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ATRANS
ASIAN TRANSPORTATION RESEARCH SOCIETY

Development of Compiled Road Safety Data and Analysis for Safety Research: Phase 4

March 2018

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List of Abbreviations

ARMS	Accident Report Management System
DOH	Department of Highways
DRR	Department of Rural Roads
EXAT	Expressway Authority of Thailand
HAIMS	Highway Accident Information Management System
ISIS	Injury Surveillance Information System
MOPH	Ministry of Public Health
MOT	Ministry of Transport
OTP	Office of Transport and Traffic Policy and Planning
POLIS	POLice Information System
RSC	Road Safety Culture
RSWG	Road Safety Prevention Working Groups
RTIIS	Road Traffic Injury Information System
RTP	Royal Thai Police
RVP	Road Victim Protection Co., Ltd.
TRAMS	Thailand Road Accident Management Systems
WHO	World Health Organization

CHAPTER I INTRODUCTION

1. Introduction

1.1. Statement of problems

Road crash is a serious problem causing Thai citizen deaths about 10,000 people annually (Royal Thai Police, 2013), as shown in Figure 1. According to the World Health Organization (WHO) Global Status Report in the year 2015, Thailand was ranked as the second highest fatality rate worldwide. It was estimated that Thailand has the road crash fatality rate of 36.2 persons per 100,000 populations (WHO, 2015).

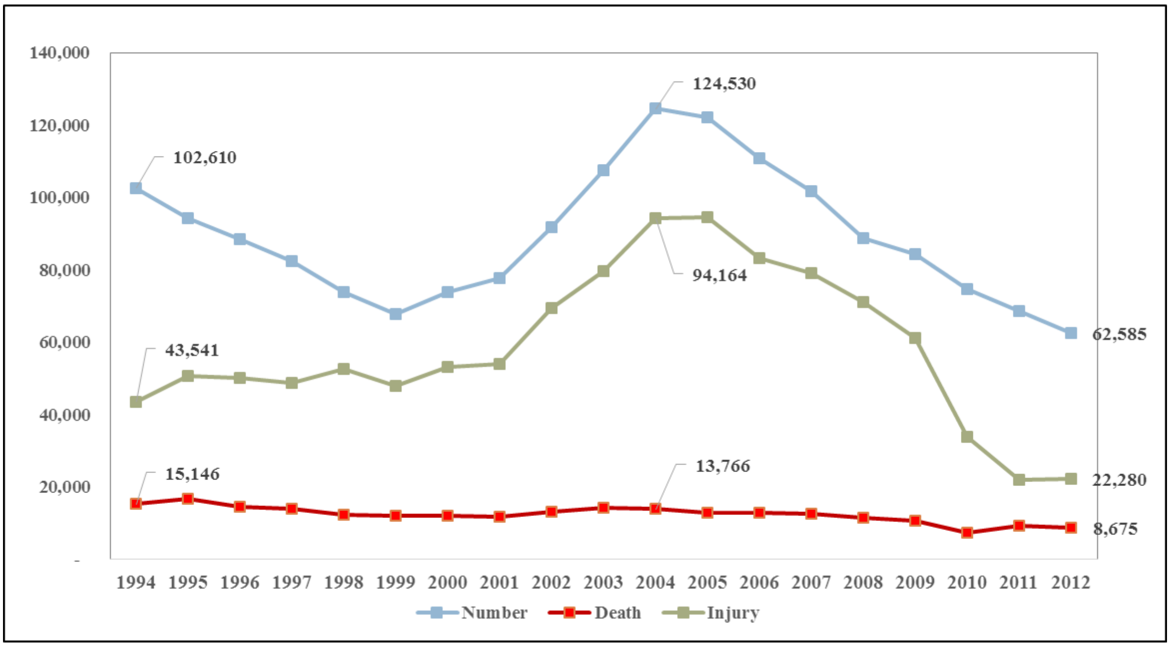


Figure 1 The trend of road traffic accidents in Thailand
Data source: Royal Thai Police (2013)

In the past, various road safety research and measures were conducted to tackle with road crash problems. The development of road safety maps/databases is one of the effective tools for safety professionals to understand the bottom of the issues and to efficiently propose active measures and actions to correct the unsafe problems.

In Thailand, various concerned authorities have developed a variety of road crash databases (ATRANS, 2015), for example, the police database, called POLIS, developed by the Royal Thai Police (RTP), the Highway Accident Information Management System (HAIMS) developed by the Department of Highways (DOH), the Accident Report Management System (ARMS) developed by the Department of Rural Roads (DRR), the Emergency Medical Service (EMS) database developed by the Ministry of Public Health (MOPH), and the Thai Road Safety Collaboration database (ThaiRSC) developed by the Road Accident Victims Protection Company Limited (RVP). From the literature, the developed databases have been used separately for different purposes and lack of an integration, as shown in Figure 2. In addition, most of the safety maps present the locations where people are being killed and seriously or slightly injured.

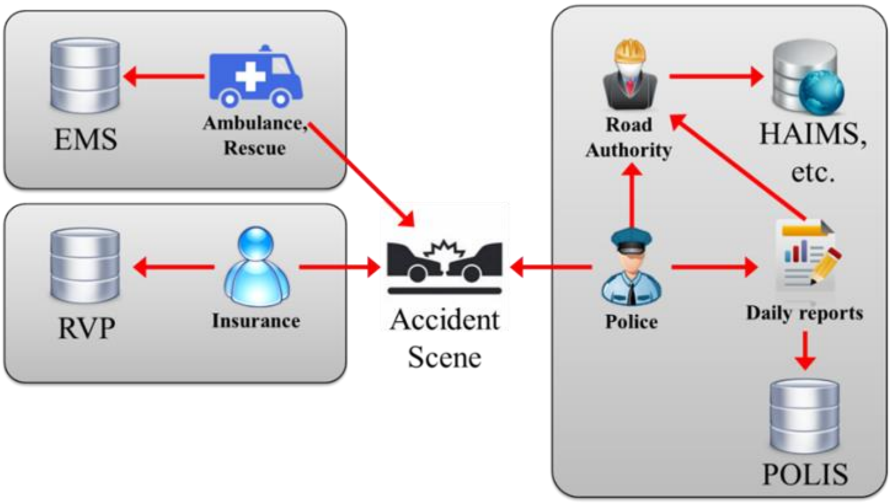


Figure 2 Road accident reporting and databases in Thailand.
Source: ATRANS (2015)

Distinctly, the safety map developed by the Honda company in Japan collects the sudden braking information from Inter-Navi system in the Honda cars running over the country, and the traffic accident information from all road users. This safety map has been developed from the voice of everyone in the hope and looks forward to the world that everyone can live in peace more (Honda Motor Co., Ltd., 2017).

ATRANS launched a 3-year common research project (the Year 2014-2016) to tackle the road safety issue. The research project focuses on the development and implementation of the interactive road safety map application called “ATRANSafetymap” (or shortly ATRANSafety App). The application could

- allow anyone to easily access and perceive the incident/crash information for traveling daily or during national holidays (e.g. New year, Songkran festival);
- allow concerned authorities to apply the collected data of crash and risk locations for enhancing road safety, e.g., identification of hazardous locations (passive approach), implementation of road safety audit (active approach);
- be further developed by integrating previous ATRANS research tools, for example, driving styles evaluation using smartphones.

The ultimate outcome of this research would increase attention and awareness of local people and road safety related agencies in perceiving that road accident is a high risk for himself/herself, his/her family, and the society. If so, with no enforcement their behavior would change to be a safety culture.

The common research project is divided into three phases as shown in Figure 3. The details of each phase are explained comprehensively as follows.

Figure 3 Development of ATRANSafety Applications for Safe Communities.

Phase 1: Review of current practices (the Fiscal year 2014)

The effort was made to explore road traffic safety databases. The literature review showed that various road safety maps and databases have been developed under different platforms for different purposes. Among them, the HONDA safety map and its database are one of the potential prototypes that could be applied to Thailand. Various potential sources of road crash data and high-risk location (Hiyari) data required for the ATRANSafety App were highlighted. In this phase, the two workshops were held mainly in Khon Kaen and Hat Yai in order to collect the data of crash locations and high-risk locations based on the experience of local residents and road safety agencies (police, rescue teams, and hospital). The data would be used for developing the ATRANSafety App in the second phase of the research.

Phase 2: Development and implementation (the Fiscal year 2015)

The effort was made to develop the prototype of two mobile applications to help to create the crash map and Hiyari map, namely ER (Emergency Room) App and Public App, and their databases. The ER App was designed for the medical staffs in the ER who are responsible for recording the relevant data from road crashes. On the other hand, the Public App was designed for any persons who are willing to help to identify high-risk (Hiyari) locations in their neighborhood. The research team also discussed with the potential users in Khon Kaen province (a pilot study area) such as a hospital, Khon Kaen Provincial Administrative Organization (PAO), and Khon Kaen municipality.

Phase 3: Evaluation process (the Fiscal year 2016)

The third phase of the common research project focused on gaining awareness of the proposed applications and attention to their capability and usefulness. This phase evaluated the ATRANSafety App (both ER and Public applications), proposed the implementation plans, and analyzed the crash characteristics using the data collected by the ATRANSafety App.

From the above progress, there were some gaps from the research need to be fulfilled, especially, the capability of the Public App.

1.2. Research objectives

This extension phase (Phase 4: the Fiscal year 2017) aims to revise and implement the Public App to Thai society, especially, for local communities. The objectives of this phase are as follows:

- To revise the Public App in the most user-friendly way;
- To employ the revised application in pilot study areas;
- To conduct the before and after study of safety actions in the study areas.

1.3. The scope of the research

In this phase, five main tasks are defined as shown in Figure 4.

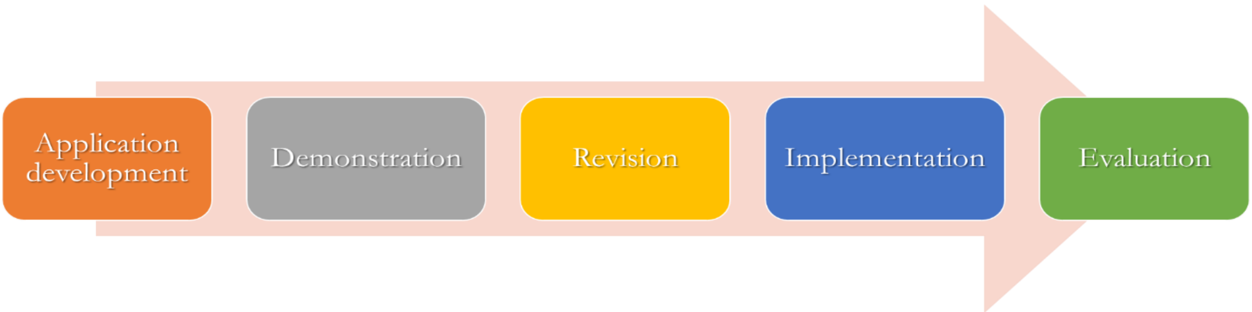


Figure 4 Research framework.

Task 1: Application development

The results of the evaluation process in Phase 3 were used to identify the gaps in ATRANSafety App. It was found that the Public App needed major revisions. The design concept of the modified Public App (shortly named SafetyMap) was proposed in Figure 5.

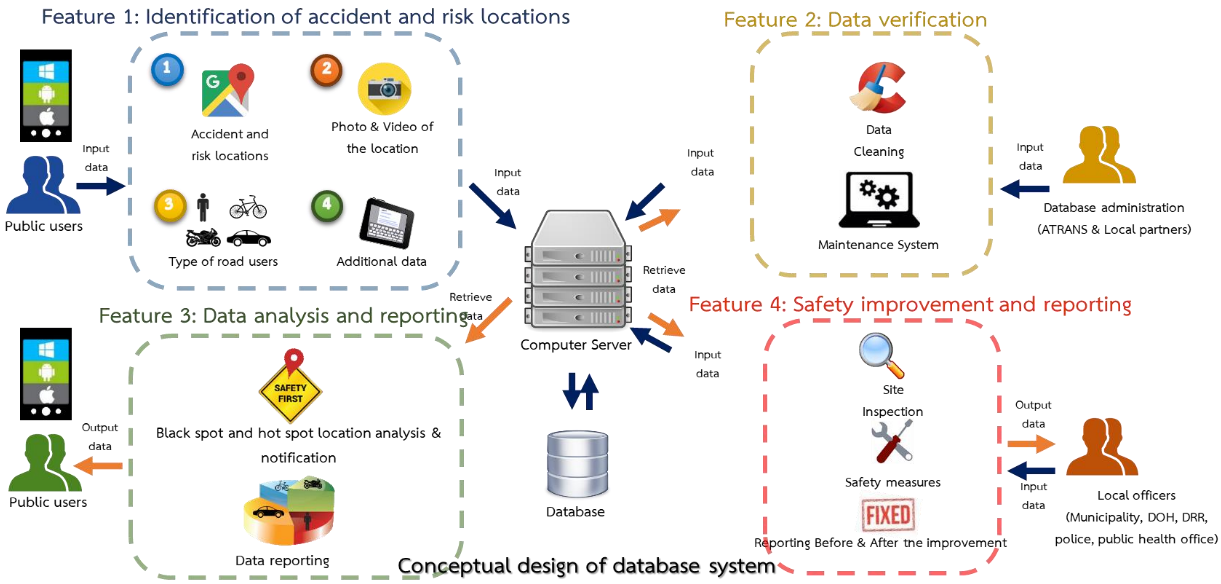


Figure 5 Design concept of SafetyMap

As shown in Figure 5, the SafetyMap consists of four main features. The first feature allows the users (any persons and local concerned agencies) input the accident and risk data such as location, photo/video, type of road users and related data. The data are then verified and stored in the server computer as the second feature of the application. The database administrators (IT staff) can check and verify the data as well as maintain the database system. The third features allow any user to analyze and show the report of black spot and hot spot locations classified by, for example, type of user, the cause of risk. The last feature allows local officers in the municipality, DOH, DRR, police, or the public health office to report the safety improvement of black spot and hotspot locations. Note that the mobile application was developed by applying the cross-platform mobile development so that any user can use the application via iOS, Android, and web browser (e.g. Google Chrome).

Task 2: Demonstration of the application

The application developed from Task 1 were demonstrated to key persons and concerned agencies, for example, municipality, Provincial Health, police for one-day workshops. The feedback was collected to assess the level of satisfaction of the application and to obtain the recommendation for improving the application.

Task 3: Application revision

The feedback obtained from the previous task was applied to revise and update the functions in the application.

Task 4: Final implementation

For local level, the workshops were conducted to implement the SafetyMap application for potential users at the provincial level, for example, police, rescue team, road safety working groups.

Task 5: Research evaluation

The success of the research project in terms of quantity and quality was evaluated at the final stage. For the quantity, a number of crashes and risk locations reported, a number of staff and users trained, and a number of locations for safety improvement were investigated. For the quality, a set of questionnaire surveys were conducted to obtain the feedback from the users and key persons in road safety agencies.

2. Development of SafetyMap application

This chapter presents the results of the application development, demonstration, and revision (Tasks 1 to 3 in Figure 4). The details are as follows.

2.1. Application development

The SafetyMap application was developed based on the Cross-Platform Mobile Development, see the details in Redda, (2012). Therefore, the application can be used on various platforms, for example, iOS, Andriod, and web browsers. The application was tested and compatible with the popular browsers including Google Chrome, Firefox, and Microsoft Edge. The quick response (QR) codes to access the application on different platforms are shown in Figure 6. In addition, the line ID “ATRANS Safety” was generated to answer any inquiry from and keep in touch with the users.

In the application, as shown in Figure 7, there are four main functions, including identification of the crash location, identification of risk location, view the report, and navigation

For the first function, the authorized users (police and rescue team) can identify the location of any crash occurred in their response area(s). The steps to identify the crash location are summarized in Figure 8.

For the second function, any users (pedestrian, bike cyclist, motorcyclist, car user) can identify the risk location that may cause an accident to the users. The process to identify the risk location are illustrated in Figure 9.

For the third function, any users can view the reports of crash locations and the risk locations stored in the database. The reports can be classified into two main features. The first feature is the overview report in the Google map format (examples are shown in Figure 11) when the second feature presents the summary reports in table and graph formats. The examples of crash location report are shown in Figure 11a) when the examples of risk location report are shown in Figure 11b).

For the last function, any users can check the locations of risk and crash along their desired route using the Navigation as shown in Figure 12.

Figure 6 QR codes to access the SafetyMap on different platforms

Figure 7 Three main functions in the application

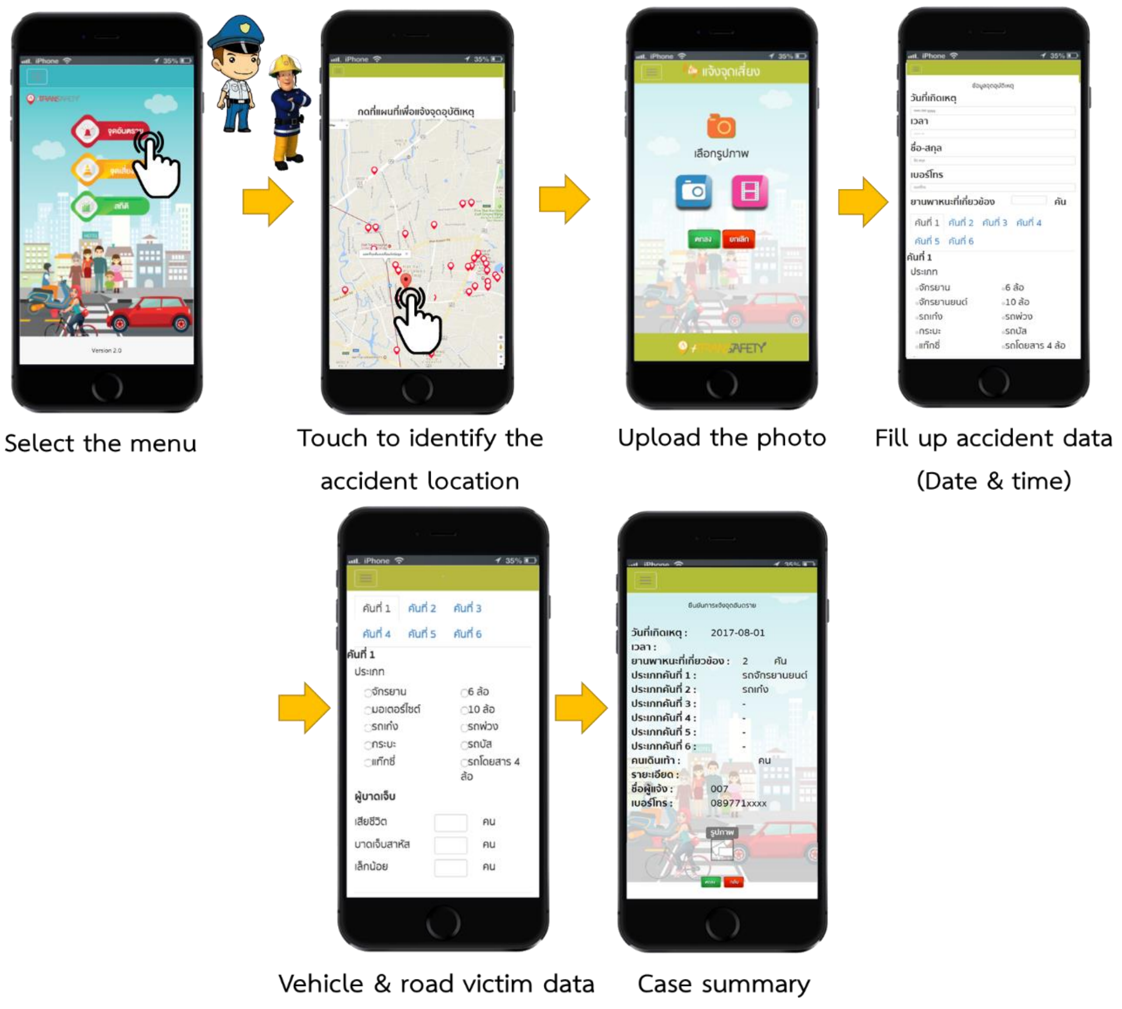


Figure 8 Steps to identify the crash location

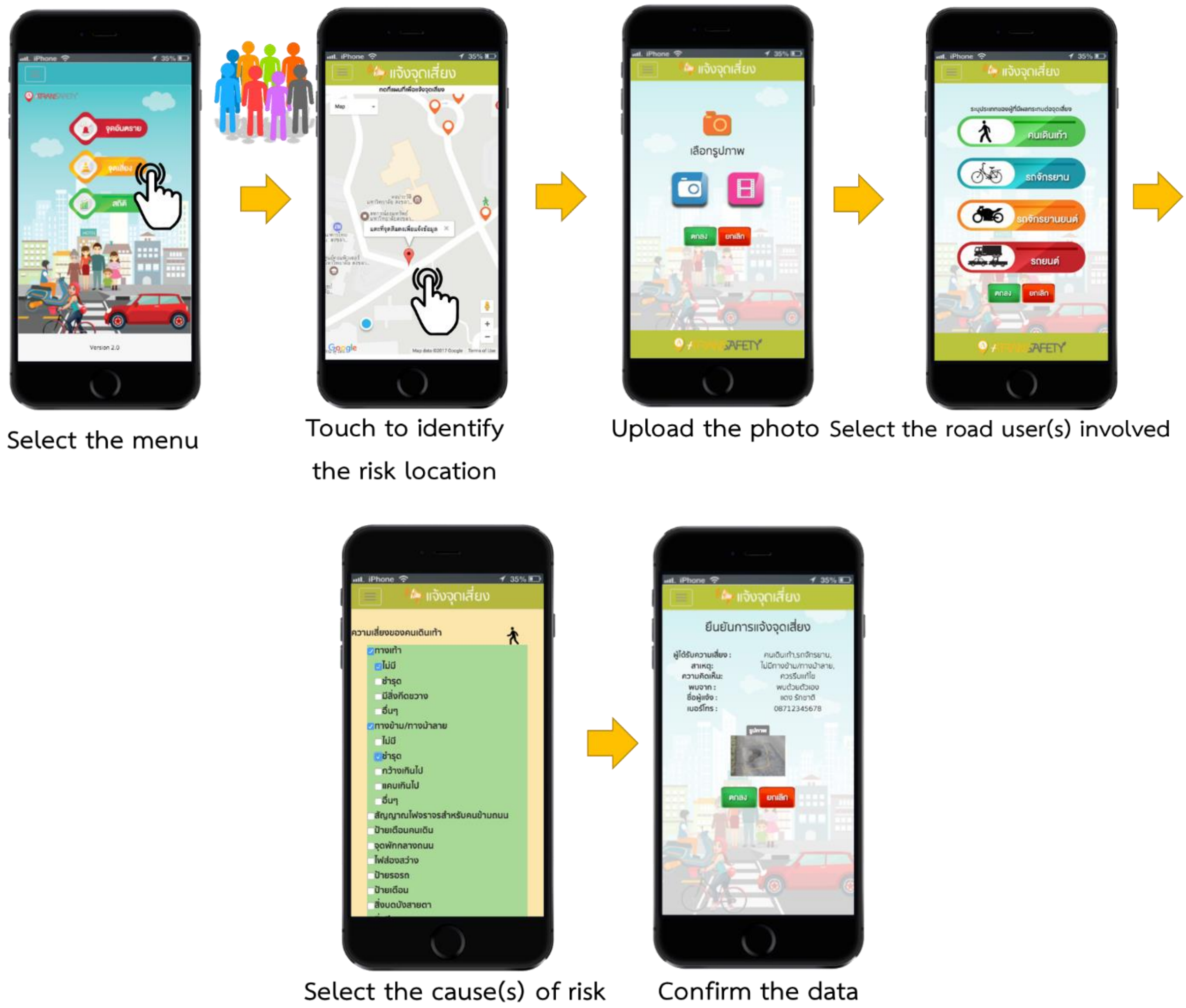
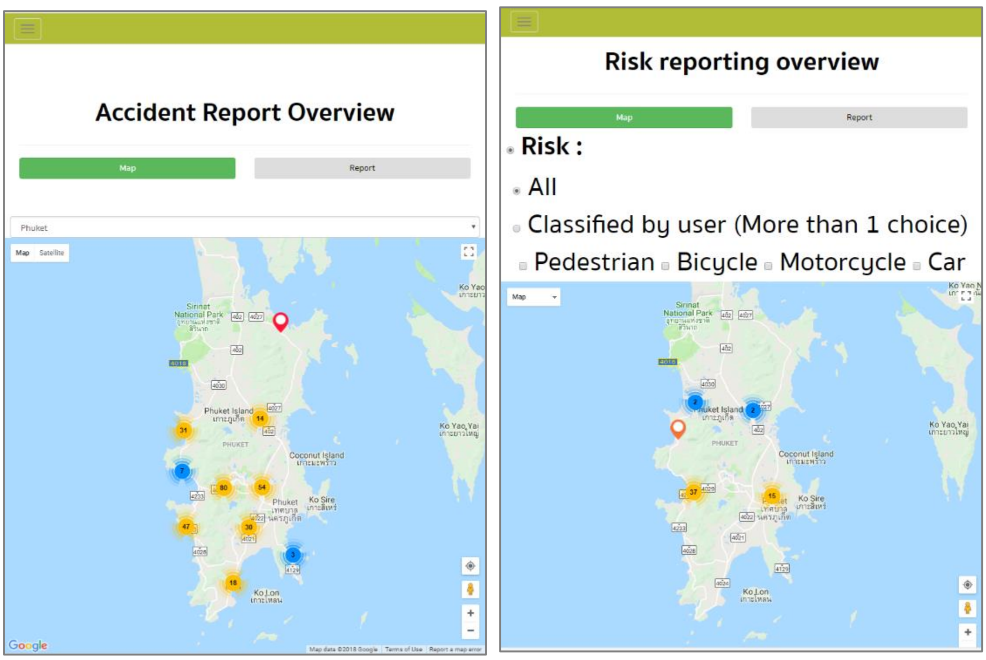
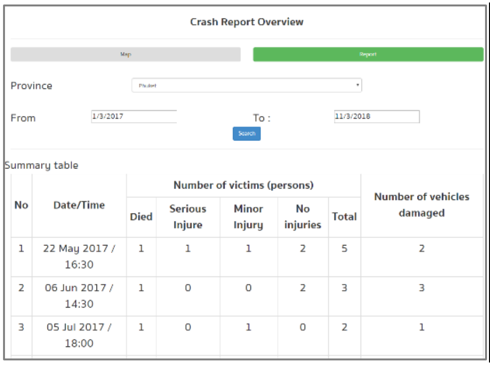


Figure 9 Steps to identify the risk location



a) Crash locations b) Risk locations

Figure 10 Overview reports in Google map format



Crash Report Overview

Map | Report

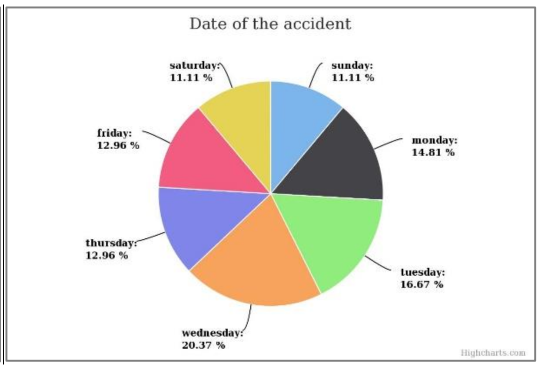
Province

From 1/3/2017 To : 11/3/2018

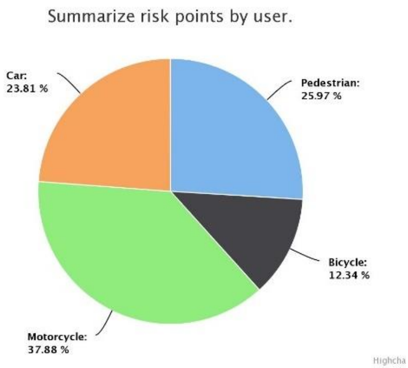
Search

Summary table

No	Date/Time	Number of victims (persons)					Number of vehicles damaged
		Died	Serious Injure	Minor Injury	No injuries	Total	
1	22 May 2017 / 16:30	1	1	1	2	5	2
2	06 Jun 2017 / 14:30	1	0	0	2	3	3
3	05 Jul 2017 / 18:00	1	0	1	0	2	1



a) Crash location report



Top 5 Causes of Group Risk

1. Footpath-Any obstacle 14.97 %
2. Footpath-Defective 12.57 %
3. Pedestrian crossing -Not available 9.58 %
4. Pedestrian crossing sign-Not available 8.38 %
5. Walking behavior-Too many pedestrians 8.38 %

b) Risk location report

Figure 11 Examples of the reports in table and graph formats

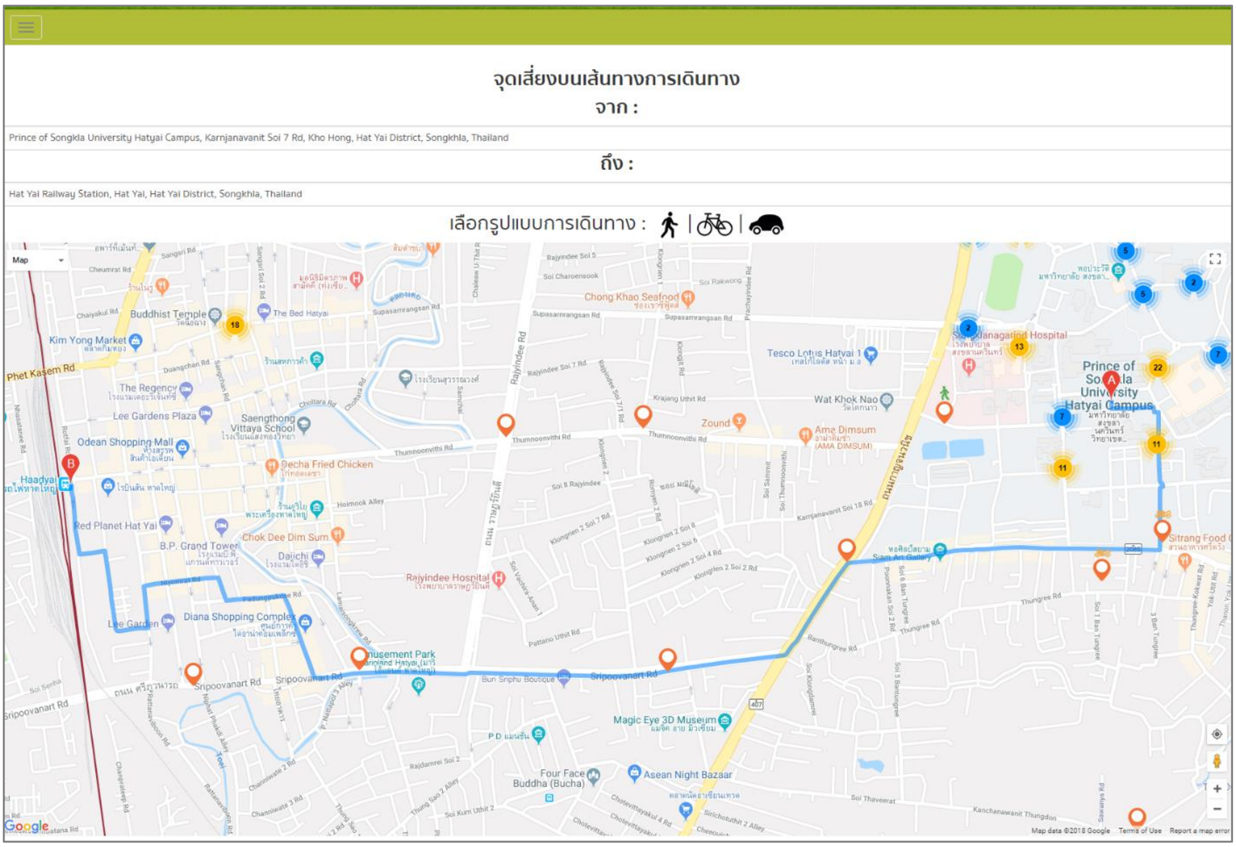


Figure 12 Risk and crash locations along the desired route

Apart from the above main functions, the application allows the authorized staffs from the road related agencies and road safety agencies to update the improvement of risk or crash location. The steps to report safety improvement are shown in Figure 13.

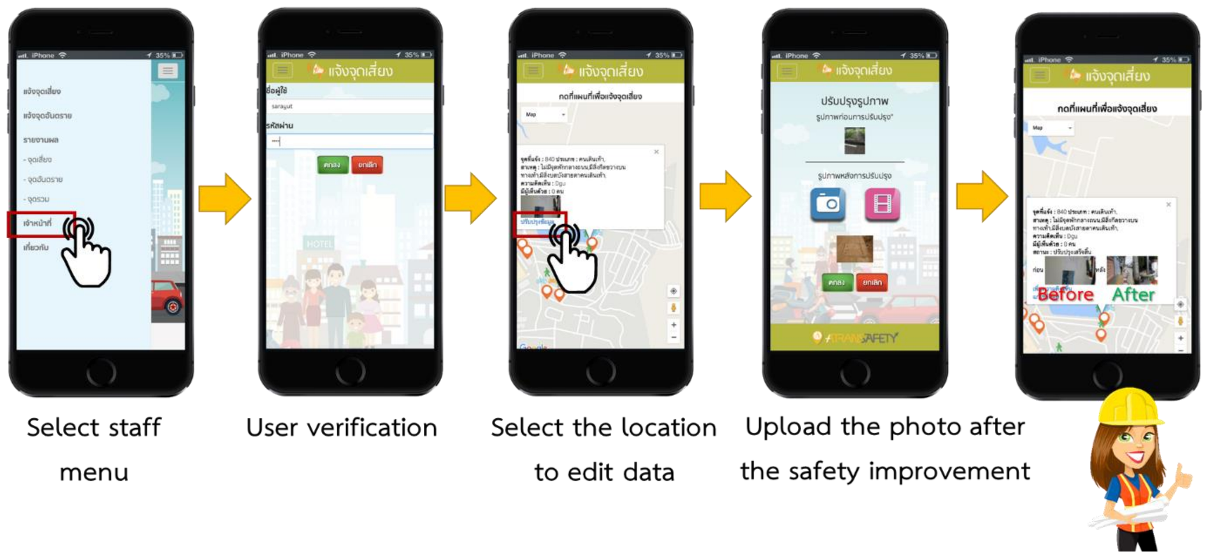


Figure 13 Steps to report safety improvement of risk or crash location

2.2. Demonstration of the application

The application was demonstrated to the staff of the road safety related agencies (e.g., police, department of highways, department of highways, department of rural roads, provincial public health, municipality) in 7 provinces (as shown in Figure 14), which include Chiang Mai, Khon Kaen, Ubon Ratchathani, Bangkok, Suphanburi, Songkhla, and Phuket. The application was also demonstrated to the students and staff in the partner universities. Some photos taken during the demonstrations are presented in Figure 15.

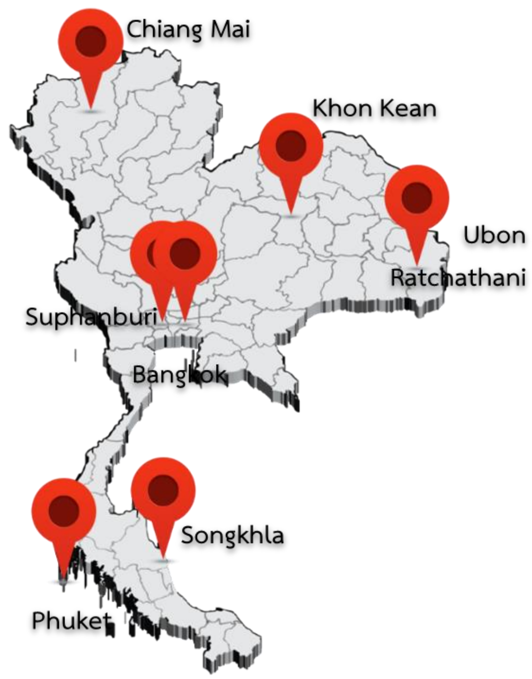


Figure 14 The provinces that the application was demonstrated.

a) Demonstration to road safety authorities

b) Demonstration to local road agencies

c) Demonstration to students and staff in the partner universities

Figure 15 Photos taken during the demonstrations

2.3. Application revision

The feedback from the demonstrations was used to revise the application in order to fit with the users in all platforms as shown in Figure 16.

a) smartphone b) web browser

c) tablet

Figure 16 Application revision for all platforms

3. Application implementation and evaluation

This chapter presents the results of the implementation and evaluation of the application (Tasks 4 and 5 in Figure 4).

Implementation workshops at the provincial level were conducted in three provinces, including Suphanburi, Phuket, and Khon Kaen. In each workshop, the copies of application manual (in Thai) and related material as shown in Figure 17 were distributed to the participants. In addition, a series of short films (shown in Figure 18) introducing the application and how to use were presented. The details are explained comprehensively in the following subsections.

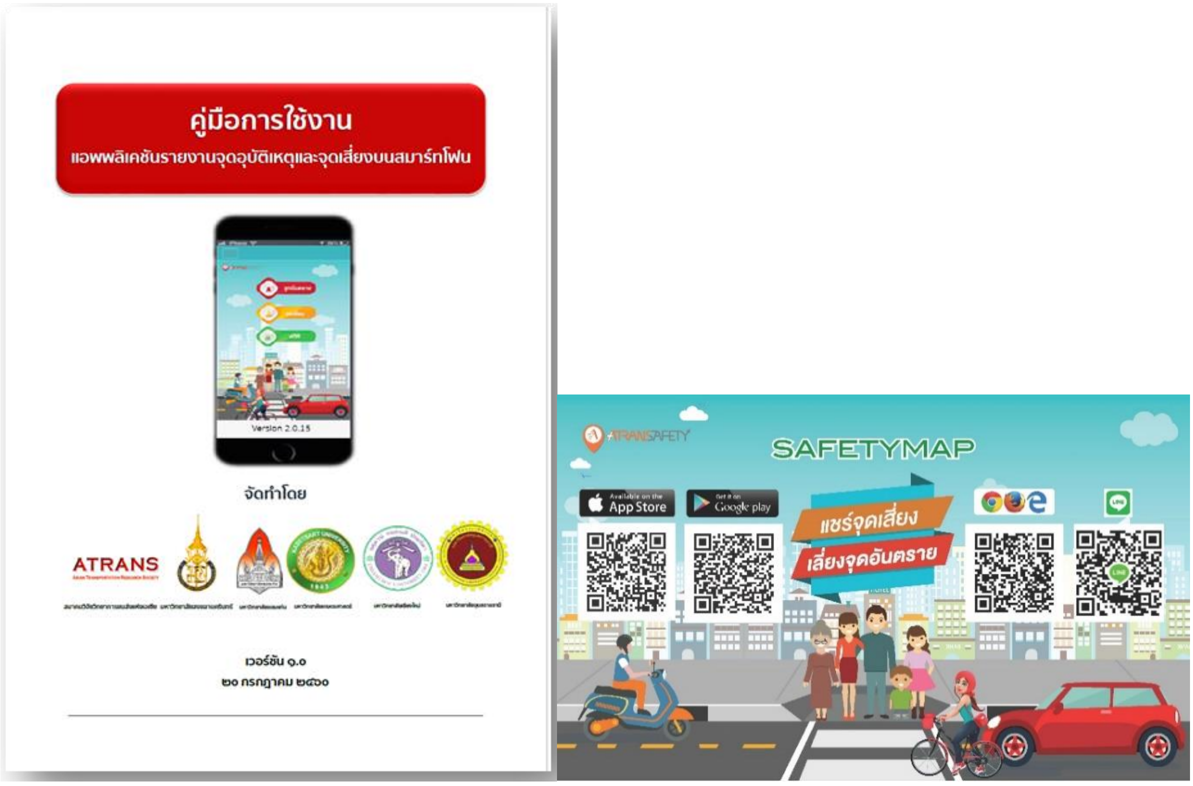


Figure 17 Application manual

Figure 18 Short films introducing the application

3.1. Implementation in Suphanburi province

In Suphanburi, two workshops were conducted on 6th July 2017 and 19th August 2017. The first workshop was conducted at Suphanburi Provincial Police and about 70 police officers attended the workshop as shown in Figure 19a). The second workshop was conducted at Ta Rahad Municipality and about 50 local people attended the workshop as shown in Figure 19b).

Apart from the two workshop, the project member was kindly invited to present the SafetyMap application to 12 mentors of Road Safety Prevention Working Groups (RSWG) in the central region on 20th January 2018 at Bueng Chawak. Some photos of the activities are illustrated in Figure 20.

a) 1st workshop at Suphanburi Provincial Police

b) 2nd workshop at Ta Rahad Municipality

Figure 19 Two implementation workshops in Suphanburi province

Figure 20 SafetyMap workshop for RSWG mentors

3.2. Implementation in Phuket province

In Phuket, there were 31 staffs (police officers and EMS staffs) attended the workshop on 11th August 2017 as shown in Figure 21.

Figure 21 Implementation workshop at Phuket Province Police

3.3. Implementation in Khon Kaen province

As a part of road safety workshop in Khon Kaen conducted by IATSS and ATRANS, the SafetyMap was introduced to 45 participants from Department of Rural Roads, Department of Highways, police officers, rescue staffs, and communities on 24th February 2018 at Bureau of Rural Road 6 Khon Kaen as shown in Figure 22.

Figure 22 Implementation workshop at Bureau of Rural Road 6: Khon Kaen

4. Results of data analysis

This chapter presents the analysis results of data collected in the database between April 1, 2017, and February 28, 2018. As shown in Figure 23, a total number of users visited the application (report risk and crash locations or see the report) during April 2017 to February 2018 are 82,635. The most of them (95%) visited the application via web browsers (e.g., Google Chrome, Firefox, Microsoft Edge). Only 3% (2,786 users) and 2% (1,627 users) visited the application via iOS application (Apple store) and Android application (Google play), respectively. Most of the users prefer using the application via the web browsers rather than the other platforms because the iOS and Android applications sometimes counter with technical problems and needs for updating the new version of the applications.

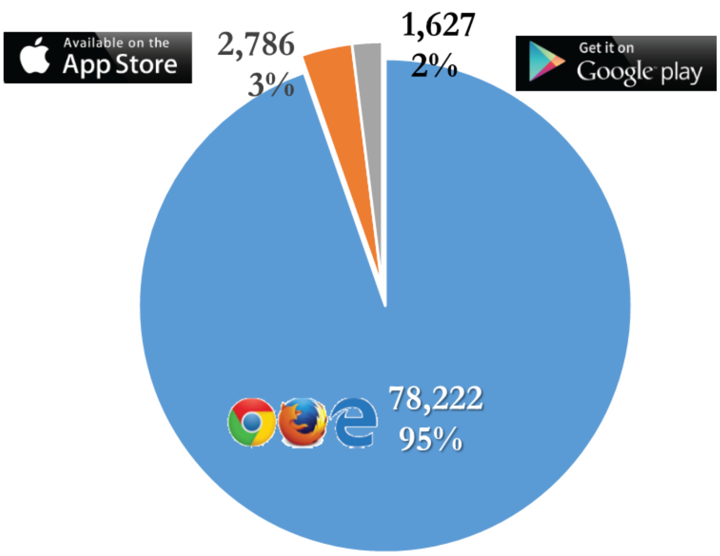


Figure 23 Number of users visited the application

4.1. Results of crash locations

From the database, there are a total of 487 crash locations reported using the application during April 2017 and February 2018. Figure 24 shows that 286 crashes (59%) occurred in Phuket, followed by 118 crashes (24%) in Songkhla, 66 crashes (14%) in Suphanburi and 17 crashes (3%) in other provinces.

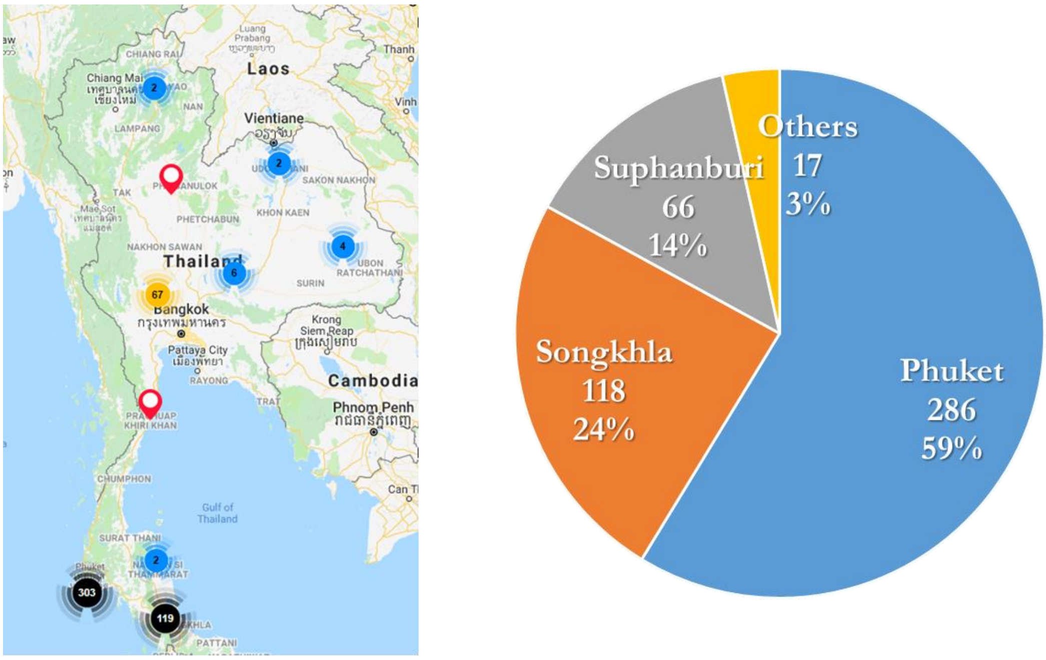


Figure 24 Number of crash locations reported in the database

The 487 crashes reported in the database resulted in a total of 850 casualties and 696 vehicles involved. Figure 25 shows that among the 850 casualties the most of them (53%) were slightly injured, followed by no injured and seriously injured (18% each group) and dead 11%. In addition, Figure 26 shows that from the 696 vehicles involved the top three vehicle types involved the crashes are the motorcycle (36.3%), passenger car (28.5%), and bicycle (18.2%), respectively. From this result, it can imply that more than half of the casualties (54.5%) are related to vulnerable road users (motorcyclist and bicyclist).

Figure 27 shows the percentage of crashes classified by day of the week. It is found that a number of crashes occurred on each day are almost similar. However, the crashes most frequently occurred on Monday (19%). Regarding the time of crashed occurred, Figure 28 illustrates that the crashes often occurred at 15:01-18:00 (3:01-6:00 p.m.).

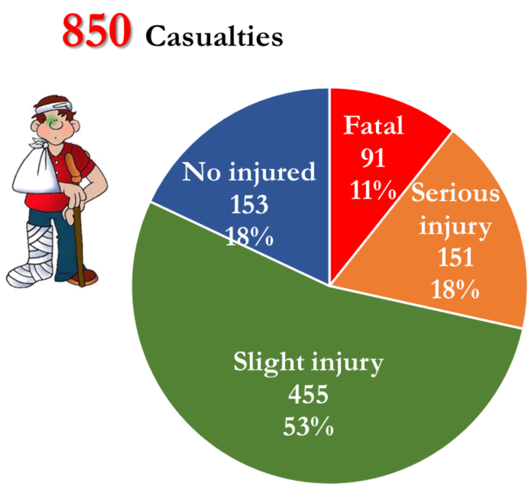


Figure 25 Percentage of casualties classified by injury type

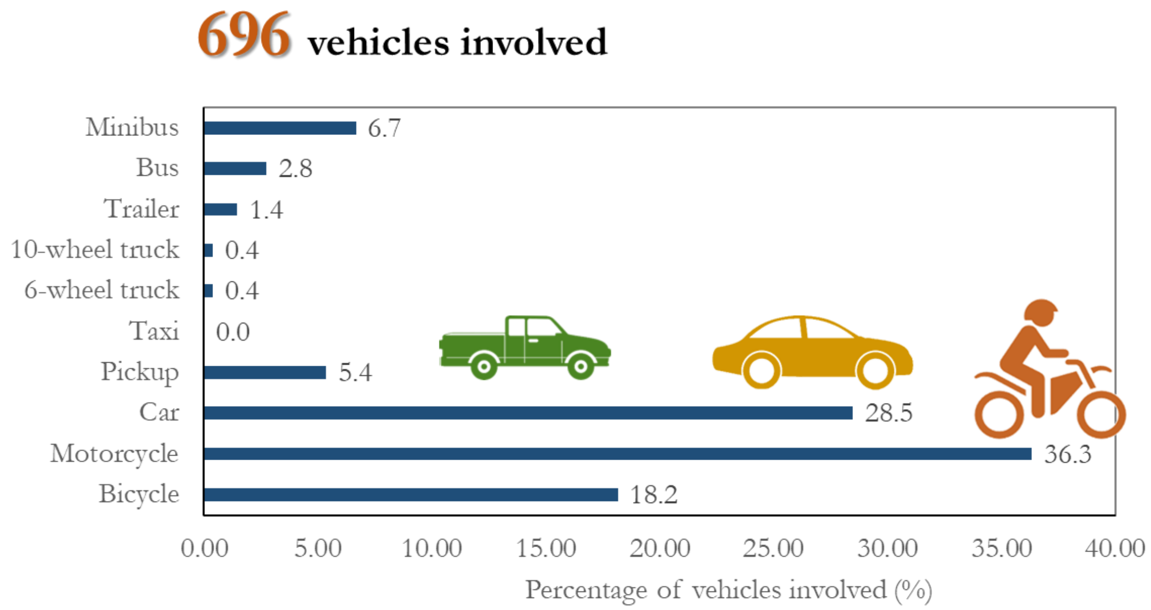


Figure 26 Percentage of vehicles classified by vehicle type

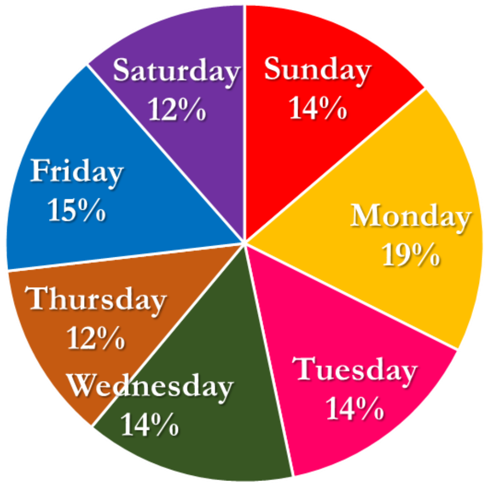


Figure 27 Percentage of crashes classified by day of the week

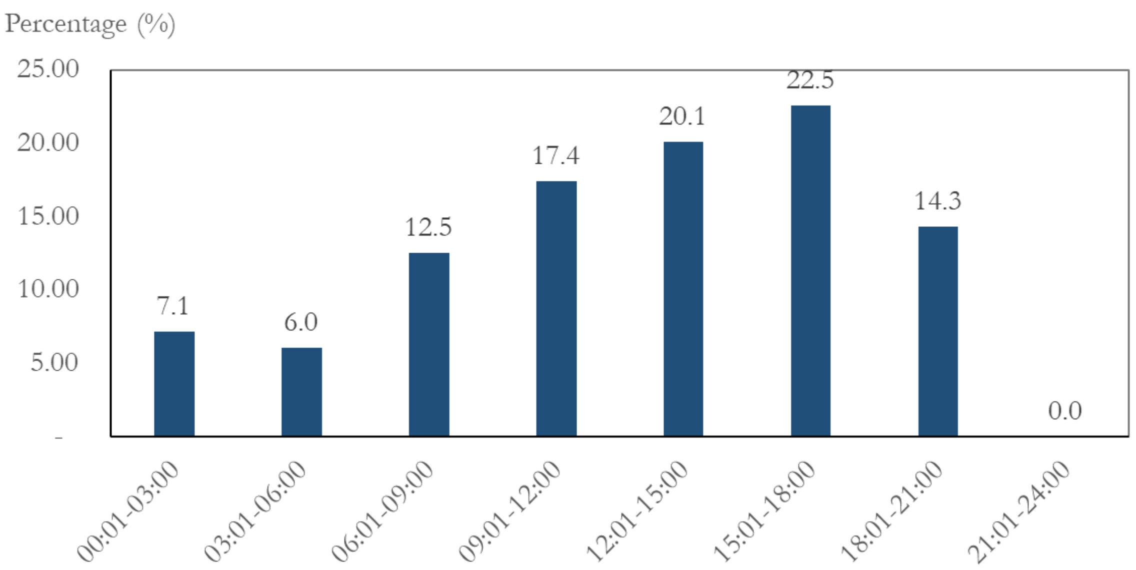


Figure 28 Percentage of crashes classified by time of day

From the crash locations reported in the database, the details of crash locations in Phuket and Songkhla were investigated. Figure 29 shows that from the 286 cases in Phuket 51% happened along the road sections (midblock) and 49% occurred at the junctions. Regarding the crashes occurred along the road sections, 62% were on the straight sections, 36% on the curves, and only 2% nearby the U-turns. For the crashes occurred at the junctions, the top two locations (94%) were found at the 3-leg intersections (54%) and 4-leg intersections (40%). The less of them were at the roundabouts (3%), U-turns (2%) and more than 4-leg intersections (1%), respectively.

Similarly, in Songkhla, Figure 30 shows that from the 118 cases 52% happened along the road sections (midblock) and 48% occurred at the junctions. Regarding the crashes occurred along the road sections, 65% were on the straight sections and 35% on the curves. For the crashes occurred at the junctions, the top two locations (92%) were found at the 3-leg intersections (52%) and 4-leg intersections (40%). Only 8% were at the roundabouts. However, there is no crash occurred at any U-turn.

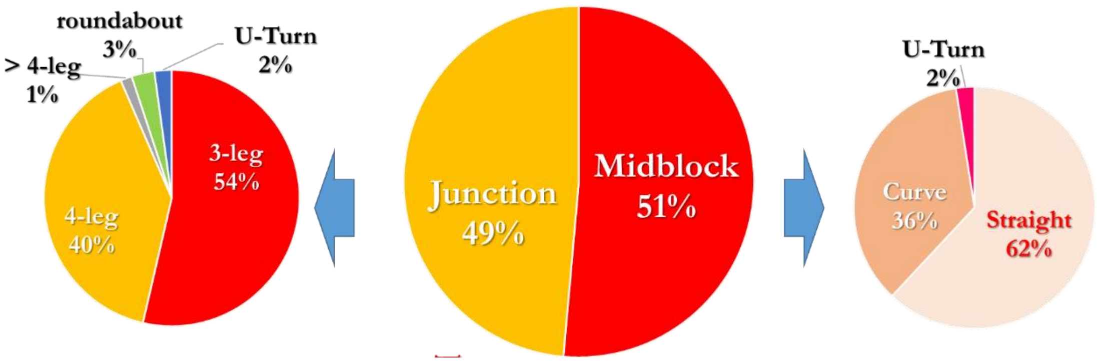


Figure 29 Crash locations in Phuket classified by type of road section

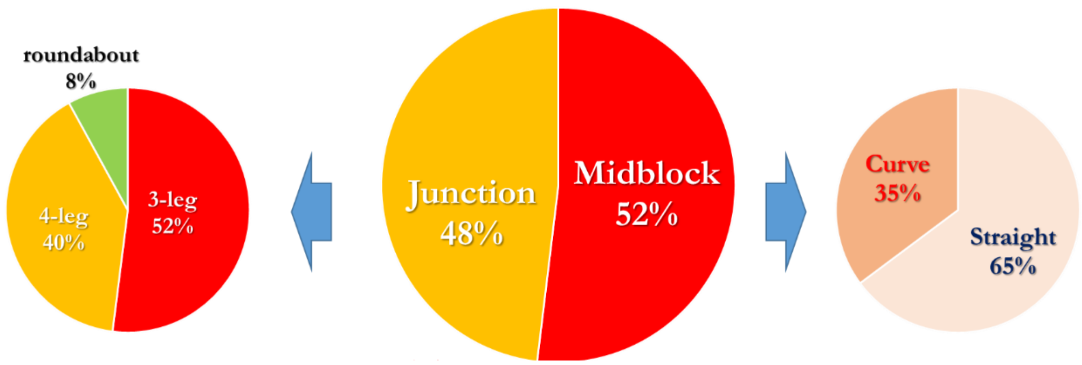


Figure 30 Crash locations in Songkhla classified by type of road section

4.2. Results of risk locations

From the database, there are a total of 554 risk locations reported during April 2017 and February 2018. Figure 31 shows the number of risk locations in different provinces reported in the database. It is found that a total number of risk locations reported are 554 records. From the 554 risk locations reported, Figure 32 shows that more than three-quarter of road users affected by the risk locations are vulnerable road users, i.e., motorcyclist (38%), pedestrian (26%), and bicyclist (13%) when 23% are car drivers.

Regarding the top five risk factors related to each road user, Figure **33** shows that for the pedestrian the obstacle on the walkway is the most risk factor (15.4%), followed by broken surface (13.0%), no crosswalk (9.9%), no crosswalk sign (8.6%), and walking behavior (8.0%), respectively.

For the bicyclist, Figure **33** shows that unsmooth drain cover is the top risk factor (15.2%), followed by unsmooth surface (10.6%), no bicycle warning sign (9.1%), no traffic light (7.6%), and guardrail (7.6%), respectively.

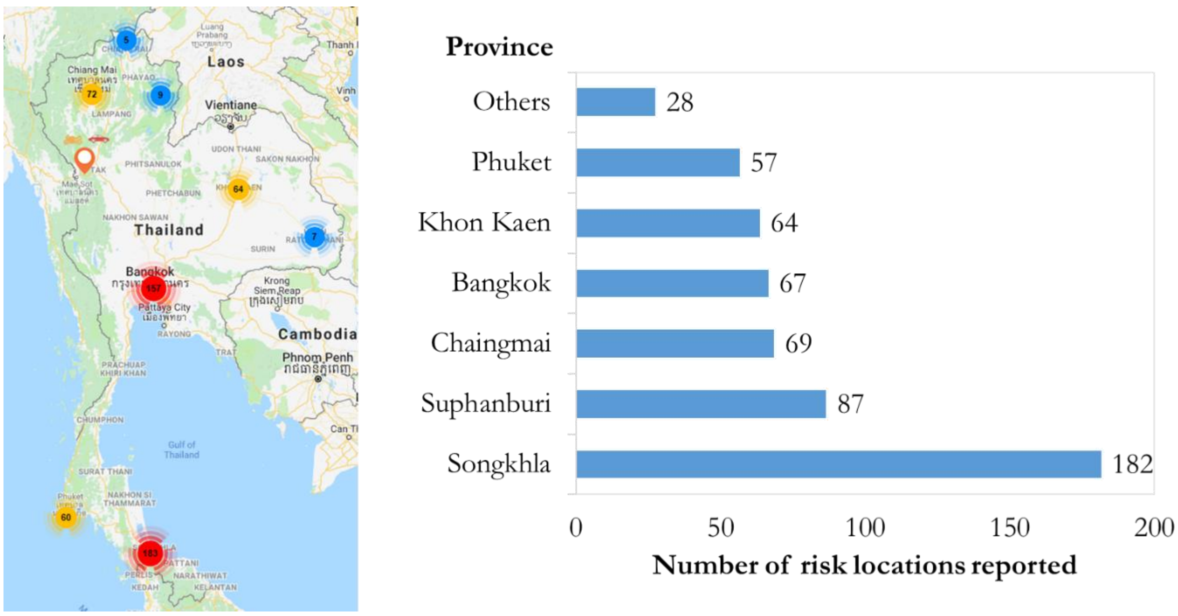


Figure 31 Number of risk locations reported in the database

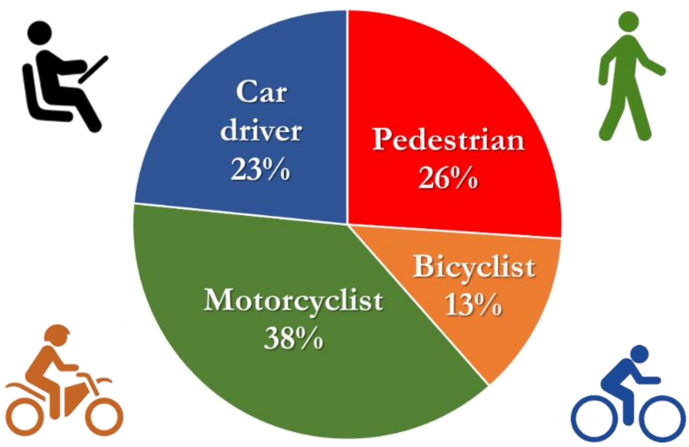


Figure 32 Percentage of road users involving in risk locations

For the motorcyclist, Figure **33** shows that no motorcycle lane is the first risk factor (6.3%), followed by over speeding (6.0%), no motorcycle warning sign (5.6%), broken surface (5.3%), and too narrow traffic lane for bicycle (4.6%), respectively.

Finally, for the car driver it is found that no traffic light at the intersection and non-reflective road surface marking are the top two factor (8.6% each), followed by no warning sign (7.0%), too wide traffic lane (6.3%), and over speeding (6.3%), respectively.

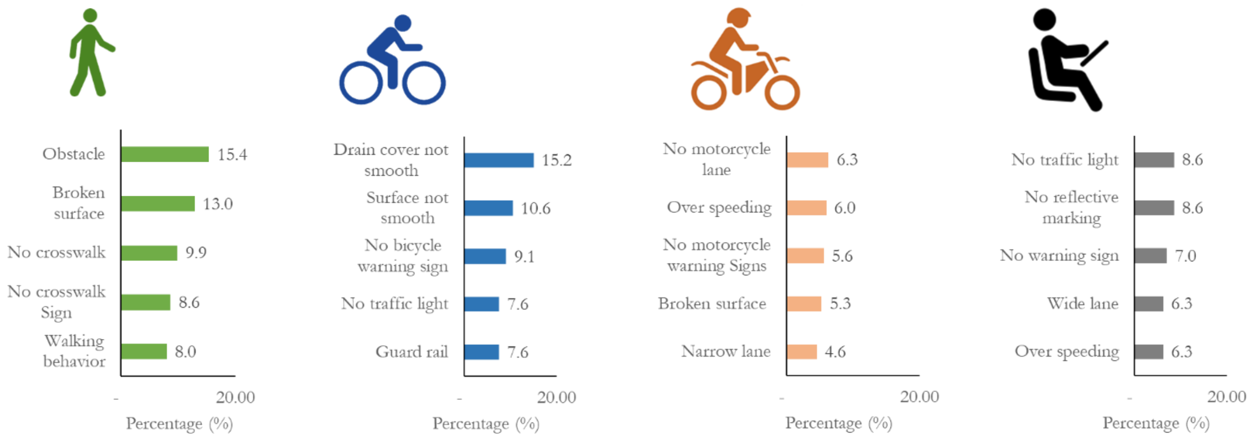


Figure 33 Top five risk factors related to road users

4.3. Results of road safety improvement

The locations of crash and risk reported were used by local agencies in order to improve road safety. Some improvements can be illustrated from Figure 34 to Figure 37.

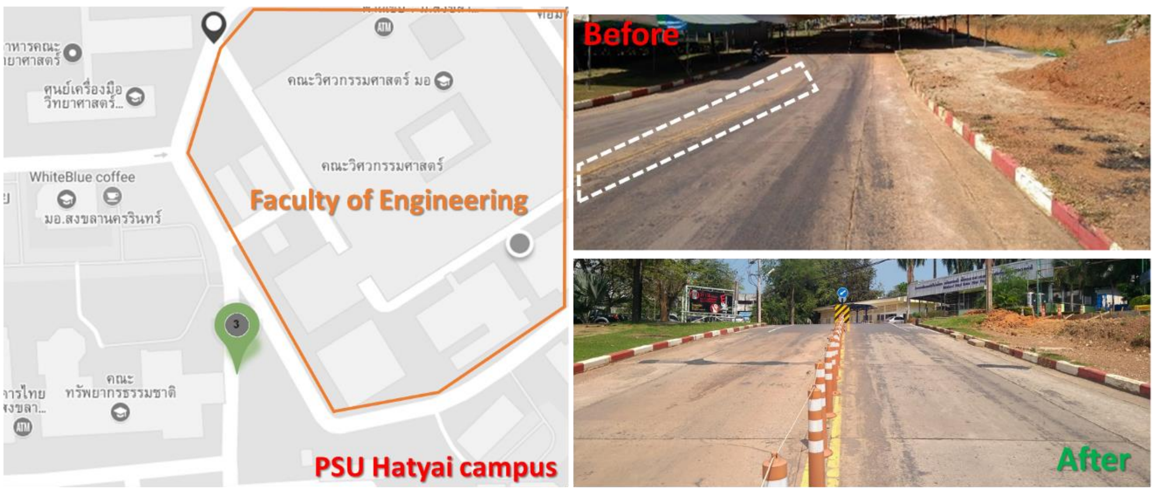


Figure 34 Example of road safety improvement in Songkhla: Case 1

Figure 35 Example of road safety improvement in Songkhla: Case 2

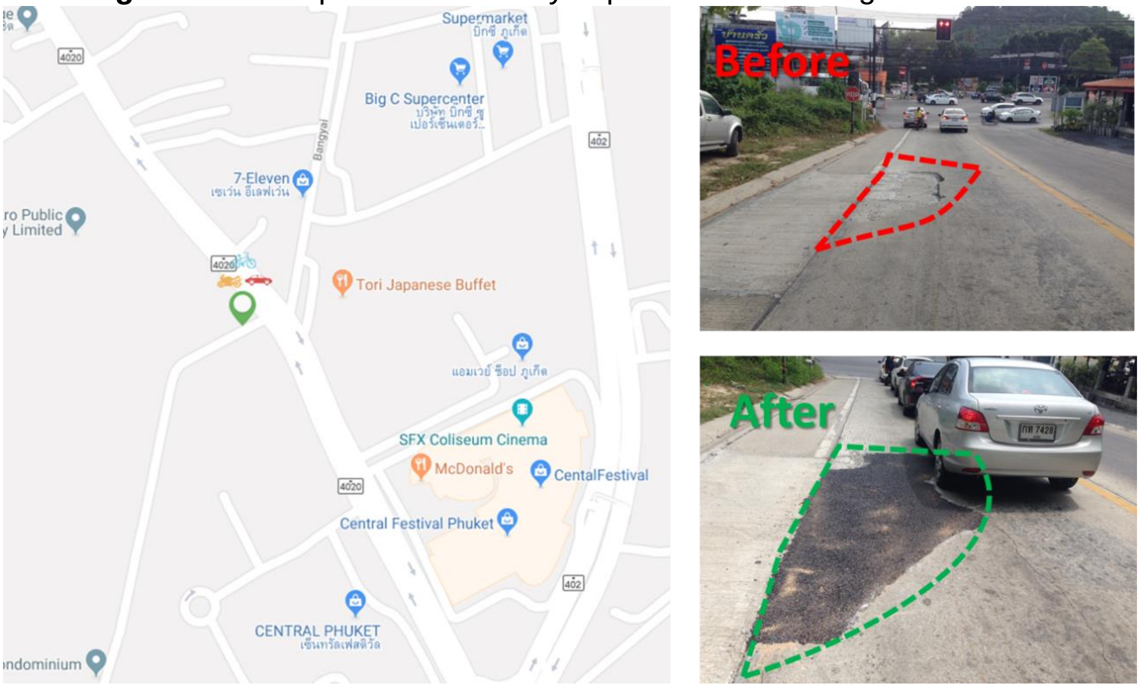


Figure 36 Example of road safety improvement in Phuket: Case 1

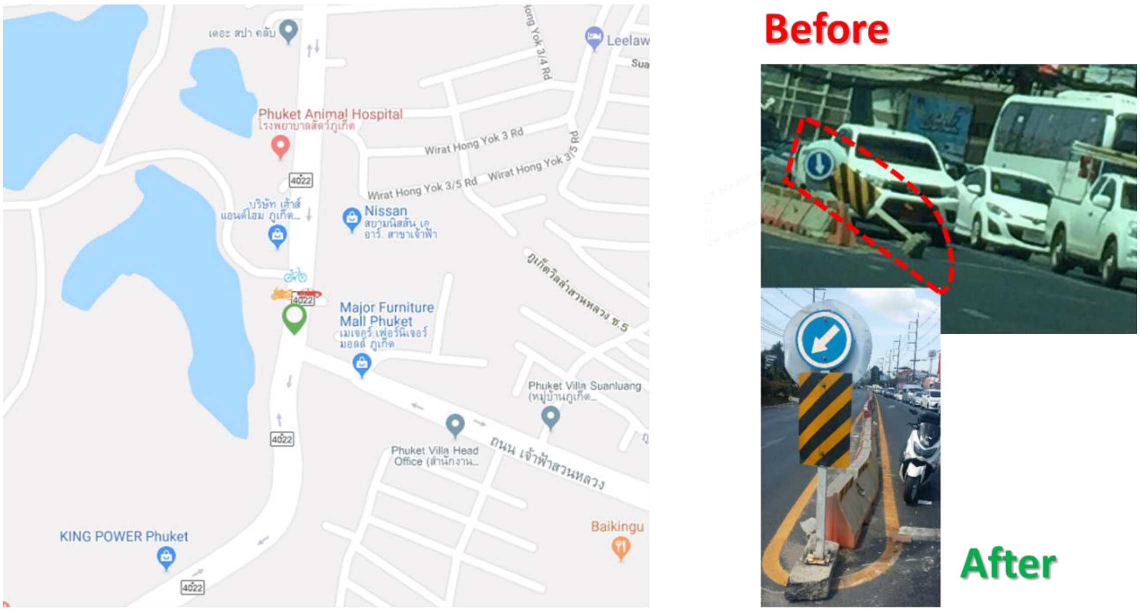


Figure 37 Example of road safety improvement in Phuket: Case 2

5. Conclusions and recommendations

This chapter concludes the main results and findings of the research. Some recommendations for further works are also presented. The details are as follows.

5.1. Conclusions

5.1.1. Application development

The SafetyMap application was developed based on the Cross-Platform Mobile framework so that any users can use the application via iOS mobile, Andriod mobile, and web browsers (e.g. Google Chrome, Firefox, Microsoft Edge.). There are four main functions in the application. The first function allows the authorized users (police and rescue team) to report the crash location and its related data (e.g. a number of casualties, vehicles involved, comprehensive description of the crash). The second function allows any road users (pedestrian, bicyclist, motorcyclist, and car driver) to report the risk location and its risk factor(s). The third function allows any users to view the reports and analysis results of crash locations and the risk locations stored in the database. The last function, any users can check the risk and crash locations along their desired route in order to avoid or prepare for passing those locations safely.

5.1.2. Application demonstration and implementation

The application was demonstrated to some staff of the road safety related agencies (e.g., police, department of highways, department of highways, department of rural roads, provincial public health, municipality) and students in several provinces (e.g. Chiang Mai, Khon Kaen, Ubon Ratchathani, Bangkok, Suphanburi, Songkhla, and Phuket). Subsequently, implementation workshops for key staffs at the provincial level were conducted in Suphanburi, Phuket, Khon Kaen, and Songkhla.

5.1.3. Results of data analysis

From the data collected during April 1, 2017, and February 28, 2018, it was found that there were a total number of 82,635 users visited the application (identify risk and crash locations or see the report). 95% visited the application via web browsers. Only 3% and 2% used iOS mobile and Android mobile, respectively. This may be from the technical problems and needs for updating the new version of iOS and Android applications.

Regards the crash data, there were 487 crashes reported. The most of them (53%) were slightly injured, followed by no injured and seriously injured (18% each group) and dead 11%. In addition, there were a total of 696 vehicles involved the crashes. The top three vehicle types were the motorcycle (36.3%), passenger car (28.5%), and bicycle (18.2%), respectively. It can imply that more than half of the casualties (54.5%) are related to vulnerable road users (motorcyclist and bicyclist). It was also found that the crashes most frequently occurred on Monday (19%). 15:01-18:00 (3:01-6:00 p.m.) was the period with the highest number of crashes occurred.

The data of crash locations in Phuket and Songkhla were further investigated. It was found that in Phuket 51% of the total crashes happened along the road sections when 49% occurred at the junctions. Regarding the crashes occurred along the road sections, 62% were on the straight sections, 36% on the curves, and only 2% nearby the U-turns. For the crashes occurred at the junctions, the top two locations

(94%) were found at the 3-leg intersections (54%) and 4-leg intersections (40%). The less of them were at the roundabouts (3%), U-turns (2%) and more than 4-leg intersections (1%), respectively.

In Songkhla, 52% happened along the road sections (midblock) and 48% occurred at the junctions. Regarding the crashes occurred along the road sections, 65% were on the straight sections and 35% on the curves. For the crashes occurred at the junctions, the top two locations (92%) were found at the 3-leg intersections (52%) and 4-leg intersections (40%). Only 8% were at the roundabouts.

For the risk data, there were 554 locations reported. More than three-quarter of the road users affected by the risk locations were vulnerable road users, i.e., motorcyclist (38%), pedestrian (26%), and bicyclist (13%) when 23% were car drivers. Regarding the top five risk factors related to each road user, it was found that for the pedestrian the obstacle on the walkway is the most risk factor (15.4%), followed by broken surface (13.0%), no crosswalk (9.9%), no crosswalk signs (8.6%), and walking behavior (8.0%), respectively. For the bicyclist, unsmooth drain cover is the top risk factor (15.2%), followed by unsmooth surface (10.6%), no bicycle warning sign (9.1%), no traffic light (7.6%), and guardrail (7.6%), respectively. For the motorcyclist, no motorcycle lane is the first risk factor (6.3%), followed by over speeding (6.0%), no motorcycle warning sign (5.6%), broken surface (5.3%), and too narrow traffic lane for bicycle (4.6%), respectively. Finally, for the car driver, no traffic light at the intersection and non-reflective road surface marking are the top two factor (8.6% each), followed by no warning sign (7.0%), too wide traffic lane (6.3%), and over speeding (6.3%), respectively.

5.2. Recommendations

Some recommendations for future research

5.2.1. Identification of hazardous location

In this research, crash location and risk location are considered separately. Future research may focus on identifying hazardous (or black spot) locations by using the accident frequency method (as shown in Table 1) or applying the unit cost of the accident cost (as shown in Figure 38).

Table 1 Identification of hazardous location based on accident frequency

Section	Black spot location
Straight	> 4 accident per year
3-legs junction	> 5 accident per year
4-legs junction	> 6 accident per year
5-legs junction	> 4 accident per year
Others junction	> 5 accident per year
Curve	> 3 accident per year
Bridge	> 4 accident per year

Source: OTP (2013)

Economic loss = a (No. Fatalities) + b (No. Disables)
+ c (No. Injuries) + property damage costs

where

a is the economic loss per fatality = 5,315,556 baht
b is the economic loss per disable = 6,167,061 baht
c is the economic loss per injury = 147,023 baht
d is the economic loss per fatality = 45,898 baht

Source: DOH (2007)

Figure 38 Identifying black spot location using accident cost method

5.2.2. Proposal for national and local implementations

In order to implement the application to the nationwide, the operation and maintenance costs for national hub and local (provincial) centers need to be estimated thoroughly. The possibility of the application implementation is another challenge. Potential users at the national level can be summarized and illustrated in Figure 39. Apart from the government agencies presented in Figure 39, the Road Safety Prevention Working Groups (RSWG) are the other potential users of the application at the provincial level.

Figure 39 Potential users at the national level

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Appendix

Manual of ATRANSafety Map Application (in Thai)


คู่มือการใช้งาน

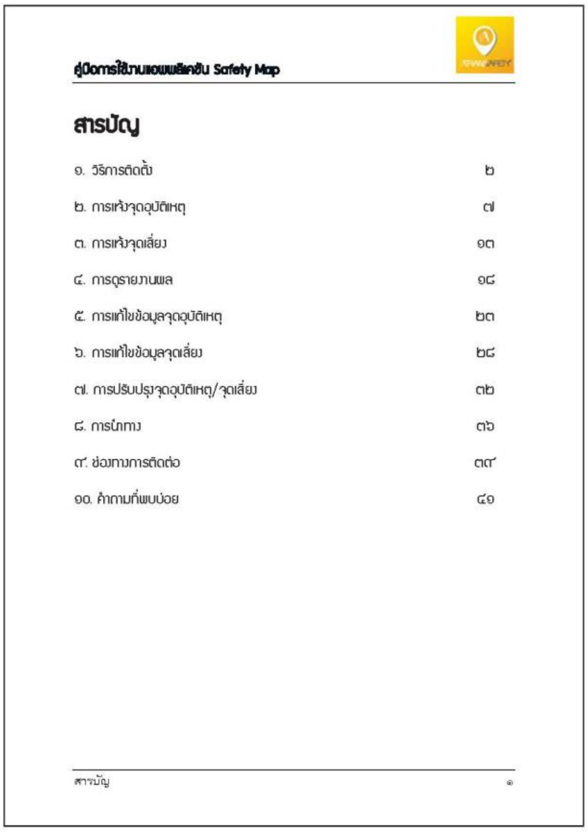
แอพพลิเคชันรายงานจุดอุบัติเหตุและจุดเสี่ยงบนสมาร์ทโฟน

จัดทำโดย

ATRANS

เวอร์ชัน ๒.๐

๑๖ มกราคม ๒๕๖๑


คู่มือการใช้งานแอพพลิเคชัน Safety Map

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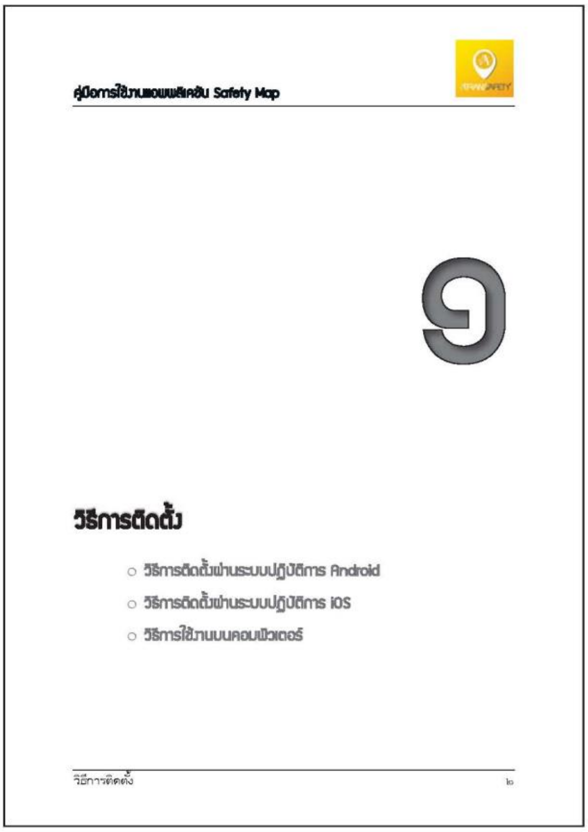
๑. วิธีการติดตั้ง	๒
๒. การแจ้งจุดอุบัติเหตุ	๗
๓. การแจ้งจุดเสี่ยง	๑๓
๔. การดูรายงานผล	๑๘
๕. การแก้ไขข้อมูลจุดอุบัติเหตุ	๒๓
๖. การแก้ไขข้อมูลจุดเสี่ยง	๒๘
๗. การปรับปรุงจุดอุบัติเหตุ/จุดเสี่ยง	๓๒
๘. การนำทาง	๓๖
๙. ช่องทางการติดต่อ	๓๙
๑๐. คำถามที่พบบ่อย	๔๑

สารบัญ ๑


คู่มือการใช้งานแอพพลิเคชัน Safety Map

๑

วิธีการติดตั้ง

- วิธีการติดตั้งผ่านระบบปฏิบัติการ Android
- วิธีการติดตั้งผ่านระบบปฏิบัติการ iOS
- วิธีการใช้งานบนคอมพิวเตอร์

วิธีการติดตั้ง ๒


คู่มือการใช้งานแอพพลิเคชัน Safety Map

วิธีการติดตั้ง

ผู้ใช้งานสามารถติดตั้งแอพพลิเคชัน SafetyMap ผ่าน App Store (กรณีใช้งานระบบ iOS) หรือ Google Play (กรณีใช้งานระบบAndroid) และสามารถใช้งานบนคอมพิวเตอร์ โดยมีรายละเอียดของการติดตั้งและใช้งาน ดังนี้

วิธีการติดตั้งผ่านระบบปฏิบัติการ Android

๑) เข้าไป Play store สืบค้นคำว่า Safetymap

พิมพ์คำว่า Safetymap ในช่องค้นหา

๒) กด ติดตั้ง Application Safetymap

กดเลือกคำว่าติดตั้ง

๓) เมื่อติดตั้งเสร็จแล้ว จะปรากฏรูปแอพพลิเคชันบนหน้าจอ

รูปแอพพลิเคชัน Safetymap

วิธีการติดตั้ง ๓

วิธีการติดตั้งผ่านระบบปฏิบัติการ IOS

๑) เข้าไปใน App store สืบค้นคำว่า Safetymap

๒) ทำการติดตั้งแอพพลิเคชัน Safetymap

๓) เมื่อติดตั้งเสร็จแล้ว จะปรากฏรูปแอพพลิเคชันบนหน้าจอ

วิธีการใช้งานบนคอมพิวเตอร์

๑) เข้าไปใน เบราว์เซอร์ internet explorer

เบราว์เซอร์ firefox

เบราว์เซอร์ chrome

๒) เมื่อกดเข้าเบราว์เซอร์แล้ว พิมพ์ในช่องค้นหาดังนี้

https://www.atrans-safety.com/safetymap/index.html

๓) เมื่อกดค้นหาแล้ว จะปรากฏหน้าต่างดังรูป

๔) ให้กดคลิกขวา แล้วเลือกคำว่าตรวจสอบ หรือ Inspect

๕) เมื่อกดที่คำว่า ตรวจสอบ หรือ Inspect แล้วจะปรากฏหน้าต่างดังรูป

๖) เมื่อทำครบทุกขั้นตอนแล้ว จะปรากฏหน้าจอดังรูป

๒

การแจ้งจุดอุบัติเหตุ

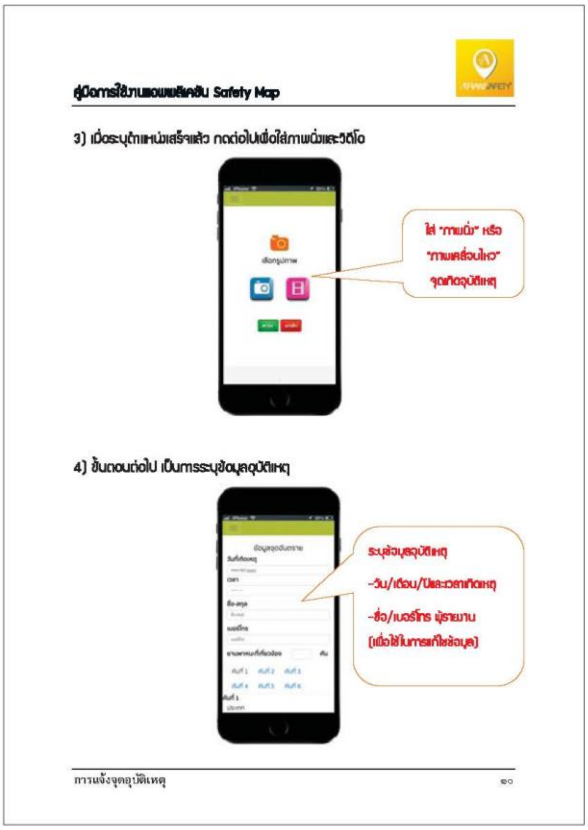
๒ การแจ้งจุดอุบัติเหตุ

เมื่อเริ่มเปิดใช้งานตัวโปรแกรม จะปรากฎหน้าจอหลัก 4 เมนู

การแจ้งจุดอุบัติเหตุ

1) กดเลือกเมนูการแจ้งจุดอุบัติเหตุ

2) ใช้นิ้วกดตรงตำแหน่งที่ต้องการเพิ่มจุดเกิดอุบัติเหตุ



3) เมื่อระบุตำแหน่งเสร็จแล้ว กดต่อไปเพื่อใส่ภาพนิ่งและวิดีโอ

4) ขั้นตอนต่อไป เป็นการระบุข้อมูลอุบัติเหตุ

5) ระบุประเภทและจำนวนยานพาหนะ รวมทั้งจำนวนผู้ประสบอุบัติเหตุ

(เสียชีวิต/สาหัส/บาดเจ็บเล็กน้อย/ไม่บาดเจ็บ)

6) อธิบายเหตุการณ์ที่เกิดขึ้นพอสังเขป โดยพิมพ์หรือบันทึกผ่านเสียง

7) กด ตกลง เพื่อยืนยันการบันทึกข้อมูล

๓

การแจ้งจุดเสี่ยง

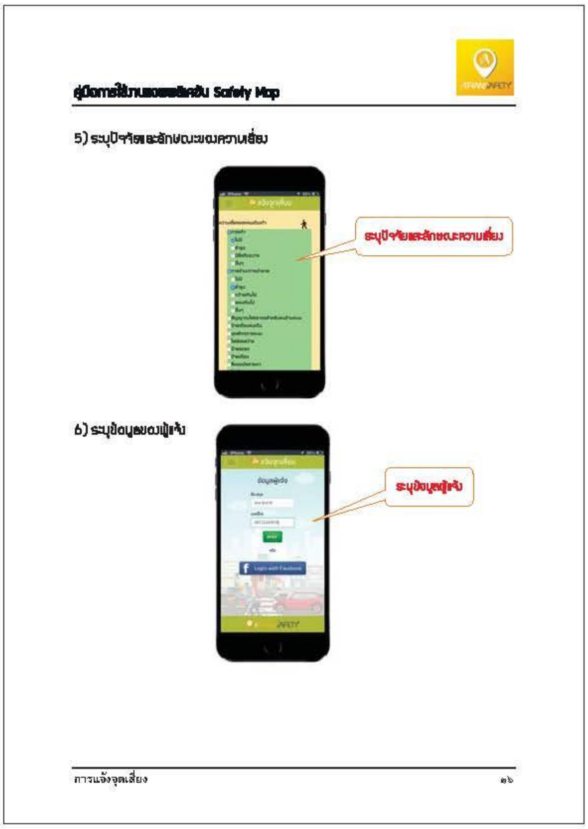
๓ การแจ้งจุดเสี่ยง

1) กดเลือกเมนูจุดเสี่ยง

2) ใช้นิ้วกดตรงตำแหน่งที่เราต้องการแจ้งจุดเสี่ยง

3) เมื่อระบุตำแหน่งเสร็จแล้ว กดต่อไปเพื่อใส่ภาพนิ่งและวิดีโอ

4) ระบุประเภทผู้ใช้ทางที่ได้รับผลกระทบจากจุดเสี่ยง


คู่มือการใช้งานแอพพลิเคชัน Safety Map

5) ระบุปัจจัยและลักษณะของความเสี่ยง

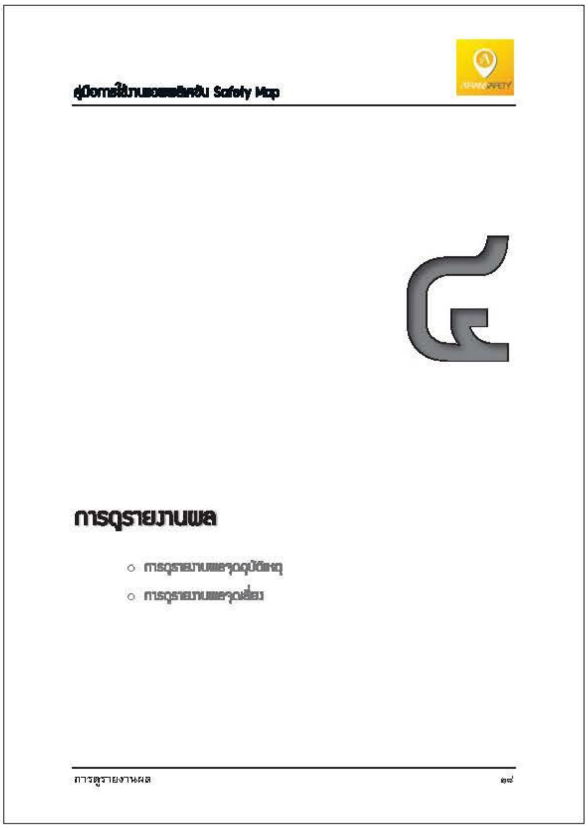
6) ระบุข้อมูลของผู้แจ้ง

การแจ้งจุดเสี่ยง ๑๖


คู่มือการใช้งานแอพพลิเคชัน Safety Map

7) กดตกลงเพื่อยืนยันข้อมูลของผู้แจ้ง

การแจ้งจุดเสี่ยง ๑๗


คู่มือการใช้งานแอพพลิเคชัน Safety Map

๔

การดูรายงานผล

- การดูรายงานผลจุดอุบัติเหตุ
- การดูรายงานผลจุดเสี่ยง

การดูรายงานผล ๑๘


คู่มือการใช้งานแอพพลิเคชัน Safety Map

๔ การดูรายงานผล

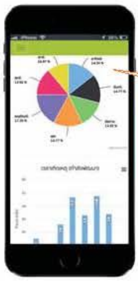
การดูรายงานผลจุดอุบัติเหตุ

1) กดเลือกเมนูรายงานผล

2) กดเลือกคำว่าจุดอุบัติเหตุเพื่อดูรายงานผล

การดูรายงานผล ๑๙

3) กดเลือกคำว่ากราฟเพื่อดูรายงานผล

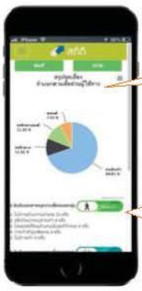


การดูรายงานผลจุดเสี่ยง

1) กดเลือกเมนูรายงานผล

2) กดเลือกคำว่าจุดเสี่ยงเพื่อดูรายงานผล

3) กดเลือกคำว่ากราฟเพื่อดูรายงานผล



๕

การแก้ไขข้อมูลจุดอุบัติเหตุ

๕ การแก้ไขข้อมูลจุดอุบัติเหตุ

1) กดเลือกจุดที่เราต้องการแก้ไขข้อมูล

2) ระบุชื่อและเบอร์โทร เพื่อใช้ในการยืนยันตัวตน (ข้อมูลต้องตรงกับที่รายงานจุดอุบัติเหตุ)

3) สามารถแก้ไขรูปภาพจุดอุบัติเหตุ

4) สามารถแก้ไขข้อมูลอุบัติเหตุ วันเดือนปี และเวลาเกิดเหตุ ชื่อ/เบอร์โทร ของผู้รายงาน

5) สามารถแก้ไขข้อมูลยานพาหนะ (จำนวน/ประเภท) และข้อมูลผู้ประสบเหตุ (เสียชีวิต สาหัส บาดเจ็บเล็กน้อย ไม่บาดเจ็บ)

6) สามารถแก้ไขคำอธิบายเหตุการณ์ได้

7) กดยืนยันการแก้ไขข้อมูลของจุดอุบัติเหตุ

๖

การแก้ไขข้อมูลจุดเสี่ยง

๖ การแก้ไขข้อมูลจุดเสี่ยง

1) เลือกจุดเสี่ยงที่ต้องการแก้ไขข้อมูล

2) ระบุชื่อและเบอร์โทร เพื่อยืนยันตัวตน (ข้อมูลต้องตรงกับที่รายงานจุดอุบัติเหตุ)

3) สามารถแก้ไขรูปภาพจุดเสี่ยง

4) สามารถแก้ไขประเภทผู้ใช้ทาง

5) สามารถแก้ไขปัจจัยและลักษณะของความเสี่ยง

6) ยืนยันการแก้ไขข้อมูล

๗

การปรับปรุงจุดอุบัติเหตุ/จุดเสี่ยง

(กรณีปรับปรุงความปลอดภัยแล้ว)

๗ การปรับปรุงจุดเสี่ยง/จุดอันตราย (กรณีปรับปรุงความปลอดภัยแล้ว)

- หน่วยงานที่เกี่ยวข้องสามารถรายงานผลการปรับปรุงความปลอดภัยบริเวณจุดอันตราย/จุดเสี่ยงได้ โดย

1) กดเลือกเมนูเจ้าหน้าที่

2) ระบุชื่อและรหัสผ่านเพื่อยืนยันตัวตน (เฉพาะหน่วยงานที่เกี่ยวข้อง)

3) เลือกจุดที่ต้องการรายงานการปรับปรุงจุดอันตราย (จุดอุบัติเหตุ/จุดเสี่ยง)

4) กดเลือกอัพโหลดรูปภาพที่ได้ปรับปรุง

5) ยืนยันความถูกต้องของข้อมูล

6) แสดงรายละเอียดการปรับปรุงข้อมูลจุดอันตราย (จุดอุบัติเหตุ/จุดเสี่ยง)

๘

การนำทางและแสดงจุดเสี่ยงระหว่างเส้นทาง

๘ การนำทาง

1) กดเลือกเมนูนำทาง

2) ระบุข้อมูลต้นทางและปลายที่ต้องการ โดยการเลือกจุดบนแผนที่หรือพิมพ์ข้อความในแถบในช่อง และเลือกรูปแบบการเดินทาง

3) ระบบแสดงจุดต้นทาง (A) จุดปลายทาง (B) และเส้นทางการเดินทางพร้อมทั้งแสดงจุดเสี่ยงที่อยู่ใกล้เคียงกับเส้นทางทั้งหมด

๙

ช่องทางการติดต่อ

- ID Line
- E-mail

๙ ช่องทางการติดต่อ

❖ มีคำถามหรือสงสัย

➢ ติดต่อผ่าน

✓ Line ID: atrans.safety

✓ Email: atrans.safety@gmail.com

๑๐

คำถามที่พบบ่อย

คำถามที่พบบ่อย

1) ถ้าต้องการลบจุดเสี่ยงหรือจุดอุบัติเหตุ ทำอย่างไร

ตอบ เบื้องต้นแจ้งหมายเลขจุดเสี่ยงหรือจุดอุบัติเหตุ (ปรากฏบนหมุดเมื่อจิ้มดูข้อมูลจุด) ให้กับแอดมินทางไลน์ เพื่อลบจุดให้

2) ถ้าต้องการแก้ไขข้อมูลจุดเสี่ยงและจุดอุบัติเหตุจะต้องทำอย่างไร

ตอบ กดตรงจุดที่เราต้องการแก้ไขแล้วดำเนินการตามขั้นตอนของแอพพลิเคชั่นที่ได้กำหนดวิธีไว้แล้ว

3) ถ้าต้องการใช้งานแอพพลิเคชั่นบนคอมพิวเตอร์ต้องทำอย่างไร

ตอบ สามารถเข้าตามลิงค์ข้างล่าง

https://www.atrans-safety.com/safetymap/index.html

4) ถ้าหากมีข้อสงสัย ติดต่อได้อย่างไร

ตอบ สามารถติดต่อผ่านทางไลน์ และ อีเมลล์

✓ Line ID: atrans.safety

✓ Email: atrans.safety@gmail.com

5) ดาวน์โหลดแอพพลิเคชั่นได้จากที่ไหนบ้าง

ตอบ สามารถดาวโหลดผ่านระบบ Android ระบบ iOS และสามารถใช้งานบนคอมพิวเตอร์ผ่านลิงค์

https://www.atrans-safety.com/safetymap/index.html

6) ถ้าระบุพิกัดจุดในจุดอุบัติเหตุ จุดนั้นจะขึ้นในแผนจุดเสี่ยงด้วยหรือไม่

ตอบ ไม่ขึ้นในแผนที่จุดเสี่ยง ดังนั้น หากต้องการเพิ่มจุดดังกล่าวเป็นจุดเสี่ยงด้วย ต้องกดเข้าไปในจุดเสี่ยงแล้วกดเพิ่มจุดใหม่

คู่มือการใช้งานแอพพลิเคชั่น Safety Map

Final Report 2017

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