KEY FACTS ON ROAD SAFETY SITUATIONS IN THAILAND

2012-2013

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KEY FACTS ON

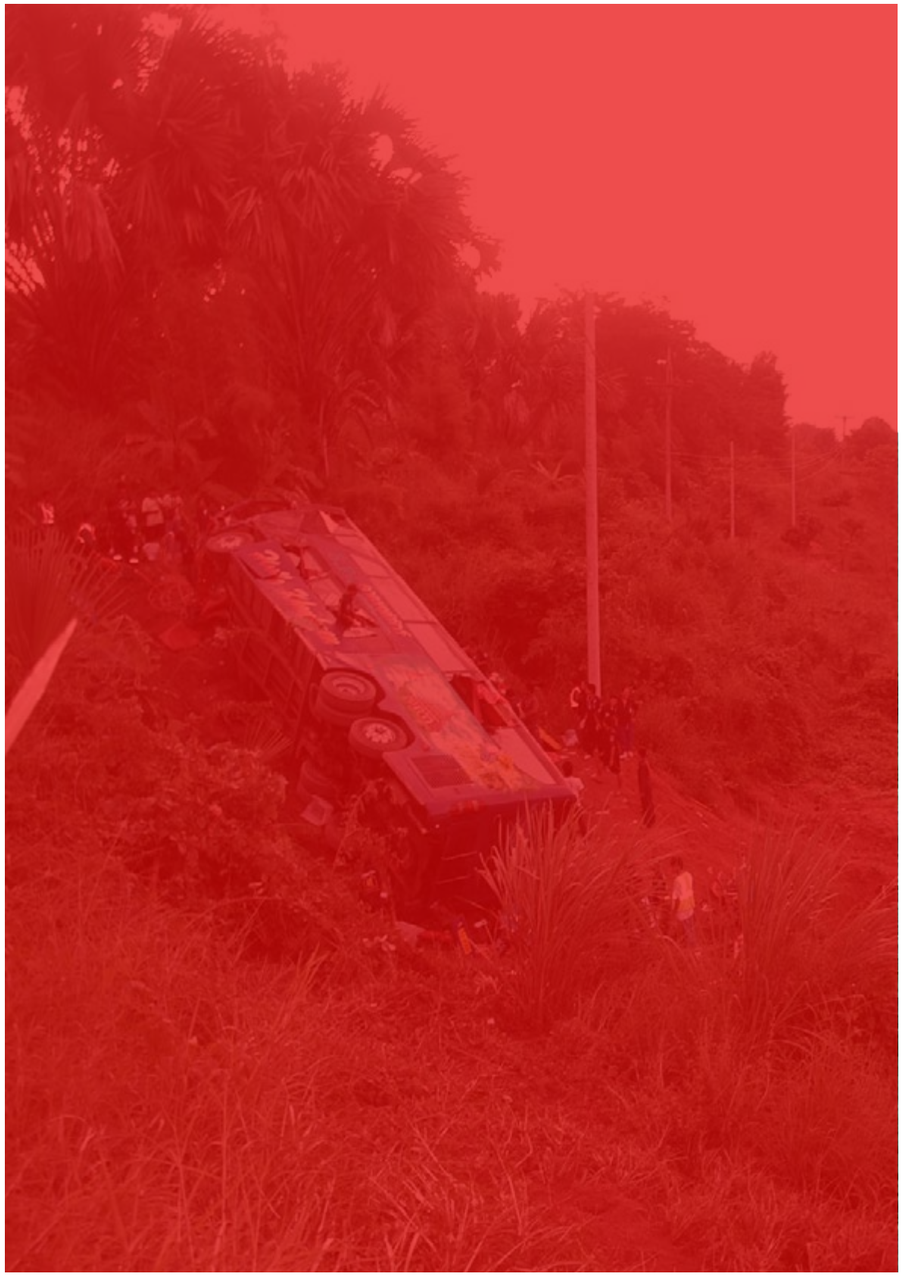
ROAD SAFETY SITUATIONS

IN THAILAND

YEAR

2012

2013



2012 - 2013

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IN THAILAND

BIBLIOGRAPHICAL INFO

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IN THAILAND 2012 - 2013

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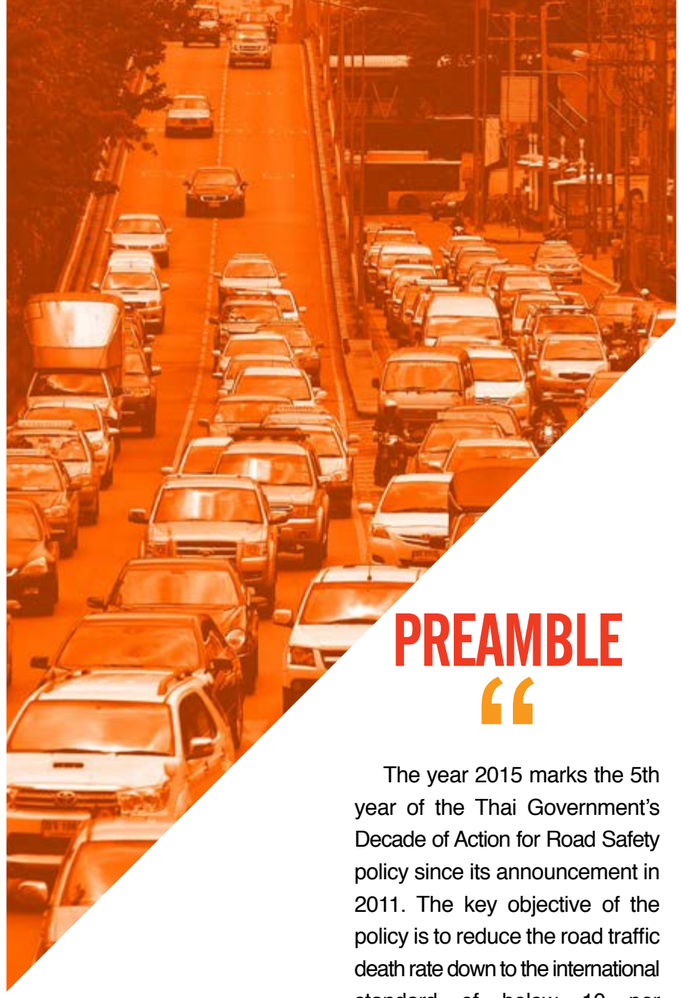

PREAMBLE

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The year 2015 marks the 5th year of the Thai Government’s Decade of Action for Road Safety policy since its announcement in 2011. The key objective of the policy is to reduce the road traffic death rate down to the international standard of below 10 per 100,000 people in 2020. Eight measures have been targeted for action in order to achieve such goal, including promoting helmet use, reducing drunk driving, speed management, road users’ capability development, black spots improvement, vehicle standard enhancement, emergency medical services and patient treatment and rehabilitation improvement and related administrative system development.

This report presents Thailand’s road safety situations using statistical data up until the year 2013. It has been found that since the policy announcement, the number of road traffic deaths has slowly declined (22,487 people killed in 2011 to 21,645 people killed in 2013). However, the severity level of road accidents has been on the rise, but due to the limitation of the data used this report, it is therefore relatively difficult to conclude the actual causes of such trend.

To some extent, a close assessment of the aforementioned eight measures after their implementations may shed some lights for the readers on whether or not the government has been successful in increasing road safety, and what measures are on the right track or if they need to be reevaluated.

Despite the fact that the road safety promotion using public media and the enforcement on the use of motorcycle helmets have been implemented for quite a period of time, the helmet usage rates among riders and passengers have not increased during the past 3 years. Such trend coincides with the increase in the number of people killed by motorcycle crashes. However, the helmet usage rates in Bangkok, Nonthaburi and Phuket provinces are higher than 60 percent, the rates of which need to be closely examined for further application to other areas. Similarly, the use of seatbelt among users of personal cars and pickup trucks have also been on the decline.

The number of drunk driving among motorcycle injuries has consistently been lowered, while that of users of personal cars, pickup trucks and motor-tricycles on minor roads has been on the rise.

In Thailand, speed law enforcement is the Royal Thai Police’s direct responsibility in all jurisdictions nationwide, however, related statistical data reveals that such enforcement has only been implemented on roads that are under the Department of Highways ‘responsibility, which account for about 25 percent of the total road length nationwide. Although the reported number of speeding related cases in 2013 was 136% more than that of 2009, the proportions of speed related crashes and fatalities remain practically unchanged. Also, the number of road traffic deaths from speeding has even increased from 2011 to 2013.

In term of road conditions, statistical data from the Department of Highways indicate that the number of black spots has consistently been reduced, which is in line with the increasing amount of government budget allocated for engineering improvements for highway safety. Similarly, there has been a reduction in the number of railroad accidents. On the contrary, the number of deaths and injuries caused by roadside crashes has remained high.

Finally, the integration of road accident data from 3 major sources, including death certificate, Royal Thai Police and insurance, has been able to provide a more accurate number of road fatalities. Such integration of the data represents improvements in related data administration and management.

It is undeniable that there will be many other challenges in the implementation of the Thai Government’s Decade of Action for Road Safety policy. Thus, we hope that the significant progress of the policy made notice in this report will provide the moral supports for everyone in related agencies to keep on with the good work and continuing efforts in order to have the policy’s ultimate goal successfully achieved.

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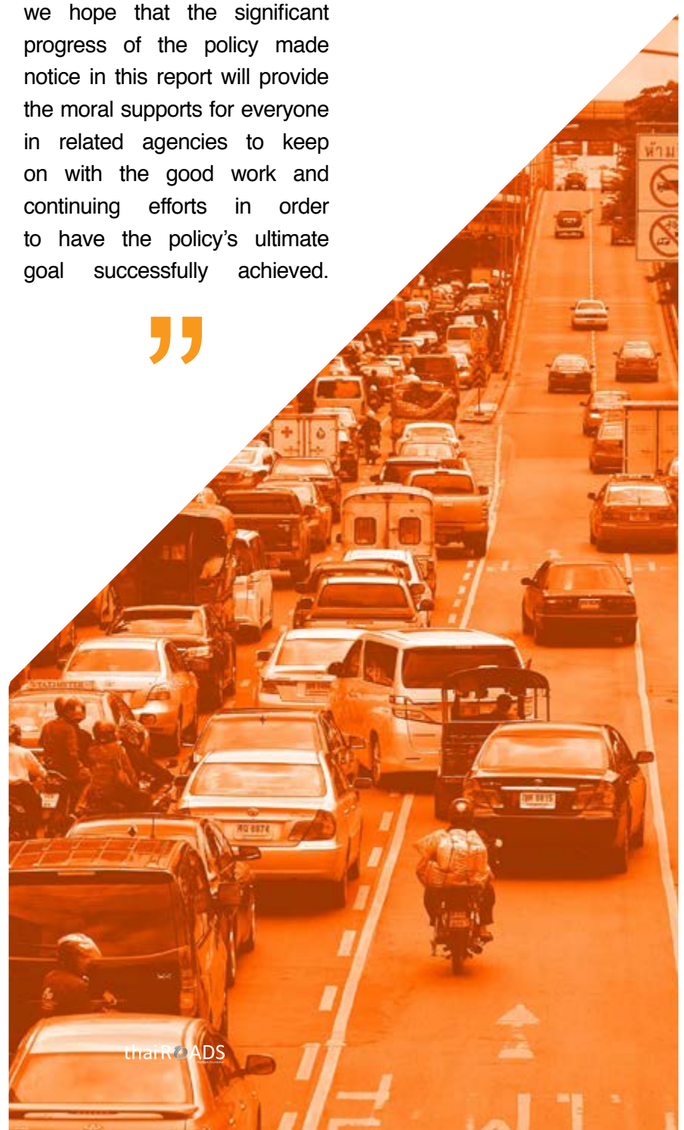

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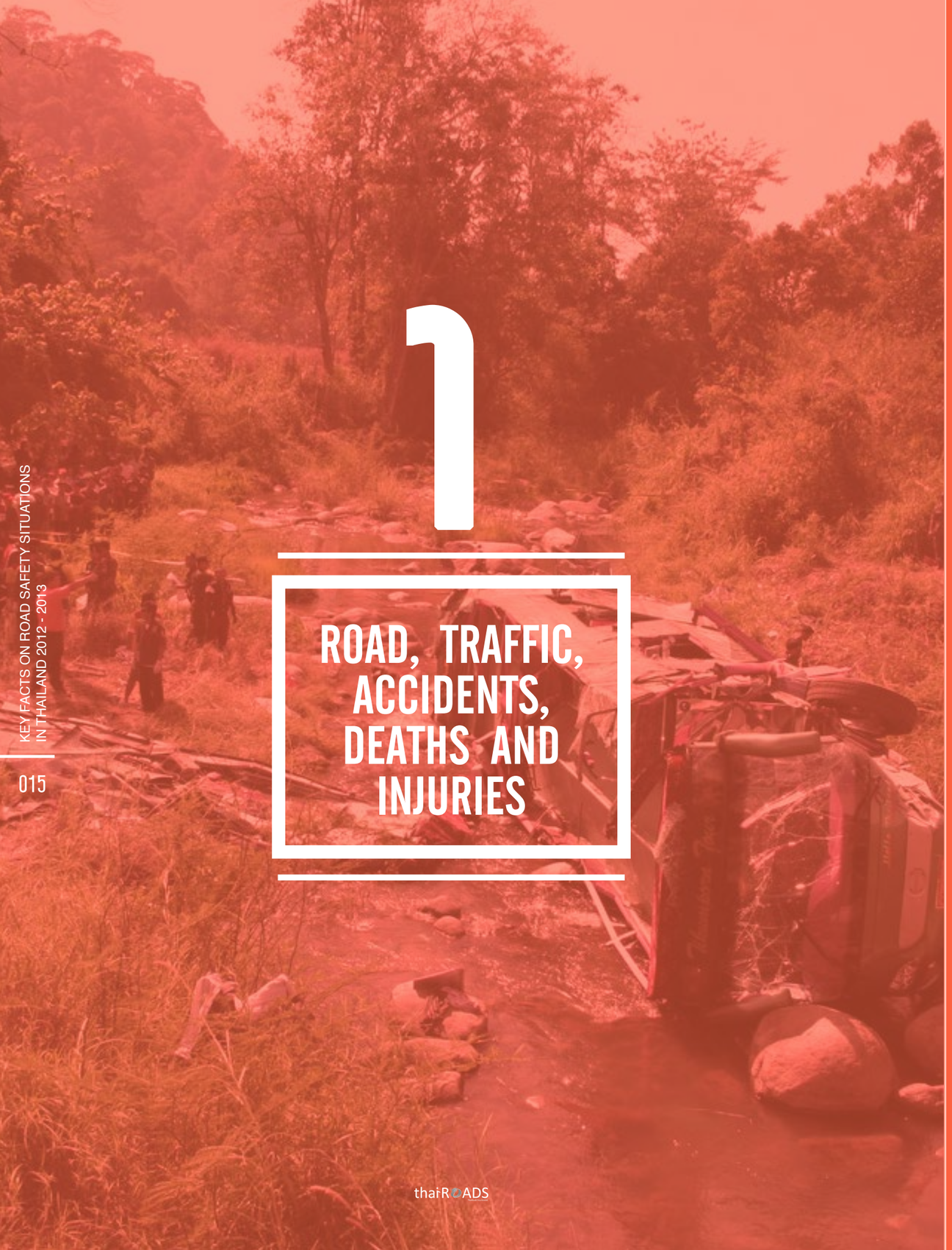
- Road accidents during festivals
- Speeding
- Drunk driving
- Motorcycle helmet Use

- Seat belt use
- Motorcycle safety
- Van and Bus safety
- Accident black spots on highways
- Roadside crashes
- Railroad accidents

KEY FACTS ON ROAD SAFETY SITUATIONS
IN THAILAND 2012 - 2013



1

ROAD, TRAFFIC, ACCIDENTS, DEATHS AND INJURIES

While the recent World Health Organization (WHO)'s report stated that Thailand has been ranked the world's 3rd nation with highest number road traffic deaths, a recent attempt in linking several road fatality databases reveals that the magnitude of actual losses incurred from road traffic accidents in Thailand is twice the size of what was reported in the past.

The accurate figure of losses incurred from road traffic accidents in Thailand has been one of the puzzles that researchers have been trying to figure out for a prolonged period of time. For example, the study by Thailand's Ministry of Public Health in collaboration with Australia's the University of Queensland in 2005, which employed the statistical sampling method, estimated that Thailand would have about 25,136 deaths from road accidents. Another estimation conducted by WHO using statistical modeling found that in 2010 Thailand had as high as 26,312 road traffic fatalities. Consequently, when compared such figure to the total population, this has made Thailand rank as the world's 3rd highest road accident death rate. However, reports produced by Thailand's responsible government agencies still indicate contradictory low road accident fatalities, including the Royal Thai Police's 2013 report and the Ministry of Health's 2013 report which stated that the road traffic deaths were about 14,059 people and 9,255 people, respectively.

In 2013, there was an attempt initiated by the Road Safety Directing Center's Database and Evaluation Sub-Committee to integrate three major accident databases from the Royal Thai Police, the Ministry of Public Health and Road Protection Victim insurance company. Such action has produced a remarkably convincing result that during 2011-2013, Thailand had as high as 22,052 road traffic deaths a year, which was equivalent to approximately 60 deaths per day. These figures are comparatively close to the number of traffic deaths per day during the 7 dangerous days of the New Year Festival, which are reported by the National Institute for Emergency Medicine.

As a result, these findings have significant implications for the direction of Thailand's road safety policies as follows:

1. The magnitude of the actual losses incurred from road traffic accidents in Thailand is twice the size of what was reported in the past.

2. Road safety measures need to be strictly implemented and enforced all year round, and not only just during festive seasons.

3. The integration of road accident data from several agencies could provide more accurate information on the number of road traffic fatalities.

4. The official working framework for database integration should be established. In addition, linking the data for road traffic deaths before 2011 should be undertaken for better understanding of the situations, which could be used to review the direction and goal of the Thai Government's Decade of Action for Road Safety policy.

YEAR

2012 - 2013

the actual losses incurred from road traffic accidents are

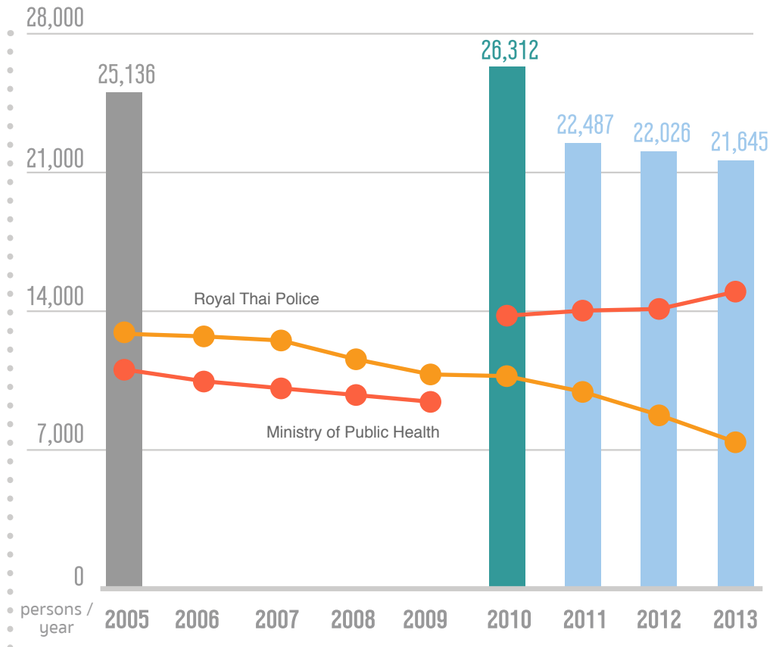
22,052
persons / year

or

60
persons / day

Road Traffic Deaths in Thailand from 2005 - 2013:
Comparison between official statistics reports and research studies

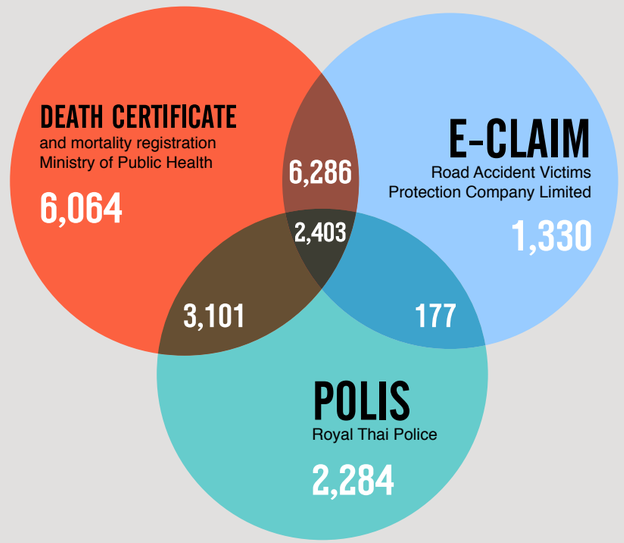
- Road traffic accident statistics, the Royal Thai Police
- Death certificate and medical certificate of death database, Office of the Permanent Secretary for Public Health. (For 2005 – 2009 use death certificate data only)
- Project on improving causes of death in Thailand from 2005-2008, the Ministry of Public Health in collaboration with the University of Queensland, Australia
- Global Status Report on Road Safety, World Health Organization, 2010
- Accident database integration (POLIS, E-claim and Death certificate), Road Safety Directing Center's Database and Evaluation Sub-Committee



Number of Road Traffic Deaths in Thailand in 2013, Obtained from the Integration of Three Major Road Accident Databases

total
21,645
persons

Source:
Road Safety Directing Center's Sub-Committee on Database and Evaluation



2

SEVERITY OF ROAD ACCIDENTS

The severity of road accidents in Thailand has continued to increase, both during festive and non-festive periods. The magnitudes of crash severity vary, depending on physical road environment, with relatively high levels of severity being around provinces that are the centers of economic activities in each region.

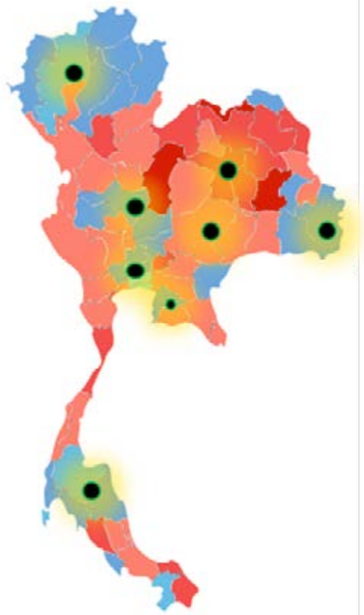
SEVERITY OF ROAD ACCIDENTS

The severity of road accidents in Thailand has continued to increase, both during festive and non-festive periods, especially on national highways of which the severity index and the fatality index have both been alarmingly on the rise. This is coinciding with the fact that the implementation of specific measures aimed to reduce crash severity on highways, such as speed enforcement and roadside hazard management, have yet to be tangibly effective.

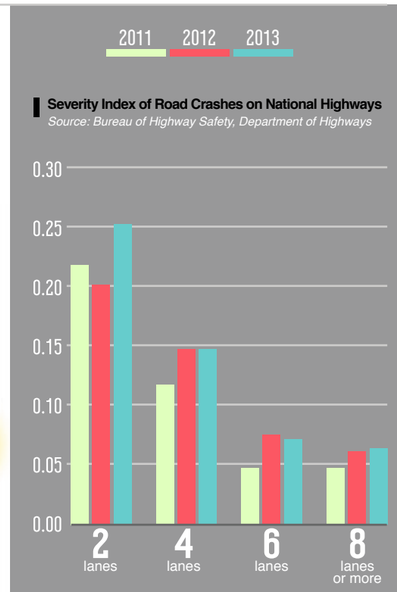
Furthermore, the comparison of spatial data during 2008 – 2013 indicates that high severity of road accidents tends to take place in provinces adjacent to the centers of economic activities in each region. Consequently, corrective measures aimed at reducing the severity of accidents need to be implemented in provinces surrounding the major cities in the regions, which typically have long-distance and through traffic with high speed.

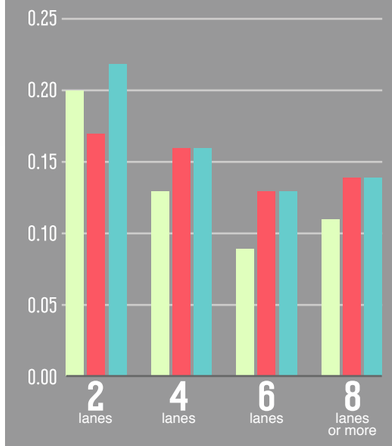
Additionally, physical characteristics of road environment are also keyfactors influencing the level of road accident severity. The recent statistical data from the Bureau of Highway Safety, the Department of Highways reveals that road accidents on 4 or more lane highways are less severe than those taking place on 2-lane highways, as the latter might have head-on collisions and be more likely to have run-off road crashes.

Road Accident Severity by Province, averaged between 2008 – 2013



Source:
Road Traffic Accidents Statistics, Royal Thai Police





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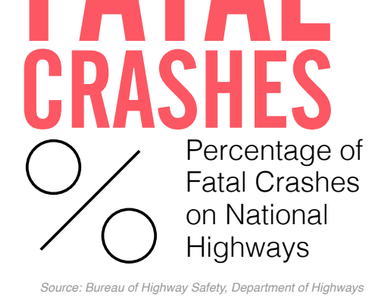
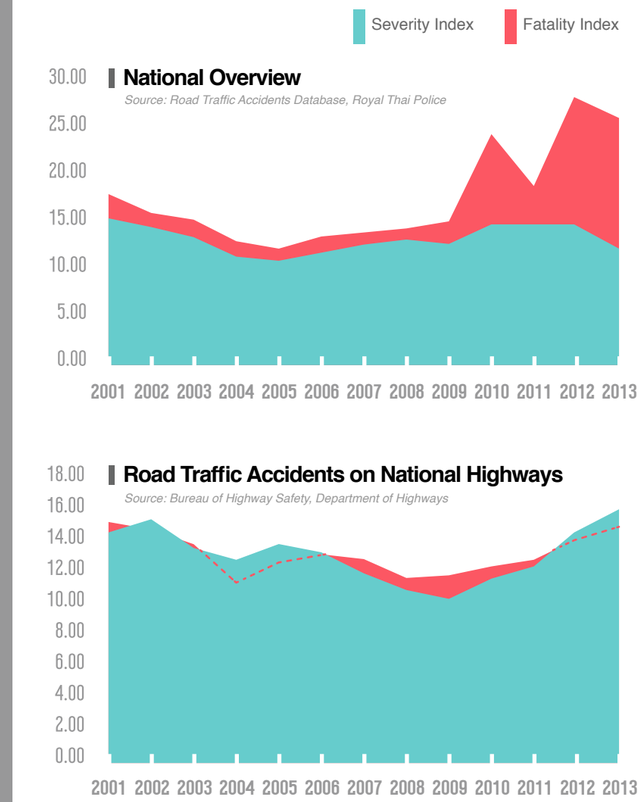
The Rising Trend of Road Accident Severity in Thailand from 2008 to 2013





FATAL CRASHES

Percentage of Fatal Crashes on National Highways

Source: Bureau of Highway Safety, Department of Highways

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3

ROAD ACCIDENTS DURING FESTIVALS

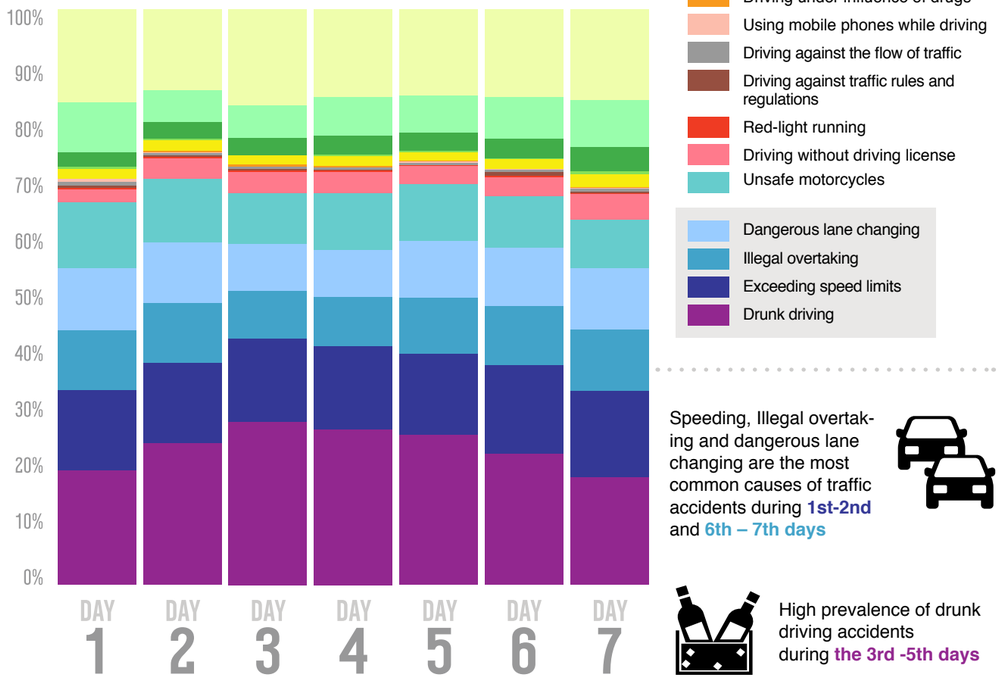
The declining trend in the losses occurred from road accidents during festive seasons is deemed to be stabilizing, thereby leaving the authorities with the need of in-depth knowledge on the causes and nature of road accidents in order to design and implement more effective countermeasures.

ROAD ACCIDENTS DURING FESTIVALS

According to the statistics from the Road Safety Directing Center and the National Institute for Emergency Medicine, it is found that the number of road traffic deaths and injuries during the 7 dangerous days of New Year and Songkran festival tends to have decreased but with diminishing rate Furthermore, the data from the Road Safety Directing Center only provide a basic understanding of road accidents during the festivals, which remain unchanged. For example, motorcycles have been mostly involved in road accidents. The majority of accidents takes place on secondary roads and straight sections. The most probable cause of accidents during festivals has been drunk driving, and accidents have occurred most frequently from 4.00 to 8.00 PM.

As a result, the related authorities are required to be more knowledgeable of the nature and causes of road accidents, such as information on drivers, vehicles and roads related to accidents, in order to design and implement more effective countermeasures. Furthermore, it is necessary to improve the quality of accident data collection and to make use of the existing data for in-depth analysis so as to obtain knowledge required for planning and designing more effective countermeasures.

Number of Road Traffic Deaths and Injuries during the 7 Dangerous Days of New Year and Songkran in 2012 and 2013,
by probable cause and time of accidents
Source: Road Safety Directing Center



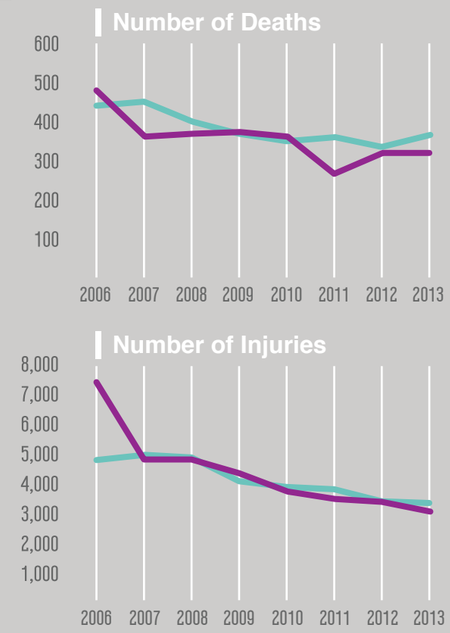
Speeding, Illegal overtaking and dangerous lane changing are the most common causes of traffic accidents during **1st-2nd** and **6th – 7th days**

High prevalence of drunk driving accidents during **the 3rd -5th days**

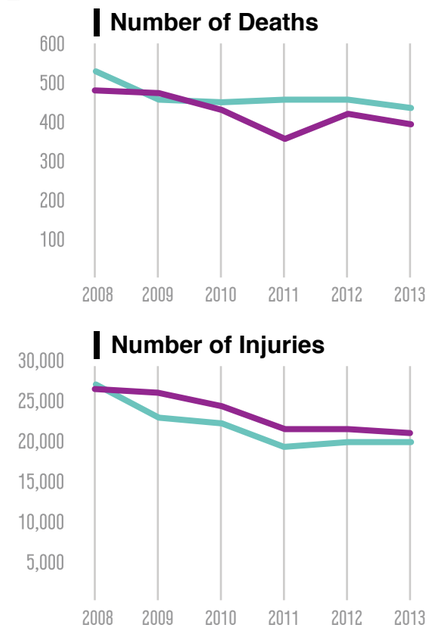
Road Traffic Accidents during the 7 Dangerous Days of New Year and Songkran Festivals

New Year
Songkran

Source: Road Safety Directing Center



Source: National Institute for Emergency Medicine



Number of Road Traffic Deaths and Injuries during the 7 Dangerous Days of New Year and Songkran in 2012 and 2013,
by Probable Cause of Accidents and Vehicle Type

Source:
Road Safety Directing Center

4

SPEEDING

The number of road traffic accidents related to speeding on national high ways indicates that the current practices of speed law enforcement in Thailand might have not been effective, and therefore need to be radically changed. This is because, although there has been the doubling increase in the number of speeding tickets over the past 5 years, the problem of speed related crashes on highways has not yet seemed to subside.

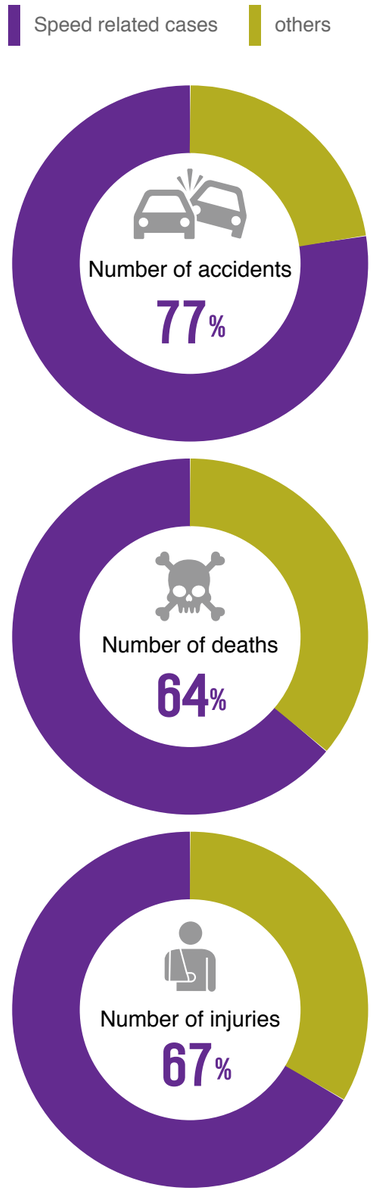
SPEEDING

Speeding behavior remains the most serious problem for road safety in Thailand, which has been pending for the implementation of effective solutions. As driving speed increases, drivers will have less time for proper judgement and effective control of their vehicles. In addition, accidents that occur at high speeds are more severe, thereby increasing the chance of death and injuries. The recent data in 2013 revealed that speeding was the most common cause of traffic accidents on national highways (8,620 speed related crashes, accounting for 77 percent of the total number road traffic accidents on national highways). Moreover, speeding was the leading cause of road traffic deaths, accounting for two third of total road traffic deaths on highways. Speed related accidents occurred most frequently on 4 lane highways (42%), mainly involved run-off road crashes (48%) and passenger cars/pickup trucks (50%).

As for the speed law enforcement, empirical evidence from recent statistics suggests that the current practices of policing speed limits on highways need to be radically changed as merely increasing the number of speeding tickets might not have effectively been able to deal with the problem of speeding. While the number of drivers apprehended for speeding on highways has consistently increased and doubled from 2008 to 2013, the proportions of speed related road accidents and deaths have yet to significantly change.

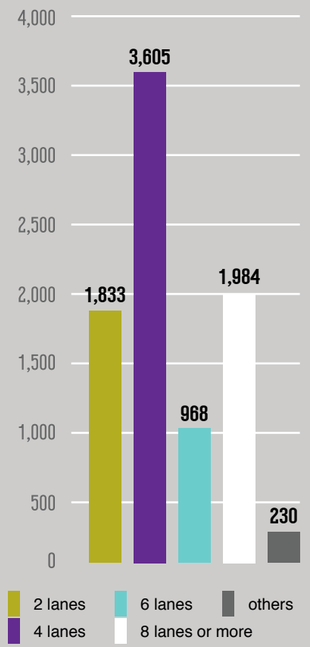
Characteristics of speed related traffic accidents on highways in 2013

Source: HAIMS system, Bureau of Highway Safety, Department of Highways

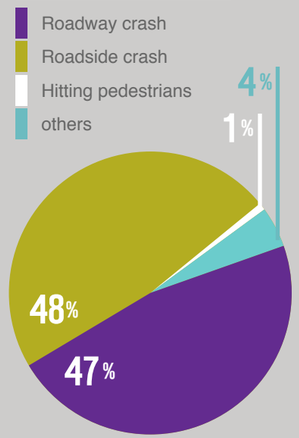


Speed related accidents

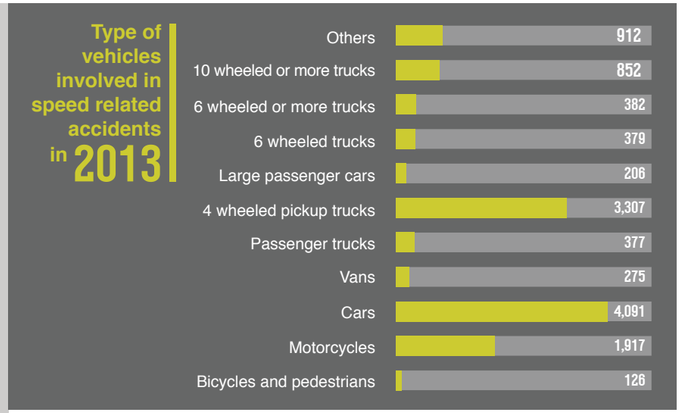
by number of traffic lanes



Speed related accidents by collision pattern

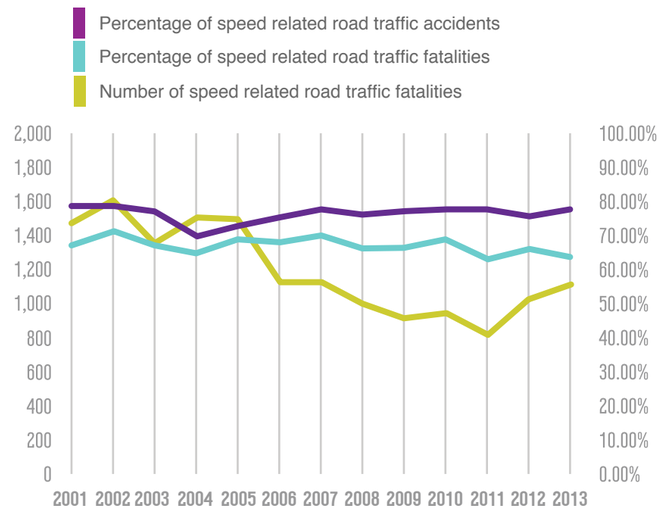


Type of vehicles involved in speed related accidents in 2013

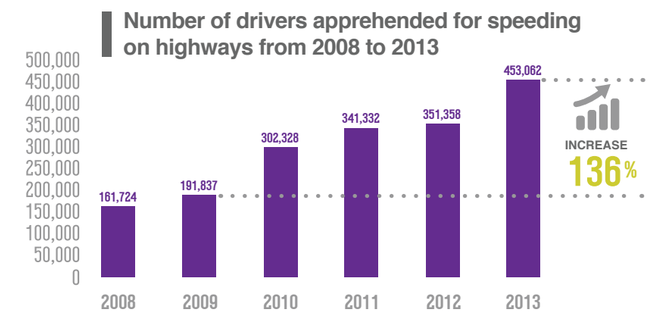


Statistics on speed related road traffic accidents and speed limit enforcement

Source: HAIMS system, Bureau of Highway Safety, Department of Highways and Highway Traffic Police



Number of drivers apprehended for speeding on highways from 2008 to 2013



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5

DRUNK DRIVING

Overall, road traffic accidents related to drunk driving and alcohol consumption of road user injuries have recently been on the declining trend. However, a closer examination of related data reveals some alarming situations which require urgent corrective measures, including the problems of drunk driving accidents on secondary highways and alcohol consumption of injured people driving private cars, pickup trucks and motor-tricycles.

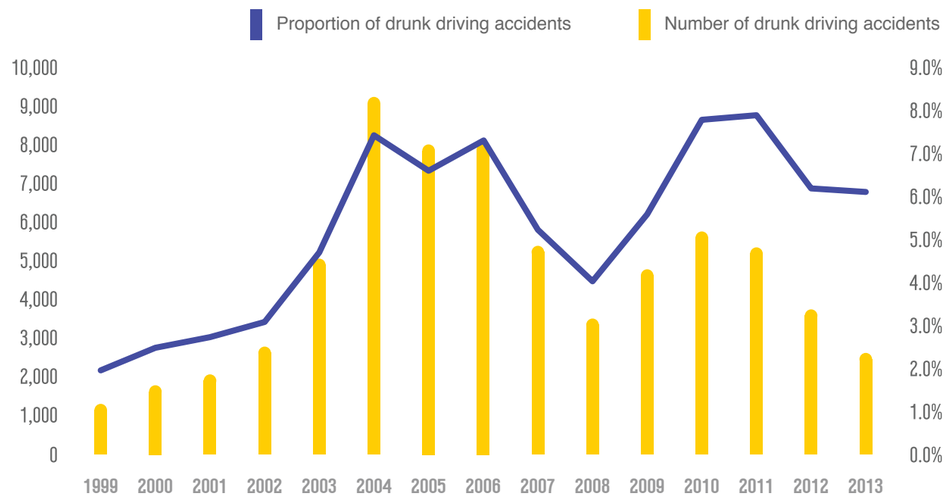
DRUNK DRIVING

The Royal Thai Police's 2013 report on road traffic accidents for the whole nation and the Department of Highways' report on accidents on highways reveal that the proportions of road traffic accidents related to drunk driving have recently been on a decline. Nevertheless, drunk driving accidents on 4-digit highways, which serve local areas at district levels, has manifested the opposite rising trend during the past few years, usually taking place during 6.00PM to 3.00AM.

The overall situation on alcohol consumption of road user injuries, according to the Injury Surveillance database, has generally been improved. The proportion of alcohol related injuries has been consistently on a decline from 45 per cent in 2005 to about 33 percent in 2013. However, when classifying the data by vehicle types, it is found that only the al cohol consumption among motorcyclists, of which are the majority of road user injuries, has continued to decline. During the past few years, the proportion of traffic injuries with alcohol consumed has been on the rise for other types of road users such as private cars, pick-up trucks and motor-tricycles.

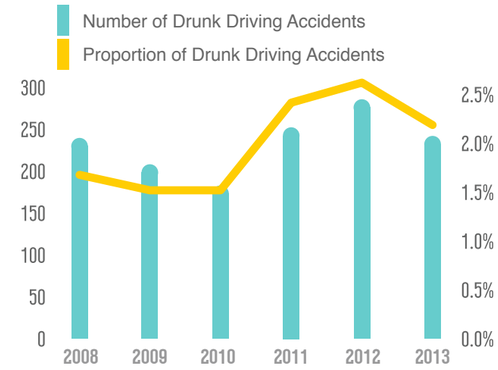
Number and proportion of road traffic accidents related to drunk driving, 1999-2013

Source: Road traffic accidents statistics, Royal Thai Police

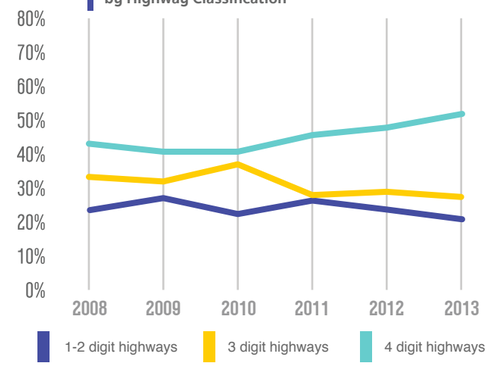


Drunk driving accidents on highways from 2008 to 2013

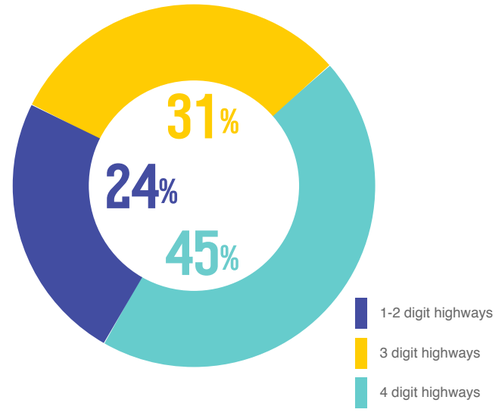
Source:
Bureau of Highway Safety, Department of Highways



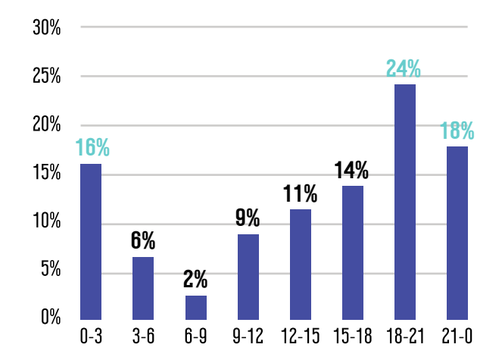
Proportion of Drunk Driving Accidents by Highway Classification



Drunk Driving Accidents on Highways 2008-2013, by Highway Classification

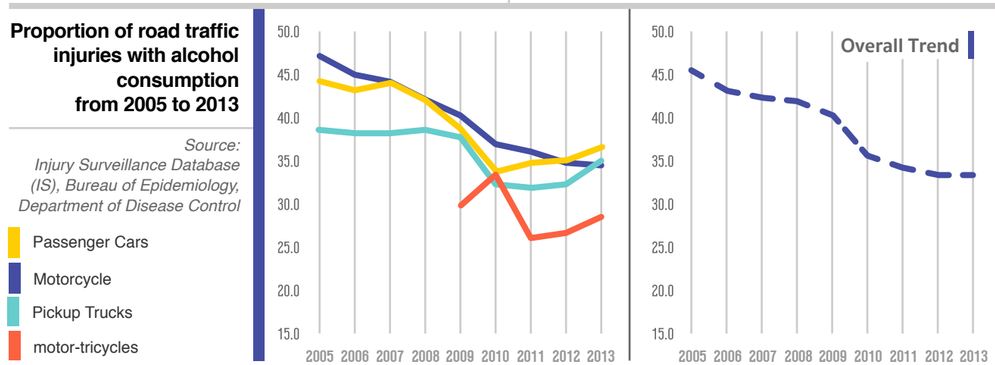


Proportion of Drunk Driving Accidents on 4 digit Highways in 2013, by Time of Day



Proportion of road traffic injuries with alcohol consumption from 2005 to 2013

Source:
Injury Surveillance Database (IS), Bureau of Epidemiology, Department of Disease Control



6

MOTORCYCLE HELMET USE

The recent survey on the use of motorcycle helmets indicates that the Thai government's 100% Helmet use campaign initiated in 2011 has yet to overall achieve its objective. Furthermore, the use of helmets among teenagers has been declining. Examining the helmet use data by province, however, reveals that some provinces exhibit signs of improvement in helmet use, though some others experiencing lower helmet use rates.

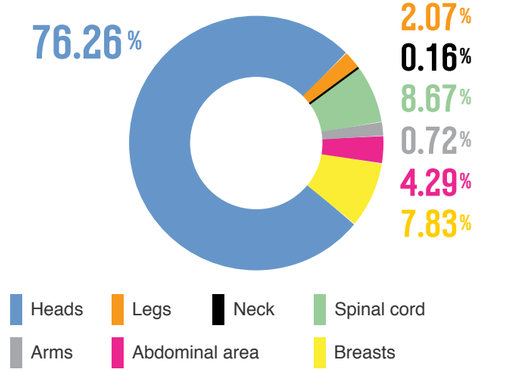
MOTORCYCLE HELMET USE

The motorcycle accident database developed by the Road Accident Victims Protection Company Limited is a great indicator of the importance of motorcycle helmet wearing. The database, called E-Claim, revealed that from 2010 to 2012, more than 70 percent of people killed by motorcycle crashes suffered from severe head injuries. However, despite the increasing awareness of the importance of helmets by all parties concerned, with a number of measures having been implemented, especially the Thai government's 100% helmet use campaign initiated in 2011, but when the overall trend of helmet usage rate nationwide is considered, it seems that those collective and concerted efforts have yet to be highly successful.

The recent helmet observational surveys conducted by the ThaiRoads Foundation and the Road Safety Watch Network in 2013 found that the helmet usage rates among riders and passengers were considerably low at 51 percent and 19 percent, respectively. Such figures were relatively close to those surveyed in previous years. Furthermore, it was found that the use of motorcycle helmets among teenagers was on a decline, from 34 percent in 2011 to only 23 percent in 2013. Also, the use of helmets among children was alarmingly low at 7 percent. When looking at helmet use statistics by province during 2010-2013, it revealed that some provinces exhibited some signs of improvement in helmet use, such as Chiang Mai, Tak, Khon Kaen, Trad, Petchaburi, Chai Nat, Ang Thong, Nakhon Si Thammarat, Ranong and Phangnga. However, some other provinces had alarmingly declining helmet usage rates, especially those in the North Eastern region, such as Loei, Nong Bua Lam Phu and Nakhon Phanom.

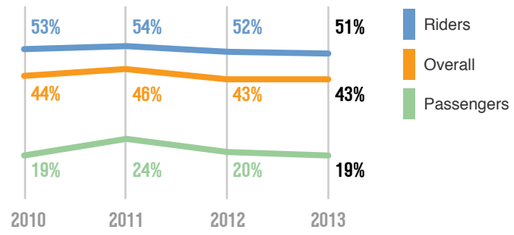
Proportions of injured organs of people killed in motorcycle accidents

Source:
E-Claim Database of Road Accident Victims Protection Company Limited



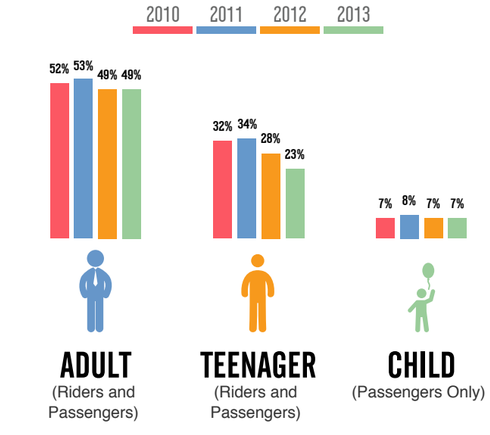
Motorcycle Helmet Use Rate in Thailand from 2010 to 2013

Source: ThaiRoads Foundation and Road Safety Watch Network

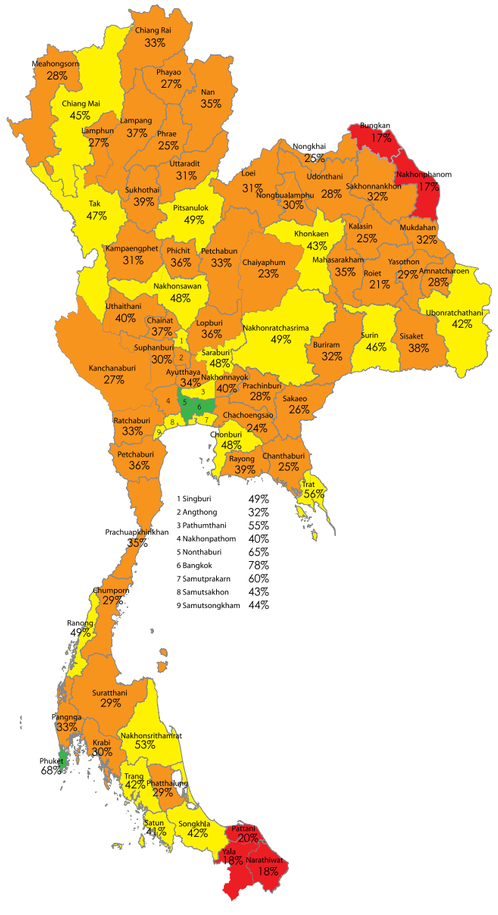


Motorcycle Helmet Use Rate in Thailand from 2010 to 2013, by age group

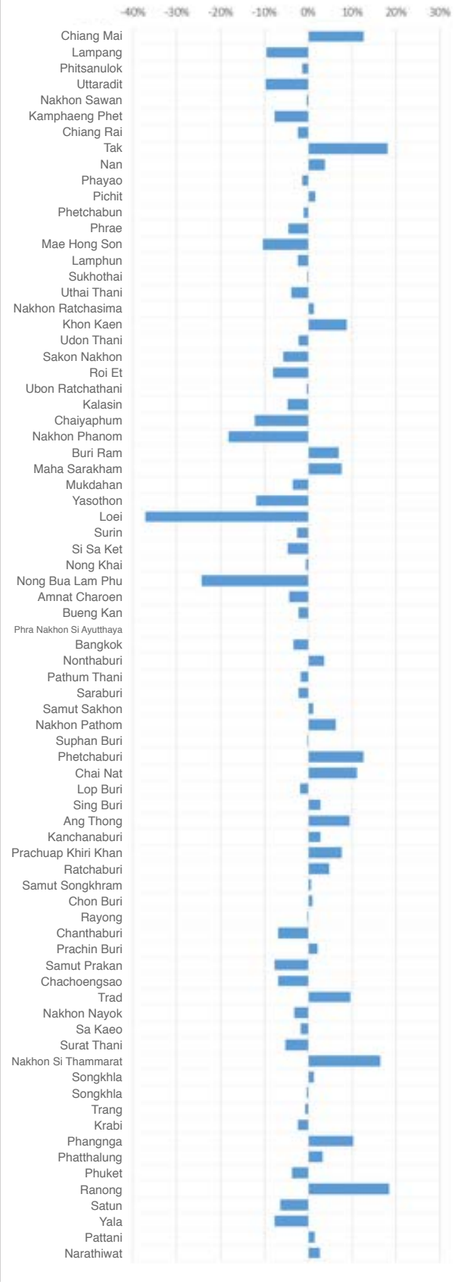
Source: ThaiRoads Foundation and Road Safety Watch Network



THAILAND MOTORCYCLE HELMET USE RATE IN 2013



Changes in motorcycle helmet use rates from 2010 to 2013, by province



7

SEAT BELT USE

Thailand has enforced the seat belt law which requires vehicle occupants to wear seat belts since 1997. However, there are only 54 percent of drivers and front seat passengers wearing seat belts, which is relatively low compared to most developed countries with seat belt use higher than 80 percent.

SEAT BELT USE

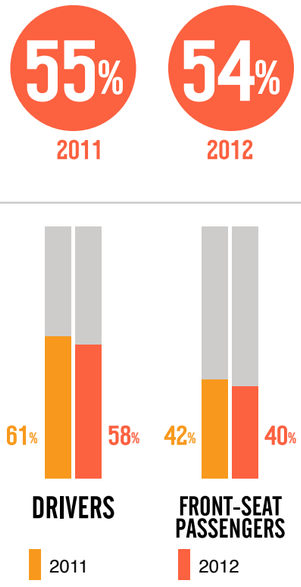
"Seat belt" is an effective vehicle safety device which could lessen the severity of occupants when the accident occurred. It currently becomes a standard device equipped in every car produced from automobile factories. Recent research studies about the efficiency of seat belts in Thailand revealed that it could reduce road traffic deaths by 34 percent while those car occupants without seat belts were 1.52 times higher risk of death than those wearing seat belts[1].

Thailand has enforced the seat belt law which requires vehicle occupants, both drivers and front seat passengers, in Bangkok areas and other provinces since 1997. However, there exists high prevalence of non-compliance with seat belt law. According to the nationwide seat belt use observations in 2011 by the ThaiRoads Foundation and Road Safety Watch Network, the results revealed that the overall seat belt usage was 54 percent, including 58 percent for drivers and only 40 percent for front-seat passengers. The seat belt use for female was 50 percent, lower than that of 54 percent for male. The seat belt use for pick-up trucks was found to be 48 percent, which that for passenger cards was higher at 60 percent. For those injured from road accidents over the past ten years, there remains below one third of them wearing seat belts.

Moreover, the seat belt usage rate in Thailand has been relatively low, compared to other countries internationally. According to the data from the Global Status Report on Road Safety in 2013 by the World Health Organization (WHO), the seat belt wearing rate of drivers and front seat passengers in most developed countries was higher than 80 percent.

Seat Belt Usage Rate of Vehicle Occupants in Thailand

Source: ThaiRoads Foundation and Road Safety Watch Network



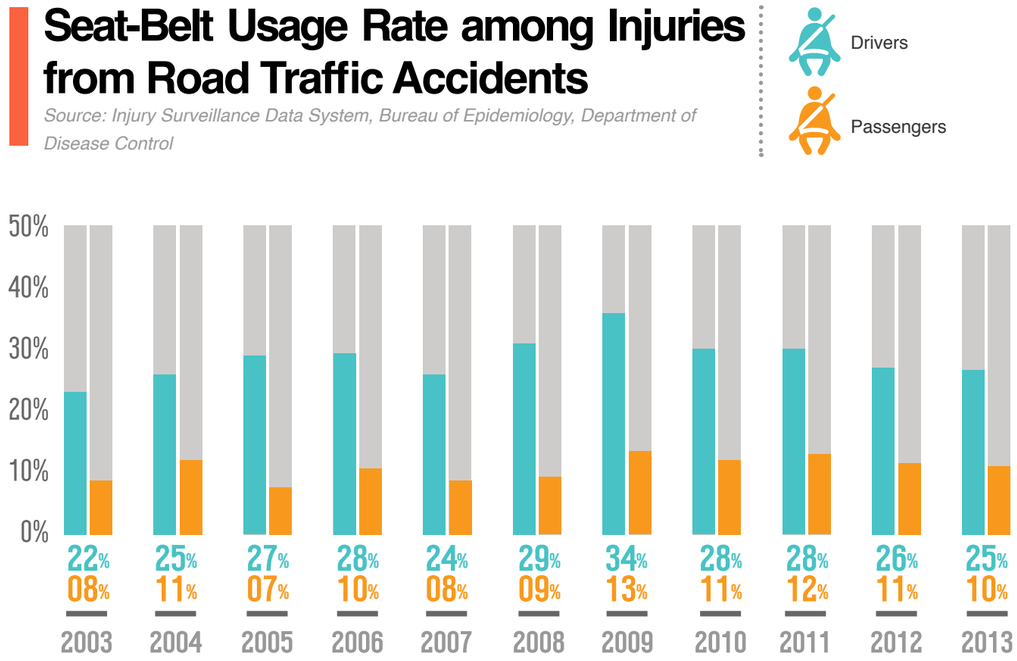
Seat-Belt Usage Rate of Vehicle Occupants in Thailand,

Classified by
Gender and Vehicle Type

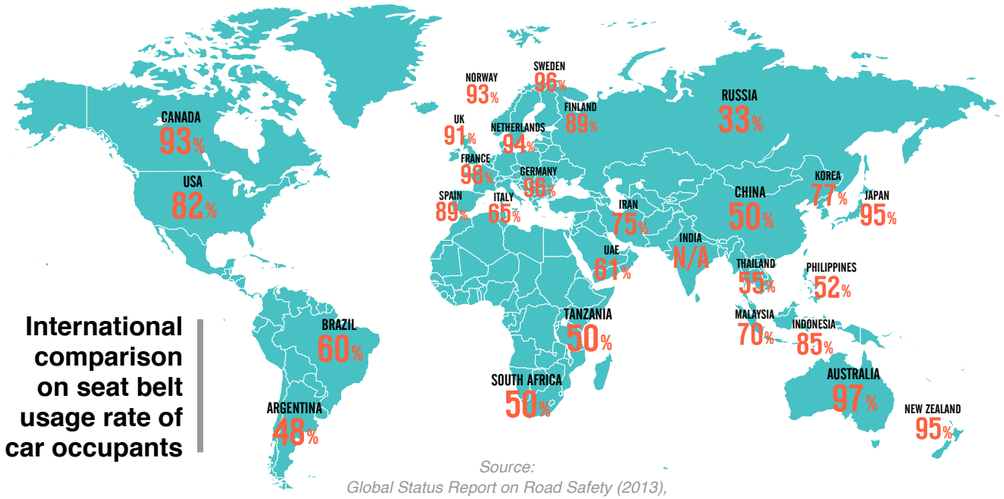
Source:
ThaiRoads Foundation and Road Safety Watch Network

Seat-Belt Usage Rate among Injuries from Road Traffic Accidents

Source: Injury Surveillance Data System, Bureau of Epidemiology, Department of Disease Control



International comparison on seat belt usage rate of car occupants



Source:
Global Status Report on Road Safety (2013), World Health Organization

[1] Boontob, N., Tanaboriboon, Y., Kanitpong, K., and Suriyawongpaisal, P. (2007) Impact of Seatbelt Use to Road Accident in Thailand, Transportation Research Record 2038, Journal of Transportation Research Board, pp 84-92

8

MOTORCYCLE SAFETY

The number of deaths and injuries from motorcycle accidents has continued to rise with gradual increases in the total numbers of registered motorcycles, which currently reaches 19 million units. The data analysis indicate that two third of motorcycle fatalities were due to collisions with other vehicles.

MOTORCYCLE SAFETY

Despite the economic fluctuation in Thailand due to domestic and external factors in 2012, motorcycles have remained very popular and there were about 19 million motorcycles registered in Thailand. At the same time, the number of injuries resulting from motorcycle accidents has been on an uptrend. Currently, there were an average of 6,000 reported deaths from motorcycle accidents and more than 200,000 injuries each year.

According to the analysis of motorcycle accident data during 2010-2012 based on E-Claim system of Road Accident Victims Company Limited, it revealed that two third of deaths were due to collisions with other vehicles, from which the risk of deaths for motorcyclists was about 3.6 times higher, compared to single-vehicle crashes or hitting other objects. With respect to type of vehicles involved, the risk of deaths for motorcyclists colliding with large size vehicles such as buses or trucks was 4 times higher, compared to crashes with other types of vehicles.

Registered motorcycles in Thailand

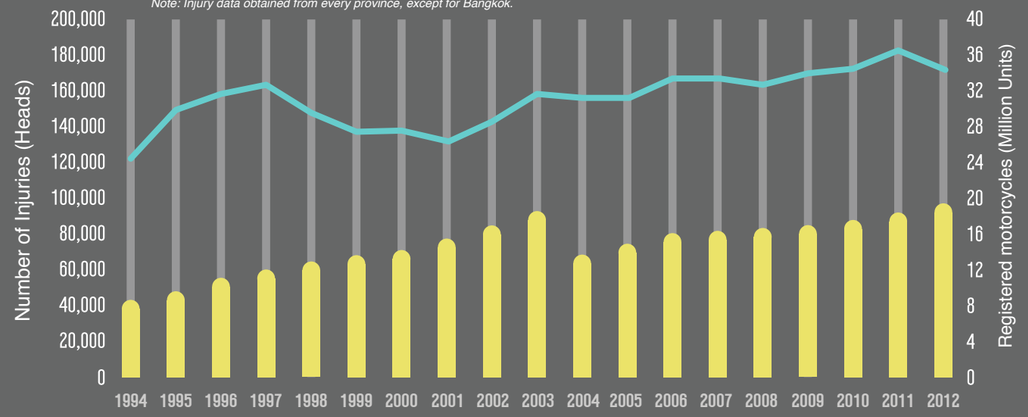
19 MILLION

Deaths from motorcycle accidents

6,000 PERSONS
per year

Number of injuries from motorcycle accidents, 1994 – 2012

Source: Hospital In-Patient Report, Office of Policy and Strategic, Ministry of Public Health and Vehicle Registration Statistic, Department of Land Transport
Note: Injury data obtained from every province, except for Bangkok.



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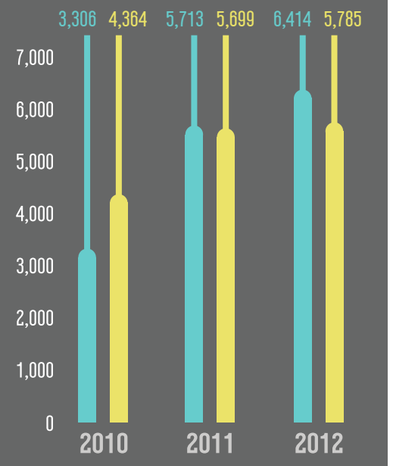
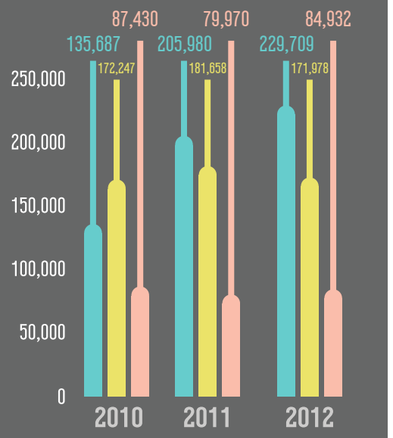
Comparison of motorcycle fatalities and injuries in Thailand 2010 - 2012

Source: E-Claim Database from Road Accident Victims Company Limited, Database of death certificate and In-Patient Database from Ministry of Public Health

Number of fatalities



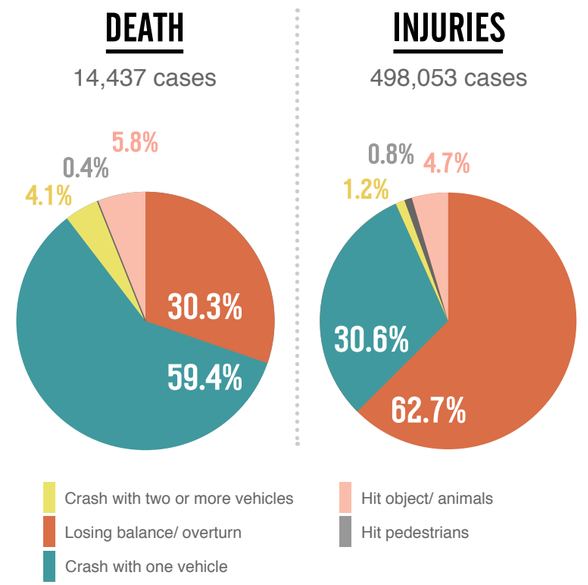
Number of Injuries



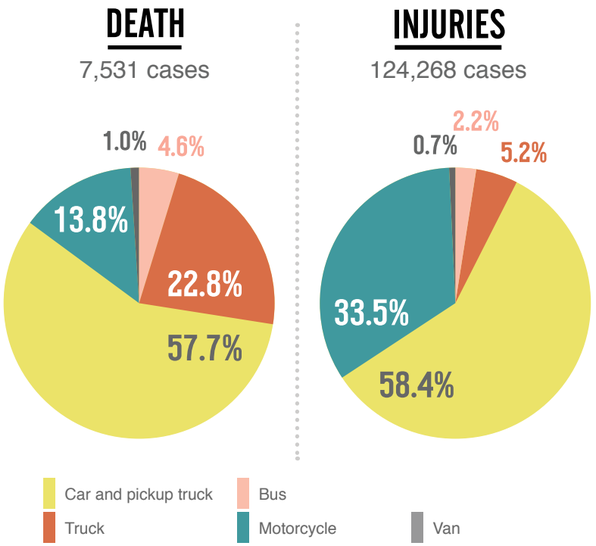
Fatalities and injuries of motorcycle users in Thailand 2010 - 2012

Source:
E-Claim Database from Road Accident Victims Company Limited

By accident type



By type of vehicles involved in crashes



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9

VAN AND BUS SAFETY

Bus accidents have increasingly become more severe with two major issues to be addressed urgently. Apart from the problem of vehicle safety conditions, there exists the issue of drivers' speeding behaviour, particularly in the group of private or rental vans and buses which likely have yet to be fully overseen by government regulating agencies.

VAN AND BUS SAFETY

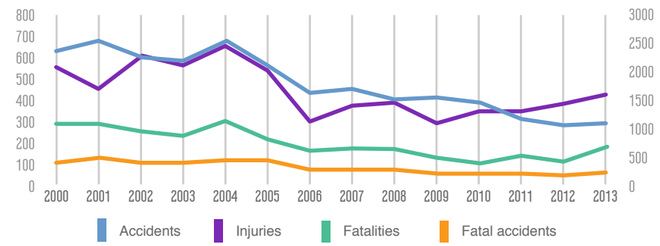
In the past few years, bus accidents on national highways have increasingly become more severe, as witnessed by the continuously rising number of deaths and injuries while the number of the accidents steadily declined. Given these situations, the vehicle safety conditions and the speeding behaviours of drivers remain two main concerns which urgently require corrective actions.

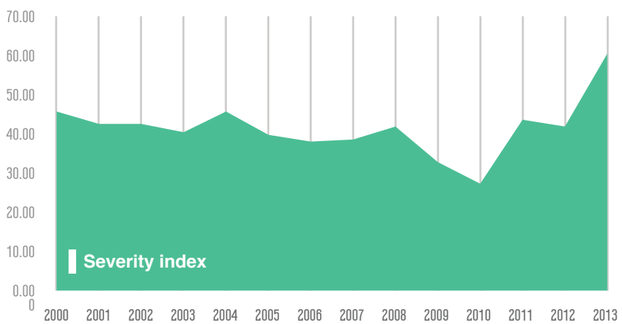
Regarding to the vehicle safety conditions, most of the existing buses have been on service for a long period of time, and if not properly and adequately maintained, they would be deteriorated and unsafe during operation. Based on statistics on motor vehicle inspections from the Department of Land Transport between the fiscal years 2006 – 2013, for instance, the problem of braking system for vehicles under the Land Transport Act such as buses and trucks has dramatically increased. The recent data in 2013 indicate that one third of buses and trucks that failed the indicated were due to braking system defects. This implies that prior to the inspection, those buses and trucks with poor braking system were running on the roads for certain periods of time.

For the speeding behaviour of drivers, the observational speed surveys for buses and vans on major highways located within the 200 kilometres from Bangkok throughout the year 2013 revealed that on average, there were about 50 percent of bus and van drivers exceeding the speed limits, though the non-compliance with speed limits above 80 percent was also observed at several locations. Furthermore, the prevalence of drivers' speeding appeared to be higher for private or rental vans and buses, compared to public van and buses. To some extent, this reflects the presence of some gaps in the government regulations which has yet to be fully overseen and covered all types of vehicles.

Statistics on bus accidents on national highways from 2000 to 2013

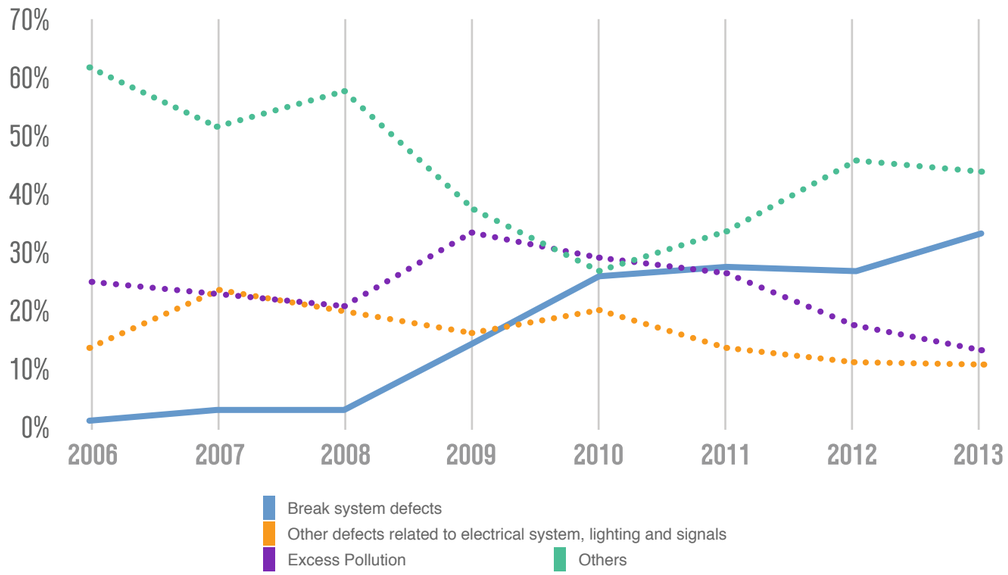
Source: Bureau of Highway Safety, Department of Highways



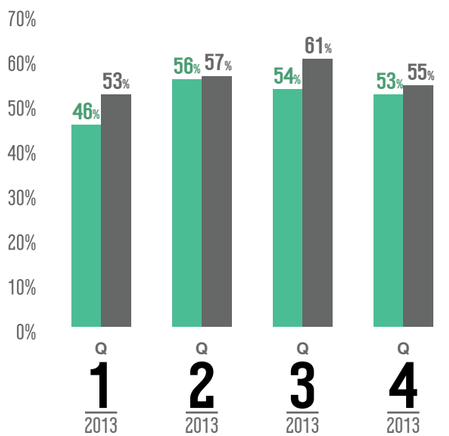


Causes of failure to pass inspections for buses and trucks during the fiscal years 2006-2013

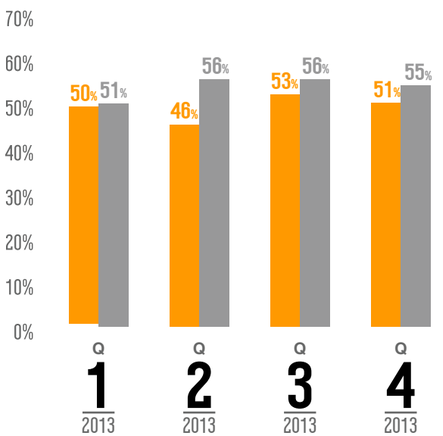
Source: Department of Land Transport



Proportion of van drivers exceeding the speed limit in 2013

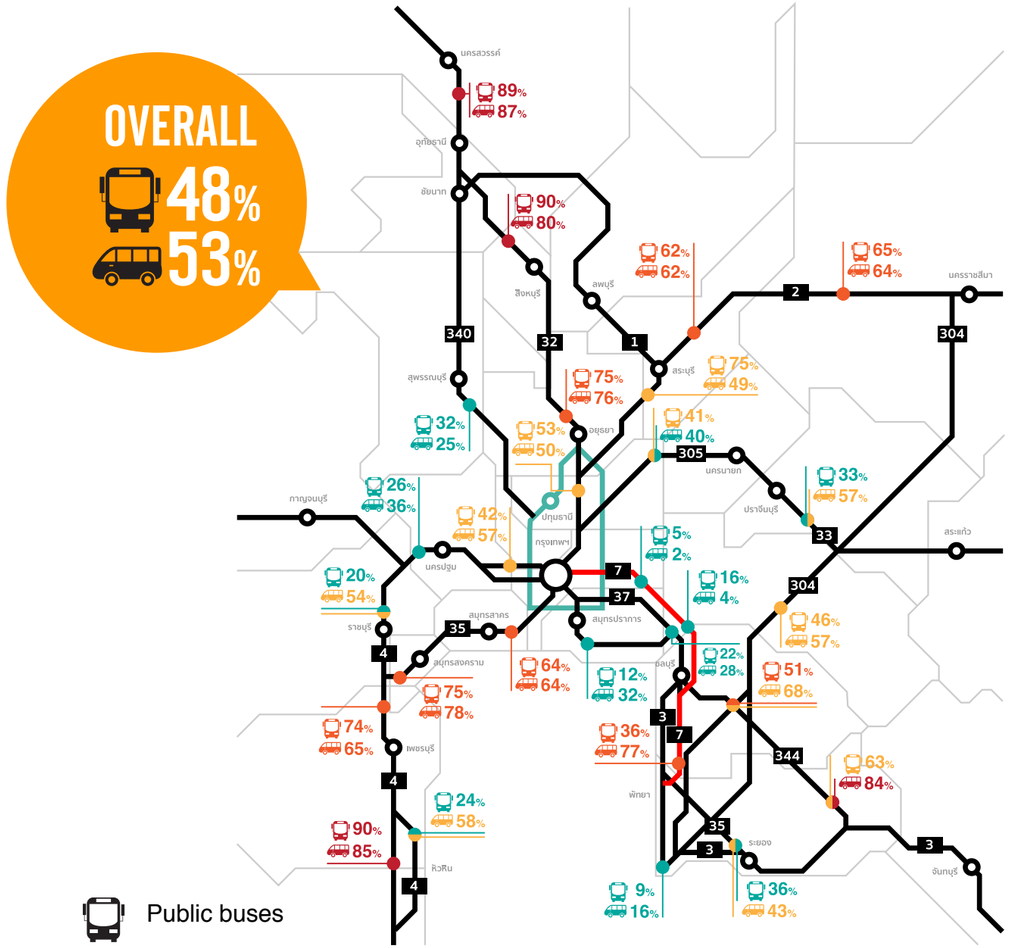


Proportion of bus drivers exceeding the speed limit in 2013

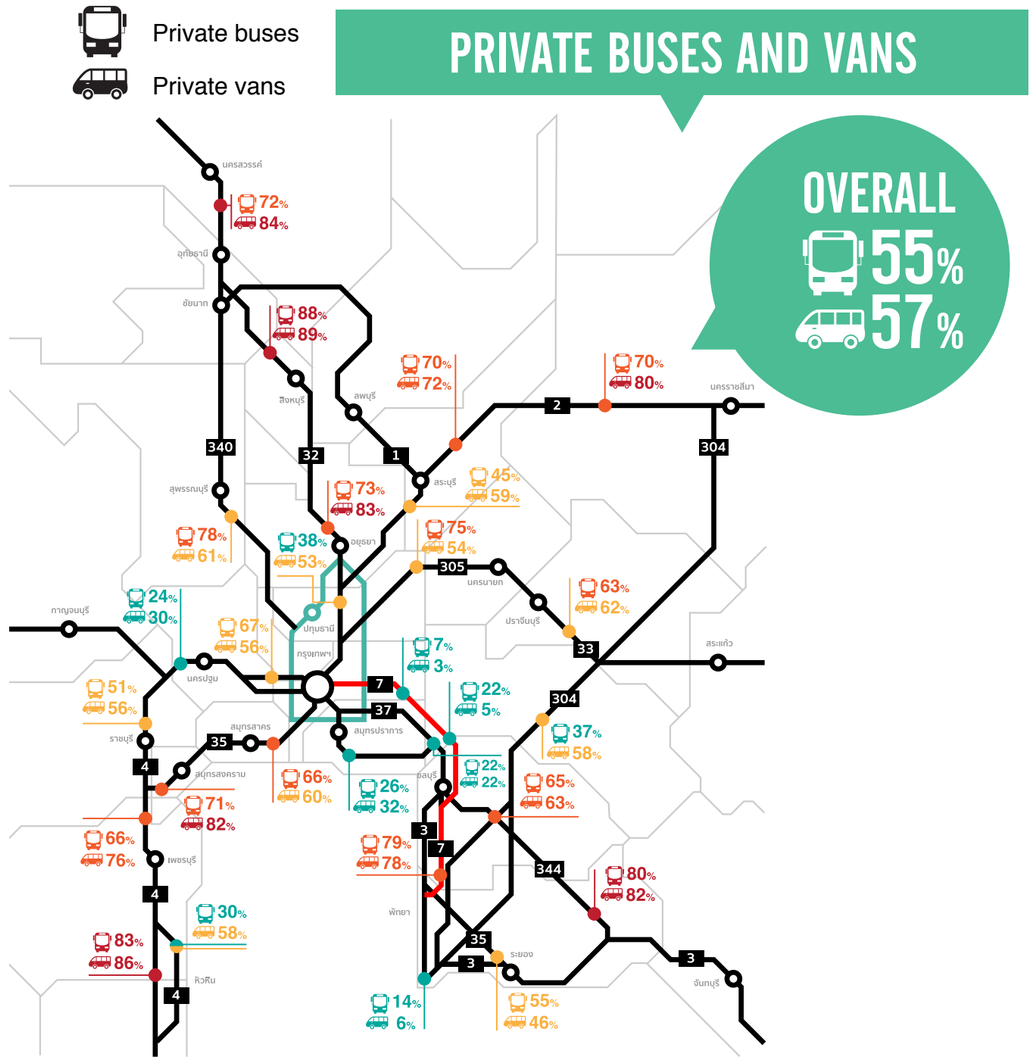


Proportion of Bus and Van Drivers Exceeding the Speed Limits in 2013

Source: ThaiRoads Foundation and Road Safety Watch Network



PUBLIC BUSES AND VANS



10

ACCIDENT BLACK SPOTS ON HIGHWAYS

The number of black spots on highways has continued to decline. However, the budget allocation for black spot improvements should still be further emphasized more on provincial highways connecting amphurs or districts on which accident black spots have shown to be on the rise.

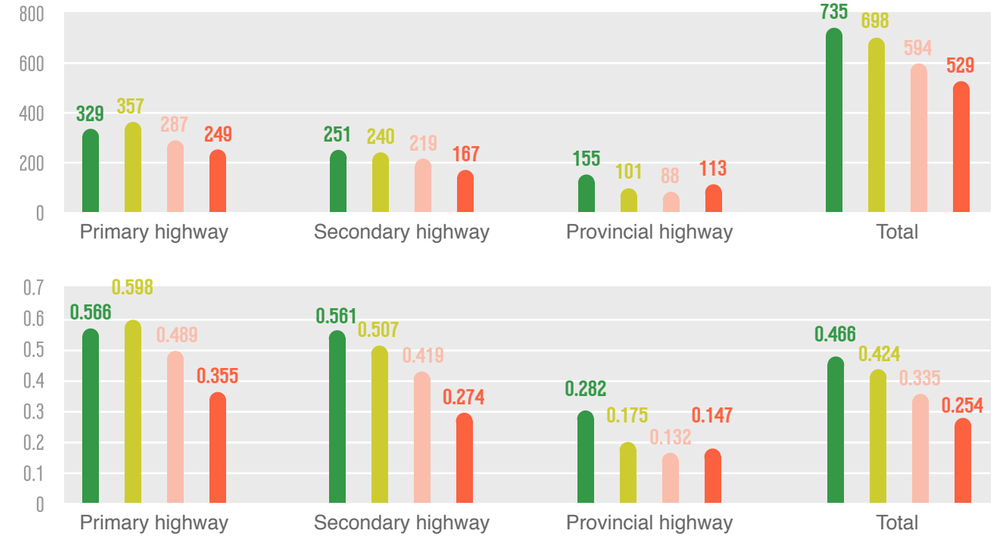
ACCIDENT BLACK SPOTS ON HIGHWAYS

The analysis of highway accident data conducted by the Department of Highways shows that the number of black spots on highways (defined as locations or sections with three or more accidents within 1 year) during 2006-2012 constantly declined. The continuing reduction in black spots is partly due to the development of Highway Accident Information System (HAIMS), which provides geographical locations of accidents and the use of these data for black spot analysis and budget allocation, in addition to increases in the budget received for highway safety improvements.

Nevertheless, according to the number of black spots in 2012, classified by provinces, it is found that there were 26 provinces with increased black spots, 24 provinces with smaller numbers of black spots, 12 provinces with unchanged numbers, and 15 provinces with no black spot. The data also suggests that about 55 percent of black spots on highways were located in Bangkok and vicinities that usually experienced high traffic volumes. Classified by highway types, it appears that there were fewer black spot locations on primary and secondary highways. However, the budget allocation for black spot improvement in the following years should be emphasized more on provincial highways connecting amphurs or districts where the recent rise in accident black spots has continuously been witnessed.

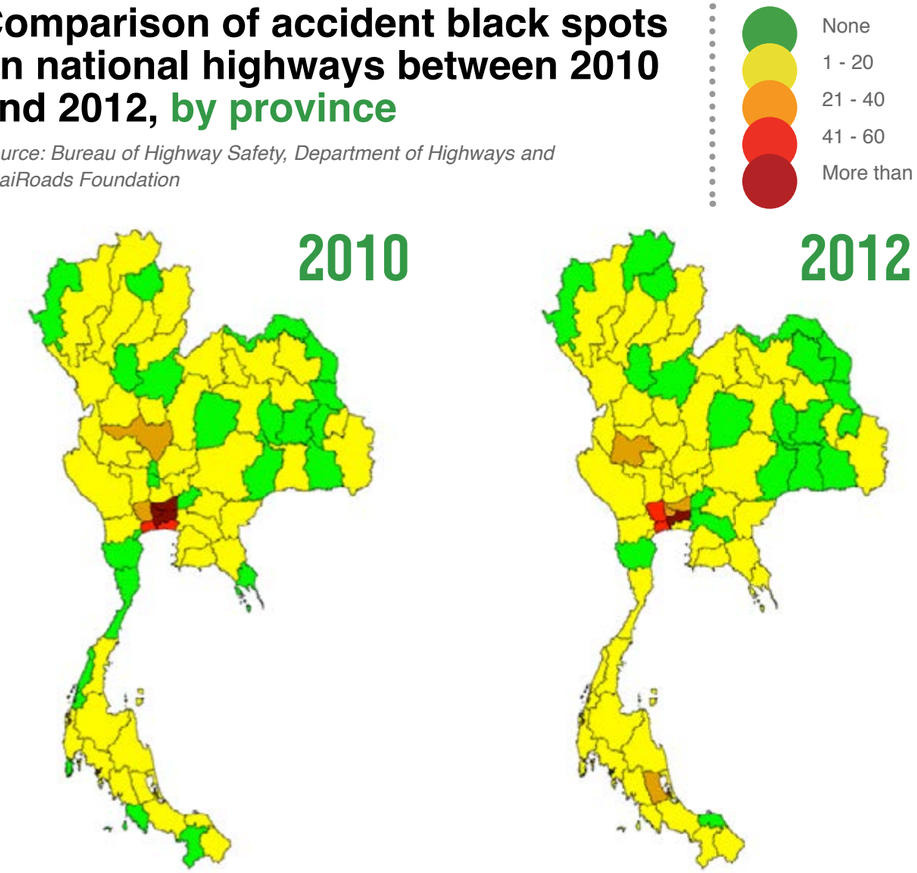
Accident black spots on national highways in 2006 - 2012

Source: Black spot data in 2006 and 2008 from Bureau of Highway Safety, Department of Highways and data in 2010 and 2012 from the analysis by ThaiRoads Foundation



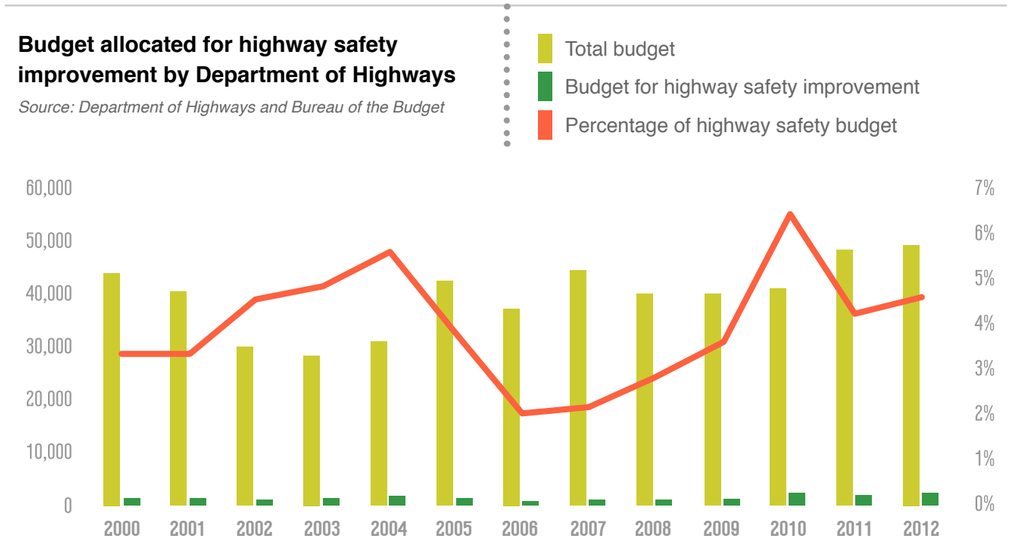
Comparison of accident black spots on national highways between 2010 and 2012, by province

Source: Bureau of Highway Safety, Department of Highways and ThaiRoads Foundation



Budget allocated for highway safety improvement by Department of Highways

Source: Department of Highways and Bureau of the Budget



11

ROADSIDE CRASHES

Roadside crashes are the major cause of deaths and injuries from highway accidents, and have become more severe over the past five years. It is thus necessary to solve these problems with urgent and concrete measures.

ROADSIDE CRASHES

Roadside crashes are the most serious problem of highway accidents. On average, roadside crashes were accounted for 43 percent of all types of accidents and became the main cause of deaths (33 percent) and injuries (42 percent).Moreover, they have become increasingly more severe over the past 5 years. Regarding the accident patterns, about 60 percent of roadside accidents involved vehicles crashing into the fixed objects such as tree, electrical pole, kilometre post, etc. Nonetheless, with respect to degree of severity, vehicle rollovers were more likely to cause deaths than other types of roadside crashes.

In addition, the analysis of recent data in 2013 revealed that most of roadside crashes occurred on 4-lane highways (48 percent) and generally occurred on a straight section (76 percent). Pick-up trucks (34 percent) were mainly involved with roadside crashes, while the main probable causes were due to exceeding speed limit (83 percent) and drowsy driving (7%).

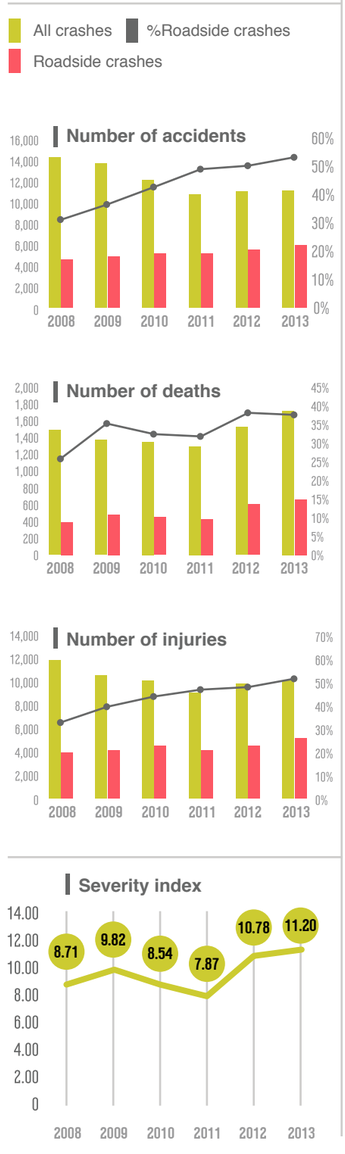
48%
76%
34%
83%
7%

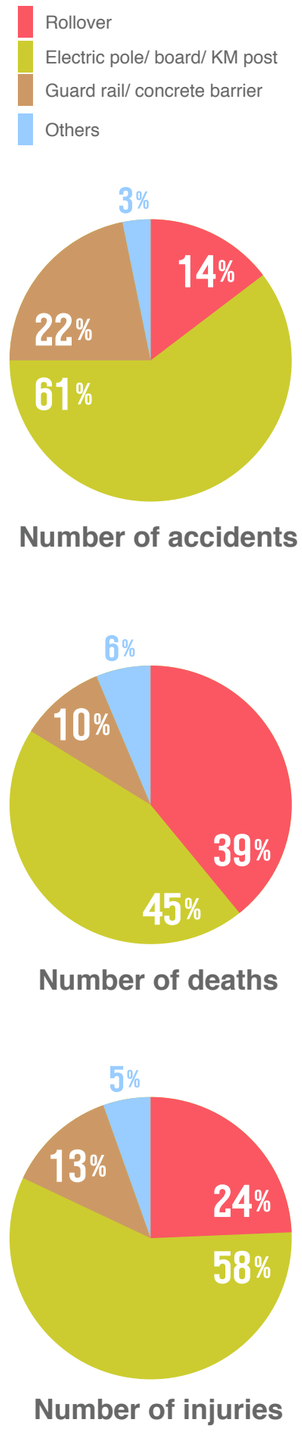
Therefore, it is necessary to manage and solve the problem of roadside crashes with urgent and concrete measures, by adapting the international good practices to local contexts. This includes, for example, the adoption of speed limit management measure to reduce run-off road as well as the implementation of engineering measures, for instance;

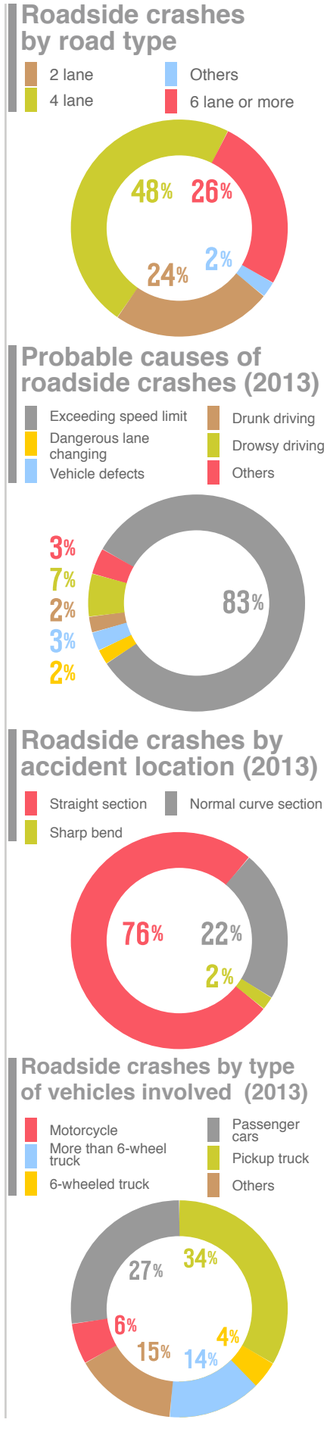
1. Providing a clear zone without any obstruction or dangerous roadside conditions such as high and steep slope, drainage system
2. Removing or relocating any roadside fixed objects to a safe area
3. Installing adequate and proper roadside protection systems such as guard rail or concrete barriers
4. Installing crash cushions at gore areas or Y-junctions to reduce crash impacts and severity
5. Installing traffic control devices to warn a drivers if there are any roadside hazards
6. Improving the budget management for maintenance to ensure that roadside protection and traffic devices installed are in good conditions and ready to use

Statistics on roadside crashes on highways in 2008 - 2013

Source: Bureau of Highway Safety, Department of Highways and ThaiRoads Foundation







12

RAILROAD ACCIDENTS

Over the past 10 years, traffic accidents at railroad crossings have steadily declined. However, the number of accidents remained considerably high and brought about losses of life and property each year. Of particular concern have been accidents at illegal crossings that occurred quite frequently and required engineering practice together with jurisprudence and political science to solve such problems.

RAILROAD ACCIDENTS

Statistical data collected by the State Railway of Thailand during the fiscal years of 2002-2013 reveals that there were high numbers of 1,912 accidents related to trains hitting other vehicles or pedestrians at railroad crossings, of which made up to 621 deaths and 1,909 injures. Despite the decline in the number of accidents and deaths in the past 10 years, the severity of railroad accidents, which was relatively higher compared to that of other types of road traffic accidents, caused several catastrophic incidences and massive losses of life and properties every year.

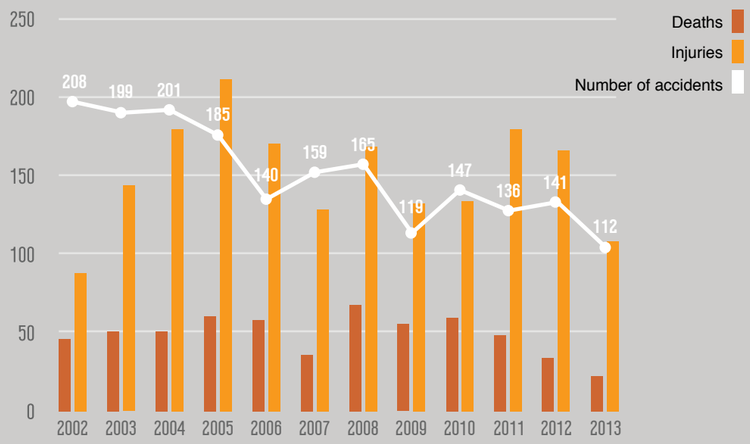
Total length of railways in Thailand is about 4,000 kilometres, and there are total of 2,457 railway crossings, including both with and without crossing barricades. Some crossings are bridges or tunnels. Included in these numbers are 538 illegal crossings with no safety protection system, some of which have frequent accidents. The data from the State Railway of Thailand in 2010-2013 also suggests that the majority of railroad accidents occurred at the crossings without barricade. From the total of 112 railroad accidents in the fiscal year 2013, for example, 96 accidents or 89 percent occurred at the crossings without barricade, and over 55 accidents or 51 percent took place at illegal crossings.

The engineering treatment for safety management at the railway level crossing is typically based on a traffic movement (T.M.) level, calculated by multiplying the number of vehicles at crossing per day with the number of trains per day. For a T.M. exceeding 100,000, grade separation such as bridges or tunnels is recommended. Only the installation of crossing barricade will be recommended if the T.M. level equals 10,000 or higher. Nevertheless, potential accident risks remain at the railway crossings only controlled by traffic signs as well as at the illegal crossings, both of which totalled about 1,500 locations nationwide.

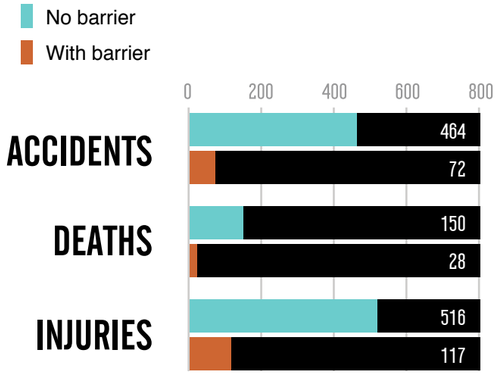
Although the installation of barricades at the illegal crossings requires a considerable amount of budget, it should be financially supported in order to enhance safety for road users. For illegal crossings with no permission from the State Railway of Thailand, it might be difficult to terminate every crossing since they are a main transportation means for local people to commute and engage in activities on a daily basis and some previous attempts to disallow the use of those crossings often face with strong public resistance. However, it is necessary for the government to address these safety issues by installing low-cost signal warning and encouraging local people to participate in monitoring and improving safety at the illegal crossings (e.g. removing vegetation to improve visibility, reporting problems of installed signs or devices to the concerned authority).

Statistics on railroad accidents during the fiscal years 2002 - 2013

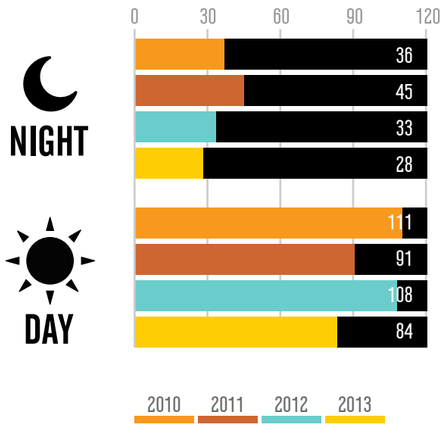
Source: The State Railway of Thailand



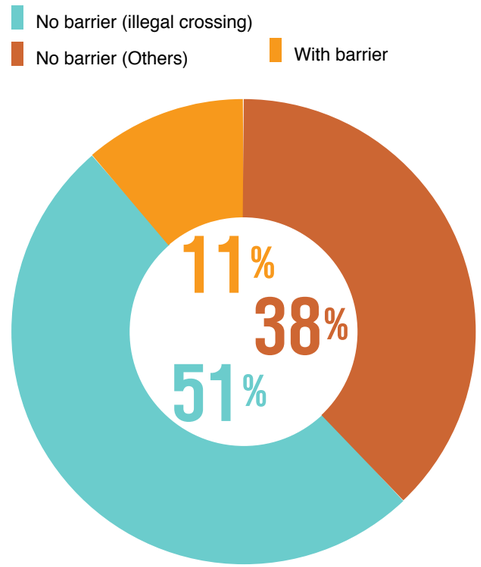
Railroad accidents by type of crossing



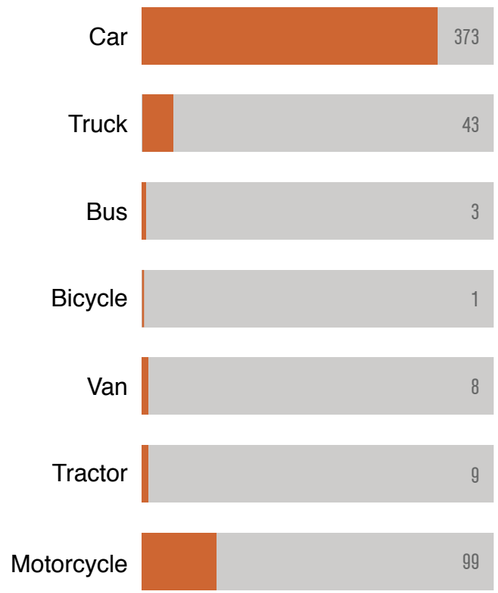
Railroad accidents by time of days



Railroad accidents in fiscal year 2013, totalled to 112 cases



Type of vehicles involved in railroad accidents



KEY FACTS ON ROAD SAFETY SITUATIONS

IN THAILAND

2012-2013