

# Courses to Fine Tune Traffic Management and Road Safety

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## Abstract

This study aims to investigate models, problems and causes of traffic safety management of agencies involved. The targeted areas were Bangkok, Chonburi, Chiangmai, Suratthani, and Khon Khaen. In-depth interview was conducted with the officers in the agencies responsible for traffic accident in relation to the managerial model, measures and courses in functional agencies involved. The results revealed that the major problem of the central agency in managing traffic was no host agency to manage, shortage of valid data collection system and the integration among agencies. The researchers proposed to appoint a committee and a host agency to replace the previous with repetitive working and disable to efficiently enforce law. The researchers proposed to enact law to specify the governmental revenue received from managing traffic or parts of using vehicles and roads to be the integrated budget. As of the local traffic administration, its agencies met limitations of knowledge to manage the traffic plans, shortage of cooperation. Roles of working in each local agency were still ambiguous and problem solving demands to form policy by various parties to allow the policy responsive to each other while being able to solve problems. As such, the behaviors of road users, it was proposed to establish the Traffic Court to reduce disputes, which might incur from injustice comparison between officers and people. It allowed people to see its importance of abiding in laws when traffic became problem and submitted to court; the drivers would fear and discourage to violate traffic rules.

**Keywords:** Law Enforcement, Traffic Management, Traffic Accidents, Road Safety

## Background and the Significance of the Problem

The land traffic accident problems were very critical because they were destructive to lives, persons and properties of countless people including Thailand had to lose larger amount of budgets to prevent and solve those problems which disabled to meet success with just some agency but cooperation among the agencies from the government, private and people. In particular, it involved the government policy to drive problem solving with constructive results. Moreover, WTO (2016) indicated that in 2013, the dead from the land traffic accidents in Thailand was the world second rank following Libya, which were 73.4 lives per

100,000. Thailand were 36.2 lives per 100,000 which was high rate and affecting societies at micro level, economy at macro level and the overall view of the country.

Causes unable to lessen the problems from traffic, partially came from the traffic management system was still short of standards system, the responsible agency was short of managerial solidarity and aligning data. Law enforcement was similar to the routine justice administration but the procedures were irresponsive to the traffic problem. This affected the implementation of law enforcement becoming the gap for malpractices and transparency among officers which was the problems of the personnel's behaviors in organizations related to traffic. It was claimed to be the factors led to failures in the traffic problem solving.

Consequently, to be the courses in problem solving about the traffic accidents, it required investigations on traffic management system so as to alleviate the land traffic accident in Thailand. This was to develop the model of efficient traffic management. Therefore the research on "Courses to Fine Tune Traffic Management and Road Safety" was academically necessary and critical for analysis, synthesis action plans of each agency or organization related with traffic and operation. This was to develop the agency management efficiency enabling to systematically solve traffic accidents.

## **Literature Review**

### **Concept of Road Safety Management**

Claiming to alleviate road accidents, we have to consider various factors influencing them. They are extensively investigated and innumerable works (Varhelyi, 2016: 144). For example, factors related to individuals creating accidents during driving vehicles. They are related to trait, personality (temperate, risk-taking, challenging, competition-oriented, and venture-oriented), self-control (short or low self-control), driving behavior (speedy drive and horrible drive), age, gender, drinking habit, addiction, and traffic lawsuit. (Cabarkapa et al., 2018: 372-375; Gicuel, et al., 2017: 3-4; Constantinou et al., 2011: 1324-1325; Sabates et al., 2011: 818-821; Berg, 2006: i16).

In addition, such factors are still related to road conditions and road surface, width-narrowness, curves, slope, coverture, obstacles, materials, flood, no signals, no lights and so on. They are also involving with law and the enforcement of traffic law imposed by the authorities-enforcement of laws with celerity, real time, certainty, fairness and non-discrimination, or not. The law enforcement must whether be severe enough to deter offenses. In fact, we can see that the police are often having problems in law enforcement. For example, someday, the police host a checkpoint to check driving licenses but someday they do not. Someday they are strict for arrestment but someday, they are not. Some case have been severely fined but to some they do not. In some areas, the police permit parking but someday, they do not. What has been regularly criticized is bribery that the police will not take lawsuit, and so on.

In addition, there are factors related to electronic devices to help controlling traffic, e.g. CCTV to monitor speed, violators of traffic rules, recording picture of accidents and other evidences. It is also related to factors of accident data incurred in the Thai roads whether they have been correctly stored with precision, covering all situations and with systematization or not and there are so many other related factors.

However, a not less import factor is the road safety management or the reduced road accidents. This is how to allow as much least accident incurred on the roads with efficiency and effectiveness. This is to not allow the losses of lives and properties of the Thais as it is witnessed today. The concepts of this management, many foreign scholars advocate that, e.g. In its Global Status Report (2009) the WHO recommends that national governments ensure that: 1) the responsible institutions for road safety actions have the necessary human and financial resources to act effectively. 2) They develop and endorse a national strategy with

realistic targets and earmarked funding for implementation. 3) They promote multi-sectorial collaboration in road safety work. 4) They promote collaboration between the different sectors involved in collecting data on road traffic injuries.

Bliss & Breen (2009) in their Guidelines for RSM (Road Safety Management) state that it is a country's safety management capacity that sets the limits to improvements in road safety. They also state that an RSM system at the country level should address three inter-related elements: "institutional management functions, interventions and results, with prime importance being placed on institutional management functions, and more specifically the role of the lead agency". Also, Bliss & Breen promote the Safe System approach, and put forward seven institutional management functions providing the foundation for an effective national RSM system: 1) Results focus-a strategic orientation that links all actual and potential interventions with results; 2) Coordination; 3) Legislation; 4) Funding and resource allocation; 5) Promotion; 6) Monitoring and evaluation; 7) Research, development and knowledge transfer.

The Safety Net report, (2009) after reviewing the literature, presents detailed recommendations on the most relevant issues in RSM. Many of those are based on the recommendations from two previous reports, i.e. The report is a useful "manual", compiling the recommendations from earlier reports, and it adopts the view of Bliss and Breen on the RSM system having three levels, i.e. 1) Institutional management functions which produce 2) Interventions, which in turn produce 3) Results. The institutional management functions comprise: 1) Results focus, which is the overarching function; 2) Coordination; 3) Legislation; 4) Funding and resource allocation; 5) Promotion; 6) Monitoring and evaluation; 7) Research, development and knowledge transfer. The important role of the lead agency is emphasized. Interventions consist of planning, design and operation of the road network for vehicles and road users, as well as the recovery and rehabilitation of crash victims. Results are expressed as quantitative long term goals and interim targets. The report describes these issues in detail and gives "good practice" examples for them.

Johnston (2010: 1180) exploring research on RSM, put forward the four well-known "Cs" as keys to best practice: 1) Constituency-unless the public demands action, appropriate resources will not be applied; 2) Commitment-without political will from the top, success will be limited; 3) Cooperation-RSM demands actions from a large number of stake holders; 4) "Coordination is vital to integration and synergy across institutional efforts."

The Global Status Report on Road Safety (2013) points out a number of areas that need to be addressed by governments. The recommendations outlined include: 1) Officially endorsed targets and indicators; 2) Improving the quality of data on fatalities, injuries and interim indicators; 3) Coordination of efforts by a well-resourced lead agency; 4) A multi-sectorial national strategy that includes specific targets; 5) Monitoring and evaluation of outputs and outcomes.

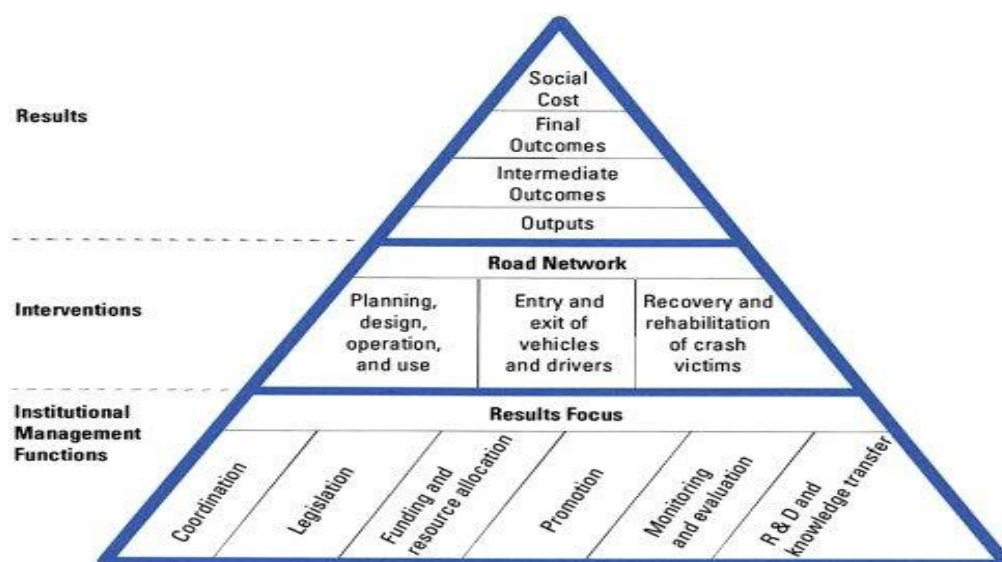
Muhlrad (2015) describes 6 components of road safety policies which are the outcome of policy formulation and policy adoption which will govern implementation: 1) A long-term vision-preferably to be decided by the parliament so that it becomes law; 2) A medium-term strategy which creates the framework in which successive road safety intervention programs will be designed and implemented; 3) Short-to-medium term (four to five year) quantitative targets of injury reduction to be used for calibrating further efforts; 4) A road safety programme coordinating all interventions planned to meet the targets; 5) A funding mechanism ensuring annual financing of the action programme and support activities; 6) Setting up implementation conditions to ensure that human, technical and financial resources are available when needed.

The Road Safety Manual issued by PIARC (2016) builds on best-practice experience and gives hands-on recommendations for RSM, where chapters of relevance are: 1) The road

safety management system focusing on results and the importance of governmental and top management leadership and management capacity; 2) The Safe System approach; 3) Effective management and use of safety data; 4) Road safety targets, investment strategies, plans and projects; 5) Roles, responsibilities, policy development and programs; 6) Intervention selection and prioritization; 7) Monitoring and evaluation of road safety interventions.

It is witnessed that the above scholars, in many ways, propose managerial principles and road safety management. A way they prioritize and agree is there must be a host agency or institutional management functions related to traffic to be directly responsible for roles and responsibilities. In addition, agencies involved need coordination of efforts or willingness in prevention and solving or alleviating road accidents rather than leaving to be just a model (various committees, etc.) or plot (structure) imposed but no any actions taken.

T. Bliss, J. Breen (2012: 48-55) a scholar of road safety management proposes guides of management to alleviate such accidents and they still emphasize a host agency to take responsibility and cooperation of these agencies in an interesting model as below.



Source: Bliss and Breen, building on the frameworks of Land Transport Safety Authority, 2000; Wegman, 2001; Koornstra et al, 2002; Bliss, 2004.

**Figure 1.** The road safety management system

It is witnessed that Bliss and Breen prioritize the managerial duties of the institutional management functions taking responsibility in this traffic affairs. Beside law enactment, funding, control and evaluations, it needs coordination as aggressive collaboration (See Figure 1 above). Bliss and Breen claim that the institutional management functions need reform particularly about inter-agency coordination function to seriously and willingly handle these affairs. There should be strengthening national leadership and for the better there should be international consultant (s) with accepted experiences assisted by mentoring from recognized road safety specialists with successful strategic management experience at country and international levels) (Bliss and Breen, 2012: 53).

In this research, the researchers determine to find ways in developing the road safety management (RSM) through embracing concepts and theories of renowned scholars for best application in order to maximize benefits for people, social and the country at present and in future.

## **Research Methodology**

1. Explore academic documents of laws, justice administration, criminology, sociology, road safety management, structures of the responsible agencies in managing traffic accident remedy in Thailand, structural features and the ways to manage problems applying strategies in order to analyze problems and barriers against managing the traffic agencies according to the scope of the study.
2. Visit the targeted sites to survey the traffic function in the targeted provinces in five (5) regions, i.e. the provinces of Bangkok, Chonburi, Chiangmai, Suratthani and Khon Khaen to explore their general traffic situations.
3. Conduct in-depth interview the with chiefs of the agencies involved, i.e. the responsible persons to reduce accidents of the central agency, Department of Disaster Prevention and Mitigation, Department of Land Transport, Department of Highways, Bangkok Metropolis, Royal Thai Police, and functional regional agencies, i.e. the secretary of the Provincial Disaster Prevention and Mitigation, Chiefs of the Provincial Disaster Prevention and Mitigation, Provincial Land Transport, Subdistrict Land Transport, Directors of Provincial Technician Division, Municipality and Traffic Inspectors and so on in each province. This is to investigate problems and barriers against the management and the ways to develop the efficiency of the traffic management for reducing accidents.
4. Organize focus groups through inviting representatives of the leaders and the functional personnel of various agencies from Department of Land Transport, Ministry of Transport, Traffic Police Division and Department of Disaster Prevention and Mitigation and so on. This is for the purpose of opinion hearing, and recommend the research results imposed in in the traffic management leading to policy recommendation to solve the problems of road traffic accidents.
5. Organize seminars to provide critiques on the works of specialists and experts of solving the problems of road traffic accidents in Thailand at the levels of policy, strategization, imposing direction of solving problems, middle managers and functional personnel directly involved with alleviating road traffic accidents. This is the invitation to contribute opinions, recommendations, and to provide critiques on the research works for their completeness to this research.

## **Results and Discussions**

The results reveal that the prime problem of the central traffic agency in its traffic management is there is no institutional management function (host agency) for its management, shortage of accurate data collection and shortage of integration among agencies. Consequently, the researchers propose to a committee and an institutional management function to host its management to replace the past agencies which repetitively work and disable to efficiently enforce laws and the problem of inadequate managerial budget. The researchers propose to enact law to impose the partial government revenue earned in handling traffic or related to using vehicles to be the integrated budget for solving the traffic problems of alleviating road accidents and for handling the local traffic. It is witnessed that the local agencies meet with limitations of road safety knowledge, preparation and plan management, shortage of coordinating for cooperation with local agencies in solving problems and the dutiful roles in working of each agency are ambiguous and problem solving need policymaking and planning from various sectors so that the policies are congruent and are able to solve problems as following details, i.e.

### **The situations of problem and barrier against working of the central agency related to road safety**

1. Problems and barriers of the central agency structure in working on road safety-Thailand has no institutional management function in addressing such problems.

2. The structural problems of the central committee, and the Road Safety Center (RSC) are too large and disable to efficiently work.
3. The problems of budget for spending in handling road safety of the RSC need screening and marshalling in reference to plans and goals including there is no specific budget for road safety.
4. The problems of storing database for road accident are found that there are more than 10 data sources but incomplete and ambiguous while integrating data is inactive.
5. The problems of coordinating collaboration and integration of the traffic agencies for road safety are diverse even with levels of policy, administration and functions either directly or indirectly. The prime institutional management function is the Royal Thai Police, Ministry of Education, Department of Highways, Department of Rural Highways, and Department of Land Transport. Department of Disease Control, and National Institute for Emergency Medicine. Each organization has to attend other prime missions

**Table 1:** Details of problems and barriers in the road safety operations of the central agency by 1-5 as in below table

<b>1: Problems of the central institutional management function structure in handling road safety</b>	
<b>Problems</b>	<b>Solutions recommended</b>
1. Thailand is barren of the institutional management function	<ol style="list-style-type: none"> <li>1. To reinforce the personnel of RSC with preparing and plan and academic management and on road safety management</li> <li>2. To transfer authorities of road safety management to other agency</li> <li>3. To establish new agency through mobilize personnel equipped with knowledge and specialization from various agencies</li> </ol>
<b>2: Problems of the central committee structure and RSC</b>	
<b>Problems</b>	<b>Solutions recommended</b>
1. Most administrative and political committees mostly choose to attend the meetings of security to be their political bases which likely disregard traffic problems. Ministers and government top officers will attend and prioritize specifically agencies run by the Prime Minister.	1. Prime drive must come from people who must see the importance of the road safety policy so that the political sector sees their power bases and prioritize traffic problems.
2. Too large the size comprising agencies playing the roles in alleviating road accidents many and less coincided which disable to work with efficiency.	2. There are representatives of the agencies who should play the leading roles in alleviating road accidents actively participate and the panel should not be too large.
3. Representatives in the meeting are often changed which shortens consistency, understanding and work follow up.	3. It is necessary to impose substitute representatives to each one particularly the committee members from the top management of the government agencies.
<b>3: Problems of the budget spent in handling road safety of RSC</b>	
<b>Problems</b>	<b>Solutions recommended</b>
1. RSC has no authority on budget and the integrated budget is just the collection of projects proposed by various agencies but without screening and marshalling referenced to plans and goals	1. Integrated budget referenced to plans and goals will be the important tool in integrated various aspects. The partial income earned from handling traffic or using vehicles and roads must be the integrated budget in solving the problems of traffic management for alleviating accidents such as fees, maintenance fees, remuneration, service fees, or income from running the petroleum company, road construction companies, car companies, and fines from violating traffic laws with procedures endorsed by laws, e.g. imposing interests or any benefits coming the government assets earned from handling traffic affairs or related to using cars

	and roads. The Cabinet has to review part of allocating income to be the fund, such as “Road Safety Management Fund” allocated to the income specifically for the office and the allocation to the fund must be adherent to the rates, principles and protocol imposed by the Cabinet
2 . There is no specific budget for road safety and funds for cars and road uses safety but it is not linked with risk un car and road uses. Nevertheless, the fund size is small.	2 . Related agencies need to know the certainty of budget for planning and efficiently operating.
3. Shortage of budget certainty which sometimes there are causes delaying the budget proposal for approval and it becomes problems and barriers in operations. In addition, during normalcy, agencies must seek approval under routine budget which is hard to distinguish road safety budget from other budgets.	3 . Distinguishing the road safety budget is necessary and it allows to recognize costs and operational worthiness, which will become the data for evaluation, priority of plans and projects.
<b>4: Problems on storing data of road accidents</b>	
<b>Problems</b>	<b>Solutions recommended</b>
1. There are more than 10 accident data sources but data are incomplete and ambiguous.	1 . Most road safety data come from registration collected by the government agencies responsible for related missions. It is thus hard to expect the outside government agencies will play the prime roles to collect data. However, other agencies such as National Statistical Office or the outside government agencies can play the roles in collecting data through surveying, e.g. data of speed drive, helmeting, data collection from surveying to regularly evaluate performance and to help in pursuing situations and the operational progress.
2.Integrating data slowly progress.	2 . Handling road safety demands cooperation from many sectors. Then the central agency need skills to seek cooperation with the organizational groups in various sectors. 3 . Integrating road safety data between the important government sectors will create links, and mutual inspection, which will lead to enhancing the data quality incessantly. As such, the emphasis point on working about data at first, it should be the data from the Royal Thai Police because the notification is the origin of important accident data under Ministry of Transport.
<b>5: Problems of coordinating collaboration and integration with other agencies.</b>	
<b>Problems</b>	<b>Solutions recommended</b>
1. There are many working agencies related to handling traffic regarding the levels of policy, administration and function directly and indirectly. The prime institutional management function is the Royal Thai Police, Ministry of Education, Department of Highways, Department of Rural Highways, and Department of Land Transport. Department of Disease Control, and National Institute for Emergency Medicine.. Each organization has to attend other prime missions.	1 . To efficiently integration development comes from the administrative level to policymaking to drive various measures into the other organizations and could be studied from the provincial model. The results revealed if the governors determine and drive policies for the road safety; other local administration organizations incline to adhere and to coordinate collaboration.

### **The problems of the local structure**

1. The traffic management under the governor is appropriate where the locality attends meetings for discussions, planning from various parties to efficiently solve the problems and to enable in exchanging data which is the prime problem in management.

2. The educational institutions share creating much road safety with regards to cultivating consciousness to contributing academic advices on the policy, road engineering and public relations.
3. Fines from violating traffic rules should partially be paid to the managerial organizations and the local administration organizations but they have been spent with the related affairs of solving road accidents. Therefore, there should be measures to impose such fines to be spent for solving traffic.
4. There should be interrogation on the cases of traffic accidents. The samples of success in integration for handling road safety are NGOs established by interdisciplinary professions or Office of Traffic Accident Prevention in Khon Khaen province.
5. Handling provincial road safety policy is under supervision of the governors and might unlikely effective because some area might meet other problems rather than road accidents and the governors must contingently solve them. Consequently, the government has to impose the policy of accident prevention and to be the national agenda so that the operations in every area will be in the same direction

**Table 2:** The details of problems and barriers in the central operation related to road safety according to 1-5.

1. The problems of the local structure	
Problems	Solution recommended
1. Most local agencies meet limitations of knowledge in preparation and managing plans and road safety knowledge.	1. Support the province with academic and evaluating performance from the academic team such as supporting traffic accident prevention or the local schools and to plan together in the local for training, creating knowledge and understanding road safety for both personnel and people. Creating conscious will be the key to success in alleviating road accidents. In addition, local schools should be coordinated about traffic engineering for the personnel specifically for the traffic engineering quality. (Peden et al., 2004: 52-59) (Breen, 2015: 73-75).
2. Shortage of coordinating collaboration in the local organizations in problem solving and roleplaying in working in each agency is still ambiguity and unlikely evident.	2. Meeting for discussions, collective planning through the order of the governor for creating communication among agencies, understanding duties and integrating collective knowledge. (Breen, 2015: 68-72) (Loughborough, University, 2017: 13).
3. Engineering construction is not standards.	3. Seeking funding sources for the local agencies responsible for handling road and environment engineer selected from the responsible central agency with auditing process of fund spending. (Breen, 2015: 70).
4. People are short of cooperation with the government agencies in creating road safety culture and conscious shortage of cars and roads	4. Public relation and creating the awareness prioritizing safety where the local agencies might coordinate with schools municipality. In addition, Traffic Court might be established piloted in big cities like Pattaya, and Chiangmai so that burdens of fines after offense become troublesome when traffic cases are sued to court. Drivers will fear and dare not violate the traffic rules. (WHO Organization, 2015: 65).

## Recommendations

The researchers recommend for developing and solving road safety management as below, i.e.

1. Demanding the many agencies involved the road safety in Thailand but short of efficient coordination because of institutional management function which exercises duties of planning, coordinating, and follow up performance among the managerial structures related to all the road safety ever been established in Thailand. RSC has begun in 2003 closest to “the point of handling” road safety at the national level but cannot drive working and impose direction to success, incessantly. (European Commission, 2016: 26-32).



The researchers find that appointing a committee and an institutional management function to replace the previous agency which is repetitive and might disable to best efficiently enforce laws. As such, Ministry of Transport has to propose the government as the national agenda on road safety so that it will lead to appointing an institutional management function to manage traffic and road safety in the form of public company. Then, Ministry of Transport being a ministry intended to appoint a public company to adhere to the Cabinet resolution on 18<sup>th</sup> July 2006 to prepare explanation complement to the petition and submit to the OCSC so that it will review and forward to the Cabinet for the stage of law enactment at the level of an ACT. This is for the purpose of establishing an agency to manage traffic and road safety where it can far better drive the policy of problem solving, planning, and coordinating collaboration.

2. To efficiently control behavior of using vehicles and roads and to witness the constructive performance; the researchers find that establishing Traffic Courts is another alternative to reduce the dispute between the personnel and people coming from unfair fines and allow people to see the importance of adherence to law. People will find that traffic cases become troublesome and are sued to court. The drivers will fear and be discouraged to violate traffic laws. (World Health Organization, 2015: 64-67).

3. As of managing local traffic and road safety, they are necessary to participate in meeting for discussions for policymaking and planning from various parties. This is to allow agendas or policies congruent and enabling to efficiently solve problem. In addition, each agency can use the meeting to exchange accident data which are the prime problem in management because the local source data are incongruent. (Loughborough University, 2017: 17).

4. However, as the option of the budget for management, it is proposed to enact law to impose the government revenue earned from traffic or related to using cars and roads which part has come from the integrated budget to solve problems of traffic management to alleviate accidents such as fees, maintenance fees, remuneration, service charges and income earned from petrol companies, road construction companies, cars companies and fines against traffic rule violation with legal endorsement. For example, any interests or other benefits from the government assets earned from the related traffic works or using cars, rods, petrol tax, petrol companies, road construction companies, cars companies and fines against traffic rule violation; the Cabinet is demanded to allocate part of the income to establish funding such as "Road Safety Management Fund" for allocating income to the agencies on their office affairs. Allocating into the fund has to adhere to the rate, criteria and method specified by the Cabinet. (European Commission Road Safety, 2016: 33-35).

5. In future studies, there should be investigating ways to draft an Act in order to establish a public company to be responsible for traffic management and road safety. It should be the efficient ways the government can sustainably and really solve the road accidents in Thailand. (World Health Organization, 2015: 45,65).

## References

- Arnau-Sabates, L., Sala-Roca, J., & Jariot-Garcia, M. 2012. "Emotional abilities as predictors of risky driving behavior among a cohort of middle aged drivers." **Accident Analysis and Prevention** 45: 818-825.
- Berg, H-Y. 2006. "Reducing crashes and injuries among young drivers: what kind of prevention should we be focusing on?." **Injury Prevention** 12 (Suppl I): i15-i18.
- Bhothisuwan, S. 2016. **Law Enforcement in Traffic Controls: Nakhon Pathom Province**, Bangkok: Office of Registration Administration, Department of Administration, Ministry of Interior.
- Bliss, T. 2004. **Implementing the recommendations of the World Report on Road Traffic Injury Prevention**. Washington D.C.: World Bank.

- Bliss, T. and Breen, J. 2009. **Implementing the Recommendations of the World Report on Road Traffic Injury Prevention**. Washington, DC: World Bank.
- Bliss, T. and Breen, J. 2012. "Meeting the management challenges of the Decade of Action for Road Safety." **IATSS Research** 35: 48-55.
- Boonyopas, W. 2015. **The Establishment of Traffic Court in Bangkok**. Bangkok: Department of Disaster Prevention and Mitigation, Thailand Research Fund.
- Cabarkapa, M, Cubranic'-Dobrodolac, M., Cicevic, S. & Antic, B. 2018. "The Influence of Aggressive Driving Behavior and Impulsiveness on Traffic Accidents." **International Journal for Traffic and Transport Engineering** 8 (3): 372-389.
- Certo, S. 2009. **New Public Management**. Bangkok: Pearson Education.
- Janruang, A. 2002. **Factors Influencing the Motorbike Accident Preventive Behaviors of Technical Students in Suphanburi Province**. Nakhon Pathom: Faculty of Education, Silpakorn University.
- Jeanne Breen Consulting. 2015. **Road safety study for the interim evaluation of Policy Orientations on Road Safety 2011-2020**. Brussels: European Commission.
- Johnston, I. 2010. "Beyond 'best practice' road safety thinking and systems management-a case for culture change research." **Saf. Sci.** 48: 1175-1181.
- Juto, N. 2008. **Qualitative Research**. Bangkok: PrintPro.
- Kijtiwaranont, P. 2009. **Problems of Enforcing Road Traffic Act BE2522 (1979): A Case of Bangkok and its premises (Nonthaburi, Pathumthani and Samut Prakarn)**. Bangkok: Justice College, Office of the Judiciary.
- Koornstra, M. et al. 2002. **SUN flower: A comparative study of the development of road safety in Sweden, United Kingdom, and the Netherlands**. Leidschendam: SWOV, Dutch Institute for Road Safety Research.
- Muhlrad, N. 2015. "Road safety management from the national to the local level." In G. Tiwari and D. Mohan (eds.). **The Way Forward: Transportation Planning and Road Safety**. Kolkata: Macmillan India Ltd..
- Noiprasert, A. 1988. **Attitude of the Officers in the Justice Administration and Lecturers in the Faculty of Laws towards Establishing the Traffic Court in Bangkok**. Master's Thesis, Mahidol University.
- Peden, M., Scurfield, R., Sleet, D., Mohan, D., Hyder, A., Jarawan, E. & Mathers, C. 2004. **World Report on Road Traffic Injury Prevention**. Geneva: World Health Organization.
- PIARC. 2016. **Road Safety Manual. A manual for practitioners and decision makers on implementing safe system infrastructure**. Retrieved from roadsafety.piarc.org.
- PWC Middle East & Loughborough University. 2017. **A Guide for Policy Makers: on Reducing Road Fatalities**. Retrieved from www.pwc.com/me.
- Thongtoa, K. et al. 2012. **The Project on the Process of Road Safety Culture Creation among the Students and Communities around Ubon Ratchthani University**. Bangkok: Thai Health Promotion Foundation.
- Safety Net. 2009. **Road Safety Management**. Safety Net.
- Santikarn, J. 2002. **A Comparative Study on Youth Traffic Accident Prevention Behavior both in and outside informal Education**. Khon Khaen: Faculty of Public Health Sciences, Khon Khaen University.
- Santiwong, T. 2000. **Organizations and Administrations**. 11<sup>th</sup> ed. Bangkok: Thaiwattanapanich.
- Sathapitanont, P. 2010. **Drunk No Drive with Thai Societies**. Bangkok: Foundation of Drunk No Drive.

- Sitamanotch, S. et al. 2012. **Developing a Participatory Model of Solving the Problems of Death form Traffic Accident through Using Local Resources and Latency in 3<sup>rd</sup> Round in Phuket Province**. Chiangmai: Faculty of Medicine, Chiangmai University.
- Varhelyi, A. 2016. "Road Safety Management–The Need for a Systematic Approach." **The Open Transportation Journal** 10: 137-155.
- Vincoli, J. 1994. **Basic Guide to Accident Investigation and Loss Control**. New York: John Wiley & Sons. Inc.
- Waroonpititkul, Y. 2007. **Motorbike Accident Records**. Bangkok: Road Safety Center.
- WHO. 2009. **Report on Road Safety: Time for Action**. Geneva: WHO.
- WHO. 2013. **Global Status Report on Road Safety 2013: Supporting a Decade of Action**. Geneva: World Health Organization.
- Wiratchnibhawab, W. 2002. **Capital and Local Administration: USA, UK, France, Japan and Thailand**. Bangkok: National Accident Prevention Committee.
- World Bank. 2009. **Global Road Safety Facility**. Washington, DC: World Bank.
- World Health Organization. 2015. **Reporting on road safety: a guide for journalists**. Washington, D.C.: Pulitzer Center.