



**(DRAFT)**

# **National Strategy and Action Plan on EST**

*by*

**Lattanamany KHOUNNYVONG**

EST-Lao Focal Point

Permanent Secretary

Lao Ministry of Public Works and Transport

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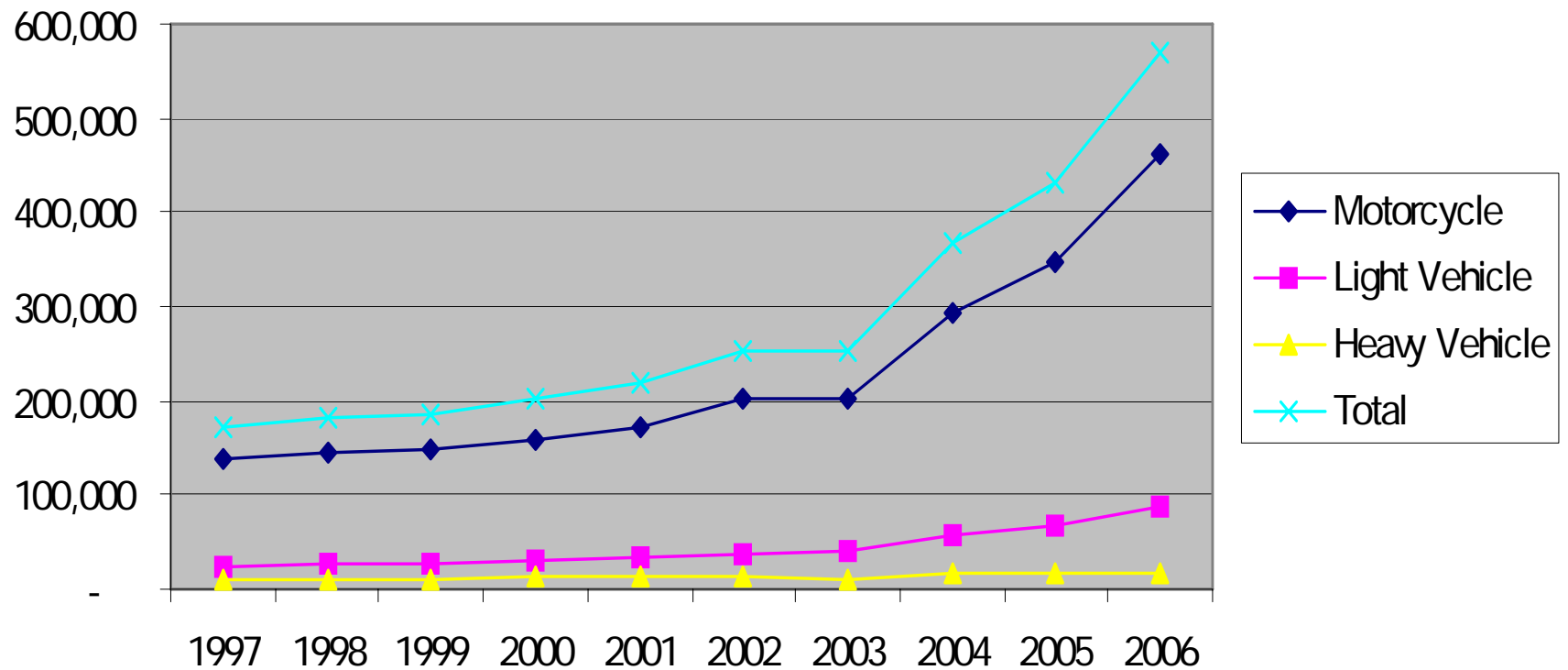
# 1. Introduction

EST is significant because:

- National development
- Link many target of **Millennium Development Goals** (MDGs)
  - + eradicate extreme poverty and hunger;
  - + achieve universal primary education;
  - + promote gender equality and empower women;
  - + reduce child mortality;
  - + improve maternal health; combat HIV/AIDS, malaria, and other diseases;
  - + ensure environmental sustainability; and
  - + develop a global partnership for development.

# 1. Introduction (Cont.)

## Number of Vehicle in the Country (1997-2006)



Source: Department of Transport, MPWT, July 2007

## 2. Key issues related to transport sector

Urban environmental issues from transportation in the country can identify each area as follows:

1. Health and Environment
2. Ambient Air Quality Monitoring and Management
3. Vehicle Emission Control (VEC)
4. Inspection and Maintenance (I/M) of Vehicle
5. Regulation of Fuel Quality and Standard
6. Transport Planning and Travel Demand Management
7. Environmentally and People Friendly Urban Transport Infrastructure Development (EPFUTID)
8. Traffic Noise Monitoring
9. Information and Public Awareness
10. Gender and Transportation

## 2.1 Health and Environment (Cont.)



Dust and smoke on road caused of asthma and bronchitis

## 2.1 Health and Environment (Cont.)

Number of fatality per 10,000 vehicles and fatality ratio in each accident (2001-2006)

Year	Number of fatality per 10,000 vehicles	Percentage of fatality in each accident
2001	16.87	7.95%
2003	16.31	8.30%
2004	11.41	9.82%
2005	9.62	8.96%
2006	8.66	10.65%

Source: Department of Transport, July 2007

## 2.2 Ambient Air Quality Monitoring and Management

Results of ambient air and noise quality standard monitoring at Vientiane Municipality (September 2002-March2003)

Parameter	Sampled Unit	Analysis Result	International Standards (24 hours average)
Total Suspended Particulates (TSP),	mg/m <sup>3</sup>	0.082 – 0.296	0.33
Particles less than ten microns in diameter (PM10),	mg/m <sup>3</sup>	0.047 – 0.089	0.12 – 0.15
Sulfur dioxide (SO <sub>2</sub> )	mg/m <sup>3</sup>	0.025 – 0.276	0.32 – 0.36
Nitrogen dioxide (NO <sub>2</sub> ),	mg/m <sup>3</sup>	< 0.001 – 0.057	0.30
Noise Leg 8 (average over 8 hours)	dB (A)	60.1 – 63.0	60 – 70
Noise Lmax (maximum level)	dB (A)	79.5 – 85.0	< 70

Source: Report on Ambient Air and Noise Monitoring in Vientiane Municipality (Sep 2002 - Feb 2003)

## 2.2 Ambient Air Quality Monitoring and Management (Cont.)

- In Vientiane: 144,690 vehicles (2002); 231,869 vehicles (2006) which **increase 80%**.
- Some parameters are nearly highest level of standard and they are threatening urban environment in near future,
- Although there is no inspection of air quality, but it may be assumed that air quality will be reach critical condition in near future.
- Now, WREA is formulating air quality standard, but it is not yet completed. Major subject of standard refers to Thailand standard and WHO.

## 2.3 Vehicle Emission Control (VEC)

Standard of VEC using in Vientiane vehicle emission inspection center

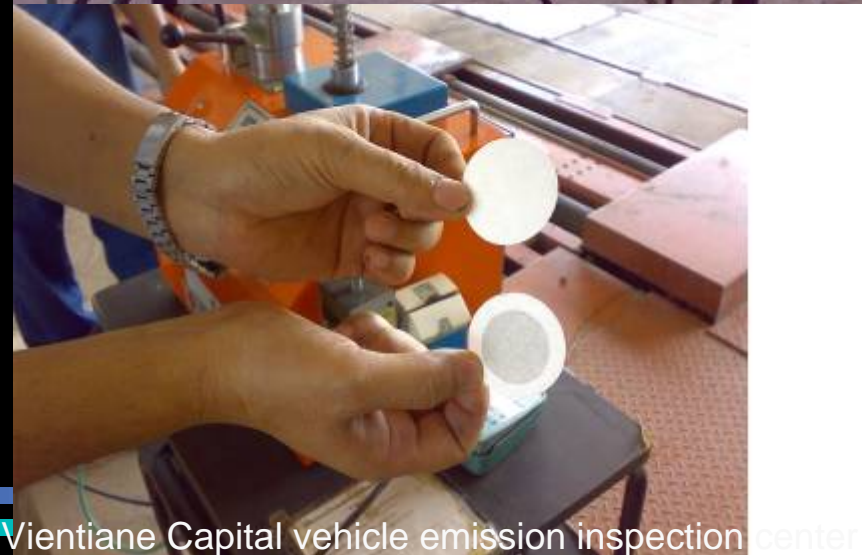
Type of Vehicle	Gasoline Vehicle		Diesel Vehicle
	Carbon Monoxide (CO)	Hydro Carbon (HC)	Black smoke
Motorcycle and Tricycle	< 4.5 %	<10.000 in 1.000.000 PPM in NON DISPERSIVE INFRARAD (NON)	-
4 Wheel vehicle and over	< 7.5 %	< 7,800 PPM in NON DISPERSIVE INFRARAD (NON)	< 50 %

Source: Department of Transport, August 2007

## Inspection equipment for gasoline engine



## Inspection equipment for diesel engine



## 2.3 Vehicle Emission Control (VEC) (Cont.)



Vehicle emission inspection on road is not yet implemented. Thus sometime black smoke still exist on road within urban area and suburb.

## 2.4 Inspection and Maintenance (I/M) of Vehicle

- In 2006, only 58,423 vehicle was inspected or about 25% of total (231,869) vehicles in Vientiane
- Annual vehicle inspection divides into two types such as
  - (1) inspection of motorcycle and tricycle; and
  - (2) inspection of vehicle (4wheels up)
- Inspection standard of motorcycle and tricycle and vehicle (4wheels up) include general condition, chassis, engine and power, wheel and tire, break, light, and emission.
- A period of inspection is two years for new vehicle and one year for used vehicle.
- There are 10 standard of vehicle inspection centers in 7 provinces.

## Basic inspection, Checking break and light



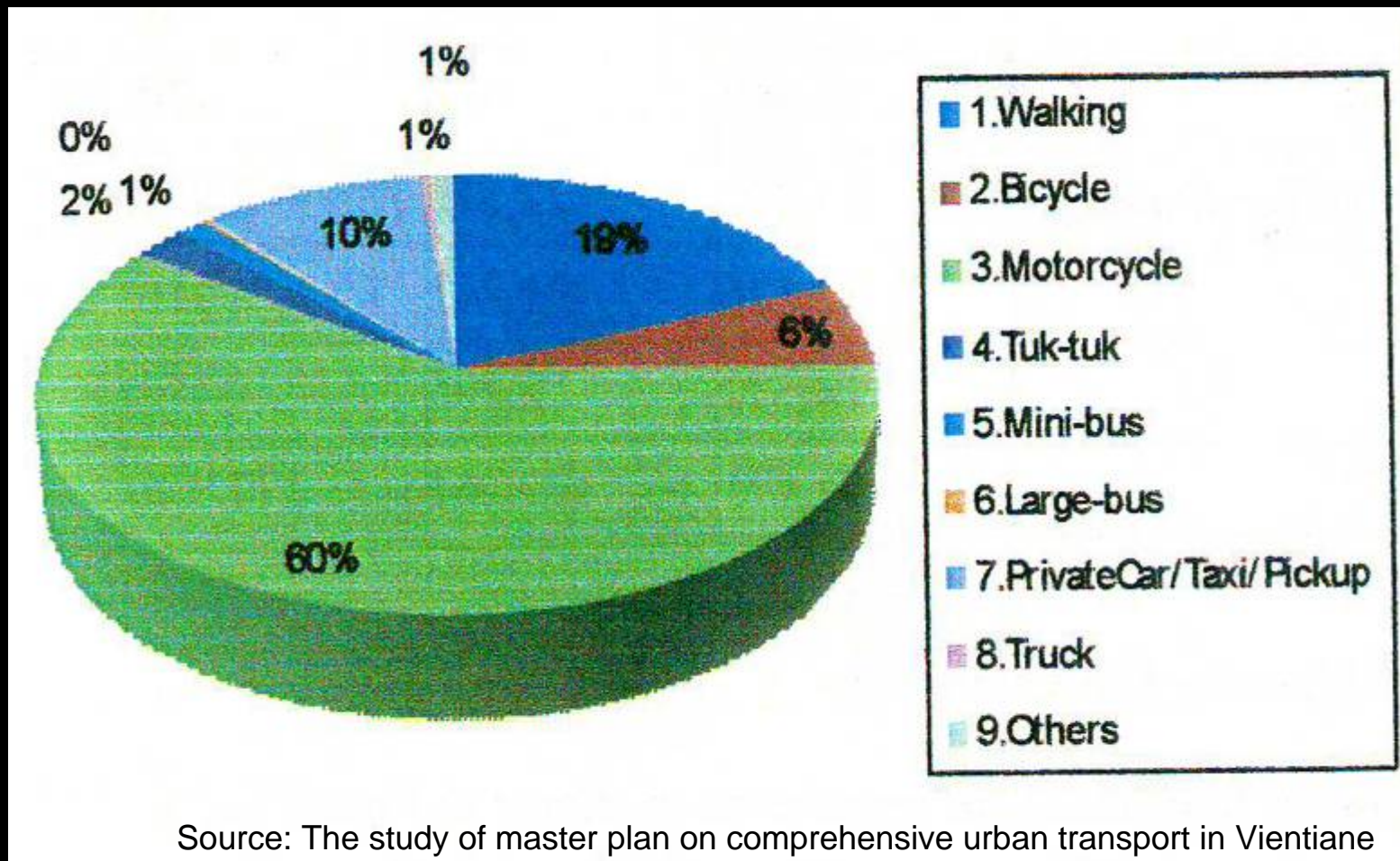
## 2.5 Regulation of Fuel Quality and Standard

The Lao fuel standard defined as follow:

- Regular gasoline, minimum octane number is 87
- Premium gasoline, minimum octane number is 94.
- Regular and Premium gasoline, Lead content was defined maximum at 0.15 gPb/l and maximum of sulfur content is 0.5 to 0.15 %wt, in order to minimize emission of CO<sub>2</sub> and SO<sub>2</sub> under standard and acceptable by society and environment.
- The minimum of octane index of diesel was defined at 47, sulfur content is between 0.5 to 1.5 %wt

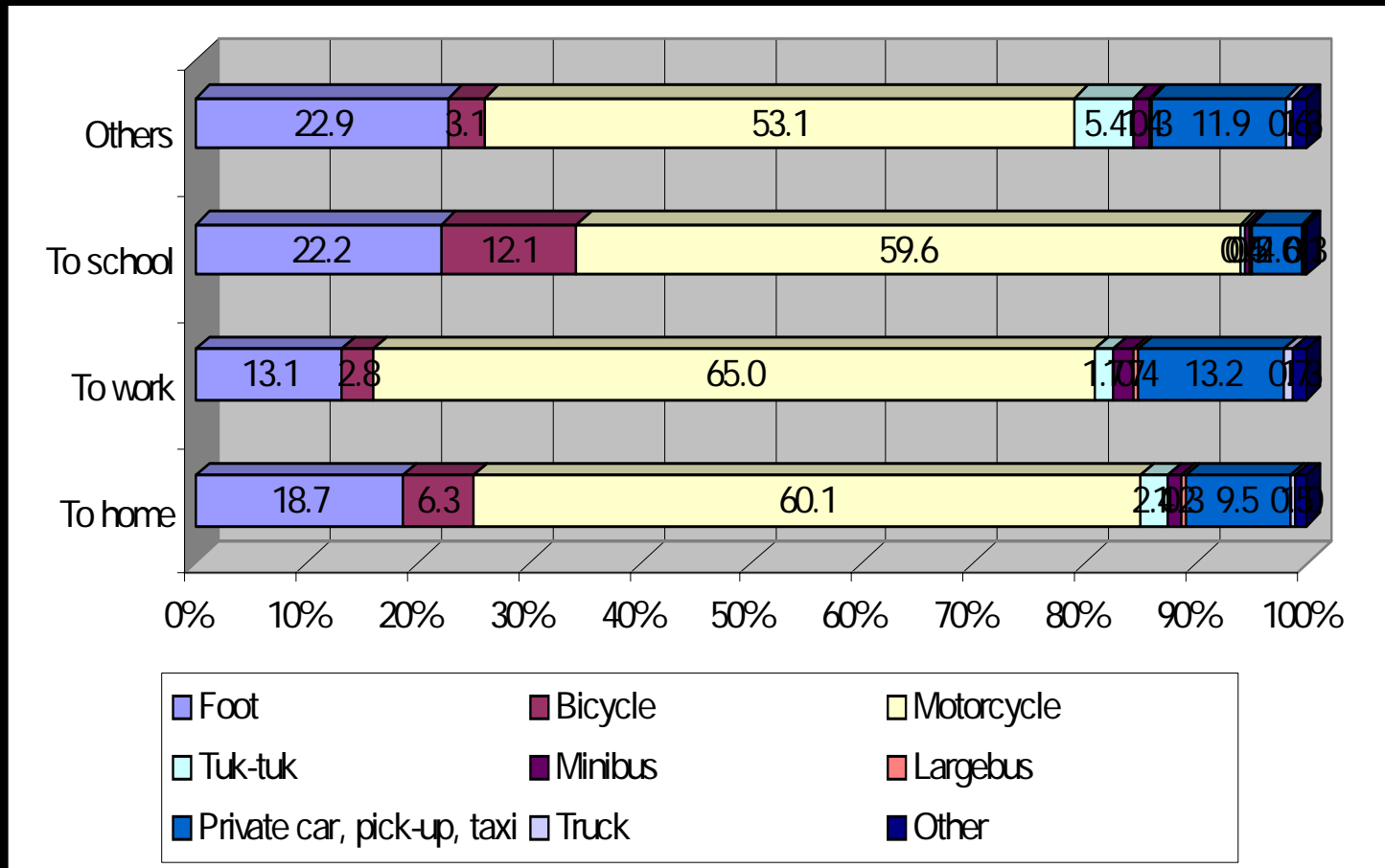
## 2.6 Transport Planning and Travel Demand Management

### (1) Travel mode of population in Vientiane



## 2.6 Transport Planning and Travel Demand Management (Cont.)

### (2) Modal share by travel purpose



Source: The study of master plan on comprehensive urban transport in Vientiane

## 2.6 Transport Planning and Travel Demand Management (Cont.)

### (3) Public Transport



Public transport in Vientiane (buses and tuk-tuk)

## 2.7 Environmentally and People Friendly Urban Transport Infrastructure Development (EPFUTID)

- EPFUTID is promoted in many countries. These structure include (1) trolleybus; (2) non-motorize vehicle (bicycle, car use NGV, battery motorcycle); (3) by foot.
- In VTE, population use bicycle about 6% and walk about 19% of total travel. Majority of people who use bicycle and walk is student on primary school.
- Walking to work is only 2.8%.
- Traveling by public transport system (bus, and tuk-tuk) is only 4%, because the services do not meet a need of population.

## 2.7 Environmentally and People Friendly Urban Transport Infrastructure Development (Cont.)

- No trolleybus system
- No vehicle use NGV and no promotion, because a changing people's behaviors is difficult, and government sector has no clear direction for this issue.
- At present, battery-motorcycles, small motorcycles sell in the country but they are not popular, because technical limitation of these motorcycles and confident of user.

## 2.8 Traffic Noise Monitoring

- No National Noise Standard (NNS) for each location as noise inside home, noise inside type of office (night/day time), also noise from vehicle engine. WREA is responsible for establishing of standard.
- However, on September 2002, there is a data collection on air quality and noise in Vientiane. Result of analysis shown that air quality and noise level is safe and acceptable based on international standard

## 2.8 Traffic Noise Monitoring (Cont.)

- Based on the Ministerial Notification, DPWT-Vientiane regulation on Technical Standard of Vehicle Inspection Center Vientiane, November 2000 which defined that noise from vehicle engine must be less than **85 db and 100 db** at a distance of **7.5 meters** and **0.5 meters** respectively.
- MPWT noticed on prohibit vehicle horn over standard travel on road, which implemented on April 2006.
- In addition, MPWT issued Decree on technical standard and logo for transport vehicle on September 2006, which article 4 session 3 defined noise level of horn must be less than 100 db.



Noise inspection equipment



Horns taken off from trucks

## 2.9 Information and Public Awareness



Helmet campaign and road safety conference

## 2.10 Gender and Transportation



Road sweeper and roadside vendors are almost women

- Air pollution, dust and accident affect directly to gender and risky group.
- 65% of road sweeper is women which receive vehicle smoke, dust and risk to accident every day.
- Other group is roadside vender, based on an observation various location in Vientiane (Victory monument, Anu Village and along a roadside) found that more than 70% are women.
- Majority of traveler by tuk-tuk and Jumbo are women.

## 3. Strategy

### Objectives

The objective of the National Strategy and Action Plan on EST are:

- A tool for management, monitoring, and evaluation of land transport in the whole country.
- A guideline for policy decision maker on transport sector in the whole country.
- A guideline for planning and investment on transport sector in the whole country.
- Identified and prioritized activities of the National Action Plan on transport sector.

### 3. Strategy (Cont.)

#### Focused strategic

National strategy and action plan on EST target at year 2020, in order to support the government target to graduate from the Least Developed Countries (LDCs) in year 2020.

*Focused strategic covers 10 areas of major issues related to transport sector including:*

### 3. Strategy (Cont.)

- 1.) Manage urban air quality to international standard, in order to create sustainability environment and eradicate disease of transportation.
- 2.) Support on technical study to find out the best alternative for transport sector such as public transport system, fuel substitution, material to reduce noise, using friendly environment and people vehicles;
- 3.) Support the development of transport facilities for risk group such as women, children, and handicap person;
- 4.) Formulate and improve an absent/inappropriate legislations to the implementation of national strategy and action plan of EST;

### 3. Strategy (Cont.)

- 5.) Create and upgrade to strengthening a concerned organization to EST by upgrading and improving of capacity on technique-technology to formulate standard, monitoring and management. Especially, coordination sector shall be easy and convenience but effective.
- 6.) Promote enforcement strictly on regulations and laws for monitoring, control, and management with fair condition for all sector in society;
- 7.) Encourage all sector in society to participate in planning, comment, take a decision to choose methodology for protection and mitigation of environmental transport;

### 3. Strategy (Cont.)

- 8.) Promote an awareness on EST continuously;
- 9.) Create financial mechanism on environmental transport (ET) and encourage government organizations and private sector participate to ET fund, in order to protect and improve environmental quality.
- 10.) Strengthen international cooperation to request assistance on technique-technology, fund, and human resource development relevant to EST.

## 4. Action Plan

- To achieve focused strategy, detail of action plan should be determined, in priority of action related to transport sector.
- Identify responsible agencies on implementation and timetable.

*Detail of action plan as follows:*

# 1). Health and Environment

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Accurately survey on disease related to pollution from transport	- MOH - LNU	-	Short Term
2. Continue implemented on Road Safety Strategy and Action Plan which adopted by government	- MPWT - Traffic police	-	Short Term
3. Review and improve Road Safety Strategy and Action Plan which adopted by government in order to appropriate with real condition of each period.	- MPWT - Traffic police - LNU	-	Medium, and Long Term

## 2). Ambient Air Quality Monitoring and Management

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Formulate a national air quality standard	-WREA -MPWT		Short Term
2. Formulate a regulation, control and management system on ambient air quality	-WREA -MPWT		Short Term
3. Improve capacity of staff to formulation of air quality standard, monitoring and management system	-WREA -MPWT		Short, medium, and Long Term
4. Provide adequate air inspection equipment to concerned authorities	-MPWT		Short, medium, and Long Term
<b>5. monitoring and inspection</b> air quality on roadside and give recommendation to concerned organization	-WREA		Short, medium, and Long Term

## 2). Ambient Air Quality Monitoring and Management

(Cont.)

Action in Order of Priority	Responsibility	Indicative Budget	Timing
6. inspection food stall along roadside to ensure that food does not pollute by lead from vehicle emission or other disease to advice vender for prevention	-MOH		Medium, and Long Term
7. Allocate budget for pavement lanes at least 30 meters from section point with main road	-MPWT -UDAA		Short, medium, and Long Term
8. Provide more budget for road cleaning to cover whole town	-VUDAA		Short, medium, and Long Term
9. Improve regulation on fining truck leakage gravel and sand on road, and strictly enforcement.	-UDAA -Police		Short, medium, and Long Term

### 3). Vehicle Emission Control

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Formulate a national vehicle emission standard	-WREA -MPWT		Short Term
2. Formulate a regulation, control and management system on vehicle emission to appropriate with future development condition	-WREA -MPWT		Short Term
3. Upgrade and improve capacity of staff related to formulation of vehicle emission standard, monitoring and management system by training in the country or abroad	-WREA -MPWT		Short, medium, and Long Term

### 3). Vehicle Emission Control (Cont.)

Action in Order of Priority	Responsibility	Indicative Budget	Timing
4. Standard and regulation should be enforced strictly Provide adequate vehicle emission inspection equipment to concerned authorities to control vehicle emission	-MPWT -Police -UDAA -DPWT-PV		Short, medium, and Long Term
5. Provide adequate vehicle emission inspection equipment to concerned authorities	-MPWT -DPWT-PV -Police		Short, medium, and Long Term
6. Regular monitoring and inspection vehicle emission on roadside and give recommendation to concerned organization for solving a problem	-MPWT -Police -LNU		Short, medium, and Long Term

## 4). Inspection and Maintenance (I/M) of Vehicle

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Review and formulate new regulation on vehicle inspection	- MPWT - DPWT-PV		Short term
2. Enforce strictly standard and regulation to control vehicle inspection	- MPWT - Police		Short, medium, and Long Term

## 5). Regulation of Fuel Quality and Standard

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Review Lao fuel standard which adopted in 2001 in order to be conformable to present and future condition	- WREA		Short Term
2. Formulate a regulation, control and management system on fuel quality and standard.	- WREA		Short Term
3. Monitor and inspect strictly on import fuel quality	- WREA		Short, medium, and Long Term
4. Conduct feasibility study on alternative fuel and natural gas for new option of a society	- WREA		Short Term

## 6). Transport Planning and Travel Demand Management

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Conduct National Transport Master Plan	- MPWT		Short Term
2. Study on public transport in major town to find out pattern, system and function of each such as buses, songthia, tuk-tuk.	- MPWT		Short Term
3. Install public transport facilities by providing specific lane for buses, and bus stop.	- MPWT - UDAA - Bus Companies - Private sector		Short Term
4. Conduct feasibility study on other public transport alternative inWREAd of public transport use fuel to reduce emission and operation cost.	- MPWT		Medium Term

## 6). Transport Planning and Travel Demand Management (Cont.)

Action in Order of Priority	Responsibility	Indicative Budget	Timing
5. Conduct detail plan on social infrastructure for distribution service entire town area, to reduce service congestion in one area which cause of traffic jam especially on peak hours.	- MPWT - MOH - MOE - MOC - UDAA		Short, and Medium Term
6. Study on appropriate of car parking along a road, as present it cause of traffic jam and move slowly	- MPWT - LNU		Short Term
7. Formulate a standard on service activities shall have adequate car parking.	- MPWT - MOC		Short, and Medium Term
8. Conduct feasibility study to move education institute and hospital to appropriate location which adequate car parking and comfortable.	- MPWT - MOE - MOH		Medium, and Long Term

## 7). Environmentally and People Friendly Urban Transport Infrastructure Development

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Review inappropriate regulation and formulate absent regulation which apply for future of traffic on main road and transport sector in order to conform with real situation and implementation.	- MPWT		Short Term
2. Review inappropriate standard of road design to this strategy as road design should take into account on pedestrians, handicap, and bicyclist.	- MPWT		Short Term
3. Undertake tree planting along the road connecting as green belt to provide a shade and absorb pollution and dust	-VUDAA		Short, Medium, and Long Term

## 7). Environmentally and People Friendly Urban Transport Infrastructure Development (Cont.)

Action in Order of Priority	Responsibility	Indicative Budget	Timing
4. Detail study on appropriate of tree planting along a road as provide shade, deep root to avoid damage of road surface.	- MOAF		Medium Term
5. Conduct feasibility study to permit bicyclist use pedestrian walkway as bicycle route because bicycle is low speed, thus it should use with pedestrian	- MPWT		Medium, and Long Term
6. Feasibility study construction of electric Tram in major town	- MPWT		
7. Promote non-motorize as vehicle use NGV, battery motorcycle	- MPWT - MOC		Short, Medium, and Long Term

## 8). Traffic Noise Monitoring

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Formulate National Vehicle Noise Standard (engine, horn)	- WREA - MPWT		Short Term
2. Formulate a regulation, control and management system on vehicle noise to appropriate with present and future condition	- WREA - MPWT		Short Term
3. Standard and regulation should be enforced strictly to control vehicle noise	- MPWT - POLICE - DPWT-PV		Short, Medium, and Long Term
4. Provide adequate vehicle noise inspection equipment to concerned authorities	- MPWT - POLICE - DPWT-PV		Short, Medium, and Long Term

## 8). Traffic Noise Monitoring (Cont.)

Action in Order of Priority	Responsibility	Indicative Budget	Timing
5. Conduct a study to find out appropriate technique and material to reduce noise from surface of tire and road.	-MPWT - LNU		Medium Term
6. Conduct a study to find out appropriate technique to reduce a vibration cause by vehicle passing to give recommendation to concerned organization or people who was affected directly.	-MPWT - LNU		Medium Term
7. Regular monitoring and inspection vehicle noise on roadside and give recommendation to concerned organization for solving a problem	- Police		Short, Medium, and Long Term

## 9). Information and Public Awareness

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Disseminate essential regulations to government organization, private, personal, how to protect themselves from negative impact of transportation	- MPWT		Short, Medium, and Long Term
2. Implement awareness program to road sweepers, roadside vendors, travelers by tuk-tuk, motorcycle, and traffic polices to know negative impact, and how to protect themselves.	- MOH		Short Term

## 9). Information and Public Awareness (Cont.)

Action in Order of Priority	Responsibility	Indicative Budget	Timing
3. Promote and campaign people participation any activities of transport sector for environmental sustainable such as road safety	- MPWT		Short, Medium, and Long Term
4. Coordination, collaboration with international organization, NGOs, and supporter to held activities and campaigning on environmental affect.	- WREA - MPWT - NGOs - International Organization		Short, Medium, and Long Term

## 10). Gender and Transportation

Action in Order of Priority	Responsibility	Indicative Budget	Timing
1. Implement awareness program to road sweepers to know negative impact, and how to protect themselves	- MOH		Short, Medium, and Long Term
2. Provide essential equipment to road sweepers such as gloves, boots, and mask.	- VUDAA		Short, Medium, and Long Term

Thank you for your kind attention