

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
NATIONAL TRAFFIC SAFETY COMMITTEE (NTSC), VIETNAM

THE STUDY ON
NATIONAL ROAD TRAFFIC SAFETY MASTER PLAN
IN THE SOCIALIST REPUBLIC OF VIETNAM UNTIL 2020

FINAL REPORT

VOLUME 2: MASTER PLAN AND ACTION PROGRAM

March 2009

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PREFACE

In response to the request from the Government of the Socialist Republic of Vietnam, the Government of Japan decided to conduct “The Study on National Road Traffic Safety Master Plan in Vietnam” and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA dispatched a study team headed by Mr. TAKAGI Michimasa of ALMEC Corporation, during the period from July 2007 to March 2009. The study team conducted the study with the Vietnamese counterpart team and held a series of discussions with the officials concerned of the Government of Vietnam. After the team returned to Japan, further studies were made and then the report was finally completed.

I hope that this report will contribute to the improvement of traffic safety measures and reduction of traffic accident in Vietnam.

I wish to express my sincere appreciation to the officials concerned of the Government of Vietnam for their close cooperation extended to the study team.

March 2009

TSUNO Motonori
Chief Representative of Vietnam Office
Japan International Cooperation Agency

March 2009

Mr. TSUNO Motonori

Chief Representative

Japan International Cooperation Agency

Vietnam Office

LETTER OF TRANSMITTAL

Dear Sir,

We are pleased to formally submit herewith the final report of the Study on National Road Traffic Safety Master Plan in the Socialist Republic of Vietnam.

This report compiles the result of the study which was undertaken both in Vietnam and Japan from July 2007 to March 2009 by the Team, organized by ALMEC Corporation and Nippon Koei Co., Ltd.

We owe a lot to many people for the accomplishment of this report. First, we would like to express our sincere appreciation and deep gratitude to all those who extended their extensive assistance and cooperation to the Team, in particular the National Traffic Safety Committee in Vietnam.

We also acknowledge the officials of your agency and National Police Agency as well as Ministry of Foreign Affairs for their support and valuable advice in the course of the Study.

We wish the report would contribute to the promotion and sustainable development of road traffic safety in Vietnam.

Very truly yours,

TAKAGI Michimasa

Team Leader

The Study on National Road Traffic Safety Master Plan
in the Socialist Republic of Vietnam

**NATIONAL ROAD TRAFFIC SAFETY MASTER PLAN
IN THE SOCIALIST REPUBLIC OF VIETNAM UNTIL 2020
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ABBREVIATION

ADB	Asia Development Bank
ASEAN	Association of South East Asian Nations
CSR	Corporate Social Responsibility
D/D	Detailed Design
DOT	Department of Transport
EIRR	Economic Internal Rate of Return
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
FDI	Foreign Direct Investment
F/S	Feasibility Study
GDP	Gross Domestic Product
GOV	Government of Vietnam
GRSP	Global Road Safety Project
GTZ	German Technical Cooperation
HAIDEP	Hanoi Integrated Development and Environmental Program
HCMC	Ho Chi Minh City
ITS	Intelligent Transport System
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
M/C	Motorcycle
MIC	Ministry of Information and Communications
MOCI	Ministry of Culture and Information
MOET	Ministry of Education and Training
MOF	Ministry of Finance
MOH	Ministry of Health
MOJ	Ministry of Justice
MOPS	Ministry of Public Security
MOT	Ministry of Transport
NGOs	Non Governmental Organizations
NH	National Highway
NRADS	National Road Accident Data System
NTSA	National Traffic Safety Authority
NTSC	National Traffic Safety Committee
ODA	Official Development Assistance
OJT	On-the-Job Training
PDOT	Provincial Department of Transport
PTSC	Provincial Traffic Safety Committee
R&D	Research and Development

RRMU	Regional Road Management Unit
RSA	Road Safety Audit
RSMS	Road Safety Management System
SAPROF	Special Assistance for Project Formation
SIDA	Swedish International Development Cooperation Agency
TA	Traffic Accident
TDSI	Traffic Development and Strategy Institute
TDM	Traffic Demand Management
TRAHUD	Traffic Safety Human Resource Development Project in Hanoi
TS	Traffic Safety
TSA	Traffic Safety Audit
TSC	Traffic Safety Committee
TSPMU	Traffic Safety Project Management Unit
TUPWS	Transportation and Urban Public Works Services
UNICEF	United Nations Children's Emergency Fund
USD	United States Dollar
VITRANSS	Vietnam National Transport Development Study
VND	Vietnamese Dong
VR	Vietnam Register
VRA	Vietnam Road Administration
VRSP	Vietnam Road Safety Project
WB	World Bank
WG	Working Group
WHO	World Health Organization
WTO	World Trade Organization

PART I

NATIONAL TRAFFIC SAFETY MASTER PLAN 2020

1 INTRODUCTION

1.1 Outline of the Master Plan

This is the first road traffic safety master plan for Vietnam covering the period until year 2020. The action program (year 2008 to 2012) which accompanies this master plan is also the first ever 5-year road traffic safety program in the country. The master plan and action program shall be periodically reviewed and updated as a rolling plan of the national government. Being the first master plan, it will include fundamental policies such as basic principles and goals for sustainable traffic safety development in Vietnam.

Objective of the master plan study is to formulate strategies which can reduce the number of road traffic accidents and develop desirable living environment. Road traffic accidents are caused by various factors such as inadequate road facilities, defective vehicles, and at present, mostly due to human errors. It is justifiable to assume that as rate of motorization continuously increase, road traffic accidents would highly likely occur. And the causes of traffic accident are bound to change depending on socio-economic situations. Thus, long-term planning is of utmost importance and makes it necessary that during this master planning exercise, the following two areas are properly addressed:

- 1) Development of countermeasures that can alleviate road traffic accidents at present as well as in anticipation of the highly- motorized traffic society in the future.
- 2) Development of institutional fundamentals for the sustainable development of traffic safety policy and measures.

The first refers to the detailed strategies which can help at least alleviate, if not completely eradicate, current serious traffic accident situation while the second refers to the necessary organizations, systems and laws/regulations for an effective and sustainable implementation of traffic safety policies.

As already mentioned, the varying levels of economic development as well as social conditions in the urban and rural areas (e.g. regional and income level disparities, road density, etc.) significantly affect the traffic safety situation across the country. This Traffic Safety Master Plan has taken into consideration these factors and has formulated appropriate measures, particularly for the rural areas located along the major traffic corridors. Thus, although this is a national master plan, regional features were considered carefully which allows the master plan to be an adequate guideline for regional or provincial traffic safety development.

The overall targets will be divided by sector, and milestones will be set to monitor achievement of targets of the 5-year action program. The numeric targets were set as a common target among concerned organizations and are developed to be practical, attainable and sustainable.

1.2 Master Plan Development Approach

In order to implement a comprehensive traffic safety program, cooperation and coordination among the relevant concerned agencies will be very indispensable (i.e. between central ministries, between central and local government agencies, as well as between government agencies, NGOs and private companies) to ensure institutional strengthening for road traffic safety. Moreover, a strong leadership from the National Traffic Safety Committee will be very critical.

Figure 1.2.1 illustrates the master plan development process. The first step is the identification of current problems and issues based on the results of the survey, collected data and information from relevant agencies, as well as discussions with the responsible organizations. The problem and issues identified here are not only limited to the existing ones, but also include emerging problems and issues due to the anticipated continuing economic development and rapid rate of motorization until 2020. This has been already discussed in Volume 2 (Analysis) of this Report.

The second step is the formulation of the basic framework of the master plan, which includes basic principles, development policies and strategies, etc. These basic elements will outline the government agencies' platform on how to build a consensus for the national social development policy. In addition, this will be the basis in promoting a comprehensive traffic safety program consisted of the 4Es of Engineering, Enforcement, Education, and (Medical) Emergency.

As mentioned in the previous subsection, there are two significant areas worth mentioning again in connection with this master plan development: the formulation of possible countermeasures to reduce the number of traffic accidents and/or number of fatalities and the evaluation of concerned institutions' capability to ensure effective and sustainable implementation of the proposed countermeasures.

An overall national target and subsector targets on traffic accident reduction shall therefore be established. To achieve these set targets, possible alternative strategies will be developed, evaluated and finalized to come up with the most feasible option. While comparative and objective evaluation will be more enviable in the final selection of strategies, this may be based on majority decision due to study constraints in pursuing an extensive scientific analysis.

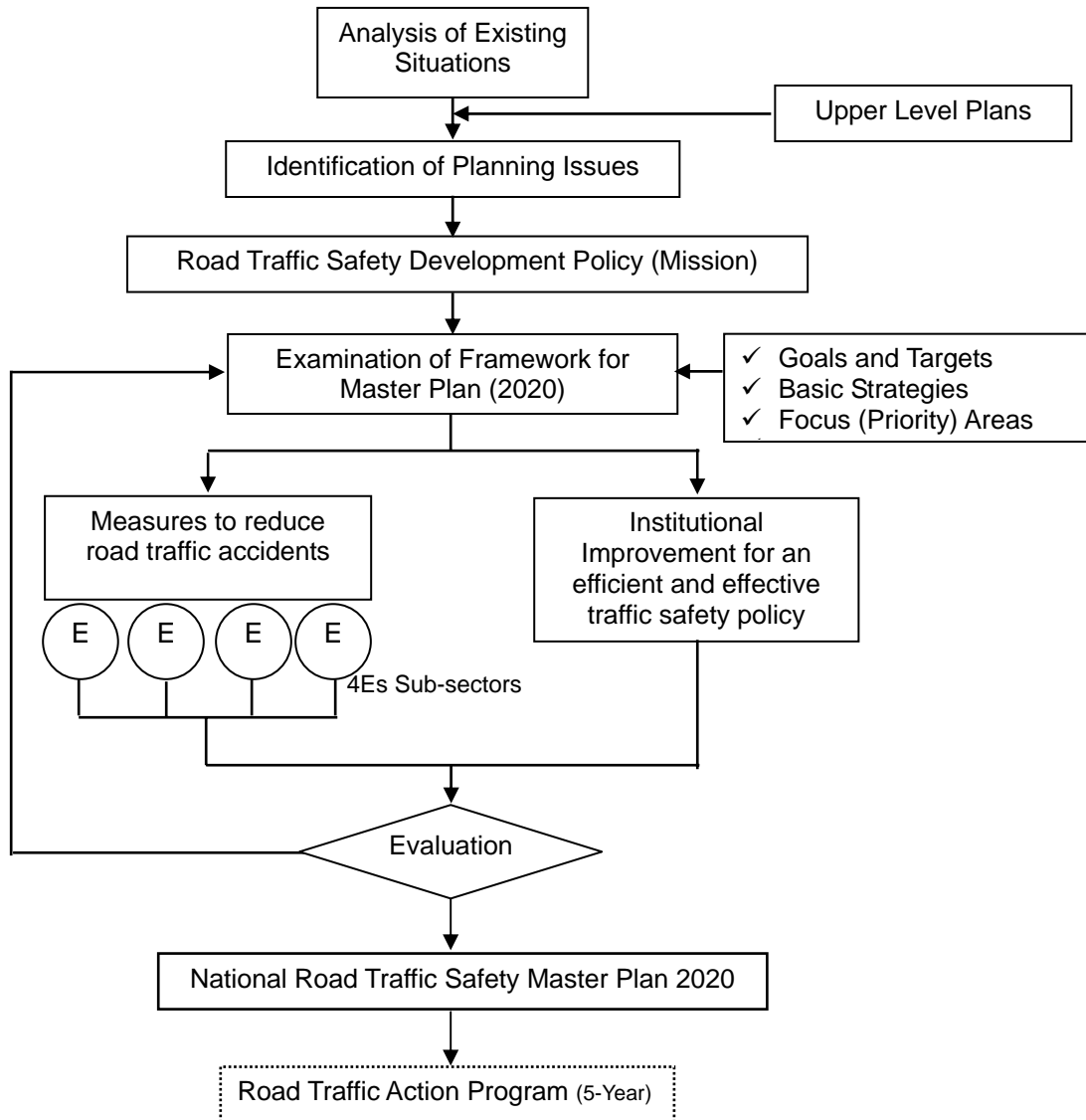
While a numeric target will be more effective and easier to monitor in terms of progress of implementation, this may not be applicable to some proposed measures which will require qualitative indicators and measures. Even so, more objective target shall be examined for the respective measures. It is also important to establish a road map towards target achievement, with indicated milestones for appropriate monitoring guidance.

However, even if effective strategies and countermeasures are developed, realization of expected impacts will still highly depend on the implementation. Thus, one proposed countermeasure may be effective in some areas but may not be as effective in other areas. This may be due to several factors: capability of the responsible organization, level of awareness of the people in the area, or may also be due to lack of coordination among the responsible agencies, etc. Therefore, institutional capability and effective

systems and management will be very important in ensuring the realization of expected impacts from the proposed measures.

Magnitude of the proposed investment will be evaluated in terms of the socio economic cost effectiveness derived from the reduction of the traffic accident. However, while some of the impacts cannot be quantified and can only be evaluated qualitatively, appropriate assumptions and hypothesis will be established to guide in the impact evaluation and assessment.

Figure 1.2.1 Master Plan Development Approach



Source: JICA Study Team.

2 FRAMEWORK DEVELOPMENT FOR THE NATIONAL ROAD TRAFFIC SAFETY MASTER PLAN

This chapter will discuss the mission, goals/targets and the basic strategies, as well as the focus areas which are the guidelines during the Master Plan development. Traffic safety measures cover a wider range of sectors, fields and areas; from small children to elderly people; various types of road users, from motorcycle riders to pedestrians, among others. This framework was the platform which guided the development of an effective and efficient comprehensive traffic safety Master Plan.

2.1 Formulation of Mission Statement for Road Traffic Safety

Road traffic safety has now become a national issue which requires a long-term plan to ensure smooth and sound economic development of Vietnam. It is therefore necessary to institutionalize a national traffic safety rolling plan in coordination with other existing government plans such as the National Economic Development Plan, the Industrial Development Plan, etc., among others.

The basic principle that will be discussed here is expected to be the theme applied for Vietnam's Traffic Safety Policy Development. In other countries, catchy phrases describe their respective traffic safety policies such as "Achieving a Society with No Traffic Accidents", "Zero Traffic Death and Zero Disabling Injuries", etc.

Most countries apply very optimistic vision or mission, at times almost bordering to impossibility. However, they understand that even if set mission targets will be almost impossible to achieve, the policy should express the most desirable situation to be able to highly motivate the concerned organizations.

In the case of Vietnam, the appropriate mission that should be inspiring and understandable for the Vietnamese people will be confirmed by the Government of Vietnam. This Master Plan study recommends that the mission statement adopted by the Government of Vietnam for road traffic safety is "A Kindhearted, Traffic Accident-Free Society".

2.2 Establishment of Goals and Target of Master Plan

In the formulation of the goal and target of the master plan and its action program, there are some differing opinions on whether these should be expressed quantitatively or qualitatively. Favoring qualitative goals and targets is based on the fact that data and information are not adequate and accurate to establish reliable numerical target. Or even if a numerical target can be established, rapidly changing economy easily makes this target obsolete or not enough to address the present situation. Qualitative targets may also present the problem of different interpretations, thus making it hard to establish a common and understandable target among concerned agencies. Subsequently, qualitative target or goal will be suitable for long term plan and a more realistic qualitative target will be applied for the short term plan, such as 5-year action program.

However, in order to show a stronger mission statement for this master plan, a numerical target, even if reliability is not so high, will be proposed so that socio-economic benefit derived from the measures can be estimated and evaluated in the proposed policies. At the same time, qualitative target for institutional issues will also be examined.

The following two targets will be proposed for the road traffic safety master plan:

- (i) To reduce the number of fatalities into half (based on 2007 figures) or to reduce fatality rate per 100,000 population into less than 6.4%.
- (ii) To strengthen the capability and functions of the organizations involved in road traffic safety and to develop new organizations and rules/regulations necessary to ensure sustainability of traffic safety measures.

The following discussion shows how the numerical target is derived.

Implementation of the Master Plan should ensure that *by 2020, traffic accidents will cease to be a serious and crucial social concern*. This can be validated by the reduction of absolute number of fatalities by 50% in 2020.

A careful analysis shows that this target corresponds to three other equivalences:

- the fatalities rate per 100,000 population less than 6.4%;
- the fatalities rate per 10,000 vehicles is less than 1.2-1.8%
- a reduction of 5.2% in traffic accidents per year against previous year, in terms of the absolute number of fatalities.

- (i) *So what does “fatalities rate per 100,000 population is less than 6.4%” mean?*

A comparison with related data in 2006 of various countries of the World (Table 2.2.1), shows that the value 6.4 is at present acceptable in the cases of Japan, Germany and Iceland, while other countries are trying to reach this target as well.

Table 2.2.1 Fatalities Rate per 100,000 Population in 2006 in Various Countries

	Country	f		Country	f		Country	f
1	Singapore	4.2	11	Finland	7.2	21	Luxembourg	11.1
2	Netherlands	4.6	12	Australia	8	22	Portugal	11.8
3	Norway	4.9	13	France	8.8	23	Czech Rep.	12.6
4	Sweden	4.9	14	Canada	9.1	24	Hungary	12.7
5	Great Britain	5.5	15	Austria	9.3	25	Slovenia	12.9
6	Switzerland	5.5	16	Ireland	9.3	26	Korea	13.2
7	Denmark	6.1	17	Italy	9.7	27	Poland	14.3
8	Japan	6.2	18	New Zealand	9.9	28	USA	14.7
9	Germany	6.5	19	Spain	10.2	29	Greece	15
10	Iceland	6.5	20	Belgium	10.4		Vietnam	15.16

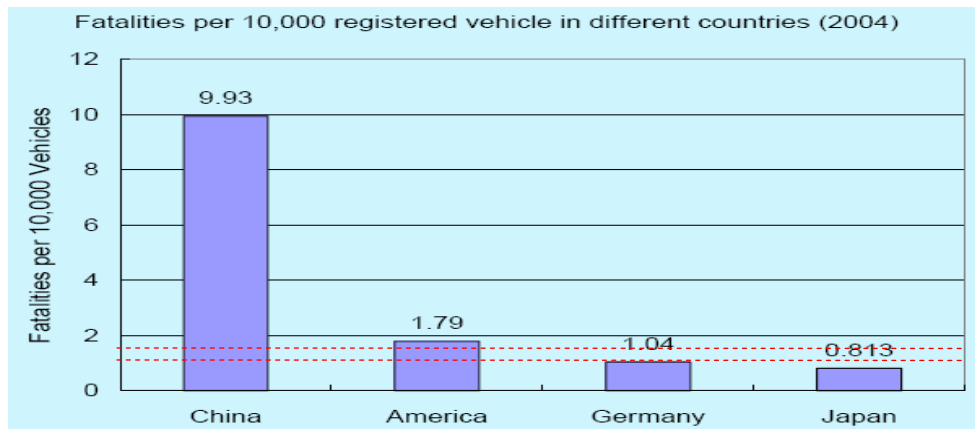
Source: IRTAD, 2007

- (ii) *What do fatalities rate per 10,000 vehicles is less than 1.2-1.8% mean?*

Another comparison with other countries as shown in Figure 2.2.1 shows the

meaning of these values. It is evident that other countries in the ASEAN as Laos and Cambodia have set their targets to limit to 2% as shown in the Figure 2.2.2.

Figure 2.2.1 Rate of Fatalities per 10,000 Vehicles in Different Countries (2004)



----- Case of Vietnam as proposed

Source: Wang Hongyan - Analysis on Traffic Accidents Obstructing the Sustainable Development of Chinese Traffic, Tongji University, Shanghai, Sep 2007

Figure 2.2.2 Target Reduction in Number of Fatalities per 10,000 Vehicles in Lao PDR and Cambodia

<p>LAOS: the Road Safety Strategy (with support from ADB and SIDA)</p> <ul style="list-style-type: none"> • 8% by 2010 • 5% by 2015 and • 2% by 2020 <p>CAMBODIA: to reduce from 18 in 2006 to</p> <ul style="list-style-type: none"> • 7% by 2010 • 2% by 2020
--

Source: UN ESCAP Report E/ESCAP/CMG(4/I)/7, July 2007

(iii) *Annual reduction rate of fatalities at 5.2% conforms with target of new schemes of the Government*

On 4 March 2008, the Government has approved a Scheme to Ensure Traffic Safety until 2010 with a target to reduce traffic accidents by 5-7% per year against previous year in terms of all three indicators: number of accidents, fatalities and injuries. Another scheme of MOPS for Enhancement and Modernization of Traffic Patrol, Checking and Violation Treatment Tasks up to 2010 sets the target at 5%. Thus, the 5.2% rate is consistent.

2.3 Basic Strategies for the Traffic Safety Measures in the Master Plan

Motorization in Vietnam is expected to further accelerate in line with the flourishing economic development in the country. Accordingly, however, high risk road traffic accidents alarmingly increase as well and are now regarded as a national social concern, not only in the urban areas but also in the rural areas.

Basic policies for road traffic safety development are discussed above as a foundation of the master plan. Basic strategies discussed hereon are basic consideration to formulate safety measures on common foundation toward 2020. In other words, these

will be the strategies or basic approaches to achieve the goals by the year 2020. The strategies will be guidelines for the safety measures of each sub-sector.

Basic strategies will be discussed in two areas, Basic Planning Policies and Implementation Strategies.

1) Basic Planning Policies

- (1) Covering the three elements of Person, Vehicle and Road Traffic Environment, six (6) measure areas are identified for implementation of effective and efficient traffic safety measures.
 - (i) Development of Safe Road Traffic Environment
 - (ii) Enhancement of Safe Driving
 - (iii) Ensuring Safety in Vehicles
 - (iv) Effective and Efficient Traffic Control and Enforcement
 - (v) Enhancement of Traffic Safety Education and Propaganda
 - (vi) Development of Post-Accident Countermeasures
- (2) For sustainable traffic safety development, all necessary institutions and database shall be established within this master plan period, including establishment of new laws and regulations and database for scientific analysis, and minimum organizational setup for handling those activities.
- (3) How to ensure sustainable human and financial resource development is another critical issue that should be closely considered. During this master plan period, systematic collaboration with higher education institutions such as universities and other academic organizations are established including a post graduate training system. At the same time, responsible organizations in government shall establish necessary units/departments/ committees for traffic safety development in their respective organizations.

For financial resource development, a new mechanism with private sector involvement was examined during this master plan period.

It is also important to fully and effectively utilize ODA projects such as Hanoi Traffic Safety Human Resource Development Project (JICA), Vietnam Road Safety Project (WB), Injury Prevention Project (WHO), Northern Region Trunk Road Traffic Safety Project (JBIC), among others.

2) Implementation Strategies

- a) In order to promote comprehensive traffic safety measures, the appropriate environment and mechanisms shall be enhanced and developed, which can be referred to as the 4Cs (communication, cooperation, collaboration, and coordination) among traffic safety stakeholders. Periodic communication and knowledge sharing activities among the agencies were the initial activities.
- b) Introduction of new policies for the development of a Traffic Safety Culture in Vietnam in order to achieve sustainable changes in the peoples' present unsafe driving behaviors. Given the widening regional differences due to economic development and rate of motorization, appropriate measures are introduced in

accordance with the living environment and standards of each respective regions or provinces.

- c) There has been remarkable technology development in the automobile industry which has expanded in the developed countries such as Intelligent Transportation Systems (ITS), safety vehicles and advanced equipment for enforcement, supporting system to minimize human errors, etc. However, acquisition, operation and maintenance of such systems require massive investment, aside from the required additional highly-skilled manpower. For this master plan period, priority will instead be given to human resource development rather than on investing on these advanced technologies. However, introduction of the practical and reasonable advanced technology for Vietnam shall be periodically enhanced and upgraded.

2.4 Focus Areas for the Achievement of the Master Plan's Targets

Basic strategies discussed so far are directed towards 2020. This section will now focus on responses to Basic Planning Policy No. 1 and the major issues affecting the eight (8) focus areas will be examined. Table 2.4.1 shows key understanding on the current traffic accidents obtained from the examination of the current conditions discussed in Volume 2 of this Final Report. Justification for these key understandings, however, is not adequate mainly because of lack of detailed traffic accident data and its analysis. Even so, these key understandings may not be far from the actual conditions. While lack of accurate data and analyses may be a cause for inefficiency of the measures, this may be compensated by appropriate monitoring and evaluation.

In the previous subsection, basic strategies and overall focus areas have been discussed and proposed. As a next step, focus measures for the reduction of the traffic accident and fatalities were examined based on the key understandings. Focus was given on the following six (6) areas:

- (i) Motorcycle Accident

More than 80% of total accident involves the motorcycle. Thus, comprehensive countermeasures, from the improvement of the licensing system up to engineering measures such as lane separation, were examined.

- (ii) Black-spot and Black-section on National Highways

A significantly high number of serious traffic accidents have occurred on National Highways, not only in the unimproved sections, but also along upgraded sections. Thus, proposed countermeasures include both enforcement and education programs.

Table 2.4.1 Key Understandings on the Current Traffic Accident Environment

Causes of Traffic Accident
Speeding, lane violation, reckless overtaking and drunk-driving
Lack of awareness on safe driving
Disregard for traffic rules and regulations
Overloading and reckless driving of professional driver and lack of driver management in transport companies
Illegal occupation of and encroachment into road safety corridors
Inexperience of participants in the new motorized society
Insufficient attention to the vulnerable road users
Types of Traffic Accident
Between Motorcycle and Motorcycle (20%)
Automobiles and Motorcycle (20%)
Involving Bicycles (20%)
Areas where many traffic accidents occur
Number of traffic accidents in urban areas higher than other areas
In the rural areas, many serious accidents occur on the national roads/highways
Tendency for many accidents to occur on the newly- opened highways
Implementation Issues
Lack of collaboration among the organizations involved
Lack of planning based on scientific analyses
Newly emerging issues that cause traffic accidents
Increase in the number of automobiles and trucks (4-wheel vehicle era)
Expansion of motorization to rural areas
Acceleration of high-speed society because of expressway network and high specs of vehicles

Source: JICA Study Team

(iii) Traffic accidents and Congestion in the urban areas

Rapid motorization results to complicated traffic situations due to lack of peoples' awareness on traffic rules and regulations which subsequently cause a lot of traffic accidents. In major urban areas, traffic problems are getting more complicated so that more comprehensive measures are needed, particularly for the modal share of the public transport system: to reduce number of private vehicles including motorcycle and to promote public transport system such as bus transport and other rail base transit system. Traffic congestions sometimes discourage people from following the traffic regulations and proper traffic behavior.

(iv) Accidents involving young population

More than 40% of total traffic accidents involve the young population and this trend is expected to increase as a result of economic development with more and more young people having the capability to buy motorcycles or even cars for some. Urgent measures for students and younger population will therefore be required.

(v) Traffic accidents involving privately-operated commercial and public transport vehicles

Although number of traffic accidents involving these vehicles is not very high at present (although sometimes involving mass casualties), magnitude of its social impact is much more significant. And more and more, concerns are being raised in terms of issues of reckless driving behavior of their professional drivers, who

actually should have a moral responsibility to set good example on safe driving.

(vi) Caring for traffic accident victims

Improvement of the emergency medical care system will help save peoples' lives and also minimize residual disability. In December 2007, wearing of helmet was made compulsory for all motorcycle riders. This has effectively contributed to the reduction of number of fatalities. But since the number of fatalities and injuries are still relatively high, continuous efforts on the improvement of the emergency system are required. In addition to the emergency system, specific attention to the poor traffic accident victims and their children are equally important, which will be useful in the development of a more kindhearted and considerate traffic society.

The other target of the Master Plan is institutional innovation for the sustainable traffic safety development. While many institutional issues exist in both the sectoral and inter-sectoral systems, the following institutional issues were examined.

(i) Status of National Traffic Safety Committee (NTSC)

NTSC would not only be limited to being a "coordinating agency" as it is at present, but would also have more "executive" roles. Thus, NTSC should be strengthened in both functional and operational capacities. Provincial Traffic Safety Committee (PTSC) will be an independent agency for traffic safety under direct leadership of the Chairman of People's Committee.

(ii) Traffic Safety Law and its Implementing Guidelines

Objective of this law is to institutionalize the function of NTSC and PTSC and other systems related to traffic safety, including Traffic Safety Audit and Traffic Impact Assessment, etc. The law will be implemented in line with Road Traffic Law.

(iii) Traffic Safety Institute (Center)

Establishment of a permanent institute which will be responsible for developing traffic safety policies, as well as project monitoring, among others.

(iv) Traffic Safety Foundation

Establishment of this proposed Foundation is aimed at mobilizing contributions from the private sector (business groups, individuals, etc.) towards enhancement of traffic safety and Corporate Social Responsibility (CSR).

(v) Traffic Safety Audit

Many accidents have occurred on newly-opened trunk roads and therefore it is necessary to prepare appropriate traffic safety measures during the planning stages. This system shall also apply the identification or evaluation of potential black spots and shall formulate proposed countermeasures. Since major causes of traffic accident are due to human errors, the system shall evaluate the education and enforcement perspectives. In 2007, MOT has issued a Circular on this Audit, but there are present more urgent issues to be addressed.

(vi) Traffic Impact Assessment

Traffic Safety Audit will assure safe road planning and operations while Traffic

Impact Assessment will control the unplanned, improvised and inappropriate roadside developments and connections. It shall be proposed that any new building constructions which will bring high traffic and parking demand should include appropriate measures to ensure traffic safety order and related costs should be covered by the project owner.

- (vii) New Driver Licensing System (periodic renewal and licensing for less than 50cc) and Vehicle Inspection for Motorcycle

This is aimed at enhancing the responsibility and consciousness on traffic safety of the motorcycle users who comprise majority of the motorized society.

- (viii) Traffic Safety Driving and Internal Operation Inspector System

All companies involved in transport operation and business, including passenger and freight transport, shall assign at least one authorized office to ensure safety driving and operation. In addition, responsibility of the organization for the traffic accident shall be clearly identified.

- (ix) Clear responsibility on Traffic Control and Management

At present, traffic control and management responsibility is shared between road administration agencies and police agencies. For example, traffic signal installation is by road administration agency and is operated by the police agency. This separate responsibility, however, sometimes result in inefficient project implementation.

- (x) Comprehensive Automobile Insurance System and Voluntary Insurance System

While there is an insurance system for the vehicles at present, however, it is necessary to upgrade the system to ensure adequate coverage for accident victims and property damages towards the development of a desirable motorized society. The system will be supported by a periodical inspection system and will be a stable fund source for traffic safety.

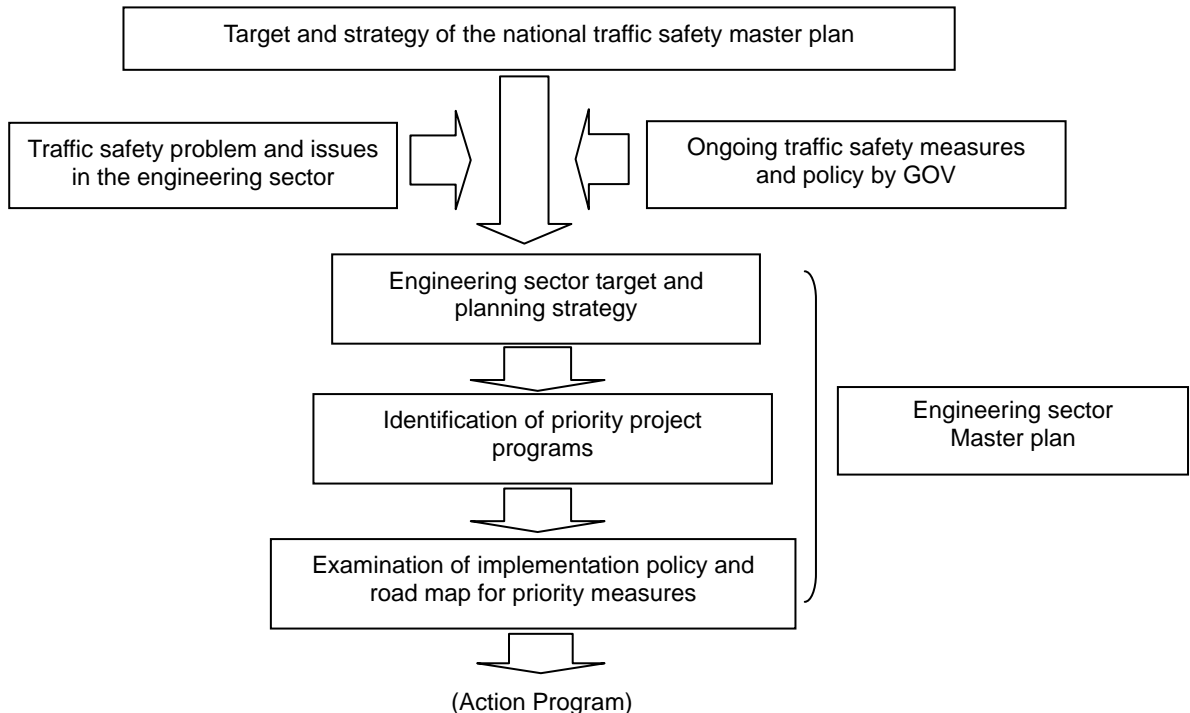
3 DESIRABLE ROAD SAFETY ENVIRONMENT DEVELOPMENT STRATEGY

3.1 Planning Approach

Overall strategy and target for the engineering sector are prepared based on the overall basic strategy, target, critical issues, etc. of the national road traffic safety master plan discussed in the preceding chapters.

In the engineering sector, targets are set not only based on the present critical issues and problems facing traffic safety but also in coordination with ongoing policy of the Government of Vietnam. The process of examination and target setting is illustrated in Figure 3.1.1. In addition, a road map on how to achieve the target of the priority policy, examination of the priority measures and establishment of a strategic plan to achieve the target are examined.

Figure 3.1.1 Examination Flow of Master Plan (Engineering)



Source: JICA Study Team

3.2 Engineering Sector Development Policy and Strategy

1) Sector Development Policy and Strategies

The objective of this sector is to establish a holistic traffic safety policy of improving all elements of traffic safety (person, vehicle and road environment) with close linkage to and upgrading of level of safety and comfort of road traffic. Traffic safety mitigation facilities in Vietnam have not been adequately developed to respond to the currently increasing number of traffic accidents which result in high socioeconomic losses for the country. Meanwhile, a comprehensive road network development is about to be implemented in accordance with the government's economic development policy. The more that consideration for road safety should be prioritized by the government to

maximize benefits of economic development.

Therefore, based on this situation, the sector goal is towards system development for a desirable road environment to minimize traffic accident risk.

In line with the basic strategies discussed in the previous section, six (6) strategies for the engineering sector are reformulated:

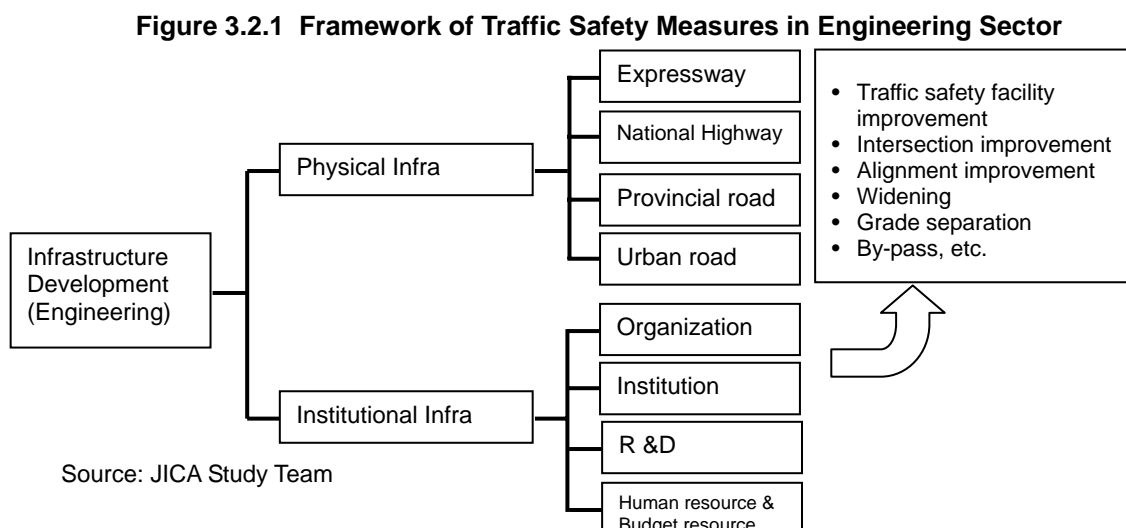
- (i) To improve road physical conditions (road structure and geometric) to provide safe and comfortable driving environment;
- (ii) To improve traffic control and management devices to provide safety guidance to the drivers and road users;
- (iii) To develop effective measures in line with road functions and traffic conditions (accidents and demand) with scientific approach;
- (iv) To promote comprehensive measures for the focus target and areas such as Black Spot, School Zone, Residential areas, etc.
- (v) To improve institutions (organization, rules and regulations, R&D, Database, etc.) to ensure sustainable road safety environmental development; and
- (vi) To ensure sustainable human and financial resources development.

Engineering measures are developed based on two perspectives: one is to provide physical improvement such as geometric improvement, and the other is to provide appropriate and adequate information to the road users who are not familiar with traffic rules and regulations. Lack of people's awareness on safety and on the traffic rules and regulations should be taken into consideration.

2) Framework of Traffic Safety Measures in Engineering Sector

In the engineering sector, it is necessary to execute an effective and efficient measure under different road administrators, different traffic situation, and different natural conditions such as climate and geographical features. Therefore, planning formulation based on detailed survey and analysis by the road administrators should therefore be undertaken.

Figure 3.2.1 illustrates the process by which traffic safety measures in the engineering sector will be developed.



Given the various possible engineering countermeasures, each target location shall be evaluated and proposed an appropriate measure based on local conditions. Table 3.2.1 shows alternative engineering countermeasures, divided into the structural measures and driver guidance measures. For each target location, several measures may be appropriate; for example, symptomatic measures and radical/preventive measures. In order to select the most appropriate measure, scientific analysis will be very important based on traffic accident data and other traffic-related data. Table 3.2.2 shows typical countermeasures by road functions.

Table 3.2.1 Road Safety Engineering Measures

Cause of Accident	Structural Measures	Control/Guidance, etc.
Facility: - Encroachment - Insufficient Intersection Facilities - Narrow road width - Insufficient Road alignment - Lack of safety sight distance and visibility - Others Traffic Flow/Behavior: - Mix Traffic - Speeding - Reckless crossing and turning - Reckless overtaking - Jaywalking - Ignoring of red light - Others	✓ Traffic safety corridor development ✓ Lane separation by type of vehicle ✓ Service/collector road ✓ Pedestrian facilities (sidewalk, crossing facilities) ✓ Bicycle lane ✓ Safeguard facilities ✓ Median and separators ✓ Alignment improvement ✓ Intersection improvement ✓ Provision of sight distance ✓ Pavement improvement ✓ Railroad crossing facilities ✓ Bus stop facilities ✓ Parking facilities	✓ Road Information System ✓ Road lighting system ✓ Visual guidance system ✓ Rest facilities ✓ Traffic Signal System ✓ Road marking and signs ✓ Traffic Management (Speed limit, One-way, etc) ✓ Parking Management
	Radical and Comprehensive Measures <input type="checkbox"/> Road Functional Network Development including bypass, grade separation, access control, etc. (Primary, Secondary, Tertiary and Urban Road System) <input type="checkbox"/> Appropriate Transport Modal Share (w/ TDM scheme)	

Source: JICA Study Team.

Table 3.2.2 Typical Countermeasures by Road Function

Road classification (Traffic Feature)	Suggested Short-term Measures	Radical/Preventive/Long-term Measures
Inter-Urban NH - High Traffic volume - High Speed - Mix Traffic - Heavy vehicle	<ul style="list-style-type: none"> • Black Spot Improvement <ul style="list-style-type: none"> - Intersection Improvement - Median/separator - Lighting, Delineator - Marking/Signage, etc • Lane Separation for M/C • Speed Reduction Measure • Pedestrian Crossing Facility (bridge, tunnel, etc) 	<ul style="list-style-type: none"> • TS Corridor Development with service road • Separated M/C, B/C lane • Alignment Improvement • Road Information System • Road Rest Stops/Facilities (Michi no Eki) • Railway Crossing Facilities • Comprehensive program for the metropolitan areas
Provincial/District Road - Less Traffic Volume - Poor Rd facility	<ul style="list-style-type: none"> • Black Spot Improvement • School Zone measures 	<ul style="list-style-type: none"> • Installation of traffic signal • Upgrading road facilities including widening and realignment

Table 3.2.2 Typical Countermeasures by Road Function (con't)

Road classification (Traffic Feature)	Suggested Short-term Measures	Radical/Preventive/Long-term Measures
Urban Road - High Traffic Vol - Congestion - Mix traffic - Busy economic activities	<ul style="list-style-type: none"> • Black Spot Improvement • School Zone Measures • Commercial Zone Measures • Lane Separation on the primary urban roads 	<ul style="list-style-type: none"> • Public Transport System Development and TDM • Parking Facility Development • Traffic Control Management System

Source: JICA Study Team.

3.3 Identification of Priority Program for the Master Plan

1) Traffic Safety Measure Examination for Major Accident Type

To achieve efficient reduction of traffic accident number, safety measures shall be selected and implemented to prioritize traffic accident areas in conformity with sustainable traffic safety measures implementation. Based on the traffic accident analysis, the following types of accidents frequently occur which therefore requires urgent measures.

Table 3.3.1 Traffic Accident Matrix in Vietnam

(%)	0	10	20	30	40	50	60	70	80	90
Where	National Highway					Provincial road			Urban road	Others
Who	Motorcycle						Car		Others	
Why	Speeding		Wrong overtaking	Wrong lane shifting	Careless driving	Others				

Source: People's Police Academy, Road and Rail Transport Division, MOPS

Table 3.3.2 Accident Number Ranking by Provinces and Cities

Rank	Province/City	No. of Accident	No. of Fatality
1	HCMC	8,494	5,434
2	Hanoi	6,783	2,591
3	Dong Nai	3,898	2,773
4	Binh Duong	2,704	1,554
5	Ha Tay	2,299	2,030
Total		90,731(27%)	60,243(24%)

Source: Road and Rail Transport Division, MOPS

The following priority traffic accident areas are selected according to above tables: (i) traffic accident on National Highway; (ii) traffic accident related to Motorcycles; (iii) traffic accident caused by Speeding, Wrong overtaking, Wrong lane shifting, and Careless driving; and (iv) traffic accident on urban areas.

Traffic safety measures focusing on the priority traffic accident areas are summarized below:

(i) Traffic Safety Measures focusing on Motorcycle

Cause of Accident	Arterial National Highway	National Highway, Provincial Road
1. Speeding	<ul style="list-style-type: none"> • Analysis of cause of traffic offense • Traffic sign, Ramble Strip 	<ul style="list-style-type: none"> • Analysis of cause of traffic offense

Cause of Accident	Arterial National Highway	National Highway, Provincial Road
Share:10.4%	<ul style="list-style-type: none"> Review of regulatory speed 	<ul style="list-style-type: none"> Traffic sign, Ramble Strip Analysis of cause of traffic offense Review of regulatory speed
2. Wrong Lane Shifting Share:4.0%	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Median barrier, Road stud, Driving lane designation, Service road Review of lane change restriction section 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Road stud Review of lane change restriction section
3. Wrong Overtaking Share: 9.0%	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Median barrier, Road stud, Driving lane designation, Service road Review of over pass restriction section 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Road stud Review of over pass restriction section
4. Turning at non-signalized intersection	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Curve mirror, Hump, Median barrier, Channelizing island 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Curve mirror, Hump, Channelizing island
5. Disregard of red signal	<ul style="list-style-type: none"> Analysis of cause of traffic offense Improvement of visibility, Count indicator type signal Review of signal location Review of yellow time Review of stop line location 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Improvement of visibility, Count indicator type signal Review of signal location Review of yellow time Review of stop line location
6. Offensive driving distance	<ul style="list-style-type: none"> Analysis of cause of traffic offense Distance guide, Traffic sign 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign
7. Careless Driving	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Ramble Strip 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Ramble Strip
8. Offensive pedestrian crossing	<ul style="list-style-type: none"> Analysis of cause of traffic offense Guard rail, Guard fence (median), Grade separated crossing facilities Review of pedestrian crossing location Review of pedestrian signal location and phasing design 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Guard rail Review of pedestrian crossing location Review of pedestrian signal location and phasing design

(ii) Traffic Safety Measures focusing on all vehicle

Cause of Accident	Arterial National Highway	National Highway, Provincial Road
1. Speeding Share: 3.8%	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Ramble Strip, ORBIS, Electric speeding cautionary Review of regulatory speed 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Ramble Strip Review of regulatory speed
2. Wrong Lane Shifting Share: 3.0%	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Median barrier, Road stud Review of lane change restriction section 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Road stud, Climbing lane Review of lane change restriction section

Cause of Accident	Arterial National Highway	National Highway, Provincial Road
3. Wrong Overtaking Share: 1.8%	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Median barrier, Road stud Review of over pass restriction section 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Road stud, Climbing lane Review of over pass restriction section
4. Turning at non-signalized intersection	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Curve mirror, Hump, Median barrier, Channelizing island 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Curve mirror, Hump, Channelizing island
5. Disregard of red signal	<ul style="list-style-type: none"> Analysis of cause of traffic offense Improvement of visibility, Count indicator type signal Review of signal location Review of yellow time Review of stop line location 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Improvement of visibility, Count indicator type signal Review of signal location Review of yellow time Review of stop line location
6. Offensive driving distance	<ul style="list-style-type: none"> Analysis of cause of traffic offense Distance guide, Traffic sign 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign
7. Careless Driving	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Ramble Strip 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Ramble Strip
8. Offensive pedestrian crossing	<ul style="list-style-type: none"> Analysis of cause of traffic offense Guard rail, Guard fence (median), Grade separated crossing facilities Review of pedestrian crossing location Review of pedestrian signal location and phasing design 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Guard rail

(iii) Traffic Safety Measures focusing on Urban Road

Cause of Accident	Arterial National Highway	National Highway, Provincial Road
1. Speeding	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Ramble Strip, Driving lane restriction(Heavy vehicle, Motor-cycle) Review of regulatory speed 	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic calming(Traffic sign, Hourly traffic ban, Hump, Ramble Strip) Review of regulatory speed
2. Wrong Lane Shifting	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Median barrier, Road stud, Driving lane restriction(Heavy vehicle, Motor-cycle) Review of lane change restriction section 	-
3. Wrong Overtaking	<ul style="list-style-type: none"> Analysis of cause of traffic offense Traffic sign, Road marking, Median barrier, Road stud, Driving lane restriction(Heavy vehicle, Motor-cycle) Review of over pass restriction section 	-

Cause of Accident	Arterial National Highway	National Highway, Provincial Road
4. Turning at non-signalized intersection	<ul style="list-style-type: none"> · Analysis of cause of traffic offense · Traffic sign, Curve mirror, Hump, Median barrier, Channelizing island, Narrowing of shoulders 	<ul style="list-style-type: none"> · Analysis of cause of traffic offense · Traffic sign, Curve mirror, Hump, Channelizing island, Pedestrian crossing, Grade separated crossing facilities
5. Disregard of red Signal	<ul style="list-style-type: none"> · Analysis of cause of traffic offense · Improvement of visibility, Count indicator type signal · Review of signal location · Review of yellow time · Review of stop line location 	<ul style="list-style-type: none"> · Analysis of cause of traffic offense · Counting indicator signal · Review of signal location · Review of blue signal time
6. Offensive driving distance	<ul style="list-style-type: none"> · Analysis of cause of traffic offense 	<ul style="list-style-type: none"> · -
7. Careless Driving	<ul style="list-style-type: none"> · Traffic sign, Ramble Strip 	<ul style="list-style-type: none"> · -
8. Offensive pedestrian crossing	<ul style="list-style-type: none"> · Analysis of cause of traffic offense · Guard rail, Guard fence (median), Grade separated crossing facilities · Review of pedestrian crossing location · Review of pedestrian signal location and phasing design 	<ul style="list-style-type: none"> · Analysis of cause of traffic offense · Guard rail, Guard fence (median), Grade separated crossing facilities · Review of pedestrian crossing location · Review of pedestrian signal location and phasing design

Note: Share of the cause of accident is estimated based on the data from the People's Police Academy

2) Examination of Programs

Based on analysis made as indicated in the above discussion, Table 3.3.3 presents the 12 priority programs in the engineering sector for the traffic safety master plan.

Table 3.3.3 Priority Program of the Engineering Sector

Program	Objective	Assumed Components	Target up to 2020
		<ul style="list-style-type: none"> ▪ Physical Infra ▫ Institutional Infra 	
1. Black Spot Improvement Program	Safety measures for frequent occurrence of traffic accident point. Overall approach of 3Es is implemented if necessary.	<ul style="list-style-type: none"> ▪ Intersection improvement, Traffic signal improvement, alignment improvement, etc. ▪ Maintenance of Traffic sign and display (attention rousing to frequent occurrence of accident section) ▫ Frequent occurrence of accident point selection system ▫ Establishment of TSA system 	Reduction of Black Spot on the arterial national highway

Program	Objective	Assumed Components <ul style="list-style-type: none"> ▪ Physical Infra ▫ Institutional Infra 	Target up to 2020
2. Traffic Safety Corridor Development Program	Corridor maintenance, road side land use, and access restriction to maintain traffic function.	<ul style="list-style-type: none"> ▪ Safety corridor facilities maintenance such as service roads ▫ Legislation for illegal occupation ▫ Maintenance by TIA system 	Corridor on the arterial national highway is secured.
3. Highway Traffic Safety Facility Enhancement Program	Development of measures for safety in arterial national highway such as lane separation and speed restriction, etc. Improvement of risk section not included in the black Spot.	<ul style="list-style-type: none"> ▪ Modification of road crossing elements ▪ Speed easing facilities, maintenance of sign and display, and traffic information provision ▫ Selection of appropriate business section and content by establishment of TSA system 	Promote improvement of national highway centering toward the major city.
4. Urban Bypass Development Program	Through traffic is excluded, and safety in an urban section is secured. Classification of the road network is promoted.	<ul style="list-style-type: none"> ▪ Development of by-pass on national highways 	Development is attempted on the city more than population * person scale.
5. Vulnerable Road User Accident Prevention Program	Secure safety of pedestrian, bicycle, and disable people.	<ul style="list-style-type: none"> ▪ Development of pedestrian crossing ▪ Development of bicycle road ▫ Development of bicycle road standard ▫ Development of barrier-free law 	Development in the school, public facilities, and the village, etc. is promoted in the major arterial road.
6. Railway Crossing Accident Prevention Program	Secure safety at railway crossing.	<ul style="list-style-type: none"> ▪ Development of railway crossing safety facilities ▪ Development of railway crossing overpass ▫ Development of agreement for railway crossing safety facilities management? 	Promotion of overpass at railway crossing where a lot of traffic Signal set up at railway crossing with all the arterial national highway.
7. Expressway Safety Development Program	Secure safety on expressway.	<ul style="list-style-type: none"> ▪ Promotion of facilities development according to safety facilities maintenance standard ▪ Development of rest facilities ▫ Expressway safety facilities development standard 	Development standard is settled on, and facilities corresponding to it are developed.

Program	Objective	Assumed Components ▪ Physical Infra ▫ Institutional Infra	Target up to 2020
8. Road Work Traffic Safety Development Program	Secure safety under road works	▪ Development of road traffic safety management facilities ▫ Legislation concerning arrangement of traffic controller and traffic safety authorities etc.	The regulation is made, and traffic management and safety are secured.
9. Traffic Safety Monitoring and Maintenance Program	Implementation of traffic safety measures and evaluation of the measures are made, and maintenance is confirmed to subject base data for considering following measures.	▫ Establishment of monitor system ▫ Establishment of organization	The system and the organization are established, and a regular evaluation is executed.
10. Prov'l Traffic Safety Plan Development Program	Support for establishment of other safety program based on national road safety M/P (basic plan).	▫ Development of traffic safety planning manual for province	The safety program based on a basic plan in each province is implemented.
11. Urban Road Traffic Safety Development Program	Support of establishment safety program according to city based on national road safety M/P (basic plan).	▫ Preparation of urban traffic safety plan manual ▫ Development of TIA and parking law, etc.	The safety program based on a basic plan in each city is implemented.
12. R&D, Human and Financial Resources Development Program	Research and development and personnel training to execute traffic safety measure sustainably.	▫ Construction of data base such as traffic and safety facilities ▫ System development like TSA, TIA, and fiscal resources, etc. ▫ Research and development of measures ▫ Execution of personnel training	The data base and the organizational structure are developed, and the research and development is executed. The personnel training is executed.

Source: JICA Study Team.

3.4 Development Strategy for the Priority Program

1) Black Spot Improvement Program

(i) Objectives of the Program

Since black spot improvement is still in its early stages in Vietnam, a significant traffic accident reduction is yet to be achieved by the responsible agencies.

The benefit from black spot improvement is not only limited to alleviating traffic accident at a specific location; instead, it is expected to also provide further practical guidelines for other black spot improvement as discussed below.

In general, accidents have been shown not to be completely randomly distributed but to be clustered at certain locations on any road. And an accident study would often show common patterns of traffic accidents. Thus, implementation of appropriate road improvement measures developed based on results of black spot accident analyses could prevent or mitigate similar occurrences in the future. Black spots are locations where many of the traffic accidents occur. Thus, prioritizing treatment of these sites would expectedly provide the highest return in terms of number of traffic accidents avoided. Moreover, simple yet very cost-effective countermeasures such as use of road signs, markings to channel traffic through complex intersections and safe waiting areas for turning vehicles would provide significant traffic accident alleviation.

Therefore, the black spot improvement system has to be conducted immediately as it is expected to effectively reduce traffic accidents and is highly cost-effective, and to accumulate and utilize experiences and feedbacks.

(ii) Issues of the Program

- (1) Need for legislation to designate executing agencies with clear delineation of respective obligations and responsibilities and to further promote understanding among stakeholders.
- (2) Development of the black spot improvement system
 - Definition or criteria of the black spot and guideline to identify it
 - Upgrading of the black spot improvement system
 - Development of cost-effective measures both in terms of time and resources and to ensure stable and sustainable financial resources
- (3) Training and technical upgrading system for the black spot improvement engineers

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- (1) Short-term
 - Completion of black spot treatment pilot project in urban and rural road
 - Completion of revised black spot treatment guidelines
- (2) Medium-term
 - Reduction of black spot on national highways (50%)

(iv) Program Components

(1) Legislation designating executing agencies with clear delineation of obligations and responsibilities and further promotion of understanding

Roads should be safe for both vehicles and pedestrians and should follow certain standards. Safety in road construction depends on the road management authority. However, definition of “safety” varies among areas and type of roads. Safety measures in planning and design stages are not adequate which results in black spots on the newly constructed roads such as NH-5. In Japan, the road management authority must discuss with the police,

which is the responsible agency for traffic safety, during the planning and design stage and the police agency in turn approves the road construction plan. Therefore, there is a clear delineation of responsibility among relevant agencies which contribute to the improvement of safety of road facility development.

Under the black spot improvement project in Vietnam, priority should be given on the development of a system of cooperation between the traffic police and the road management authority with clear definition and delineation of respective obligations and responsibilities. Also, to respond to the expanding motorization, support must be given to improve and maintain traffic safety in local areas which are experiencing constraints in human and financial resources.

Project for Institutional Development: Development of cooperative mechanism between traffic police and road management authority.

(2) Development of the black spot improvement system

To develop the black spot improvement system, the relevant guidelines will be revised through the conduct of a pilot project.

(a) Definition or criteria of the black spot and guideline to identify it

As criteria for identification of black spots vary, some of the black spots might not be identified which may result in recurrence of traffic accidents at the same spot. To address this concern, the definition of black spot will be reconsidered and disseminated for wider understanding. In addition, to effectively and strategically reduce traffic accidents, a guideline will be developed focusing on the black spots as well as road sections with potential risk for accidents such as school zones.

(b) Upgrading of the black spot improvement system

Previous cases of black spot improvement will be analyzed based on its effectiveness and problems encountered.

(c) Development of cost-effective measures both in terms of time and resources and to ensure stable and sustainable financial resources

Timeframe and cost for the black spot improvement will be estimated based on the results of analysis of similar cases in other countries and this will be included in the guideline. Regarding the financial resources, a plan assessment-based budget allocation system will be considered.

Project for Institutional Development: Review on the black spot improvement guideline.

(3) Training and technical upgrading system for black spot improvement engineers

To plan and design an effective black spot improvement system, it is necessary for knowledge and experience on traffic safety mitigations, in addition to traffic engineering and road engineering specialization, to be enhanced. As the black spot improvement engineer should take care of various black spots, effective

and efficient methods will be required to improve their capacity for traffic safety mitigation. Thus, a pilot project will be implemented which will be aimed at capacity development of the black spot improvement team. The pilot project will be implemented in some areas with varying characteristics to accumulate valuable knowledge and data on traffic safety mitigations which can further enhance the engineers' capacity. In addition, an exchange system for human resources and techniques among areas may also be developed.

Project for Facilities Development: Implementation of the black spot improvement pilot project including training for engineers and capacity development.

Project for Institutional Development:

- (a) Development of an exchange system for human resources and techniques/expertise related to black spot improvement system
- (b) Promotion of understanding of black spot improvement system to the road management authorities
- (c) Promotion of black spot improvement implementation to local governments

(4) Utilization of the black spot improvement database, development of supporting tools and establishment of the executing agency

The present road management structure does not have any department or unit responsible for safety control of road facility. Thus, in addition to abovementioned human resource development, measures to be implemented should be sustainable as well as efficient to be able to respond to increasing traffic volume and accidents. Therefore, the establishment of an implementing unit in the road management organization which will be exclusively responsible for traffic safety mitigation shall be proposed.

To increase efficiency of the black spot improvement system, the following support mechanisms will be developed:

- Establishment of the common black spot data system
- Preparation of the black spot data formats and database
- Shared-access among traffic police of the above black spot database and traffic data.

These support mechanisms will be developed upon the establishment of the executing agency which will then conduct the research and development activities such as traffic accident analysis, effectiveness analysis and cost-effectiveness analysis, as well as development of the traffic safety mitigation guideline.

(5) Follow-up on the results of post-monitoring of the black spot improvement

Post-monitoring of black spot improvement is important to evaluate the effectiveness of the implemented measures as well as to assess on the progress of the road management authority. The above executing agency shall be in-charge of developing the monitoring system to evaluate the progress and

effectiveness of the black spot improvement, shall provide feedback to the road management authority and should have the capacity to provide very technical assessments as well as recommendations on traffic safety policy to the road management authority.

Table 3.4.1 presents a summary of the black spot improvement program components, estimated cost, and implementation plan.

Table 3.4.1 Black Spot Improvement Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)															Total Cost (M US\$)
	2008-2010			2011-2015					2016-2020							
	1	2	3	1	2	3	4	5	1	2	3	4	5			
1. Black Spot Improvement Plan																
1) Development of cooperative mechanism between traffic police and road																
2) Review on the black spot improvement guideline	5.0														5.0	
3) Implementation of the black spot improvement pilot project including training for engineers and capacity development	10.0	10.0													20.0	
4) Development of an exchange system for human resources and techniques/expertise related to black spot improvement system	5.0	5.0	5.0												15.0	
5) Promotion of understanding of black spot improvement system to the road management authorities		2.5	2.5												5.0	
6) Promotion of black spot improvement implementation to local governments				10.0	10.0	10.0	10.0	10.0							50.0	
<i>Sub-total:</i>	<i>20.0</i>	<i>17.5</i>	<i>7.5</i>	<i>10.0</i>	<i>10.0</i>	<i>10.0</i>	<i>10.0</i>	<i>10.0</i>							<i>95.0</i>	

Source: JICA Study Team.

2) Traffic Safety Audit System Development Program

(i) Objectives of the Program

The road network development is one of the most important policies to promote economic development in Vietnam. However, the budget for road development projects is too small to undertake all the planned projects. Therefore, cost effectiveness is really necessary to be able to smoothly implement the policy.

In countries where RSA is already introduced, indications of effectiveness of RSA in decreasing road development costs are already documented. For example, in the United Kingdom, the average number of fatal and injury crashes at audited project sites fell by 1.25 crashes per year (from 2.08 to 0.83 crashes per year) while the post-implementation reduction in crashes at comparable, non-audited sites was only 0.26 crashes per year (from 2.6 to 2.34 crashes per year). In the United States, New York DOT reported a 20% to 40% reduction in crashes in more than 300 high-crash locations treated with low-cost improvements recommended as a result of RSAs¹.

Also as reported from the United States, conduct of RSAs and implementation of their recommended safety improvements in design is estimated to typically cost 5% of overall engineering design fees. In general, design cost is 7% to 10% of the construction cost of a road development project. When RSA is estimated 5% of the design cost, it is 0.35% to 0.50% of the construction cost. Therefore, if RSA is carried out appropriately, the cost effectiveness would be quite high. So considering the huge amount of investment to road development in the future, savings may instead be allocated to the improvement of damaged sections. Then the operation and maintenance cost which accounts for a large part of road sector

¹ FHWA Road Safety Audit Guidelines by U.S. Department of Transportation, Federal Highway Administration

budget can then be saved to enhance new road construction in the future.

Based on the above discussion, the RSA system should therefore be enhanced and implemented appropriately as soon as possible. By doing so, improvement in cost-effectiveness of road sector development and the reduction in traffic casualties can be expected.

(ii) Issues of the Program

- (1) Enhancement of legislations regarding obligation and responsibility of relevant authorities, and education on and expansion of RSA.
- (2) Suggested contents of revised RSA system:
 - Established guideline of selection of target road and traffic development plans
 - Improvement of safety control method including revision of the audit checklist
 - Approval and licensing/accrediting system for auditing organizations
 - Estimated time and costs required, and sustainable financial sources
 - Utilization of the auditing results
 - Guaranteed legal support
- (3) Establishment of licensing/accrediting system and human resource development mechanism for the auditors.

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- (1) Short-term
 - Updated RSA guideline
 - Conduct of RSA pilot project and establishment of RSA database
 - Complete involvement of relevant agencies into RSA

(iv) Program Components

(1) Enhancement of legislations regarding responsibilities of relevant authorities and education and expansion of RSA

The road management authority may be responsible for traffic accidents during road operation and maintenance caused by concealed or underlying defects on the road structure and incidental facilities and it should be legally indicated. In the same manner, obligation and responsibility of the executing agency for RSA implementation should be stated in the legislation. The scope of responsibilities should be clearly delineated between these two authorities. The RSA auditor should be accredited by a national authority after undergoing through the licensing/accreditation system. The auditing process should be standardized and indicated in the approved manual. Also, the road management authority should have satisfactory understanding of the approved standard auditing process and manual.

Project for Institutional Development:

(a) Promotion of RSA system to the road management authorities

Suggested contents of revised RSA

Revision of the RSA system should be immediately proposed by reviewing the guidelines including the following points and pilot projects:

1) Establishment of a guideline in selecting target road and traffic development plans

A standardized guideline should be developed and applied nationwide in the future. The guideline should for example consider selecting a plan which covers a wide area that consists of varying local characteristics. For road development plans with less social and natural environmental impacts such as expressway network development, its feasibility may be evaluated by using existing guidelines being used by other countries.

2) Improvement of safety control method including revision of the audit checklist

A case study on previous RSA implementation should be conducted to collect and analyze relevant information regarding its effectiveness, problems and issues encountered during implementation, and to suggest countermeasures to improve the implementation. The suggested improvement plans should then be carried out as a pilot project. As the existing audit checklist is not designed to address local characteristics and conditions of current traffic situation in Vietnam, the revision of the list should be prioritized.

3) Estimated time and cost required, and sustainable financial sources

Required time and cost implications for RSA implementation should be included in the revised guideline based on experiences from other countries. Regarding the financial sources, budget allocation system among the relevant authorities should be considered based on the assessment of their plans and the guideline of selection the target development plans mentioned in 1).

(b) Revision of RSA guideline

(2) Establishment of licensing/accrediting system and human resource development mechanism for the auditors

As a road planning and design engineer, the RSA auditor should be able to judge whether the target road development plan and the design are in accordance with the design standard. Although the target plan fulfills the requirements, he/she should consider traffic safety to prevent frequent accidents at a particular point because of road structure or design. Such capability can be acquired through case studies on road structure, traffic condition and surrounding situation of the places where traffic accidents have occurred aside from road planning and design works. In the United Kingdom, since RSA was legally compelled since 1991, the issue of establishing a

database of information and knowledge regarding training of the auditor team and the auditing cases has been raised. Recently, traffic safety indicators were developed to measure and improve traffic safety in accordance with the outputs of road assessment program to evaluate traffic safety of each characteristic of road based on the existing road safety survey. Taking into consideration the varying local characteristics of road transportation in Vietnam, implementation of a pilot project introducing road management planning technique which is similar to RMS (Road Management Strategies) of the United Kingdom may be proposed. Under this pilot project, diagnosis, development of countermeasure and assessment of traffic problems and accidents will be carried out to train RSA auditors as well as to establish the knowledge database. This may contribute in the further enhancement and upgrading of skills of RSA auditors.

Project for Facilities Development: RSA pilot project

Table 3.4.2 presents a summary of the traffic safety audit system development program components, estimated cost, and implementation plan.

Table 3.4.2 Traffic Safety Audit System Development Program Components and Implementation Plan

Program Item	Annual Required Cost (M.US\$)															Total Cost (M.US\$)
	2008-2010			2011-2015					2016-2020							
	1	2	3	1	2	3	4	5	1	2	3	4	5			
2. Traffic Safety Audit Development Plan																
1) Revision of RSA guideline		5.0														5.0
2) RSA pilot project		15.0	15.0													30.0
3) Promotion of RSA system to the road management authorities		5.0														5.0
<i>Sub-total :</i>		<i>25.0</i>	<i>15.0</i>													<i>40.0</i>

Source: JICA Study Team.

3) Traffic Safety Corridor Development Program

(i) Objectives of the Program

Illegal encroachments and delay of land acquisition on road construction sites cause various problems. In connection with road traffic and traffic safety, this is expected to cause inconvenience as well as put risk to pedestrians since they will be forced to use the road way for walking. In addition, presence of pedestrians on roadways will in turn disturb vehicle traffic and may cause accidents. Presence of illegal encroachments may also cause vehicle collisions on junctions and corners due to lack of visibility. Installation and maintenance of lifelines such as water supply and sewage system, electricity and telecommunication will also be disturbed.

The Government of Vietnam has been taking measures to address these problems. However, the situation analysis might not be enough to plan and implement an integrated action. It is also quite difficult to relocate long-time illegal dwellers from the construction sites. But if these situations will not be immediately improved, road facilities would not be able to respond accordingly to rapid motorization brought about by the country's socioeconomic development and the number of traffic accidents could eventually increase.

Therefore, the road management authority and the local governments are jointly taking the necessary actions to address these problems through the creation of an appropriate and effective coordination system. Meanwhile, necessary legislations to support such actions should be formulated and enacted. Based on the situation analysis and lessons learned, a pilot project on improvement traffic safety mitigation measures should be implemented on sample road sections to obtain useful outputs, feedbacks and practical recommendations for future traffic safety policy.

(ii) Issues of the Program

- Establishment of integrated database on status of land acquisition and illegal dwellers in cooperation with the road management authorities and the local governments.
- Establishment of improvement plan including estimation of compensation costs and relocation plan based on the above database.
- Preparation of measures for consensus building on compensation package for relocation of illegal dwellers.
- Application of coercive measures to clear illegal structures and constructions on the traffic safety corridor.
- Investments on improvement, upgrading, construction of side roads in line with the current guidelines.
- Planning of access roads to economic zones, commercial and residential areas, locations to connect to national roads.
- Recommendations to amend, modify and supplement the legal provisions to ensure appropriateness of management requirements in the restoration of the traffic safety corridor.
- Widening of the existing road in the urbanized sections will require huge amount of the investment for the traffic safety corridor. Careful examination will be needed which one is more feasible either widening or construction a new bypass. [Refer to 5) Urban Bypass Development Program]

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

(1) Short-term

- Completion of data base development for inventory of encroachment and road conditions.

(2) Medium-term

- Installation of necessary safety facilities on access point from heavy traffic generating road side facilities (50%).

(iv) Program Components

- ##### **(1) Establishment of integrated database on status of land acquisition and illegal dwellers in cooperation with the road management authorities and**

the local governments.

It is essential to integrate information on status of land acquisition and illegal dwellers. Especially during road widening in urban areas, it usually takes several years to complete land acquisition partly due to the presence of illegal dwellers that refuse to leave because of unavailability of alternative lands. This situation in turn delays the smooth implementation of the construction project. Thus, to control such risks, development of a database on surrounding condition of the roads and characteristics of illegal residents is necessary.

Project for Institutional Development. Database development for inventory of encroachment and road conditions.

(2) Establishment of improvement plan including estimation of compensation costs and relocation plan based on the above database.

To smoothly and efficiently implement road improvement projects, cost estimates must be accurate, particularly estimates relating to land acquisition and compensation for illegal dwellers. The local governments should therefore prepare an integrated data on land price and its practical implementation. When implementing road development projects in areas which have illegal dwellers, a relocation plan must be prepared during the early stage of the project and the local governments must be made responsible for implementation of the relocation plan.

Project for Institutional Development:

- (a) Setting of land value based on market price and application in land acquisition for road projects
- (b) Improvement of compensation system for affected people

(3) Preparation of measures for consensus-building on compensation package for relocation of illegal dwellers.

To promote an efficient relocation process for illegal dwellers, rapid consensus on compensation package and relocation sites are important. Measures should be established to arrive at a consensus on such issues as public consultation and transparency during cost estimation of compensation package as well as finding of appropriate relocation sites.

Project for Institutional Development:

- (a) Improvement of public consultation system
- (b) Mandatory requirement of resettlement plan in road projects

(4) Application of coercive measures to clear illegal structures and constructions on the traffic safety corridor.

Professional squatting (i.e. the repetitive and/or intentional illegal occupation of land to gain entitlement for compensation) should be strictly dealt with by forceful eviction. In particular, an appropriate system must be developed to eliminate these professional squatters who move from one construction site to another as an income-generating activity. In addition, relevant penal regulations should be enacted for violators and suitable sites must be identified

for relocation of affected small businesses and families.

Project for Institutional Development: Strengthening and strict enforcement of sanctions against returning illegal dwellers

(5) Investments on improvement, upgrading, construction of side roads in line with the current guidelines.

On urban sections of intra-urban highways, congestion by through traffic and internal traffic, traffic accidents are a concern. Frequent in and out flow of traffic is repeated at short sections in internal traffic which could cause traffic accidents. Land use in sections where there is in and out flow of traffic should be reviewed to separate mixed traffic based on characteristics. A holistic approach will be implemented to identify points causing mixed traffic based on scientific data analysis on traffic accidents, to plan installation of service road facilities and to ensure that the plan and its implementation is in accordance with the road policy.

Project for Institutional Development: Planning development focus on heavy access sections

(6) Planning of access roads to economic zones, commercial and residential areas, locations to connect to national roads.

Regarding the areas with increasing traffic volume such as industrial estates, commercial areas, residential areas, and a trade center, access to the National Highways should have safety mitigation measures based on existing design guideline. However, it seems to be difficult to follow the guideline strictly in many cases and under such situation, serious traffic accidents on the heavy loaded section surrounding industrial estates occur. Appropriate measures will be provided for such points, and capacity of local governments to check safety in approving the development plans as well as understanding the guideline will be enhanced.

Project for Institutional Development: Strengthening regulation for access from heavy traffic generating road side facilities

(7) Recommendations to amend, modify and supplement the legal provisions to ensure appropriateness of management requirements in the restoration of the traffic safety corridor.

To implement the above measures, relevant agencies should cooperate systematically and share their existing data. The obligation and responsibility for implementation should be indicated to avoid delay of the project because of political confusion. The legislation system on the measures for encroachment reduction should clearly state obligation and responsibility of the executing agency.

Project for Institutional Development: Legal system improvement for encroachment

Table 3.4.3 presents a summary of the traffic safety corridor development program components, estimated cost, and implementation plan.

Table 3.4.3 Traffic Safety Corridor Development Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)															Total Cost (M US\$)
	2008-2010			2011-2015					2016-2020							
	1	2	3	1	2	3	4	5	1	2	3	4	5			
3. Traffic Safety Corridor development Plan																
1) Database development for inventory of encroachment and road conditions	5.0	5.0														
2) Setting of land value based on market price and application in land acquisition for		1.3	1.3													
3) Improvement of compensation system for affected people				0.8	0.8	0.8										
4) Improvement of public consultation system	1.3	1.3														
5) Mandatory requirement of resettlement plan in road projects		1.3	1.3													
6) Strengthening and strict enforcement of sanctions against returning illegal dwellers	1.3	1.3														
7) Planning development focus on heavy access sections				2.5	2.5	2.5	2.5	2.5								
8) Strengthening regulation for access from heavy traffic generating road side facilities									0.8	0.8	0.8					
9) Legal system improvement for encroachment	1.3	1.3														
<i>Sub-total:</i>	<i>8.8</i>	<i>11.3</i>	<i>2.5</i>	<i>3.3</i>	<i>3.3</i>	<i>3.3</i>	<i>2.5</i>	<i>2.5</i>	<i>0.8</i>	<i>0.8</i>	<i>0.8</i>					

Source: JICA Study Team.

4) Highway Traffic Safety Facility Enhancement Program

(i) Objectives of the Program

(1) Traffic Safety Facilities

Instruction and guidelines on adoption of basic traffic safety facilities in Vietnam are indicated in road design standards such as TCVN4054-05 and TCXDVN104. For example, median installation is not prescribed for roads below class III in rural areas. However, since many traffic accidents occur in these sections due to illegal overtaking, conformity to design standards and guidelines therefore is not an absolute measure for traffic accident alleviation. Since design standards are developed based not only on vehicle movement characteristics but also on assumed driving behaviors, effectiveness of road safety facilities become compromised by wrongful driving behaviors and inadequate traffic enforcement. It would also be clarified by statistics that the traffic accident fatality per 10,000 in local province may be higher than the cities but driving behavior and traffic offense enforcement in local provinces seem to be weaker than in the cities.

Therefore, assessment of appropriate traffic safety measures should be conducted based not only on road design standard but also on practical accident analysis of subject road.

(2) Design Standards/Guidelines

In consideration of lessons learned from the past transition of the design standard and guidelines in Vietnam, simply adopting international design standards from developed countries has not resulted in levels of safety that are achieved in the developed countries because such standards are generally accompanied by effective enforcement, driver training and safety education and promotion. In addition, traffic conditions and types of traffic on the roads of Vietnam are very different from those of the developed countries.

Important aspects that should be reflected into consideration of the design standards and guidelines in Vietnam are different vehicle mode comparing with the developed country such as heavy motor-cycle traffic volume and its driving behaviors, disparity of road development level between urban and rural, and adaptability for both budgetary situation and human resource capacity of road

administrations.

Therefore, it is necessary to review and revise accordingly the design standards and guidelines for more safety-conscious road and road safety facilities design based on the abovementioned factors, as well as based on accident analysis and assessment of relevance between the accident and road facilities.

(ii) Issues of the Program

- (1) Road network development with appropriate road function sharing
 - Systematic development of arterial roads, sub-arterial roads and collector roads according to local characteristics
- (2) Enhancement of traffic control to respond to local characteristics and the road function
 - To minimize traffic noise in residential and commercial areas of black spots
 - To promote traffic control according to function and roles of each road
- (3) Promotion of smooth and comfortable road traffic, and road accident prevention measures on general roads
 - Road safety facilities and traffic control facilities development
 - Development of road facilities and traffic control facilities to enhance smooth traffic
 - Development of facilities to increase driver's level of comfort
 - Development of safety facilities to prevent railway crossing accident
- (4) Review of design standard considering traffic and local characteristics
- (5) Review of design standard considering motorcycle traffic, bicycle and pedestrians
- (6) Review of design standard considering variety of financial sources of urban and local governments and traffic safety level
- (7) Promotion of design standard and its applicable application
- (8) Unifying the design standards and preparation of instruction manuals
- (9) Preparation of standard drawings

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- (1) Short-term
 - Publication of standard design drawings
- (2) Medium-term
 - Installation of traffic control system for cities
 - Establishment of research and development institute for the design standard and guideline
- (3) Long-term
 - Reduction of traffic accident at railway crossing by 50%.

- Publication of integral design standards

(iv) Program Components

(1) Systematic road network development with appropriate function sharing

Status of road network development in Vietnam is developing and systematic road network development based on traffic demand and roadside land use must be promoted to achieve national development policies as well as securing fundamental traffic safety.

Share of traffic accidents occurring on local residential roads has been increased and lack of systematic road network is deemed as the major factor that leads to this situation. Therefore, systematic improvement of roads shall be promoted to ensure appropriate role sharing among different types of roads including high-standard arterial road and local residential streets in Vietnam, as follows:

- To develop systematic road networks consisting of various roads ranging from arterial road to local residential streets aimed at facilitating separation of traffic among automobiles, bicycles, pedestrians, etc. to improve traffic flows.
- To attempt redesigning of traffic flow to sift as much through traffic as possible to arterial road, for the purpose of improving the living environment at residential zones surrounded by arterial roads, or commercial zones that have a large volume of pedestrians. This measure is intended to implement systematic improvement of arterial roads, local access roads and streets for the exclusive use of pedestrians as well.

Project for Facilities Development:

- (a) Safety facilities improvement for roads along residential areas
- (b) Systematic road network improvement in residential and commercial zones
- (c) Systematic road network development

(2) Enhancement of traffic control in accordance to local characteristics and road function

It is necessary to improve as well the traffic regulation in Vietnam; thus, development and examination of more strategic traffic regulation to contribute to the alleviation of traffic accident related to other traffic safety improvement measures. Moreover, existing traffic regulation shall be enhanced to ensure their suitability against traffic accidents based on analysis of the actual conditions of each classified roads, including their road side conditions, road geometry, status of traffic safety facilities, and conditions of traffic flow and volume.

- To review and make any necessary revisions on existing restrictions, including speed limits, the rule to prohibit crossing the lane line for passing on the left for securing traffic safety and ensure smooth traffic on arterial road by taking into account the road structure, status of traffic safety facilities and traffic conditions.

- To enhance traffic regulation for each cases of through traffic road, local community traffic road, and pedestrians and bicycles traffic road with the development of an effective mix of existing traffic regulations.

Project for Facilities Development

- (a) Improvement of traffic regulations and operation in accordance with local conditions
- (b) Traffic regulation improvement for arterial road

(3) Promotion of smooth and comfortable road traffic, and road accident prevention measures on general roads

Regulation of traffic flow contributes not only to mitigation of traffic congestions but also in the alleviation of traffic accident since collision often occurs when traffic flow becomes complicated. Typical traffic accidents in Vietnam are caused by speeding, illegal overtaking and lane swerving and careless driving such as reckless darting from inner roads. Therefore, appropriate traffic safety countermeasures shall be promoted to minimize the occurrence of traffic accidents and to ensure a safe, smooth and comfortable traffic. Some of these proposed countermeasures are as follows:

- Introduction of necessary traffic safety facilities, including road signs, median strips, stopping lanes for vehicles, road lamps, guardrails, and pedestrian facilities when needed to ensure safety of pedestrians
- Decreasing the number of intersections; grade separation in crossings to prevent traffic accidents and reduce traffic congestion at and around intersections
- Introduction of intelligent transportation system (ITS) such as sophisticated traffic control systems which uses new information technologies for simulation, real-time control and communications network to appropriately respond to the changing traffic characteristics.
- Installation of service roads that would offer better and safer access from inner roadside zones; establishment of green zones taking into consideration the actual status of traffic flow, functions of each road and actual status of road use, including the conditions of roadside zones.
- With the country's rapid economic growth comes increasing rate of motorization and number of trips that includes long distance traffic which is mostly consisted of large vehicles such as container trucks and commuter buses. And these long distance trips are generally made on arterial roads which, of course, are also used for ordinary inter-city traffic. Therefore, to improve both safety and comfort of arterial road network usage, installation of rest facilities for drivers and passengers and introduction of comprehensible road signs shall be proposed.
- Alleviation of traffic accidents between train and motor vehicles is a very unique and urgent issue on national highways because the railway network in Vietnam was developed mostly alongside national roads. Thus, most of the accidents occur at non-signalized or uncontrolled railway crossings as

well as illegal railway crossings.

- Promotion for installation of passing lanes particularly on arterial roads connecting to urban districts and rest facilities such as “road stations”.
- Introduction of user-friendly road traffic information systems such as traffic monitoring cameras, vehicle sensors, other traffic information systems that allow drivers to obtain accurate information promptly, and traffic information boards and signs in foreign languages to respond as well to the rising number of foreign nationals traffic participants.
- Closure of illegal railway crossings, installation of warning signals at railway crossings and installation of a fixed barrier at crossing points where traffic accident between train and other vehicles frequently occur.

Project for Facilities Development

- (a) Railway crossing improvement
- (b) Service road development on residential areas and urban sections
- (c) Traffic control and information system development for inter-city road
- (d) Traffic signal and control system development
- (e) Intersection improvement
- (f) Passing lanes and road station development for inter-city road
- (g) Traffic safety facilities improvement

(4) Review of design standard considering traffic and local characteristics

The road design standards in Vietnam including 22TCN-273-01 mainly target traffic characteristics of car transportation and have less consideration of motorcycles, which, however, consist of 90% of traffic volume. Meanwhile, accidents involving motorcycles were estimated at 72% in 2001, which may have include accidents caused by structures of roads designed according to the existing design standard. The difference between car drivers' and motorcycle riders' eyes, starting and stopping functions and gyrating features requires fundamentally different design standards. In integrating such standards, priority should be given to vulnerable traffic participants such as pedestrians, bicycle and motorcycle riders to be able to address the alarmingly rising number of traffic accidents involving these vulnerable road users (40% in 2001). Additional facilities considering land use and characteristics of pedestrians should be installed and standard of networking of such facilities should be prepared.

Although there is still lesser number of traffic accidents in the rural than in the urban areas, many of these traffic accident cases may have been caused or affected by road structure. Especially in mountainous areas, most cases were caused by narrow width, insufficient sight distance, small radius curve, steep slopes, and lack of guardrails and traffic signs. In addition, construction of roads in mountainous areas is more expensive and given the budgetary constraints, the design standards could not be strictly followed. Thus, flexible measures of road design would be prepared based on the existing standards

and considering desirable road structure in mountainous areas.

The following measures are suggested to respond to the abovementioned issues:

- Review of design standard particularly to integrate considerations for motorcycle, bicycle and pedestrian traffic.
- Review of design standard taking into consideration the various financial sources of urban and local governments and traffic safety level.

Project for Institutional Development

- (a) Design standards and guideline improvement based on Vietnam's unique traffic characteristics
- (b) Design standards and guideline improvement based on regional characteristics and budgetary situations

(5) Promotion of design standard and its applicable application

Design standards on road facilities cover most of relevant facilities. However, this is revised to include the additional decisions on new standard which is issued very often. Thus, road design engineers intend to prepare a unified, integrated standard, which would enable them to document a historical account of the revisions made as well as the changing strategies, and therefore increase the effectiveness of design works. In addition, the existing standards only include figures without any background explanation and instruction to support decision making process of engineers. To address this situation, an accompanying instruction manual of the existing standards should be prepared. For example in Japan, the road design standard stipulated by the road law and the instruction manual was issued including explanation of backgrounds and strategies of each standard. This helps road design engineers in implementing their work efficiently and in upgrading design techniques. In addition, central and local governments issue the standard designs of road facility, which are commonly used, to promote quality improvement and capacity building of road design.

The following measures are suggested to respond to the abovementioned issues:

- Unifying the design standards and preparation of instruction manuals
- Preparation of standard drawings

Project for Institutional Development

- (a) Integration of design standards and development of design standard instruction manual
- (b) Standard design drawings development

Table 3.4.4 presents a summary of the highway traffic safety facility enhancement program components, estimated cost, and implementation plan.

Table 3.4.4 Highway Traffic Safety Facility Enhancement Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)															Total Cost (M US\$)
	2008-2010			2011-2015					2016-2020							
	1	2	3	1	2	3	4	5	1	2	3	4	5			
4. Highway Traffic Safety Facility Enhancement Plan																
1) Systematic road network development <i>[Practical Design Standards/Guidelines Preparation for Traffic Safety]</i>																
2) Design standards and guideline improvement based on Vietnam's unique traffic	5.0	5.0	5.0													
3) Design standards and guideline improvement based on regional characteristics and budgetary situations	5.0	5.0	5.0													
4) Integration of design standards and development of design standard instruction				5.0	5.0	5.0										
5) Standard design drawings development <i>[Improving Traffic Safety Management Origination/Institution System]</i>						5.0	5.0	5.0								
6) Improvement of traffic regulations and operation in accordance with local conditions	1.3	1.3														
7) Traffic regulation improvement for arterial road <i>[Promoting Smooth/Comfortable Road Traffic]</i>		1.3	1.3													
8) Railway crossing improvement	15.0	15.0	15.0													
9) Service road development on residential areas and urban sections				10.0	10.0	10.0	10.0	10.0								
10) Traffic control and information system development for inter-city road				25.0	25.0	25.0	25.0	25.0								
11) Traffic signal and control system development	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0								
12) Intersection improvement	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6		
13) Passing lanes and road station development for inter-city road										5.0	5.0	5.0	5.0	5.0		
14) Traffic safety facilities improvement <i>[Improving Traffic Flow in Residential/Commercial Area]</i>	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		
15) Safety facilities improvement for roads along residential areas				10.0	10.0	10.0	10.0	10.0								
16) Systematic road network improvement in residential and commercial zones										20.0	20.0	20.0	20.0	20.0		
<i>Sub-total:</i>	<i>85.9</i>	<i>87.1</i>	<i>85.9</i>	<i>109.6</i>	<i>109.6</i>	<i>114.6</i>	<i>109.6</i>	<i>109.6</i>	<i>59.6</i>	<i>59.6</i>	<i>59.6</i>	<i>59.6</i>	<i>59.6</i>	<i>59.6</i>	<i>1,110.0</i>	

Source: JICA Study Team.

5) Urban Bypass Development Program

(i) Objectives of the Program

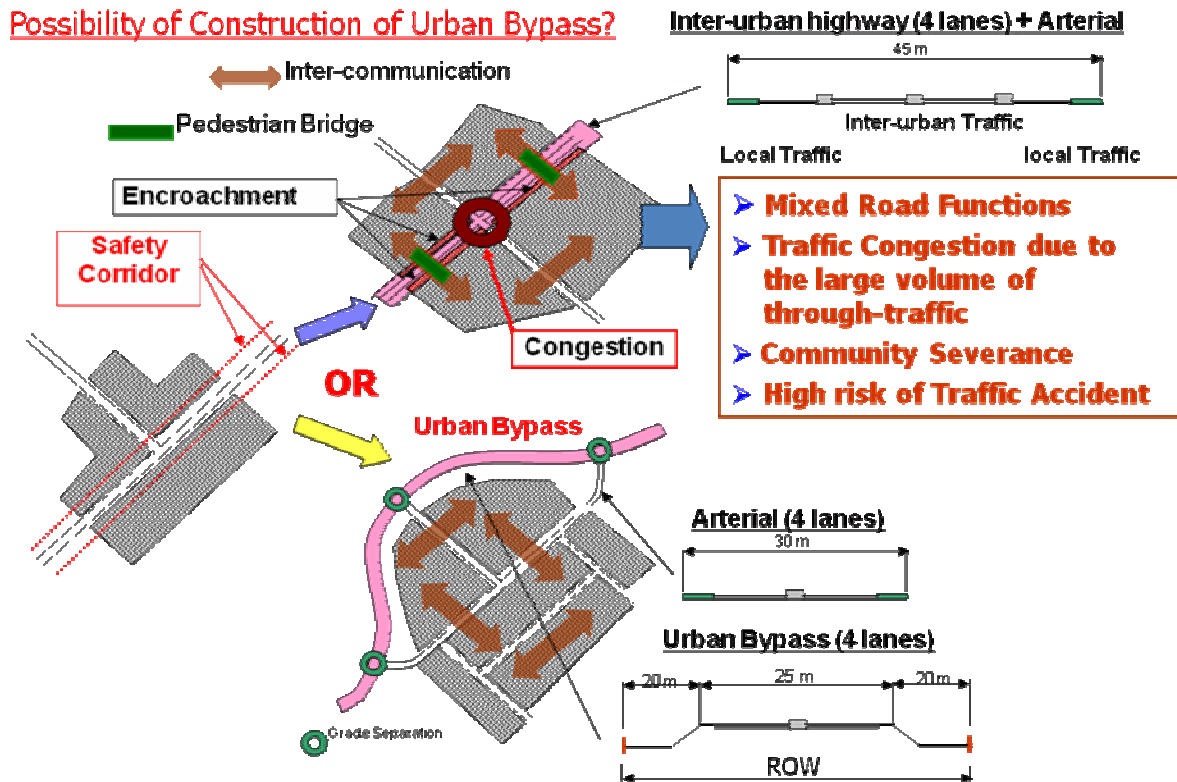
Traffic congestions in urban areas are getting serious due to increase in traffic volume and lack of adequate roads. Moreover, this causes deterioration in the living environment by increasing traffic volume passing through the residential areas. This condition is primarily due to delay of systematic road network development and disparity in the land use and road function with traffic safety consideration.

Therefore, the development of a systematic road network should be promoted to reduce accidents particularly on roads in residential areas and to protect the living environment of surrounding areas.

(ii) Issues of the Program

- Road network development with appropriate road function sharing
 - Reducing transit traffic volume by systematic road network development
- Urban bypass will play a significant role for the modernized road transport system in Vietnam. In the near future, most of the urbanized areas will need a new urban bypass. Therefore Traffic Safety Corridor Development program and this urban bypass development program shall be examined carefully to determine which will be the more feasible option. Figure 3.4.1 illustrates advantages and disadvantages of these alternatives.

Figure 3.4.1 Comparison Between Widening of Existing National Highway and Construction of Urban Bypass



(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- Medium-term
 - Ring road and bypass development in five cities

(iv) Program Components

(1) Systematic road network development with appropriate function sharing

Status of road network development in Vietnam is developing and systematic road network development based on traffic demand and roadside land use must be promoted to achieve national development policies as well as securing fundamental traffic safety.

Share of traffic accidents occurring on local residential roads has been increased and lack of systematic road network is deemed as the major factor that leads to this situation. Therefore, systematic improvement of roads shall be promoted to ensure appropriate role sharing among different types of roads including high-standard arterial road and local residential streets in Vietnam, as follows:

- To promote the development of bypasses, small-scale bypasses and ring roads to restrain the entry of through traffic and disperse traffic effectively, with the ultimate objective of preventing excessive traffic congestion and frequent occurrence of traffic accidents in urban areas.

Project for Facilities Development: Ring road and bypass development

Table 3.4.5 presents a summary of the urban bypass development program component and implementation plan.

Table 3.4.5 Urban Bypass Development Program Component and Implementation Plan

Program Item	Annual Required Cost (M US\$)										Total Cost (M US\$)						
	2008-2010			2011-2015					2016-2020								
	1	2	3	1	2	3	4	5	1	2		3	4	5			
5. Urban Bypass Development Plan																	
1) Ring road and bypass development																	

Source: JICA Study Team.

6) Vulnerable Road User Accident Prevention Program

(i) Objectives of the Program

Traffic accidents involving vulnerable road users and cars accounted for 40% in 2006, with this number still increasing. Pedestrians and bicycle riders, vulnerable participants in road traffic with high risk to serious damage caused by traffic accidents, should be protected. However, safety facilities for these vulnerable users have not been sufficiently installed in many road sections, with some sections not even completely passable to them. While sidewalks in urban areas may be considered well developed, many of these are not interconnected. Crossing facilities have not been installed except for those in junctions with traffic lights. Thus, pedestrians have to cross the roads under very dangerous situations. While bicycles are still considered to be an important mode of transport for daily activities, especially in the rural areas, bicycle lanes are still not properly designated on roads which are often causes of traffic bottleneck and accidents. Therefore, to ensure safety of vulnerable road users, appropriate facilities for pedestrians and bicycle riders should be prioritized.

(ii) Issues of the Program

- (1) Development of safe pedestrian space
 - To ensure safety of pedestrians and to promote separate traffic
 - To ensure safety on school zones of kindergartens and primary schools
- (2) To separate car traffic from light vehicles and to develop facilities for the light vehicles
 - To ensure safety of bicycle riders and to promote separate traffic

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- (1) Short-term
 - Installation of pedestrian lanes along school roads located on national highways
- (2) Long-term
 - Reduction on the number of fatalities in residential and commercial areas in five cities

(iv) Program Components

(1) Development of safe pedestrian space

Strong policy on people-oriented concept introduction for road infrastructure development is essential in consideration of present undesirable road environment for vulnerable road users. There is a lack of road facilities that segregate motorized vehicle and vulnerable road users, which are usually installed only on heavy pedestrian traffic way, and this makes it particularly hazardous especially on commune road of primary school and kindergarten pupil. Taking into consideration the above condition, the following measures shall be implemented:

- To promote development of walkways along school routes to ensure the safety of school or preschool children walking to elementary schools and kindergartens. Also the examination of standards and guidelines for facilities installation and selection.
- To implement improvements of walkways at residential or commercial districts where there is high-risk of traffic accidents involving pedestrians to ensure the safe, comfortable use of road for pedestrians, and promote removal of wire poles from arterial roads for the purpose of securing safe and comfortable walking spaces.

Project for Facilities Development

- Pedestrian facility improvement along school routes
- Pedestrian facility improvement for high-risk accident areas

(2) Separation of car traffic and development of facilities for light vehicles

To improve overall environment for the use of bicycles such as exclusive bicycle lanes and networks to facilitate the safe, smooth use of bicycles as a mode of transport by clarifying the positioning and role of bicycles as an urban transport facility and suitable for urban structures.

Project for Facilities Development: Exclusive bicycle lane facility development

Table 3.4.6 presents a summary of the vulnerable road user accident prevention program components, estimated cost, and implementation plan.

Table 3.4.6 Vulnerable Road User Accident Prevention Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)															Total Cost (M US\$)
	2008-2010			2011-2015					2016-2020							
	1	2	3	1	2	3	4	5	1	2	3	4	5			
6. Vulnerable Road User Accident Prevention Plan																
1) Pedestrian facility improvement along school routes	10.0	10.0	10.0													30.0
2) Pedestrian facility improvement for high-risk accident areas	10.0	10.0	10.0													30.0
3) Exclusive bicycle lane facility development				5.0	5.0	5.0										15.0
<i>Sub-total :</i>	<i>20.0</i>	<i>20.0</i>	<i>20.0</i>	<i>5.0</i>	<i>5.0</i>	<i>5.0</i>										<i>75.0</i>

Source: JICA Study Team.

7) Expressway Safety Development Program

(i) Objectives of the Program

Traffic safety measure assessment for expressways should consider other unexpected driving characteristics which can cause traffic accidents such as high-speed driving, swerving and merging as well as high-speed overtaking of drivers in Vietnam. Thus, a proactive assessment of traffic safety measures on the expressway is very important.

(ii) Issues of the Program

- (1) Road network development with appropriate road function sharing
 - Systematic development of arterial roads, sub-arterial roads and collector roads according to local characteristics
- (2) Promotion of road accident prevention measures on expressways
 - Development of safety facilities to prevent accidents due to uncharacteristic traffic behaviors on expressways
 - Introduction of advanced traffic control system for expressways

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- (1) Short-term
 - Completion of traffic safety measures guidelines for expressway.
- (2) Medium-term
 - Installation of ETC system for all developed expressway.

(iv) Program Components

(1) Systematic road network development with appropriate function sharing

Status of road network development in Vietnam is developing and systematic road network development based on traffic demand and roadside land use must be promoted to achieve national development policies as well as securing fundamental traffic safety.

Share of traffic accidents occurring on local residential roads has been increased and lack of systematic road network is deemed as the major factor that leads to this situation. Therefore, systematic improvement of roads shall be promoted to ensure appropriate role sharing among different types of roads including expressways, high-standard arterial road and local residential streets in Vietnam, as follows:

- To promote the development of a safer expressway which has lower rates of traffic accident fatalities and injuries compared to a general road, and to facilitate usage of the expressway.

Project for Facilities Development: Expressway network development

(2) Enhancement of traffic control in accordance to local characteristics and road function

It is necessary to improve as well the traffic regulation in Vietnam; thus, development and examination of more strategic traffic regulation to contribute to the alleviation of traffic accident related to other traffic safety improvement measures. Moreover, existing traffic regulation shall be enhanced to ensure their suitability for traffic accidents based on analysis of the actual conditions of each classified roads, including their road side conditions, road geometry, status of traffic safety facilities, and conditions of traffic flow and volume.

- To examine existing traffic regulations operated in other countries to ensure traffic safety and smooth traffic for expressways by taking into consideration the road structure as well as transport characteristics in Vietnam. In addition, lessons learned from existing expressways shall also be reviewed.

Project for Institutional Development: Traffic regulation development for expressways

(3) Promotion of road accident prevention measures on expressways

The expressway network development in Vietnam is still considered at an initial stage. The network has been planned by the Government of Vietnam based on road functions which are different from other road categories such as accessibility and regulated speed. Since traffic accident prevention perspectives different from other road categories is necessary, systematic improvement of traffic safety facilities on expressways from the comprehensive implementation of traffic safety measures perspective should urgently be developed in Vietnam.

- Development of expressway traffic safety measures guideline based on traffic accident analysis of accidents which have occurred on NH-1 or other high-grade roads, including accidents which may have occurred usually during rainy days or night time. Appropriate measures, thus, such as installation of guardrails to reinforce median strips, road lamps, self-luminous delineators, high-function pavement, and high-visibility road lines shall be included in the guideline with proper application method.
- Promoting use of Electronic Toll Collection (ETC) System to mitigate traffic congestion and improve convenience for expressway users.
- Formulation of efficient cooperative mechanism between traffic police and VEC to maintain traffic safety on the expressway with reference to best practices implemented in other developed countries.

Project for Institutional Development

- (a) Establishment of efficient cooperation body between VEC and traffic police for expressway traffic control
- (b) Traffic safety measures guidelines development for expressways

Project for Facilities Development: Advanced traffic control system (ETC) development for expressways

Table 3.4.7 presents a summary of the expressway safety development program components, estimated cost, and implementation plan.

Table 3.4.7 Expressway Safety Development Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)										Total Cost (M US\$)				
	2008-2010			2011-2015					2016-2020						
	1	2	3	1	2	3	4	5	1	2		3	4	5	
7. Expressway Safety Development Plan															
1) Expressway network development															
2) Establishment of efficient cooperation body between VEC and traffic police for expressway traffic control	2.5														2.5
3) Traffic regulation development for expressways		1.3	1.3												2.5
4) Traffic safety measures guidelines development for expressways	2.5	2.5	2.5												7.5
5) Advanced traffic control system (ETC) development for expressways				20.0	20.0	20.0	20.0	20.0							100.0
<i>Sub-total:</i>	<i>5.0</i>	<i>3.8</i>	<i>3.8</i>	<i>20.0</i>	<i>20.0</i>	<i>20.0</i>	<i>20.0</i>	<i>20.0</i>							

Source: JICA Study Team.

8) Road Work Traffic Safety Development Program

(i) Objectives of the Program

Inadequate road maintenance often leads to traffic accident. For example, the total length of gravel pavement and unpaved road sections on national roads and provincial roads in 2006 is 10,743km or about 26% of total. Gravel pavement and unpaved road sections are likely to be potential traffic accident spots due to unstable structural characteristics and slippery surface conditions during rainy season. Lack of proper maintenance causes hazardous situation such as pothole and limited sight distance. Even in asphalt-paved road sections, about half of these sections are constructed with DBST (Double Bituminous Surface Treatment) pavements which are also susceptible to become uneven if not properly maintained. Therefore, adequate and periodic assessment of road maintenance system improvement is also necessary to ensure traffic safety and sustainability of roads.

(ii) Issues of the Program

- (1) Development of efficient road maintenance system and satisfactory implementation
 - Improvement of road maintenance method
 - Facilitation of comprehensive road maintenance management system
 - Development of accident prevention measures during road construction

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- (1) Short-term
 - Completion of road maintenance database and comprehensive management system development for national highways.

(iv) Program Components

(1) Development and satisfactory implementation of efficient road maintenance system

To maintain road safety and level of comfort on roads, periodical monitoring

and repair as well as prompt improvement for damaged road is necessary. And for effective road maintenance, utilization of a road inventory database is very important as well as advanced pavement maintenance management system which is able to conduct long-term maintenance plan including investment and maintenance work schedule based on pavement structure data and cumulative passage axle load.

VRA introduced HDM-4, an advanced pavement maintenance management system developed by WB, and this has been utilized for pavement maintenance and management for national highways. Several foreign-assisted pilot projects by WB and ADB have also initiated development of road inventory database for national highways. However, despite efforts on and development of the road maintenance sector, road management authorities at local government levels still use the classic road maintenance management method despite acknowledgment of advantages of the advanced road maintenance management system.

For example, asphalt pavement is commonly applied in Vietnam. However, in general, the cost of repairing asphalt pavement damage is rapidly increased after its life cycle period. Instead, economical pavement maintenance contributes higher cost-savings in the long-term and road maintenance can be achieved by implementation of optimum periodic maintenance based on scientific pavement life cycle analysis and economic evaluation.

Thus, to develop a road maintenance system for national highways, it is important that the computerized road inventory database be completed and the local governments should be introduced and encouraged to use the advanced pavement maintenance system.

During ongoing works for road maintenances and road constructions, some road sections are usually temporarily un-passable which result in traffic congestions and sometimes, traffic accidents in cases where appropriate countermeasures are not applied. Unfortunately, effective and uniform countermeasures during road maintenance and construction are not adequately being taken in Vietnam. Thus, it is necessary that appropriate regulations and guidelines as well as institutional framework for safety measures during road construction be developed.

Project for Institutional Development

- (a) Regulation and guidelines development for safety measures during road construction and maintenance
- (b) Road maintenance data base and comprehensive management system development for national highways

Table 3.4.8 presents a summary of the road work traffic safety development program components, estimated cost, and implementation plan.

Table 3.4.8 Road Work Traffic Safety Development Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)										Total Cost (M US\$)				
	2008-2010			2011-2015					2016-2020						
	1	2	3	1	2	3	4	5	1	2		3	4	5	
8. Road Work Traffic Safety Development Plan															
1) Road maintenance database and comprehensive management system development for national highways	2.5	2.5													5.0
2) Regulation and guidelines development for safety measures during road construction and maintenance	7.5	7.5													15.0
<i>Sub-total :</i>	<i>10.0</i>	<i>10.0</i>													

Source: JICA Study Team.

9) Traffic Safety Project Monitoring and Maintenance Program

(i) Objectives of the Program

The successful implementation of the traffic safety might depend on the road management authority's capacity for planning and implementation, as well as stability of financial resources. However, as human and financial resources are limited in local authorities, it might be difficult to plan and implement an effective and efficient road safety mitigation measure. Thus, the introduction of capacity development for planning, implementation and monitoring system and the establishment of the executing agencies both at the central and local governments is proposed.

(ii) Issues of the Program

- (1) Capacity development on planning and implementation of traffic safety environment improvement
 - Capacity development on planning and implementation of local government
 - To ensure financial sources for traffic safety environment improvement in local government

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- (1) Medium-term
 - Completion of monitoring and evaluation unit arrangement

(iv) Program Components

(1) Capacity development on planning and implementation of traffic safety environment improvement

The road management authorities are responsible for the abovementioned traffic safety mitigation measures. The successful implementation might depend on their capacity for planning and implementation, as well as stability of financial resources. However, as human and financial resources are limited in local authorities, it might be difficult to plan and implement an effective and efficient road safety mitigation measure. To address this issue in England, for example, the local government establishes the Local Transport Plan which includes traffic strategy and investment plan. The central government evaluates and monitors it. Based on the results of post evaluation, the

subsidies are allocated. Such system can enhance the capacity of local government for road policy implementation and bring the benefit of efficient financial management.

Thus, the introduction of capacity development for planning, implementation and monitoring system and the establishment of the executing agencies both at the central and local governments is proposed. To ensure transparency of the evaluation process and to develop planning capacity of local governments, there should be an independent organization in charge of the above tasks.

Project for Institutional Development

- (a) Monitoring and evaluation system for local planning development
- (b) Establishment of a monitoring and evaluation unit of road safety plan

Table 3.4.9 presents a summary of the traffic safety project monitoring and maintenance program components, estimated cost, and implementation plan

Table 3.4.9 Traffic Safety Project Monitoring and Maintenance Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)															Total Cost (M US\$)
	2008-2010			2011-2015					2016-2020							
	1	2	3	1	2	3	4	5	1	2	3	4	5			
9. Traffic Safety Monitoring and Maintenance Plan																
1) Establishment of a monitoring and evaluation unit of road safety plan				15.0	15.0											30.0
2) Monitoring and evaluation system for local planning development							1.7	1.7	1.7							5.0
<i>Sub-total:</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>15.0</i>	<i>15.0</i>		<i>1.7</i>	<i>1.7</i>	<i>1.7</i>							

Source: JICA Study Team.

10) Urban Road Traffic Safety Plan Development Program

(i) Objectives of the Program

Traffic safety issues in urban areas are closely related with road facility, traffic characteristics, road side land use, as well as diversified utilization of road space independently and/or compositively. Therefore, examination of urban traffic safety measures should be implemented using comprehensive perspectives.

Major issues of urban traffic safety in Vietnam are mix traffic by high motorcycle traffic, insufficient development of traffic control system such as traffic signals and traffic signs, frequent illegal parking on sidewalks and carriageways, undesirable driving and walking behaviors, and lack of traffic enforcement and institutional framework development. These are very common traffic safety issues especially in Southeast Asian cities. Moreover, modal transition from motorcycle to 4-wheel motor vehicles, which can be anticipated to happen in the near future, and lack of road infrastructure may result in serious traffic congestions and further deterioration of traffic safety environment. Therefore, timely implementation of comprehensive traffic safety measures to meet both rapidly increasing rate of urbanization and motorization is essential based on lessons learned from other big Asian cities such as Bangkok and Manila. Traffic demand management activities such as encouraging modal shift from private to public transportation will be key countermeasures to address these urban traffic problems.

(ii) Issues of the Program

- (1) Enhancement of traffic control to respond to local characteristics and the road function
 - To promote traffic control according to function and roles of each road
- (2) Promotion of upgrading and efficient traffic signal system development
 - Strengthening of applicability for diversified traffic and traffic accident prevention
- (3) Development of parking space and strengthening of enforcement for illegal parking
 - Development of flexible parking regulations
 - Promotion of parking development plan
- (4) Improvement of traffic demand control
 - Promotion of public transport usage
 - Promotion of time-based traffic control measures (i.e. number coding, etc.) to mitigate congestion during peak hours

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

- (1) Short-term
 - Installation of coordinated traffic signal system in congested corridor in cities
 - Reduction of illegal parking in frequent illegal parking corridor in cities
- (2) Medium-term
 - Installation of area wide and flexible signal control system in cities
- (3) Long-term
 - Introduction of park and ride system in Ho Chi Minh and Hanoi

(iv) Program Components

(1) Enhancement of traffic control in accordance to local characteristics and road function

It is necessary to improve as well the traffic regulation in Vietnam; thus, development and examination of more strategic traffic regulation to contribute to the alleviation of traffic accident related to other traffic safety improvement measures. Moreover, existing traffic regulations shall be enhanced to ensure their suitability for traffic accidents based on analysis of the actual conditions of each classified roads, including their road side conditions, road geometry, status of traffic safety facilities, and conditions of traffic flow and volume.

- To promote systematic traffic regulation in urban areas and to attempt appropriate distribution of traffic flow and volume in order to ensure safe functional urban traffic; traffic regulation to secure the safety and priority of public buses.

Project for Institutional Development: Traffic regulation improvement for urban road

(2) Promotion of upgrading and efficient traffic signal system development

Improvement of traffic flow control on urban road is key issue to obtain an efficient and safe road network. To adequately meet the changing traffic environment characteristics in Vietnam brought about by urbanization, introduction of new and upgrade of existing traffic control systems needs to be implemented.

- Improvement of functions of traffic signals in regulating traffic flow efficiently with the introduction of coordination system among parallel signals and multi functional signal phasing system.
- Introduction of signal control systems to promote area wide and accurate traffic control facilities such as signal phasing and traffic flow monitor and remote signal controller together with installation of traffic detector on important intersections.

Project for Facilities Development

(a) Coordinated traffic signal system development

(b) Area wide and flexible signal control system development

(3) Development of parking space and strengthening of enforcement for illegal parking

Parking is becoming a serious problem especially in the urban centers due to rapid increase of 4-wheel motor vehicles and lack of parking facility development. It is essential that strategic parking development be implemented in the urban areas to maintain urban functions as well as to promote smooth traffic flow through the elimination of illegal parking. Therefore, promotion of comprehensive measures for car parking based on local traffic conditions and regional needs shall be implemented.

- Review on current parking regulations vis-à-vis traffic volume on an hourly, daily, and weekly basis of traffic flow and volume. And from a location perspective, focus will be on characteristics of roadside land use such as school and market in each section of the roads to establish a more organized parking practice to meet traffic conditions and parking demand.
- Introduction of illegal parking prevention systems at intersections where illegal parking or stopping makes significant disturbance to traffic flow.
- Development of parking improvement programs in each local level. In addition, campaigns to promote development of parking zones, especially in those areas affected by heavy traffic congestion.
- Establishment of new regulations to instruct developers of high-rise buildings to have appropriate and adequate parking facilities for their tenants and clients. In addition, assistance to private sectors in their development of parking facilities through the utilization of various institutions.

- Promotion of developing the “park and ride” facilities by constructing parking facilities to control excessive inflow of vehicles from suburban areas to urban areas and to prevent traffic congestion.

Project for Facilities Development

- (a) Illegal parking prevention facilities development

Project for Institutional Development

- (a) Efficient parking regulation system development
- (b) Formulation of regulations making parking facility compulsory in every building construction
- (c) Comprehensive parking system plan development

(4) Improvement of traffic demand control

Traffic demand management (TDM) is a restrictive measure to be applied to private modes of transportation. The purpose of TDM are to discourage the use of private modes and encourage the use of public transportation and time-wise and space-wise leveling of traffic volume to expand traffic capacity through promotion of park and ride, introduction of staggered working hours/school hours or a flex--time system, etc. Promotional campaigns will also be utilized through various forms of mass media and educational activities to facilitate the wide use of TDM measures.

- Implementation of measures to promote bus use, including the introduction of exclusive bus lanes or priority bus lanes, bus-priority traffic signal system, and park and ride facilities to congested roads in urban area.
- Introduction of staggered working hours/school hours and traffic congestion information services to disperse traffic volume during peak hours.

Project for Facilities Development

- (a) Public transport prioritizing facilities development

Project for Institutional Development

- (a) Promotion of public transport usage facilitation
- (b) Measures promoting traffic dispersion during peak hour
- (c) Park and ride system development

Table 3.4.10 presents a summary of the urban road traffic safety plan development program components, estimated cost, and implementation plan.

Table 3.4.10 Urban Road Traffic Safety Plan Development Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)															Total Cost (M US\$)
	2008-2010			2011-2015					2016-2020							
	1	2	3	1	2	3	4	5	1	2	3	4	5			
10. Urban Road Traffic Safety Development Plan																
1) Traffic regulation improvement for urban road		1.3	1.3													
<i>[Upgrading Traffic Signal System]</i>																
1) Coordinated traffic signal system development	15.0	15.0	15.0	15.0	15.0											
2) Area wide and flexible signal control system development				10.0	10.0	10.0	10.0	10.0								
<i>[Strengthening Parking Space Management]</i>																
3) Illegal parking prevention facilities development	5.0	5.0														
4) Efficient parking regulation system development	12.5	12.5														
5) Formulation of regulations making parking facility compulsory in every building				2.5												
6) Comprehensive parking system plan development			5.0	5.0	5.0											
<i>[Improving Traffic Demand Control]</i>																
7) Public transport prioritizing facilities development	15.0	15.0	15.0													
8) Promotion of public transport usage facilitation	5.0	5.0	5.0													
9) Measures promoting traffic dispersion during peak hour				2.5	2.5	2.5										
10) Park and ride system development				5.0	5.0	5.0	5.0	5.0								
<i>Sub-total:</i>	<i>52.5</i>	<i>53.8</i>	<i>41.3</i>	<i>40.0</i>	<i>37.5</i>	<i>17.5</i>	<i>15.0</i>	<i>15.0</i>								<i>272.5</i>

Source: JICA Study Team.

11) R&D, Human Resources Development Program

(i) Objectives of the Program

The present road management structure does not have any department or unit responsible for safety control of road facility. Thus, in addition to abovementioned human resource development, measures to be implemented should be sustainable as well as efficient to be able to respond to increasing traffic volume and accidents. Therefore, the establishment of an implementing unit in the road management organization which will be exclusively responsible for traffic safety mitigation shall be proposed.

To increase efficiency and capacity of the traffic safety improvement system, the following support mechanisms shall be developed:

- Establishment of the R & D facilities including database system
- Promotion of professional human resource for traffic safety area

(ii) Issues of the Program

- Enhancement of legislations regarding obligation and responsibility of relevant authorities, and education on and expansion of RSA.
- Establishment of licensing/accrediting system and human resource development mechanism for the auditors.
- Utilization of database supporting the auditing, development of the supporting tools and establishment of the responsible agency.
- Scientific traffic accident analysis, evaluation of the effectiveness of RSA implementation and cost-effectiveness, and feedback mechanism for the results to be appropriately utilized.
- Post auditing monitoring to follow up the results and establish the responsible agency.
- Scientific support for design standard preparation

- Establishment of a research and development institution to support design standard preparation and institutional development
- Utilization of the black spot improvement database, development of supporting tools and establishment of the executing agency
- Follow-up on the results of post monitoring of the black spot improvement

(iii) Milestone of the Program Implementation

Following milestones are proposed as the goals of the program improvement:

(1) Short-term

- Conduct of RSA pilot project and establishment of RSA database
- Complete involvement of relevant agencies into RSA

(2) Medium-term goal

- Establishment of research and development institute for the design standard and guideline
- Establishment of qualifying and licensing/accrediting system for RSA auditor
- Establishment of new traffic safety research center

(3) Long-term goal

- A 50% reduction of annual average traffic accident fatalities on RSA-audited road

(iv) Program Components

(1) Utilization of the black spot improvement database, development of supporting tools and establishment of the executing agency

To increase efficiency of the black spot improvement system, the following support mechanisms will be developed:

- Establishment of the common black spot data system
- Preparation of the black spot data formats and database
- Shared-access among traffic police of the above black spot database and traffic data.

These support mechanisms will be developed upon the establishment of the executing agency which will then conduct the research and development activities such as traffic accident analysis, effectiveness analysis and cost-effectiveness analysis, as well as development of the traffic safety mitigation guideline.

(2) Follow-up on the results of post monitoring of the black spot improvement

Post monitoring of black spot improvement is important to evaluate the effectiveness of the implemented measures as well as to assess on the progress of the road management authority. The above executing agency shall be in-charge of developing the monitoring system to evaluate the progress and effectiveness of the black spot improvement, shall provide feedback to the road

management authority and should have the capacity to provide very technical assessments as well as recommendations on traffic safety policy to the road management authority.

Project for Institutional Development

- (a) Development of support mechanisms to increase efficiency of the black spot improvement such as database and guideline
- (b) Promotion of establishment of an independent implementing unit in the road management organization which shall be responsible for traffic safety mitigation
- (c) Legal establishment of research institution on black spot improvement

(3) Establishment of licensing/accrediting system and human resource development mechanism for the auditors

As a road planning and design engineer, the RSA auditor should be able to judge whether the target road development plan and the design are in accordance with the design standard. Although the target plan fulfills the requirements, he/she should consider traffic safety to prevent frequent accidents at a particular point because of road structure or design. Such capability can be acquired through case studies on road structure, traffic condition and surrounding situation of the places where traffic accidents have occurred aside from road planning and design works. In the United Kingdom, since RSA was legally compelled since 1991, the issue of establishing a database of information and knowledge regarding training of the auditor team and the auditing cases has been raised. Recently, traffic safety indicators were developed to measure and improve traffic safety in accordance with the outputs of road assessment program to evaluate traffic safety of each characteristic of road based on the existing road safety survey. Taking into consideration the varying local characteristics of road transportation in Vietnam, implementation of a pilot project introducing road management planning technique which is similar to RMS (Road Management Strategies) of the United Kingdom may be proposed. Under this pilot project, diagnosis, development of countermeasure and assessment of traffic problems and accidents will be carried out to train RSA auditors as well as to establish the knowledge database. This may contribute in the further enhancement and upgrading of skills of RSA auditors.

Project for Institutional Development: Licensing/accreditation system for the RSA auditor

(4) Utilization of database supporting the auditing, development of the supporting tools and establishment of the responsible agency

The existing databases of traffic accidents of the traffic police and road inventory of the road management authority support RSA. The traffic accident database includes information on when and where the accident happened, who were involved, and what was the outcome of the accident. However, it does not record condition and sketch or diagram of the site to describe the

accident. The inventory database also does not provide detailed information on situation of intersections, witness accounts or evidences as well as traffic violations/charges filed. Given such situation, it might be difficult to take appropriate countermeasures to be able to prevent and forecast traffic accidents. However, these existing databases can already be utilized to categorize the accidents and prepare countermeasures at a certain level. And when the new database for RSA and a risk management map are established, the existing databases may then be linked to analyze correlation among relevant factors.

In addition, a new institution responsible in studying traffic safety measures and maintaining the existing and proposed traffic safety-related databases may also be proposed.

(5) Scientific traffic accident analysis, evaluation of effectiveness of RSA implementation and cost-effectiveness, and feedback mechanism for the results to be appropriately utilized

To promote understanding of effectiveness of RSA for traffic accident prevention, it is important to scientifically analyze traffic accidents, study on effectiveness of RSA implementation and cost-effectiveness nationwide. To implement these analyses, the database mentioned in (iv) and accumulated data on effectiveness of RSA are essential. In addition, the proposed new institution also abovementioned should be closely coordinating with the other concerned agencies, establish a feedback mechanism regarding the implementation of RSA and provide knowledge and data to RSA auditors.

(a) Post audit monitoring of the results and establishment of the responsible institution

Monitoring after traffic safety audit is important for the proposed responsible institution to analyze the effectiveness of RSA implementation in general and to determine the status of RSA implementation among concerned agencies in particular. In addition, this proposed responsible new institution should monitor and assess implementation and effectiveness of RSA in each road management authorities and provide them feedback. At the same time, it should be able to provide recommendations on the preparation of the traffic safety policy for road management authorities and policy evaluation.

Project for Institutional Development: Establishment of new institution in charge of traffic safety analysis

(6) Scientific support for design standard preparation

Many of road design standards in Vietnam such as 22TCN-273-01 were patterned after those of other developed countries' design standards. However, those design standards were prepared in accordance with the unique natural condition, socioeconomic status, financial situation and transport situation in each of the respective countries. Their road design standards have been widely discussed by experts in the industry, government and academe, in cooperation and coordination with relevant specialized institutes and research

and development units. And its feasibility has been assessed on various perspectives.

Therefore, for the road design standards of Vietnam to become relevant to the country, it should also be prepared in accordance with the unique characteristics of Vietnam's traffic sector, natural environment, socioeconomic status, and financial standing.

To respond to the need to prepare a relevant road design standard for Vietnam, it is proposed that a research and development institution to support design standard preparation and institutional development be established.

Based on the above discussions, the following is the summarized countermeasures for each issue.

Project for Institutional Development: Establishment of research and development institute for the design standard and guideline improvement.

Table 3.4.11 presents a summary of the R&D, human resources development program components, estimated cost, and implementation plan.

Table 3.4.11 R&D, Human Resources Development Program Components and Implementation Plan

Program Item	Annual Required Cost (M US\$)															Total Cost (M US\$)
	2008-2010			2011-2015					2016-2020							
	1	2	3	1	2	3	4	5	1	2	3	4	5			
11. R&D, Human Resources Development Plan																
1) Establishment of research and development institute for the design standard and guideline improvement [Black Spot Improvement]		25.0	25.0													
2) Development of support mechanisms to increase efficiency of the black spot improvement such as database and guideline		2.5	2.5													
3) Promotion of establishment of an independent implementing unit in the road management organization which shall be responsible for traffic safety mitigation				2.5	2.5											
4) Legal establishment of research institution on black spot improvement [Traffic Safety Audit System Improvement]							1.7	1.7	1.7							
5) Establishment of new institution in charge of traffic safety analysis					15.0	15.0										
6) Setting-up and strengthening of coordination and cooperation mechanism among concerned agencies				2.5	2.5											
7) Licensing/accreditation system for the RSA auditor						10.0										
<i>Sub-total :</i>		27.5	27.5	20.0	30.0	1.7	1.7	1.7								
Total :	202.1	255.9	203.4	222.9	230.4	173.8	160.4	160.4	60.4	60.4	60.4	59.6	59.6	1,910.0		

Source: JICA Study Team.

3.5 Implementation Strategies

The fundamental issues that should be considered for the smooth and effective implementation of the proposed measures are the following:

- Establishment of numeric targets
- Development of institutional infrastructure including organization system and guidelines which will be needed to ensure the sustainable implementation, and
- Human and financial resource development

Subsequently, the following targets are proposed in the succeeding subsections.

1) Targets of Engineering Sector in Action Program

- All black spots on the major national highway network (under VRA) shall be

removed by year 2020, and reduced by 50% (as compared to year 2007) in 2012.

- Compared to 2007 figures, the number of fatalities caused by motorcycle accidents on major national highway network will be reduced by 30% by 2012 and 50% by 2020.
- Compared to 2007 figures, the number of accidents involving pedestrians and bicycle users on major national highway network will be reduced by 30% by 2012 and 50% by 2020.

2) Prioritization of Traffic Safety Measures

(i) Infrastructural Measures for National Road

The following physical infrastructural measures focused on national and urban roads shall be implemented:

- Strengthening and promoting black spot treatment / improvement.
- Formulating and implementing the national road traffic safety strengthening project to consist of the following countermeasures:
 - Intersection improvement in accordance with design standards to be specified.
 - Lane separation by vehicle type in accordance with design standards to be specified.
 - Upgrading safety facility on railway crossing.
 - Installing vehicle weight station to mitigate accident related to vehicle overloading.
 - Strengthening countermeasure for night-time accident on high traffic section and high risk section.
 - Arrangement of pedestrian path, bicycle path and pedestrian crossing facilities at necessary section based on specified design criteria.

(ii) Safety Measure on Expressway Development

With several construction projects ongoing or in the detailed design stage, establishment of sufficient institutional traffic safety framework is thus required. In this regard, the following institutional arrangements should be established:

Establishment of a responsible and supervising department in MOT.

Formulation of traffic and operation rules/regulations on the expressway.

Formulation of a traffic operation/management standard and a technical standard of traffic safety facility/device by MOT.

Establishment of traffic safety assurance framework on expressway project or operation with the use of traffic safety audit system.

(iii) Institutional Arrangement to backup Safety Measure

The following institutional measures will be developed to support physical infrastructure countermeasure:

(1) Black Spot Improvement

- Establishment of practical criteria to identify black spot.
- Conduct of capacity development program for black spot management under WB and JBIC Traffic Safety Project and formulation of a trainer training framework.
- Development of a technical guidebook for black spot treatment practice.

(2) Traffic Safety Audit System

- Establishment of an executive guideline to coordinate with WB Traffic Safety Project and conduct of capacity development program under WB Traffic Safety Project.
- Establishment of road construction work traffic safety guideline for the safety audit during construction stage.
- Formulation of a technical manual for traffic safety audit to support design works by the engineers and practice by auditors.

(3) Safety Planning / Designing / Monitoring

- Establishment of a traffic safety benefits evaluation guideline to include damage loss circulation method.
- Establishment of practical technical criteria for intersection design, providing lane separation for different vehicle types, safety facility for pedestrian and bicycle in accordance with traffic conditions, and formulation of phasing manual of traffic signal system aimed at enhancing safety measures on urban roads.
- Formulation of traffic safety monitoring/evaluation framework after conduct of physical infrastructural measure.

(4) Proper Maintenance System on Major National Highway

- Introduction of long-term performance base maintenance system on major national highway.
- Implementation of a pilot performance base maintenance project on selected section which has high risk of accident and establishment of performance standard/requirement for maintenance work.

(5) Traffic Safety Corridor Restoration

- Formulation of a prioritized process to implement traffic safety corridor restoration.
- Establishment of institutional framework such as a legal system to guide the enforcement of clearing and relocation of illegal dwellers. In addition, establishment of a public consultation system to support implementation of traffic safety corridor restoration.

4 SAFE DRIVING AND VEHICLE SAFETY DEVELOPMENT STRATEGY

4.1 Planning Approach and Priority Issues

1) Identification of Priority Issues

The following table shows a summary of the major issues on transport operation system. Basically, these issues arise due to the fact that the present transport operation system is not always responsive or in accordance with the present and fast changing road traffic conditions. Due to the rapidly increasing rate of motorization, road traffic situation becomes more and more complicated brought about by mixed traffic. It is therefore necessary to develop a suitable system accordingly.

Table 4.1.1 Summary of Major Issues on Transport Operation System

Driver Licensing & Testing	Overall	
	Improvement of Textbook Contents	The textbook should be improved to ensure that its contents are more comprehensible and informative on traffic safety concerns.
	Periodic Driver Training	Periodic training for drivers should be required in accordance with revisions on the new road traffic law and emerging road environment.
	Periodic Re-training for Lecturer & Examiner	Continuing skills and knowledge upgrade for instructors is necessary. Despite advancing technology available for M/C and automobiles at present, there is neither an adequate re-training provided nor a periodic training system in place.
	Responsive to Future Demand	Transport operation has to meet the future demand and thus an adequate system will be required.
	Insufficient Training Fee	Training fees collected from drivers seem inadequate and must therefore be adjusted accordingly especially since costs related to driving are increasing (such as fuel prices).
	M/C	
	Improvement of Training Curriculum	The required number of hours for driver training for M/C is remarkably low compared with training for car drivers.
	Improvement of Examination Method	Technical examination only tests the basic driving skill. Therefore, an improvement of the examination method is required.
	For drivers of less than 50 cc class	It is expected that high school student drivers will increase in the near future. Hence, an appropriate licensing or instruction system is necessary.
	Professional Driver (Private or Public Transport Company)	
	Management System for Truck & Bus Driver	Serious traffic accidents which have occurred in the rural areas were caused by truck and bus. It is therefore necessary to develop appropriate countermeasures.
	Vehicle Inspection	Periodic Inspection for M/C
Inspection Database System		Coordination between VR and traffic police is not adequate. Thus, enhancement of coordination will further contribute to a more efficient system which will uncover cases of protection from illegal inspection, traffic violation, defective parts, etc.
System for Renewal of Registration		Introduction of this system can result to new budget collection which can be very useful in implementing improvements in the transport operation system.

Source: JICA Study Team

2) Planning Approach

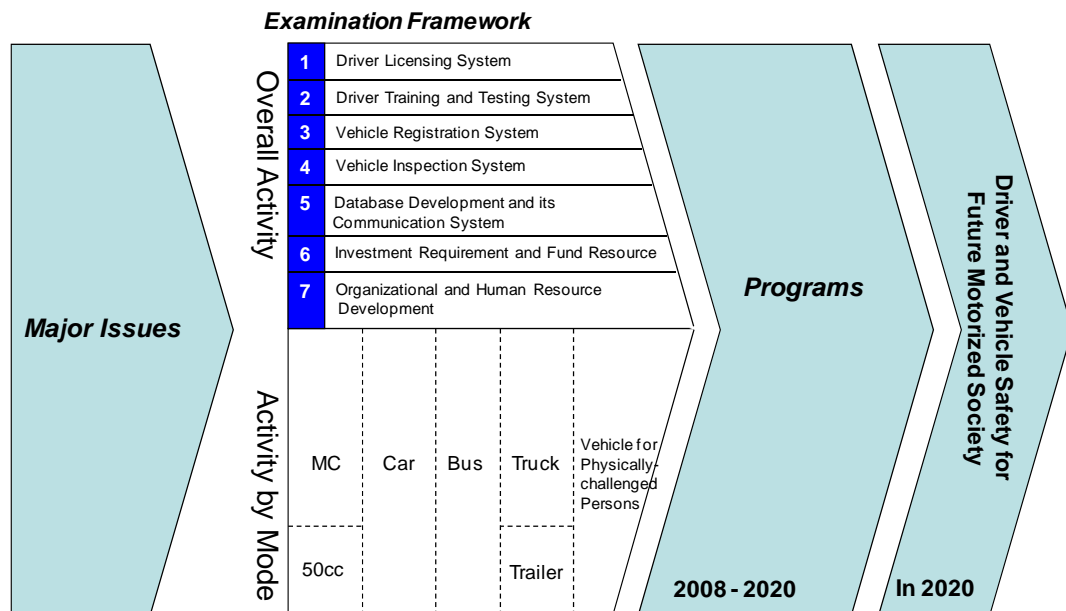
Based on abovementioned issues, an analytical framework is presented in Figure 4.1.1

to achieve target transport operation system for driver and vehicle safety that can accommodate the future motorized society in Vietnam. The overall activities (as indicated by activities 1-7) are the main content and, in addition, different issues by mode are presented which are as important. For example, there seems to be an evolving need for development of countermeasures for drivers of M/C and trailer trucks in the future. Moreover, there is a need for vehicles appropriate for physically-challenged individuals.

Results of this analytical exercise will be selected and programs towards a safe traffic society in the future will be proposed to be developed, as follows:

- 1) Basic License Renewal System
- 2) License Renewal System based on Traffic Violation
- 3) Promotion of M/C Licensing in the Rural Areas
- 4) License System for M/C under 50cc
- 5) License System for Beginner Drivers
- 6) Comprehensive Program for Driver Training and Testing
- 7) Safe Driving Management System for Transport Companies
- 8) Vehicle Registration Renewal System
- 9) Technical Inspection for M/C
- 10) Vehicle Countermeasures for People with Disability
- 11) Human Resource Development for Driving Instructors

Figure 4.4.1.1 Framework of Transport Operation System



Source: JICA Study Team

4.2 Driver Licensing System for Future Motorized Society

The road traffic situation is dramatically changing due to rapid motorization which seems to continue up to 2020. For that same reason, the road environment of the driver is also expected to continuously be changing. Thus, a revision of the road traffic law is

necessary to address these developments. In addition, it is proposed that a sustainable driver licensing system be developed to achieve a safe traffic society.

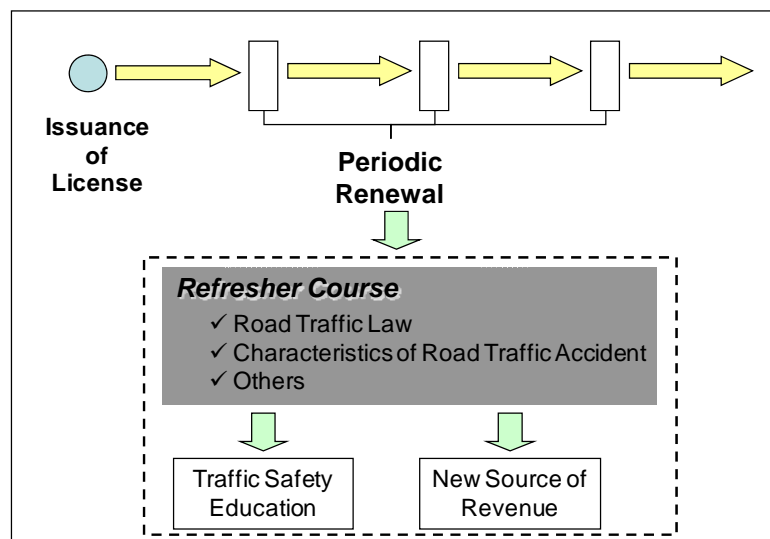
1) License Renewal System

(i) Basic License Renewal System (1st Step)

It is proposed that the standard periodic license renewal system be implemented not only for B1 class and above but as well as from A1 to A4 classes to ensure efficient management of licensing system. And during this renewal period, the drivers will be provided a refresher course through compulsory attendance in a lecture class on road traffic law, traffic accident characteristics, etc. It is expected that these lecture classes will contribute to the prevention of dangerous and delinquent driving behaviours.

Regarding the required facilities to implement this proposed conduct of refresher course during the license renewal period, the use of existing driver training and testing centers will be maximized. However, new infrastructure and equipment shall also be required which may be funded from collected fees by the license renewal system.

Figure 4.4.2.1 Introduction of Refresher Course during Periodic License Renewal



Source: JICA Study Team

(ii) License Renewal Based on Traffic Violation (2nd Step)

As a second step, the suggested content of the refresher course and renewal period should be based on traffic violations committed by the driver. For a non-delinquent and law-abiding driver, for example, the validity of the renewed license may be longer while required number of hours to attend a refresher course is shorter than a driver with a record of traffic violations. Moreover, a suitable beginner drivers' period for young drivers will be set.

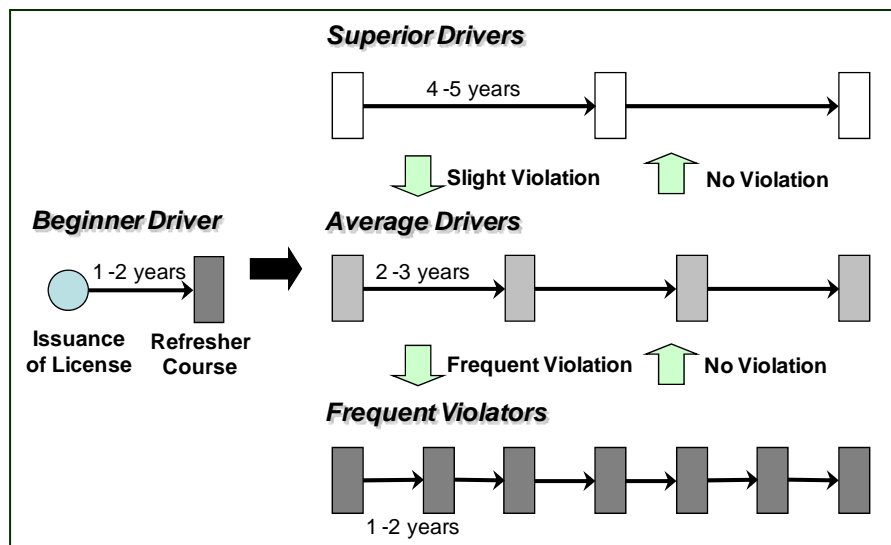
For the effective implementation of this proposed license renewal system based on traffic violation, a driver violation database system should be developed and collaboratively implemented by the VRA, PTSC, driver training center, DOT, and the Police. Before such system is implemented, however, an in-depth study on driver's

characteristics and personality in relation to traffic violations should be conducted. Thus, this system is being proposed for the medium- to long-term.

(iii) Option to Introduce a License with Integrated Chip (IC)

It is further recommended that a built-in IC on the license be introduced to further contribute in the efficiency of database management and traffic control, as well as to prevent forgery of licenses. However, introduction of this high technology system will require high costs, which will then require a significant increase in user charges. Thus, a further study should be done after the successful implementation of the proposed license renewal system based on drivers' traffic violations and delinquency.

Figure 4.4.2.2 Renewal System for Drivers' License Holders



Source: JICA Study Team

(iv) Implementation Plan

(1) Implementation Scheme

The operation and management costs shall be covered by collection charges from the drivers. Responsibilities of concerned organizations are as follows:

- The contents are provided by VRA and NTSC
- PTSC manage and operate this system
- The instructors of driving school are in charge of the lecture class

(2) Implementation Schedule

Table 4.2.1 shows the proposed implementation schedule for the license renewal system. The 2nd step is the development of the traffic violation database system which will be accessible to concerned organizations involved in this proposed license renewal system.

Table 4.4.2.1 Proposed Implementation Schedule for License Renewal System

Key Activity		Year	2008-2010	2011-2012	2013-2015	2016-2020
1 st Step	Preparatory works		■	■		
	Training of Instructors			■		
	Law enactment			■		
	Implementation			■	■	■
2 nd Step	Development of database		■	■	■	
	System design & textbook preparation				■	
	Coordination with concerned organizations			■	■	
	Training of Instructors			■	■	
	Law enactment				■	
	Implementation					■

Source: JICA Study Team

2) Promotion of M/C Driver Licensing in the Rural Areas

(i) Introduction of Mobile Driver Training and Testing Centers

Given the economic growth and rapid motorization in Vietnam, license demand for M/C drivers has been significantly increased not only in the urban areas but also in the rural areas. Despite recent efforts of increasing the number of driver training centers in the country, it is difficult to fully cover the rural areas, particularly in areas with minority groups. Therefore, this proposed mobile driver training and testing centers intend to address this situation by targeting unlicensed M/C drivers in the rural areas. Instructors and necessary training equipments will be brought to the target rural areas where training and testing will be provided prior to licensing by the PDOT.

The presence of some minority groups in the rural areas necessitates that the training content and testing procedures be simplified. In the same manner, given the more complex traffic conditions in the urban areas, a limited coverage of use should be given for licenses issued to members of these minority groups.

It is however proposed that as economic conditions improve in these rural areas where people's literacy skills have significantly improved and rate of attendance in formal education has increased, this mobile driver training and examination service be terminated by 2015.

(ii) Implementation Plan

Table 4.2.2 shows the proposed implementation schedule which indicates at least 5 years for system to be implemented.

Table 4.2.2 Proposed Implementation Schedule for Promotion of the M/C Driver Licensing System in the Rural Areas

Key Activity	Year	2008-2010	2011-2012	2013-2015	2016-2020
	Preparatory works		■ ■ ■ ■ ■ ■ ■ ■ ■ ■		
Instructor education			■ ■ ■ ■ ■ ■ ■ ■ ■ ■		
Implementation				■ ■ ■ ■ ■ ■ ■ ■ ■ ■	

Source: JICA Study Team

3) Licensing System for Drivers of M/C under 50cc

(i) Licensing System Alternatives

Taking into consideration the anticipated future motorized society in Vietnam, the development and implementation of a licensing system for drivers of M/C under 50cc is being proposed. Based on experiences of countries in the region, the following licensing alternatives are listed in Table 4.2.3.

Critical aspect to be considered is the setting of age limit. While there is an increasing concern over traffic accidents among high school students, on the other hand, ensuring these students' mobility is also very important especially in the rural areas.

Table 4.4.2.3 Licensing System Alternatives for M/C under 50cc Institution

Alternative	Alt. 1	Alt. 2	Alt. 3
Enforcement	Same as M/C		Traffic safety education in school
Contents	<ul style="list-style-type: none"> Short course on driving skill and knowledge of road safety and law (2-4 hours) Theoretical examination 		<ul style="list-style-type: none"> Short course on driving skill and knowledge of road safety and law (2-4 hours)
License	Issued		-
Target	At least 16 years old	At least 18 years old (same as other drivers' licenses)	At least 16 years old high school student
Advantage	<ul style="list-style-type: none"> Accident reduction is expected with the acquisition of both driving skills and knowledge as the road user Prevention of accidents among student drivers 		<ul style="list-style-type: none"> All students can acquire driving skills and gain required knowledge. As a result, this can prevent traffic accidents for pedestrians, bicycle users and M/C users.
Disadvantage		<ul style="list-style-type: none"> Decrease in mobility of students (rural area) 	<ul style="list-style-type: none"> Promotes M/C use among students and thus increase chances of traffic accidents Exclusion of non-students

Source: Study Team

The following table summarizes the institutionalized use of M/C under 50cc in Japan, Taiwan, and Thailand where all three countries have introduced licensing system for its use. The contents slightly vary by country. For example, Japan allows licensing for high school students but this is not the case in Taiwan and Thailand. Since 1990, Japan has required attendance to a driving course to be issued a license. As a result, number of traffic accidents caused by M/C under 50cc has

decreased based on the International Association of Traffic and Safety Sciences. Thailand also requires a 2-hour lecture.

Table 4.4.2.4 Comparative Case Study of Institutionalized Use of M/C under 50cc

Country	Japan	Taiwan	Thailand
Content	<ul style="list-style-type: none"> • Eye Test • Theoretical Exam • Driving Skill Course (3 hours) 	<ul style="list-style-type: none"> • Theoretical Exam (30 min.) 	<ul style="list-style-type: none"> • Eye Test • Reaction test • Traffic Law and Safe Driving Course (2 hours) • Theoretical Exam • Driving Skill Test
Age Limit	At least 16 years old	At least 18 years old	
Year Started	1953	1968	-
Remarks	<ul style="list-style-type: none"> • Renewal every 3-5 years (USD25-35) • Compulsory lecture attendance (30min to 2 hours, depending on violation) • Driving skill course was started in 1990. 	<ul style="list-style-type: none"> • Renewal every 6 years (USD7-8) • Content of examination includes traffic rules, signs and regulations 	<ul style="list-style-type: none"> • Renewal every 5 years (USD8)

Source: Study Team

(ii) Implementation Plan

For the long-term, it is suggested that an institutionalized driver licensing system like that for M/C more than 50cc be set-up at the district levels. The content of driver training courses should include driving skills, traffic rules and regulations and accepted moral behavior comparable to experiences from other counties.

Based on joint assessment, discussions and further studies of concerned organizations in the medium-term, the final structure of licensing system for M/C under 50cc will be set-up.

First to be observed is that the actual system will be decided based on the discussion among related organizations during the further investigation in middle term.

In fact, it seems that M/C under 50cc is indispensable for vulnerable road users, especially in rural area. Therefore, the implementation of this kind of system should be carefully investigated to keep up with the times.

4) License System for Beginner Drivers

Based on experiences from developed countries, setting-up of an appropriate system for beginner driver is a very important issue in the future.

The graduated driver licensing scheme (GDLS) is among the effective program to reduce the traffic accidents among young drivers. The statistics in New Zealand show that new drivers, particularly those 20 years of age, are up to three times more likely to be involved in a serious road accident. GDLS was introduced to address this problem in New Zealand, Australia and the USA. Based on the journal of safety research

“Graduated driver licensing: the New Zealand experience”, this scheme has led to significant reductions in accidents both before and after obtaining a driver’s license.

The GDLS is a gradual process of obtaining a full driver’s license which involves the following:

- At least 50 hours of supervised driving during the Learner’s Permit phase
- A two-stage Provisional License (P1 and P2)
- A compulsory Hazard Perception Test to progress from P1 to P2
- Rewards for drivers who do the right thing, and penalties for those who don’t.

The GDLS process is illustrated in Figure 4.2.3.

Figure 4.4.2.3 Graduated Driver Licensing Scheme (GDLS)



Source: Graduated License Scheme by the Government of South Australia, MOT

During implementation of such program, evaluation should be made during the medium- and long-term (after 2013) since appropriateness of program will depend on future traffic accident characteristics.

4.3 Driver Training and Testing System

1) Comprehensive Program for Driver Training and Testing

With the road traffic situation dramatically changing due to rapid motorization and the amendment of the road traffic law, updating and modification of the driver training and testing curriculum is necessary to include safe interaction among all types of road users. It is suggested that the comprehensive program has the following detailed activities:

- Coordination with related organization and private sector
- Preparation of driver training textbook
- Preparation of Manual for professional driver of transport company
- Establishment of instructor education system (training programs)
- Preparation of the new training and testing curriculum for M/C under 50cc
- Preparation of the new training and testing curriculum for Traction Vehicle drivers

- Support for an adequate financial operation of public driver training centre and testing centre

(i) Appropriate for Traction Vehicle Drivers

At present, there is a rapid increase in the export and import container volume at major ports of Vietnam, with annual growth ratio around 11%. This indicates that in the future, the volume of container trailer handling the 20 feet by 40 feet container shall also rapidly increase on primary roads. Thus, appropriate driver license class and adequate driver training program will be required since this kind of vehicle has different characteristics compared with other vehicles.

(ii) Organization of a Working Group

Since this involves inter-sectoral issues related to road administration, enforcement and education, it is therefore suggested that a working group composed of concerned agencies be organized for driver re-training and testing system. This working group will act as a support committee, with MOT and VRA as co-chairs. Committee members shall be composed of representatives from NTSC, MOF, MOET, PTSC, driver training centers, police, police academy, and private individuals with related experience or academic standing.

Assigning a representative from each member agency to be in charge for their respective concerned sectors will ensure the development of an effective and practical system. For example, MOET will develop textbooks to enhance driving skills and prevent traffic accidents based on traffic accident characteristics data provided by the Police Academy.

(iii) Implementation Plan

Implementation schedule is shown in Table 4.3.1. Periodic development and updating of textbooks and manuals for professional drivers shall be required at least every 5 years.

Table 4.4.3.1 Proposed Implementation Schedule for Driver Training and Testing

Key Activity	Year	2008-2010			2011-2012			2013-2015			2016-2020		
Preparatory works		■	■	■									
Coordination with concerned organization(s)													
Textbook preparation													
Manual preparation for professional driver													
Development of an Instructor Education system													
New content materials for training and testing for Traction Vehicle													
Adequate financial support to ensure sustainable operation													

Source: JICA Study Team

Although the budget will be sourced from the government at the beginning, proceeds from sale of new drivers' textbooks shall eventually finance the program.

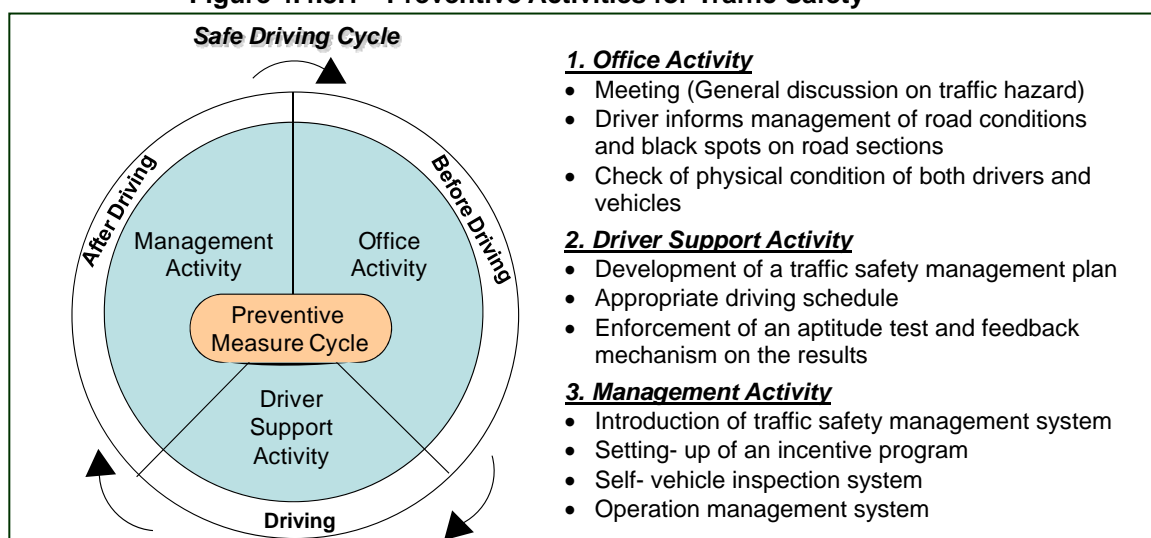
2) Drivers' Education in Transport Companies

To ensure safe driving behavior in the future motorized society, a safe driver management system targeting the transport companies shall be required. Traffic accidents are usually caused by overloading (both of cargo and passenger), over speeding and driver errors (due to driver fatigue resulting from extended driving hours) by buses and trucks which are owned and operated by transport companies. It is therefore expected that this system can contribute to the adequate driver education and management in transport companies.

(i) Safe Driving Management System for Transport Companies

It is suggested that business operation law will be amended and enhanced to include traffic accident prevention activities. The preventive activities can be classified into three categories (Figure 4.3.1). The first is the office activity before the employees are allowed to drive. This includes a general discussion on traffic hazards on road and a check on both physical condition of driver and condition of vehicle, including cargo loading state (checking of overloading). Second category is driver support activity when driving a vehicle. A transport company should understand the drivers' physical limitations such as over fatigue due to extended hours of driving, the required period of rest and sleep, and therefore has to develop an appropriate driving schedule. Third category is management activity. The company may develop internal systems to encourage safe driving, such as incentive programs that includes driver reward and punishment.

Figure 4.4.3.1 Preventive Activities for Traffic Safety



Source: JICA Study Team

(ii) Implementation Plan

Table 4.3.2 shows that introduction of this system to transport companies shall require an experimental period, particularly in large-scale transport companies. And if the system will be deemed successful, transport companies will be obliged to

adopt the system. In addition, the implementation of this new system shall require the transport companies to designate a driver manager and a short training course will be prepared for them.

Table 4.4.3.2 Proposed Implementation Schedule for Safe Driving Management System for Transport Companies

Key Activity		Year	2008-2010	2011-2012	2013-2015	2016-2020
1 st Step	Preparatory works		■			
	Coordination with concerned organizations			■		
	Development of manual for transport companies		■			
	Experimental study			■		
2 nd Step	Request for the creation of a new law			■		
	Short course for driver manager			■		
	Enactment of a new law				■	
	Implementation					■

Source: JICA Study Team

4.4 Vehicle Registration System

1) Present Vehicle Registration System

The present vehicle registration system in Vietnam does not require renewal of registration. Thus, it is not unusual for vehicles to be owned by second owners. With the second-hand car ownership anticipated to further increase in the future, renewal of registration will be very important and should therefore be required. This will enable the police traffic enforcers to identify a traffic violator with the use of the camera system.

2) Proposed Vehicle Registration Renewal System

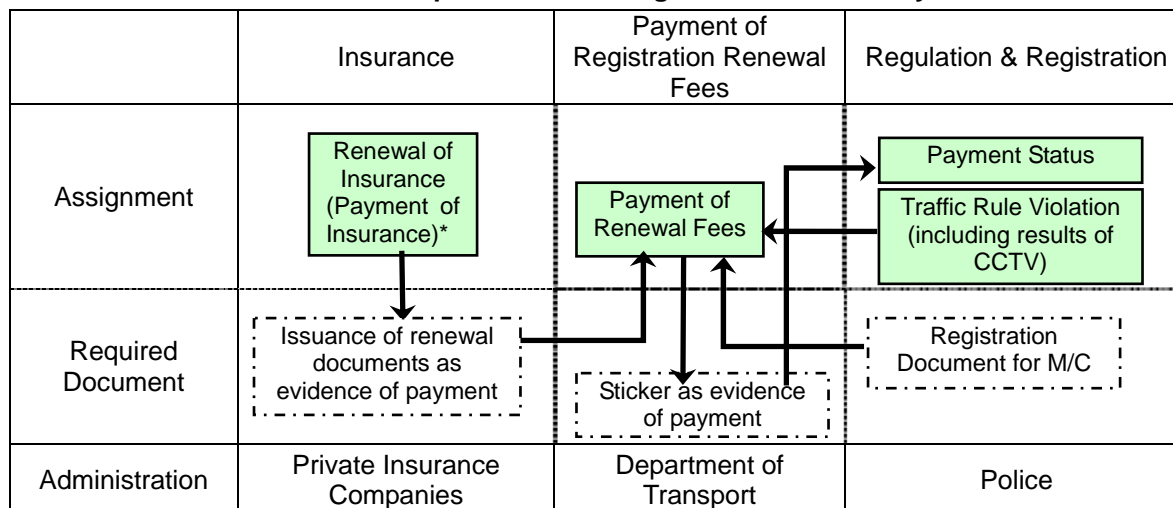
Table 4.4.1 shows the proposed system for the renewal of motor vehicle registration as discussed below:

- All vehicle owners must renew registration of their vehicles periodically (every year or every two years). Previously-owned vehicles should be renewed by the second-hand owners.
- Upon renewal of registration, the vehicle owner shall receive a registration sticker which will serve as proof of registration and payment of annual registration fees. This will allow the traffic enforcers and the police to control and monitor traffic violators by checking the registration stickers.
- All vehicle owners and/or users shall be compelled to obtain an automobile third party liability insurance. During the renewal of vehicle registration, the DOT shall require the presentation of the original receipt as proof of payment for this insurance coverage. This liability insurance will prove to be very useful to both traffic violator and victim during cases of serious traffic accidents.
- The “user charge” approach is essentially justifiable. The collected fees will be used

to fund road construction and road safety measures.

- Insurance system can also contribute to the collection of minor accident data since insurance companies' coverage is based on traffic accident situations.
- Transport department can monitor the exact number of vehicles.

Table 4.4.4.1 Proposed Vehicle Registration Renewal System



* Automobile Third Party Liability Insurance
Source: JICA Study Team

Japan and Thailand have both introduced this system vehicle registration renewal system, cost of insurance of which is shown in Table 4.4.2. For example, in the case of Thailand, the transport department has been collecting USD3-4 from each M/C user every year. As compared with Thailand, the renewal fee in Japan is higher. And during the height of Japanese economy, these collected fees served as road fund for road construction and traffic safety measures. Thus, it seems natural to conclude that this system can encourage both economic growth and road safety.

Table 4.4.4.2 Vehicle Registration Renewal Fees in Thailand and Japan

		Annual Insurance (Approx. in USD)	Annual Registration Renewal Fees (Approx. in USD)	Regulation & Registration (USD)
M/C	Thailand	10	3-4	-
	Japan	50-80	20	2,700*- 4,500**
Car	Thailand	45	At least 10 ***	Check at the vehicle inspection
	Japan	140	100/ton	
Business Car	Thailand	-	At least 20***	
	Japan	290****	50/ton	

* Maximum penalty in case driver does not put the sticker on number plate.

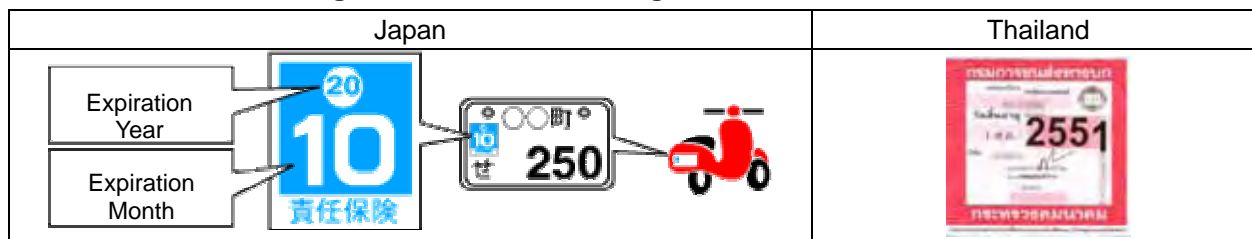
** Maximum penalty in case driver did not renew the previous year.

*** Price is set by vehicle size.

**** Case of 2 ton truck

Sample vehicle registration stickers are shown in Figure 4.4.1.

Figure 4.4.4.1 Proof of Registration Sticker for M/C



Source: <http://jibai.exblog.jp/>

Implementation Plan: Consensus building among government and concerned organizations will be the priority during the first two years of implementation. The insurance system set-up and the required laws will then be the next major issues to be considered. Proposed implementation schedule is presented in Table 4.4.3 .

Table 4.4.4.3 Proposed Implementation Schedule for Vehicle Registration Renewal System

Key Activity	Year	2008-2010	2011-2012	2013-2015	2016-2020
Preparatory works		■			
Coordination with related organizations		■			
Development of system		■			
Setting-up of the insurance system			■		
Enactment of a new law				■	
Implementation					■

Source: JICA Study Team

4.5 Vehicle Inspection System

An adequate vehicle inspection system for cars was already introduced in Vietnam. Thus, the issue at present is how the quality of motorcycles will be managed. Compared with other Asian countries, M/C user in Vietnam is significantly higher which makes it more imperative that quality of M/C be guaranteed. In addition, the number of vehicles for persons with disability is also an important issue to address in a traffic safety society.

1) Technical Inspection for M/C

It is proposed that the technical inspection system for M/C will be enforced to particularly target old M/C.

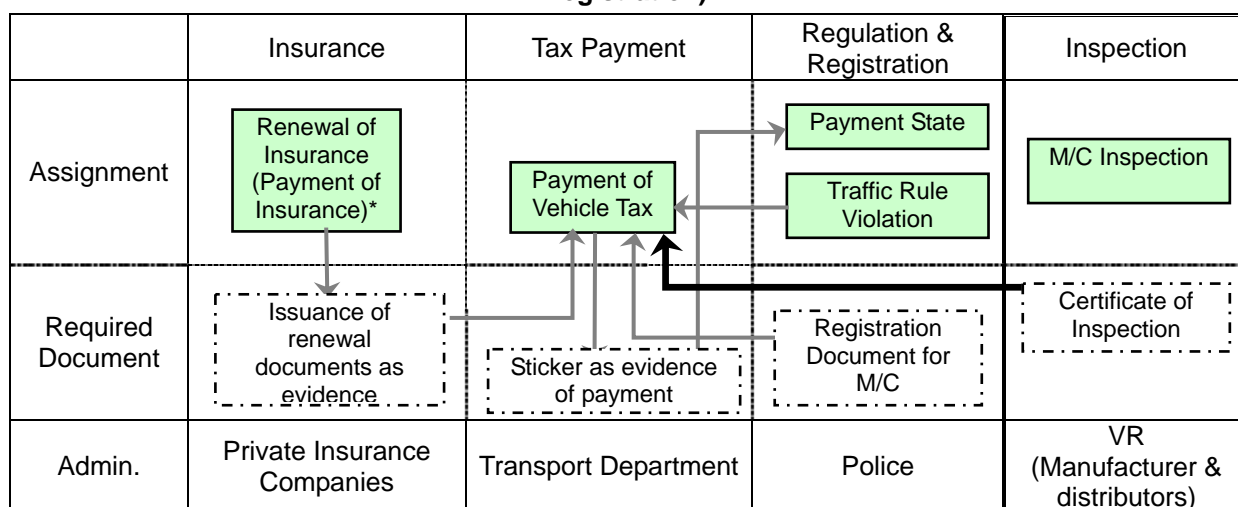
- After the fifth renewal of M/C registration, the M/C holders must have their M/C inspected at an authorized inspection unit and submit the certification of inspection upon renewal of registration. In this case, the designated M/C manufacturer and other M/C distributors may be designated as inspection units. The proposed framework is shown in Table 4.5.1.
- The M/C technical inspection standard should be established by the VR. During this time, the environmental standard for exhaust gas control can also be established.

This inspection system is presently being implemented in Thailand, with cost of inspection amounting to approximately USD2.

In Japan, inspection is required only for 250cc class M/C, with the method of inspection

similar to that of car inspection. In addition, since the number of M/C is significantly lower than the number of cars, this does not seem to be a critical issue in Japan.

Table 4.4.5.1 Proposed Technical Inspection System for M/C (from 5th renewal of registration)



* Automobile Third Party Liability Insurance
Source: JICA Study Team

(i) M/C Inspection Items

Compared with cars, items for inspection in M/C are very uncomplicated such as exhaust gas, klaxon, back mirror, tire, etc. M/C inspection should therefore ensure that M/C has complied with the installation of a simple system.

(ii) Implementation Plan

This system assumes that the proposed System for Renewal of Vehicle Registration is already being implemented. Thus, it will be more practical and logical that pilot projects targeting big cities such as Hanoi, Haiphong, Danang, and HCMC be conducted initially before nationwide implementation.

Table 4.4.5.2 Proposed Implementation Schedule for M/C Technical Inspection

Key Activity	Year	2008-2010	2011-2012	2013-2015	2016-2020
Preparatory works		■			
Coordination with related organizations		■	■		
Development of system		■	■		
Enactment of a new standard			■		
Instruction to manufacturers & distributors			■		
Enactment of a new law				■	
Implementation				■	■

Source: JICA Study Team

2) Strategies to Improve Vehicle Conditions for People with Disability

It is important to discuss how the condition of vehicles for people with disability can be improved since the safe mobility of people with disability is also an increasingly urgent

issue in the future.

A popular measure is vehicle tax exemption for people with disability. In addition, some preferential treatment may be observed, such as support system for acquiring a driver's license, subsidy for vehicle purchase and modification and parking regulations exemption.

In order to allow vehicle modification, the preparation of a vehicle standard is therefore necessary to include the following: (i) after-sales driver support device, (ii) accelerator by left foot, (iii) winker by foot, (iv) parking brake device, and (v) driver seat special features, among others.

As a 1st step, the organization of a preparatory committee composed of concerned organizations is required. The implementation schedule is shown in Table 4.5.3.

Table 4.4.5.3 Implementation Schedule of Vehicles for People with Disability

Key Activity	Year	2008-2010	2011-2012	2013-2015	2016-2020
Organization of preparatory committee		■			
Assessment of subsidy system			■		
Enforcement of law				■	
Assessment on vehicle standard			■		
Development of vehicle standard				■	
Implementation					■

Source: JICA Study Team

4.6 Organization and Resource Development

1) Function by Organization for Transport Operation Strategy

Compared with the usual traffic safety programs, the proposed programs here will require partnerships among representatives of different sectors (Table 4.6.1). A summary of the functional database management and sharing among partner organizations are shown in Table 4.6.2.

2) Database Development and its System of Access among the Relevant Agencies

Management of databases among relevant organizations responsible for licensing and vehicle registration is very important for the proposed programs. Table 4.6.1 shows the proposed organizational management and level of access to the database system of related organizations. The licensing database should be shared by VRA, DOT and the Police. The vehicle inspection database of M/C should be accessible to VRA and DOT. Implementation of such system will then make it possible to enforce the proposed programs.

3) Fund Generation

(i) New Fund Source

To ensure sustainable enforcement of programs, fund generation activities are necessary. As shown in Table 4.6.2, user fees may be collected such as those from vehicle registration renewal system which can secure large scale funding for the

proposed programs. And with proper budget allocation from this fund source, the proposed programs will be deemed feasible.

(ii) Adjustment of Driver Training Fees

Driver training centers are at present finding it difficult to operate due to rising operation expenses. Thus, training fees should be adjusted in accordance with increases in related expenses such as fuel prices as well as regional disparity.

Table 4.6.1 Proposed Organizations for Transport Operation Strategy

Program	Core Organization		Coordinating Organization	Remarks	
	Management	Operation			
License Renewal System	1 st Step	VRA	DOT	MOET	
	2 nd Step	VRA & MOPS	DOT, Police	MOET	
Promotion of M/C Licensing in Rural Area		VRA	DOT		
License System for M/C under 50cc		VRA	DOT, District office	MOET	Alt. 1 & 2
		MOET	MOET	VRA & DOT	Alt.3
License System for Beginner Drivers		-	-	-	Long-term plan
Comprehensive Program for Driver Training and Testing		VRA		NTSC, MOF, MOET, PTSC, Police, driver training center, testing center, experts in the academe	
Safety Driver Management System for Transport Company		MOT, VRA	Transport Companies	MOH, VR, DOT, MOL	
Vehicle Registration Renewal System	M/C	VRA, MOPS	DOT, District office, Police	Private Insurance Company	
	Car		DOT, Police		
Technical Inspection of M/C		VR	VRA, DOT	M/C Manufacturer, Distributor (Shop)	
Strategies to Improve Condition of Vehicles for People with Disability		VR	VRA	MOH, Support group for people with disability	

Table 4.4.6.2 Database Management and Access Among Concerned Agencies

Kind of Data	Management Organization	Access Organization (Access User)
State Driver License Data	VRA	DOT, PDOT, Police
M/C under 50cc License Data*	DOT	VRA, District office, Police
Traffic Violation Record	MOPS	VRA, DOT
Drivers' License Data of Minority Race	DOT	VRA, District office, Police
Vehicle Registration Data	MOPS, DOT	VRA, VR
Data Related to Renewal of Vehicle Registration Fees	DOT	VRA, Police
Vehicle Inspection Data	M/C	VRA, DOT
	Car	VR
Data on Vehicle for Person with Disability	VR	VRA, MOH
Transport Company Information	MOT, VRA	MOH, VR, DOT, MOL

* This data is including the driver's information and number of professional driver, etc.

** The case of Alt.1 & 2.

Table 4.6.3 New Fund Sources for Proposed Transport Management Programs

Program		Core Organization		Fund Sources
		Management	Operation	
License Renewal System	1 st Step	VRA	DOT, PDOT	Lecture fee
	2 nd Step	VRA & MOPS	DOT, PDOT Police	Lecture fee
Promotion of M/C Licensing in Rural Area		-	-	
Licensing System for M/C under 50cc		VRA	DOT, PDOT	Lecture fee
		MOET	MOET	-
License System for Beginner Drivers		-	-	-
Comprehensive Program for Driver Training and Testing		VRA		Sales from driver text-books and manuals
Professional Driver Safety Management System		MOT, VRA	Transport Companies	-
Vehicle Registration Renewal System	M/C	VRA, MOPS	DOT, District office, Police	Portion of insurance (Automobile liability insurance) Annual Vehicle Registration Renewal Fees
	Car		DOT, Police	
Certificate of Parking Space		-	-	-
Technical Inspection of M/C		VR	VRA, DOT	-
Strategies to Improve Vehicle Conditions for People with Disability		VR	VRA	-

Source: JICA Study Team

4) Human Resource Development

An important component of the organizational and resource development system is the human resource. Thus, if neither the quality nor the quantity of human resources will be enhanced, enforcement of the system will be very difficult.

(i) Establishment of Working Group for Instructor Training

At present, it is still feasible for VRA to directly train instructors/teachers since their number is still manageable. However, the number of instructors needs to be increased by at least 100% in accordance with the forecasted increase in motorization rate by 2020. Thus, the establishment of a working group to address continuing driver education is needed. In particular, focus should be given in education and training of driving instructors, examiners and driver managers of transport companies.

Implementation should start with the preparation of system and contents from 2010 to 2012, followed by the introduction and enhancement of programs to meet the demand after 2012. Highly-qualified experts are expected to play active roles in each sector.

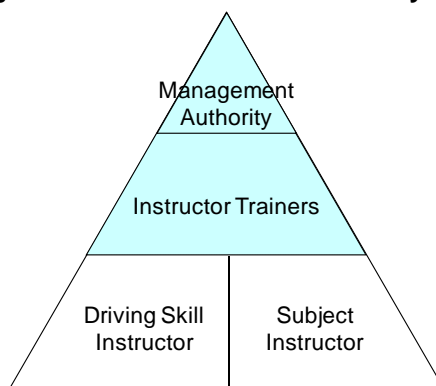
Table 4.6.4 Proposed Implementation Schedule for Human Resource Development

Key Activity	Year	2008-2010	2011-2012	2013-2015	2016-2020
Preparation of system and contents					
Personnel training					

Source: JICA Study Team

One example of human resource development is the establishment of an instructor education system (Figure 4.6.1) where the management authority that centers on VRA will prepare the training system and contents and train instructors (Instructor Trainers) from DOT. The Instructor Trainers will then train a new batch of instructors.

Figure 4.6.1 Instructor Education System



Source: JICA Study Team

4.7 Implementation Strategies

1) Milestone and Goal

The objective in this sector is to establish a comprehensive system that can manage safe driving and vehicle system for the future motorized society in 2020. Accordingly, the milestone and goal by each program is set as shown in Table 4.7.1.

On the driver licensing system, the license renewal system targeting M/C drivers will be implemented until 2012. In addition, the mobile driver training and testing center targeting unlicensed M/C drivers will be introduced to meet the demand particularly in the rural areas. As a long-term strategy, license renewal system based on traffic violations will be introduced to manage the drivers' data and information including the traffic violations they committed. This system is aimed to be operational from 2015.

The driver training programs include updating of training contents and instructor training. Safe driver management system in Transport Companies will be introduced in 2015.

For the vehicle registration and inspection, human resource development, quite new programs for Vietnam will be required to manage safety vehicle to secure budget and to encourage of skilled instructor. Therefore, the first 5 years will be preparation period to establish these systems. And these systems should be introduced in 2015.

2) Examination of a Road Map

The detailed roadmap for safe driving and vehicle safety development strategy up to 2020 (proposed implementation schedule) is shown in Tables 4.7.2 to 4.7.4.

As indicated in Table 4.7.4, budgetary requirements in this sector are in the range of USD50 million for each period up to year 2020, or approximately a total of USD227.8 million up to year 2020.

Table 4.7.1 Milestones and Goals in the Proposed Transport Management Program

Programs		Milestones			Goals
		To 2012 (Short-term)	To 2015 (Medium-term)	To 2020 (Long-term)	
Driver Licensing System for Future Motorized Society	1. Basic License Renewal System	<ul style="list-style-type: none"> Introduction of license renewal system for M/C 			<ul style="list-style-type: none"> To properly manage the licensing database system (including personal traffic violation data) To establish licensing system for various drivers
	2. License Renewal System by Traffic Violation		<ul style="list-style-type: none"> Introduction of license renewal system by traffic violation 		
	3. Promotion of M/C Driver Licensing in Rural Areas	<ul style="list-style-type: none"> Introduction of mobile driver training and testing centers 			
	4. License System for M/C under 50cc				
	5. License System for Beginner Drivers				
Driver Training	6. Comprehensive Program for Driver Training and Testing	<ul style="list-style-type: none"> Textbook revisions and updating Implementation of Instructor training Review of existing system 			<ul style="list-style-type: none"> To encourage safe drivers
	7. Safe Driving Management System for Transport Companies	<ul style="list-style-type: none"> Introduction of safe driving management system 			
Vehicle Registration & Inspection	8. Vehicle Registration Renewal System		<ul style="list-style-type: none"> Introduction of vehicle registration renewal system 		<ul style="list-style-type: none"> To properly manage safety vehicles To secure budget
	9. Technical Inspection for M/C		<ul style="list-style-type: none"> Introduction of inspection system for M/C 		
	10. Strategies to Improve Vehicle Conditions for People with Disability		<ul style="list-style-type: none"> Implement counter-measures 		
Human Resource Development	11. Human Resource Development for Instructors		<ul style="list-style-type: none"> Introduction of periodic instructor education system 		<ul style="list-style-type: none"> To encourage skilled instructors

Source: JICA Study Team

Table 4.7.2 Implementation Schedule for the Proposed Transport Management Program

Programs		Purpose	Target	Implementation Strategy	Milestone				2008-2010	2011-2012	2013-2015	2016-2020	Budget Requirement for 5 years ¹ (M. USD)	Assumed Budget Source ²	Core Agency	Coordinating Agency			
					08-10	10-12	13-15	15-20											
Basic License Renewal System (1 st Step)	Preparatory works	To ensure efficient management of license. To prevent dangerous driving behaviors.	Not only for B1 class and above but as well as A1 to A4 classes.	Car drivers will be provided a refresher course through a lecture class on road traffic law, etc. M/C drivers will be provided a textbook when they renew their license.	Refresher course, textbook								21.9	AB	VRA	MOET			
	Training of Instructors				Training for instructor												VRA	MOET, DOT	
	Enactment of Law				Issue of Decision												AB	MOT, VRA	
	Implementation				Implementation												UC	DOT	VRA
License Renewal System by Traffic Violation (2 nd Step)	Database Establishment	Appropriate driver education will be provided for frequent violators.	Frequent violators	Content of the refresher course and renewal period will be based on traffic violations committed by the driver.	Database system development								7.0	DL	MOPS, VRA	-			
	System design & textbook development				Refresher course, textbook										DL	NTSC, VRA	MOET		
	Coordination with concerned organization(s)				Establishment of committee										AB	MOPS	MOT, VRA, DOT		
	Instructor training				Training for instructor										AB	VRA	MOET, DOT		
	Law Enactment				Issue of Decision														
	Implementation				Implementation												UC	DOT	VRA, MOPS
Promotion of M/C Driver Licensing in the Rural Areas	Preparatory Works	To promote licensing of M/C drivers targeting the rural areas	People in rural areas including minority group	Mobile driver training and testing center provides wider access in obtaining M/C license.	Equipment							1.8	AB, DL	VRA	DOT				
	Instructor education				Training for instructor										AB, DL	VRA	DOT		
	Implementation				Implementation										AB, UC	DOT			
Licensing System for Drivers of M/C under 50cc	Investigation	To reduce the accident caused by drivers of M/C under 50cc.	At least 16 years old	-								-	AB	VRA, NTSC	MOET, DOT				
Licensing System for Beginner Drivers	Investigation	To educate beginner drivers.	Beginner drivers	-								-	AB	VRA, NTSC	MOET, DOT				

¹ This is the budgetary requirement for 5 years (from 2008 to 2012).

² AB: Agency Budget; UC: User Charge; RF: Road Fund; VI: Vehicle Insurance; DL: Development Loan; PS: Private Sector

Table 4.7.2 2 Implementation Schedule for the Proposed Transport Management Program (con't)

Programs	Purpose	Target	Implementation Strategy	Milestone				2008-2010	2011-2012	2013-2015	2016-2020	Budget Req't for 5 years (M. USD)	Assumed Budget Source	Core Agency	Coordinating Agency			
				08-10	10-12	13-15	15-20											
Driver Training and Testing	To meet the demands of changing road traffic conditions due to rapid motorization and the revision of the road traffic law.	All drivers	Revision of driver training design and testing curriculum to include safe interaction with all types of road users.	Committee establishment.								4.3	DL, PS	MOT, VRA	NTSC, MOET			
													DL, PS, AD	MOT, VRA	NTSC, MOET, PDOT			
				Textbook development for driver training											UC	VRA, DOT	MOET	
				Manual devt for professional drivers											UC	VRA, DOT	MOET	
					Training for instructor											DL	VRA, PDOT	MOET
				Textbook devt for traction vehicle driver												DL	VRA, DOT	MOET
				Review of regulation												AB	MOT, MOF	VRA
Safety Driving Management System for Transport Company	To promote the safety driving by the bus and truck, which are owed by the transport company	Driver on transport companies	The content of business operation law will be enhanced from the viewpoint of traffic accident preventive activity.	Committee establishment.								2.4	AB	MOT, VRA				
														AB	MOT, VRA	MOH, MOL, MOET		
				Dev't of driver instruction manual											AB	MOT, VRA	DOT	
					Implementation											AB, PS	MOT, VRA	DOT
					Establishment of short course											AB	MOT	VRA
					Issue of Decision											AB	MOT	VRA
						Implementation										AB, PS	VRA	DOT

Table 4.7.2 2 Implementation Schedule for the Proposed Transport Management Program (con't)

Programs	Purpose	Target	Implementation Strategy	Milestone				2008-2010	2011-2012	2013-2015	2016-2020	Budget Requirement for 5 years (Mi. USD)	Assumed Budget Source	Core Agency	Coordinating Agency
				08-10	10-12	13-15	15-20								
Vehicle Registration Renewal System	Preparatory works	To secure new fund sources. Insurance can aid both violator and the victim. To monitor exact number of vehicles. To identify violators using CCTV.	All vehicle users	Insurance system makes all vehicle owners responsible. DOT requires evidence of insurance coverage and registration document when owner renews vehicle registration every year (or 2 years). Vehicle owners receive registration sticker as evidence of renewal and payment of required fees. Police can control violators by checking the registration sticker.	Establishment of committee							37.1	AB	MOT	VRA
	Coordination with concerned organization(s)										AB, DF		MOT, VRA	MOPS	
	Development of System									AB, DF	MOT, VRA		MOPS		
	Setting-up of the insurance system									AB, PS	MOT, VRA		Private Insurance Company		
	Law enactment									AB	MOT		VRA		
	Implementation					Implementation				UC, VI	MOT, VRA		MOPS, DOT, District Office,		
Technical Inspection for M/C	Preparatory works	To develop an adequate M/C inspection system. To ensure fund source.	M/C users	Enforcement shall target old M/C. M/C holders must have their M/C inspected at an authorized inspection site, and present this certification of inspection upon renewal of M/C registration. Designated M/C manufacturer and distributors may be assigned as the authorized inspectors.	Establishment of committee						37.9	AB, PS	VR, VRA	Maker	
	Coordination with concerned organization(s)											AB, PS	VR, VRA	Maker	
	Development of System					Dev't of System				AB		VR, VRA			
	Enactment of the new standard					Issue of Decision				AB		VR			
	Instruction to Manufacturer & Dealer					Establishment of M/C committee				AB, PS		VR	Makers		
	Law enactment					Issue of Decision				AB		VR			
	Implementation					Implementation				UC		VR	VRA, DOT		
Strategies to Improve Vehicle Conditions for People with Disability	Organization of Preparatory Committee	To ensure mobility of people with disability.	People with Disability	Some measures that will be examined are exemption from vehicle tax and registration fees, preferential treatment and vehicle standard.	Establishment of committee						1.0	AB	VR, VRA	MOH	
	Evaluation of Subsidy System											AB	VRA	VR, MOH	
	Law enforcement					Issue of Decision				AB		VRA			
	Investigation of Vehicle Standard					Investigation				AB		VR	VRA, MOH		
	Development of Standard					Issue of Decision				AB		VR			
	Implementation					Implementation				RF, VI		VR, VRA			
Human Resource Development*	Preparation of system and contents	To develop human resource.	Driver instructor & examiner	VRA will train instructors from DOT who will in turn become Instructor Trainers.	Develop system & content						0.5	AB, DL	VRA		
	Personnel training						Enforce training					AB, DL	VRA	DOT	
Budget Requirement in this sector up to 2020 (Million USD)								64.1	49.8	57.0	57.0	113.9	Grand Total: USD227.8 Million		

Source: JICA Study Team