

# Traffic Safety Education and Information Campaign Activities in Taiwan

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## Summary

This report introduces the traffic safety education and information campaign activities in Taiwan. The report is divided into five parts. Subsequent to the introduction in Part 1, Part 2 describes the trends and major characteristics of traffic accidents in Taiwan, providing background information regarding the causes of crashes and the evolution of traffic safety education and information campaign activities. Part 3 introduces the collaborating of organizations closely involved in traffic safety education programs and information campaign activities; this section profiles both the government and non-government sides. Part 4 describes selected traffic safety education programs and information campaign activities, detailing how children are educated in road safety, the design of graduated licensing programs for ensuring the safety fitness of drivers, and some special programs designed for further enhancing road safety. Part 5 is the conclusion to the report.

## 1 Introduction

Education is a crucial element in the so-called 3E (engineering, enforcement, and education) road safety system. No single one of the 3E strategies is able to stand alone in dramatically improving traffic safety. Traffic safety in Taiwan is heavily reliant on the continuous improvement of roadway engineering and law enforcement. For example, encouraging schoolchildren to walk to school requires a safe and secure pedestrian environment; only then would parents and family members be willing and feel comfortable to give their children the green light to walk to school<sup>1</sup>. Another example where traffic law enforcement is indispensable is drunk driving, even though a considerable effort has been made to disseminate information regarding the dangers of drunk driving on the roads. The reason is simple: not all drivers appreciate the danger of drunk driving, and even some of those who are cognizant of the dangers still consume alcohol before hitting the roads<sup>2</sup>. Consequently, traffic law enforcement, in addition to safety education, is essential to improving traffic safety.

Despite the importance of engineering and enforcement, safety education has its own particular role in improving traffic safety in contemporary Taiwanese society. Roadway engineering is stepping into a mature stage in Taiwan; the standards for designing and constructing roadways have been well developed and followed, implying a minimum safety standard for most roads. Traffic law enforcement is limited by the available resources, including the number of police officers and traffic enforcement equipment such as speed cameras. Moreover, the major concern of traffic law enforcement is violations of traffic laws; however, other aberrant driving behaviors, such as lapses in judgment and mistakes, have also been found to have significant relationships with traffic crashes<sup>3</sup>. Traffic

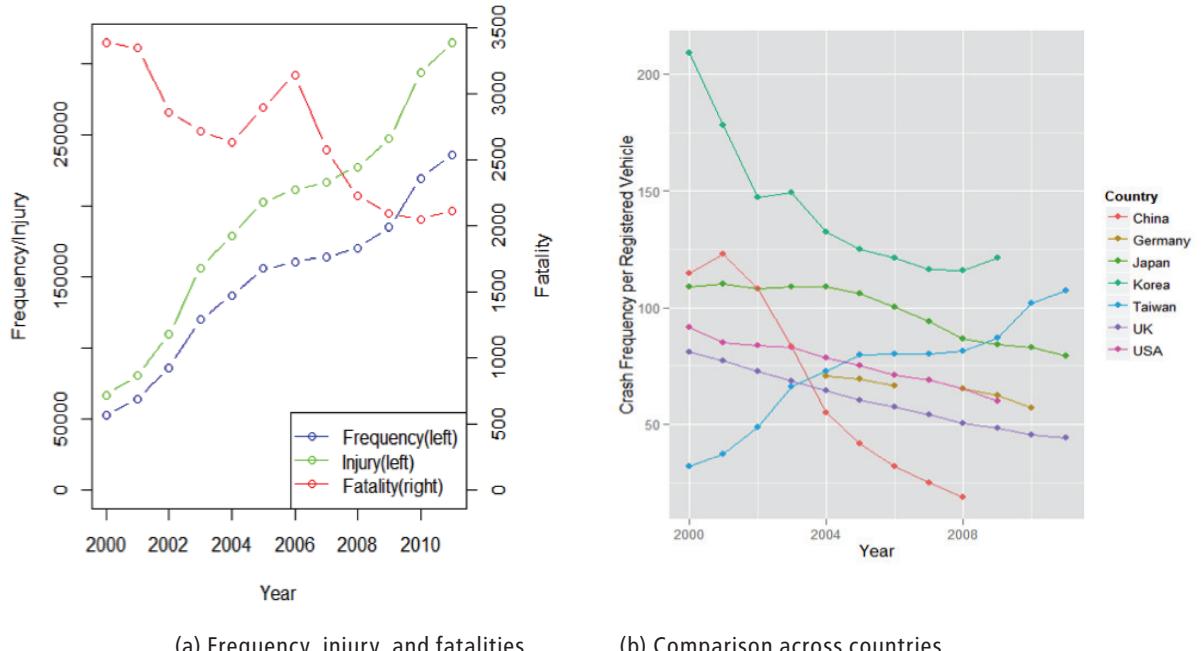
safety education and information campaign activities, which aim to promote safe road user behavior, may exert a relatively profound effect on reducing some traffic crashes, especially those related to driving behavior.

The remainder of this report is organized as follows. Section 2 describes the trends and major characteristics of traffic accidents in Taiwan. Section 3 presents the collaborating of traffic safety education organizations in Taiwan. Section 4 gives a detailed description of selected traffic safety education programs and information campaign activities in Taiwan. Section 5 provides a conclusion.

## 2 Traffic Accidents in Taiwan

### 2.1 Trends of Traffic Accidents in Taiwan

Traffic accidents in Taiwan are actually a public health issue. Accidental death has long been one of the top ten leading causes of death in the country, with traffic accidents normally being the most common cause of accidental death. The Taiwanese government and local communities have thus expended considerable effort and time trying to reduce the numbers of traffic accidents, injuries, and fatalities. As shown in Fig. 1(a), the number of fatalities due to traffic accidents (red line) has fallen since 2000, but the frequency and number of injuries have both increased (blue and green lines). Fig. 1(b) shows a comparison of accident frequency per registered vehicle in seven countries. Taiwan's rate has been increasing steadily, rising from the lowest of all seven countries in 2000 to the second highest in 2011, trailing only Korea.



**Figure 1.** Traffic accident trends in Taiwan (2000–2011)

### 2.2 Major Characteristics of Traffic Accidents in Taiwan

Motorcycles, elderly drivers, and drunk driving are the three most frequent elements of traffic accidents in Taiwan.

Motorcycles, including mopeds and light motorcycles, are the major mode of transportation in Taiwan, comprising two-thirds of all registered motor vehicles. Due to cost

and convenience considerations, motorcycles are used for a variety of daily non-leisure activities—a pattern that strikes a contrast with customs in Western countries. Because of this high exposure, motorcycle accidents are the most common type seen in Taiwan. In 2012, approximately 47% of all traffic fatalities were motorcycle drivers or passengers.

As is the case in many developed countries, Taiwan is developing into an aging society. In 2012, people older than 65 accounted for 11.15% of the total population, and the elder-child ratio was 0.76:1. The growth of the elderly population has created concerns about traffic safety. The aging process can cause deterioration of vision and hearing, reduced motor skills, and longer cognitive reaction time, among other changes. Some illnesses, such as dementia or Alzheimer's, can also affect the safety of elderly drivers. Some elderly drivers may take preventive strategies (e.g., avoid driving at night) to compensate for their reduced physical and mental abilities. The increasingly aging population and the particularly fragile bodies of elderly drivers have made elderly driver safety a focal point for the Taiwanese government. While the number of traffic fatalities among drivers older than 65 has been steadily decreasing, dropping from 670 in 2001 to 543 in 2011, the percentage of elderly people involved in fatal crashes is still increasing, rising from 20% in 2001 to 26.7% in 2012.

Traffic crashes involving drunk driving are normally severe, and have thus long been a serious concern for governmental authorities. Taiwanese lawmakers have made several revisions to legal provisions that punish drunk driving in hopes of reducing these behaviors and thus limiting related traffic accidents. The maximum allowable threshold for alcohol in a breath test has become a stricter 0.15 milligrams. In addition to having to pay higher fines, drunk drivers who exceed the threshold of 0.25 milligrams or have a blood alcohol concentration of 0.05% or greater go immediately into police custody even if they have not caused an accident. The effectiveness of stricter laws and acts is evident in the continuous drop in drunk driving fatalities, which declined from 477 in 2008 to 382 in 2012.

### 3 Partnerships between Traffic Safety Education Organizations in Taiwan

Safety education and information campaign activities in Taiwan are conducted by both governments and nongovernmental organizations. Schools also play a crucial role in child and adolescent safety education. Communities sometimes become involved in road safety education and information campaign activities, especially those for schoolchildren and elderly drivers. These organizations may work together or separately to conduct traffic safety education programs or information campaign activities. The following subsections detail the roles and responsibilities of these organizations in safety education and information campaign activities in Taiwan.

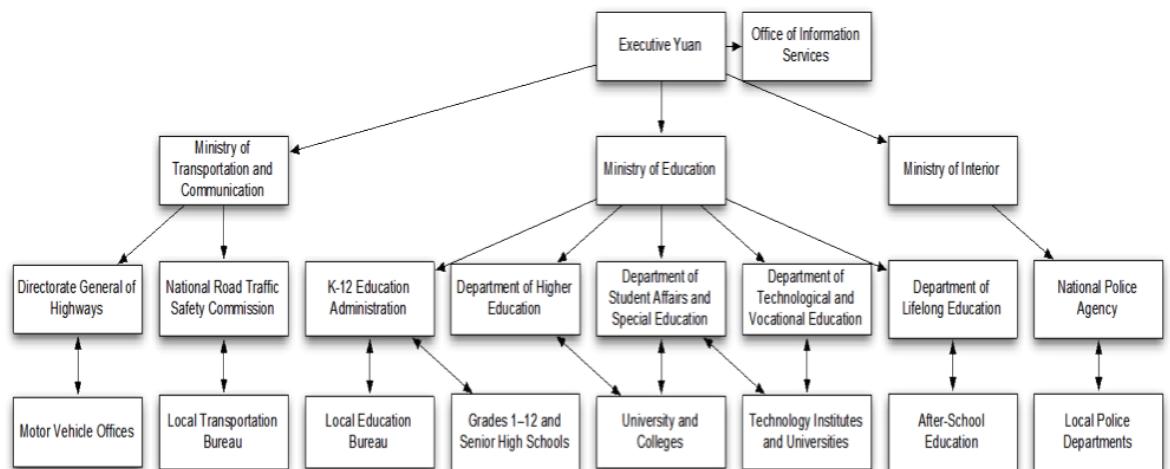
#### 3.1 Governments

Government plays a crucial role in road safety education and information campaign activities in Taiwan; as government agencies are responsible for developing traffic safety policies and programs, subsidizing safety education programs, and monitoring the operation of safety education and information campaign activities. Three ministries in the central government are particularly crucial: the Ministry of Transportation and Communication (MOTC), the Ministry of Education (MOE), and the Ministry of the Interior (MOI). These three ministries—the highest-ranking government departments—are handling traffic and transportation, education, and police enforcement, respectively. Subordinate to the MOTC, the National Road Traffic Safety Commission (NRTSC) is responsible for reviewing black spots and for developing nationwide traffic safety education policies and informa-

tion campaign activities, while the Directorate General of Highways (DGOH) is responsible for driver and vehicle licensure programs and management. The portal site of the NRTSC (<http://168.motc.gov.tw>) is the primary source of traffic safety education and information material in Taiwan. As in the education system, the MOE has various subordinate departments involving in traffic safety education, including the K-12 Education Administration (for schoolchildren in grades 1–12 and high school students), the Department of Higher Education (university and colleges), the Department of Technological and Vocational Education (technology institutes and universities), the Department of Student Affairs and Special Education (senior high schools and all types of universities and colleges), and the Department of Lifelong Education (adult education). While these departments have their own responsibilities, specific to students of different ages, the Department of Lifelong Education is currently the branch that coordinates traffic safety education programs and activities across all departments. As for the MOI, the National Police Agency (NPA) is the subordinate agency in charge of traffic safety education. The NPA is the highest-ranking agency in the police system. In addition to enforcement, police officers provide traffic safety education programs and information campaign activities to the public, especially programs related to severe traffic accidents and dangerous violation behaviors. Clearly, traffic safety education in Taiwan is not solely the responsibility of the education system; the MOTC and MOI, whose original jobs were roadway engineering and traffic law enforcement, also collaborate with the MOE to improve traffic safety through education.

Partnerships among local governments are similar to those in the central government. Local government education bureaus, transportation government departments, and police departments play their own roles in safety education and information campaign activities. They also cooperate in resolving traffic safety issues requiring approaches that integrate education, engineering, and enforcement. Unlike the traffic safety education programs and information campaign activities initiated by the central government, those provided by local governments are designed to fit local needs. For example, while cycling safety is a nationwide issue, the concern in eastern cities famous for tourism is tourists' cycling safety and electronic motor vehicle safety.

The partnership of government departments and agencies and schools for improving traffic safety education and information campaign activities in Taiwan is illustrated in Fig. 2.



**Figure 2.** Partnership of government departments, agencies and schools for traffic safety education and information campaign activities

### **3.2 Nongovernmental Organizations**

Nongovernmental organizations are crucial in improving traffic safety in Taiwan especially in terms of safety education and information campaign activities. Different programs and activities are provided depending on the vision of each organization. Some organizations are specific to child safety, for example; others may be more professional, aimed at motorcycle safety. Most of these organizations are nonprofit. They could be assisting governments to conduct specific safety education programs; they may be involved in promoting laws and regulations to enhance traffic safety; they could also be platforms for governments, corporations, and the public to exchange ideas related to traffic safety issues. Some of the nongovernmental organizations actively promoting traffic safety are introduced below.

#### **3.2.1 Jing Chuan Foundation**

The Jing Chuan Child Safety Foundation is a nonprofit organization specifically concerned with children's safety, including traffic safety (TW9). The foundation was started in 1993 to commemorate a kindergarten teacher who sacrificed herself to save children from a burning school bus. Over the past twenty years, the foundation has been working in many areas. First is to educate the public about the correct procedures for children riding motorcycles as passengers. According to a survey conducted by the foundation, approximately 60 percent of Taiwanese children ride a motorcycle as a passenger every day, and the odds of them being involved in a fatal crash are 1.25 times higher than they are for adults. To improve motorcycle safety, the foundation first promoted the importance of wearing helmets for students in elementary school. They also solicited helmets and sent them to school-aged children, especially those in the countryside. Another activity has been to promote reducing the motorcycle speed limit to 30 kph, especially when carrying a child. This is based on research findings that crashes where the speed is 30 kph have an injury rate of 5%, but crashes at 50 kph have an injury rate as high as 85%<sup>4</sup>. The foundation also promotes the idea of not letting children younger than six years old ride a motorcycle, given that their muscles are not strong enough to hold on tightly. Children whose legs are not long enough to be placed on the motorcycle also should not ride as passengers.

The second area of focus in Jing Chuan's traffic safety promotion efforts is the correct use of child car seats. Partly because of Jing Chuan's efforts, the Taiwanese government passed a law specifying that children four years old or younger need to use child car seats when sitting in the back seat of a car. This regulation was further extended in 2012 to include children up to the age of 12, who are not allowed to sit in the front seat. As child car seats are relatively new to the Taiwanese people, the foundation has expended tremendous effort disseminating the concepts and promoting the advantages of using child car seats. The foundation has also cooperated with hospitals, vehicle manufacturers, child car seat manufactures, and retailers to promote the ideas.

The organization's third area of concern is child school bus safety. In Taiwan, the design requirements for school buses, such as model year and markings on bus exterior, for children seven years old or younger are different from those for children over seven. The foundation has been trying to educate parents on the importance of choosing school buses with the right designs for children under different ages and also educate them on how to identify school buses certified by local governments or motor vehicle offices (MVOs).

The fourth area is safety training for school bus drivers and escort teachers. In Taiwan, the regulation is that every child school bus must be accompanied by one escort teacher. The foundation offers two types of courses: one for school bus drivers, and the other for

escort teachers. The course for bus drivers is designed to improve driver knowledge of safe driving skills, particularly defensive driving. The course for escort teachers is designed to instruct them in ways to help children safely on and off the bus and techniques for communicating with parents. The courses also provide opportunities for both drivers and teachers to learn together, sharing knowledge and skills on how to respond to emergencies (e.g., evacuating children from the bus in case of emergency) and other topics.

The last area is improving commuter safety for elementary schoolchildren. Based on surveys that have been conducted since 2003, it appears that parents would be willing to choose active transportation modes (such as walking or bicycling) for their children to commute rather than passive modes (such as motorcycles or cars) only if the commuting environment improved. Hoping to tap into power from local governments, police departments, communities, schools, and safety experts alike, the foundation provides a platform connecting all interested parties. From 2003 to 2013, the organization has helped 72 schools improve their commuting environments and finished 895 roadway improvements<sup>5</sup>. In addition to engineering, foundation representatives also went to campuses, providing safety knowledge to schoolteachers and crossing guards\*. In 2013, the foundation conducted a pilot program at five elementary schools to promote walking to school. Representatives conducted field and questionnaire surveys to understand the issues in the local commuting environment and worked with schoolteachers to develop strategies to encourage children to walk to school after the environment was improved. These efforts tripled the number of children walking to school.

The Jing Chuan Foundation's systematic operating procedure deserves special mention. Before developing a strategy, the foundation conducts surveys to identify problems and issues. This means that any strategy proposed by the foundation is normally evidence-based and thus valued by governments and the public. The foundation therefore has a substantial impact on introducing new regulations and amending old or inappropriate regulations.

### **3.2.2 Hsinchu-Safety Education Center**

The Hsinchu-Safety Education Center, founded by the Sanyang Industry Corporation in 1988, is located in Hsinchu County (TW6). The center specializes in promoting safe driving skills and knowledge and provides various driving safety courses, especially for commercial drivers, such as taxi, company car, truck, school bus, ambulance, and police car drivers. Most of the instructors at the center have been trained at the Suzuka Circuit\*\*. The center also provides training courses for people who want to obtain heavy-duty motorcycle operator's licenses. The center sometimes cooperates with local governments, providing short training courses for college students. Safe and economic driving behavior is the focus of the center's recent activities.

### **3.2.3 Yamaha Motor Taiwan Foundation**

Another organization that provides training courses is the Yamaha Motor Taiwan Foundation, funded by the Yamaha Motor Taiwan Corporation (TW8). Differing from the Hsinchu-Safety Education Center, whose target customers are commercial drivers, the Yamaha Motor Taiwan Foundation aims to disseminate traffic safety knowledge, especially motorcycle safety information, to college students. The foundation normally cooperates

\* In Taiwan, crossing guards or "lollipop ladies/gentlemen" are mainly in charge of stopping the flow of traffic so that schoolchildren may cross an intersection safely. They also help manage traffic in the drop-off and pick-up areas.

\*\* The Suzuka Circuit has been merged with the Twin Ring Motegi as MobilityLand.

with local governments and schools to give speeches on campus and demonstrate safe motorcycle riding skills. The foundation also hosts an annual driving safety poster design contest to encourage adolescent students to think about driving safety. As heavy-duty motorcycles are becoming increasingly popular among young adults, the foundation has been devoting special effort to dealing with heavy-duty motorcycle safety; for example, the foundation initiated a "Young Motorcyclists Safe Driving Program" (TW20). Since 2006, the Yamaha Motor Education Foundation has trained over 50,000 students in safe motorcycle operation<sup>6</sup>. By providing instructors and motorcycle equipment, the foundation aims to give adolescents and young adults a proper grounding in the correct concepts and skills for motorcycle driving. Recently, the main topic has been defensive driving.

### **3.2.4 Automotive Research & Testing Center**

The Automotive Research & Testing Center (ARTC) was co-founded by the Ministry of Economic Affairs, the Ministry of Transportation and Communications, the Environmental Protection Administration, and vehicle manufacturers (TW7). With research into vehicle manufacturing representing its primary role, the ARTC has invented several advanced vehicular safety techniques, including a lane deviation warning system. In addition, the center also provides driving safety courses on things like defensive driving to the public.

### **3.2.5 Genesis Social Welfare Foundation**

The Genesis Social Welfare Foundation (GSWF) was personally founded by Cao Ching in 1986. The GSWF is a nonprofit professional organization aimed at taking care of impoverished people in a persistent vegetative state (PVS). Recognizing that traffic injuries are responsible for a certain portion of PVS sufferers, the foundation has been going to campuses to promote safe driving by highlighting information about real cases of PVS in their activities (TW25). Students and teachers see these promotions as effective in changing young adults' attitudes toward motorcycle usage and aberrant driving behavior.

## **3.3 Schools and Colleges**

The integration of traffic safety into school education in Taiwan started in 1969. In 1982, the Executive Yuan developed the "Plans for Improving Road Traffic Conditions and Safety," which have been modified every three years. The MOTC is responsible for implementing the developed plans with the assistance of other ministries subordinate to the Executive Yuan, including the MOE and MOI. Traffic safety education in schools falls within the framework of the plans. The strategies related to traffic safety education in the most recent three-year plan (11th three-year plan) include<sup>7</sup>:

- Enhancing the integration of traffic safety education with other school courses;
- Enhancing the informatization of traffic safety education materials;
- Planning traffic safety education courses and design course materials for senior high school students and those in higher education;
- Promoting traffic safety education and activities in schools and society;
- Enhancing the safety of the commuting environment at all school levels;
- Reducing traffic accidents and violations involving schoolchildren and students;
- Promoting the knowledge of first-aid responses to traffic accidents in schools and society; and
- Enhancing traffic safety for schoolchildren.

### 3.4 Community

The process of incorporating the community into traffic safety education and information campaign activities is relatively new in Taiwan. Normally, communities can be involved in traffic safety education in two ways. First, schools are trying to improve commuting safety, which requires the participation of communities; although streets six meters wide or narrower are legal for parking unless otherwise marked, for example, this may jeopardize commuter safety for schoolchildren. In these sorts of cases, schools are advised to talk to neighborhood magistrates to resolve the issue by prohibiting parking in narrow streets during school commuter hours or via other means. It is also common in Taiwan for community stores to cooperate with schools (especially elementary schools) as a help station, providing assistance to schoolchildren in need on the way to and from school. The second way for communities to be involved in traffic safety education is through community colleges, which provide courses for lifelong learning. Some communities with rapidly growing aging populations also cooperate with local governments to provide safety education for the elderly.

## 4 Selected Education Programs and Information Campaigns

### 4.1 From Child to Qualified Road User

As mentioned previously, traffic safety education in Taiwan starts from a young age; all school levels are required to provide traffic safety education to their students.

In elementary schools, children learn about fundamental traffic safety concepts and traffic rules. Therefore, they develop sufficient knowledge to walk on roads<sup>\*</sup> and use different modes of transportation, such as buses and trains, safely. Junior high schools concentrate on more advanced traffic knowledge like how to use bicycles safely. In senior high schools, students acquire traffic safety knowledge and motorcycles, as well. In particular, they watch videos and receive other instruction about the dangers of various types of motorcycle-riding behavior that could lead to severe traffic accidents. Upon moving on to universities and colleges, students are legally able to obtain a driver's license and most do so; therefore, the top priority for traffic safety education at universities and colleges is safe vehicle operations, especially motorcycle operations. Traffic data have shown that an average of approximately 170 college students have died in road accidents per year over the last decade, with being male, riding a motorcycle, and being a first-year college student the three most common characteristics. To reduce this number, universities have developed countermeasures to decrease the exposure of first-year students riding motorcycles such as not offering them parking spaces, writing letters from the school president to these students and their parents explaining the dangers of riding motorcycles in the first year of college, and providing shuttle bus services from campus to dormitory and downtown areas<sup>8</sup>.

To keep the aforementioned traffic safety education system running, a national traffic safety education evaluation program (TW10) has been in operation since 1990. Co-organized by the NRTSC and MOE, the program aims to evaluate the performance of traffic safety education at all levels of schools. A principal investigator (PI), normally a professor from the transportation research center of National Chiao Tung University, appoints four leaders to be in charge of the evaluation of elementary schools, junior high schools,

<sup>\*</sup> In Taiwan, children younger than 10 years old are advised not to cross roads on their own.

senior high schools, and universities, respectively. These leaders have the authority to recruit around four to eight evaluation committee members, depending on the number of schools being evaluated that year. The recruited committee members may include university professors who specialize in traffic safety, safety experts from governmental or nongovernmental organizations, or retired school presidents or police officers. Schools are randomly selected from a list provided by the local government. The evaluation is conducted in March, April, and May based on standardized evaluation criteria in four categories: 1) organization, planning, and promotion; 2) courses and activities; 3) traffic safety and commuting environment; and 4) innovative safety education programs (see detailed evaluation criteria in Table 1). The evaluation includes paper (including a safety education website) and on-site evaluations. The top schools in each group receive a Golden Traffic Safety Award (TW12), while failing schools have to undergo a re-evaluation in the following year. Approximately one school in each group may fail the evaluation, and would be re-evaluated in the following year.

**Table 1.** Evaluation criteria for traffic safety education at schools:

Criteria	Sub-Criteria
Organization, Plan, and Promotion	Organization and operation of traffic safety education committee Yearly plan design for traffic safety education and information campaign activities Traffic safety symposium with school staffs, local police officers, neighborhood magistrates, etc.
Courses and Activities	Planning of traffic safety education courses in different grades
	Consolidation of traffic safety education into regular courses
	Utilization of traffic safety education materials from the governments
	Provision and promotion of traffic safety activities
	Situated teaching in traffic safety education
	Field trip safety practice
Traffic Safety and Commuting Environment	Pedestrian and vehicle conflicts on campus Campus parking safety Understanding of students' commuting demands Design of pick-up and drop-off areas Organization of traffic service teams Provision of escort service Provision of commuter help situation Student traffic violations Traffic accidents in the neighborhood areas
Innovative Safety Education Program	Safety awards
	Special or innovative safety education programs

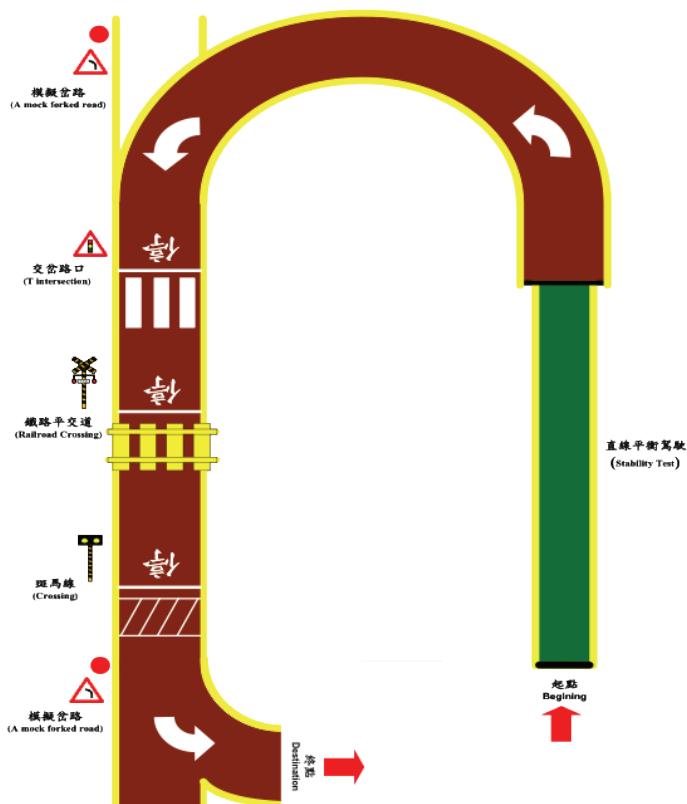
An annual road safety conference is held to give the awards to the selected schools and others who make significant contributions to traffic safety (TW11). In addition to presenting awards, the annual conference offers a platform for people to exchange experience in improving traffic safety, with keynote speakers invited to share the latest traffic safety knowledge. The conference is sponsored by the MOE and NRTSC and organized by the transportation research center of National Chiao Tung University.

## 4.2 Becoming a Safe Driver

As is the case in many countries, Taiwan has developed a graduated licensing program for people who desire to obtain driver's licenses and become safe drivers before they hit the road.

### 4.2.1 Regular driver's license

To obtain a 50cc moped driver's license, a person only needs to pass a written test on road knowledge. Licenses for motorcycles and mopeds (51–250cc) require both a written test and a practical driving test. The practical driving test consists of two parts (see Fig. 3): for the first part, the driver has to drive straight down a narrow, 15-meter strip without touching the ground. The second part includes driving through a traffic light, a railroad crossing, and a pedestrian crossing. The driver is required to stop under appropriate conditions before proceeding. The aforementioned tests require no field experience, however, which means that novice motorcyclists need to acquire driving experience by trial and error. To help resolve this issue, the DGOH initiated a pilot program in 2013 that requires all novice motorcyclists to attend a free two-hour course (TW22) on courteous driving and skills. Videos containing footage of real traffic accidents are shown to the trainees as a warning.



**Figure 3.** Motorcycle road test site diagram

Source: Motor Vehicle Offices

Drivers of heavy-duty motorcycles have to take courses at DGOH training institutes or certified private driving schools before passing their formal licensing tests. Drivers of small, private-use cars, meanwhile, need to take intensive training courses for a total of around 56 hours. The courses include both in-class (20 hours) and on-road (36 hours) training. The topics of the in-class training include driving courtesy, knowledge of first aid, driving skills and safe driving, traffic accident prevention and responses, traffic rules, and basic car mechanics and maintenance. Those who choose not to attend the training schools can

obtain a learner's license and then self-train for three months, getting on-road driving experience in the company of a qualified driver. They are then qualified to take the driver license tests (TW1).

Seeing that each individual ages differently, Taiwan has not stipulated any ages at which drivers have to give up their licenses. In the past, people needed to renew their driver's licenses every six years, which gave motor vehicle offices (MVOs) a chance to examine whether or not the driver was still physically and mentally capable. However, starting in 2013, drivers are no longer required to renew their driver's licenses at the MVOs; this means that MVOs have no official power to perform regular examinations of aptitude for safe driving. Considering the development of Taiwan's aging society and the improvement of public transport in the country, local governments have begun to develop strategies to encourage elderly drivers to forfeit their licenses in exchange for rewards such as free convenience cards, which people can use to take public transportation like mass rapid transit, trains, and buses (TW23). The government of New Taipei City, for example, provides convenience cards pre-charged with NT\$500 for drivers over the age of 70 who are willing to give up their licenses.

#### **4.2.2 Professional driver's license**

Obtaining a professional driver's license is more difficult than obtaining a regular driver's license. For small cars such as taxis, drivers need to have completed a seven-week training course or had a learning permit for at least six months before taking the driving test. The prerequisite for taking the license test for a commercial truck driver is to have had a small car occupational driver's license for at least one year; a commercial bus driver must have had a commercial truck driver's license for at least one year or a commercial small car driver's license for at least two years and have completed related training courses before they can take the licensing test; prior to taking the trailer truck driver's license test, the driver must have had a commercial bus driver's license for at least one year or a commercial truck driver's license for at least two years.

The legal age to the test for a professional driver's license is between 20 and 65. Professional drivers are required to renew their licenses every six years, while drivers over 60 need to take a physical examination once a year to ascertain whether they are physically and mentally capable of driving safely. Small car professional drivers can extend their licenses until the age of 68 as long as they pass the physical examinations and their licenses have not been revoked in the previous year.

### **4.3 Enhancing Road Safety**

#### **4.3.1 New commercial driver training program**

The recent development of tourism in Taiwan has stimulated demand for drivers of large passenger vehicles. As group travel in Taiwan normally involves long-distance and mountain routes, the DGOH initiated a new commercial driver training program in 2010 based on Article 19 of the Transportation Enterprise Management Regulation (TW2). City bus drivers and other commercial drivers who have large passenger vehicle driver's licenses but no certification for coach driving or highway driving can join this program, which offers courses at DGOH training institutes. The program includes one-day (6 to 6.5 hours) training in areas such as mountain driving safety, traffic rules, case studies of traffic accidents, vehicle mechanics, and health self-management.

#### **4.3.2 Large passenger vehicle driver training programs**

Large passenger vehicle drivers have a tremendous impact on public safety because their behavior may lead to serious incidents affecting the public or transportation network.

In 2007, the DGOH initiated a special commercial driver training project (TW4) in direct response to the occurrence of fatal traffic accidents. The goal of this project is to help target drivers understand recent fatal large passenger vehicle accidents more thoroughly through training provided by tutors from the DGOH. The project has run twice: once in 2007 and once in 2009. All the participants were required to attend a six-hour training course that focused on recent fatal traffic accidents.

The other program is a regular training program for commercial drivers (TW3). Unlike the program described above, which is triggered by fatal crash events, this program recalls drivers of large passenger vehicle every three years to refresh their driving skills and knowledge, especially in relation to safety, in six-hour training courses conducted by the DGOH at its institutes all over Taiwan.

#### **4.3.3 Optional short courses**

After obtaining a driver's license, drivers can choose to attend courses offered by government or private training schools to enhance their driving skills.

Local motor vehicle offices provide various short courses to help road users improve their driving skills and traffic safety knowledge. The topics of the courses may vary depending on local needs. Popular courses in recent years include bicycle riding safety and defensive driving. Some of these courses are available free of charge (TW5).

In addition to government agencies, several private training institutes also offer traffic safety courses for road users who want to improve their driving skills and traffic safety knowledge. Those institutes include the Hsinchu-Safety Education Center, Yamaha Motor Taiwan Foundation, and Automotive Research & Testing Center, which provide standard courses for the public and customized courses for companies.

### **4.4 Special Programs**

#### **4.4.1 Reducing aberrant driving behavior**

Reports have underlined the relationship between aberrant driving behavior and traffic accidents and fatalities in Taiwan. To reduce aberrant driving behavior, governments and private organizations have taken various actions.

From the government side, the NRTSC is responsible for making policies and taking countermeasures; the organization also provides free education material for local governments. For example, they have invited celebrities to shoot public-interest advertisements to be broadcast all over Taiwan; the advertisements can also be recorded as DVDs and sent to local governments and schools for further safety education.

Local governments also develop their own education materials and tailor them to local needs. For example, the Taoyuan County government has collected real street videos from crash cases that have been widely used in various safety education programs all over Taiwan.

Considering that speeding and other forms of aberrant driving behavior are common among adolescents and young adults, the NPA has designed special programs aimed at this group. The Aberrant Driving Prevention Program and Young Drivers' Aberrant Driving Action Plans (TW14), for example, are offered by local police bureaus and stations. The

NPA targets specific aberrant driving behaviors according to the types of traffic violations and accidents that have occurred during the year, such as drunk driving, speeding, and tailing. Recently, the focus has shifted to young adults, especially motorcyclists. The primary objective is to increase the intensity and scale of enforcement.

The police force has used radio broadcasting as a means of disseminating traffic information to the large portion of drivers who listen to the radio while on the road. The broadcasts include updates on traffic regulations, warnings of accidents (including information on location, time, and severity), answering questions from drivers, and more. Radio broadcasting is also a frequent choice for police officers to remind drivers of the dangers of aberrant driving behavior, especially for special occasions; for example, reminders about drunk driving during the Lunar New Year vacation are common. Police officers have "Traffic Safety Promotion Groups." In addition to working on radio broadcasts, these groups also attend community activities to promote traffic safety (TW13).

#### **4.4.2 Driver and passenger safety**

Several severe traffic accidents in 2010 and 2011 resulted in serious injuries to back-seat passengers. In response, the Taiwanese government imposed a new regulation (Article 31 of the Road Transportation and Management Penalty Act) specifying that not only front-seat passengers but also the back-seat passengers had to fasten their seat belts while on the road, regardless of the speed limit (TW15). Previously, Taiwan required only drivers and front-seat passenger(s) to fasten their seat belts while their cars were in motion. For back-seat passengers, seat belts were optional. Under the new legislation, enacted in 2011, back-seat passengers—including children and infants—have to wear seat belts or appropriate safety equipment in order to reduce the severity of injuries in the event of a crash. Local police departments spent six months to one year promoting the new regulation and then started enforcement in 2012.

#### **4.4.3 Improving elderly driver safety**

Elderly driver safety has become increasingly crucial in today's Taiwanese society. To connect with elderly drivers, governments have been trying to channel community power. Local governments, particularly education departments, normally integrate traffic safety education courses into their "lifelong learning systems" (TW16). For example, they provide one-day courses at local community centers and similar locations to discuss traffic safety and drug safety for elderly people. The traffic safety education course includes basic information about the impact of the aging process on the individual's physical and mental ability, such as vision, hearing, muscle strength, short-term memory loss, and so on, and how deterioration in these areas may affect driving behavior and traffic safety. The course also features videos demonstrating traffic rules and real traffic accidents.

Although elderly traffic safety is an emerging issue, there is still a shortage of instructors in elderly traffic safety education. The Elderly Traffic Safety Instructor Training Program was initiated in hopes of training as many prospective instructors as possible so that they could go back to their communities to disseminate traffic safety knowledge and skills to elderly road users (TW24). This program has been running for three years. Every year, the program sponsors a nationwide, two-day training course through which traffic safety experts and experienced instructors share their experience with prospective instructors.

#### **4.4.4 Improving pedestrian safety**

The MOE established the "Walking to School Promotion Program" (TW17) in 2004. The first five years of the program (2004–2008) focused on improving the health of elementary

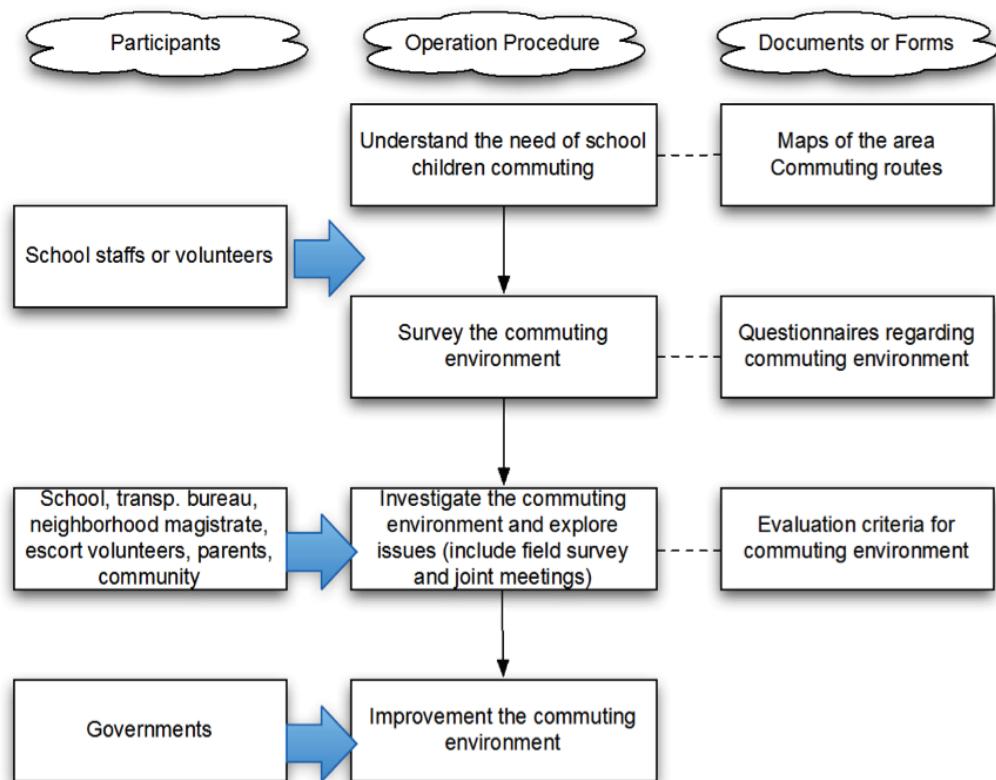
schoolchildren, especially by reducing the problem of being overweight (or obese). After that, some local governments (e.g., the Taoyuan County government) worked with foundations like the Jin Chuan Child Safety Foundation to continue this program. The foundation has developed the "Operation Manual for Improving Schoolchildren Commuting Environment," which lists potential traffic safety pitfalls in the school commuting environment (see Table 2) and provides possible countermeasures to resolve these problems<sup>9</sup> (TW19). The foundation, in cooperation with local governments, communities, schools, and traffic safety experts, reviews the commuting environment and identifies potential problems. Subsequently, the organizations discuss possible solutions. These discussions are crucial to the problem-solving process because the problems usually involve several different parties. The talks thus provide a chance to work problems out together. For example, elementary schools located in downtown areas may face the problem of illegal parking, sometimes by neighborhood residents. Local police stations may have to become involved if these violations are deemed to jeopardize the commuting safety of schoolchildren. Fig. 4 illustrates the operation procedure for improving the commuting safety of schoolchildren.

**Table 2.** Frequently encountered problems in commuting environment

Category	Frequently encountered problems
Drop-off and pick-up areas	Areas are not utilized or occupied by parent or neighbor vehicles. Areas are too small and easily cause traffic congestion. Mix of motorcycles and cars
Sidewalk	Streets are too narrow, have no pedestrian equipment, and double parking. Holes at sidewalk cause potential danger. Sidewalk is occupied, making commuters difficult to walk. Sidewalk is too small. Inappropriate equipment for the disabled
Walking environment and traffic engineering	Commuters cannot cross signalized intersections easily. Unclear road markings Driving speed on streets is too fast. Vision of left- or right-turn drivers is blocked. Ineffective setup of "neighborhood streets"
Parking space	No warning sirens in the entrance/exit of parking space The design of the entrance/exit of parking space is inappropriate such that drivers could not spot pedestrians easily.
Driving behavior	Illegal U-turn or wrong way on a one-way street Driving speed is too fast and vehicles did not give ways to pedestrians. Frequent run red lights violations
Miscellaneous	Sidewalk is occupied with trash Big construction in the neighborhood without appropriate work zone equipment Homeless people or strangers in the neighborhood Abandoned houses in the neighborhood Stray dogs or cats in the neighborhood

\*Neighborhood street is a street dedicated to school children during school commuter hours; vehicles are not allowed.

Source: Operation Manual for Improving School Children Environment (Jing Chuan Child Safety Foundation, 2011)



**Figure 4.** Operation procedure for improving school children commuting safety

Another program for improving the commuting safety of schoolchildren is the "Giving Way to Pedestrian and Safety Flags Promotion Program" (TW18). The first aim of this program is to reduce conflicts between vehicles and pedestrians on the road. A new regulation stipulates that cars, motorcycles, and other vehicles have to give way to pedestrians; the vehicle needs to stop for pedestrians at least three meters away. This is crucial for resolving the conflicts between right-turning vehicles and pedestrians crossing the street, especially in crowded areas\*. The second aim is to improve the safety of schoolchildren, especially when they cross intersections. As schoolchildren are relatively short and difficult for drivers to spot, the Taiwanese government thus initiated a safety flag program. Elementary school students are given safety flags to be used while commuting, especially when crossing a road (see Fig. 5). A few elementary schools have been selected to first demonstrate the use of safety flags, and the media have been invited to disseminate and promote this program. The governments have also produced a video demonstrating the use of safety flags and distributed it to school teachers, administrative staffs, and elementary schoolchildren. Lastly, the program advertises to drivers by giving out safety flag stickers. This program has continued for two years. In 2011 and 2012, approximately 170 thousand safety flags were distributed, and eighty percent of first-grade elementary schoolchildren had them.

\* In Taiwan, vehicles drive on the right.



**Figure 5.** Safety flags for school children

Source: Ministry of Transportation and Communications

#### **4.4.5 Improving cycling safety**

##### (1) Central government agencies:

The MOE plays the central role in educating schoolchildren about cycling safety. The ministry has produced two cycling safety manuals for schoolchildren: the Cycling Teaching Manual for Elementary and Junior High School Students and the Cycling Safety Learning Manual for Elementary and Junior High School Students (TW21).

The Sports Administration, under the MOE, is responsible for hosting activities that encourage cycling as a form of exercise and for holding conferences aimed at exchanging ideas on cycling safety.

The Ministry of Interior is responsible for conducting cycling riding safety information campaign activities through the NPA.

##### (2) Local governments:

Local governments may host local activities or conferences to promote cycling riding and safety. Local police stations in Taiwan may also conduct activities to promote cycling safety. For example, the Hualien County police bureau, located in eastern Taiwan (famous for ecotourism), initiated a special project called "Cycle Safely, Travel Easily." The bureau selected 26 police stations located in popular tourism spots in Hualien County and provided simple maintenance service for bicycles. Other service items included free water, air pumping, basic first aid, and travel information.

##### (3) Private organizations:

Private organizations such as bicycle manufacturers and travel agencies sometimes conduct different activities to promote cycling riding and safety.

The aforementioned cycling safety manuals comprise five parts<sup>10</sup>. The first part is about the basic structure of the bicycle, providing riders with basic knowledge about bicycles so that they can maintain their bicycles regularly and thereby reduce the risk of problems during riding. The second part is aimed at checking the roadworthiness of the bicycle prior to riding. The third part covers cycling clothing and safety equipment (for example, clothes such as coats should not be tied around the waist while riding). The fourth part is about safety knowledge for cycling, which includes road courtesy and emergency

response to vehicle collisions. For example, when riders need to overtake pedestrians, other bicycles, or cars in front of them, they should reserve a one-meter gap for safe passing. Bicycles are not allowed on sidewalks or inside lanes. When encountering vehicle collisions, riders should follow the following five steps: 1) display warning signs to warn approaching upstream vehicles; 2) call the police or an ambulance, if necessary; 3) record the position of the vehicle collision using, for example their smartphones; 4) remove collided vehicles from roads, if possible; and 5) wait for the police or an ambulance. The last part of the manual is related to bicycling safely and includes information about braking distances at various riding speeds and the correct way to brake (first rear wheel, then front wheel), cross intersections, turn or change lanes safely, and ride at night or without illumination.

## 5 Conclusion

To improve traffic safety, full cooperation among engineering, law enforcement, and education groups is crucial. Roadway engineering, law enforcement, and safety education all have a profound influence on driving behavior and thus the occurrence of traffic accidents. In Taiwan, traffic safety education has become increasingly important, as roadway engineering and law enforcement have stepped into a mature stage.

This report first introduced the trends and major characteristics of traffic accidents in Taiwan, followed by an overview of the partnerships between organizations involved in traffic safety education and safety campaign activities. Lastly, the report detailed selected programs and campaign activities. Clearly, government plays a crucial role in traffic safety education and information campaign activities in Taiwan, particularly the transportation and education departments. A few private organizations, such as the Jing Chuan Child Safety Foundation, also devote themselves to various types of traffic safety education. Traffic safety education has been formally promoted in schools since 1969 and has recently become a crucial topic in elderly driving safety and lifelong learning education. The graduated licensing programs for both regular and professional operating licenses are robust and continue to improve. Some special programs, such as safety flags for schoolchildren, and the regulations requiring back-seat passengers to buckle their seat belts are relatively new but gradually finding a footing in Taiwanese society.

The trends of traffic accidents in Taiwan indicate that, while fatalities have steadily declined, the number of traffic accidents and accident rates are increasing. Compared to other developed countries such as Japan, the United Kingdom, and Germany, Taiwan can do better, and safety education will play a crucial role in the improvement effort. As suggested by the NRTSC, motorcycles, elderly drivers, and drunk driving are the three top safety issues in Taiwan that demand resolution in the near future. While various education programs and information campaign activities have been developed, it will be very important to continue running them in an effective manner. The cooperation among engineering, enforcement, and education is also a key to continuous improvement of traffic safety, requiring input from governments, private organizations, and the public.

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## Author Profile



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Yi-Shih Chung obtained a master's degree from Northwestern University and a Ph.D degree from National Chiao Tung University in Taiwan in 2008. Before joining Kainan, Dr. Chung was a postdoctoral fellow at the Georgia Institute of Technology in the U.S. His research interests include traffic safety, driving behavior, transportation economics, and travel demand modeling. He has published several papers in journals such as *Accident Analysis and Prevention*, *Transportation Research Part F: Traffic Psychology and Behaviour* and *Journal of Air Transport Management*.