

Final Report

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ASIAN TRANSPORTATION RESEARCH SOCIETY

**Managing Change in Driving Behaviour
for Creating Safe Community by
Students and Public Participation**

Phase I

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Phase I

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CHAPTER 1 Introduction

1.1 Introduction

In 2015, Thailand has been ranked the second highest in road traffic fatality rate in the world according to the World Health Organization (WHO, 2015), with 36 deaths per 100,000 population. Thai government has been putting a lot of efforts and budget to save more lives from road accident. Many activities have been deployed to reduce number of accidents, such as raising public awareness on driving safely through public events and media, improving road geometries, and law enforcement. However, the latest statistics indicates that our efforts have not yet reach the goal of saving lives.

Most of accidents caused by drivers. It was found that three distinct patterns of behaviour have a powerful influence on driver safety: (1) lapses or absentminded behaviour, (2) errors caused by misjudgement of danger or failures of observation, and (3) violations or deliberate neglect of safe driving (Blockey and Hartley 1995; Parker et al. 1995). However, research on driver behaviour has focused almost entirely on individual differences as contributors to unsafe driving behaviour (Moeckli and Lee, 2007). They suggest that safety culture is an important influence on driving behaviour, and plays a critical role in driving safety (Lee, 2006).

It is very likely that improving driving behaviour can decrease accident rate significantly. Safe driving behaviours cannot be achieved by law enforcement alone, and without cooperation from the public. To be successful, changing driver behaviour must be a structured process that is carefully planned and managed seamlessly with public participation.

There are two key questions: what are causes of unsafe driving behaviours? and how to manage change in unsafe driving behaviours? Those who can answer these questions clearly are road users. This project will help to answer the questions by setting process and environment to allow active road users to be researchers and activists in changing driving behaviour.

The project first mainly focuses on students in universities. This is because most young people use two-wheelers which are therefore exposed to the risk of crashes involving larger and faster moving vehicles. Moreover, young people are more prone to take risks on the road, particularly as motorcycle drivers.

Thus, objectives of this research are:

- (1) to establish “ATRANS Road Safety Club” in university level, local community level, and municipality level;
- (2) to design and implement safety interventions for managing change in driving behaviour; and
- (3) to develop young ambassadors for creating safe community.

1.2 Study framework and research questions

The study framework presents in Figure 1. This study is not a pure research, it also involve community engagement. People in selected communities work as assistant researchers. They set up road safety clubs, investigate causes of road accidents in their communities, and design interventions for managing change in driving behaviour. This process is called participatory action research (PAR).



Figure 1.1 Study framework

Each community attempt to answer two research questions including:

- What are the causes of unsafe driving behaviours?
- How to manage change in unsafe driving behaviours?

1.3 Outputs of the projects

Outputs of the projects include:

- “ATRANS Road Safety Club” in university level, local community level, and municipality level;
- Effective safety interventions for managing change in driving behaviour;
- Young road safety ambassadors for creating safe community.

CHAPTER 2 Methodology

One of the basis models for understanding change was developed by Kurt Lewin in the 1950s, and is still used today. His model is for managing change known as three steps: Unfreeze – Change – Refreeze. This model is elaborated into five phases to manage change in driving behaviour (Greenroad Technologies, 2015), as shown in Figure 1.

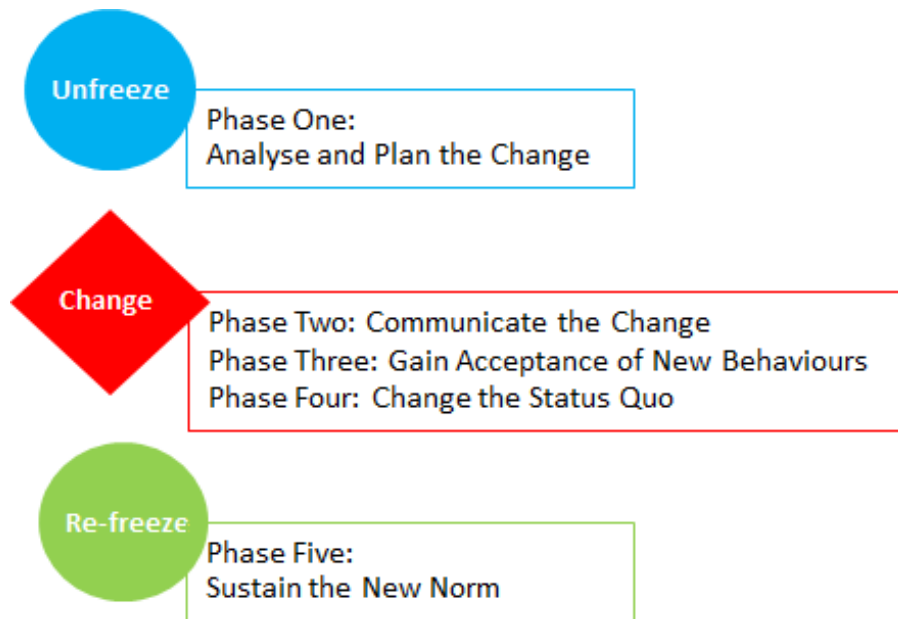


Figure 1 Model for managing change in driving behaviour

Firstly, “unfreeze” current behaviours, accident data in study areas will be collected and analysed. Secondly, “change”, countermeasures will be designed and communicated to gain acceptance from road users, then the measures will be implemented to manage change of unsafe driving behaviours (status quo). Finally, the best practice will be propagating to the public to ensure that the behaviour changes that make driving risk-free become the permanent norm, and become culture of safe driving.

Methodology of this research is based on Participatory Action Research (PAR). This is defined as “systematic inquiry, with the collaboration of those affected by the issue being studied, for purposes of education and taking action or effecting change” (Green et al., 2003: 419). PAR typically involves community action to address issues raised through the research process (Kemmis and McTaggart 2005). This reframes social research as a powerful form of public engagement (Gibson-Graham 1994).

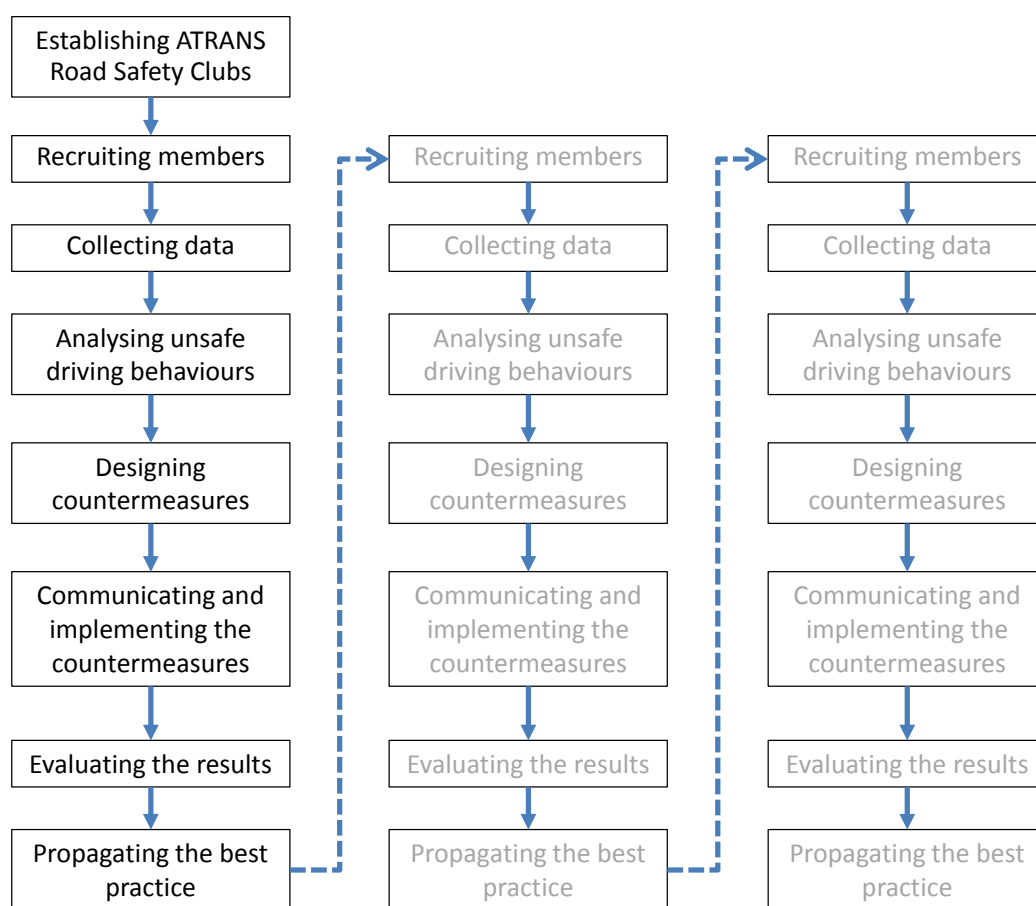
ATRANS Road Safety Clubs are established in universities. The clubs seek to engage members of local communities, including: schools, universities, local governments, community leaders, and the public in general. ATRANS Road Safety Clubs aims to educate, enlighten and empower local communities to create their own safe community. Objectives of the clubs are for studying unsafe driving behaviours, designing and implementing countermeasures to manage the behaviours, and propagating them to road users to make culture of safe driving. The clubs will also develop young ambassadors as trainers to take up this to each individual to bring the change in driving behaviours.

All members of ATRANS Road Safety Clubs participate in research. They share ownership in research projects and activities, with the focus of research defined by analyses of social problems at the local level.

This project is separated into three years, starting from small community (inside university campuses) to the bigger ones (districts and municipalities), as shown in Figure 2.



Figure 2 Project steps



(a) Year 1 University level (b) Year 2 Local community level (c) Year 3 Municipality level

Figure 3 Project activities

Based on the model in Figure 1, for each year, project activities are set as shown in Figure 3. In the first year, it is intended to establish five ATRANS Road Safety Clubs in five universities including Ubon Ratchathani University (UBU), Khon Kaen University (KKU), Prince of Songkla University (PSU), Chiang Mai University (CMU) and Burapha University (BU). The clubs are organised and managed by students, and supervised by ATRANS members. The members are trained about road safety. Then, they plan and study unsafe driving behaviours. Data collection is based on secondary data, ATRANS road safety map, focus group and questionnaire survey. The data are analysed to understand causes of unsafe driving behaviours. Each club may find different unsafe driving behaviours, or the same behaviours but different causes. The clubs design and implement countermeasures (which are suitable for local conditions) to manage the behaviours. The comparative case studies provide an assessment of the project as a whole. Evaluation process is done to identify best practices. Finally, the experiences are summarised and propagated to road users to make culture of safe driving.

In the second and third years, the activities will be expended into larger areas, which are district and municipality levels. The students would be young ambassadors to disseminate the change model and participate in local community for creating safe community.

In summary, the project's goal would be to facilitate collaborations between researchers and regional organisations with selected local communities in order to identify and address local issues regarding driving and road safety. Together, they would develop an action plan to address local driving issues and participate in its implementation. The project would be community-based in order to ensure relevancy for local driving circumstances, and the behaviour changes that make driving risk-free become culture of safe driving.

CHAPTER 3 Results

3.1 Introduction

ATRANS Road Safety Clubs have been established in the five universities. The clubs seek to engage members of local communities, including: schools, universities, local governments, community leaders, and the public in general. ATRANS Road Safety Clubs aims to educate, enlighten and empower local communities to create their own safe community. Objectives of the clubs are for studying unsafe driving behaviours, designing and implementing countermeasures to manage the behaviours, and propagating them to road users to make culture of safe driving. The clubs will also develop young ambassadors as trainers to take up this to each individual to bring the change in driving behaviours. All members of ATRANS Road Safety Clubs participate in research. They share ownership in research projects and activities, with the focus of research defined by analyses of social problems at the local level.

Based on the project activities in Figure 4, five ATRANS Road Safety Clubs were established in five universities, called “Safe You, Safe Me” (SYSM) road safety clubs. The clubs have been organised and managed by students, and supervised by ATRANS members. The clubs’ members were trained about road safety. Then, they studied about unsafe driving behaviours. Data collection was based on secondary data, ATRANS road safety map, focus group and questionnaire survey. The data was analysed to understand causes of unsafe driving behaviours. Finally, the experiences were summarised and disseminated to road users to make culture of safe driving.

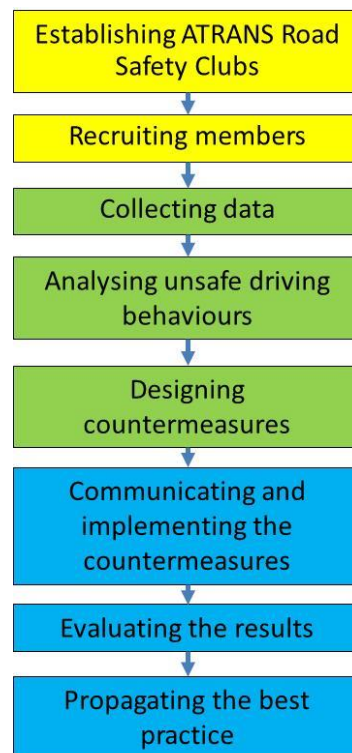


Figure 4 Project activities

3.2 Project activities

There were three project activities including:

- Road safety workshop
- Safety campaigns
- Data collection on students' attitudes and behaviours

3.2.1 Road safety workshop

The workshop aimed to provide practical training for member of the SYSM clubs, who were student representatives from the five universities. The workshop was hosted by Khon Kaen University (KKU) during 13-17 June 2016. The participants included five students from each university, in total 25 participants. (Pictures of the workshop show in Appendix A)

The purposes of the workshop were to train the students to (1) to understand road safety concepts, (2) to be able to identify risk locations, based on the Hiyari model, and design countermeasures (3) to be leaders in their universities, and (4) to work on road safety campaigns.

3.2.2 Road safety campaigns

The safety campaigns were organised in two campuses including Khon Kaen University (KKU) and Prince of Songkla University (PSU). The main aim of the campaigns was to promote road safety among universities' students, in particularly motorcycle riding behaviours, e.g. wearing helmet, speeding, and drink driving.

The safety on campus at KKU (pictures of the workshop show in Appendix B) was took place on 24 November 2016. There were about 100 participations. The activities included: a special lecture on road safety by Khon Kaen Governor, introduction on ATRANS Safety Map, Helmet decoration, giving helmets, demonstrations from Department of Disaster Prevention and Mitigation (DDPM), CPR, and Traffic police.

The safety on campus at PSU (pictures of the workshop show in Appendix C) was took place on 28 November 2016. There were about 200 participations. The activities included: lectures on road safety, introduction on ATRANS Safety Map, helmet decoration, demonstrations of driving simulator by AP Honda, and giving 200 helmets by AP Honda.

3.2.3 Students' attitudes and behaviours

Data collection on students' attitudes and behaviours was done during the road safety campaigns at the two campuses – KKU and PSU. This was based on a questionnaire survey. In total, there were 249 samples (KKU 60 samples and PSU 189 samples).

The survey gathered data including:

- Travel mode and accident experience
- Attitudes towards problems - road safety, cost of living, safety and security, environment in the community, accommodation, and health
- Unsafe driving behaviours
- Helmet wearing behaviour
- Attitudes towards effective of safety measures

Table 1 presents students' travel mode and accident experience. Most of students travel by motorcycle. Some travel by car. A few proportion travel by bus, walking and cycling. More than 70% of students have never involved road accidents. For those who ever had experience in road accident, most of them were only slightly injury.

Table 1 Travel mode and accident experience

Issues		KKU	PSU	All samples
Travel modes	Car	28%	15%	18%
	MC	61%	68%	67%
	Cycling	2%	3%	3%
	Walking	2%	9%	7%
	Bus	7%	5%	5%
Number of accident	0	78%	72%	73%
	1	19%	19%	19%
	2+	3%	10%	8%
Serious of accident	Slightly	67%	65%	67%
	Medium	13%	30%	27%
	Serious	7%	6%	6%

The questionnaire asked student to rate how serious of each problem including: road accident, cost of living, safety and security, environment in the community, accommodation, and health. Compared to other problems, road accident was the highest concerned by students. But only 23% of samples perceive road accident as high or very high important (as shown in Figure 5).

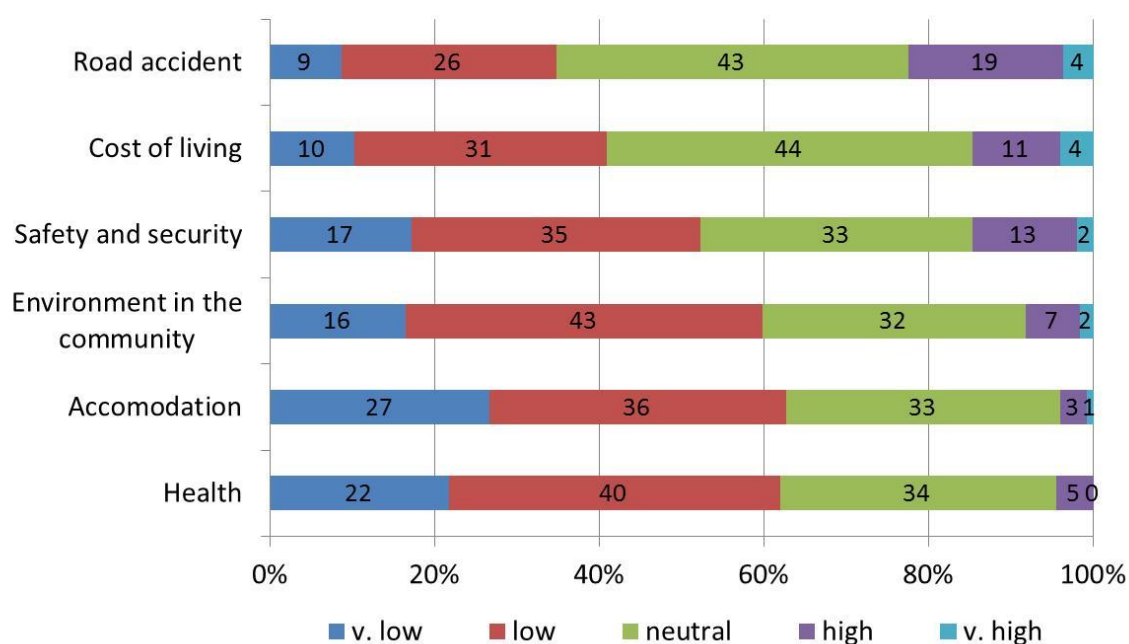


Figure 5 Attitudes towards problems

Students think that the top three unsafe driving behaviours include suddenly overtaking, red light violating, and speeding (as shown in Figure 6).

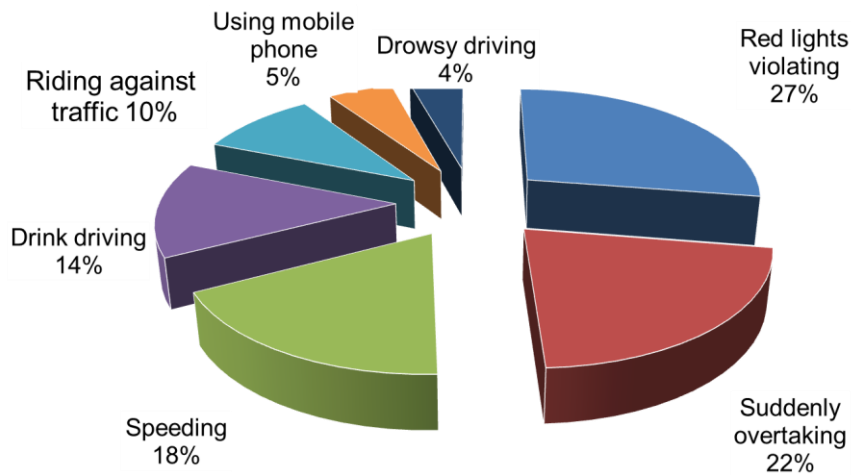


Figure 6 Unsafe driving behaviours

Overall only about a third of students always wear helmet (only 15% of KKU’s students). A half often wear helmet. Some students rarely wear helmet (as shown in Table 2)

Table 2 Helmet wearing behaviour

Frequency	KKU	PSU	All samples
Always	15%	39%	33%
Often	58%	51%	53%
Sometimes	25%	9%	13%
When enforced	2%	1%	1%
Never	0%	1%	0%

60% feel that the all measures: education, legal and physical measures are effective in reducing road accident.

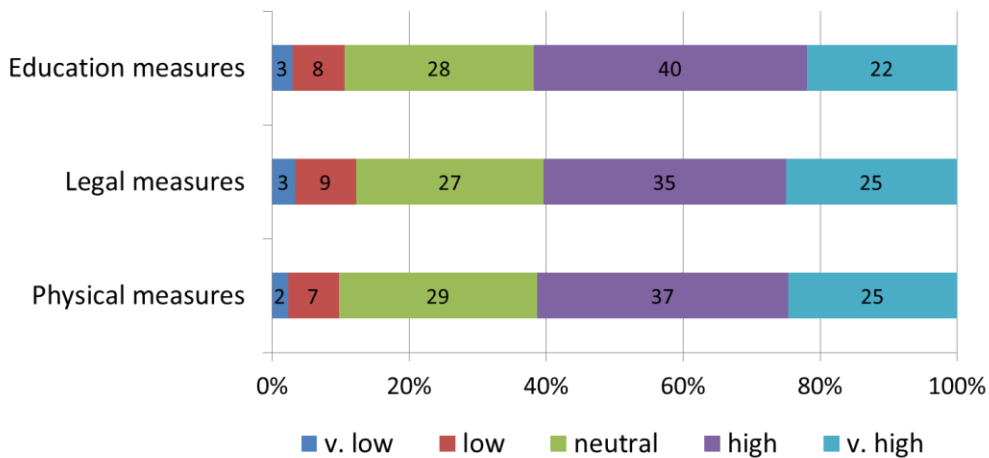


Figure 7 Attitudes towards effective of safety measures

3.2.4 Value of life

Previously, evaluation of value of life is based on human capital costing. This assumes that the economic value of life is equal to the average loss of life expectancy multiplied by per capita gross national product. However, this method is criticised by Mishan (1971) and Schelling (1968) that it is inconsistent with the principles of cost benefit analysis. They argued that costs should reflect the amounts the road user themselves are willing to pay for a reduction in the risk of a fatal accident or injury.

In Thailand the average loss of life expectancy is 35 years and per capita GNP in 2014 is 186,276 Baht. So that the Economic value of life is 6.55 million Baht.

The willingness to pay (WTP) method is a popular technique, known as the contingent valuation method, used to estimate the value of life saved from increased traffic safety (see e.g. Schelling, 1968; Jones-Lee, 1969; Mishan, 1971; Jones-Lee, 1989). An individual's maximum willingness to pay for safety is referred as the Contingent Valuation (CV) approach. This provides a clear indication of the aggregate of the amounts that individuals would be willing to pay for the safety improvement concerned (Jones-Lee and Spackman, 2013).

This study estimates the value of life based on WTP method. The questions in the survey form was prepared following the format developed by Jones-Lee et al. (1985, 1993) with some adjustments to suit local conditions.

Respondents were provided information that in their local situations the fatality rate was 30 per 100,000 populations. Then they were asked how much they were willing to pay to reduce the rate for three cases including: (1) to 27 per 100,000 populations (10% reduction), (2) to 21 per 100,000 populations (30% reduction), and (3) to 15 per 100,000 populations (50% reduction),

For each case, respondents provide an amount that they are willing to pay to safe lives from road accidents. The value of life is calculated from (Md. Nor and Mohd Yusoff, 2003; Chaturabong, et al., 2010)

$$\text{Value of life} = \text{WTP} / \Delta p$$

Where

$$\begin{aligned} \text{WTP} &= \text{Willingness to pay} \\ \Delta p &= \text{The change of the rate of fatality} \end{aligned}$$

It is common that the mean and median are differences. Miller and Guria (1991) suggested the median as the best estimate if the difference is not very high. In this study, it was found that the mean values of WTP were slightly higher than the median, because some respondents (small proportion) provided rather high WTP. So, it is fairer to the majority that the median values of WTP were used to calculate the value of life.

The values of WTP were also different according to differences rate of fatality reductions. The value of life should use the rate of 10% reduction because it is a short term target (Desaigues and Rabl, 1995).

Therefore, in this study the estimated value of life is 6.7 million Baht (as presented in Table 3), which respondents are youngsters and most of them are motorcyclists. This value is similar to the value studied by AIT in 2010, which the respondents are motorcyclists. But it is lower than the value studied by TDRI in 2016, which respondents were from all groups of populations and all travel modes. The values of life based on the WTP method are much higher than the value based on the human capital method.

Table 3 Estimation of value of life

Source	Value of life (mBaht)	Method
This study (KKU and PSU students)	6.7	WTP method
TDRI, 2016	10.0	WTP method
AIT, 2010	5.5 - 7.0	WTP method
PSU, 2007	3.95	Human capital method

CHAPTER 4 Conclusions

In the project - Phase I (2016), five ATRANS Road Safety Clubs were established in five universities including Ubon Ratchathani University (UBU), Khon Kaen University (KKU), Prince of Songkla University (PSU), Chiang Mai University (CMU) and Burapha University (BU). The clubs called “Safe You Safe Me: Road Safety Club” (SYSM). The key project activities in Phase I including: SYSM Workshop, Safety on Campus @ KKU, and Safety on Campus @ PSU, as well as data collection on students’ attitudes and behaviours.

SYSM Workshop was hosted by KKU during 13-17 June 2016. This was to provide practical training for student representatives. There were five students from each university. The purposes of the workshop were to train the representatives for understanding road safety concepts, being leaders in their universities, and working on road safety campaigns.

Campaigns “Safety on Campus” were implemented at KKU on 24 November 2016 and at PSU on 28 November 2016. There were about 100 participations at KKU and 200 participations at PSU. The activities included; for example: special lecture on road safety, introduction of ATRANS Safety Map, helmet decoration, and giving free helmets. Data on students’ attitudes and behaviours was conducted in both universities.

Furthermore, SYSM clubs were established informally in five universities. There have been three different approaches in setting up the SYSM clubs and doing activities in the five universities, as presented in Table 4. For the “voluntary approach” in KKU and PSU, the clubs have been leading by active voluntary students from various faculties and guiding by post-grad students and ATRANS members. For the “systematic approach” in UBU and CMU, the clubs have been linking with the students’ unions and councils. For the “small scale approach” in BU, the club has starting in the Faculty of Political Science.

Table 4 Different approaches in doing road safety activities

Approach	Feature	Case	Remark
Voluntary approach	Leading by active students and Guiding by post-grad students and ATRANS members	KKU PSU	<ul style="list-style-type: none"> • Depending on some students • Need strong support from ATRANS • Progress well in short term • Need further development to be sustainable clubs
Systematic approach	Linking with student unions and councils	UBU CMU	<ul style="list-style-type: none"> • Rather slow progress • Independence from ATRANS • Road safety campaign could be a routine work
Small scale approach	Starting in faculty level	BU	<ul style="list-style-type: none"> • Having flexibility • Difficulty in recruiting members and sustaining the activities

However, the clubs cannot stand by themselves within one year (in Phase I). The clubs need to recruit more members for the clubs, need further development to be sustainable clubs, and need to include road safety campaign as a routine work in the universities, as well as attempt to create innovative interventions to manage change in unsafe driving behaviours. Thus, these whole activities will be continuing in Phase II, which will further manage change in unsafe driving behaviours in the universities and expand to a community, as well as evaluate behaviour change.

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Appendix A - SYSM Workshop in KKU









Appendix B - Safety on Campus @ KKU









Appendix C - Safety on Campus @ PSU











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