , almost of user are middle age people with their family or children, some for carry out goods from the market to their home and elsewhere. This vehicle is illegal and always risk to accident.

Skylab is one kind of three wheel vehicle like TUK TUK, but low quality and cheaper than TUK TUK. Which use for transport people mostly at districts for low income people conducting by industry but not enough quality for distant, it appropriate in rural area or not traffic jam especially in rural area.

Preliminary study by interview transportation officer and policeman (Chulaporn Sota, 2008) the transportation officer mentioned in "Thailand has no legal to support the three wheel motor vehicle. Three wheel motor vehicle are modifying vehicle. Mix part of motorcycle that made from the metal which under standard. It's come from illegal shops which open for the people who tend to make sidecar for their motorcycle. Sidecar which make for carry the stuffs, most for trading." In Thailand, we don't have three wheel motor vehicle patterns which are really designed from industry because it too high investing and expensive and the people cannot accesible. About the Three wheel motor vehicle register, they do by take the sidecar off when they come to transportation office for make registered. The transportation staffs don't even notice that this motorcycle is such a kind of three wheel motor vehicle already. Now we don't have any measurement that can prohibit some people to make sidecar for benefit. Only the police try to arrest the people who own or drive sidecar but can only do just a period of time. In spite of the police arrest them but no achievement. They try to break the law and had demonstration about arrested them last year. The people who using sidecar mentions please don't stop them because they earn some money from Three wheel motor vehicle. So now the police indulgent for them but seems to be cannot stop them anymore. About the accidents which occurred from three wheel motor vehicle also had sometime but every time the police recorded that accident only from general motorcycle. So we didn't have real clue to specific about this problem.

Nothing can guarantee about accident when the car hit in sidecar then people who sitting there die and cannot get insurance claim because of insurance cannot protect sidecar as a law.

Three wheel motor vehicle both skylab and sidecar become way of life of poor people. Some lead to cause of accident and no…concern from policy maker…and lack of research about Three wheel motor vehicle driving behavior both skylab and sidecar. Three wheel motor vehicle in this research focus both Local Three wheel motor vehicle so called Skylab usually transport in District area and sidecar so called rot motorcycle-puong usually transported in urban area.

Khon Kaen located in the Northeast of Thailand far 500 Km from Bangkok capital of Thailand. There are 26 districts. There are various transportation in Khon Kaen such as airplane, train, bus, three wheel motorcycle such as Tuk tuk, sidecar, skylab, motorcycle, bicycle thee wheel without motor.

However three wheel vehicle sidecars are popular in low income people, for transfer well and some transport for poor people in urban area in the city. Meanwhile skylab is most popular in district for transport the people and transfer goods among poor people also. But the research or study about these vehicles is seldom.

Researchers are concerned about this problem so would like to study for further improvement quality of life of the peoples.

1.1 Statement of Problem

Accidents in developing countries are higher by 10 – 40 times than in developed countries. The number of people are killed on road traffic accident each year approximately to 13,000 while the number of injured could be as 1 million In the years 2003 and 2004 there were 65,932 and 86,528 accidents, with 46,035 and 80,305 injuries as well as 11,252 and 13,836 deaths and increased died to 13,996 and injured 973,104 in 2006. (Ministry of Public Health, Thailand,2006)

1.2 Research Question

How should Behavioral Study of Local Three Wheel Motor vehicle Skylab and Sidecar in Urban Area of Khon Kaen Province be implemented?

1.3 Research Objectives

1. Study causes of Using Three wheel Vehicle both Skylab and sidecar in Urban Area Khon Kaen.
2. Study problems of Using Three wheel Vehicle both Skylab and sidecar in Urban Area Khon Kaen
3. Study safety behaviors of Three wheel Vehicle both Skylab and sidecar drivers.
4. Study Three wheel Vehicle Policy formulation guideline both Skylab and sidecar.
5. Study passenger's satisfaction

1.4 Limitation

Study in 1 in urban area in Khon Kaen provinces in the Northeast of Thailand for Sidecar and 3 Districts for skylab such as Ban phang district, Kuasuan kuang district and Namphong district.

1.5 Research Usefulness

1. Know cause of Three Wheel Vehicle both Skylab and sidecar using
2. Know problem and need assessment of Three Wheel Vehicle both Skylab and sidecar.
3. Know safety behavior of Three Wheel Vehicle driving both Skylab and sidecar.
4. Know guideline for Three wheel Vehicle Policy formulation both Skylab and sidecar.
5. Know satisfaction of passenger.

1.6 Definition of Terms

Three Wheel Vehicle means Both Local Three Wheel Motor Vehicle such as Skylab and sidecar.

Skylab is the three wheel vehicle like Tuk Tuk but lower standard than Tuk Tuk using for transportation the peoples.

Sidecar or Rot motorcycle Puong. Is the three wheel vehicle construct the tow in the right side of motorcycle.

2. Literature Review

Three wheel vehicles study by interview transportation officer and policeman (Chulaporn Sota, 2008) the transportation officer mentioned in "Thailand has no legal to support the three wheel motor vehicle. Three wheel motor vehicle are modifying vehicle. Tow is a part of motorcycle that made from the metal which under standard. Tow come from illegal shop which open for the people who tend to make tow for their motorcycle. Tow motorcycles which make for carry the stuffs, most for trading." In Thailand, we don't have three wheel motor vehicle patterns which are really designed from industry because of high investing and the people who gain money day by day also cannot support for this. About the Three wheel motor vehicle register, they do by take the tow off when they come to transportation office for make registered. The transportation staffs don't even notice that this motorcycle is such a kind of three wheel motor vehicle already. Now we don't have any measurement that can prohibit some people to make tow for benefit. Only the police try to arrest the people who own or drive tow motorcycle but can only do just a period of time. In spite of the police arrest them but no achievement. They try to break the law and had demonstration about arrested them last year. The people who using tow motorcycle mentions please don't stop them because they earn some money from Three wheel motor vehicle. So now the police indulgent for them but seems to be cannot stop them anymore. About the accidents which occurred from Three wheel motor vehicle also had sometime but every time the police recorded that accident only from general motorcycle. So we didn't have real clue to specific about this problem.

Nothing can guarantee about accident when the car hit in tow area then people who sitting there die and cannot get insurance claim because of insurance cannot protect tow area as a law.

Three wheel motor vehicle become way of life of poor people who earn money day by day. Some lead to cause of accident and no…concern from policy maker…and lack of research about Three wheel motor vehicle driving behavior.

Three wheel motor vehicle in this research focus both Local Three wheel motor vehicle so called Skylab usually transport in District area and sidecar so called rot motorcycle-puong usually transported in urban area.

Table 1-1 shows the road accident statistics on Thailand National Highways in the year 2005 reported by the Bureau of Highway Safety, Department of Highways. Out of 16,267 cases in total, a sum of 7,219 cases or 44% are recorded as roadside hazard accidents (categorizes as "vehicle hit fixed objects" and "turnover/runoff"), and have caused 703 deaths. This figure accounts to about one-third of the total fatalities caused by all types of accidents.

Accident Type	Number of Accident	Severity		
		Fatality	Serious	Slight
Pedestrian accident	309	94	64	174
Bicycle accident	97	23	27	50
Motorcycle vs Motorcycle	740	47	226	729
Motorcycle vs Car	3,223	529	914	1,679
Car vs Car	3,280	307	623	1,598
Fixed Object Accident	4,287	272	722	1,958
Turnover/Runoff Accident	1,550	314	627	1,614
Other	169	19	26	103
Total	13,655	1,605	3,226	7,906

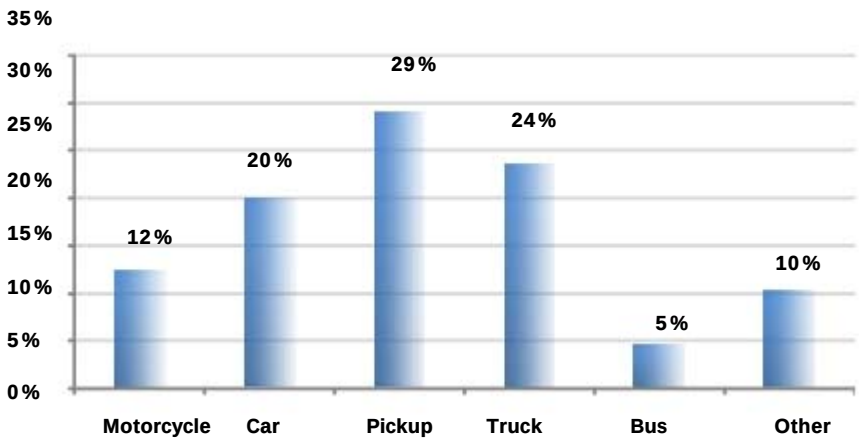
Source: Bureau of Highway Safety, Department of Highways

Based on the international and national statistics shown above, it is highly recommended by the Department of Highways and the World Bank that Thailand Accident Research Center should conduct a research on roadside hazards towards creating a forgiving highway system. This project is hence a realization of the recommendation.

Type of Vehicle

This study classifies the vehicles by different types which are motorcycles, passenger cars, pickups, trucks, and buses. Figure 3-9 shows the proportion of roadside accidents by type of vehicle and indicates that pickups have the highest proportion (29%) compared to other vehicle types. This finding could be explained by the purpose of use of the pickups. Mainly pickups are used for freight carriage and are modified to carry higher-than-standard loads, causing difficulties for controlling the vehicles at high speeds. Therefore, pickups have more chances to leave the roadway and hit the roadside furniture compared to other types of vehicles.

Figure 1: The Proportion of Roadside Accidents by Type of Vehicle



The purpose of the speed-injury curves is to estimate the probability of fatal or serious injury in an

accident at different impact speeds for different impact types. These will be compared with those curves produced by Wramborg (2005), which are shown in Figures 2 and 3 These show the probability of fatality for a car occupant in a front impact and a car occupant in a side impact.

Figure 2: Probability of car driver/passenger fatality by head-on collision (Wramborg,2005)

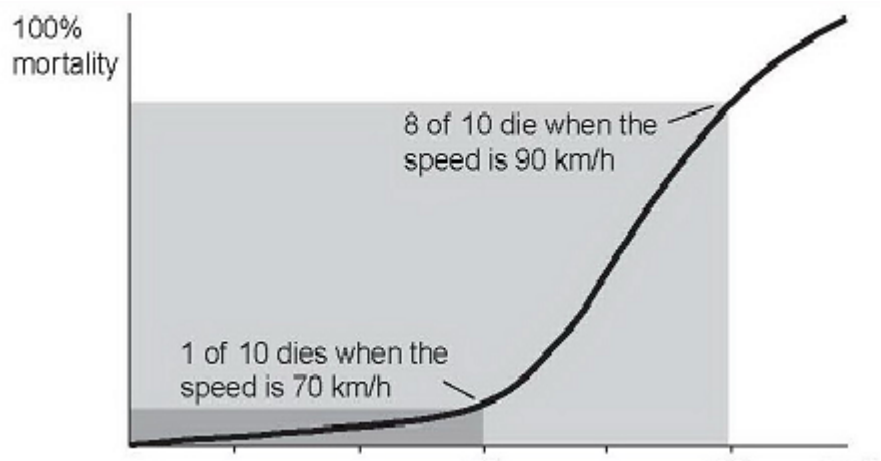
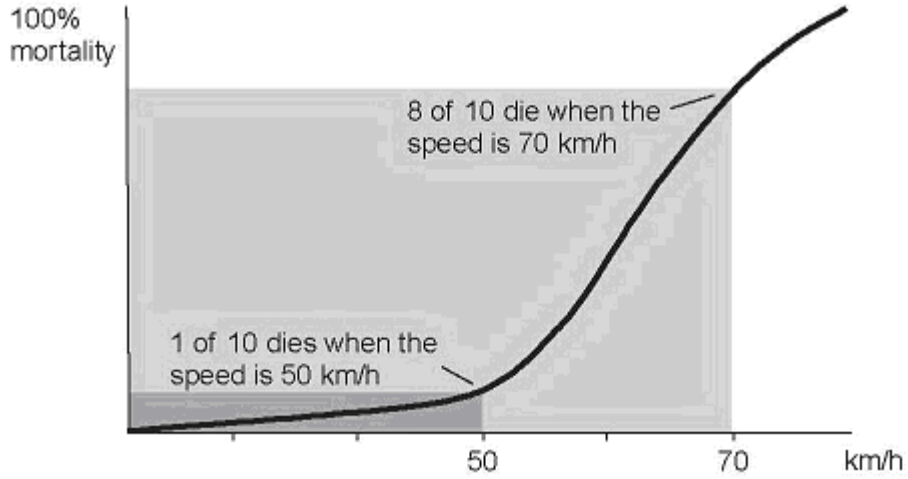
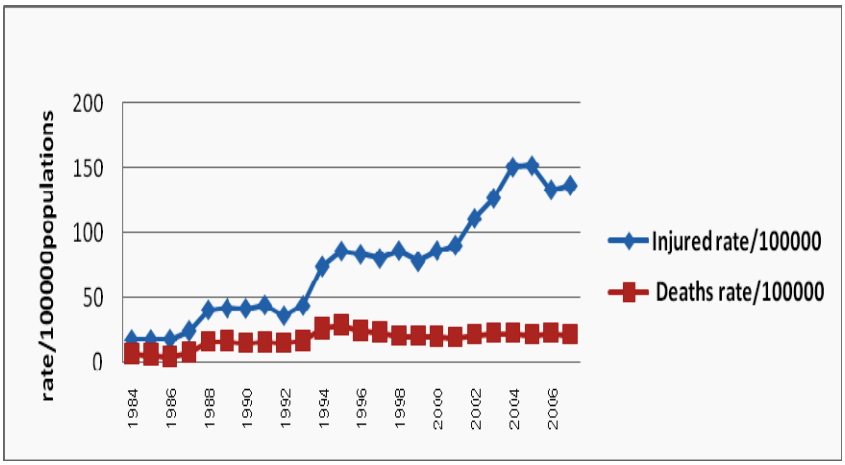


Figure 3: Probability of car driver/passenger fatality by side impact collision (Wramborg, 2005)



Road traffic accidents are a serious problem in Thailand and worldwide. Since 1984 the situation of road traffic accidents has increased from 18,344 cases to 124,530 cases in 2007.The rate of fatalities from road traffic accidents increased from 5.71/100,000 in 1984 to 22.27/ 100,000 in 2006, and the injuries rate from 17.14/100,000 to 136.3/ 100,000 in 2007. Since 1994, more than 12,000 Thai people died from road traffic accidents, and more than 43,000 people were injured. The details annually are as shown in figures 2 and 3

Figure 4 Trend of fatality rate and mortality rate from road traffic accidents in Thailand, 1984-2006



Source: Thailand Health profile, 2007

When all three groups of accident are examined according to time of day and day of the week on which they occur, the following patterns are revealed (Figures 4 and 5).

Figure 5: Frequency of three types of motorcycle accident by time of day.

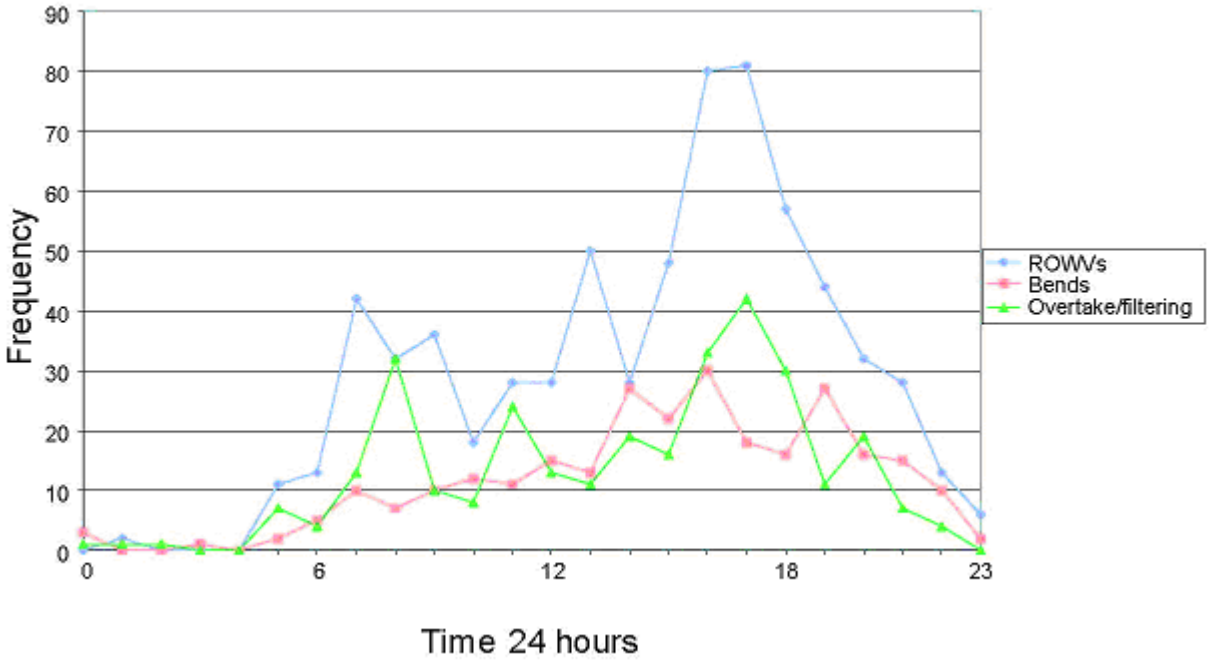
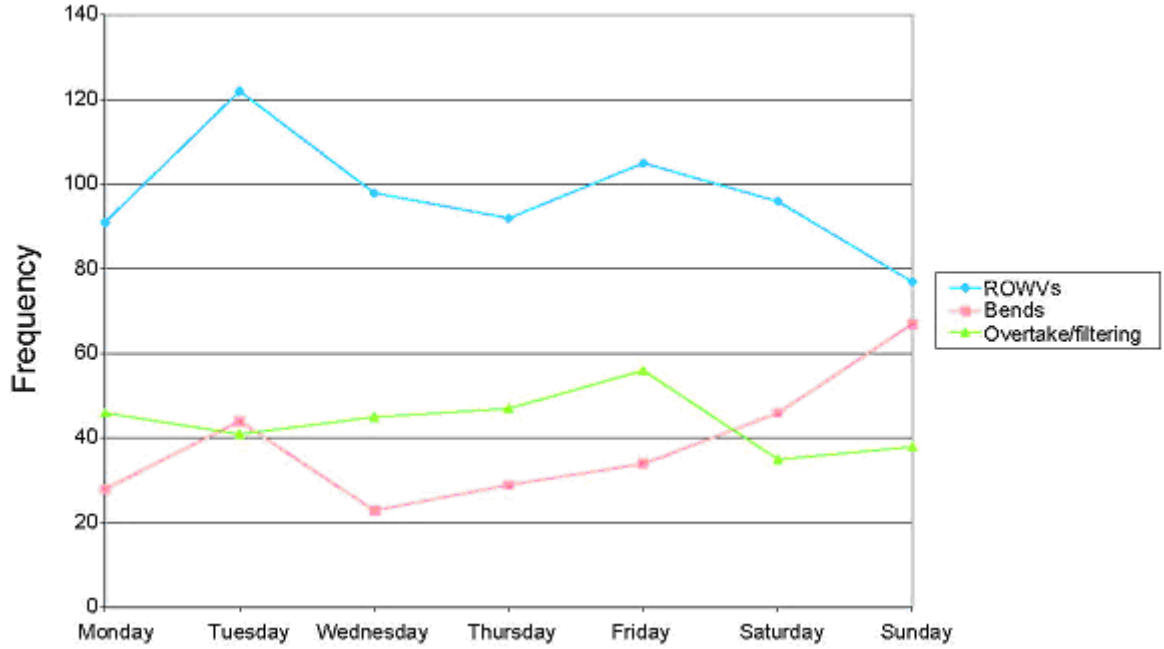
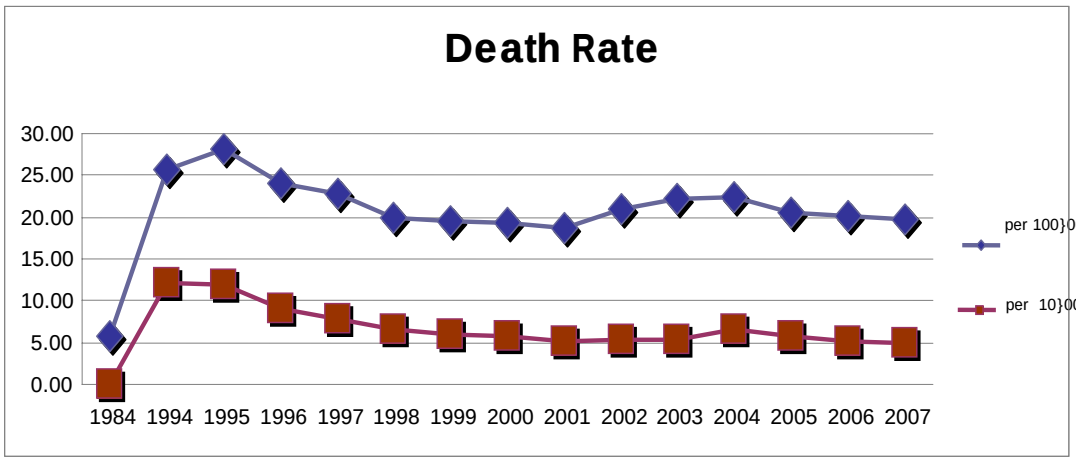


Figure 6: Frequency of three types of motorcycle accident by day of week.



It can be seen in Figure 6 that, while ROWVand overtake/filtering accidents cluster around times of peak traffic flow in the early morning and late afternoon, bend accidents show peaks in the afternoon and early evening. This suggests that these accidents might be associated more with 'recreational' riding than the other two types. This assertion is also backed up by the peak in bend accident frequency on Sundays shown in Figure 6, and the fact that, of cases where the purpose of the rider's journey is known, bend accidents show the highest percentage of riding for pleasure rather than for work/commuting/other purposes. However, it is important to remember that the figures above take no account of the level of motorcyclists' exposure at different times, or on different days, so these findings must be treated with some caution

Figure 7 Trend in the number of accident fatalities per 100,000 population and per 10,000 vehicles during 1994-2007



Source: Department of Highways 2007 Ref.PichaiTaneerananon(2008)

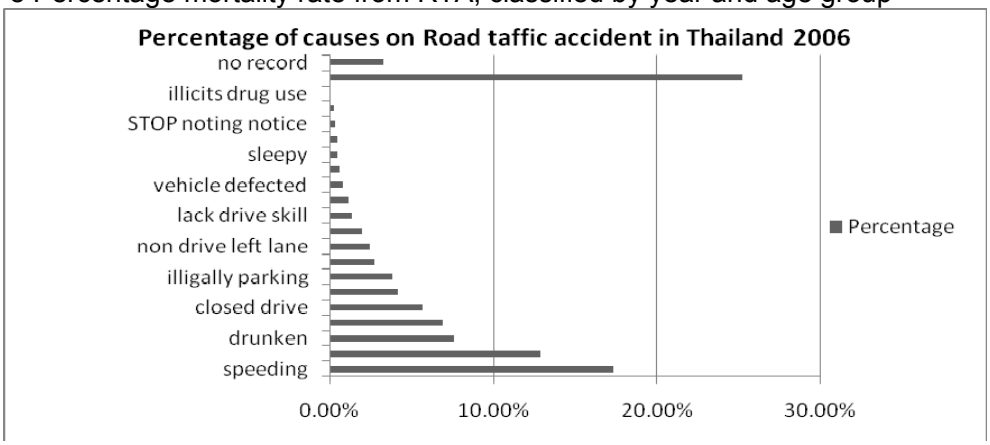
Statistical analysis of the causes of road traffic accidents by cumulative cases in Thailand, from 1984-2006. There occurred 1,755,624 cases, with 1,094,933 injuries, and 241,077 deaths. The causalities occurred because of human error (about 69.6%), environmental error (0.6%), vehicle error (1.2%), others (25.3%), and unknown causes (3.3%) (Minister of Public Health, Thailand, 2007).

When Analyzing factors related to road traffic accidents in Thailand from 1984-2006, speeding is the major cause of road traffic accidents at about 17.35%, suddenly passing other

vehicles at 12.94%, drunk driving at 7.64%, illegal interference at 6.93%, close driving at 5.73%, disregarding traffic lights at 4.18%, illegally parking at 3.82%, disregarding stop signs at 2.73%, no driving on the left 2.45%, driving in the wrong lane at 1.99%, lacking driving skill at 1.38%, aggressive driving at 1.2%, unknown causes at 25.27%, and others less than 1%.

From the three age groups analyzed, the age group 15-29 years-old is the most impacted. Between 1996- 2006 road traffic accidents occurring in this group were 38.9-47.9%, in age group 30-44 years-old were 24.8-29.4%, and more than 45 years-old were 18.3-27.6%. Details are shown in Figure 8.

Figure 8 Percentage mortality rate from RTA, classified by year and age group



Source: Thailand Health Profile, 2007

2.1 Previous Studies

Luchemos Por La Vida, and Mara Cristina Isoba (2007) studied why traffic as a system is an important conceptual contribution to road safety teaching.

Everybody who goes out on the street, regardless of their destination, shares the common activity of moving from one place to another. Each one depends on others to fulfill his or her goal. Individual conduct conditions and influences other people, and vice versa. Each road user is responsible for a part of traffic.

Despite the fact that the safety of this system also depends on other elements that are part of it: clear and effective rules; adequate maintenance of the road and good signs; and on the vehicles that run within it, it is people, road users (pedestrians and drivers) who, at each moment and each place, finally give shape to and define traffic characteristics with their behavior.

The purpose of this paper was to introduce new content in the subject of road safety education in schools: to develop a systematic concept of traffic, as explicit, basic and introductory content, and as the main subject around which different approaches to teaching safety and road safety will revolve, in order for these educational processes to be successful and result in safe and responsible **attitudes and behaviors on the part of students, in their behavior on the road** and the role they play in the creation of a healthier social and living environment.

Kim Pagna, Matthew Ericson and Seang Monith (2007) studied road traffic accidents and Cambodian university student with a case study in Phnom Penh municipality.

In early 2006, the Coalition for Road Safety (CRY) undertook a survey of five hundred Phnom Penh university students to ascertain their road safety attitudes and behaviour. At the time the survey was planned, it was recognised that more than ninety per cent of road traffic injuries (RTIs) were caused by human factors, particularly excessive speed, drink driving and not obeying traffic rules, with people aged between 15 and 24 being overly represented in RTI data. The survey of Phnom Penh university students was essentially undertaken because of the students' over-representation in RTI data. This survey was the first research to be conducted on the topic of road safety amongst Cambodia's students.

The terms of reference included generating recommendations and strategies on how to

effectively reduce road accidents amongst the students. This paper reports the survey results and concludes how these results were used to form road safety policies. The results of this survey have found their way into practice by a variety of stakeholders' strategies and programs which have been formed by the survey results. While the results confirmed some perceptions and challenged others, they have been most useful in forming project planning amongst stakeholders.

Mariela Hernandez-Sanchez, Francisco Valdés-Lazo, and Ren García Roche repeated on the Preparation of specialists from different community sectors related to road traffic injuries prevention in Cuba, 2004-2006.

Road traffic injuries constitute a worldwide health problem because they are an important cause of mortality, morbidity, sequels, human suffering, years of potential life lost and economic costs. In Cuba, road traffic injuries comprise the fifth cause of general mortality and the first of mortality from 1 to 34 years of age. It is precisely the need to increase the preparation of specialists from different community sectors and disciplines that pave the way to this work, because their appropriate preparation is an important support to increase the knowledge in other people for preventing injuries. The intervention study was carried out with 155 specialists from different community sectors and disciplines (health, education, jurists, mass organizations, traffic police and others), through 6 regional courses for the different provinces in the country. The knowledge that the participants had on road traffic injuries and the activities they had prepared to prevent them in the communities were measured with an initial questionnaire designed to this purpose. After that, a training plan was imparted and at the end, knowledge was measured again to observe its variation. The indicators were percentages, average and standard deviation. The participants stated that for road traffic injuries prevention they carried out bigger number of educational activities during meetings with the community, followed by patient's consultations and home visits. At the beginning, 76.1 % of the participants considered themselves ready to prevent road traffic injuries (78.6 % among medical doctors, 83.7 among nurses and 58.6 % among other professions).

Every year 1.2 million people are killed and up to 50 million are injured and disabled as a result of road traffic crashes. Around the world, nearly 16,000 people die every day as a result of injuries. According to the World Health Report 1999 Database (WHO 1999), road traffic injuries are the leading cause of injury- related deaths for all ages worldwide. Nearly three-quarters of road deaths occur in low and middle-income countries (Odero 1997), and account for about 85% of the deaths and for about 90% of the annual disability adjusted life years (DALYS) lost because of road traffic injury.(WHO,2004) In high-income countries, The situation projection show that between 2000 and 2020 road traffic deaths will decline by about 30% in high-income countries but it increase substantially in low-income countries. Without appropriate action, by 2020, road traffic accident injuries are predicted to be the third leading contributor to global burden of disease and injuries. (WHO, 2004)

Everyone killed, injured or disabled by road traffic accident, whole has a network deeply impacted of others, including family, their friend and social. Globally million of people are coping with the deaths and disabilities from road traffic accidents. It would be impossible to attach a value in each case of human sacrifice and suffering. The economic cost of road traffic accidents and injuries is estimated to be 1% of gross national product (GNP) in low income countries, 1.5% i\n middle income countries and 2% in high income countries The global cost is estimated to be 518 US dollars per years. In low income countries for 65 US dollars, it more than they receive in development assistance (Jacoe et al, 2000)

In Thailand, the situation of road traffic accident is increasing and can be categorized by the time period. Form the Period time before 1986: Economic Recession. The number of accidents was not so high during this period, there were about 18,000 - 25,000 accidents with about 2,000-4,000 deaths or a mortality rate of 3.9-5.7 per 100,000 population. And there were approximately 8,000-9,000 injury cases each year, or an injury rate of 17.2 per 100,000 population. The period as follows after 1986, when economic Recovery, the situation of road traffic accident is increase. The prevalence from 17.5 per 100,000 populations in 1987 was increased to **110.8 per 100,000 populations in 2002**. Exactly the mortality rate from the causes of road traffic accident as followed as road traffic accident incident from 7.4 per 100,000 population in 1987 up to 20.97 per 100,000 population in 2002. It was found that those who died from accidents were mostly in

the working-age group, (15-34 years old), the number for males being four or five times greater than for females.
This kind of situation caused a direct loss of property worth 1,494.9 million baht in 2002. But actually there are other incalculable losses including life losses, medical expenses, disabilities, etc. According to the 2000 study on economic losses from road traffic accidents, conducted by the Thailand Development Research Institute (TDRI), the economic loss is as high as 115,337 million baht or 2.3% of the gross domestic products. (4,923,263 million baht).

Road safety is no accident. Over a million people are killed each year on the world's roadways: over3,000 die each day, and tens of millions more are injured. Road traffic related crashes impose an enormous public health burden global In 2000, road traffic injuries were the ninth leading cause of disability-adjusted –life years lost worldwide and are projected to become third by 2020. The World Health Organization (WHO) is taking a bold step forward by addressing road traffic injuries as a preventable global health problem. (Peden et all, 2001 and Holder, et al, 2004)

The first National Socio-Economic Development plan of Thailand was established in 1961. This caused Thailand to develop rapidly in all aspects, such as transportation, industry, agriculture, etc. The government however had no national accident prevention plan, so more development produced more traffic accidents and thus patients. Therefore we could say that the traffic accident is a disease that is caused by an increase in development from 1969 up to now. Traffic accidents are a major cause of death and the trend increases rapidly every year. Most deaths occur in youths with about 20,000 cases per year. (Vichit Booryahotara, 1993).

Traffic accidents are a serious problem in Thailand in every province. This leads to Public Health, economic and social problems. In the years 2003 and 2004 there were 65,932 and 86,528 accidents, with 46,035 and 80,305 injuries as well as 11,252 and 13,836 deaths. Traffic accidents have been the third cause of death since 1969 until now. The trend of traffic accidents is increasing rapidly. Although the Thai governor alert to implemented to tackle traffic problem.

Bureau of epidemiology, Division of disease control, Minister of Public Health (2007), classified cases by type of road occurred, The TOA's and village road were the most places of road traffic accident, occurred about 36%, occurred in high way 17%, rural high way 16%, municipal road 13%, and others road 8%. These situations related trends of motorcycle accident (Bureau of epidemiology, Division of disease control, Minister of Public Health, 2007).

Albert Kircher and Anna Anund. VEHICLE TO VEHICLE COMMUNICATION HOW TO PREPARE DRIVERS FOR DANGEROUS SITUATIONS. 14th international Conference Road Safety on Four Continents. Bangkok, Thailand, 14-16 November 2007 at Nai Lert Park Hotel in Bangkok, Thailand.

Situations where drivers pass a bus stopped to load or unload passengers near the road are known to be hazardous, as the number of fatalities each year confirm. ITS based on vehicle to vehicle communication have the potential to improve traffic safety in such situations as drivers are warned in advance for the danger lying ahead and therefore have time to prepare and react. A driving simulator study was conducted to evaluate drivers' reaction in a bus passing situation where they received a warning in advance. The results were very promising: speed when passing the bus was reduced significantly, and drivers prepared for possible emergency maneuvers well in advance. The study suggests that adoption of ITS systems to warn drivers could lead to decreased number of accidents in bus-passing situations.

Jaruwit Prabnasak and Michael A P Taylor. A Critical Review of Travel Demand Studies in Motorcycle Dominant Environments on The 5th National Transport Conference on 19th December 2008 at Rama Garden Hotel Bangkok, Thailand.

Massive use of motorcycle is a signature of Eastern-Asia developing countries. This is may be termed a *motorcycle dominant environment.* Although the use of motorcycles is likely to provide many benefits to the riders, it also produces many serious transport issues for the community. To find out the solution, an understanding of traveler behaviour is necessary. *Travel demand modeling* then becomes a useful tool. It is used to capture the behaviours contributing the travel demands, and also to predict expected results of each solution.

This paper reviews previous studies on travel demand modeling in motorcycle dominant environments, and discusses the findings. Results of the discussion have shown that there are still large gaps, arguments and doubts found from those previous studies, especially a lack of

knowledge about *medium-sized urban areas.* This can be the inspiration for a new research, as described briefly in the last section of the paper.

Telsuhiro Ishizaka and Atsushi Fukuda. Development of Motorcycle Simulation Model under Mixed Traffic flow on The 5th National Transport Conference on 19th December 2008 at Rama Garden Hotel Bangkok, Thailand.

Since motorcycle is convenient and economy transport mode, it becomes more and more popular and is one of an important urban transportation mode in most of Asian cities. However, most of among other vehicles. These umpteen traffic accidents by motorcycle in Thailand often occur because of this phenomenon. To reduce such driving behavior and make traffic flow smooth, many counter measures such as introducing motorcycle exclusive lane, motorcycle pocket at an intersection, etc. have before introducing them because there is no available tool to evaluate them.

Micro traffic simulation model can simulate a vehicle moving based on lane. But there is no simulation model which can simulate motorcycle running pattern disregarding traffic lane. Therefore, this study aims to develop the micro traffic simulation model which can simulate the mixed traffic flow including motorcycle and passenger cars.

Firstly, the authors summarized problems and condition to simulate motorcycle running behavior and proposed an idea of traffic simulation model which could simulate the mixed traffic flow including motorcycle and passenger cars. To simulate specified motorcycle running pattern such as lane-non-oriented running of motorcycle, this model employs the concept of potential between vehicles means ease of running by motorcycle on road section and is shown by depth among vehicles. To decide exponential curve drawn from vehicle edges. This motorcycle and other vehicle decide its direction on minimum potential (depth), speed also is calculated by slope of potential.

The verification of this model is conducted by simulate traffic flow of specified road in Bangkok and Chiang Mai. This study compared the traffic volume with current situation and simulation result. As a result of verification, this model is possible to simulate real traffic flow and specified motorcycle running pattern.

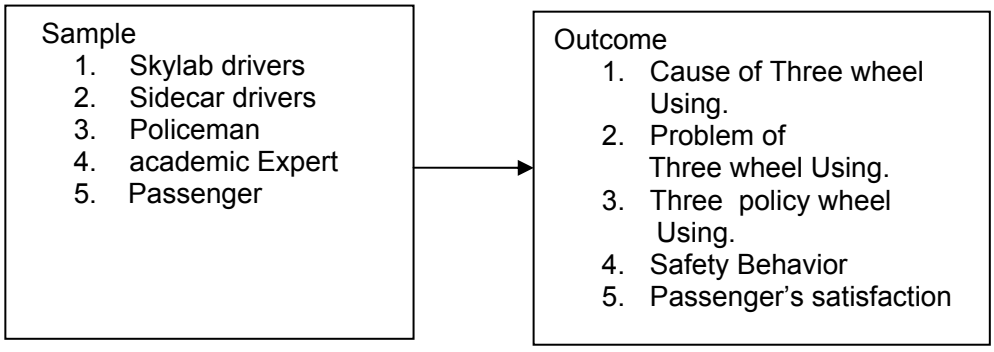
Tippayanate N., Chadbunchachai W. and Chareonkiate D. GIS Based Traffic Accident Study in Khon Kaen Municipality 2002 – 2006 on The 5th National Transport Conference on 19th December 2008 at Rama Garden Hotel Bangkok, Thailand.

In Thailand, road traffic accidents cause more than 14,000 deaths annually. Human factors were the major contributor for most traffic accident. In order to prevent such losses, the concise information set for decision-making traffic planners and road safety administrator has to be done.

This paper detailed some of the findings of an Injury Surveillance system, coupled with a GIS based information system for analyzing causes of road traffic accident in Khon Kaen numicipality. Four major types of analysis were developed, 1) factors contributing to traffic accident, 2) trend of hazardous intersection, 3) trend of hazardous road section, 4) comparison of traffic accidents on arterial and collector.

We included the importance of local conditions and human error, and the multidisciplinary approached for the 5 E strategies (Engineering, Enforcement, Education, EMS and Empoerement)

2.2 Conceptual frame work



CHAPTER 3 METHODOLOGY

3. Methodology

3.1 Research Design

The study design was descriptive study design and will be study both quantitative method by 1) Quantitative study

1.1) Population and sample

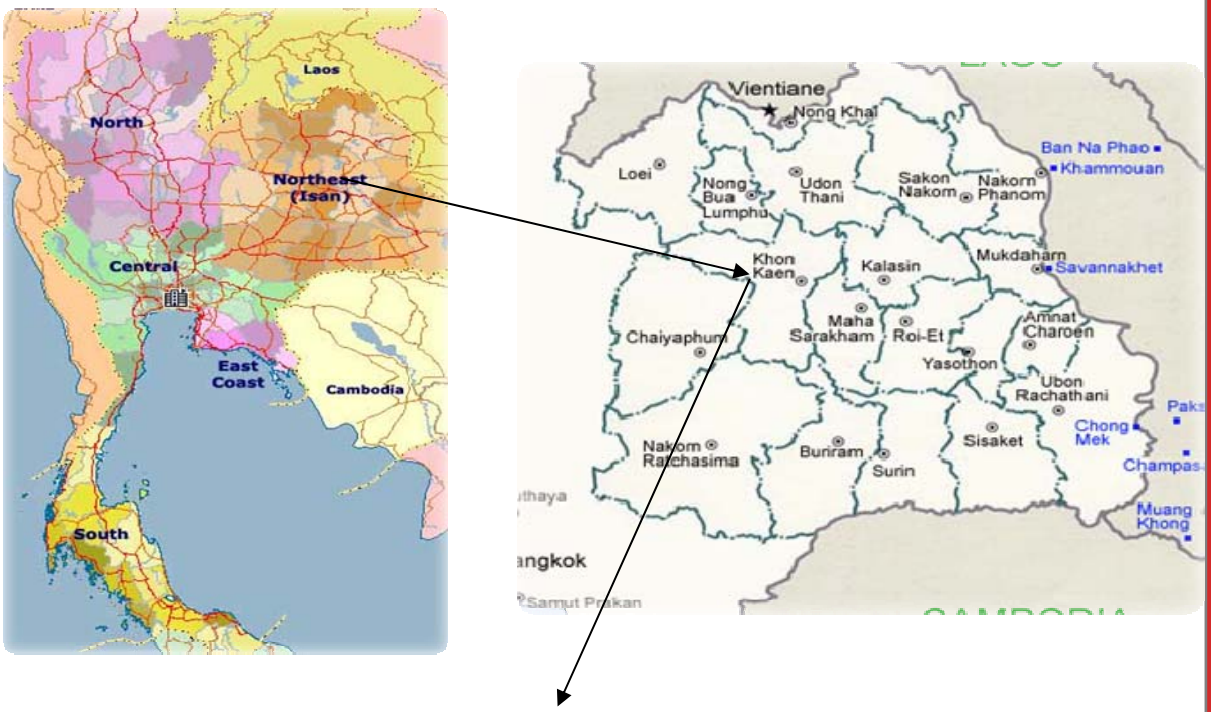
(1) Population

The populations in this study were three wheel Motorcycle Vehicle Drivers, and administrators including passenger in Khon Kaen Province Thailand.

(2) Setting study area

Muang District for Sidecar KuasuanKuang District, Ban Phi Distict and Namphong district for Skylab, Khon Kaen Province., Thailand questionnaire and qualitative method by In-depth interview and Focus group discussion.

Figure 9 Study setting areas.



(3) Sample and sampling size calculation

3.1.1 Sampling setting and method

1. The study samples were consist of 125 Sidecars and 125 Skylab driving so total is 250 cases drivers and 250 passengers

Sample size (Infinite Population)

$$n = \frac{Z2pq}{d2}$$

Meaning

n = sample size

Z =statistical value under standard normal curve =1.96

P = Anticipated population proportion(80%)

Q = p-1

d =precision of estimate =0.07

$$n = \frac{(1.96)2\ (0.8)(0.2)}{(0.07)2}$$

$$= 125.77$$

Samples = 125 cases each skylab and sidecar

Therefore the Total is 258 cases

Sidecar Passenger 250 Persons, Skylab passenger 250.

Total 758 Participants

2. Administrator: Policeman, Transportation, academic expert 10-15 persons.

3.1.2 Data collection

(1) Instruments

The variables of this study will collect by structural questionnaires which answer the aims of the study by literatures reviews. The questionnaires consist of 5 sections such as 1).personal data, 2.) Cause of Using three wheel motor vehicle 3.) Problem of Using three wheel motor vehicle 4). Traffic accident prevention behavior of drivers. 5.) Policy guideline for three wheel motor vehicle

(2) Standardize properties of questionnaires

(a) Content validity; the content validity will check by sending questionnaires to unless than 3 road traffic accident experts to consideration in content validity, suggestion, and recommendation, after that the researcher will improve as followed suggestions for correctly and completely. .

(3) Data collection method

(a) Coordinating with administrator and Three Wheel Motor Vehicle Driver and passenger then interviews and qualitative data collection.

(b) Data; will collect by researchers team, the initially processes by explaining the study purposes, research procedure, and opening opportunity for asking questions.

(c) The researcher team establishes a relationship with participants by introduction themselves, explaining about the study as following

(1) To protect the human rights of an individual participant, each participants were asked for consent and received an explanation about the purposes of the study, assurance to confident in anonymous, benefits, risks, future implications of the future research and could be right to withdraw from the study at every time, the time for completing the questionnaire about 30 minutes for each asked participant.

(2) After the participants agree to participate in this study, the research team asks the participants to sign in a consent form, then the researcher assistants interview by face-to-face on the structured questionnaire.

(g) After completing data collection, the research assistants' check all items in the questionnaire completely, if not, the participants will be asked to fulfill again.

(h) Checking a completely of questionnaires, compile and analysis the data by the author.

3.1.3 Data management and analysis

Quantitative data

The data will be recorded into the computer base on double data entry procedure by researcher's assistants using program STATA. The analyses will be taken place in order, starting from descriptive statistic for percentage, standard deviation, arithematic mean.

Tools for qualitative methods Qualitative data.

1) In-depth interview target samples about policy implication and recommendation for Thee wheel Motor Vehicle with administrators in Khon Kaen Province.

3.1.4 Data analysis

- Quantitative data using frequency distribution, percentage, mean standard deviation.
- Qualitative data used content analysis

4. Results

The results of this study were based on the responses of 258 drivers and 250 passenger. The results are presented as follows.

1. General Characteristics of Skylab and Sidecar's drivers
   (1) Demography of characteristics of Skylab's drivers and Sidecar's drivers
   (2) Demography of evolution of three wheel vehicles
   (3) Demography of using three wheel vehicles
   (4) Demography of the problem of using cars
   (5) Demography of safety behavior of using cars
   (6) Demography of opinion to improving both of cars
2. General Characteristics of Skylab's passenger and Sidecar passenger
   (1) Demography of characteristics of Sidecar's passengers
   (2) Demography of degree of satisfaction in Sidecar's passengers
   (3) Demography of characteristics of Skylab's passengers
   (4) Demography of degree of satisfaction in Skylab's passengers

4.1 General Characteristics of Skylab's drivers and Sidecar's driver

4.1.1 General Characteristics of Skylab's drivers and Sidecar's driver in communities

The total sample consisted of 258 drivers. Skylab's drivers of 130 person and Sidecar's drivers of 128 person. Most of them had age of 41 – 45 years (20.54%), were male and were owner house (86.82%). Education was primary school and Junior high school at 151 and 19.38%, 90.70% were married, Income per month was less than 5,000 baht, Duration of using a car was less than 5 years (38.37%), satisfaction in a car was high satisfaction (73.64%), and attention to using a car was Use continue at 251. The details are shown in Table 1.

Table 1 Number and Percentage of Personal Data (n=258)

Socio-demographic characteristics	No (n=50)	Percentage
1. Type of car		
Side car	130	50.39
Skylab	128	49.61
2. Age		
Less than 15 Years	1	0.39
15 – 20 Years	4	1.55
21 – 25 Years	7	2.71
26 – 30 Years	17	6.59
31 – 35 Years	42	16.28
36 – 40 Years	37	14.34
41 – 45 Years	53	20.54
46 – 50 Years	44	17.05
51 – 56 Years	31	12.02
57 – 60 Years	11	4.26
More than 60 Years	11	4.26
3. Address		
Owner	224	86.82
Rent house	24	9.30
Other	10	3.88
4. Education		
Primary school	151	58.53
Junior high school	50	19.38
High school	32	12.40
Vocational certificate	16	6.20

Socio-demographic characteristics	No (n=50)	Percentage
High vocational certificate	4	1.55
Bachelor's degree	2	0.78
other	3	1.16
5. Marital Status		
Single	20	7.75
Married	234	90.70
Divorce	4	1.55
6. Income per month		
Less than 5,000 Baht	123	47.67
5,001 – 10,000 Baht	84	32.56
10,001 – 15,000 Baht	46	17.83
15,001 – 20,000 Baht	3	1.16
20,001 – 25,000 Baht	2	0.78
7. Duration of using three wheel vehicle		
Less than 5 years	99	38.37
6 – 10 years	81	31.40
11 – 15 years	56	21.71
16 – 20 years	11	4.26
More than 20 years	11	4.26
8. Satisfaction of three wheel vehicle		
High satisfaction	190	73.64
Moderate Satisfaction	68	26.36
9. Attention to using three wheel vehicle		
Use continue	251	97.29
No use anymore	7	2.71

4.1.2 Evolution of three wheel vehicles

The total sample consisted of 258 drivers. The price of the cars was 24,001 – 46,000 Baht, Price of construct the tow was 6,751 baht up, and how many three wheel vehicle was used was the first (70.93%) (Table 2)

Table 2 Number and Percentage of evolution of three wheel vehicle

Items	Number	Percentage
1. Price of the car		
Less than or equivalent 24,000 Baht	85	32.95
24,001 – 46,000 Baht	91	35.27
46,001 – 68,000 Baht	58	22.48
68,001 up	24	9.30
Max –Min = 90000 - 2000		
$\overline{X} \pm$ SD = 34819.44 ± 20637.42		
2. Price for construct the tow		
Less than 2,250 Baht	28	10.85
2,251 – 4,500 Baht	69	26.74
4,501 – 6,750 Baht	19	7.36
6,751 up	142	55.04
Max – Min = 9000 - 0		
$\overline{X} \pm$ SD = 3484.27 ± 1776.16		
3. How many three wheel vehicle was used		
The first	183	70.93
The second	58	22.48
The third	10	3.88
The fourth	2	0.78
The fifth	5	1.94

4.1.3 Using three wheel vehicles

The purpose of using three wheel vehicles was private using at 146 person (56.59%), the type of goods was others at 43 (16.67%), Skylab for transport the people anywhere was others at 36 (13.95%), Useful for family of skylab's drivers (sample 42 persons) and sidecar's drivers (sample 173 persons) was income less than 500 baht, at 38 and 156, Income enough as purchase or invest was enough (77.64%), this car increasing convenient was yes (92.64%), how long and long time for using this car per day was only day (73.26%) and less than 6.5 hours (55.81%) and mainly using car was use car only for occupation at 140 (54.27%). (Table 3)

Table 3 Number and Percentage of Using three wheel vehicles

Items	Number	Percentage
1. The purpose of using three wheel vehicle		
Transportation People per time	85	32.95
Transfer goods	53	20.54
Others	10	3.88
Private using	146	56.59
For Selling	86	33.33
2. Type of Goods		
Steamed dumpling	5	1.94
Noodle	8	3.10
Meat ball	14	5.43
Fruit	8	3.10
Beverage	17	6.59
Miscellaneous	3	1.16
Papaya salad and chicken grill	3	1.16
Others	43	16.67
3. Skylab for transport the people anywhere		
Hospital	30	11.63
Police station	27	10.47
District hall	29	11.24
Train station	32	12.40
Others	36	13.95
4. Useful for family (Sample 42 persons)		
Income less than 500 Baht	38	14.75
501 – 1,000 Baht	1	0.39
1,001 – 1,500 Baht	1	0.39
1,501 Baht up	3	1.17
5. Useful for family (Sample 173 persons)		
Income less than 500 Baht	156	90.18
501 – 1000 Baht	12	6.94
1001 – 1500 Baht	3	1.74
1501 Baht up	1	0.58
Income enough as purchase or invest		
Enough	191	77.64
Not enough	55	22.36
6. This car increasing convenient		
Yes	239	92.64
No	19	7.36
7. How long for using this car per day		
Only day	189	73.26
Only night	3	1.16
All day and night	66	25.58
8. How long time for using this car per day		
Less than 6.5 hours	144	55.81
6.51 – 12.50 hour per day	109	42.25
12.51 – 18.50 hour per day	4	1.55
18.51 hour up	1	0.39
Min – Max = 0.5 - 24		
$\overline{X} \pm$ SD = 6.18 ± 3.10		

Items	Number	Percentage
9. Mainly using car		
Use car mainly for occupation	140	54.27
Use this car some time because have the main occupation	122	47.28

4.1.4 The problem of using car

Almost no problem of driving 251 (97.29%), no checking from policeman was 243 (94.19%), and no Queuing system was 255 (99.22%). (Table 4)

Table 4 Number and percentage of the problem of using car

Items	Number	Percentage
1. The problem of drive or traffic		
Yes	7	2.71
No	251	97.29
2. Checking from policeman		
Yes. How	15	5.81
No	243	94.19
3. Queuing system		
Yes. Manager was	2	0.78
No.	255	99.22

4.1.5 Safety behavior for using this car

Almost driver no has the register ID.Card (71.21%), They get ID.Card by Test (98.65%), No practice before using car (62.83%), no traffic accident experience (91.09%), character of accident was Moderate (70.37%), not severe or not of accident (94.19%), using traffic light before turn (84.11%), no reflect sticker (53.49%), always no using helmet (53.88%), no turn light before in the curve road (49.61%), car checking before using (74.03%), and no speed over law enforcement (79.84%) (Table 5)

Table 5 Safety behavior for using this car

Items	Number	Percentage
1. Register ID. Card		
Yes	74	28.79
No	183	71.21
2. How get ID card		
Test	73	98.65
Others	1	1.35
3. Practice before using car		
Yes	71	37.17
No	120	62.83
4. Accident		
Yes cause	23	8.91
No	235	91.09
5. Character of accident		
Strongly	8	29.63
Moderate	19	70.37
6. Severe or not of accident		
Yes	15	5.81
No	243	94.19
7. Using traffic light before turn		
Yes	217	84.11
No	41	15.89
8. Reflect sticker		
Yes	120	46.51
No	138	53.49
9. Always helmet use		
Sometime	80	31.01
Always	39	15.12

Items	Number	Percentage
No using	139	53.88
10. Turn light before in the curve road		
Sometime	54	20.93
Always	76	29.46
No using	128	49.61
11. Car checking before using		
Yes	191	74.03
No using	67	25.97
12. Speed over law enforcement		
Sometime	47	18.22
Always	5	1.94
No using	206	79.84

4.1.6 Opinion to improving both of cars

The cars was the register (56.20%) and no intention to cancel using this car (90.31%) (Table 6)

Table 6 Number and percentage of Opinion to improving both of cars

Items	Number	Percentage
1. Register this car		
Yes	145	56.20
No	113	43.80
2. Cancel using this car		
Yes	25	9.69
No	233	90.31

4.2 General Characteristics of Skylab's passenger and Sidecar passenger

4.2.1 General Characteristics of Sidecar's passenger in communities

The total sample consisted of 250 passengers. Most of them had age 39 – 43 years (20.8%), Education was primary school (32.8%), Occupation was serve under the crown/state enterprise (31.6%), Income per month was less than 5,000 baht, this car seldom used service was (82.8%) and objective for used was take to other place (61.2%). The details are shown in Table 7

Table 7 Number and Percentage of Personal Data Sidecar's passenger (n=250)

Item	Number	Percentage
1. Age		
Less than 18 years	27	10.8
19 – 23 years	22	8.8
24 – 28 years	13	5.2
29 – 33 years	23	9.2
34 – 38 years	32	12.8
39 – 43 years	52	20.8
44 – 48 years	33	13.2
49 – 53 years	23	9.2
54 – 58 years	13	5.2
59 – 63 years	7	2.8
More than 63 years	5	2.0
2. Education		
Unlettered	13	5.2
Primary School	82	32.8
Secondary School	30	12.0
High school / Vocational certificate	35	14.0
Diploma / High vocational certificate	17	6.8
Bachelor's degree	64	25.6
Other……..	9	3.6
3. Occupation		
Serve under the crown / State enterprise	79	31.6
Garden	6	2.4

Item	Number	Percentage
Work as employee	64	25.6
Trade	46	18.4
Be free	44	17.6
Other…….	37	14.8
4. Average income per month		
Less than 5,000 baht	72	28.8
5,001 – 8,000 baht	54	21.6
8,001 – 10,000 baht	19	7.6
10,001 – 12,000 baht	25	10.0
More than 12,000 baht	51	20.4
Non income	29	11.6
5. How often to used Skylab or Sidecar		
Regularly	7	2.8
Oftentimes	22	8.8
Seldom	207	82.8
Other…….	14	5.6
6. Objective for used		
Portage	79	31.6
Take to other place	153	61.2
Other…….	18	7.2

4.2.2 Degree of satisfaction in Sidecar's passenger

The satisfaction of driver's habit was moderately (67.6%), confidence and truth for safety on take a sidecar was moderate (62.8%), the driver confidence to requirement was moderate (62.4%), the driver use word and tuner of good was moderate (56.8%), and the number of driver and car enough for service was moderate (71.6%)

Service quality found that knowledge and capability in a drive and place of a driver was moderate (49.2%), receive service as their want (53.6%), the driver service unbiased was moderate (72.4%), service on appropriate and necessity times (74.8%) choose a car or driver as they want was moderate (55.2%), safety of service was moderate (63.6%), speed on service was moderate (46.8%), confidence on service was moderate (60.8%), and gentleness and properly on service was moderate (72.4%)

The driver can introduce others place in case you unknow was moderate (69.2%), suggestion about get in and get of a car for safety was moderate (56.4%), and show time of service on day to day was moderate (60.8%)

The car had a cleanness and ventilation was more (49.2%), the car enough for service was moderate (65.6%), number of seat for service was moderate (53.2%), ample bright light and wide was moderate (64.0%), had a bus stop was moderate (45.2%) the car had a cleanness was moderate (74.8%)

The time in wait for take in a car properly was moderate (74.4%), and a time in wait for use service properly was moderate (72.4%).

Organize queue on service was moderate (56.4%), communicate for used other car if this car can't service was moderate (65.2%) and convenience of service was moderate (55.2%)

Appropriate cost for used in Moderate (68.8%) (Table 8)

Table 8: Degree of satisfaction in Sidecar's passenger

	Items	Satisfaction		
		More	Moderately	Less
	Personal			
1	Driver's habit	69 (27.6%)	169 (67.6%)	12 (4.8%)
2	You have confidence and truth that have a save on take a Skylab.	50 (2.0%)	157 (62.8%)	43 (17.2%)
3	The driver had confidence to your require	76 (30.4%)	156 (62.4%)	18 (7.2%)
4	The driver use word and tuner of good	80 (32.0%)	142 (56.8%)	28 (11.2%)
5	The number of driver and car enough for service	53 (21.2%)	179 (71.6%)	18 (7.2%)
	Service quality			
6	Knowledge and capability of driving and	115 (46.0%)	123 (49.2%)	12 (4.8%)

	Items	Satisfaction		
		More	Moderately	Less
	places of a driver.			
7	You receive service as you want	91 (36.4%)	134 (53.6%)	25 (10.0%)
8	The driver give service for you as others	57 (22.8%)	181 (72.4%)	12 (4.8%)
9	Have a service on appropriate and necessity times	42 (16.8%)	187 (74.8%)	21 (8.4%)
10	You could choose a car or a driver as you want.	52 (20.8%)	138 (55.2%)	60 (24.0%)
11	Safety on service.	49 (19.6%)	159 (63.6%)	42 (16.8%)
12	speed on service	113 (45.2%)	117 (46.8%)	20 (8.0%)
13	confidence on service	58 (23.2%)	152 (60.8%)	39 (15.6%)
14	gentleness and properly on service	49 (19.6%)	181 (72.4%)	19 (7.6%)
	Data receive			
15	The driver can introduce others place in case you unknow	45 (18.0%)	173 (69.2%)	32 (12.8%)
16	Suggestion about get in and get of a car for safety	42 (16.8%)	148 (59.2%)	60 (24.0%)
17	Giving information about caution for safety.	32 (12.8%)	142 (56.4%)	76 (30.4%)
18	Show time of service on day to day	22 (8.8%)	152 (60.8%)	76 (30.4%)
	Convenience of service			
	Car			
19	The car had a cleanness and ventilation.	123 (49.2%)	102 (40.8%)	25 (10.0%)
20	The car enough for service	49 (19.6%)	164 (65.6%)	37 (14.8%)
21	Have a seat for service	25 (10.0%)	133 (53.2%)	92 (36.8%)
22	Ample bright light and wide	53 (21.2%)	160 (64.0%)	37 (14.8%)
23	Have a bus stop	33 (13.2%)	113 (45.2%)	104 (41.6%)
24	The car had a cleanness	40 (16.0%)	187 (74.8%)	23 (9.2%)
	Time			
25	Times in wait for take in a car properly.	25 (10.0%)	186 (74.4%)	39 (15.6%)
26	A time in wait for use service properly.	23 (9.2%)	181 (72.4%)	46 (18.4%)
	Coordinate of service			53 (21.2%)
27	Have organize queue on service	56 (22.4%)	141 (56.4%)	
28	Have a communicate for used service other car if this car can't service.	35 (14.0%)	163 (65.2%)	52 (20.8%)
29	Have a convenience of service.	94 (37.6%)	138 (55.2%)	18 (7.2%)
	Cost of service			
30	Appropriate cost for used service	42 (16.8%)	172 (68.8%)	36 (14.4%)

4.2.3 General Characteristics of Skylab's passenger in communities

The total sample consisted of 250 passengers. Most of them were age 24-28 years (15.2%), Education was primary school (38.4%), Occupation was other (34.0%), Income per month was non income (34.8%), seldom to used service this car (72.8%) and objective for using was take to other place (90.0%). The details are shown in Table 9

Table 9 Number and Percentage of Personal Data (n=250)

Item	Number	Percentage
1. Age		
Less than 18 years	15	6.0
19 – 23 years	34	13.6
24 – 28 years	38	15.2
29 – 33 years	35	14.0
34 – 38 years	26	10.4
39 – 43 years	27	10.8
44 – 48 years	14	5.6
49 – 53 years	23	9.2
54 – 58 years	7	2.8
59 – 63 years	15	6.0

Item	Number	Percentage
More than 63 years	16	6.4
2. Education		
In literature	40	16.0
Primary School	96	38.4
Secondary School	50	32.0
High school / Vocational certificate	32	12.8
Diploma / High vocational certificate	20	8.0
Bachelor's degree	7	2.8
Other……..	5	2.0
3. Occupation		
Serve under the crown / State enterprise	6	2.4
Garden	21	8.4
Work as employee	66	26.4
Trade	28	11.2
Be free	44	17.6
Other…….	85	34.0
4. Average income per month		
Less than 5,000 baht	66	26.4
5,001 – 8,000 baht	77	30.8
8,001 – 10,000 baht	16	6.4
10,001 – 12,000 baht	3	1.2
More than 12,000 baht	1	0.4
Non income	87	34.8
5. How many time to used service in Skylab or Sidecar		
Regularly	14	5.6
Oftentimes	49	19.6
Seldom	182	72.8
Other…….	5	2.0
6. Objective for used		
Portage	24	9.6
Take to……	225	90.0
Other……	1	0.4

4.2.4 Degree of satisfaction in Skylab's passenger

The satisfaction of driver's habit was more (92.4%), confidence and truth safety on take skylab was moderate (57.2%), the driver confidence to requirement was more (80.4%), the driver use word and tuner of good was more (82.4%), and the number of driver and car enough for service was more (74.4%)

Service quality found that knowledge and capability in a drive and place of a driver was more (85.6%), receive service as their want was more (82.8%), the driver service unbiased was more (80.8%), service on appropriate and necessity times was moderate (69.2%) choose a car or driver as they want was moderate (68.0%), safety of service was more (76.4%), speed on service was more (77.2%), confidence on service was more (76.4%), and gentleness and properly on service was more (79.2%)

The driver can introduce others place in case you unknow was more (81.6%), suggestion about get in and get of a car for safety was moderate (59.6%), giving information about caution for safety was moderate (58.0%) and show time of service on day to day was more (66.8%)

The car had a cleanness and ventilation was more (85.2%), the car enough for service was more (66.4%), number of seat for service was more (70.4%), ample bright light and wide was more (80.8%), bus stop was less (76.04%) the car had a cleanness was more (80.0%)

The time in wait for take in a car properly was moderate (61.6%), and a time in wait for use service properly was moderate (64.0%).

Had organize queue on service was more (83.2%), communicate for used other car if this car can't service was more (78.0%) and convenience of service was more (81.4%)

Appropriate cost for used was More (82.0%) (Table 10)

Table 10: Degree of satisfaction in Skylab's passenger

	Items	Satisfaction More	Moderately	Less
	Personal			
1	Driver's habit	231 (92.4%)	19 (7.6%)	
2	You have confidence and truth that have a save on take a Skylab.	107 (42.8%)	143 (57.2%)	
3	The driver had confidence to your require	201 (80.4%)	49 (19.6%)	
4	The driver use word and tuner of good	206 (82.4%)	44 (17.6%)	
5	The number of driver and car enough for service	186 (74.4%)	61 (24.4%)	3 (1.2%)
	Service quality			
6	Knowledge and capability in a drive and place of a driver.	214 (85.6%)	36 (14.4%)	
7	You receive service as you want	207 (82.8%)	43 (17.2%)	
8	The driver give service for you mean others	202 (80.8%)	47 (18.8%)	1 (0.4%)
9	Have a service on appropriate and necessity times	74 (29.6%)	173 (69.2%)	3 (1.2%)
10	You could choose a car or a driver as you want.	69 (27.6%)	170 (68.0%)	11 (4.4%)
11	Have a safety on service.	191 (76.4%)	59 (23.6%)	
12	Have a speed on service	193 (77.2%)	55 (22.0%)	2 (0.4%)
13	Have a confidence on service	191 (76.4%)	59 (23.6%)	
14	Have a gentleness and properly on service	198 (79.2%)	52 (20.8%)	
	Data receive			
15	The driver can introduce others place in case you unaware	204 (81.6%)	46 (18.4%)	
16	Suggestion about get in and get of a car for safety	101 (40.4%)	149 (59.6%)	
17	Giving information about caution for safety.	105 (42.0%)	145 (58.0%)	
18	Show time of service on day to day	167 (66.8%)	78 (31.2%)	5 (2.0%)
	Convenience of service			
	Car			
19	The car had a cleanness and airy.	213 (85.2%)	27 (10.8%)	
20	The car enough for service	166 (66.4%)	84 (33.6%)	
21	Have a seat for service	176 (70.4%)	72 (19.2%)	2 (0.4%)
22	Ample bright light and wide	202 (80.8%)	48 (19.2%)	
23	Have a bus stop	59 (23.6%)	90 (36.0%)	101 (76.04%)
24	The car had a cleanness	200 (80.0%)	50 (20.0%)	
	Time			
25	Times in wait for take in a car properly.	96 (38.4%)	154 (61.6%)	
26	A time in wait for use service properly.	90 (36.0%)	160 (64.0%)	
	Coordinate of service			
27	Have organize queue on service	208 (83.2%)	37 (14.8%)	5 (2.0%)
28	Have a communicate for used service other car if this car can't service.	195 (78.0%)	55 (22.0%)	
29	Have a convenience of service.	204 (81.6%)	46 (18.4%)	
	Cost of service			
30	Appropriate cost for used service	205 (82.0)	45 (18.0%)	

4.3 Focus Group Discussion among sidecar driver.

1. Mr.C. Ten years ago using sidecar, 2nd car for selling salapao, noodle, coffee in summer in the cerebrate/ festival, use helmet some time. No accident. It's comfortable and good enough.
2. Mr.U. Using 15 years selling salapao in festival, drive 40 – 50 km per hour. Using helmet always, has accident not severe.
3. Mr.S. 10 years using, Supporting from Lanset project for road cleaning. Collect old thing for selling. It's convenient, love, it.
4. Mr.W. 10 years using car. Lanset project support. Wake up 3 am for road cleaning. Collect old thing for buying, Satisfy this car, happy and useful convenient. His second occupation is cloth serving, drive 40 – 50 km per hour and use helmet always.

5. Mrs.Ur. use 10 – 15 years. Selling papaya salad, sticky rice, and chicken grill everyday until 9.00 am – 6.00 pm. No accident, drive not fast and use helmet always.

6. Mr.K. 6 months to using sidecar, work 2 period per day. Fruit selling, Soap tooth brush, detergent, sometime unhappy for using sidecar because. He worked in company and good greasing but now feel better because it's freedom, income more than 200 – 300 Baht. Second period selling fruit low invest but more benefit from this car, use always helmet, no accident, some time many other sidecar.

4.4 Sidecar Driver Indebt interview

First person

Mr.S. He is 54 years old. Worker at day care. Start working at 4.00 am to cleaning at community, 7.30 am send student to school and work at day health station. 4.30 pm. Pick up children from school, 5.00 pm prepare far aerobic and work at day care 8 pm – 6 am.

Second person

Mr.S.K. He is 47 years old. His occupation is salapao selling 191/10 Samliam 2 community. He start work 6 am. and working salapao. Salapao selling at 2.30 pm and return home 2 am.

Third person

Mr.U 56 years old grocery selling. 40/111 Samliam 4 community. 5 am open his shop, 8 am buying goods at market, 11 am buying old thing, 1 pm. work at community office, 4 pm. visit his sister at kokfunpong village and return home 6 pm.

4.5 skylab Driver Indebt interview

First person

Mr.S.A. He is 49 years old. Start to used skylab since 2538. Income 150 Baht / days. Skylab driving is main occupation. He start work at 6 am, sent passenger to market 20 Baht, sent passenger to Ban Konoi 100 Baht. Have launch at home, start work 10 Baht, go to village 30 Baht, sent passenger to Khowsuankwang hospital 10 Baht and turn home at 6 pm. Total 240 Baht per days.

Second person

Mr.S.J. 49 years old. Address is Ban Koke Khowsuankwang sub-district Khowsuankwang district KhonKaen province. Work only free time form rice farm.

11.00 am Sent monk to market 60 Baht, 12 am launch at home, 3.00 pm. come to station, 5.00 pm sent passenger go khummoung village and return home 6.00 pm. Total income 110 Baht per day.

Third person

Mr.T.C. 49 years old. Address is Ban Koke Khowsuankwang sub-district Khowsuankwang district Khon Kaen province. Second skylab. Start at 6 am. no passenger until 12.00, have launch at home, about 1.00 pm sent student 2 persons receive carfare 50 Baht, 4.00 pm sent passenger to market 10 Baht, sent gas to market 10 Baht and return home 6 am. Total income 70 Baht per day.

4.6 Causes of using skylab and side care

- Occupation
- Oil saving
- Convenient Comfortable
- Earn money
- Private using, carry out goods
- Convenient for long distant from one district to other districts.
- Good condition car
- Private occupation without be employee and earn more money
- Not fall and convenient
- Carry out more goods, and can take and pick up children to school

4.7 Place for buying a car

Place for buying a car	
Side car	**Skylab**
- Phi shop center - Sidecar repairing shopping - Buy from council - Muang district - second hand buying from friend in the same village - Thai yon company	- Udon-Thanee Province - Second hand buying from agent - Udon-ekpanit shop • From their friend • Khon Kaen Province • Kranaun district Khon Kaen Province • Nongkhung sub-district, Namphong
Side car	**Skylab**
- motorcycle selling shop in Khon kaen - Khon kaen Loa pisan company - Kalasin province - Openg hong shop, mahasarakam - Bangkok - Roi et province	• district, Khon Kaen Province • Pornpiwat car shop
Side car construction	
- Phi shop center - repairing car shop	
Side car	**Skylab**
- buy with tow - village shop - council made - Motorcycle repairing shop at vangto village, muang district, Khon Kaen - construction by themselves - Motorcycle repairing shop at nontan village - Banfang district, khon kaen - kalasin province - Gudnangthui village Motorcycle repairing shop at bantum village, muang district, Khon Kaen - Motorcycle repairing shop at bantum village, muang district, Khon Kaen - Motorcycle repairing shop at banmung village, muang district, Khon Kaen - Pimai district, Nakorn ratchaseema province - Kalasin Province - Mahasarakam Province - Bangkok	
Former car using before used this car	
- Motorcycle - Car - Bicycle - two wheel Pulling car	- Motorcycle - Pulling car - No car - Three wheel side car

4.8 Driver's Impression

- "Sidecar help to earn money, make security and qualities of life" "My children graduate from the University and get good job because of Sidecar.
- "I love sidecar, it take me and family every where".
- "I sell salapoa in day time and meat ball in the night time"

- I have net work of sidecars. Sidecar make me and my friends earn money and self reliance.
- I work in the office in the morning in daytime I use sidecar at 3 am. for garbage carrying everyday.
- It makes my life and family get more convenient and earn money everyday by transport the people to anywhere: hospital, police station, market, city hall.
- It's not too expensive it suitable for us, so I don't need improving it, I think it ok.

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion and Recommendations

General Characteristics of Skylab's drivers and Sidecar's driver in communities

The total sample consisted of 258 drivers. Skylab's drivers of 130 person and Sidecar's drivers of 128 person. Most of them had age of 41 – 45 years (20.54%), were male and were owner house (86.82%). Education was primary school and Junior high school at 151 and 19.38%, 90.70% were married, Income per month was less than 5,000 baht, Duration of using a car was less than 5 years (38.37%), satisfaction in a car was high satisfaction (73.64%), and attention to using a car was Use continue at 251.

Evolution of three wheel vehicles

The total sample consisted of 258 drivers. The price of the cars was 24,001 – 46,000 Baht, Price of construct the tow was 6,751 baht up, and how many three wheel vehicle was used was the first (70.93%)

Using three wheel vehicles

The purpose of using three wheel vehicles was private using at 146 person (56.59%), the type of goods was others at 43 (16.67%), Skylab for transport the people anywhere was others at 36 (13.95%), Useful for family of skylab's drivers (sample 42 persons) and sidecar's drivers (sample 173 persons) was income less than 500 baht, at 38 and 156, Income enough as purchase or invest was enough (77.64%), this car increasing convenient was yes (92.64%), how long and long time for using this car per day was only day (73.26%) and less than 6.5 hours (55.81%) and mainly using car was use car only for occupation at 140 (54.27%).

The problem of using car

Almost no problem of driving 251 (97.29%), no checking from policeman was 243 (94.19%), and no Queuing system was 255 (99.22%).

Safety behavior for using this car

Almost driver no has the register ID.Card (71.21%), They get ID.Card by Test (98.65%), No practice before using car (62.83%), no traffic accident experience (91.09%), character of accident was Moderate (70.37%), not severe or not of accident (94.19%), using traffic light before turn (84.11%), no reflect sticker (53.49%), always no using helmet (53.88%), no turn light before in the curve road (49.61%), car checking before using (74.03%), and no speed over law enforcement (79.84%)

Opinion to improving both of cars

The cars was the register (56.20%) and no intention to cancel using this car (90.31%)

General Characteristics of Skylab's passenger and Sidecar passenger

General Characteristics of Sidecar's passenger in communities

The total sample consisted of 250 passengers. Most of them had age 39 – 43 years (20.8%), Education was primary school (32.8%), Occupation was serve under the crown/state enterprise (31.6%), Income per month was less than 5,000 baht, this car seldom used service was (82.8%) and objective for used was take to other place (61.2%).

Degree of satisfaction in Sidecar's passenger

The satisfaction of driver's habit was moderately (67.6%), confidence and truth for safety on take a sidecar was moderate (62.8%), the driver confidence to requirement was moderate (62.4%), the driver use word and tuner of good was moderate (56.8%), and the number of driver and car enough for service was moderate (71.6%)

Service quality found that knowledge and capability in a drive and place of a driver was moderate (49.2%), receive service as their want (53.6%), the driver service unbiased was moderate (72.4%),

service on appropriate and necessity times (74.8%) choose a car or driver as they want was moderate (55.2%), safety of service was moderate (63.6%), speed on service was moderate (46.8%), confidence on service was moderate (60.8%), and gentleness and properly on service was moderate (72.4%)
The driver can introduce others place in case you unknow was moderate (69.2%), suggestion about get in and get of a car for safety was moderate (56.4%), and show time of service on day to day was moderate (60.8%)
The car had a cleanness and ventilation was more (49.2%), the car enough for service was moderate (65.6%), number of seat for service was moderate (53.2%), ample bright light and wide was moderate (64.0%), had a bus stop was moderate (45.2%) the car had a cleanness was moderate (74.8%)
The time in wait for take in a car properly was moderate (74.4%), and a time in wait for use service properly was moderate (72.4%).
Organize queue on service was moderate (56.4%), communicate for used other car if this car can't service was moderate (65.2%) and convenience of service was moderate (55.2%)
Appropriate cost for used in Moderate (68.8%)

General Characteristics of Skylab's passenger in communities

The total sample consisted of 250 passengers. Most of them were age 24-28 years (15.2%), Education was primary school (38.4%), Occupation was other (34.0%), Income per month was non income (34.8%), seldom to used service this car (72.8%) and objective for using was take to other place (90.0%).

Degree of satisfaction in Skylab's passenger

The satisfaction of driver's habit was more (92.4%), confidence and truth safety on take skylab was moderate (57.2%), the driver confidence to requirement was more (80.4%), the driver use word and tuner of good was more (82.4%), and the number of driver and car enough for service was more (74.4%)
Service quality found that knowledge and capability in a drive and place of a driver was more (85.6%), receive service as their want was more (82.8%), the driver service unbiased was more (80.8%), service on appropriate and necessity times was moderate (69.2%) choose a car or driver as they want was moderate (68.0%), safety of service was more (76.4%), speed on service was more (77.2%), confidence on service was more (76.4%), and gentleness and properly on service was more (79.2%)
The driver can introduce others place in case you unknow was more (81.6%), suggestion about get in and get of a car for safety was moderate (59.6%), giving information about caution for safety was moderate (58.0%) and show time of service on day to day was more (66.8%)
The car had a cleanness and ventilation was more (85.2%), the car enough for service was more (66.4%), number of seat for service was more (70.4%), ample bright light and wide was more (80.8%), bus stop was less (76.04%) the car had a cleanness was more (80.0%)
The time in wait for take in a car properly was moderate (61.6%), and a time in wait for use service properly was moderate (64.0%).
Had organize queue on service was more (83.2%), communicate for used other car if this car can't service was more (78.0%) and convenience of service was more (81.4%)
Appropriate cost for used was More (82.0%)

Focus Group Discussion among sidecar driver.

7. Mr.C. Ten years ago using sidecar, 2nd car for selling salapao, noodle, coffee in summer in the cerebrate/ festival, use helmet some time. No accident. It's comfortable and good enough.
8. Mr.U. Using 15 years selling salapao in festival, drive 40 – 50 km per hour. Using helmet always, has accident not severe.
9. Mr.S. 10 years using, Supporting from Lanset project for road cleaning. Collect old thing for selling. It's convenient, love, it.
10. Mr.W. 10 years using car. Lanset project support. Wake up 3 am for road cleaning. Collect old thing for buying, Satisfy this car, happy and useful convenient. His second occupation is cloth serving, drive 40 – 50 km per hour and use helmet always.
11. Mrs.Ur. use 10 – 15 years. Selling papaya salad, sticky rice, and chicken grill everyday until 9.00 am – 6.00 pm. No accident, drive not fast and use helmet always.

12. Mr.K. 6 months to using sidecar, work 2 period per day. Fruit selling, Soap tooth brush, detergent, sometime unhappy for using sidecar because. He worked in company and good greasing but now feel better because it's freedom, income more than 200 – 300 Baht. Second period selling fruit low invest but more benefit from this car, use always helmet, no accident, some time many other sidecar.

Sidecar Driver Indebt interview

First person
Mr.S. He is 54 years old. Worker at day care. Start working at 4.00 am to cleaning at community, 7.30 am send student to school and work at day health station. 4.30 pm. Pick up children from school, 5.00 pm prepare far aerobic and work at day care 8 pm – 6 am.

Second person
Mr.S.K. He is 47 years old. His occupation is salapao selling 191/10 Samliam 2 community. He start work 6 am. and working salapao. Salapao selling at 2.30 pm and return home 2 am.

Third person
Mr.U 56 years old grocery selling. 40/111 Samliam 4 community. 5 am open his shop, 8 am buying goods at market, 11 am buying old thing, 1 pm. work at community office, 4 pm. visit his sister at kokfunpong village and return home 6 pm.

skylab Driver Indebt interview

First person
Mr.S.A. He is 49 years old. Start to used skylab since 2538. Income 150 Baht / days. Skylab driving is main occupation. He start work at 6 am, sent passenger to market 20 Baht, sent passenger to Ban Konoi 100 Baht. Have launch at home, start work 10 Baht, go to village 30 Baht, sent passenger to Khowsuankwang hospital 10 Baht and turn home at 6 pm. Total 240 Baht per days.

Second person
Mr.S.J. 49 years old. Address is Ban Koke Khowsuankwang sub-district Khowsuankwang district KhonKaen province. Work only free time form rice farm.
11.00 am Sent monk to market 60 Baht, 12 am launch at home, 3.00 pm. come to station, 5.00 pm sent passenger go khummoung village and return home 6.00 pm. Total income 110 Baht per day.

Third person
Mr.T.C. 49 years old. Address is Ban Koke Khowsuankwang sub-district Khowsuankwang district Khon Kaen province. Second skylab. Start at 6 am. no passenger until 12.00, have launch at home, about 1.00 pm sent student 2 persons receive carfare 50 Baht, 4.00 pm sent passenger to market 10 Baht, sent gas to market 10 Baht and return home 6 am. Total income 70 Baht per day.

Causes of using skylab and side care

- Occupation
- Oil saving
- Convenient Comfortable
- Earn money
- Private using, carry out goods
- Convenient for long distant from one district to other districts.
- Good condition car
- Private occupation without be employee and earn more money
- Not fall and convenient
- Carry out more goods, and can take and pick up children to school

Driver's Impression

- "Sidecar help to earn money, make security and qualities of life" "My children graduate from the University and get good job because of Sidecar.
- "I love sidecar, it take me and family every where".
- "I sell salapoa in day time and meat ball in the night time"

- I have net work of sidecars. Sidecar make me and my friends earn money and self reliance.
- I work in the office in the morning in daytime I use sidecar at 3 am. for garbage carrying everyday.
- It makes my life and family get more convenient and earn money everyday by transport the people to anywhere: hospital, police station, market, city hall.
- It's not too expensive it suitable for us, so I don't need improving it, I think it ok.

5.2 Recommendations

Skylab:
1. Polices have strict in some chances like the general traffic control or in the time that the traffic crowded or depend on the specification of the police.
2. Not sure, the police impossible to strict very because almost are used in the countryside area.
3. It is illegal because of is the modified motor that not permitted if violate a law will be fined not exceed 1,000 baths.
4. Forbid to drive the Skylab in urban area.
5. Very strict because the Skylab is still illegal if take it in urban area must be arrested and be fined not exceed 1,000 baths with allegation of modify the motor.
6. Very strict, forbid to use in urban area.
7. There are strict to do correctly according to law if do illegally will be arrested and fined.
8. Strict about the license, motor system management, black smoke or loud sound.
9. Strict because of used not to see the Skylab in urban area. It still does not be permitted from the officer or may be illegal because it has not registered correctly.

Sidecar:
1. It may be strict in some chances such as in the important festival, the traffic crowd, etc.
2. There are checking and arresting and forbid to run in the night.
3. It possible to strict in some time
4. Strict a little because if the police strict, it will not has many side tow motor in urban area like this.
5. The police have lessened for the structure expansion but forbid to transport the passenger strictly because it is very dangerous, allow transporting the thing only.
6. The rider must wear the helmet every time and must have the license.

5.3 Policy

Skylab:
1. It should training driving.
2. The license making should be conducted.
3. Queue management should have performed.
4. Motor standard checking – Should have very.
5. Motor register correctly.
6. Depend on the policy of the Military Transportation.
7. The queue management
8. There is the specific license for tricycle motor.

Sidecar:

1. It's Should have the riding training but must have the participation from other organization such as the transport office.
2. Motor registration
3. It's should not have the register because it can use the register in the same of motorbike.
4. Queue management
5. It should rider training because there is someone who does not have skill to use.
6. There are trainings about the side tow motorbike riding often.
7. License Making
8. Can use the normal motorbike's license.
9. Should have training to know about the traffic law.
10. Motor standard checking
11. It should manage to standard for safety of rider.

12. Should have the standard management because the motor does not strong enough
13. If there are breaking the traffic law, they will have arresting normally, strict about loud sound of motor, the toxic fumes and the license.

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APPENDIX

Appendix A:

Behavioral Study of Local Three Wheel Motor vehicle Skylab and Sidecar in Urban Area of Khon Kaen Province

Part 1. Evolution, Cause and safety behavior for using a car

Type of car O 1) Sidecar O 2) Skylab

Table 1 Number and Percentage of Personal Data (n=258)

Item	Answer	Notice (Interviewer)
1.Name - Surname	Mr./Mrs./Miss……	
2.Age	O 1) Less than 15 years O 2) 15 – 20 years O 3) 21 – 25 years O 4) 26 – 30 years O 5) 31 – 35 years O 6) 36 – 40 years O 7) 41 – 45 years O 8) 46 – 50 years O 9) 51 – 56 years O 10) 57 – 60 years O 11) More than 60 years	
3.Address	Number …..... Sub-district..... District..... Province..... O 1) Owner O 2) Rent House O 3) Others	
4.Phone number	Telephone ..... Mobile phone.....	
5.Education	Primary school..... Secondary school..... High school ..... Vocational certificate..... High vocational certificate..... Bachelor's degree..... Others	
6.Marital Status	O 1) Single O 2) Marries O 3) Divorce	
7.Income per month	O 1) Less than 5,000 baht O 2) 5,001-10,000 baht O 3) 10,001- 15,000 baht O 4) 150,001-20,000 baht O 5) 20,000-25000 baht **Note** Your income of break even O Yes ..... O No.....	
8.Duration of using three wheel vehicles.	O 1) Less than 5 years O 2) 6-10 years O 3) 11-15 years O 4) 16-20 years O 5) More than 20 years	
9.Satisfaction of three wheel vehicle	O 1) High satisfaction O 2) Moderate satisfaction O 2) Low satisfaction	
10.Attention to using three wheel vehicle	O 1) Use continue O 2) No use anymore	
11.Why you intend to use continue this car? (Please identify of merit)	1) ..... 2) ..... 3)	
12. If has a training in subject a safety of traffic, you will come to join.	O 1) Yes O 2) No	
13.If you answer Yes, Date and time to be convenient is….. The place of convenient is…..	….. ……..	

Part 2 Number and Percentage of evolution of tree wheel vehicle

Item	Answer	Notice (Interviewer)
1.The place of purchase a car	....	
2.The place of construct the tow	....	
3.Price of the car	..... baht	
4.Price for construct the tow	..... baht	
5. Before you have a sidecar or skylab what typed of car that you use	....	
6. How many three wheel vehicle was used	O 1) The first O 2) The second O 3) The third O 4) The fourth O 5) The fifth	

Part 3 Number and Percentage of Using three wheel vehicles

Items	Answer	Notice (Interviewer)
1.The purpose of using three wheel vehicle	O 1) Transportation People per time O 2) Transfer goods..... O 3) Others..... O 4) Private using ……. O 5) For Selling..... Type of Goods O 1) Steamed dumpling O 2) Noodle O 3) Meat ball O 4) Fruit O 5) Beverage O 6) Miscellaneous O 7) Papaya salad and chicken grill O 8) Others …… Skylab for transport the people anywhere O 1) Hospital O 2) Police station O 3)District Hall O 4) Train station O 5) Others..... Note Can make more 1 choice	
2. Useful for family	.... Income per time ..... baht Income per day ..... baht Income enough as purchase or invest O 1) Enough O 2) Not enough	
3. This car increasing convenient	O 1) Yes ..... O 2) No How long for using this car per day O 1) Only day O 2) Only night O 3) All day and night How long time for using this car per day O Less than 6.5 hours O 6.51 – 12.50 hour per day O 12.51 – 18.50 hour per day O 18.51 hour up	
4. Mainly using car	O 1) Use car mainly for occupation O 2) Use this car some time because have the main occupation	

Part 4 Number and percentage of the problem of using car

Item	Answer	Notice (Interviewer)
1.The problem of drive or traffic	O 1) Yes O 2) No	
2.Checking from policeman	O 1) Yes O 2) No	
3.Queuing system	O 1) Yes. Manager was…….. O 2) No	
4.How to manage of queuing system.	.... ……	

Part 5 Safety behavior for using this car

Item	Answer	Notice (Interviewer)
1.Register ID. Card	O 1) Yes O 2) No (If shoot No you can skip to answer items 4)	
2 How get ID. Card	O 1) Test O 2) Others.....	
3 Practice before using car	O 1) Yes O 2) No	
4.Did you have accident?	O 1) Yes, cause..... O 2) No (If shoot No you can skip to answer items 8)	
5.Character of accident	....	
6.Severe or not of accident	O 1) Yes 2) No	
7.When had accident, how you did a solve problem?	....	
8.Did you have arrest form policeman?	O 1) Yes O 2)No (If shoot No you can skip to answer items 10)	
9. How many time for you had arrest from policeman and what is a cause?	Arrest ..... time Cause is 1..... 2..... 3	
10. Using traffic light before turn	O 1) Yes O 2) No	
11. Reflect sticker	O 1) Yes O 2) No	
12. Always helmet use	O 1) Sometime O 2) Always O 3) No using	
13. Turn light before in the curve road	O 1) Sometime O 2) Always O 3) No using	
14. Car checking before using	O 1) Yes O 2) No using	
15. Speed over law enforcement	O 1) Sometime O 2) Always O 3) No using	

Part 6 Number and percentage of Opinion to improving both of car

Item	Answer	Notice (Interviewer)
1.Register this car	O 1) Yes O 2) No	
2.Cancel using this car	O 1) Yes O 2) No	
3. How to rectify for standard car?	....	
4.What do you want assistant about using this car?	....	
5. How you want to rectify structure or type of car.	....	

Impression in this car.....
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Suggestion.....
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Behavioral Study of Local Three Wheel Motor vehicle Skylab and Sidecar in Urban Area of Khon Kaen Province

Satisfaction of Skylab and Sidecar's passenger

Part 1: General Data

Explanation: Please fill in the blank or mark ✓ in □ have a statement appropriate that you choose

1. Aged .....years
   Less than 18 years
   19 – 23 years
   24 – 28 years
   29 – 33 years
   34 – 38 years
   39 – 43 years
   44 – 48 years
   49 – 53 years
   54 – 58 years
   59 – 63 years
   More than 63 years
2. Education
   - □ Unlettered
   - □ Primary education
   - □ Secondary education
   - □ High school education / Vocational certificate
   - □ Diploma / High vocational certificate
   - □ Bachelor's degree
   - □ Other.....
3. Address.....
4. Occupation
   - □ Serve under the crown / State enterprise
   - □ Garden
   - □ Work as employee
   - □ Trade
   - □ Be free
   - □ Other…….
5. Average income per month..... Baht / Month
   Less 5,000 Baht
   5,001 – 8,000 Baht
   8,001 – 10,000 Baht
   10,001 – 12,000 Baht
   More than 12,001 Baht
   Non income
6. How many time to used service in Skylab or Sidecar
   - □ Regularly
   - □ Oftentimes
   - □ Seldom
   - □ Others.....
7. Objective for used
   - □ Portage
   - □ Take to.....
   - □ Others.....

Part 2: Degree of satisfaction in Skylab's passenger

Explanation: Please mark ✓ in the blanks that you want to receive service some one answer

	Items	Satisfaction		
		More	Moderately	Less
1	**Personal** Driver's habit			
2	You have confidence and truth that have a save on take a Skylab.			
3	The driver had confidence to your require			
4	The driver use word and tuner of good			
5	The number of driver and car enough for service			
6	**Service quality** Knowledge and capability in a drive and place of a driver.			
7	You receive service as you want			
8	The driver give service for you mean others			
9	Have a service on appropriate and necessity times			
10	You could choose a car or a driver as you want.			
11	Have a safety on service.			
12	Have a speed on service			
13	Have a confidence on service			
14	Have a gentleness and properly on service			
15	**Data receive** The driver can introduce others place in case you unaware			
16	Suggestion about get in and get of a car for safety			
17	Giving information about caution for safety.			
18	Show time of service on day to day			
19	**Convenience of service** **Car** The car had a cleanness and airy.			
20	The car enough for service			
21	Have a seat for service			
22	Ample bright light and wide			
23	Have a bus stop			
24	The car had a cleanness			
25	**Time** Times in wait for take in a car properly.			
26	A time in wait for use service properly.			
27	**Coordinate of service** Have organize queue on service			
28	Have a communicate for used service other car if this car can't service.			
29	Have a convenience of service.			
30	**Cost of service** Appropriate cost for used service			

Part 3: Suggestion for adaptation service

Explanation: Please give one's opinion for used service three wheel vehicles

1. The convenience for receive service
   .....
   .....
   .....
2. Systematization of queue
   .....
   .....
   .....
3. Drivers
   .....
   .....
   .....
4. Data for tour
   .....
   .....
   .....
5. Quality for service
   .....
   .....
   .....
6. Expense for service
   .....
   .....
   .....
7. Other
   .....
   .....

Qualitative Questionnaire (Sidecar)
For the academicians, professionals, teachers who have the knowledge and expert about the traffic accident

1. At present, there is many of the sidecar using, is it lawful?
2. What is the advantage of sidecar?
3. What are the disadvantages of sidecar?
4. How do you agree that we should have the policy to support or control the sidecar using (Riding training, the license making?)
    1. Training – Should have.
    2. Motor license making – Not necessary.
    3. Motor registration – Should have.
    4. Queue management –
    5. Motor standard checking
5. Do the police have any special strict?

Qualitative Questionnaire (Sidecar)
For the policeman

1. At present there are many of Sidecar using. Is it lawful?
2. What are the advantages of Sidecar?
3. What are the disadvantages of Sidecar?
4. How do you agree that we should have the policy to support or control Sidecar using (Riding training, the license making)
    - 4.1 Riding training
    - 4.2 Rider' s license making
    - 4.3 Motor registration
    - 4.4 The queue management
    - 4.5 Motor standard checking
5. Do the police have any special strict?

Qualitative Questionnaire (Sidecar)
For the Transport officer of Khon Kaen province

1. At present there are many of Sidecar using. Is it lawful?
2. What are the advantages of Sidecar?
3. What are the disadvantages of Sidecar?
4. How do you agree that we should have the policy to support or control Sidecar using (Riding training, the license making?)
    1. Training
    2. License making
    3. Motor registration
    4. The queue management
    5. Motor standard checking
5. Do polices have any special strict?

Qualitative Questionnaire (Skylab)
For the policeman

1. At present there are many of Skylab using. Is it lawful?
2. What are the advantages of Skylab?
3. What are the disadvantages of Skylab?
4. How do you agree that we should have the policy to support or control Skylab using (Riding training, the license making?)
    4.1 Riding training
    4.2 Rider' s license making
    4.3 Motor registration
    4.4 The queue management
    4.5 Motor standard checking
5. Do polices have any special strict?

Qualitative Questionnaire (Skylab)
For the Transport officer of Khon kaen province

1. At present there are many of Skylab using. Is it lawful?
2. What are the advantages of Skylab?
3. What are the disadvantages of Skylab?
4. How do you agree that we should have the policy to support or control Skylab using (Riding training, the license making?)
    2. Training
    2. License making
    3. Motor registration
    4. The queue management
    5. Motor standard checking
5. Do polices have any special strict?

Qualitative Questionnaire (Skylab)
For the academicians, professionals, teachers who have the knowledge and expert about the traffic accident

1. At present there is many of Skylab using. Is it lawful?
2. What are the advantages of Skylab?
3. What are the disadvantages of Skylab?
4. How do you agree that we should have the policy to support or control Skylab using (Riding training, the license making?)
    - 4.1 Riding training
    - 4.2 Rider's license making
    - 4.3 Motor registration
    - 4.4 The queue management
    - 4.5 Motor standard checking
5. Do polices have any special strict?

Appendix B:

แบบสัมภาษณ์การวิจัยเรื่อง การศึกษาพฤติกรรมการใช้รถมอเตอร์ไซค์พ่วงข้างและรถสกายแล็ปในเขตชุมชนเมือง จังหวัดขอนแก่น

1. วิวัฒนาการ สาเหตุ และพฤติกรรมความปลอดภัยในการใช้

ประเภทของรถ ☐ 1) รถมอเตอร์ไซค์พ่วงข้าง ☐ 2) รถสกายแล็ป

ส่วนที่ 1 ข้อมูลส่วนบุคคล

รายการ	คำตอบ	ข้อสังเกต (ผู้สัมภาษณ์)
1.ชื่อ- นามสกุล	นาย/นาง/นางสาว……	
2.อายุ	☐ 1) ต่ำกว่า 15 ปี ☐ 2) 15 – 20 ปี ☐ 3) 21 – 25 ปี ☐ 4) 26 – 30 ปี ☐ 5) 31 – 35 ปี ☐ 6) 36 – 40 ปี ☐ 7) 41 – 45 ปี ☐ 8) 46 – 50 ปี ☐ 9) 51 – 56 ปี ☐ 10) 57 – 60 ☐ 11) มากกว่า 60 ปี	
3.ที่อยู่	เลขที่ ……. ตำบล..... อำเภอ..... จังหวัด..... ☐ 1) บ้านของตนเอง ☐ 2) บ้านเช่า ☐ 3) อื่น ๆ	
4.หมายเลขโทรศัพท์	บ้าน ..... มือถือ	
5.การศึกษาสูงสุด	ประถมศึกษา..... มัธยมต้น..... มัธยมปลาย ..... ปวช. ..... ปวส. ..... ปริญญาตรี ..... อื่น ๆ	
6.สถานภาพสมรส	☐ 1)โสด ☐ 2) สมรส ☐ 3) หย่า	
7.รายได้(ต่อเดือน)	☐ 1) น้อยกว่า 5,000 บาท ☐ 2) 5,001-10,000 บาท ☐ 3) 10,001- 15,000 บาท ☐ 4) 150,001-20,000บาท ☐ 5) 20,000-25000 บาท หมายเหตุรายได้ของท่านคุ้มทุนหรือไม่.....คุ้ม .....ไม่คุ้ม	
8.ระยะเวลาที่ใช้รถสกายแล็ป / รถมอเตอร์ไซค์พ่วงข้าง	☐ 1) น้อยกว่า 5 ปี ☐ 2) 6-10 ปี ☐ 3) 11-15 ปี ☐ 4) 16-20 ปี ☐ 5) มากกว่า 20 ปี	
9.ความพึงพอใจในการใช้รถ	☐ 1) พึงพอใจมาก ☐ 2) พึงพอใจปานกลาง ☐ 2) ไม่พึงพอใจ	
10.ความตั้งใจในการใช้รถต่อไป	☐ 1) ใช้รถต่อไป ☐ 2) ไม่ใช้รถต่อไป	
11.เพราะเหตุใดจึงตั้งใจจะใช้รถต่อไปหรือไม่ใช้ (มีข้อดีอะไรบ้าง)	1) ..... 2) ..... 3)	
12. ถ้ามีการอบรม เรื่องความปลอดภัยในการจราจร ท่านยินดีเข้ารับการอบรมหรือไม่	☐ 1) ยินดี ☐ 2) ไม่ยินดี	

13.ถ้ายินดี วันเวลาที่สะดวก คือ สถานที่ที่สะดวก คือ	…….. ……..	

ส่วนที่ 2 วิวัฒนาการของรถ

รายการ	คำตอบ	ข้อสังเกต (ผู้สัมภาษณ์)
1.สถานที่ ซื้อรถคันนี้	....	
2.ประกอบรถพ่วงที่ไหน	....	
3.ค่าใช้จ่ายในการซื้อรถ	..... บาท	
4.ค่าใช้จ่ายในการประกอบรถพ่วง	..... บาท	
5. ก่อนมีการประกอบรถพ่วง หรือรถสกายแล็ป ท่านใช้รถอะไรมาก่อน	....	
6. ใช้รถกี่คันแล้ว	☐ 1) คันที่ 1 ☐ 2) คันที่ 2 ☐ 3) คันที่ 3 ☐ 4) คันที่ 4 ☐ 5) คันที่ 5	

ส่วนที่ 3 เหตุผลในการใช้รถ

รายการ	คำตอบ	ข้อสังเกต (ผู้สัมภาษณ์)
1.จุดประสงค์ของการใช้รถ หมายเหตุ ตอบได้มากกว่า 1 คำตอบ	☐ 1) เพื่อรับจ้างรับส่งคน จำนวนครั้งละ.....คน ☐ 2) เพื่อขนส่งสินค้า คือ ..... ☐ 3) อื่น ๆ ระบุ..... ☐ 4) เพื่อใช้ส่วนตัว ..... ☐ 5) เพื่อค้าขายคือ.....จำนวน..... สินค้าที่ขาย ☐ 1) ซาลาเปา ☐ 2) ก๋วยเตี๋ยว ☐ 3) ลูกชิ้น ☐ 4) ผลไม้ ☐ 5) เครื่องดื่ม ☐ 6) ของใช้เบ็ดเตล็ด ☐ 7) ส้มตำ ไก่ย่าง ☐ 8) อื่น ๆ ระบุ..... กรณี สกายแล็ป ไปส่งผู้โดยสารที่ใดบ้าง ☐ 1) โรงพยาบาล ☐ 2) สถานีตำรวจ ☐ 3)ที่ว่าการอำเภอ ☐ 4) สถานีรถไฟ ☐ 5) อื่น ๆ ระบุ ..... หมายเหตุ ตอบได้มากกว่า 1 คำตอบ	
2. ประโยชน์ต่อครอบครัว คือ	.... มีรายได้ครั้งละ ..... บาท มีรายได้วันละ ..... บาท เพียงพอกับค่าใช่จ่าย/ลงทุน หรือไม่ ☐ 1) เพียงพอ ☐ 2) ไม่เพียงพอ	
3. รถนี้เพิ่มความสะดวกหรือไม่	☐ 1) ใช่ อย่างไร..... ☐ 2) ไม่ใช่ ใช้รถนี้กี่ชั่วโมงต่อวัน ..... ชั่วโมง / วัน เวลาใดบ้าง ☐ 1) เฉพาะกลางวัน ☐ 2) เฉพาะกลางคืน ☐ 3) ทั้งกลางวันและกลางคืน	
4. การใช้รถนี้เป็นหลักหรือไม่	☐ 1) ใช้เป็นงานหลักในการประกอบอาชีพ ☐ 2) ใช้เป็นงานรอง เนื่องจากมีอาชีพหลักคือ	

ส่วนที่ 4 ปัญหาที่เกิดจากการใช้รถ

รายการ	คำตอบ	ข้อสังเกต (ผู้สัมภาษณ์)
1.มีปัญหาในการขับขี่ และการจราจร หรือไม่	☐ 1) มี มีปัญหาอย่างไร ..... ☐ 2) ไม่มี	
2.มีการตรวจสอบหรือ กวดขันจากเจ้าหน้าที่ตำรวจ หรือไม่	☐ 1) มี ตรวจสอบอย่างไร ..... ☐ 2) ไม่มี	
3.มีระบบการจัดคิว หรือไม่	☐ 1) มี ผู้บริหารคือ..... ☐ 2) ไม่มี	
4.การบริหารจัดการการจัดคิวเป็นอย่างไร โปรดระบุ	....	

ส่วนที่ 5 พฤติกรรมความปลอดภัยในการใช้รถ

รายการ	คำตอบ	ข้อสังเกต (ผู้สัมภาษณ์)
1.ท่านมีใบอนุญาตขับขี่ หรือไม่	☐ 1) มี ☐ 2) ไม่มี (ถ้าไม่มี ข้ามไปตอบข้อ 4)	
2ใบขับขี่ ได้มาอย่างไร	☐ 1) สอบ ☐ 2) อื่น ๆ ระบุ.....	
3ได้ฝึกหัดขับขี่มาก่อนหรือไม่	☐ 1) ฝึก ☐ 2) ไม่ฝึก	
4.เคยประสบอุบัติเหตุหรือไม่	☐ 1) เคย สาเหตุคือ..... ☐ 2) ไม่เคย (ถ้าไม่เคยข้ามไปตอบข้อ 8)	
5.ลักษณะของอุบัติเหตุเป็นอย่างไร	....	
6.อุบัติเหตุเป็นรุนแรงหรือไม่	☐ 1) รุนแรง 2) ไม่รุนแรง	
7.เมื่อประสบอุบัติเหตุ มีการแก้ไขปัญหาอย่างไร ระบุ	....	
8.เคยถูกตำรวจจับหรือไม่	☐ 1) เคย ☐ 2)ไม่เคย (ถ้าไม่เคยข้ามไปตอบข้อ 10)	
9.ถูกตำรวจจับกี่ครั้ง สาเหตุคืออะไร	ถูกจับ .....ครั้ง สาเหตุคือ 1..... 2..... 3	
10. มีการให้สัญญาไฟก่อนเลี้ยวหรือไม่	☐ 1) มี ☐ 2) ไม่มี	
11. มีการติดสติ๊กเกอร์สะท้อนแสงหรือไม่	☐ 1) มี ☐ 2) ไม่มี	
12. สวมหมวกนิรภัยทุกครั้งที่ขับขี่ยานพาหนะหรือไม่	☐ 1) สวมใส่เป็นบางครั้ง ☐ 2) สวมใส่ทุกครั้ง ☐ 3) ไม่เคยใส่เลย	
13. เวลาเข้าโค้งท่านเปิดไฟเลี้ยวก่อนหรือไม่	☐ 1) ทำบางครั้ง ☐ 2) ทำทุกครั้ง ☐ 3) ไม่เคยทำ	
14. ท่านตรวจเช็คสภาพรถก่อนใช้รถหรือไม่	☐ 1) ใช่ ☐ 2) ไม่ใช่	

15. ท่านขับขี่โดยใช้ความเร็วสูงเกินที่กฎหมายกำหนดหรือไม่	☐ 1) ทำบางครั้ง ☐ 2) ทำทุกครั้ง ☐ 3) ไม่เคยทำ	

ส่วนที่ 6 ความคิดเห็นอย่างไร ต่อการปรับปรุงในการใช้รถทั้งสองประเภท

รายการ	คำตอบ	ข้อสังเกต (ผู้สัมภาษณ์)
1.ท่านเห็นว่ารถมอเตอร์ไซด์พ่วงข้าง หรือสกายแล็ป ควรจดทะเบียนให้ถูกต้องตามกฎหมายหรือไม่	☐ 1) ควร ☐ 2)ไม่ควร	
2.รถมอเตอร์ไซด์พ่วงข้าง หรือสกายแล็ป ควรยกเลิกการใช้รถหรือไม่	☐ 1) ควร ☐ 2)ไม่ควร	
3.ควรปรับปรุงให้ได้มาตรฐานอย่างไรบ้าง	....	
4.ท่านต้องการความช่วยเหลืออย่างไรบ้างเกี่ยวกับการใช้รถนี้	....	
5. ท่านต้องการให้มีการปรับปรุงโครงสร้างหรือลักษณะของรถอย่างไร	....	

ส่วนที่ 8 ความประทับใจกับการใช้รถชนิดนี้ .....
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ส่วนที่ 9 ข้อเสนอแนะอื่น ๆ.....
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แบบสัมภาษณ์

เรื่อง ความพึงพอใจของของผู้โดยสารในการใช้รถ สกายแล็ป หรือ รถสามล้อพ่วงข้าง

ส่วนที่ 1: ข้อมูลทั่วไป

คำชี้แจง: โปรดเติมคำในช่องว่าง หรือทำเครื่องหมาย ✓ ลงใน☐ ที่มีข้อความตรงกับที่ท่านเลือก

1. อายุของท่าน.....ปี
2. ระดับการศึกษาของท่าน
   - ☐ ไม่ได้เรียนหนังสือ
   - ☐ ประถมศึกษา
   - ☐ มัธยมตอนต้น
   - ☐ มัธยมตอนปลาย/ปวช.
   - ☐ อนุปริญญา/ปวส.
   - ☐ ปริญญาตรี
   - ☐ อื่นๆ.....
3. ที่อยู่ปัจจุบัน.....
4. ท่านประกอบอาชีพ
   - ☐ รับราชการ/พนักงานรัฐวิสาหกิจ
   - ☐ ทำสวน
   - ☐ รับจ้าง
   - ☐ ค้าขาย
   - ☐ ไม่ได้ทำงาน
   - ☐ อื่นๆ.....
5. รายได้เฉลี่ยของท่านคือ.....บาท/เดือน
6. ท่านเดินทางโดยใช้รถสกายแลบ /สามล้อพ่วงข้าง บ่อยแค่ไหน
   - ☐ เป็นประจำ
   - ☐ บ่อยครั้ง
   - ☐ นานๆครั้ง
   - ☐ อื่นๆ.....
   - ☐ เจ้าหน้าที่สาธารณสุข
7. วัตถุประสงค์ในการใช้รถ
   - ☐ ขนย้ายสิ่งของ
   - ☐ โดยสารไปที่ .....
   - ☐ อื่นๆ.....

ส่วนที่ 2 : ระดับความพึงพอใจของผู้ใช้**<u>รถสกายแล็ป</u>** หรือ สามล้อพ่วงข้าง

คำชี้แจง: โปรดทำเครื่องหมาย ✓ ลงในช่องคำตอบที่ท่านมีต่อการมารับบริการมากที่สุดเพียงคำตอบเดียว

ข้อ	ข้อความ	ความพึงพอใจ		
		มาก	ปานกลาง	น้อย
1	**ด้านบุคลากร** อุปนิสัยของผู้ขับขี่	231 / 92.4%		
2	ท่านมีความมั่นใจและไว้วางใจในการรับส่งโดยสารว่ามีความปลอดภัย			
3	ผู้ขับขี่มีความสนใจต่อสิ่งที่ท่านต้องการ			
4	การใช้ถ้อยคำและน้ำเสียงของผู้ขับขี่ดี			
5	จำนวนโชเฟอร์และรถเพียงพอกับการให้บริการ			
6	**ด้านคุณภาพบริการ** ความรู้ความสามารถในการขับรถและการไปสถานที่ต่างๆของผู้ขับขี่			
7	ท่านได้รับบริการตามที่ท่านต้องการ			
8	ผู้ขับขี่ให้บริการแก่ท่านเช่นเดียวกับบุคคลอื่น			
9	มีการให้บริการในเวลาที่เหมาะสมและจำเป็น			
10	ท่านสามารถเลือกรถหรือโชเฟอร์ที่ท่านต้องการได้			
11	มีความปลอดภัยในการใช้บริการ			
12	มีความรวดเร็วในการใช้บริการ			
13	มีความมั่นใจในการใช้บริการ			
14	การให้บริการมีความสุภาพ เหมาะสม			
15	**ด้านข้อมูลที่ได้รับ** โชเฟอร์แนะนำสถานที่ที่ท่านต้องการ ในกรณีท่านไม่ทราบ			
16	คำแนะนำเกี่ยวกับการขึ้นลงรถที่ปบอดภัย			
17	การบอกกล่าวเมื่อต้องระมัดระวังเพื่อความปลอดภัย			
18	การแสดงเวลาให้บริการในแต่ละวัน			
19	**ด้านความสะดวกในการรับบริ**การ <u>รถ</u> รถมีความสะอาดและการถ่ายเทอากาศ			
20	มีรถเพียงพอต่อการให้บริการ			
ข้อ	ข้อความ	ระดับความพึงพอใจ		
		มาก	ปานกลาง	น้อย
21	มีที่นั่งสำหรับรอรับบริการ			
22	แสงสว่างเพียงพอ ไม่คับแคบ			
23	มีป้ายบอกสถานีรถรับส่งผู้โดยสาร			

24	รถมีความสะอาดเพียงพอ			
25	<u>เวลา</u> เวลาในการรอขึ้นรถเหมาะสม			
26	เวลาในการรอรับบริการเหมาะสม			
27	**ด้านการประสานงานการให้บริการ** มีการจัดระบบคิวในการให้บริการ			
28	มีการส่งต่อให้ใช้บริการรถอื่น ถ้ารถนี้ไม่สามารถบริการได้			
29	มีความสะดวกในการใช้บริการ			
30	**ด้านค่าให้จ่ายเมื่อรับบริการ** ค่าใช้จ่ายเหมาะสมกับบริการที่ได้รับ			

ส่วนที่ 3: ข้อเสนอแนะเพื่อการปรับปรุงบริการ

คำชี้แจง: โปรดแสดงความคิดเห็นของท่านต่อการใช้บริการรถสกายแลปหรือมอเตอร์ไซด์พ่วงข้าง ต่อไปนี้

1. ความสะดวกในการมารับบริการ

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2. การจัดระบบบริการ

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3. ผู้ขับขี่รถ

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4. ข้อมูลเกี่ยวกับการเดินทาง

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5. คุณภาพการบริการ

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6. ค่าใช้จ่ายในการรับบริการ

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7. ด้านอื่นๆ

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แบบคำถามเชิงคุณภาพ (มอเตอร์ไซค์พ่วงข้าง)

สำหรับเจ้าหน้าที่ตำรวจ

ชื่อ.....

1. ปัจจุบันมีการใช้รถมอเตอร์ไซค์พ่วงข้างจำนวนมาก มีการถูกกฎหมายรึเปล่า.....

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2. ข้อดีของการมีรถมอเตอร์ไซค์พ่วงข้างมีอะไรบ้าง .....

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3. ข้อเสียมีอะไรบ้าง.....

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4. ท่านเห็นว่าควรมีนโยบายการสนับสนุนหรือควบคุมการใช้อย่างไรบ้าง (การอบรมการขับขี่, การทำใบขับขี่)

    1. การอบรม.....
    2. การจัดทำใบขับขี่.....
    3. การจดทะเบียนรถ.....
    4. การจัดคิว.....
    5. การตรวจมาตรฐานรถ.....

5. ทางตำรวจมีการเข้มงวดอะไรเป็นพิเศษหรือไม่.....

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แบบคำถามเชิงคุณภาพ (มอเตอร์ไซค์พ่วงข้าง)

สำหรับเจ้าหน้าที่สำนักงานขนส่งจังหวัดขอนแก่น

ชื่อ.....

1. ปัจจุบันมีการใช้รถมอเตอร์ไซค์พ่วงข้างจำนวนมาก มีการถูกกฎหมายรึเปล่า.....

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2. ข้อดีของการมีรถมอเตอร์ไซค์พ่วงข้างมีอะไรบ้าง .....

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3. ข้อเสียมีอะไรบ้าง.....

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4. ท่านเห็นว่าควรมีนโยบายการสนับสนุนหรือควบคุมการใช้อย่างไรบ้าง (การอบรมการขับขี่, การทำใบขับขี่)

    1. การอบรม.....
    2. การจัดทำใบขับขี่.....
    3. การจดทะเบียนรถ.....
    4. การจัดคิว.....
    5. การตรวจมาตรฐานรถ.....

5. ทางตำรวจมีการเข้มงวดอะไรเป็นพิเศษหรือไม่.....

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แบบคำถามเชิงคุณภาพ (มอเตอร์ไซค์พ่วงข้าง)

สำหรับนักวิชาการ ผู้เชี่ยวชาญ อาจารย์หรือผู้ที่มีความรู้ความเชี่ยวชาญเรื่องอุบัติภัยจราจร

ชื่อ.....

1. ปัจจุบันมีการใช้รถมอเตอร์ไซค์พ่วงข้างจำนวนมาก มีการถูกกฎหมายรึเปล่า.....

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2. ข้อดีของการมีรถมอเตอร์ไซค์พ่วงข้างมีอะไรบ้าง .....

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3. ข้อเสียมีอะไรบ้าง.....

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4. ท่านเห็นว่าควรมีนโยบายการสนับสนุนหรือควบคุมการใช้อย่างไรบ้าง (การอบรมการขับขี่, การทำใบขับขี่)

    1. การอบรม.....
    2. การจัดทำใบขับขี่.....
    3. การจดทะเบียนรถ.....
    4. การจัดคิว.....
    5. การตรวจมาตรฐานรถ.....

5. ทางตำรวจมีการเข้มงวดอะไรเป็นพิเศษหรือไม่.....

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แบบคำถามเชิงคุณภาพ (สกายแล็ป)

สำหรับเจ้าหน้าที่ตำรวจ

ชื่อ.....

1. ปัจจุบันมีการใช้รถสกายแล็ปจำนวนมาก มีการถูกกฎหมายรึเปล่า.....

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2. ข้อดีของการมีรถสกายแล็ปมีอะไรบ้าง .....

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3. ข้อเสียมีอะไรบ้าง.....

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4. ท่านเห็นว่าควรมีนโยบายการสนับสนุนหรือควบคุมการใช้อย่างไรบ้าง (การอบรมการขับขี่, การทำใบขับขี่)

    1. การอบรม.....
    2. การจัดทำใบขับขี่.....
    3. การจดทะเบียนรถ.....
    4. การจัดคิว.....
    5. การตรวจมาตรฐานรถ.....

5. ทางตำรวจมีการเข้มงวดอะไรเป็นพิเศษหรือไม่.....

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แบบคำถามเชิงคุณภาพ (สกายแล็ป)

สำหรับเจ้าหน้าที่สำนักงานขนส่งจังหวัดขอนแก่น

ชื่อ.....

1. ปัจจุบันมีการใช้รถสกายแล็ปจำนวนมาก มีการถูกกฎหมายรึเปล่า.....

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2. ข้อดีของการมีรถสกายแล็ปมีอะไรบ้าง .....

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3. ข้อเสียมีอะไรบ้าง.....

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4. ท่านเห็นว่าควรมีนโยบายการสนับสนุนหรือควบคุมการใช้อย่างไรบ้าง (การอบรมการขับขี่, การทำใบขับขี่)

    1. การอบรม.....
    2. การจัดทำใบขับขี่.....
    3. การจดทะเบียนรถ.....
    4. การจัดคิว.....
    5. การตรวจมาตรฐานรถ.....

5. ทางตำรวจมีการเข้มงวดอะไรเป็นพิเศษหรือไม่.....

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แบบคำถามเชิงคุณภาพ (สกายแล็ป)

สำหรับนักวิชาการ ผู้เชี่ยวชาญ อาจารย์หรือผู้ที่มีความรู้ความเชี่ยวชาญเรื่องอุบัติภัยจราจร

ชื่อ.....

1. ปัจจุบันมีการใช้รถสกายแล็ปจำนวนมาก มีการถูกกฎหมายรึเปล่า.....

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2. ข้อดีของการมีรถสกายแล็ปมีอะไรบ้าง .....

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3. ข้อเสียมีอะไรบ้าง.....

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4. ท่านเห็นว่าควรมีนโยบายการสนับสนุนหรือควบคุมการใช้อย่างไรบ้าง (การอบรมการขับขี่, การทำใบขับขี่)

    1. การอบรม.....
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    4. การจัดคิว.....
    5. การตรวจมาตรฐานรถ.....

5. ทางตำรวจมีการเข้มงวดอะไรเป็นพิเศษหรือไม่.....

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Appendix C:

Skylab

Sidecar

Focus group discussion of sidecar drivers

Meeting of researcher

Focus group discussion of sidecar drivers


Coca-Cola


เติมคุณค่า
5 บาท

Research Report 2009

ATRANS