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Chapter 1
Introduction

- Project Background and Significance
- Objectives
- Project Scope
- Benefits

1.1 Project Background and Significance

Thailand is ranked among top three in the world for road accidents. In 2011, World Health Organization (WHO) estimated Thailand’s accident rate at 26,000 fatalities per year. Meanwhile, unofficial data from Thailand’s accident agency showed an estimate of 24,000 fatalities per year which is considered very high. Nonetheless, official data from Royal Thai Police reported only 9,060 fatalities in the same year, while Ministry of Public Health reported 14,033.

<table>
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<th>Year</th>
<th>Fatalities from Road Accidents (Persons)</th>
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<tr>
<td></td>
<td>Royal Thai Police</td>
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<tr>
<td>2007</td>
<td>12,492</td>
</tr>
<tr>
<td>2008</td>
<td>11,561</td>
</tr>
<tr>
<td>2009</td>
<td>10,717</td>
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<tr>
<td>2010</td>
<td>7,661</td>
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In 2007 WHO estimated that road accident caused a damage value up to 230,000 million baht per year, equivalent to 2.81% of GDP. If this is true, Thailand could lose from road accidents up to 450,000 baht or equivalent to 5.5% of GDP.

No matter if the loss is 2.81% or 5.5% of GDP, or whether fatality rate is 9,060 or 24,000 per year, these figures cannot be accepted. Accidents have been assigned a national agenda. All agencies have reacted and participated including Royal Thai Police, Ministry of Public Health, Ministry of Transport, Department of Disaster Prevention and Mitigation, Department of Highways and many others. The Department of Land Transport (DLT) is also
of the key agencies who plays a role in control, regulate and supervise vehicle registration and driver’s license. In other words, DLT controls both vehicles and drivers which are two out of four key factors that causes accidents. In addition, more than 80% of accidents are resulted from drivers. DLT is inevitably the key player in road accident prevention and reduction.

To solve any problems, including road safety issue, a clear direction is utmost important. A clear direction is generated from planning under the right academic principles. In the past DLT did not have the master plan or strategic plan for road accidents and road safety, but only relied on integrated plans. DLT realizes importance of developing specific plan for road safety which is an academic work conducted by specialists. Therefore, DLT hires the Consultant to establish appropriate and efficient road safety plan.

1.2 Objectives

1.2.1 To develop road safety strategic and master plans for DLT and relevant agencies as their implementation framework.

1.2.2 To develop safety action plans from the strategic and master plans containing sufficient program/project detail for relevant agencies to utilize and practice.

1.3 Project Scope

1.3.1 The consultant reviews documents relevant to development of safety strategic plan, master plan and action plans, including:

- Policies, strategic plans, and measures of relevant agencies, such as:
  - 11th Economic and Social Development Plan (B.E. 2555-2559)
  - Regulation of Prime Minister’s Office on Road Accident Prevention and Reduction (B.E. 2554)
  - Ministry of Transport’s Strategic Plan B.E. 2554-2558
  - Public Disaster Prevention and Mitigation Act B.E. 2550
  - Road Safety Master Plan B.E. 2552-2555
  - Road Safety Action Plan B.E. 2554-2555
  - Road Safety Master Plan B.E. 2556-2559
  - Other relevant documents

- Theories and analysis process related to master plan development, such as:
  - Assessment of 5E strategy: Law Enforcement, Engineering, Education, Emergency Medical Service, and Evaluation and Information
Executive Summary Report

Chapter 1 Introduction

1.3.2 The Consultant collects and analyzes land transport accident data from relevant agencies, such as Royal Thai Police, Road Safety Directing Center and Safety Technology Bureau, to determine causes and governing factors. The findings are used to develop master plan and safety action plans.

1.3.3 The Consultant develops a safety master plan for DLT in line with Ministry of Transport’s strategic plan by synthesizing and analyzing data from 1.3.1 and 1.3.2. The plan is divided into three stages as follows:

- Short range plan. The plan should be comprehensive and meet the goals of the action plan. It also has to be in the same direction with the intermediate and long range plans.
- Intermediate range plan. This is the medium connecting short and long range plans so that the operation is conducted to set strategies and goals.
- Long range plan. This is a strategic-level plan with goals to bridge management and implementation in the long term.

1.3.4 The Consultant develops the safety master plan into safety action plans which include:

- Principle and detail of action plan
- Key performance indices in terms of quantitative, qualitative, temporal, and cost-wise.
- Budget and expenses.

1.3.5 The consultant arranges at least 6 brainstorming seminars participated by DLT and other agencies to establish efficient safety master plan and action plans.

1.4 Benefits

1.4.1 DLT has a road safety strategic plan.
1.4.2 DLT has a master plan to use as a base for road safety action plan development in short, intermediate and long ranges to clearly identify DLT operation.
1.4.3 DLT has a safety action plan.
Chapter 2
Data Review

- Review of Road Safety Policies, Strategies, and Measures
- Review of Related Theories for Road Safety Master Plan Development
- Review of DLT Structure and Relevant Major Laws
- Summary of Road Accident in Thailand
- Summary of Road Transport Accidents from Relevant Agencies
- Summary of Key Factors of Road Accident from Relevant Studies
- Summary of Key Factors of Road Accidents
- Summary of Accident Data Classified by Vehicle Type

2.1 Review of Road Safety Policies, Strategies, and Measures

A review of road safety policies, strategies, and measures in international and ASEAN levels indicates that the world gives a high priority to road safety problem as it causes lives and damages. The road safety issue is promoted and a target is set to reduce road accident fatalities by 50% by 2020. The member countries agree to announce road safety creation as a “national agenda” and take each nation into the “Decade of Action for Road Safety”.

In the policy level, Thailand has assigned 2011-2020 as the Decade of Action for Road Safety. The Road Safety Directing Center develops an action plan for Decade of Action for Road Safety B.E. 2554-2563, along with strategic and master plans, and relevant road safety action plans. This has been done continually with emphasis on educating road safety to public and focusing on major festivals in which travel demand is high and fatalities are excessive.

2.2 Review of Related Theories for Road Safety Master Plan Development

To develop the safety strategic plan, master plan and action plans, the consultant has reviewed concepts of 5E strategy, 5-pillar approach, SWOT analysis, ISO 39001 road traffic safety management system, and PDCA Quality Control. The consultant has adopted these concepts as initial guidelines for road safety planning.
2.3 Review of DLT Structure and Relevant Major Laws

Thailand’s road safety implementation requires cooperative effort from various agencies from public sector, which is responsible for developing road infrastructure system and regulating the road users, and private sector, which operates road-related businesses including freight and public transport. The consultant reviews organization structure of DLT who is accounted for controlling, regulating and supervising vehicles and drivers (both of which are main common factors for 90-95 percent of road accidents) as well as organizing road transport.

The overview of the organization structure and staffing of DLT. Currently DLT divides its operation into two parts: central and regional administrations, with 6,408 staff. DLT missions include control and organize road transport according to Motor Vehicle Act and Land Transport Act. This aims for road transport system and road usage to maximize benefits to economy, society, politics and security.

2.4 Summary of Road Accident in Thailand

The 2015 Global Status Report on Road Safety reports that Thailand’s accident situation is in a critical level. Thailand has fatality rate at 36.2 per one hundred thousand, which is ranked 2nd only to Libya. Thailand has the highest fatality rate among ASEAN countries in 2009. Before assigning the Decade of Action for Road Safety (2011 – 2020) WHO presented road accident fatality statistics of more than 190 member countries. Thailand’s fatality rate of 19.6 per 100,000 inhabitants was not among top 20, while the first was Eritrea. In 2013, Thailand was under the radar again when it was announced as number three in road fatality rate behind Neua and Dominican Republic. The fatality rate was increased to 38.1, 41.7 and 68.3 even though Thailand was not ranked among the top 20 in 2009 report.

Figure 2.4-1 Twenty Countries with the Highest Road Accident Fatality Rate in 2015
Thailand has the highest road accident death rate among ASEAN countries, followed by Vietnam and Malaysia with death rates of 36.2, 24.5 and 24.0 per 100,000 inhabitants respectively. Meanwhile, Singapore, the Philippines and Laos hold the lowest road accident death rates of 3.6, 10.5 and 14.3

![Road Accident Fatality Rates per 100,000 Inhabitants in ASEAN countries](image)

Figure 2.4-2 Road Accident Fatality Rates per 100,000 Inhabitants in ASEAN countries

2.5 Summary of Road Transport Accidents from Relevant Agencies

1) Royal Thai Police

Royal Thai Police collects data in form of reported accident cases. The statistics of road accident cases show that the number of accidents reduced from 107,353 in 2007 to 59,021 in 2014. However, the fatality rate increases while the number of accidents decreases. This means these accidents are more severe. It is also found from reported cases that motorcycles are the vehicle type with the most frequent accidents. Causes and major factors to accidents are speeding, sudden cutting, close following, and inexperience driving, all of which come from user behavior.

2) Ministry of Public Health

Office of Policy and Strategy has gathered data on road accident deaths in form of death certificate or proof of death. It is found that the road accident death rate increases from 15 to 21.61 per 100,000 inhabitants in 2009 and 2010 respectively. In 2013, the death rate is 22.89 per 100,000 inhabitants. Data also classified accidents by sex, age, and vehicle type. It is found that males are 3 times more likely to die from road accidents than females. People from age group 15-19 are most likely to die from motorcycle accidents. This shows that teenagers are riskiest to the accidents as they are young, vigorous and inexperience.
They may not correctly assess the situation at the critical moment. Measures should be applied to people from this age group to reduce loss.

3) Road Accident Victims Protection Company Limited.
This agency collects data from the Protection for Motor Vehicle Accident Victims Act Insurance which involves reported accident cases. From the report statistics in 2015, there are more than 5,000 deaths, 400,000 injuries and more than 600 disables. The major causes for road accidents are alcohol, speeding, and unsafe vehicles. These come from user behavior and vehicle false.

4) Thailand Accident Database.
Thailand currently has 5 road accident fatality reporting systems:
1. Injury Surveillance
2. Information Technology for Emergency Medical System
3. E-Claim
4. Police Information and Statistics (POLIS)
5. Certificate of Death

The study finds that these reporting systems are collect data differently in objectives. The death and injury statistics contains errors and fails to reflect true problem and severity. Out of the 5 systems, the most practical analyses can come from a combination of three databases: 1. Injury Surveillance, 2. Police Information and Statistics (POLIS), and 3. Certificate of Death.

2.6 Summary of Key Factors of Road Accident from Relevant Studies
Office of Transport and Traffic Policy and Planning (OTP) in collaboration with 5 universities including Chiang Mai University, Khon Kaen University, Suranaree University of Technology, King Mongkut University of Technology Thonburi, and Prince of Songkhla University have conducted a study on accident investigation. In addition, DLT in cooperation with Naresuan University and the five aforementioned universities, Ministry of Public Health by Bureau of Epidemiology and Traffic Accident Research Center (TARC) have also studied causes of road The human, vehicle, road, and environment. Each accident may come from one or more factors. The analyses show that human factor takes the largest share of the accident causes because human is the vehicle controller. It is the most vulnerable with the higher risk of errors than others.

2.7 Summary of Key Factors of Road Accidents
After a review factors of road accidents from researches and agencies, it is found that the main causes of accidents are human error, vehicle deficiency, and road or environment faults. Each main factor consists of secondary factors as follows:
1) Human factor

The study summarizes causes from human factor as follows:

- Vehicle operators usually lack knowledge of road use and good skills to control vehicles. They also lack public responsibility, for example, unaware/not seeing/not looking the vehicles ahead or give importance to fellow road users.
- Violate traffic laws or lack conscience to obey traffic laws.
  - Speeding over the speed limit/rush.
  - Violate traffic signs and traffic lights, and ignore law enforcement.
  - Do not use seat belts or helmets.
  - Under influence of psychotropic substance such as alcohol or amphetamine.
  - Do not own drivers’ license.
  - Closely follow leading vehicles, do not leave enough stopping distance under emergency.
  - Sudden lane changes for passing or U-turn.
- Unready physical condition, for example, fatigue, exhaustion, not enough rest, bad temper.
- Unfamiliar with the road or vehicle.
- Wrong driving assumptions, for example, thinking that one cannot pass on the left on more-than-two-lane road, or using high gear on steep slopes.

2) Vehicle Factor

The study summarizes causes from vehicle factor as follows:

- Structure strength of some vehicles domestically assembled is not approved or lacks of test standard. Passenger seats are not equipped with seat belts and not firmly clamped with the vehicle.
- Vehicle equipment does not meet the standard/lack of specifications. For example, tire tread is worn and depreciate, braking system do not work properly, use of retread tires, bad bush and doors.
- Vehicle modification and passenger overloading.
- Different heights between trucks and passenger vehicles. When accidents happen the drivers or passengers may be under the truck.
• CNG and LPG powered vehicles do not have a system that stops gas feeding immediately when abnormal pressure is detected.

• Modified pick-up trucks lack standard characteristics for public transport vehicles because seats do not meet the standard and seat belts are not installed. When accidents occur passengers may be thrown from the vehicles.

• Pick-up trucks are not designed for passenger at the back because there are no seats and passenger fastening. It is also a violation of Traffic Act B.E. 2522, Clause 4, except that safety of pick-up truck is improved.

• Blind spot on pick-up truck drivers.

3) Road and environment factors

The study summarizes causes from road and environment factors as follows:

• Road gradients are steeper than normal driving capability.

• Emergency stops on high gradient roads or mountainous terrain roads do not meet standard.

• Safe sight distances are blocked by trees, buildings, etc.

• Allowing U-turns at dense traffic areas or community entrances and exits.

• Junctions are close to intersections or curves with high-speed traffic.

• Traffic sign installation is not enough or not appropriate such as U-turn sign.

• Slippery roads due to low skid resistance and danger from pot holes.

• Two-lane road with narrow shoulders and steep slope. Roads are not improved to increase safety according to principle of “forgiving highway” for drivers’ mistakes.

• Improper design and construction, for example insufficient super elevation and equipment on bending sections.

• Dangerous roadside conditions due to obstacles in “clear zone” which increase accident severity. Materials are hard type such as concrete guide post, trees with diameter larger than 10 cm, and utility posts.

Substandard railroad crossing, for example uphill approach, uneven pavement between rails, insufficient sight distance, etc.
2.8 Summary of Accident Data Classified by Vehicle Type

An analyses of accidents classified by vehicle type including motorcycle, public bus and public vans can be summarized as follows:

- **Motorcycle** is the vehicle type that causes the most frequent accidents. According to accident data, teenagers to early working ages (15-24 years) face the highest accident risk which associates with human factors including speeding and alcohol.

- **Bus** does not show as frequent accidents but each of which causes great loss. **Human factors.** Driving behavior leading to accidents are:
  - Drowsiness and exhaustion,
  - Long and continuous driving,
  - Disregard warning signs,
  - Alcohol or narcotic usage,
  - Lack of experience of the route, for example two drivers altered their routes. This include drivers’ emotion such as bad temper, bitter or was aggravated by passengers.

**Vehicle factors.**
  - Double-decked bus running on risky curve and downhill routes.
  - Vehicle height and force outside center of gravity.
  - Basic systems of the vehicle such as braking and suspension systems
  - Modified and re-assembled vehicles still use old braking systems.

**Road and environment factors.** Normally, road is not the direct cause of bus accidents but it is a joint factor along with drivers’ mistakes. For example, the road was designed and built to accommodate traffic in the past, but traffic increases at the present time.

- **Van.** Passenger behavior and fault vehicle characteristics are main reasons in increasing accident frequency and severity.
  - Passenger overloading especially during rush hours or on modified school van.
  - School vans modified from trucks allow too many students to get on and hang off the vehicle frame.
  - Public van passengers do not use safety belts or there are more passengers than the seats with safety belts.
Vehicles are key factors in increasing accident injuries and fatalities.

- Old vans with weak passenger chamber are modified to school vans.
- Weak chamber structure press upon passengers when the van is overturned.
- Many vans use various fuel systems on one vehicle including LPG, CNG and gasoline.
- Seats are not firmly fastened to the vehicle and lose free in accidents.

Road and environment are supporting, and sometimes key factors.

- Median is opened for U-turn without auxiliary lane.
- Traffic lights at major intersections are switched off while traffic is congested.
- Deep median ditches exist without guardrails or fences.
- Construction warning signs are placed in a short advance distance and no warning lights are present.

Law enforcement on road safety issues should be very strict. Some clauses should be amended such as blood alcohol concentration measurement, vehicle owner’s responsibility and vehicle standards. In addition priority should be given to safe driving awareness and data collecting for accident studies and prevention. This should lead to accident reduction and drops in injuries and fatalities.
Chapter 3
Road Safety Strategic Plan, Master Plan and Action Plan Development Process

- General Concept for Strategic Planning, Master Plan and Action Plan Development.
- SWOT Analysis
- Executive In-depth Interviews
- Seminar and Brainstorming

3.1 General Concept for Strategic Planning, Master Plan and Action Plan Development.

In general planning is the most important management process that all organizations must conduct and follow. The operation would focus toward the target goal of the agencies.

3.1.1 Concept of Strategic Planning

In general, a strategic plan refers to direction or resolution according to mission to achieve set vision and goal. Good strategic plans must be developed from visions which are results from collaborative thinking of the organization members who work or will work together. These visions are the consensus that they are desired destination. The visions are converted into tangible and measurable objectives. Strategic plans are the key element for action plan development framework in a later stage.

3.1.2 Strategic Planning Process

Strategic planning process consists of three stages: 1) strategic environment analysis, which include internal and external environment of DLT, 2) strategic plan direction layout which involves identifying mission, vision, goal, performance index, target and strategy, and 3) strategic planning is undertaking that makes strategic plan tangible and practical, which will lead to vision, mission and goal achievements.
Action plan development process can be summarized as follows:

1. Arrange a meeting for mid-level executives, operation chiefs and staff, and personnel responsible for project planning.
2. Arrange a lecture by experts summarizing techniques related to modern action plan development for audience to appreciate modern action plan development.
3. Arrange a brainstorming workshop to collaboratively develop action plan by filling in the form.
4. Experts oversee the process and give advice.

### 3.2 SWOT Analysis

Future safety trend analyses for DLT along with relevant regulations and laws lead to results of a SWOT safety analysis for DLT as follows:

1. **Strength**
   1) Main mission: control, regulate and oversee road safety issues.
   2) Minor agencies work in supporting one another.
   3) Budgets are available from Road Safety Fund and other sources.
   4) Data on vehicles, registration, and operators are available.
   5) Staff has fundamental academic knowledge and possesses occupational skills.
   6) Decentralized management with mechanism to support work in all area throughout the country.
   7) Laws that certify DLT’s authority and operation on road safety issues.
   8) Experience and ability to apply technology.
   9) Main service mission is to provide fast service.

2. **Weakness**
   1) Large organization structure and overlapped operations.
   2) Drivers’ license issuing does not concern enough safety issues.
   3) Lack efficient driver building process.
   4) Lack effective data management and linkage.
   5) Lack R&D support and real implementation.
   6) Insufficient staff and lack specific expertise.
   7) Staff lack work morale and career path.
   8) Past operation relies on public relation and campaign which are not reasonably successful.
10) Safety authority by law is limited.
11) Experienced and capable in using technology but lack technology coverage and innovation.

3. Opportunity
1) The world give priority to rad safety. This is considered national agenda.
2) Public is aware of importance of road safety.
3) The government supports policy to reduce fatality accidents by 50%.
4) The government is stable. Projects can be continuously developed.
5) There exists national road safety master plan.
6) Advanced vehicle technology such as pre-collision system.
7) IT advancement enhances efficiency in safety management.
8) The government supports large public transport systems (rail systems) and other public transport systems.
9) Public has opportunities to get more involved.

4. Threat
1) Thailand’s location is the center of the region. ASEAN Economic Community (AEC).
2) Thailand’s proactive tourism policy.
3) Lack of agreements on international drivers’ license laws in some countries.
4) Limited budget for implementation. The government policy does not reflect true condition in the area. Most people are poor and cannot cooperate.
5) Laws are outdated and not suitable to rapidly changing society. Too light punishment.
6) Laws are not strictly enforced.
7) Lack of laws that make the operators raise up safety standard.
8) Lack of monitoring and evaluation. Lack of data. Regulators cannot control operation to meet the target.
9) Culture and value of Thai people which favor convenience more than safety.
10) Lack of cooperation between DLT and other agencies.
11) Lack of system that supports public participation.
3.3 Executive In-depth Interviews

In order to increase efficiency in strategic planning and action plan development, in-depth interview adds important information in addition to seminar and questionnaire. It is also used to verify information obtained from questionnaire.

From in-depth interviews with organization executives to gain result for road safety plan development, it is found that desired safety goals are to reduce or completely eliminate accidents, good public transport and good connection between modes with modern control and monitoring systems, and social responsible and disciplined road users. To move towards these goals, implementation frameworks including strategy, vision and mission are required.

![Image of in-depth interviews with DLT Executives]

Figure 3.3-1 In-depth interviews with DLT Executives

3.4 Seminar and Brainstorming

The consultant arranges six seminars to gather opinions and comments from DLT officers and relevant agencies including Royal Thai Police, Department of Disaster Prevention and Mitigation and National Institute of Emergency Medicine to develop strategic plan for road safety master plan and action plans.
1\textsuperscript{st} Seminar and Brainstorming for DLT high-level executives was held on 23 September 2015. The purposes were to survey perspectives and lay out the direction of road safety master plan in a policy level.

2\textsuperscript{nd} Seminar and Brainstorming for high-level executives from relevant agencies was held on 30 October 2015. The purposes were to survey perspectives and lay out the direction of road safety master plan in a policy level.

3\textsuperscript{rd} Seminar and Brainstorming for DLT practitioner, professional, senior professional and expert level analysts was held on 1 December 2015. The purposes were to survey perspectives and directions in academic level, and transfer policy-level approach or direction from the executives to analysts.

4\textsuperscript{th} Seminar and Brainstorming for practitioner, professional, senior professional and expert level analysts from relevant agencies was held on 27 January 2016. The purposes were to present the direction of the strategic plan and transfer approach to officers from external road safety agencies.

5\textsuperscript{th} Seminar and Brainstorming for country-wide DLT road safety practitioners was held on 12 February 2016. The purposes were to present the overall picture of the project and direction framework of DLT’s road safety strategic plan and master plan.

6\textsuperscript{th} Seminar and Brainstorming for country-wide road safety practitioners from DLT and external government and private agencies was held on 1 March 2016. The purposes were to present the overall picture of the project and direction framework of DLT’s road safety strategic plan and master plan obtained from the study.

From the six seminars the consultant receives opinions and comments from all road safety relevant sectors, including opinions from DLT officers. The consultant has brought these proposals to improve DLT road safety plan to maximize its efficiency and benefits to road users and general public.
Chapter 4
Road Safety Strategic Plan

- Vision
- Mission
- Goal
- Strategies
- Implementation Timeframe

4.1 Vision

From the study, information review, in-depth interviews with the organization executives, and seminars with relevant parties, the consultant proposes DLT’s road safety vision as follow:

“Safe road transport system with Thai innovation and funds”

4.2 Mission

Reviewing DLT’s main road safety mission from DLT policy included in DLT strategic plan 2016-2020, the consultant proposes mission of road safety strategic plan, master plan and action plan as follow:

“Develop system, control and regulate road transport system operation to achieve standard and safety”

4.3 Goal

The consultant specifies 5 goals for DLT road safety plan as follows:

1) Road accident fatality reduction by 50%. The road accident or road fatality statistics which will be used as indicators must be clear and come from reliable sources.
2) **Safe public transport**, consisting of
   - Statistical public transport accident data from reliable sources to be used as performance indicators.
   - Regulate operators and business establishment.
   - Regulate and set standard for public transport vehicles.
   - Regulate and set standard for entering public motorcycles.

3) **Safe freight and hazardous material transportation systems**, consisting of
   - Statistical freight and hazardous material transport accident data from reliable sources to be used as performance indicators.
   - Regulate and set standard for operator licensing.
   - Regulate containers for hazardous materials and general transportation according to transportation container and procedure standard.
   - Regulate transportation.
   - Accident life and property insurance, including environment protection.

4) **Efficient driver building program** with safety culture.

5) **Safe Vehicles**

### 4.4 Strategies

From road safety vision, mission and goals, the consultant specifies 3 strategies for DLT’s road safety master plan with the following detailed strategic programs:

**S1: 1st Strategy – Build Safe Culture**

This strategy focuses on developing road safety culture through educating and enhancing driving skill. This also includes building safe road use attitude which will change human behavior to road use. Cultural management not only emphasizes individual change, but also requires systematic management from all sectors.

**Strategic Programs**

- **S1-1 Proper Knowledge**

  By reviewing accident causes, it is found that the key factor of road accidents is human factor, especially in the young age and motorcycle user groups. Therefore, one of the important programs under this strategy is to educate safe road use for road users though public relation programs and medias such as radio, television, remote satellite education, etc. In addition, there will be cooperation with the Ministry of Education on reducing classroom time and increasing learning time. This will be done by inserting road safety activities through clubs in activity sessions and in curriculum for all levels. This is to educate Thai youths to gain knowledge and understanding and be aware of road safety, and apply it correctly and safely.
○ S1-2 Proper Training

In addition to building knowledge and understanding on safe road use, enhancing driving skills for all drivers on all vehicle types also plays a major part in reducing road accidents and severity, especially under unusual circumstances. The target groups of the skill enhancing program are youths from elementary, secondary and vocational schools, along with the motorcycle riders, both public and private, which are the group with the highest loss.

○ S1-3 Proper Attitude

This strategy emphasizes on building a network to promote road safety attitude in a broad scope. It focuses on responsibility to society and raise understanding and awareness of loss due to accidents. This includes cooperation with public and private agencies, associations and clubs. For example, movie and soap opera producers and directors may raise awareness of road safety via TV and radio commercials and media in public vehicles. In addition, projects will be carried out to improve attitudes of drivers with past violation records such as drunk driving, to gain proper attitude and not to repeat the same mistakes.

○ S1-4 Proper Behavior

Improper road use behavior is one of the key factors for road accidents. This strategy emphasizes promotion to road use behavior change. It focuses on prototype community development to solve road accident problem and applies Thai fund to promote observing and obeying traffic regulations. The prototype community project achievement will be recorded as good practice and publicized in a broader scope.

S2: 2nd Strategy – Safe Transportation System

This strategy focuses on developing road safety culture through educating and enhancing driving skill. This also includes building safe road use attitude which will change human behavior to road use. Cultural management not only emphasizes individual change, but also requires systematic management from all sectors.

Strategic Programs

○ S2-1 Safe Road Users

By reviewing traffic accident causes, it is found that the main factor of road accidents is human. The first sub-strategy in Safe Transportation System emphasizes on raising standard in issuing drivers’ licenses by increasing concentration on the whole process, while promoting private driving school for all vehicle types according to DLT’s standard. This will provide learning channel to build knowledge, understanding and skills on safe driving. New drivers who practice by themselves in the past will change to learn driving from the school with a standard approved by DLT. This focuses on producing efficient drivers. License holders will feel pride and cherish the licenses and drive safer.

○ S2-2 Safe Vehicle

By reviewing traffic accident causes, it is found that part of the reason comes from faults in vehicle equipment including braking system, tires and other safety equipment.
This sub-strategy focuses on developing Thailand’s automotive industrial standard up to international one. Vehicles on the road should be at the international standard. Time to inspection and vehicle life limits must be reconsidered. DLT must improve vehicle inspection system with modern technology and connect to centralized system so that data from private inspection can be verified.

- **S2-3 Safe Speed**
  Vehicle speeds have direct impact to accident severity. Vehicle speed monitoring will promote safety. Management approach for safe speed in this program relies on innovation and technology for speed control. In addition, the program focuses on increasing DLT authority to undertake safety operation. Target groups involve public transport and hazardous materials transport which will generate high impact to the society in case of accidents.

- **S2-4 Safe Public and Freight transportation System**
  Safe public and freight transportation program focuses on promotion and support to raise operators’ standard and quality. Operator selection criteria must be improved. Modern technology will be used to regulate. This also includes quality specifications such as driver characteristics, vehicle age, structure type, standard equipment and safety equipment. Freight and public transport vehicles must be periodically inspected. Social responsibility will also be reconsidered in case of accident.

**S3: 3rd Strategy - Safety Management**
Management system improvement strategy emphasizes on organization management, enhancing work efficiency, and develop personnel to gain knowledge on safety. Management system also focuses on driving mechanism for DLT’s safety master plan and action plan to be implemented and evaluated so as to achieve the set goals.

**Strategic Programs**
- **S3-1 Safety Control Center Establishment**
  To operate according to 1st and 2nd strategies successfully, DLT requires to establish an agency directly responsible for additional safety missions. Land Transport Control Center is the data center to support, develop and control road transport safety activities throughout the country. This covers driver (control, regulate, and oversee issuing and extend drivers’ licenses), vehicle (control, regulate, and oversee public transport, freight and hazardous material transport vehicles), and evaluation of project success.

- **S3-2 Innovation and Technology**
  In the past, safety activities face limitations in many sectors including thorough regulation and lack of database connectivity which makes analysis and evaluation difficult. Applying innovation and technology to safety operation will promote more efficient controlling and regulating safety operation according to DLT mission.
○ **S3-3 Proficient Personnel**

By reviewing DLT organization structure, number of current staff, and safety mission according to road safety strategic plan, it is found that the number of DLT staff is not sufficient to achieve the goals. Expertise in safety is needed. Professional staff program will promote and support current DLT staff to gain knowledge and skills through various safety trainings. Staffing increase is essential to implement safety tasks efficiently.

![Figure 4.4-1 Road Safety Plan Concept](image_url)
Vision
“Safe road transport system with Thai innovation and funds”

Mission
“Develop system, control and regulate road transport system operation to achieve standard and safety”

Goal
1) Road accident fatality reduction by 50%.
2) Safe public transport
3) Safe freight and hazardous material transportation systems
4) Efficient driver building program with safety culture
5) Safe Vehicles

1st Strategy – Build Safe Culture
- S1-1 Proper Knowledge
- S1-2 Proper Training
- S1-3 Proper Attitude
- S1-4 Proper Behavior

2nd Strategy – Safe Transportation System
- S2-1 Safe Road Users
- S2-2 Safe Vehicle
- S2-3 Safe Speed
- S2-4 Safe Public and Freight transportation System

3rd Strategy - Safety Management
- S3-1 Safety Control Center Establishment
- S3-2 Innovation and Technology
- S3-3 Proficient Personnel

Figure 4.4-2 DLT Road Safety Strategic Plan
4.5 Implementation Timeframe

- DLT Road Safety Master Plan will be effective for 10 years (2016-2025)
- DLT Road Safety Action Plan will be effective 5 years (2016-2025)
Chapter 5
Road Safety Master Plan

❖ Approach to Road Safety Master Plan Development
❖ Road Safety Master Plan

5.1 Approach to Road Safety Master Plan Development

After the road safety strategic plan is developed under road safety development direction, the consultant identifies details for strategic implementation programs with secondary goals and outcomes as follows:

Table 5.1-1 Association and Compliance of Goals Classified by Strategy and Strategic Programs for Road Safety Plan

<table>
<thead>
<tr>
<th>Goal</th>
<th>Strategy</th>
<th>Strategic Program</th>
<th>Minor Goal</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1. Reduce road accident fatalities by 50%</td>
<td>S1: Create safety culture</td>
<td>S1-1 Proper Knowledge</td>
<td>• To promote road users to have road safety knowledge and skills.</td>
<td>Road users possess road safety knowledge and skills.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S1-2 Proper Training</td>
<td>• To promote road users to have right attitudes, be aware of safety, and have road safety behavior.</td>
<td>Road users have right attitudes, are aware of safety, and have road safety behavior.</td>
</tr>
<tr>
<td>G2. Safe passenger transportation</td>
<td>S1-3 Proper Attitude</td>
<td>S1-4 Proper Behavior</td>
<td>• More efficient road users.</td>
<td>Drivers are proud of their licenses.</td>
</tr>
<tr>
<td>G3. Safe freight and hazardous material transport system</td>
<td>S-2: Promote safe system</td>
<td>S2-1 Safe Road Users</td>
<td>• To develop more stringent controlling and regulating system on road safety for drivers’ license issuance.</td>
<td>Safer road vehicles of all types.</td>
</tr>
<tr>
<td>G4. System that develops efficient drivers</td>
<td>S2-2 Safe Vehicle</td>
<td>S2-3 Safe Speed</td>
<td>• To develop safer vehicle controlling and regulating system</td>
<td></td>
</tr>
<tr>
<td>G5. Safe vehicles</td>
<td>S2-4 Safe Public and Freight transportation system</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5.1-1 Association and Compliance of Goals Classified by Strategy and Strategic Programs for Road Safety Plan (continued)

<table>
<thead>
<tr>
<th>Goal</th>
<th>Strategy</th>
<th>Strategic Program</th>
<th>Secondary Goal</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S3-1 Land Transport Control Center</td>
<td>• Develop safety controlling and regulating system for freight transport and public transport vehicles.</td>
<td>• Transport operators have knowledge and understanding, and participate more in safety concerns.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S3-2 Innovation And Technology</td>
<td>• To identify a responsible agency especially in DLT’s safety task implementation.</td>
<td>• DLT has a key division which is responsible for safety concerns.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S3-3 Professional Staff</td>
<td>• To promote application of innovation and technology to control and regulate road safety related tasks.</td>
<td>• Innovation and technology are applied to efficiently control and regulate road safety related tasks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To improve staff’s knowledge for efficient safety operations.</td>
<td>• DLT staff have safety expertise.</td>
</tr>
</tbody>
</table>

5.2 Road Safety Master Plan

After developing road safety policy and strategic plan for 10-year period (2016-2025) the consultant reviews DLT’s road safety programs/projects that were implemented in the past 5 years, are implemented at present, and expected to be implemented in the future, together with programs/projects resulted from workshop. These are programs/projects under concepts of “sustaining” efficient programs/projects, “integrating” programs/projects from all DLT divisions, “extending” successful programs/projects, and “proposing” new
programs/projects by the consultant, focusing on application of innovation and technology to achieve goals of road safety strategic plan.

DLT’s 2016-2025 road safety master plan consists of 3 strategies and 11 strategic programs. Examples of activities and projects together with strategy driving approach as shown in Table 5.2-1 to 5.2-11.
### Table 5.2-1 Proper Knowledge Program

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S1:</strong> 1&lt;sup&gt;st&lt;/sup&gt; Strategy: Create Safety Culture</td>
<td></td>
</tr>
<tr>
<td>This strategy focuses on developing road safety culture through educating and enhancing driving skill. This also includes building safe road use attitude which will change human behavior to road use. Cultural management not only emphasizes individual change, but also requires systematic management from all sectors.</td>
<td></td>
</tr>
<tr>
<td><strong>S1-1</strong> Proper Knowledge Program</td>
<td></td>
</tr>
<tr>
<td>Driving Approach: Driving proper road safety knowledge program starts with high risk groups which are youths and motorcycle users. This will be done through campaigns and public relation using television, radio, and other information medias. In addition, road safety knowledge will be given in schools to educate Thai youths to gain knowledge and understanding and be aware of road safety. Examples of activities under this programs include:</td>
<td></td>
</tr>
<tr>
<td>1) Public relation on road safety</td>
<td>Road users and general public receive news and information via various kinds of medias, and have the right knowledge on safe road use.</td>
</tr>
<tr>
<td>2) Educating Thai youths to give attention to traffic disciplines for safe road use.</td>
<td>Participating youths and parents gain more knowledge on proper and safe road use.</td>
</tr>
<tr>
<td>3) Educating Thai youths to have safety culture via school activities.</td>
<td>Participating youths gain knowledge on proper and safe road use, and pass the test criteria.</td>
</tr>
<tr>
<td>4) Campaign and public relation on safe motorcycles and traffic disciplines.</td>
<td>Students from the 1st year of secondary school and older who wish to ride motorcycle will be cautious and have knowledge before actual ride. They will also have proper knowledge on safety.</td>
</tr>
<tr>
<td>5) Promoting knowledge on safe road use through various medias.</td>
<td>General public is aware of and give importance to road accidents, and voice their opinions through medias.</td>
</tr>
<tr>
<td>6) Campaign for accident prevention and reduction.</td>
<td>Operators have knowledge and understanding on road safety. Bus and truck accidents reduce throughout the year and especially during festivals.</td>
</tr>
</tbody>
</table>
**Table 5.2-2 Proper Training**

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S1:</strong> 1&lt;sup&gt;st&lt;/sup&gt; Strategy: Create Safety Culture</td>
<td></td>
</tr>
<tr>
<td>This strategy focuses on developing road safety culture through educating and enhancing driving skill. This also includes building safe road use attitude which will change human behavior to road use. Cultural management not only emphasizes individual change, but also requires systematic management from all sectors.</td>
<td></td>
</tr>
<tr>
<td><strong>S1-2 Proper Training Program</strong></td>
<td></td>
</tr>
<tr>
<td>Driving Approach: Driving proper training program focuses on high risk groups which are youths and public and private motorcycle riders. Traffic simulation field activities will be held to enhance road use skills appropriate to each academic level ranging from primary, secondary and vocational levels. The activities will also build safe road use skills for public vehicles, trucks and hazardous material transport vehicles. This program will reduce accidents when the drivers faces unexpected circumstances through proper decision and skills. Examples of activities under this program consist of:</td>
<td></td>
</tr>
<tr>
<td>1) Road use skill reinforcement via traffic simulation town in schools</td>
<td>Participating students gain knowledge on traffic rules and proper and safe road use, and pass the test criteria.</td>
</tr>
<tr>
<td>2) Enhancing motorcycle riding skill.</td>
<td>Motorcycle riders have safer riding skill, especially within public motorcycle riders.</td>
</tr>
<tr>
<td>3) Enhancing safety skills for buses, trucks and hazardous material transport vehicles.</td>
<td>Participating bus, truck and hazardous material vehicles drivers gain addition knowledge in a great to greatest level. They will have safe road use behavior with no passenger complaints and zero accident.</td>
</tr>
<tr>
<td>4) Developing motorcycle training track in community and safety skilled trainers.</td>
<td>Encourage building motorcycle training track with trainers. This transfer right messages on safety within family, community and school. People in the community possess safe motorcycle riding skill.</td>
</tr>
</tbody>
</table>
Table 5.2-3 Proper Attitude Program

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S1:</strong> 1st Strategy: Create Safety Culture</td>
<td></td>
</tr>
<tr>
<td>This strategy focuses on developing road safety culture through educating and enhancing driving skill. This also includes building safe road use attitude which will change human behavior to road use. Cultural management not only emphasizes individual change, but also requires systematic management from all sectors.</td>
<td></td>
</tr>
<tr>
<td><strong>S1-3</strong> Proper Attitude Program</td>
<td></td>
</tr>
<tr>
<td>Driving Approach: Driving proper attitude program involves media production to improve road safety attitude focusing on social responsibility. It will raise understanding and awareness of loss from accidents, for example wearing helmet to save life and not to avoid police arrest, and understanding danger of drunk driving. This will be done through advertisement and radio and TV commercial together with cooperation from all sectors who appreciate importance of accidents, cooperate in attitude improvement activities, and build safe transport culture. Example of activities under this program include:</td>
<td></td>
</tr>
<tr>
<td>1) Media production for road safety attitude improvement.</td>
<td>DLT has media with contents that encourage public to become aware of road safety, and are continuously advertised through various types of medias.</td>
</tr>
<tr>
<td>2) Enhance cooperation with government and private agencies to raise public awareness on road safety.</td>
<td>All sectors are aware of importance of accidents and participate in activities to reduce accidents.</td>
</tr>
</tbody>
</table>
### Table 5.2-4 Proper Behavior Program

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S1:</strong> 1st Strategy: Create Safety Culture</td>
<td>This strategy focuses on developing road safety culture through educating and enhancing driving skill. This also includes building safe road use attitude which will change human behavior to road use. Cultural management not only emphasizes individual change, but also requires systematic management from all sectors.</td>
</tr>
<tr>
<td><strong>S1-4 Proper Behavior Program</strong></td>
<td>Driving Approach: Driving proper attitude program involves promoting safety-related clubs in schools and promoting prototype communities to solve road accident problem. It applies Thai fund concept to observe and obey traffic regulations. The prototype community project achievement will be recorded as good practice and publicized in a broader scope. Traffic rule violators or those with fault driving behaviors will have to attend a behavior training course so they will not make the same mistakes. Example of activities under this program include:</td>
</tr>
<tr>
<td>1) Build safe transport culture through school clubs.</td>
<td>Promote building and transferring safe driving culture through clubs in schools. Sustainable safety culture will be developed focusing on enhance knowledge, build skills, and transfer culture from seniors to juniors which will change behavior in target groups -- youths who ride motorcycles.</td>
</tr>
<tr>
<td>2) Build safety culture in Thai communities</td>
<td>Promote building and transferring safe driving culture through pilot communities using road injury prevention measures. These include identifying risk groups, eliminating black spots, and precaution measures to control and reduce risky behaviors in the household and community levels. This will lead to sustainable success in Thailand’s road injury and fatality reduction.</td>
</tr>
<tr>
<td>3) Behavior improvement training for severe violators and those with repeated mistakes.</td>
<td>For severe violators or those with repeated mistakes to get the right attitude. They will be aware of loss from road accidents and change behavior towards safer driving.</td>
</tr>
</tbody>
</table>
### Table 5.2-5 Safe Road Users Program

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S2:</strong> 2(^{nd}) Strategy: Promote Safety System</td>
<td></td>
</tr>
<tr>
<td>This strategy focuses on building safe traffic system, concentrating on developing safer drivers, safer vehicle, safer public transport and freight and hazardous transport systems.</td>
<td></td>
</tr>
<tr>
<td><strong>S2-1</strong> Safe Road Users</td>
<td></td>
</tr>
<tr>
<td>Driving Approach: safe road user program is driven through developing more comprehensive and efficient safe driving course. The program can also promote private driving school to adopt DLT standard, and build a high level curriculum to improve safe driving behavior in hazardous material vehicles, emergency vehicles, ambulance and international transport vehicles. Activities under this program include:</td>
<td></td>
</tr>
<tr>
<td>1) Developing training curriculum for each type of drivers’ license.</td>
<td>Safe driving curriculum for each vehicles type.</td>
</tr>
<tr>
<td>2) Certifying driving trainers.</td>
<td>Certified trainers trained and tested by DLT.</td>
</tr>
<tr>
<td>3) Driving school certification.</td>
<td>Driving schools certified by DLT to operate by a set standard.</td>
</tr>
<tr>
<td>4) Driving simulator provision</td>
<td>Driving students gain knowledge and skills in driving various kinds of vehicles, and operate instruments properly. Students can pass driving tests.</td>
</tr>
<tr>
<td>5) Train the private driving trainers to give lecture for drivers’ license extension.</td>
<td>Driving trainers from DLT certified schools receive training and gain proper knowledge.</td>
</tr>
<tr>
<td>6) Inspect DLT certified schools.</td>
<td>DLT certified schools operate to the DLT set standard.</td>
</tr>
<tr>
<td>7) Specify initial safety qualifications for seniors and those with chronic health conditions.</td>
<td>Specifications and standard in license extension for seniors and those with chronic health conditions such as apoplexy and heart disease.</td>
</tr>
<tr>
<td>8) Develop e-exam system for DLT certified driving schools.</td>
<td>E-exam system for driving schools.</td>
</tr>
<tr>
<td>9) Develop high level curriculum to improve safe driving.</td>
<td>High level curriculum to improve safe driving focusing on hazardous material transport, emergency vehicles, ambulances, and international freight transport.</td>
</tr>
</tbody>
</table>
### Table 5.2-6 Safe Vehicle Program

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S2: 2nd Strategy: Promote Safety System</strong></td>
<td>This strategy focuses on building safe traffic system, concentrating on developing safer drivers, safer vehicle, safer public transport and freight and hazardous transport systems.</td>
</tr>
<tr>
<td><strong>S2.2 Safe Vehicle Program</strong></td>
<td></td>
</tr>
<tr>
<td>Driving approach: Safe vehicle program involves study and issuing regulations on vehicle standards according to the plan. Road vehicles shall meet the international standards. Time to inspection will be improved along with vehicle age limit specification. DLT will improve inspection system with modern technology and data connection with private inspection facilities.</td>
<td></td>
</tr>
<tr>
<td>Example activities under this program include:</td>
<td></td>
</tr>
<tr>
<td>1) Readiness evaluation and priority for improving vehicle safety towards international standards.</td>
<td>Realize priority of vehicle standard by safety criteria consideration.</td>
</tr>
<tr>
<td>2) Study vehicle inspection age and proper charge rates for safe operation.</td>
<td>Proposals in time, inspection, maintenance criteria for safe operation and proper charge rates for various vehicle types.</td>
</tr>
<tr>
<td>3) Study integrated regulation measures on inspection facilities, focusing on safety issues.</td>
<td>Systematic and verifiable data collection on vehicle inspection. More intense measures on safe operation inspection such as detail report on important instruments including brake and tires. All divisions can efficiently utilize these data.</td>
</tr>
<tr>
<td>4) Draft electric automotive announcement for safe operation.</td>
<td>Draft ministerial law concerning specifications, functions, and power of electric automotive and inspection approach for safe operation.</td>
</tr>
<tr>
<td>5) Set hazardous material transport safety management specifications.</td>
<td>Proposed standards are adopted to set regulations for hazardous material transport vehicles.</td>
</tr>
<tr>
<td>6) Study and set safety criteria and regulations for international vehicle use in the Kingdom.</td>
<td>DLT has criteria and regulations for international vehicle use in the Kingdom, including driver and vehicle parts, for safe operation.</td>
</tr>
<tr>
<td>7) Enhancing efficiency of mobile inspection units for accident prevention and reduction.</td>
<td>DLT units inspect important instruments under operation, focusing on high risk areas which may be developed into permanent inspection centers for public vehicles and trucks.</td>
</tr>
</tbody>
</table>
Table 5.2-7 Safe Speed Program

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S2:</strong> 2nd Strategy: Promote Safety System</td>
<td>This strategy focuses on building safe traffic system, concentrating on developing safer drivers, safer vehicle, safer public transport and freight and hazardous transport systems.</td>
</tr>
<tr>
<td><strong>S2-3 Safe Speed Program</strong></td>
<td>Driving Approach: Safe speed program involves study and propose approach for DLT to regulate, control and oversee speed control. This will increase efficiency on safety operation in accordance with DLT innovation and technology development for vehicle speed control in the future.</td>
</tr>
<tr>
<td>Example activities under this program include:</td>
<td></td>
</tr>
<tr>
<td>1) Study and improve regulations to regulate, control and oversee vehicles speeds using innovation and technology.</td>
<td>DLT officers can regulate, control and oversee vehicle speeds for road safety enhancement in accordance with DLT innovation and technology development in the future.</td>
</tr>
</tbody>
</table>
Executive Summary Report

Chapter 5 Road Safety Master Plan

Table 5.2-8 Safe Public and Freight Transportation System

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Strategy: Promote Safety System</td>
<td></td>
</tr>
<tr>
<td>This strategy focuses on building a safe traffic system, concentrating on developing safer drivers, safer vehicle, safer public transport and freight and hazardous transport systems.</td>
<td></td>
</tr>
<tr>
<td>Safe Public and Freight Transportation System Program</td>
<td></td>
</tr>
<tr>
<td>Driving Approach: Safe Public and Freight Transportation System Program improves freight and passenger transport with efficient management and safety standard, including studies and specifies service quality.</td>
<td></td>
</tr>
<tr>
<td>Example activities under this program include:</td>
<td></td>
</tr>
<tr>
<td>1) Improve passenger and freight transport operation with safety standard</td>
<td>- Passenger and freight transport operators gain knowledge on efficient management with standard. - DLT has a road map to improve safety standard for transport operations.</td>
</tr>
<tr>
<td>2) Promote service and safety quality specifications for passenger, freight and hazardous material transport (Q-mark)</td>
<td>Transport operators gain knowledge and skills on efficient management with safety quality in operation.</td>
</tr>
<tr>
<td>3) Promote safe school vehicles.</td>
<td>Promote school vehicle service with safety standard according to the laws.</td>
</tr>
</tbody>
</table>
Table 5.2-9 Land Transport Control Center

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd Strategy: Develop Safety Management</td>
<td>Safety Management emphasizes on organization management, increase work efficiency and develop staff with safety knowledge and skills. Management system also focuses on driving mechanism for DLT’s safety master plan and action plan into implementation. Results can be assessed so as to achieve the goals.</td>
</tr>
</tbody>
</table>

Land Transport Control Center Program

Driving Approach: Land Transport Control Center Program involves establishing the center to support, develop and control safety activities throughout the country, including passenger and hazardous material vehicles. This program will regulate transport operators, vehicles and drivers, for example, using violation data from connection with Royal Thai Police database in consideration for granting drivers’ or transport licenses.

Example activities under this program include:

| 1) Establish Land Transport Control Center and increase GPS control operation and management center for country-wide transport and passenger services. | DLT has a road safety data center and supporting data for developing and controlling safety activities. |
| 2) Establish an integrated road safety unit of DLT. | Office-level unit responsible for driving road safety strategy, programs and projects towards the set goals. |
| 3) Develop a road accident data exchange gateway with relevant agencies. | Reliable central road accident data center that can connect with other agencies’ database for safety issue analysis. |
### Table 5.2-10 Innovation And Technology Program

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S3: 3rd Strategy: Safety Management</strong></td>
<td></td>
</tr>
<tr>
<td>Safety Management emphasizes on organization management, increase work efficiency and develop staff with safety knowledge and skills. Management system also focuses on driving mechanism for DLT’s safety master plan and action plan into implementation. Results can be assessed so as to achieve the goals.</td>
<td></td>
</tr>
</tbody>
</table>

| **S3-2 Innovation and Technology Program** | |
| Driving Approach: Innovation and technology program involves developing DLT databases into a single database and connect to external agencies. This creates data connection and reliability, and enables passenger vehicle and truck inspection. DLT has a tool to efficiently regulate, control and oversee operations. Example activities under this program include: | |
| 1) Develop active monitoring and control system for freight and passenger vehicles | Modern active monitoring and control system for freight and passenger vehicles. |
| 2) Developing incident forensic system for freight and passenger vehicles. | Know causes of accidents and prevention approach for freight and passenger vehicles. |
| 3) Developing driving safety assessment system for freight and passenger vehicles. | Freight and passenger vehicle drivers’ profile supporting safety operations. Data supporting route consideration and setting and safety activities. |
| 4) Developing Transport Safety Statistics System relating to DLT. | Data supporting road safety management. |
| 5) Increase efficiency in traffic control and safety issues with information technology for automatic license plate reading. | Realize demand and problems on use of license plate for various purposes by relevant units. Identify license plate format proper to information technology. If implemented, traffic disciplines and law enforcement will be more efficient. This will reduce staff requirement while maintaining 24-hr operations. |
Table 5.2-11 Professional Staff

<table>
<thead>
<tr>
<th>Activity Program and Project</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3: 3rd Strategy: Safety Management</td>
<td>Safety Management emphasizes on organization management, increase work efficiency and develop staff with safety knowledge and skills. Management system also focuses on driving mechanism for DLT’s safety master plan and action plan into implementation. Results can be assessed so as to achieve the goals.</td>
</tr>
<tr>
<td>S3-3 Professional Staff Program</td>
<td>Driving Approach: Professional Staff Program involves developing DLT staff to gain knowledge and skills through proper training and in line with the field of work. Sufficient budget must be available to implement the program to meet the set goals.</td>
</tr>
<tr>
<td>1) In-depth accident cause analysis.</td>
<td>In-depth analysis to realize the causes of accidents which lead to prevention approach and measures.</td>
</tr>
<tr>
<td>2) Developing DLT staff capacity by safety training and study visit.</td>
<td>DLT staff from all units gain knowledge, attitude, conscience and awareness of roles and responsibilities to public in road safety concerns. Staff can apply modern technology in developing safety work.</td>
</tr>
<tr>
<td>3) Budget provision for road safety.</td>
<td>DLT has budget resource for road safety operation to meet the set goals.</td>
</tr>
</tbody>
</table>
Chapter 6
Road Safety Action Plan

- 1st Strategy – Create Safety Culture
- 2nd Strategy: Promote Safety
- 3rd Strategy: Develop Safety Management


DLT Road Safety Action Plan (2016-2025) is developed from land transport accident studies including road traffic accident statistics from the past and future trend, causes of road accidents and factors affecting accident severity in Thailand. The consultant reviews approach to road traffic accident solution from other international agencies such as UNECE vehicle regulations, and technology application to control, regulate and oversee road safety undertaking such as drivers’ license issuance and GPS systems to adopt as guidelines for action plan development under national policy/strategy frameworks. The consultant also takes into consideration results from the first seminar with policy-level DLT executives in which a strategic plan was drafted. Strategic plan, master plan, and action plan development diagram is shown in Figure 6.1-1.
Figure 6.1-1 Strategic plan, master plan, and action plan development diagram
Thailand road safety problem is in serious condition. Characteristics and pattern of accidents are repeated from similar causes and factors by dominated by human and vehicles. The problems occur with the specific road user group which is teenagers to early working age, and specific vehicle groups which are motorcycle, public transport (van/bus) and pick-up trucks. When considering these causes and factors together with missions of DLT internal units, it can be appreciated that DLT whose mission is to control, regulate and oversee road transport, is the main agency that plays an important role in reinforcing road safety in Thailand.

In addition, the consultant reviews road safety programs/projects by DLT in the past (5 years), at present, and in the future together with projects/programs under concepts of

1. “sustaining” efficient programs/projects,
2. “integrating” programs/projects from all DLT divisions,
3. “extending” successful programs/projects, and
4. “proposing” new programs/projects which proposed by the consultant and DLT personnel, focusing on application of innovation and technology to achieve the goals of safety master plan.

The consultant develops and improves “DLT Road Safety Action Plan (2016-1025)” consisting of 3 strategies and 11 strategic programs, each of which contains projects/programs. The plan is divided into short term (1-2 years) and medium term (3-5 years) with the following details:

S1: 1st Strategy – Create Safety Culture consisting of 4 strategic programs and 15 projects as follows:

S1-1 Proper Knowledge Program comprises 6 projects:
   S1-1-1 Public Relation for Road Safety Project
   S1-1-2 Implanting Youth’s Traffic Discipline Project
   S1-1-3 Implanting Youth’s Safety Culture in School Project
   S1-1-4 Safe Motorcycle Driving under Traffic Laws Project
   S1-1-5 Promote Safe Road Use Knowledge through Radio Stations Project
   S1-1-6 Road Accident Prevention and Reduction Campaign Project

S1-2 Proper Training Program comprises 4 projects:
   S1-2-1 Traffic Simulation Town Promoting Safety Conscience Project
   S1-2-2 Enhancing Motorcycle Riding Skill Project
   S1-2-3 Enhancing Safety Skills for Buses, Trucks and Hazardous Material Transport Project
   S1-2-4 Motorcycle Training Track and Trainer Development Project

S1-3 Proper Attitude Program comprises 2 projects:
   S1-3-1 Media Production for Road Safety Attitude Improvement Project.
S1-3-2 Government and Private Agency Cooperation to Raise Public Road Safety Awareness Project

S1-4 Proper Attitude Program comprises 3 projects:
- S1-4-1 School Safe Driving Club Project
- S1-4-2 Community Road Safety Culture Building Project
- S1-4-3 Severe and Repeated Violators Training Project

S1-2 Proper Training Program comprises 4 projects:
- S1-2-1 Traffic Simulation Town Promoting Safety Conscience Project
- S1-2-2 Enhancing Motorcycle Riding Skill Project
- S1-2-3 Enhancing Safety Skills for Buses, Trucks and Hazardous Material Transport Project
- S1-2-4 Motorcycle Training Track and Trainer Development Project

S1-3 Proper Attitude Program comprises 2 projects:
- S1-3-1 Media Production for Road Safety Attitude Improvement Project.
- S1-3-2 Government and Private Agency Cooperation to Raise Public Road Safety Awareness Project

S1-4 Proper Attitude Program comprises 3 projects:
- S1-4-1 School Safe Driving Club Project
- S1-4-2 Community Road Safety Culture Building Project
- S1-4-3 Severe and Repeated Violators Training Project

S2: 2nd Strategy: Promote Safety System consisting of 4 strategic programs and 23 projects as follows:

S2-1 Safe Road User Program comprises 9 projects:
- S2-1-1 Drivers’ License Training Curriculum Development Project
- S2-1-2 Driving Trainer Certification Project
- S2-1-3 Driving School Certification Project
- S2-1-4 Driving Simulator Provision Project
- S2-1-5 Private Driving Trainer Training for Drivers’ License Extension Course Project
- S2-1-6 DLT Certified School Inspection Project
- S2-1-7 A Study of Safety Qualifications for Seniors and Those with Chronic Health Conditions Project
- S2-1-8 E-exam Development for DLT Certified Driving School Project
- S2-1-9 High-Level Safe Driving Curriculum Development Project

S2-2 Safe Vehicle Program comprises 7 projects:
- S2-2-1 Readiness Evaluation and Priority for Improving Vehicle Safety Towards International Standards Project
- S2-2-2 Vehicle Inspection Age and Proper Charge Rates for Safe Operation Project
S2-2-3 Integrated Inspection Facilities Regulation Measures with Safety Focus Project
S2-2-4 Electric Automotive Announcement Draft for Safe Operation Project
S2-2-5 Hazardous Material Transport Safety Management Specifications Project
S2-2-6 Safety Criteria and Regulations for International Vehicle Use in the Kingdom Project
S2-2-7 Mobile Inspection Unit Efficiency Enhancement for Accident Prevention and Reduction Project

S2-3 Safe Speed Program comprises 1 project:
S2-3-1 Regulation Improvement to Regulate, Control and Oversee Vehicles Speeds Using Innovation and Technology Project

S2-4 Safe Public and Freight Transportation System Program comprises 6 projects:
S2-4-1 Freight Transport Operation Improvement with Safety Standard Project
S2-4-2 Passenger Transport Operation Improvement with Safety Standard Project
S2-4-3 Passenger Transport Service and Safety Quality Specifications (Q-mark) Project
S2-4-4 Freight Transport Service and Safety Quality Specifications (Q-mark) Project
S2-4-5 Hazardous Material Transport Service and Safety Quality Specifications (Q-mark) Project
S2-4-6 Safe School Vehicle Promotion Project

S3: 3rd Strategy: Develop Safety Management consisting of 3 strategic programs and 17 projects as follows:

S3-1 Land Transport Control Center Program comprises 4 projects:
S3-1-1 GPS Transport Operation and Management Enhancement Project
S3-1-2 Land Transport Control Center Formation Project
S3-1-3 DLT Integrated Road Safety Unit Formation Project
S3-1-4 Road Accident Data Exchange Gateway Development Project

S3-2 Innovation and Technology Program comprises 8 projects:
S3-2-1 Active Freight Vehicle Monitoring and Control System Development Project
S3-2-2 Active Passenger Vehicle Monitoring and Control System Development Project
S3-2-3 Freight Vehicle Incident Forensic System Development Project
S3-2-4 Passenger Vehicle Incident Forensic System Development Project
S3-2-5 Freight Vehicle Driving Safety Assessment System Development Project
S3-2-6 Passenger Vehicle Driving Safety Assessment System Development Project
S3-2-7 DLT Transport Safety Statistics System Development Project
S3-2-8 Traffic Control and Road Safety Efficiency Enhancement with Automatic License Plate Reading Information Technology Project

S3-3 Professional Staff Program comprises 5 projects:
S3-3-1 In-Depth Accident Analysis Project
S3-3-2 DLT Staff Safety Training Project
Executive Summary Report

Chapter 6 Road Safety Action Plan

S3-3-3 Safety Study Visit for Sustainable Accident Control and Reduction Project
S3-3-4 Road Safety Budget Provision Project
S3-3-5 Motorcycle Accident Study and Analysis

All projects under the plan, considering only additionally proposed ones by the consultant or proposed from the seminars, can be classified into 9 groups. The consultant has prioritized and urgency for undertaking to achieve the set goals with details as follows:

Group 1: Operation management by GPS and other safety devices
From public vehicle accident severity problems and lack of data for controlling, regulating, and overseeing road safety, the 1st project group emphasizes on applying modern innovation and technology to control, regulate and oversee road safety focusing on the main target group which is public vehicles such as public vans, public bus and non-fixed route bus, and all types of freight vehicles.

The projects in this group include:
- S3-1-1 GPS Transport Operation and Management Enhancement Project
- S3-1-4 Road Accident Data Exchange Gateway Development Project
- S3-2-1 Active Freight Vehicle Monitoring and Control System Development Project
- S3-2-2 Active Passenger Vehicle Monitoring and Control System Development Project
- S3-2-3 Freight Vehicle Incident Forensic System Development Project
- S3-2-4 Passenger Vehicle Incident Forensic System Development Project
- S3-2-5 Freight Vehicle Driving Safety Assessment System Development Project
- S3-2-6 Passenger Vehicle Driving Safety Assessment System Development Project
- S3-2-7 DLT Transport Safety Statistics System Development Project
- S3-2-8 Traffic Control and Road Safety Efficiency Enhancement with Automatic License Plate Reading Information Technology Project

Group 2: Drivers’ license system development
This is the project group under strategies 1 and 2, by increasing comprehension on drivers’ license application from processes before and between applying, and after receiving the license. Projects in this group will help drivers’ license holders gain knowledge and understanding with safe driving skills, and feel proud of passing the test and owning the license. This covers all types of vehicles such as big bike, rescue/emergency vehicles and hazardous material vehicles.

After receiving the license, if the driver behaves inappropriately, for example point reduction from traffic law violation or causing accidents, the license will be suspended, or canceled, or permanently revoked.

The projects in this group include:
- S2-1-1 Drivers’ License Training Curriculum Development Project
- S2-1-2 Driving Trainer Certification Project
- S2-1-3 Driving School Certification Project
S2-1-4 Driving Simulator Provision Project
S2-1-5 Private Driving Trainer Training for Drivers’ License Extension Course Project

S2-1-6 DLT Certified School Inspection Project
S2-1-7 A Study of Safety Qualifications for Seniors and Those with Chronic Health Conditions Project
S2-1-8 E-exam Development for DLT Certified Driving School Project
S2-1-9 High-Level Safe Driving Curriculum Development Project

Group 3: Road safety unit formation
Road safety operation is the main mission with high importance and require continuous action. Driving road safety strategy, programs/projects to achieve goals requires DLT to set up office-level unit to assume full responsibility. This operation should follow the ensuing guidelines: 1) reorganization to combine DLT’s road safety related units and set up an integrated road safety division with main mission in strategy management, run road safety activities for the data center and connect strategic goals with effective and productive performance, and monitoring and evaluation, and 2) recruit more staff to operate according to programs/projects, considering personnel specifications suitable for each position and workload so that road safety operation can be run effectively.

Projects in this group include:
- S3-1-3 DLT Integrated Road Safety Unit Formation Project
- S3-3-1 In-Depth Accident Analysis Project

Group 4: Improving vehicle specifications to international standard
This project group consists of projects which aim to obtain “safe vehicles”. The implementation involves regulations specifying minimum vehicle standard in line with UNECE standard as planned. Vehicles on the road should meet this international standard, and shall improve time to inspect and vehicle age limit. DLT will develop vehicle inspection system to meet the set standard, and connect to database from private inspection facilities.

Projects in this group include:
- S2-2-1 Readiness Evaluation and Priority for Improving Vehicle Safety Towards International Standards Project
- S2-2-2 Vehicle Inspection Age and Proper Charge Rates for Safe Operation Project
- S2-2-3 Integrated Inspection Facilities Regulation Measures with Safety Focus Project
- S2-2-4 Electric Automotive Announcement Draft for Safe Operation Project
- S2-2-5 Hazardous Material Transport Safety Management Specifications Project
- S2-2-7 Mobile Inspection Unit Efficiency Enhancement for Accident Prevention and Reduction Project
- S2-4-6 Safe School Vehicle Promotion Project

Group 5: Budget provision for road safety activities
Budget provision and allocation to support road safety programs/projects is an important factor that directly affect goal achievement. Implementations of road safety strategic plan, master plan and action plan are considered very important and urgent. This requires a large amount of budget, especially at the onset of the implementation (first 5 years). Nonetheless, due to many limitations, the consultant proposes an approach to budget provision for road safety implementation by improving the regulations so that DLT has the budget to implement according to the set goals.

Projects in this group include:

S3-3-4 Road Safety Budget Provision Project

Group 6: Road safety personnel development

This involves skill and expertise enhancement, both in technical and managerial aspects, to promote staff to continually develop knowledge and be able to carry out road safety tasks which will increase in the future.

Projects in this group include:

S3-3-2 DLT Staff Safety Training Project
S3-3-3 Safety Study Visit for Sustainable Accident Control and Reduction Project
S3-3-5 Motorcycle Accident Study and Analysis

Group 7: Regulating, controlling and overseeing international drivers and vehicles traveling into the Kingdom

As free trade zones are opening to many countries around Thailand, coupled with an increase of international tourists that rent and drive in Thailand, road accident problems due to international drivers have increased significantly. Regulating, controlling, and overseeing international drivers and vehicles traveling into the Kingdom is a part which will help reduce accidents.

Project in this group include:

S2-2-6 Safety Criteria and Regulations for International Vehicle Use in the Kingdom Project

Group 8: Campaign and public relation to create knowledge, skills, attitude that change road use behavior.

This project group involves activities that reduce accidents by focusing on continually transfer road safety knowledge starting from youths/students and motorcycle riders through all types of medias. Medias mostly show loss from accidents and social responsibility so that public understands and is aware of loss from accidents. In addition, this project group also emphasizes on driving skill enhancement and to handle situations appropriately under emergency circumstances.

Projects in this group include:

S1-1-1 Public Relation for Road Safety Project
S1-1-2 Implanting Youth’s Traffic Discipline Project
S1-1-3  Implanting Youth’s Safety Culture in School Project
S1-1-4  Safe Motorcycle Driving under Traffic Laws Project
S1-1-5  Promote Safe Road Use Knowledge through Radio Stations Project
S1-1-6  Road Accident Prevention and Reduction Campaign Project
S1-2-1  Traffic Simulation Town Promoting Safety Conscience Project
S1-2-2  Enhancing Motorcycle Riding Skill Project
S1-2-3  Enhancing Safety Skills for Buses, Trucks and Hazardous Material Transport Project
S1-2-4  Motorcycle Training Track and Trainer Development Project
S1-3-1  Media Production for Road Safety Attitude Improvement Project.
S1-3-2  Government and Private Agency Cooperation to Raise Public Road Safety Awareness Project
S1-4-1  School Safe Driving Club Project
S1-4-2  Community Road Safety Culture Building Project
S1-4-3  Severe and Repeated Violators Training Project

Group 9: Freight and passenger transport operator service and safety improvement. This group focuses on promoting and supporting operators to safe transport in terms of standard and quality by raising the standard. It involves using modern technology to regulate, oversee and specify quality criteria such as driver age, vehicle age, structure, instrument and safety equipment, and improving vehicle inspection system at an appropriate cycle. It also emphasizes responsible to society when accidents occur. Projects in this group include:

S2-4-1  Freight Transport Operation Improvement with Safety Standard Project
S2-4-2  Passenger Transport Operation Improvement with Safety Standard Project
S2-4-3  Passenger Transport Service and Safety Quality Specifications (Q-mark) Project
S2-4-4  Freight Transport Service and Safety Quality Specifications (Q-mark) Project
S2-4-5  Hazardous Material Transport Service and Safety Quality Specifications (Q-mark) Project

To achieve the goal of 50% road accident reduction by 2020, the consultant prepares project sheets for each strategy with details shown in the final report.
Chapter 7
Implementation and Key Success Factors

- Implementation Approach
- Keys to Success

7.1 Implementation Approach

7.1.1 Plan Concept and Goal Transfer

To achieve the strategic goals, it is important to transfer the plan concept and main goals from the policy-level to the practitioners so that all sectors are on the same page. Road safety operation requires time to change. DLT internal divisions should be committed and patient in cooperation among one another. Concept and goal transfer builds organization attitude and culture which gives priority to and understand goals of road safety. The organization will be driven effectively into the desired direction.

7.1.2 DLT Integrated Road Safety Unit Formation

Road safety is the key mission with high importance that requires continual implementation. Driving road safety strategy and programs/projects to achieve the goals calls for DLT to form an office-level unit to take direct responsibility. The process consists of the following approach:

1) Reorganization to collect all DLT’s divisions relating to road safety and form an integrated road safety unit. The key mission includes strategy management and carry out safety activities of the established data center which will connect strategic goals to the resulting and productive operations and monitoring and evaluation.

2) Recruiting additional staff to carry out programs/projects needs consideration on appropriate qualifications for each position and workload so that road safety activities are performed effectively.
7.1.3 Monitoring and Evaluation

To achieve the set goals, action plans need to be monitored and evaluated. In addition, activity formats should also be assessed at all time. Flexibility is needed so that the plans are ready to be improved in each stage resulting from problems arising with changing circumstances. This may affect operation approach and goals. Programs/projects implemented in the past, no matter if they are successful or not, are worthwhile as they enhance knowledge and experience which will be used to improve future operation.

Project effectiveness monitoring process is divided into 3 stages. The first is from the start of the fiscal year (pre-evaluation) to set up monitoring and evaluation framework on projects for which budgets are under consideration. The next stage moves into monitoring and evaluation according to indices set against the projects approved during fiscal year (ongoing process). The last stage of the monitoring and evaluation system is to evaluate implementation of the projects during the close of fiscal year (post-evaluation). After the 3 stages, project data under responsibility of the agency will be archived for improving monitoring and evaluation system along with the strategic plan later.

7.1.4 Knowledge and Skill Enhancement

Staff knowledge and skill enhancement, in specific technical aspect and management process, to promote staff to improve knowledge continually and to work efficiently on safety missions which will increase in the future.

7.1.5 Resource Allocation

Resource allocation to support programs/projects is a major factor affecting ability to achieve the goals. Implementations of road safety strategic plan, master plan and action plan are considered very important and urgent. This requires a large amount of resources in implementation especially at the onset of the project (the first 5 years). Nonetheless due to many limitations DLT should consider resource allocation, both personnel and budget, to maximize efficiency.
7.2  Keys to Success

Road traffic accident is a chronic problem resulting from individual road user behavior that roots deep and is difficult to change in a short period. Public lacks understanding and knowledge, disregarding importance of road accident problem because it appears to be irrelevant or it is caused by fate. Success of the programs/projects must consider the following factors.

1) **Social supporting force and Thai positive value on road safety (Road Safety First)**. This focuses on public participation to accept stricter rules in the future. It includes building safety culture, knowledge, understanding and awareness to all public groups. The implementation should underline impact to a broad society and continuity.

2) **Drive on comprehensive and continual regulation and legal measures enforcement**. This focuses on “motorcycles” and “speeding” applying innovation and technology as main tools to implementation to achieve better efficiency.

3) **Road safety associated network cooperation**. Road safety undertaking involves many sectors. Cooperation between DLT and other associations is the key factor to drive programs/projects to success and achieve the goals.

4) **Continuous regulation and monitoring**. Lessons are learned from implementation and used to improved action plans continuously. Road safety implementation shall correspond to present situation and future trend.