DRAFT

Initial Environmental Examination

August 2014

LAO: Vientiane Sustainable Urban Transport Project

Prepared by the Ministry of Public Works and Transport for the Asian Development Bank

CURRENCY EQUIVALENTS

(as of 15 July 2014)

Currency unit		kip (KN)
KN1.00	=	$0.000124
$1.00	=	KN8,047.00

ABBREVIATIONS

ADB	–	Asian Development Bank
ADB SPS	–	ADB's Safeguard Policy Statement 2009
AP	–	affected people
BRT	–	bus rapid transit
BTEX	–	benzene, toluene, ethylbenzene, and xylenes
dB(a)	–	A-weighted sound scale
DDIS	–	detailed design and implementation consultant
DESIA	–	Department of Environment and Social Impact Assessment of MONRE
EA	–	executing agency
ECC	–	environmental compliance certificate
EIA	–	environmental impact assessment
EHSO	–	environment, health and safety officer
EMP	–	environmental management plan
GRM	–	grievance redress mechanism
IA	–	implementing agency
IEE	–	initial environmental examination
IMMC	–	Institute of Mass and Media and Culture
L	–	length
Lao PDR	–	Lao People's Democratic Republic
m	–	meter
m^2	–	square meter
mg/m^3	–	milligram per cubic meter
MONRE	–	Ministry of National Resources and Environment (formerly WREA)
MPWT	–	Ministry of Public Works and Transport
NESDP	–	National Economic and Social Development Plan
NMT	–	non-motorized transport
NO_2	–	nitrogen dioxide
NR	–	national road
ppb	–	parts per billion
PPE	–	personal protective equipment
ppm	–	parts per million
SEMR	–	semi-annual environmental monitoring report
SO_2	–	sulphur dioxide
STEA	–	Science. Technology and Environment Agency
TA	–	technical assistance
TPH	–	total petroleum hydrocarbons

USD	–	United States dollar
UTM	–	universal transverse mercator
VDES	–	Vientiane Department of Education and Sports
W	–	width
WREA	–	Water Resources and Environmental Administration (now MONRE)
VSUTP	–	Vientiane Sustainable Urban Transport Project

NOTES

In this report, "$" refers to US dollars, unless otherwise stated.

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EXECUTIVE SUMMARY

The proposed project will support the piloting of a sustainable urban transport system in the core area of Vientiane Capital City, in preparation for mainstreaming of the piloted system in other Lao urban areas. The Ministry of Public Works and Transport (MPWT) will be the executing agency for the Vientiane Sustainable Urban Transport Project (VSUTP) while the Department of Transport will serve as the implementing agency. The city core was selected as a pilot area under an ADB regional technical assistance (TA) for implementation of urban transport which was completed in March 2011. The project is aligned with Lao PDR's Seventh National Economic and Social Development Plan (NESDP), the goals of which include sustainable economic development.

The objective of the project is to improve the quality of life for people in Vientiane by improving access and mobility in Vientiane. The project will consist of the following five components: (i) Public bus transport services based on the bus rapid transit (BRT) model, (ii) Parking management system, (iii) Traffic management system, (iv) Development of non-motorized transport (NMT) facilities, and (v) Development of institutional capacity for management of the sustainable urban transport system. The Project is category B for environment and an initial environmental examination (IEE) has been prepared based on ADB's Safeguard Policy Statement 2009.

Available secondary data (2008) on ambient air quality indicate that various air quality indicators such as sulphur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), total suspended particles (TSP) and particulate matter 10 (PM10) within the city are well below the National Environmental Standards 2009. However, rapid urban development and considerable increase in the number of vehicles in Vientiane over the last five years may have likely resulted to higher pollution levels. Noise measurements carried out during the IEE study within and in the vicinity of the proposed bus depot and one of the bus staging areas show that national standards were generally exceeded. Ecologically sensitive areas are not found in the vicinity of the various project components since the BRT stations and non-motorized transport facilities will be located within developed urban areas of Vientiane. Only a few trees and grass species are found at the bus depot site and at the Vientiane Department of Education and Sports (VDES) and Institute of Mass and Media and Culture (IMMC) bus staging/temporary parking areas.

Assessment of the potential adverse impacts of the Project was carried out taking into consideration the magnitude/scale of various activities during construction and operation, existing environmental conditions, project location and design considerations. Corresponding mitigation measures have been formulated to avoid or minimize the anticipated adverse environmental impacts. The project components such as BRT stations, bus depot, bus staging areas/temporary bus parking areas and improvement works for non-motorized transport will not involve major civil works. Various adverse impacts, such as elevated noise levels, dust emission, traffic disturbance, and other construction-related impacts will be experienced in the vicinity of the project sites. These impacts, however, are considered minor being short-term and localized in nature. The proposed on-street parking and traffic management system will involve minor works such that associated environmental impacts are considered negligible.

During operation, the over-all environmental impact of the Project would be beneficial. The proposed improvements to the transport system will contribute to reduced traffic congestion, improved conditions for walking and cycling, improved community liveability and better air quality. Potential adverse impacts that may result due to operation of the bus depot

and bus staging areas are considered not significant and can be addressed through good design of the facilities and implementation of mitigation measures specified in the environmental management plan (EMP) included in the IEE. Such impacts pertain to noise, vehicle emissions, wastewater from washing, waste oil from maintenance works, leaks/spills of hazardous substances, traffic congestion due to entry/exit of buses and safety concerns.

The EMP includes environmental mitigation measures for the pre-construction, construction and operation phases for various project components as well as monitoring requirements and responsibilities for EMP implementation. The EMP will be incorporated in all the civil works contract documents. Regular monitoring will be carried out by the implementing agency - Department of Transport (DOT), with assistance from the detailed design and implementation consultant (DDIS). Semi-annual environmental monitoring reports will be submitted to ADB and will be disclosed on ADB's website.

A series of public consultations have been conducted for the different project components and environmental issues/concerns raised by the stakeholders are addressed in the EMP. A grievance redress mechanism has been developed to facilitate resolution of project-related environmental impacts.

I. INTRODUCTION

1. With increases in population and the number of vehicles, the traffic conditions in Vientiane are deteriorating. The city is starting to experience congestion and related problems of accidents, deteriorating local air quality, and greenhouse gas emissions due to the rapid growth of private motorized vehicle use. Following an 11% average annual increase in private vehicles over the last decade, the total number of vehicles registered in Vientiane has doubled over the last five years. With congestion and associated concerns about local air quality, travel times, accidents, and a deteriorating urban environment, the rapid increases in private motorized transport are placing Vientiane on an unsustainable transport development path. At present, public transport within the core area of Vientiane is largely provided by privately operated vehicles, particularly three-wheeled tuk-tuks. While the Vientiane State Bus Company provides service from the core area to other points in the greater Vientiane area on routes radiating from the central bus station, there is no bus service linking points within the core area.

2. The Ministry of Public Works and Transport (MPWT) will be the executing agency for the project while the Department of Transport will serve as the implementing agency. The proposed project will support the piloting of a sustainable urban transport system in the core area of Vientiane Capital City, in preparation for mainstreaming of the piloted system in other Lao urban areas. The city core was selected as a pilot area under an ADB regional technical assistance (TA) for implementation of urban transport which was completed in March 2011. The project is aligned with Lao PDR's Seventh National Economic and Social Development Plan (NESDP), the goals of which include sustainable economic development.

3. The objective of the project is to improve the quality of life for people in Vientiane by improving access and mobility in Vientiane. The project will consist of the following five components.

(i) Public bus transport services based on the bus rapid transit (BRT) model
(ii) Parking management system
(iii) Traffic management system
(iv) Development of non-motorized transport (NMT) facilities
(v) Development of institutional capacity for management of the sustainable urban transport system

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. ADB's Environmental Policy

4. Consistent with ADB's Safeguard Policy Statement 2009 (ADB SPS), the proposed project has been screened and categorized based on the significance of its potential environmental impacts. The project is considered environment category B, for which an initial environmental examination (IEE) is required, since it is not anticipated to cause significant adverse environmental impacts that are irreversible, diverse or unprecedented. This IEE has been carried out in accordance with the ADB SPS and the requirements described in its Appendix 1 (Safeguards Requirement 1: Environment).

B. Lao PDR Environmental Policies

5. The 1991 Lao PDR Constitution acknowledges the need for environmental protection in Lao People's Democratic Republic (PDR) and requires the conduct of environmental assessment of potential positive and negative socio-economic impacts of a project and the development of prevention and/or mitigation measures to address harmful impacts. The environmental regulations of Lao PDR are derived from the Environment Protection Law (EPL 02/99/NA 1999) and subsequent decrees and regulations, e.g. the regulation on Environmental Assessment in Lao PDR (1770/STEA 2000), the Law on Forests (No.6/2007 and Law on Wildlife (No 07/LN 2008).

2. Environmental Assessment

6. The Environmental Protection Law No. 02/99/NA (1999) specifies the "necessary principles, regulations and measures for managing, monitoring, restoring, and protecting the environment in order to protect human health, including the protection of natural resources and the richness of nature, and to ensure the sustainable socioeconomic development of the nation". Under Article 8, the law requires development projects and operations to undergo environmental assessment and to submit reports accordingly. It also stipulates that projects that generate environmental impacts should be responsible to the resulting damage caused. The law affirms that environmental conservation must come before mitigation and restoration.

7. Under the law, the Ministry of National Resources and Environment (MONRE), formerly Water Resources and Environmental Administration (WREA), is assigned as the lead agency responsible for the protection, mitigation and restoration of the environment. Other Government of Lao PDR (GOL) agencies such as the Ministry of Public Works and Transport, Department of Forestry, etc. were also given defined roles on environmental conservation.

8. The law also requires the establishment of an Environmental Management and Monitoring Unit (EMMU) at all levels of government. The EMMU is responsible for the establishment and enforcement of sector management plans, mitigating actions for environmental damage, issuance of orders to adjust, suspend, remove or close down activities that cause negative impacts.

9. The Regulation on Environmental Assessment No.: 1770/WREA dated 3/10/2000 outlines the requirements in conducting the EIA. The regulation requires all projects in Lao PDR to be environmentally screened according to the likely impact to the environment. The regulation

stipulates that environmental assessment must include at least a Project Description as basis for project environment screening under Article 7 of the Regulation. If the project is not exempt under Article 8 of the Regulation, the environmental assessment must include an IEE as specified in Article 9 of the Regulation. For some projects, through the findings of the IEE, an EIA is required as specified in Articles 11, 12, 13, and 14 of the Regulation. An Environmental Compliance Certificate (ECC) is issued after review of the IEE/EIA report. The ECC automatically expires if a project has not been implemented within two (2) years from ECC issuance.

10. On 16 February 2010, Decree No.122/PM was issued on the amendments in the environmental impact assessment requirements, upgrading the prior Regulation No.: 1770/WREA (2000). It provides the guidelines for implementing Article 8 of the Environmental Protection Law, in relation to environmental assessment. The Decree defines the principles and rules and measures on establishment, functions, management, and monitoring of environmental impact assessment, ensures that all public and private investment projects, both domestic and foreign, operating in Lao PDR, which create or may create adverse environmental and social impacts, are designed with the correct and appropriate environmental and social impact prevention and mitigation measures, and aims to effectively prevent, minimize, and resolve adverse environmental and social impacts derived from investment projects.

11. The WREA issued guideline no. 697 on 12 March 2010 specifying a list of investment projects and the environmental assessment requirements for each project according to project scope/magnitude of work or project threshold (Decision No. 697/PMO.WREA). The WREA guidelines outline the category of projects requiring the submission of a full-blown EIA or an IEE report. Strictly speaking, neither the Project as a whole, nor any of the currently proposed activities by the Project are subject to conducting an IEE or EIA based on the stipulations of Decision No. 697/PMO.WREA. However, although there is no specific section in this Decision about proposed activities in the VSUTP, the provision under Section 4.3 of Decision No. 697 is considered applicable to the VSUTP: “Part IV. Infrastructures and Services Investment Projects; Section 4.3 Road improvement projects for National, Provincial, District, Rural and National Special Road.” Projects that fall under Section 4.3 are considered Category 1 for which an IEE is required. The IEE preparation is also consistent with the provisions of the "Agreement on Approval and Implementation of Inventory of Investment Projects and Activities” issued by MONRE on 17 December 2013.

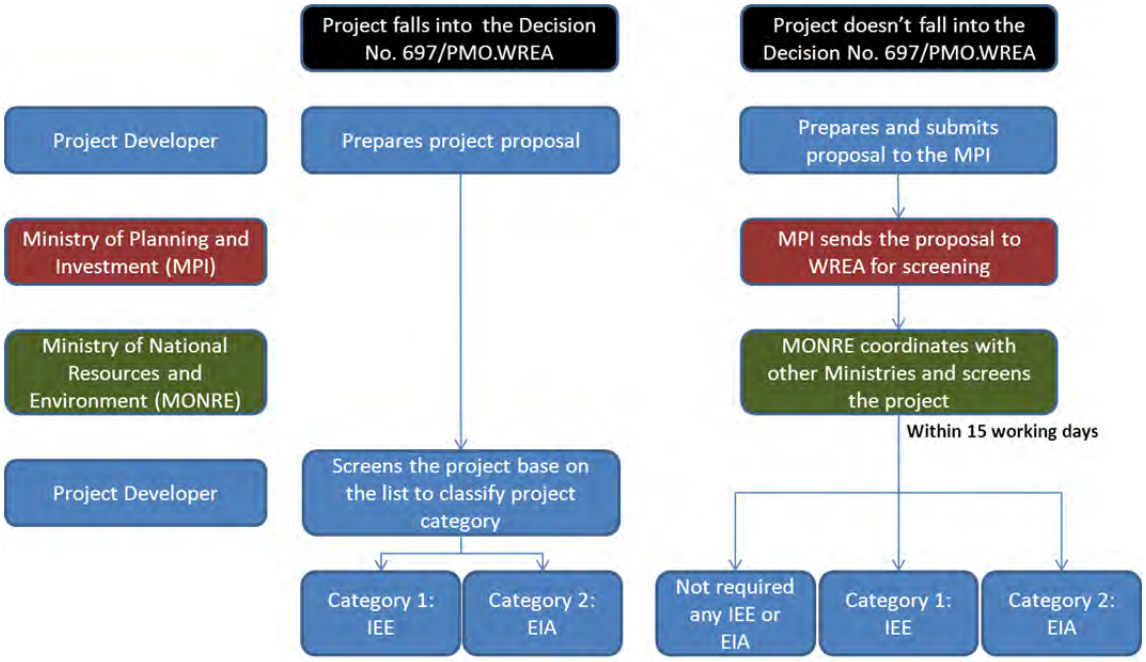


Figure 1. Environmental Screening procedures for projects in Lao PDR. Source: IDOM, in accordance to Decree No.122/PM (16 February 2010) and Decision No. 697/PMO.WREA

12. The approval procedure for an IEE in accordance with Decree No.122/PM on Environmental Impact Assessment (2010) is as shown in the **Figure 2**.

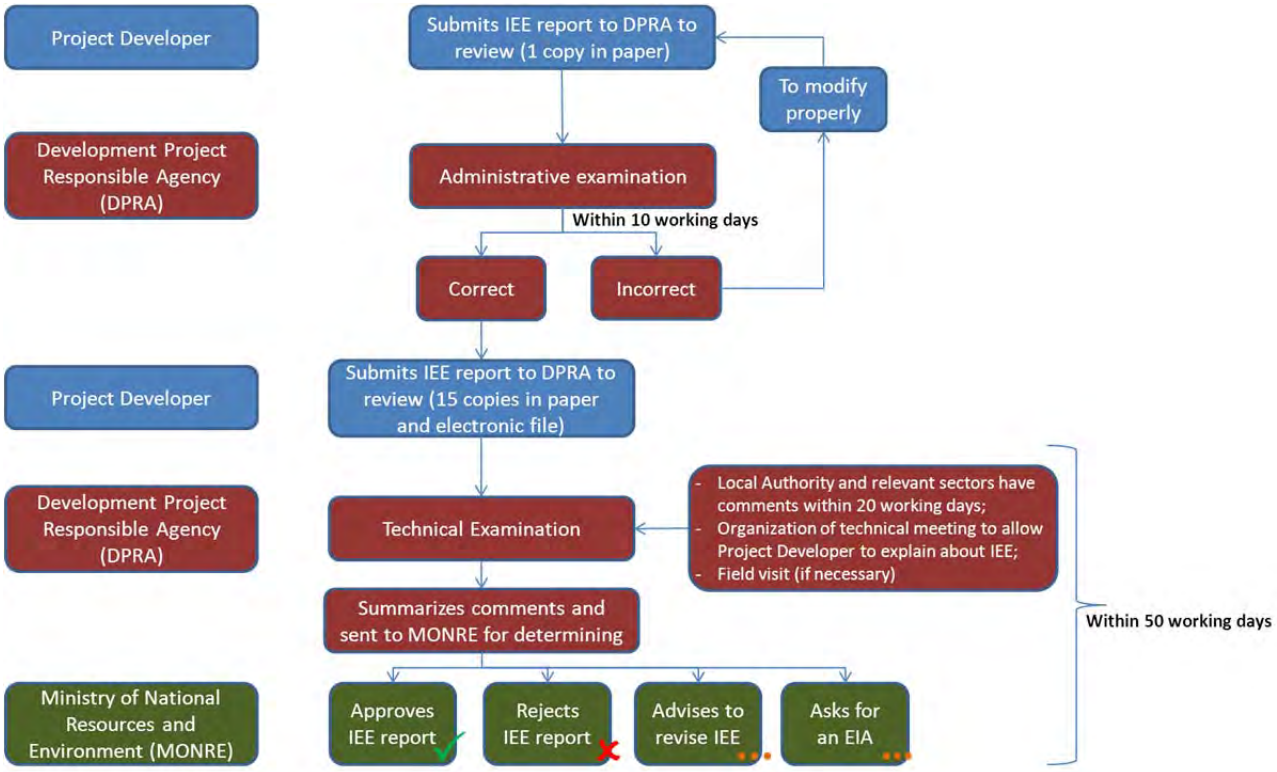


Figure 2. Environmental Approval procedures for projects in Lao PDR. Source: IDOM, in accordance to Decree No.122/PM (16 February 2010)

13. Ministries as the Ministry of Agriculture and Forestry (MAF) will be given copies of the IEE or EIA report for review and evaluation. Comments of each agency on the IEE/EIA shall be presented to MONRE for consideration before issuance of the ECC.

14. The project owner is required to establish monthly, quarterly, and annual reports on the project environmental monitoring to be sent to concerned agencies which include MONRE, MPWT and MAF.

3. Environmental Standards

15. Based on the Environmental Protection Law No. 02/99/NA dated 3rd April 1999, a National Environmental Standards was developed by Lao PDR on 7th December 2009 for the environmental monitoring and control of pollution on water, soil, air and noise. The environmental standards provides the permitted limits of quality for groundwater, surface water quality, soil, ambient air, noise, wastewater discharges, and air emission from stationary and mobile sources.

4. Land Management

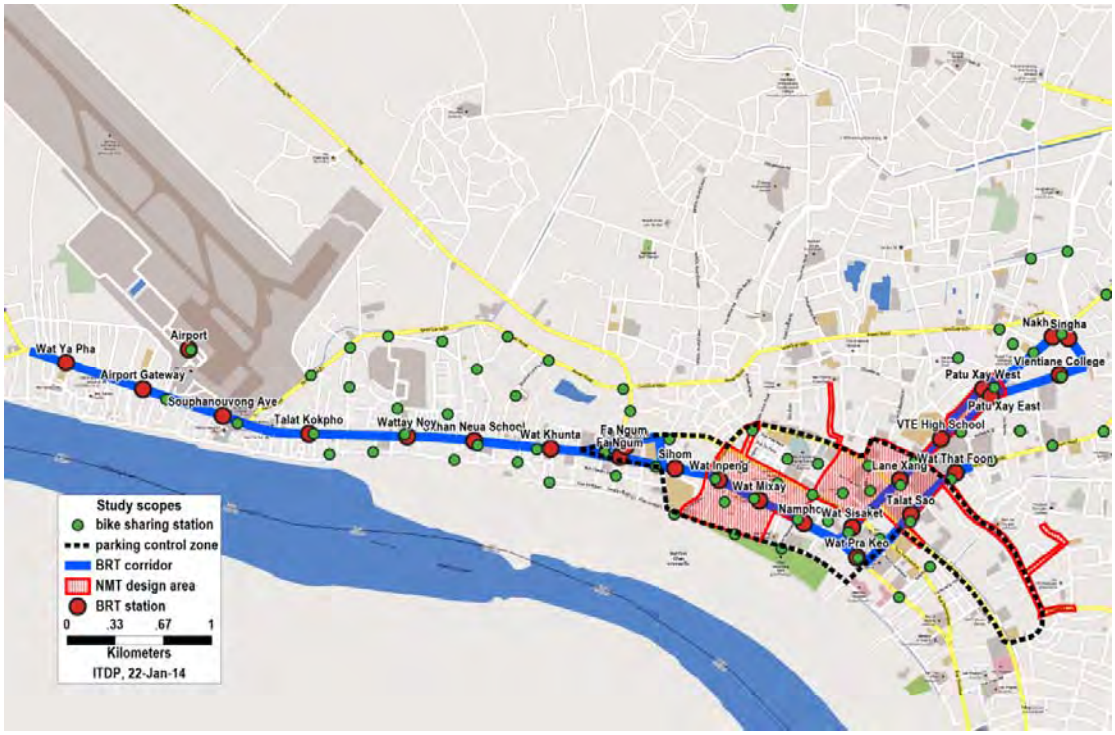
16. Land within Lao PDR is the property of the national community, and individuals are assigned to effectively use the land, but not treat it as a tradable commodity. The rights of those who have been allocated land, including the right to transfer the land are protected by the State. A District may grant the right to use agricultural and forest land within its jurisdiction for other land uses. Individuals have the duty to preserve the land in good condition. An individual's right to use the land can be terminated if the State expropriates the land for use in public interest, but the State must pay appropriate compensation damages.

III. DESCRIPTION OF THE PROJECT

A. Project Location

17. Various components of the Project will be implemented within the core area of Vientiane Capital. The Core Area includes the districts of Chanthabouly and Sisattanak located in the central part of the Capital. Chanthabouly District is on the eastern part of the core area, bordered with Sikhottabong District to the west, to the north with Naxaythong District, to the east with Xaithani and Xaysettha districts and to the south west with Sisattanak and Mekong River. Sisattanak District is on the southern part of the core area, bordered with Mekong River to the west, to the north with Chanthabouly District, to the west with Xaysettha District and to the south with Hatxayfong District. shows the location of the various components of the Project such as BRT corridor and station locations, NMT design area, parking control zone and bike sharing areas. The proposed bus depot will be located at km 18 on national road NR 13 South, Phonkham Village while the bus staging areas will be located at the Vientiane Department of Education and Sports, and Institute of Mass Media and Culture.

Figure 3. Lay-out of NMT area integrated with BRT and parking control zone.



B. Project Components

1. Public Bus Transport Services

a. Bus Rapid System (BRT)

18. High-quality public bus transport services based on the BRT model will be established on 84 km of existing roads **(Figure 4)** which will cover much of the Vientiane area and will provide intensive services in the core area.

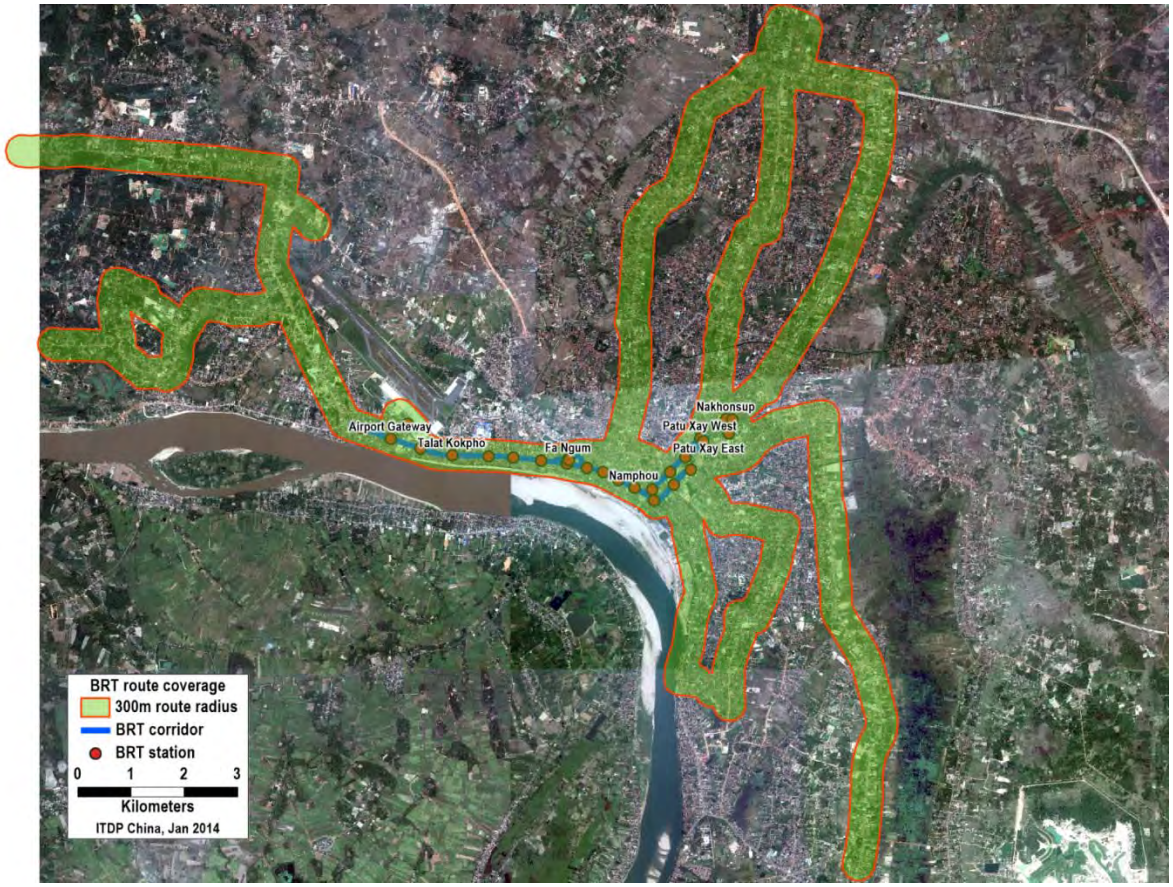


Figure 4. BRT route coverage

19. **BRT Corridor and Stations**. The BRT corridor, which will be about 11.5 km long **(Figure 5)**, will have 22 BRT stations (loading and unloading points for BRT passengers) to be constructed within the existing right-of-way of five road corridors (Luang Prabang, Setthathilath, Lane Xang, Nongbone, and Singha Road).

Figure 5. Location of BRT stations.

20. The stations will be constructed in the middle of existing roads except for stations EW12N, EW12S, NS4E and NS4W which will be located on the curbside**. Table 1** presents the location of the BRT stations.

Table 1: Location of BRT stations

Station Name		Location
1	Airport	*Airport*
2	EW3	*Wat Ya Pha*
3	EW45	*Souphavouvong Avenue (Airport Gateway)*
4	EW6	*Souphavouvong Avenue*
5	EW78	*Talat Kokpho*
6	EW9	*Wattay Noy*
7	EW10	*Sithan Neua School*
8	EW11	*Wat Khunta*
9	EW12N EW12S	*Fa Ngum*
10	EW 13	*Sihom*
11	EW14	*Wat Inpeng*
12	EW15	*Wat Mixay*
13	EW 16	*Namphou*
14	EW 17	*Wat Pra Keo*
15	NS0	*Wat Sisaket*
16	NS15	*Lane Xang*
17	NS1	*Talat Sao*
18	NS2	*Wat That Foun*

Station Name		Location
19	NS3	*Vientiane High School*
20	NS4	Patuxay
21	NS5	*Vientiane College*
22	NS6 NS7	*Nakhonsup and Singha*

21. **Figure 6** shows the proposed BRT station structure. Construction of new roads will not be undertaken. However, portions of existing sidewalks in some areas will be acquired to allow for widening of short road sections for a number of BRT stations. Each station will have a length of about 60 m and widths ranging from 3.5 m to 6 m. Estimated area of each station will range from 210 m^2 to 360 m^2 and will have marked pedestrian crossings at each end, ramp, aluminium roof sheeting, ticket office and boom, staff toilet, turnstile zone, leaning rails and passenger waiting area/platform.

Figure 6. Proposed BRT Station

22. A transit mall will be established along Setthathilath Road and will only be accessible to BRT buses, bicycles and pedestrians. **Figure 7** shows the proposed transit mall development.

Figure 7. **Proposed transit mall along Setthathilath Road.**

23. **BRT Vehicles**. Currently, there is very limited number of city buses operated in Vientiane. Vientiane State Bus Operator uses 42 Japanese-used high-floor buses, with floor height at 1.1 m, and some 5.8 m midibuses for 2 of the routes operated in Vientiane. These buses will not meet the BRT requirement as the BRT station will be designed at low floor with 30 cm elevation from the ground, and requiring doors in both sides of the bus. Apart from these buses, there are currently no existing buses in Vientiane that are suitable for BRT. As such, procurement for a new fleet that meets the requirement would need to be done.

24. The Project will provide 96 new, high quality, medium sized buses that have lower emissions than current public buses. To have bigger frequency and reduce waiting time for passenger, 9 meter buses are proposed to be used for the BRT. Current proposed design can accommodate 20 seats and 30 standing passengers.

25. The proposed station configuration and operational design of the BRT requires doors on both sides, with the left-side doors used at the BRT station, and the right-side doors operated during off-BRT corridor segment. On the right-side, 2 doors located in front and middle are provided. At the off-corridor section, front door will be used as entrance, as middle door for exit. For the Left-side door to serve the BRT station, 2-adjacent middle doors will be used. The bus will be low-floor with entrance level at 30 cm, with front-facing seat configuration.

26. The budget for purchase of BRT vehicles has been set to require a minimum of Euro IV emissions standard. The specification will not mandate a fuel type beyond the requirement to meet the minimum Euro IV level and meet local availability of the fuel source. Possible technologies could include clean diesel, CNG, biomethane, LPG, hybrid, and electric. It will be up to the bidding manufacturers to propose the fuel and propulsion technology that will meet the requirements. It should be noted that at present, most buses in Vientiane use diesel-powered engines. There is one electric bus from Toyota operated by the Vientiane State bus Company for testing only. Although electric buses are attractive, the cost, more limited spare parts availability as well as the local capacity for maintenance make implementation difficult in Vientiane. Additionally, distance travelled by electric buses may only cover between 100-120 km per charge, making it operationally challenging and limiting.

b. Bus Depot

27. A bus depot will be established for the BRT vehicles at a 1.7-hectare vacant property of the Ministry of Public Works and Transport (MPWT) at km 18 along national road NR 13 South (NR13S), Phonkham Village, Xaythany District. The depot will accommodate the 96 BRT buses to be purchased under the Project. Aside from bus parking areas, facilities to be constructed at the bus depot are listed below. The design and specifications of these facilities will be prepared during detailed design phase:

- Administrative offices
- Maintenance area
- Refuelling area
- Vehicle washing area
- Water recycling and waste management area
- Spare parts storage area
- Driver training, recreational and rest areas

28. There are several clusters of houses (about 30 houses in total) across unpaved roads which run alongside the boundary of the bus depot. The populated residential area (village centre) is about 1 km from NR13S. There are large seasonal paddy field areas and fish ponds at the back of the proposed site. A majority of houses around the deport are one and two-storey brick houses.

c. Bus Staging Areas

29. **VDES compound.** A 1,500 m^2 vacant area at the Vientiane Department of Education and Sports (VDES) site is proposed to be used for temporary parking/staging area. The area is currently used as parking for cars/vehicles and as a venue for social events such as Children's Day, Lao New Year, etc. which are attended by children and youth from the nine districts of Vientiane Capital. During project operation, the area will accommodate about 15 BRT buses. A

rest area for drivers will also be provided at the site. Washing, maintenance and refuelling of the buses will be undertaken at the bus depot. The project will not affect the existing office buildings and traning center within the compound. The proposed site (**Photo 1**) is located along Samsenthai Road in Nongduang Neua Village, Sikhottabong District and is about 2 km far from the city center. The area is within a densely populated area of the village close to offices, school and commercial buildings.

Photo 1. Proposed location of bus staging/temporary parking area at VDES compound

30. **IMMC compound.** The site (**Photo 2**) located in Simeung Village, Sisattanak District has an area of about 4,200 m^2 . There are currently three one-storey offices (**Photo 3**) of the Institute of Mass and Media and Culture (IMMC) under the Ministry of Information, Culture and Tourism at the IMMC compound. The site will serve as a bus staging/temporary parking area for about 30 BRT buses and there will be provisions for refuelling and driver rest areas. Washing and maintenance of the buses will be undertaken at the bus depot. The existing buildings will be most likely used to house the equipment and offices for the traffic management control center to be established for the Project. The site is surrounded by various government offices, residential areas and commercials establishments.

Photo 2. Proposed location of bus staging/temporary parking area at IMMC compound

Photo 3. Existing building at the IMMC compound

2. Traffic Management System

31. Some of the detected private transport problems are mostly related to over saturation which can be solved through changes such as readjustment of the green phase of the traffic lights, installation of additional traffic lights/signal at selected intersections and modifications to traffic circulation. Results of microsimulation of the traffic impacts of such changes at key intersections show large reductions in intersection saturation and improvements in capacity. Analysis of the intersections of Khouvieng Road and Nongbone Road, Khouvient Road and Lane Xang Road, Lane Xang Road and Dongpalane Road, and Rue Setthathilath and Kong Bu Lom Road shows that in each case, intersection saturation will be reduced to less than half of the current peak hour saturation, resulting in much better intersection performance. Some of the proposed changes to improve traffic flow are shown in **Figure 8** (installation of additional traffic signals) and **Figure 9** (proposed traffic circulation and access).

Figure 8. Existing and proposed traffic signals.

Figure 9. Proposed mixed traffic circulation and access.

32. Other proposed interventions are as follows:

a. Adjustment of the green phase in some intersections in order to eliminate the saturation problems (such as at Setthathirath Road – Khounboulom Boulevard, Lane Xang Avenue – Samsenethai Road, Souphanouvong Avenue– Sithane Road)

b. Suppression of left- turns in those intersections which are not controlled with traffic lights or those approaches without exclusive lanes for this turn. Some of these intersections with detected saturation problems are Thadeua Road – That Khao Road, Samsenthai Road – Khounboulom Boulevard, and Khounboulom Boulevard – Chao Anou Road.

c. New lanes for the approaches in the following intersections, in order to increase their capacity: Lane Xang Avenue – Saylom Road (new lane for Saylom Road), Saylom Road - Khounboulom Boulevard (extra lane for the right turn in Saylom Road), and in the intersection of Khounboulom Boulevard – Chao Anou Road (new lane for the North approach of Chao Anou Road.

d. New circulation scheme for Patuxay intersection.

3. Parking Management System

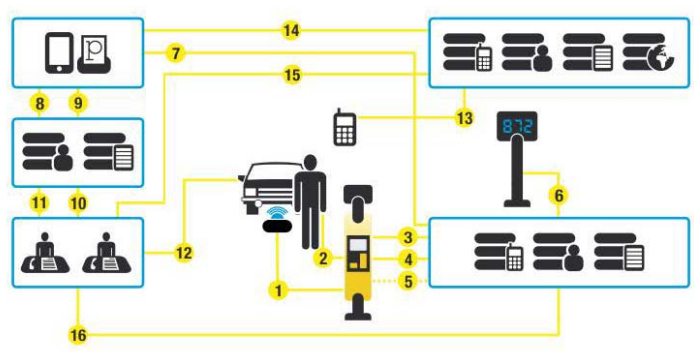
33. The Core Area becomes congested during the day, with vehicles double parked, on walkways and in “no parking‟ areas. These vehicles obstruct pedestrian access and put them in danger. The project will support for on-street paid parking scheme for city center area using electronic meter technology and the country-wide electronic vehicle registration system to enable enforcement. Under preliminary design, the on-street parking would be parallel parking on either or both sides of the street – with few streets designed for perpendicular parking. The design of on-street parking spaces is integrated with the design of BRT implementation and NMT improvements

34. The organized on-street parking system for cars and motorcycles will allow for smoother traffic flow as well as for improved availability of parking and pedestrian mobility. There will be dedicated parking spaces for 1,848 cars and 1,588 motorcycles. Improved parking management is expected to: (i) create attractive streets with higher business potential such as for restaurants and shops; (ii) reduce cruising and vehicle kilometres travelled resulting to reduced pollution, congestion and improved road safety; (iii) improve conditions for walking and cycling; and (iv) generate income for sustainable transport.

35. The system will involve installation of parking sensors for real-time occupancy information and real- time vacancy information displays to direct drivers to vacant parking slots. **Figure 10** shows the recommended on-street parking zone. On-street parking is proposed to be prohibited on prominent streets such as Francois Ngin, Rue Chao Anau, Rue Pangkham, Rue Hengboun, etc.

Figure 10. Lay-out of recommended on-street parking zone

36. **Figure 11** presents the proposed integrated system covering the operation, enforcement, customer service, traffic data and financial data aspects for on-street parking.



1. Sensor - detecting the magnetic field of the car and sending the signal via RFID to the parking meter
2. Parking meter - communicating to data center via GPRS (3G/4G)
3. Financial data - sent by the parking meter to the data center via GPRS (3G/4G)
4. Technical (maintenance) date sent by the meter to the data center via GPRS (3G/4G)
5. Parking places occupancy data sent by the meter to the data center via GPRS (3G/4G)
6. Server sending real-time parking occupancy data to LED parking space occupancy signs via GPRS (3G/4G)
7. Communication between parking controllers' and technicians' PDAs and the data center via GPRS (3G/4G)
8. The controllers' PDA sending data of non-paying car drivers to front and back office server via GPRS (3G/4G)
9. The technicians' PDA sending and receiving via GPRS (3G/4G) the maintenance data to the front and back office server
10. The front and back office server sending the data of the non-paying car drivers to the front and back office employees
11. The front and back office server sending and receiving the maintenance data to the front and back office employees
12. Customer service between car driver and front office
13. Data communication via GPRS (3G/4G) and/or SMS and/or voice call for cell phone payment between the car drivers phone and the mobile payment server
14. Data communication via GPRS (3G/4G) between the cell phone payment server and the controllers PDA – for check on parking payment
15. Data communication between the mobile phone payment server and the front and back office server
16. Data communication between the front and back office employees and the data center via the internet

Figure 11. Integrated parking system.

4. Non-motorized Transport (NMT)

a. Pedestrianization

37. The objectives of the NMT development is to make 100 villages and Talat Sao (Vientiane Morning Market) area more livable and attractive spaces for living, business, tourism and other uses. The project will support for investment in pedestrians facilities, capacitation work with tuk-tuk industry and demonstration of modern e-assist vehicles. The NMT facilities will encourage more people to walk and cycle and reduce motorized traffic, thereby contributing to improved air quality. Under the component, full-pedestrianization and NMT amenities adding (trees, street-lights, benches, paved-sidewalks, etc.) are preliminarily designed for Rue Francois Ngin and Rue Pangkham streets (between Fountaine and Rue Samsenthai) and the transit mall on Rue Setthatilath (between Rue Khu Bu Lom and Rue Pangkham). Widening sidewalks towards the road-side and providing NMT amenities are also included for Rue Chao Anau and Rue Hengboun. Total pedestrianization has been proposed for Pangkham Road between Setthathilath Road and the Nam Phou Fountain. Other NMT improvements include creating new pedestrian islands (mid-block and intersection) and segregating bike-lanes. This component is designed to integrate with the aforementioned BRT and parking systems. **Figure 12** to **Figure 14** show the proposed NMT and parking improvements for a number of roads.

38. The following improvements will be provided within the NMT area:

a. Brick pavement for pedestrian street: 1,662 m^2
b. Brick pavement for sidewalk (including sidewalk extension intersection): 45,516 m^2
c. New pedestrian island (mid-block and intersection): 1,250 m^2
d. Drainage improvement: 1,396 m
e. Street lights: 1,058 units
f. New bollard (keep cars from parking on sidewalks): 13,445 units
g. New benches: 427 units
h. Street furniture: 41 units
i. Speed bumps: 22
j. Trees: 3,460 stands
k. Aerial cable improvement: 12.2 km
l. Raised intersection: 3,780 m^2
m. Additional signalized intersection: 1
n. Repaved asphalt (repave current broken asphalt for cyclists and pedestrians: 4,816 m^2

Figure 12. Proposed pedestrianization at Rue Francois Ngin.

Figure 13. Proposed parking and NMT improvements at Hengboun Road.

Figure 14. Proposed NMT and parking improvements for Chao An Road

b. Bicycle Sharing and Bicycle Lanes

39. A bike sharing system consisting of 76 bike sharing stations with 760 bicycles for short trips and convenient access to BRT is also proposed within the NMT design area. The stations will be located at the city center (29 stations), east-west feeder (27 stations) and north-south feeder (20 stations). The proposed system is a network of publicly available bicycles throughout a defined area in a community whereby a user can take a bicycle from one location and return it to any other location in the network. The bicycle sharing scheme is considered a modern, innovative, sustainable transport solution that acts as a feeder system to public transport (solves the 'last mile' problem) and provides an alternative to short trips currently being done by walking. Bicycle lanes will be established along Samsanthai, Saylom and Khou Vieng roads as shown in **Figure 15.**

Figure 15. Lay-out of bicycle lanes.

5. Institutional Capacity Development

40. The Project will provide five years of embedded support from international advisor and training, capacity-building support for new management entity, and study tour to a high quality BRT system. The following activities will be carried out for institutional development necessary for successful implementation of the project: (i) assessment of the current legal framework and traffic code with respect to public transport, parking, and non-motorized traffic, and drafting of

amendments to the code, if necessary; (ii) development of the operational set-up of the project management unit and definition of the functions, positions, and capacity training requirements of the staff; and (iii) design of capacity training modules for traffic management and public transport operations for MPWT and Vientiane authority.

6. Project Cost and Implementation Schedule

41. The estimated project cost is USD 82 million. Project implementation will commence in 2015 and will be completed in 2020.

IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical resources

1. Ambient Air Quality

42. There are currently no air quality monitoring stations in Vientiane. Available data on ambient air quality are from studies for a specific study conducted by the private sector or organizations.

43. Ambient air quality from the report "*Study of Master Plan on Comprehensive Urban Transport in Vientiane 2008*" (**Figure 16**) conducted by STS Green Company of Thailand indicates that various air quality indicators such as sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), total suspended particles (TSP) and particulate matter 10 (PM_{10}) within the city are well below the National Environmental Standards 2009 of Laos and other internationally accepted standard values (**Table 2**). It should be noted that rapid urban development and considerable increase in the number of vehicles in Vientiane over the last five years have likely resulted to higher pollution levels. However, given the low pollution levels measured in 2008 which are 10 to 25% below the below the standard/guideline values, with the exception of PM_{10} levels, which are about 60% below the said values, the existing ambient air quality may still be considered relatively good.

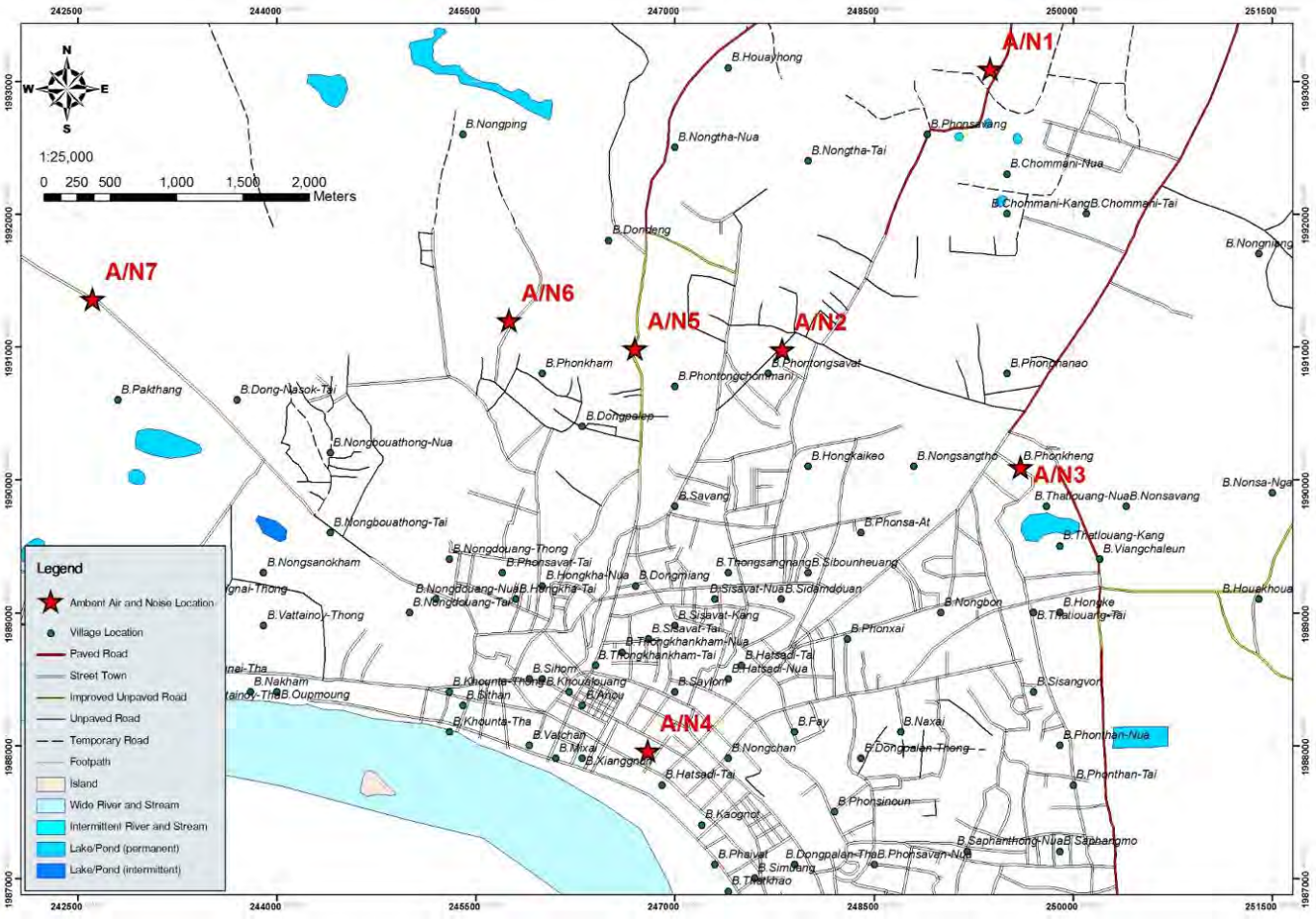


Figure 16. Vientiane Ambient Air Quality and Noise Sampling Locations in 2008. Source: Adapted from report on the Study of Master Plan on Comprehensive Urban Transport in Vientiane 2008

Note: Detail of sampling locations are as follows:

A/N 1 – At the parking area of Xaythany District Office, close to Savang road.
A/N 2 – Within Phontong temple area, opposite Phontong market and close to Savang road.
A/N 3 – At house no. 300 unit 19 Ban Phonkheng.
A/N 4 – At house no. 85 unit 10 Ban Xieng Yeun.
A/N 5 – At the idle land with laterite surrounded community and Dongpaleb road.
A/N 6 – At open space with laterite, close to Nong Bouathong road and irrigation Canal.
A/N 7 – Close to Nong Duang road

STATION	PERIOD	POLLUTANT CONCENTRATION (AVG. 24HRS.)					LOCATION (COORDINATES IN UTM)	
		SO_2 (ppb)	NO_2 (ppb)	CO (ppm)	TSP (mg/m^3)	PM-10 (mg/m^3)		
1. Ban Sivilay Xaythany District	7-8/7/2008 8-9/7/2008 Max-1 hr.	- 2.3 6.6	- 4.1 7.7	- 0.5 1.1	0.090 - -	0.037 - -	1993057	48 Q 0249379
2. Wat Phonthongsavat, Chanthabuly District	7-8/7/2008 Max-1 hr.	3.2 6.7	15.9 21.1	0.8 1.9	0.105 -	0.075 -	1990943	48 Q 0247813
3. Ban Phonkheng, Xaysetha District	8-9/7/2008 Max-1 hr.	2.7 8.6	13.1 17.3	0.7 1.9	0.052 -	0.047 -	1990060	48 Q 0249610
4. Ban Xieng Yeun, Chanthabouly District	9-10/7/2008 Max-1 hr.	10.2 26.4	4.6 6.9	0.5 1.4	0.032 -	0.023 -	1987926	48 Q 0246801
5. Ban Dongpaleb, Sikhottabong District	10-11/7/2008 Max-1 hr.	5.0 5.7	5.1 11.7	1.1 3.0	0.120 -	0.061 -	1990954	48 Q 0246705
6. Ban Phonkham, Sikhottabong District	10-11/7/2008 Max-1 hr.	2.3 2.8	6.2 19.2	0.5 1.8	0.063 -	0.052 -	1991166	48 Q 0245756
7. Ban Pakthang, Sikhottabong District	11-12/7/2008 Max-1 hr.	3.0 4.8	6.4 11.6	0.4 1.0	0.137 -	0.088 -	1991326	48 Q 0242619
Japanese standard for 24 hr.		42.0	58.5	-	-	0.1		
Japanese standard for 1 hr.		100.0	-	-	-	-		
US.EPA standard for 24 hr		140.0	-	-	0.33	0.15		
US.EPA standard for 1 hr		-	-	35.0	-	-		
WB&WHO EHS Guidelines 24hr		50.0	-	-	-	0.10		
WB&WHO EHS Guidelines 1 hr[1].		-	200.0	-	-	-		
Natural Environmental Standards 24 hr		114	-	8.28	0.33	0.12		
Natural Environmental Standards 1 hr		297	170	24	-	-		

Table 2. Ambient air quality in core urban areas of Vientiane in 2008. Source: Adapted from report on the Study of Master Plan on Comprehensive Urban Transport in Vientiane 2008

2. Ambient Noise

44. For this Project, noise measurement was carried out at the proposed bus depot and at the VDES compound for temporary parking/bus staging area since there are noise sensitive receptors (NSRs), such as residents around the bus depot, and trainees and employees at the VDES training center, that may be affected during construction and operation phases.

c. Methodology

45. Prior to conducting noise measurements, all noise tool kits have been calibrated and tested for accuracy according to the manufacturer's instructions. The noise measurement method conforms to the Lao National Environmental Standard for one day/24 hours noise measurement. Noise measurement at the different locations at the bus depot were undertaken at the same time from 6:00 AM on 04 June 2014 to 6:00 AM on 05 June 2014. Noise measurements at the VDES compound were conducted from 6:00 AM on 06 June 2014 to 6:00 AM on 07 June 2014.

[1] Environmental, Health, and Safety Guidelines (International Finance Corporation. World Bank Group) April 2007. World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. It has been selected guideline values or the next interim target more restrictive than current national standard

46. During the 24-hour continuous noise measurement at each sampling location, the results have been divided into three shifts (8 hours per shift) to conform to the periods specified in the standards. Throughout each shift, two persons supervised the measurements and kept a field note record on weather conditions and any other noise sources that may affect noise measurement works for each shift.

b. Noise Sampling Stations

47. A total of six noise sampling points were established for the Project. These are four stations within and in the vicinity of the bus depot and another two stations at the VDES compound. The coordinates and descriptions of the sampling stations are presented in **Table 3**. The location of the sampling stations are shown in **Figure 17** and **Figure 18**.

Table 3. Location of noise sampling stations.

No.	Noise Measurement	N	E	Proximity distance to centre of the proposed site (m)	Remark
I.	Bus Depot				
	BD 1	18° 4'7.29"	102°42'32.07"	0	In the middle of the bus depot, about 70 m from National Road 13S.
	BD 2	18° 4'9.10"	102°42'35.20"	107	Residential area, along an unpaved road, about 15 m from the perimeter wall of the bus depot site, about 90 m from National Road 13S
	BD 3	18° 4'9.40"	102°42'25.01"	218	Residential area, along an unpaved road, about 80 m from the boundary of the bus depot site, about 200 m from National Road 13S
	BD 4	18° 4'7.29"	102°42'32.07"	100	On an open area next to a house, about 12 m from the wall of the bus depot site, about 60 m from National Road 13S
II.	VDES Compound			Distance to centre of Samsenthai Road (m)	
	VDES 1	17°58'9.34"	102°35'45.95"	36	Open area in front of the Computer/English Language Training Center, about 33 m and 31 m from edge of Samsenthai and Sithong Roads, respectively
	VDES 2	17°58'8.22"	102°35'41.87"	25	Open area in front of the Children's Education Training Center, about 20 m from edge of Samsenthai Road.

Figure 17. Noise measurement locations at the bus depot.

Figure 18. Noise measurement locations at the VDES compound.

c. Results of Noise Sampling

48. Results show that the applicable standards for the sampling stations were generally exceeded (**Table 4** and **Table 5**). While daily living activities of communities contribute to noise levels, the main source of noise at the sampling locations are from vehicular traffic along nearby roads such as National Road 13S and an unpaved road close to the sampling stations for the bus depot site and the Samsenthai and Sithong Roads adjacent to the VDES compound .

Table 4. Noise levels at the bus depot and vicinity

Location	Noise Levels in dB(a)		
	6:00-18:00	**18:00-22:00**	**22:00-6:00**
BD1	65.9	58.9	52.7
BD2	54.6	52.1	58.0
BD3	63.9	59.1	53.6
BD4	61.7	60.1	57.3
National Environmental Standard 2010: *Noise Standards for residential area (hotels and houses)*	55	55	45

Table 5. Noise levels at the VDES compound.

Location	Noise Levels in dB(a)		
	6:00-18:00	**18:00-22:00**	**22:00-6:00**
VDES1	62.8	62.8	60.5
VDES2	63.5	61.0	57.9
National Environmental Standard 2010: *Noise Standards for quiet areas (hospitals, libraries, treatment places, kindergarten and schools)*	50	45	40

3. Topography

49. Vientiane is located in the upper central part of the Lao PDR. The city lies along the left bank of Mekong River and is part of the alluvial plain which constitutes most of Vientiane Capital, characterized by a flat topography of alluvial soil deposited by the river, with a top soil layer dominated by clay loam up to 1 m deep. The bus depot as well as the VDES and IMMC bus staging areas are located in areas with flat topography.

4. Ecological Environment

50. Ecologically sensitive areas are not found in the vicinity of the various project components since the BRT stations and non-motorized transport facilities will be located within developed urban areas of Vientiane. Only a few trees and grass species are found at the bus depot site and at the VDES and IMMC bus staging/temporary parking areas. Nongchanh wetland, which is located across the proposed IMMC bus staging area, receives domestic wastewater from surrounding areas. The wetland has also been partially filled-up as it is the

location of the World Trade Center (WTC) which is currently under construction. The WTC will house a shopping mall, rental offices and apartments, etc. In the near future, this wetland will be further developed for commercial purposes (buildings and shopping centers).

5. Surface and groundwater resources

51. The essential water feature of Vientiane Capital is the Mekong River, which runs through on the south of Vientiane Capital and forming its border with Thailand. In addition to Mekong River there still are some wetlands such as That Luang marsh, which considered as a water catchments area for accommodating the storm rain during monsoon season for Vientiane city.

52. In general, most natural streams in Vientiane have been converted to be concrete canal in order to drain wastewater from the city. The streams/canals are generally of poor water quality since these receive surface runoff, wastewater and sewage from urban areas which are then released to nearby wetlands especially to That Luang Wetland. Water flows out of the wetland via the Houay Mak Hiao River into the Mekong River, about 64 km south east of the city. This situation is worse in the dry season when there are no surface runoff (rainwater) that could dilute the urban wastewater discharged to streams/canals. This condition leads to highly degraded water quality in downstream areas.

53. Groundwater is not the main source of water for people living within the project area, though some households may own groundwater source such as deep well, but the well is mainly used for irrigation/gardening purposes.

B. Economic development and employment

1. Socioeconomic conditions

54. Vientiane Capital is the main economic centre of Lao PDR with GDP of 2,752 USD per capita in 2012. Agriculture has a 20.2% share of the gross domestic product (GDP) with industry, trade, and service sectors holds 45.6% and 34.2% of the shares respectively. While hydropower and mines and agriculture have been traditionally the key economic sectors, tourism and other service sectors are getting stronger. The service sector was the main recipient of these investments at 71% with trade coming in second at 16% of the investment share.

55. Vientiane's core area is an important political, commercial and tourist centre. It has a growing urban complexity with many public offices at national, provincial and local level, two important daily markets, many hotels and guesthouses, headquarters of some of the most important enterprises and banks of the country or some important schools with thousands of students.

2. Land use planning

56. There are three main land use patterns in the capital – urban center, suburban areas and rural areas. The urban center comprises of government offices, commercial, small and medium businesses and residential areas within the four main districts of Chantabuly, Sisattanak, Sikottabong and Saysettha. The suburban areas cover portions of the districts of Sisattanak and Saysettha as well as Hadxaifong and serve residential buildings, small and

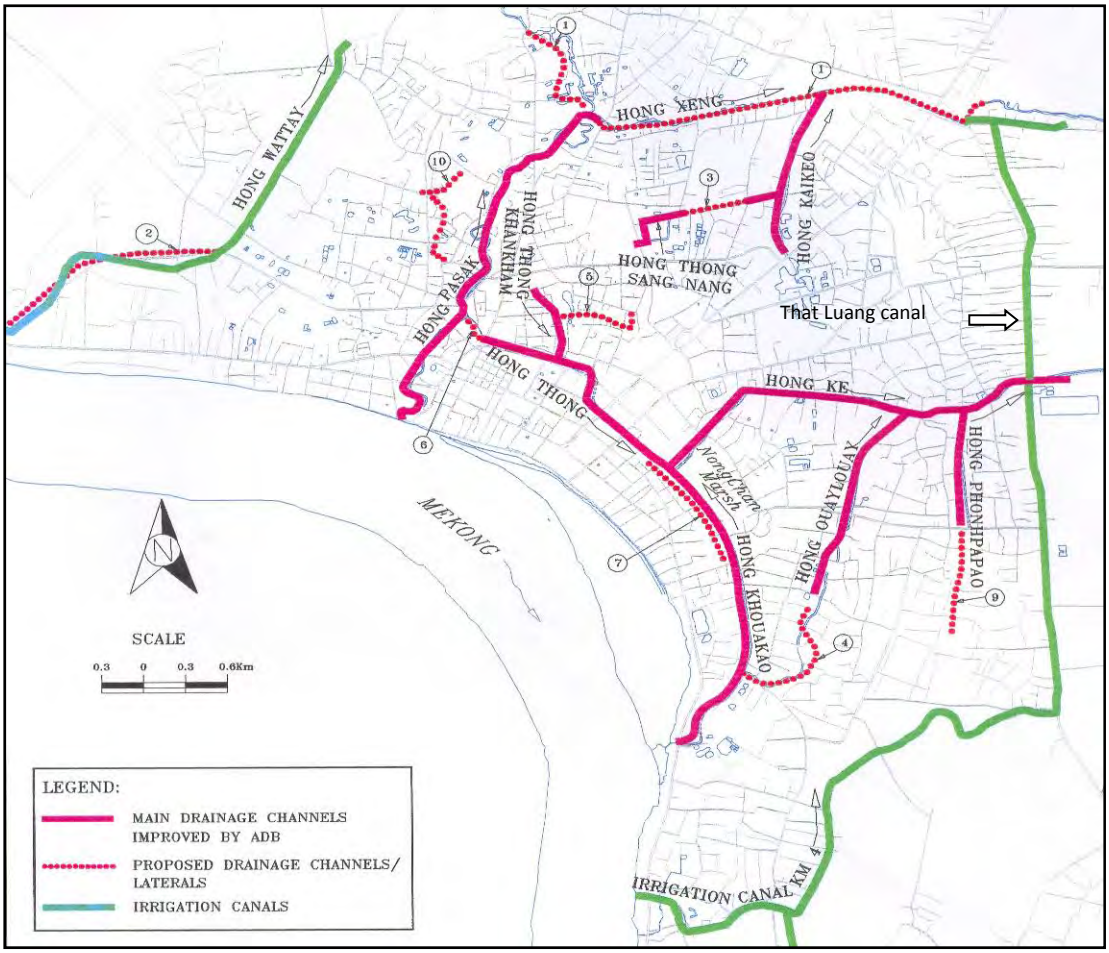
medium industries and agricultural activities. The rural areas cover parts of Xaithany and Hadsxaifong districts and are dominated by large areas of agriculture and residential properties.

3. Infrastructure and facilities (Water supply, sewage, drainage)

57. All people living in the core city areas can access water supply provided by Nam Pa Pa Lao Company. Most people usually connect water from the main water pipes which normally are buried parallel to main/access roads to their houses. Therefore, any construction activities of the project in each site should be aware to avoid cutting water supply pipes.

2. Many urban development projects have been implemented over the past twenty years in order to improve sanitation and stormwater drainage system in Vientiane. A series of drainage canals has been constructed to deal with water and hygiene issues. The overall drainage canals in the city are shown in **Figure 19** below. These core drainage canals that significantly contribute to improve the capacity of stormwater drainage system are referred to Hong Ke, Hong Xeng, Hong Thong, and Hong Khoua Khao.

Figure 19. Drainage channels map in the core areas of Vientiane. Source: Adapted from Thongkhammeng (2007).



4. Transportation and Traffic Volumes

3. Transportation in the core area are dominated by the private scooter/motorbike which make up 46.8% of the total trips made into and within the core area followed by the private cars, pickups and similar at 33.7%, while public transit and para-transits (e.g. buses and tuk-tuks) make up only around 15.4% of all modes. The remaining 4.1% are walkers and bicycle riders.

4. It is estimated that total trips per year in the core area is around 89,000 with a 50-50 split between generated and attracted trips of around 41,000 and the remaining 7,000 trips being internal trips in the core area.

5. Average speeds in the area vary from under 10 km/h to over 25 km/h. The section of Lane Xang Avenue between the junctions with Samsenthai Road and Khouvieng Road is the one section with average speed less than 10 km/h while some sections of Samsenthai and FaNgum Roads have average speeds greater than 25 km/h. The majority of the other main roads have average speeds of around 20-25 km/h.

6. Public transport currently has a small share in the transport mode. There are currently around 10 urban bus lines with a total of 438 departures per day with the longest route of 49 km. Monthly ridership varies, with the highest ridership on one line of around 70,000 per month and the lowest on another line of around 1,500 per month. Bus fares vary from 2,000 Kips to 6,000 Kips per trip.

C. Social and cultural resources

1. Population and community

7. The core area under study comprises of two districts of Chanthabouly and Sisattanak and includes 11 villages: Anou, Haysoke, Watchanh, Mixay, Xiengnhune, Saylom, Sisaket, KaoNgot, Phiawat, Hatsaid-Tai and Nongchanh. Estimated total population in the two project districts in 2009 is 156,618 compared to the city-wide population of 787,647. 2012 figures indicate a higher proportion of females to male at (51% vs. 49%). The age distribution, as estimated in 2010, has a high percentage of 0-14 year-olds at 37.6% and only 3.7% of over 65s.

2. Identification of vulnerable groups

8. The data obtained from the Rural Development and Poverty Eradication Department of Vientiane Capital revealed that in 2012 about 0.14% of the households in Vientiane Capital live under poverty line[2]. Approximately 13.8% of the poor households are found in Chanthabouly district. Based on the official poverty data, there is only one poor household identified in Sisattanak District.

[2] Based on the Decree No. 285/PM issued on 13 October 2009 poverty is defined as the lack of basic needs for a daily active healthy life such as lack of food to provide 2,100 kilo calorie per person per day, lack of necessary cloth, no permanent dwelling, cannot afford medical expenses, cannot afford basic education, and have no access to the networks of basic infrastructure services in the society. The poverty line is set at 180,000 Lao Kip per person per month for rural areas and 240,000 Lao Kip in urban areas.

9. The poor households in Chanthabouly District represent about 0.2% of the total households in this district. Most of them reside around Thongkhankham market. They earn their income from scavenging, recycling activities, daily work at Thongkhankham or Nongchanh markets as carry boys, and laundry workers. Support to the vulnerable households in each district is facilitated through the village authority structure. Village authorities are given discretionary powers to register particular individuals as 'destitute' to enable them to receive some form of state assistance. The selection process is apparently established through government criteria on poverty line, but the village chiefs do determine who is eligible to receive government support for food and medicine channelled through the Social Welfare Department. The poor communities receive fairly good support from the local authorities to cope with the hardship in town. They can obtain treatment for illness at little or no cost, or free basic education for their children.

10. The term "Indigenous Peoples" is not used in Lao PDR and the term "Ethnic Minorities" is considered politically incorrect hence not referred to in this report. The official terminology for describing the diverse population of Lao PDR is "ethnic groups" as introduced in the 1991 Constitution. Articles 8 and 22 underscore non-discrimination on the basis of ethnicity or gender, thus non-Lao people are covered under the usage of ethnic groups. The Government of Lao PDR (GOL) officially acknowledged 47 main ethnic groups or categories, and 149 subgroups in 1995 as part of conducting the national census. This list was revised by the Lao Front for National Construction (LFNC) and now contains 49 categories, and over 160 subgroups.

11. There are no indigenous people living in the core villages of the project. The Vietnamese and Chinese reside in the area are business people who are well integrated into the urban live of the Capital.

12. The Hmong women travel every day from their home village at km 52 to sell vegetable, non-timber forest products and herbal medicines on the sidewalk in front of the Central Post Office opposite the Morning Market. Enforcement of regulations on the use of sidewalk may affect the income of these ethnic women.

3. Public health and service

13. Health facilities and personnel are relatively low in proportion to the population served. There is a district hospital in each of the 9 districts in the capital with a total of 95 beds. There are 41 dispensaries and 418 private clinics available to treat minor illnesses. There are 4 general hospitals operated by the Ministry of Health which are located in Sisattanak, Xaysetha and Chantabouly districts.

4. Education facility and education

14. In 2012, the Capital had about 857 schools of which 63.4% were public schools. The 536 public schools comprised of 72% primary, 10.5% kindergartens and 17.5% secondary schools. There is one state university and several colleges and vocational training schools.

5. Cultural heritage

15. Sisattanak and Chanthabouly districts has many cultural heritage including Sisaket temple which is the oldest remaining temple in the Capital that was built by King Anouvong in 1818. Another important cultural heritage is the That Luang stupa whose original structure was built in 1566. Simuang temple is also a key cultural heritage, being the home of the city's original foundation pillar. The city also holds many traditional Lao architectural houses as well as French colonial residential and public buildings of architectural interest.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

16. Assessment of the potential adverse impacts of the Project was carried out taking into consideration the magnitude/scale of various activities during construction and operation, existing environmental conditions, project location and design considerations. Corresponding mitigation measures have been formulated to avoid or minimize the anticipated adverse environmental impacts. The Project will not involve major construction activities and there are no ecologically sensitive areas within and in the vicinity of the various project components. No significant environmental impacts are expected during construction while impacts during operation will be generally beneficial as shown in assessment below.

A. Design Stage/Pre-Construction Phase

1. Design Considerations

17. The detailed design and implementation consultant (DDIS) will undertake the following measures during design/pre-construction stage to address potential environmental impacts due to project implementation:

a. Undertake consultations with the officials, employees and trainees of the VDES training center and affected people/residents in the vicinity of the bus depot and IMMC bus staging site to formulate and agree on suitable measures (e.g., noise barriers) to minimize noise impacts and address safety issues during operation phase.
b. Include in the design installation of warning signs and traffic calming devices such as speed humps on access roads (e.g., in residential areas) close to the bus depot and bus staging areas.
c. Lay-out of refuelling area will ensure that fuel tanks, storage of flammable substances, fuel dispensers, and vent pipes of fuel tanks will be positioned as far away as possible from surrounding houses, buildings and property boundary.
d. A water recycling facility will be integrated in the design of the bus depot to maximize re-use of wastewater from bus washing.
e. Design the refuelling station in compliance with relevant local and national legislation, regulation and standards.
f. Take into consideration soil permeability in the design and specifications for fuel storage tanks to avoid contamination of soil and water resources.
g. Ensure that refuelling facility will include:
    i. Fuel tanks that are fitted with overfill protector .
    ii. Provisions to avoid spillage and leaks during loading of materials into fuel tanks.
    iii. Leak detector for underground fuel tanks and pipeline.
    iv. Monitoring well for each underground tank.
h. Ensure that the refuelling areas an d bus/equipment maintenance area are provided with roof and impermeable floor, provisions to contain spillage and leaks of fuel and hazardous substances, and provisions (e.g., oil-water separator, etc.) for collection and treatment of used oil and oil-contaminated wastewater.

i. Prior to construction, undertake baseline groundwater monitoring at the bus depot and IMMC refuelling areas. Parameter to be tested are total petroleum hydrocarbons (TPH); and benzene, toluene, ethylbenzene, and xylenes (BTEX).

2. Land Acquisition

18. **BRT.** The preliminary design and location of the bus rapid transit (BRT) station are expected to be constructed within the existing ROW of five road corridors (Luang Prabang, Setthathilath, Lane Xang, Nongbone, and Singha Road) without impacts on land of individuals or households. Only small areas of public land re expected to be acquired for the project as follows: (i) BRT Station EW12S would impact on 40 m^2 of the corner of Fangoum Park for the buses to loop around the Park and for the bus-ticket office, and (ii) BRT Station NS4 would require 35 m2 of land of Patuxay Park (1 m width x 35 m length) along the curb to provide sufficient space for the two-way bus-route. The affected land of the Parks is under administration of the Vientiane Urban Development Administration Authority (VUDAA). Compensation for land acquisition, if required, will be carried out based on the Resettlement Plan prepared for the Project.

19. **Bus Depot.** The bus depot will not require land acquisition since the proposed 1.7 ha vacant lot for this project component is owned by the executing agency (MPWT).

20. **Bus Staging Areas/Temporary Parking Areas.** The bus staging area/ temporary parking proposed at the IMMC compound will require acquisition of the entire site which has total area of about 4,200 m2. Based on the RP prepared for the project, as the entire area would be acquired, IMMC would get replacement land and compensation for replacement cost to build a new office building (s). For the bus staging area/ temporary parking proposed at VDES site, the 1,500 m2 area to be affected is currently used as a car park area for VDES staff, trainees and visitors. Based on the RP, compensation for this site will not be provided since the land is empty and government-owned. There will still be available vacant area (estimated to be more than 2,500 m2) within the compound for parking and other needs of VDES.

21. **Traffic Management System, Parking Management System, Non-motorized Transport (NMT).** These components are not expected to require land acquisition since the proposed interventions (e.g., on-street parking, improvement of sidewalks, installation of street lights, drainage improvement, etc.) will be undertaken within the existing road right-of-way (streets and sidewalks).

3. Disruption to Community Facilities

22. Construction works for various project components such as the BRT stations, bus depot, bus staging areas and pedestrianization may require relocation of utilities. To minimize impacts due to disruption of services, the contractor will implement the following measures: (i) Water supply pipelines, drainage canals and intakes, power supply, communication facilities and other utilities will be relocated before construction works commence, (ii) Provisions will be made to preserve the operation of current facilities in sufficient quantity and in agreement with the local community, (iii) Relocation of facilities will be undertaken in coordination with the utility company, and (iv) Affected households and establishments will be notified well in advance of disruptions.

B. Construction Phase

23. Implementation of the Project will not involve major civil works. Only minor construction activities will be carried out as follows:

24. Construction of BRT stations and limited road widening that will affect short sections of sidewalks at some station locations. Each BRT station, which will serve as loading and unloading points for bus passengers, will have a small footprint ranging from 210 m^2 to 360 m^2. The stations will be constructed in the middle of existing roads except for stations EW12N, EW12S, NS4E and NS4W which will be located on the curbside. Based on the preliminary designs, the dimensions of sidewalks that will be affected by widening are as follows:

i. Station EW13: 1.2 m (W) x 55 m (L) x 2 sides
ii. Station EW14: 1.1 m (W) x 55 m (L)
iii. Station EW15: 50 cm (W) x 55 m (L), 1 m (W) x 55 m (L)
iv. Station NS4: 1 m (W) x 35 m (L), 1.2 m (W) x 35 m (L)
v. Station NS2 : 1 m (W) x 55 m (L) x 2 sides
vi. Station NS5: 1.8 m (W) x 35 m (L)
vii. Station NS6NS7: 60 cm (W) x 35m (L), 90 cm (W) x 35m (L)

25. For the bus depot and bus staging areas, activities will involve earth works and paving (concrete) for the construction of the bus parking areas. There will be no major construction works since the project will only require relatively minor structures such as administrative offices, maintenance areas, storage areas, driver training area, refueling area, etc. The bus staging areas will serve as temporary parking for BRT buses and site provisions will be limited to paved (concrete) parking and driver rest areas. The existing one-storey buildings at the IMMC site will be most likely used to house offices and equipment for the traffic management system control center. A refueling area will also be installed at the IMMC site.

26. The NMT component will only involve minor civil works such as provision of brick pavement on pedestrian streets and sidewalks, installation of bollards, repaving of broken asphalt for cyclists and pedestrians, etc. The proposed works for the on-street parking and traffic management system during construction phase (e.g., installation of additional traffic lights, readjustment of green phase of traffic lights, installation of parking sensors, construction on the streets is mainly the installation of parking meters and designing the individual parking spots) are not anticipated to result to adverse environmental impacts.

1. Air Quality

27. The abovementioned construction activities for various project components are anticipated to cause emission of dust due to transport of materials and construction works, as well as emission/exhaust from construction vehicles and equipment. Such impacts, however, are considered minor and short-term given that major civil works/construction activities will not be undertaken. There are sensitive receptors close to the proposed sites, such as at the VDES compound , where construction works will be carried out in front of a training center; the bus depot where a number of houses are located along its periphery; IMMC site which is adjacent to some houses and government offices ; and the BRT corridor and NMT areas where mixed land uses are found (residential, commercial, temples, institutional, etc.). For the bus depot,

however, it should be noted that the presence of a 2.5 m high concrete fence surrounding the entire area will help reduce dust levels that could affect nearby residents. The following mitigation measures will be implemented to minimize gaseous and dust emission during construction. (i) Store excavated materials and stockpiles outside road reserve, and cover or keep these moist, but where there is no available area, spoils will be loaded and transported immediately to disposal sites approved by the Engineer and local authority. (ii) Undertake regular water spraying on roads, work areas and other construction-related facilities near or within populated areas and other sensitive receptors. (iii) Prohibit use of equipment and vehicles that emit visible smoke in excess of acceptable limits. (iv) Provide trucks transporting construction materials with covers to minimize spills and dust emission. (v) Impose speed limits for project vehicles to minimize dust emission along populated areas and other sensitive receptors. (vi) Prohibit burning of all types of waste generated at the construction sites, workers' camps, and other project-related facilities and activities.(vii) Regularly clean roads used by construction traffic to remove mud, cement, etc. (viii) Ensure that storage areas for construction materials that generate dust such as cement and aggregates, have dust suppression provisions such as cover/dust barrier, etc. (ix)Install temporary fencing or barriers around dusty activities in vicinity of sensitive receivers to minimize dust emission. (x) Provide prior notification to communities on schedule of construction activities. Given the magnitude of proposed civil works, establishment and operation of project-specific concrete batching plant and asphalt batching plant are not anticipated. That is, the contractor may likely source such materials from existing commercial sources. However, in the event the contractor opts to put up their own batching plants, the following measures will be implemented: (i) Secure required environmental approvals and permits prior to establishment and operation of batching facilities. (ii) Locate batching plants at least 300m from residential/ housing areas and other receptors such as places of worship, medical facilities, schools, cultural sites, etc, and at least 100 m from surface water courses (e.g., rivers, streams).

2. Noise and Vibration

28. Main noise pollution sources during construction works for the BRT stations, improvements for the NMT area, proposed bus depot and bus staging areas are those associated with construction tools and equipment such as excavator, compactor, concrete mixer, jack hammer, generator etc. At the bus depot, construction works is not anticipated to cause significant increase of noise levels in adjacent residential areas due to the presence of a 2.5 m high concrete wall enclosing the site on all sides. Further, since the area is flat and open with only several trees noted at the site, there is little requirement for clearing work to prepare the area for the construction work. At the bus staging area at the VDES site, noise emission due to construction will likely affect the trainees and staff of the training center located at the VDES compound. The same may also be true for a number of houses located adjacent to the IMMC site which will also be developed as a bus staging area. However, since construction works will only be limited to earthworks for paving of the parking area and construction of minor structures such as driver rest areas as well as refueling area (for IMMC site only), noise and vibration impacts are not expected to be significant provided mitigation measures listed below are implemented. The BRT stations and NMT area improvement will also not involve major infrastructure/civil works and corresponding noise and vibration impacts are expected to be moderate and temporary. However, residents and other receptors near the construction areas are expected to occasionally experience high noise levels due to operation of various equipment. Mitigation measures to be implemented by the contractors to minimize noise and vibration impacts are: (i) Install suitable noise control measures, such as noise barriers/walls

around the construction site at the IMMC and VDES , near schools, temples and other construction sites (where necessary) to reduce construction and equipment noise levels to acceptable levels based on applicable National Standards on Noise. (ii) Operation of noisy equipment and construction works during night time (19:00-06:00) in populated areas will only be undertaken after prior notification and consultation have been carried out with affected people and local officials, and suitable noise attenuation measures are implemented. (iii) Prohibit noisy construction activities at the VDES training center and in other construction sites near schools during examination period. (iv) (Position any stationary equipment that produce high noise levels (e.g., portable diesel generators, portable concrete mixer, compressors, etc.) as far as is practical from sensitive receptors; (v) Prohibit use of vibration-generating equipment near vibration sensitive structures.

3. Solid Waste

29. The project will generate various types of solid wastes due to construction activities and presence of workers. Improper handling and disposal of wastes will pose health and safety hazards and are likely to cause damage to the environment as well as nuisance to surrounding communities and the workforce. The following measures will be implemented by the contractor to avoid or minimize impacts that are associated with solid wastes: (i) Provide garbage bins with cover and facilities within the project site and worker's camp for temporary storage of construction waste and domestic solid waste. (ii) Separate solid waste into hazardous, non-hazardous and reusable waste streams and store temporarily on site in areas that areas that are protected from the elements. (iii) Ensure that wastes are not indiscriminately dumped within the project site and adjacent areas. (iv) Undertake regular collection and disposal of wastes to sites approved by local authorities. (v) Disposal of excavation waste/spoils and reclaimed asphalt/pavement will not cause sedimentation and obstruction watercourses, damage to agricultural land, aquaculture ponds and densely vegetated areas. (vi) Spoils disposal sites will be protected from erosion by avoiding formation of steep slopes and implementation of suitable measures such as grassing, etc.

4. Hazardous Substances

30. Hazardous substances such as petroleum products (fuel, oil, grease, bitumen) and other hazardous substances (solvents, paint) are expected to be used in the Project. Used oil will be generated during maintenance and repair of construction vehicles and equipment. Bitumen, which will be used for pavement repair, will be most likely transported by trucks. Releases (leaks and spills) of such materials to the environment will be avoided and/or addressed by the contractor through the following measures: (i) Prior to installation, fuel storage tanks will be thoroughly inspected for damage and necessary repairs will be done. (ii) Store fuel and hazardous substances in paved areas with embankment and roof. (iii) If spills or leaks do occur, undertake immediate clean up. (iv) Ensure availability of spill clean-up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored. (v) Train relevant construction personnel in handling of fuels and spill control procedures. (vi) Ensure all storage containers are in good condition with proper labeling. (vii) Regularly check containers for leakage and undertake necessary repair or replacement. (viii) Store hazardous materials above flood level and away from water course. (ix) Provide equipment maintenance areas with drainage leading to an oil-water separator that will be regularly skimmed of oil and maintained to ensure efficiency. (x) Prohibit discharge of oil

contaminated water. (xi) Place waste oil, used lubricant and other hazardous wastes in tightly sealed containers and store in a location with roof, impermeable floor and bund. (xii) Transport and off-site disposal of waste oil /lubricant and other hazardous substances will be carried out through a government-accredited/authorized firm and consistent with national and local regulations. (xiii) Ensure that maintenance and repairs of equipment and vehicles are only undertaken in areas with impermeable surface. (xiv) Use drip pans to catch fuel/oil leaks during repair and maintenance of equipment and vehicles.

31. For bitumen transport, the contractor will implement the following measures: (i) ensure that the hauler and supplier guarantee that the trucks to be used for transport are approved by local authorities for the transport of bitumen and are also in accordance with the supplier's instructions for transport. (ii) the truck driver must be familiar with the safe loading and unloading procedures of the bitumen products, including the emergency procedure during spillage. (iii) trucks will be provided with tools and materials for handling spills. (iv) In case of a small spill during transport, allow the bitumen to cool and solidify in order to be removed mechanically into containers for disposal. (v) For large spills, prevent from spreading by making a trench or barrier with sand, soil or other materials. Remove the spill mechanically into containers for disposal.

5. Water Quality

32. Since the project will only involve minor construction works, impacts to surface water courses are not expected. The Nongchanh wetland located across the proposed IMMC bus staging area is considered to be of poor quality since it receives domestic wastewater from surrounding areas. The wetland has also been partially filled-up as it is the location of the World Trade Center (WTC) which is currently under construction. The mitigation measures below will be implemented by the contractors to avoid or minimize the Project's contribution to degradation of receiving bodies of water due to generation of wastewater from workers' camps and construction activities: (i) Prior to operation of concrete batching plants, construct settling/retention ponds with sufficient specifications/capacity for treatment of wastewater, (ii) Properly operate and maintain settling/retention ponds to reduce the concentration of total suspended solids to acceptable levels, (iii) Install hygienic toilets at the worker's camps to prevent indiscriminate discharge of untreated sewage/sanitary wastes.

6. Flooding

33. During construction, the project may cause localized flooding due to damage or blockage of drainage. Mitigation measures to be implemented by the contractors are as follows: (i) Provide and maintain temporary drainage, as necessary, to prevent flooding and waterlogging, (ii) Ensure watercourses are not obstructed or, (iii) If obstruction to drainage is unavoidable, provide alternative temporary or permanent channels of sufficient capacity to avoid flow restriction, and (iv) Regularly inspect and maintain all drainage channels to ensure that continue to function as required.

7. Borrow Pits and Quarries

34. Since the project will not involve major civil works, the establishment and operation of project-specific quarry and crushing plant is not expected. It is anticipated that the contractors will purchase aggregates from existing commercial suppliers/facilities. Fill materials will be likely

required for the bus depot, the bus staging area (such as at the IMMC site since its elevation is lower than the surrounding areas/roads and is therefore, prone to flooding) as well as for sidewalk improvements and road repairs at the NMT area and BRT corridor. The contractor will implement the following measures to minimize impacts associated with sourcing of materials: (i) Only licensed quarries and crushers will be used for the Project, (ii) Borrow pits will be covered by required government permits/approvals and/or signed agreements with land owners, (iii) Topsoil will be saved for rehabilitation during closure of the borrow pits, (iv) Borrow pits will be provided with adequate drainage to avoid localized flooding and formation of stagnant water, (v) Upon completion of extraction activities, borrow pits will be dewatered, fences and warning signs will be installed, as appropriate to avoid impacts to public health and safety, (vi) Borrow pits will be left in a tidy state with stable side slopes and proper drainage.

8. Tree Cutting

35. The construction of BRT stations will require cutting of about 16 trees on the sidewalk and two trees within the 40 m^2 park area that will be acquired for Station EW12N. One large tree at VDES and several trees at IMMC and bus depot. None of the trees are of special status (rare, endangered or threatened). This impact is considered negligible and will be offset by planting of more than 3,000 trees within the NMT area as part of the project. DOT will obtain required permit from concerned agency before tree cutting is undertaken.

9. Traffic Congestion

36. The construction works are expected to cause traffic disruption due to temporary road/lane closure and diversions such as at the BRT station locations, NMT-related improvements works, etc. The contractors will implement the following measures to minimize traffic congestion: (i) Closely coordinate with local authorities for any closure of roads or rerouting of vehicular traffic, if required. (ii) As much as possible, allow one side of the road to be open to two-way traffic, (iii) Provide road signs indicating lane closures and detours, (iii) As much as possible, schedule delivery of construction materials and equipment as well as transport of spoils during non-peak hours, and (iv) Ensure access in areas to be closed temporarily or partially by provision of alternative access.

10. Occupational Health and Safety

37. The use of heavy equipment and various construction activities will expose workers to hazardous conditions. The following measures will be implemented by the contractors to avoid or minimize health and safety risks: (i) Provide personnel with appropriate safety equipment such as safety boots, helmets, gloves, protective clothes, welding helmets, dust masks, goggles, ear protection, safety line, fall prevention measures, etc., broadly referred to as personal protective equipment (PPE). and ensure that these are properly used as required. (ii) Conduct orientation for construction workers regarding health and safety measures, emergency response in case of accidents, fire, etc., (iii) Provide first aid facilities that are readily accessible to workers such as the workers' camp and work sites. (iv) Provide fire-fighting equipment at the work areas, as appropriate, and at construction/workers' camps. (v) Provide adequate drainage in workers camps to avoid accumulation of stagnant water, (vi) Provide adequate, clean and well-ventilated housing, with separate sleeping quarters for male and female workers, at the workers'/construction camps. (vii) Provide a reliable and safe supply of potable water and water

for washing and bathing purposes at the workers' camps. (viii) Provide separate hygienic sanitation facilities and bathing areas with sufficient water supply for male and female workers. (ix) Ensure that all wastewater emanating from workers camps, construction camps and other project-related activities and facilities is adequately treated to meet applicable national standards prior to discharge. (x) Ensure proper collection and disposal of solid wastes within the workers'/construction camps consistent with local regulations. (xi) Prohibit workers from entering work sites without the appropriate PPE.

38. The contractor will employ an Environment, Health and Safety Officer (EHSO) to ensure proper implementation of all mitigation measures in the environmental management plan. The EHSO will also undertake coordination with residents and local officials to ensure that conflicts due to presence of workers at the site are avoided.

11. Public Safety

39. The project will be implemented in populated areas, thus exposing the public to safety hazards due to operation of heavy equipment, excavation works and other construction activities. At the VDES site, in particular, employees and trainees will be exposed to safety hazards since the proposed bus staging area will be located within the VDES compound. While no major civil works will be undertaken in this area, it is important that the public's access to the construction sites is prohibited at all times. The contractors will implement the following mitigation measures at the construction sites for various project components: (i) Install barriers to keep the public away from hazardous areas such as constructions sites and excavation sites, (ii) Install signage at the periphery of the construction site advising road users and the general public that construction is in progress, (iii) Strictly impose speed limits on construction vehicles along residential areas and where other sensitive receptors such as schools, temples and other populated areas are located, (iv) Provide adequate lighting at night within and in the vicinity of construction sites, (v) Provide security personnel in hazardous areas to restrict public access. (vi) If necessary, provide safe passageways for pedestrians crossing the construction site and for people whose access has been disrupted due to construction works.

12. Archaeological and Cultural Artefacts

40. There is a possibility that "chance finds" may be discovered during excavation in the project area. To avoid impacts to such resources, the Contractor will implement the following: (i) Cease operations on a road section where artifacts or archaeological finds are discovered and immediately inform the DDIS, (ii) The DDIS to notify DOT, who will notify the relevant Government agency, such as the Ministry of Information, Culture and Tourism to obtain advice regarding the next steps, (iii)Work to recommence only after the relevant Government agency has provided official notification accordingly.

C. Operation Phase

41. The Vientiane Sustainable Urban Transport Project (VSUTP) will provide a better environment and improved quality of life for residents of Vientiane through: (i) Improved traffic flow/reduced congestion, (ii) Travel time savings due to provision of dedicated bus lanes along the BRT corridor, (iii) improved air quality due to lower greenhouse gas emission from BRT buses (compliant with European emission standard IV or Euro IV) which will have better technology and lower fuel consumption than the older vehicle models currently in use, (iv)

Improved road safety as a result of improved pedestrian crossings at the BRT stations as well as reduced interaction with other vehicles due to segregation of BRT buses from mixed traffic along the BRT corridor (v) create attractive streets with higher business potential such as for restaurants and shops; (vi) organized parking will reduce cruising and vehicle kilometres travelled resulting to reduced pollution, congestion and improved road safety; (vii) improved conditions for walking and cycling, (viii) improved community liveability, and (ix) improved pedestrian safety and access- traffic calming devices such as safety bumps, bollards to keep cars from parking on sidewalks.

42. The following adverse environmental impacts identified during operation phase are not considered significant. Mitigation measures have been formulated to address such impacts.

D. Air Quality

43. The new buses to be purchased for the Project will have lower emission compared to the buses that are currently in use in Vientiane. The buses will be compliant with Euro IV standard (i.e., European emission standard IV for trucks and buses) emission from vehicles. The following measures will be implemented to minimize exposure of sensitive receptors such as employees and trainees at the VDES bus staging areas as well as residents in the vicinity of the bus depot and IMMC bus staging area: (a) Prohibit idling of buses at the depot and bus staging areas, (b) Conduct monthly emission testing of buses, and (c) Undertake regular maintenance.

E. Noise

44. At the bus depot and bus staging areas, it is expected that the peak hours for departure will be from 6 am to 7 am, and the peak hour for return will be 7 pm to 8 pm. While there will be vehicle movements throughout the day, the frequency is expected to be considerably lesser. The full operational schedule will only be known once the consultants have completed the detailed design, but a typical start time would be 5 am and a typical closure time by midnight. The existing concrete perimeter wall at the bus depot is expected to reduce noise levels from the buses and maintenance activities. Similar noise barriers will also be necessary for the VDES and IMMC bus staging where sensitive receptors (VDES staff and trainees, nearby residents at IMMC site) are found. The following measures will be implemented to minimize impacts due to noise emissions: (i) install noise barriers that will reduce noise levels to meet national noise standards for residential areas [for bus depot and IMMC site] and quiet areas [for VDES site], (ii) strictly impose speed limits for entry and exit of buses, (ii) prohibit use of horn, to be used only for safety/emergency purposes.

F. Solid Waste

45. Solid wastes to be generated at the bus staging areas and bus depot will be addressed through the implementation of the following measures: (i) Provide garbage bins with cover within the project areas, (ii) Separate solid waste into hazardous, non-hazardous and reusable waste streams and store temporarily on site in areas that areas that are protected from the elements. (iii) Ensure that wastes are not indiscriminately dumped within the project site and adjacent areas. (iv) Undertake regular collection and disposal of wastes to sites approved by local authorities.

G. Hazardous Substances

46. The project operation will involve use and storage of hazardous substances such as fuel, oil, grease, etc. particularly at the refuelling areas (IMMC and bus depot) and bus maintenance area (depot). Used oil will also be generated during maintenance and repair of buses. Releases (leaks and spills) of such materials to the environment will be avoided and/or addressed through the following measures: (i) Prior to operation, leak and pressure tests will be conducted on tanks and pipelines to ensure integrity an necessary repairs will be done. (ii) Provide a roof, impermeable floor and provisions to contain leaks and spills at refuelling areas and storage areas for other hazardous substances, (iii) If spills or leaks do occur, undertake immediate clean up, (iii) Ensure availability of spill clean-up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored. (iv) Contaminated materials, e.g., absorbent materials used for clean-up operations, etc., will be disposed to sites approved by local authorities and such disposal will not cause pollution of the environment. (v) Train relevant personnel in handling of fuels and spill control procedures. (vi) Ensure all storage containers are in good condition, with proper labelling and leak-proof lid. (vii) Regularly check fuel tanks, dispensers and containers for leakage/damage and undertake necessary repair or replacement. (viii) Store hazardous materials above flood level and away from watercourse. (ix) Provide equipment maintenance areas with drainage leading to an oil-water separator that will be regularly skimmed of oil and maintained to ensure efficiency. (x) Prohibit discharge of oil contaminated water. (xi) Place waste oil, used lubricant and other hazardous wastes in tightly sealed containers and store in a location with roof, impermeable floor and bund. (xii) Undertake transport and off-site disposal of waste oil /lubricant and other hazardous substances through a government-accredited/authorized firm and consistent with national and local regulations. (xiiii) Ensure that maintenance and repairs of equipment and vehicles are only undertaken in designated areas with adequate provisions to avoid contamination of the environment. (xiv) Use drip pans to catch fuel/oil leaks during repair and maintenance of equipment and vehicles.

H. Drainage

47. At the bus depot where washing of buses will be undertaken and other project components (bus staging areas, BRT stations, etc.), localized flooding will be avoided through: (a) provision of drainage facilities with adequate capacity, and (ii) regular maintenance to ensure drainage/canals are free from obstruction.

I. Water Resources

48. Based on the June 2014 interview with the head of Phokham village (bus depot site) during the preparation of the IEE, about 30% out of 270 households the village that has access to piped water supply. The remaining households use deep well for domestic consumption. According to a discussion with the General Director of Nam Papa Company (Mr. Khampheuy Vongsakhamphui), the Vientiane Water Supply Company has a plan to extend the water supply network (pipe diameter 400) from Dongmakkhai Water Supply Plant to Lak 21. The expansion will include Ban Phokham, which is located between the above pipe route. The expansion project will start in early 2015 and is expected to be completed within 1 or 2 years. The company is presently in the process of procurement of a contractor. As such, it is expected that piper water supply will be available well ahead of the VSUTP project operation which is expected to be completed in 2020. About 450 liters/day/bus will be required for bus cleaning.

To minimize use of water at the bus depot and address potential pollution due to generation of wastewater, a water recycling facility will be constructed and operated to allow for re-use of wastewater from washing of buses. The recycling facility will remove soil/suspended solids as well as oil and grease from the washwater so that the treated water could be used for bus washing. Oil and grease as well as sludge from settling and filtration process will be collected and disposed consistent with national requirements to ensure that these will not cause pollution.

J. Health and Safety of Workers

49. Employees of the various project components will be exposed to health and safety hazards such as at the bus depot and bus staging areas where there will be frequent vehicle movement. Maintenance activities and operation of various equipment exposes workers to further safety risks while improper handling of sanitation wastes pose health risks. The following measures will be implemented during operation to address such impacts: (i) Install separate male and female sanitation facilities/hygienic toilets at the BRT stations, bus depot and bus staging areas for employees/workers. (ii) Provide appropriate safety equipment for workers such as safety boots, helmets, gloves, protective clothes, welding helmets, goggles, ear protection, etc. and ensure that these are properly used as required. (iii) Conduct orientation of workers regarding health and safety measures, emergency response in case of accidents, use of fire-fighting equipment, etc., (iv) Provide first aid facilities at the work sites. (v) Provide sufficient fire extinguishers and other fire-fighting equipment and supplies at all times at the refuelling area, other locations where flammable substances are present, offices and other work areas. (vi) Prohibit smoking, welding and other ignition sources in the vicinity of the refuelling area and in other sites were flammable substances are present. (vii) Designate trained signallers to guide drivers of backing buses and other vehicles at the bus depot and bus staging areas (viii) Ensure proper collection and disposal of solid wastes consistent with local regulations.

K. Public Safety

50. At the VDES bus staging area, employees and trainees of the training center will be exposed to safety hazards due to movement of buses within the compound. At the IMMC bus staging area, there are also concerns about road safety (particularly of children who usually ride their bicycles on narrow roads along and near the bus staging area). To avoid accidents, VDES employees, trainees and the general public will be prohibited from entering the bus staging site through provision of a barrier/fence. A personnel will also be designated to ensure that public access to the site is prohibited. Speed limits will be strictly implemented for buses entering and exiting the bus depot and bus staging areas, such as along access roads located in residential areas. Trained signallers at the depot and staging areas will guide drivers during entry and exit of buses. Warning signs and traffic calming devices such as speed humps will be provided, where appropriate, on village access roads in residential areas close to the bus depot and bus staging areas. As mentioned above, the refuelling areas at the bus depot and IMMC bus staging area will be provided with sufficient fire extinguishers and other fire-fighting equipment and supplies at all times. Also, as part of the design, the lay-out of the refuelling area will ensure that fuel tanks, storage of flammable substances, fuel dispensers, and vent pipes of fuel tanks will be positioned as far away as possible from surrounding houses, buildings and property boundary.

L. Traffic Congestion

51. The project owner will undertake close coordination with traffic authorities/local officials with regard to entry/exit schedule of buses and implementation of other measures to avoid traffic congestion in the vicinity of the bus depot and bus staging areas.

VI. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Objective and methodology

52. Both Lao environmental assessment legal framework and the environmental safeguard policies of the ADB require public consultation from very early stages of every project.

53. The main objectives of the stakeholders' meetings were to share the background and goals of the project for the key stakeholders, and to obtain the stakeholders' comments. The meetings/consultations were carried out in cooperation with MPWT officials including the stakeholders mapping that included representatives from public, private and civil society. The following public consultations were conducted involving residents, community leaders, local officials, representatives of various government agencies, business operators, etc.:

a. At a very early stage, two participatory workshops were carried out on 5 and 8 April 2013 regarding the main goals of the VSUTP project. The participation reached 37 and 49 people respectively on the two dates. Detailed list of participants and highlights of the discussions are shown in **Annex 1** and **Annex 2**.

b. An Interim Workshop was held on 9 July, 2013, where one of the discussion group focused on Environmental and Resettlement Safeguards. Detailed list of participants of the discussions are shown in **Annex 3**. As a result, it can be highlighted that the main concern of the project in regard to safeguards is potential resettlement.

c. A meeting with representatives of the Department of Environment and Social Impact Assessment (DESIA) of MONRE was held on 4 November 2013 They were informed about the project and the main results from the rapid environmental assessment. The DESIA representatives agreed that the proposed VSUTP will play a key role to reduce traffic congestion in the city as well as carbon reduction emitting from motored vehicles aiming to reduce numbers of private vehicle on city roads and introducing new buses for public transport. The proposed improvement of the public transport system will also act as a Clean Development Mechanism (CDM). (Minute in **Annex 4**).

d. Another public consultation was carried out on 14 January 2014, to discuss the project and recommendations. The public consultation approach was as a workshop. More than 70 stakeholders (representatives from Government, village, district, women, youth) were invited to participate. One of the work-tables talked about environmental safeguards. Detailed list of participants and conclusions are shown in **Annex 5**.

e. On 29 May 2014, public consultation was conducted at Ban Phokham (location of bus depot) involving the village chief and his staff, and 61 residents. The list of participants are presented in **Annex 6**

f. Focus group discussions **(Annex 7)** for the BRT and NMT were conducted involving a total of 120 participants (residents, business owners and village officials). The consultations were carried out on 7 June 2014 at Ban Wattay Noy (on BRT route near airport, 50 participants), on 9 June 2014 at Ban Xieng Ngeuen (city center, 40 participants), and on 10 June 2014 at Ban Haisok (city center along transit mall, 30 participants). The minutes of the meeting are in **Annex 8**.

g. On 16 May 2014, the resettlement team carried out consultation with Mr. Xomphou Deopanya, Director of VDES. According to Mr. Deopanya, he has no objection to the land acquisition for the project but he is concerned about noise and gaseous emissions from buses that would adversely affect the students and other users of the training center. During project implementation and upon official confirmation that the VDES site will be used for the project, further consultations will be carried out with VDES officers, staff and trainees to determine specific measures to address environmental impacts of the project.

h. On 25 June 2014, a focus group discussion **(Annex 9)** involving 6 residents near the proposed bus staging area at IMMC site was conducted.

B. Summary of the result of public consultation

54. Key issues identified by stakeholders during the workshops are: i) lack of parking spaces leading to illegal parking and congestion; ii) sidewalks being used for car parking, by street vendors and by motorcycles as an alternative route during traffic congestions; iii) high traffic growth leading to congestion; iv) the lack of respect for traffic rules and regulations; and v) concern for potential resettlement. Environmental impacts were not a concern for public consultation participants with regard to the BRT and NMT components.

55. For the bus depot and bus staging areas, however, environmental issues raised by the participants are as follows:

a. <u>Bus depot</u>:

i. road safety, especially for children, considering that buses will be running to and from the village

ii. Air quality, noise and environmental pollution during operation phase

b. <u>IMMC bus staging area</u>:

i. road accidents during construction and operation phase since the access road to IMMC is very narrow and there are many cars parked on both sides of the road

ii. air pollution due to dust released during transport of materials

iii. dirty road associated with transport of construction materials

iv. construction noise

v. conflict between residents and workers

vi. solid waste

vii. public safety concerns during construction and operation

viii. public safety concerns associated with refilling station

ix. traffic congestion during construction and operation

56. The environmental management plan prepared for the project includes mitigation measures to address the above concerns.

VII. GRIEVANCE REDRESS MECHANISM (GRM)

A. First Level GRM

57. Prior to commencement of site works, the implementing agency (IA) – that is, the Department of Transport (DOT) under MPWT , detailed design and implementation supervision consultant (DDIS), and the contractors will undertake establishment of a grievance mechanism to document and resolve environment-related complaints regarding the project. The DOT/IA and the contractors will publicize the existence of the GRM through public awareness campaigns, billboards, public notifications, etc. The DOT/IA and contractors will also ensure that the names and contact numbers of representatives of the contractors, the DDIS, and DOT/IA are placed on notice boards at the construction sites.

58. For the first level GRM, the contractor's representative together with the DDIS may undertake quick resolution of complaints lodged by affected persons (APs). All complaints received by the contractor will be documented and will be relayed to the DDIS and IA within 24 hours of receiving such complaint. At this first level, the grievance should be resolved within a maximum period of 10 days. If the complaint is not resolved at this level, the complainant may elevate his/her grievances to the second level GRM. During operation phase, the above procedure will also apply, however, complaints may be filed directly to the Project Operator.

B. Second Level GRM

59. The second level GRM steps to be followed in filing complaints and the procedures for handling are: (i) complainant will provide the background information and file the complaint verbally or in writing to the DOT/IA. (ii) within 2 working days, the DOT/IA representative at the field, DDIS representative, contractor's representative, village official and complainant will discuss resolution of the complaint; (iii) if the complaint cannot be resolved within 15 working days, the complainant may take further action through an appropriate legal channel such as the local court.

60. The IA will be responsible for documenting and registering complaints received both during construction and operation, respectively. The will coordinate with other complaint recipients (e.g., village heads, contractor, third parties, etc.) to ensure sure that the complaints are documented by, and registered with, the DOT/IA as soon as possible. The DOT/IA will make sure that documented/registered complaints are acknowledged and duly referenced. During operation phase, the above procedure will also apply, however, complaints may be filed directly to the Project Operator.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

61. This environmental management plan (EMP) provides necessary mitigation and monitoring measures, and corresponding implementation responsibilities. The objective of the EMP is to either avoid or minimize anticipated adverse environmental impacts during pre-construction, construction and operation phases of the project.

A. Implementation Responsibilities

Table 6. Responsibilities for EMP Implementation

Organization	EMP Responsibility
Ministry of Public Works and Transport (MPWT)/Executing Agency (EA)	• Ensure that EMP provisions are implemented for the entire Project regardless of financing source. • Ensure that Project implementation complies with the GOV and ADB's environmental policy principles and requirements • Submit semi-annual monitoring reports on EMP implementation to ADB
Department of Trasnport/Implementing Agency (DOT/IA)	• Implementing agency with designated overall responsibility for project construction and operation including environmental performance • Allocate adequate financial and human resources to fulfil environmental commitments during project construction and operation • Ensure that environmental measures and provisions specified in the EMP's design phase are incorporated in the detailed design • Prior to start of site works, establish a grievance redress mechanism as described in the IEE • Designate an environmental officer for the Project • Ensure that tender and contract documents include the EMP • Ensure that EMP provisions are strictly implemented during pre-construction, construction and operation phases of the project • Undertake monitoring of the implementation of the EMP (mitigation and monitoring measures) and prepare semi-annual environmental monitoring reports with assistance from the DDIS

Organization	EMP Responsibility
Detailed Design and Implementation Supervision Consultant (DDIS)	• Incorporate into the project design the environmental protection and mitigation measures identified in the EMP for the design stage • During detailed design phase, undertake consultations with affected people (residents, officials/employees, trainees, etc.) within and in the vicinity of the bus staging areas add bus depot to formulate and agree on suitable measures to minimize noise impacts and gaseous emission from buses as well as to address safety issues during operation phase. • Ensure that agrees mitigation measures with affected people are incorporated in the project design. • Ensure that tender and contract documents include the EMP • Undertake environmental effects monitoring/ambient sampling during pre-construction and construction phases • Undertake environmental management training of DOT environmental staff
	• Monitor the environmental performance of contractors in terms of implementation of mitigation measures for pre-construction and construction phase as specified in the EMP • Monitor over-all implementation of various EMP provisions through monthly environmental monitoring/site inspection of the Project • Prepare semi-annual environmental monitoring reports
Contractor	• Appoint and environment, health and safety officer (EHSO) to oversee timely and proper implementation of mitigation and monitoring measures specified in the EMP • Provide sufficient funding and human resources for EMP implementation • Ensure proper and timely implementation of required mitigation measures in the EMP for pre-construction and construction phases

B. Environmental Mitigation Plan

Table 7. Environmental mitigation plan

Environmental Aspect/Concern	Proposed Mitigation Measures	Estimated Cost	Responsibility	
			Implementation	Monitoring
Design Stage/Pre-Construction				
1. Unexploded ordnance (UXO)	a) Engage an authorized mines advisory group to identify if UXO is a potential threat to works in the project area (project site, borrow area, etc.)	Part of project cost	DOT/IA	DOT/IA
	b) Commission UXO clearing as necessary.	Part of project cost	DOT/IA	DOT/IA
	c) Advise the contractor that the site has been cleared prior to commencement of site works.	Part of project cost	DOT/IA	DOT/IA
2. Inclusion of environmental measures and provisions in the detailed design	a) During detailed design phase, undertake consultations with affected people (residents, officials/employees, trainees, etc.) within and in the vicinity of the bus staging areas add bus depot to formulate and agree on suitable measures to minimize noise impacts and gaseous emission from buses as well as to address safety issues during operation phase.	Part of detailed design cost	DDIS	DOT/IA
	b) Ensure that agrees mitigation measures with affected people are incorporated in the project design.	Part of detailed design cost	DDIS	DOT/IA
	c) Include in the design installation of warning signs and traffic calming devices such as speed humps on access roads (e.g., in residential areas) close to the bus depot and bus staging areas.	Part of detailed design cost	DDIS	DOT/IA
	d) Lay-out of refuelling area will ensure that fuel tanks, storage of flammable substances, fuel dispensers, and vent pipes of fuel tanks will be positioned as far away as possible from surrounding houses, buildings and property boundary.	Part of detailed design cost	DDIS	DOT/IA

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	e) A water recycling facility will be integrated in the design of the bus depot to maximize re-use of wastewater from bus washing.	Part of detailed design cost	DDIS	DOT/IA
	f) Design the refuelling station in compliance with relevant local and national legislation, regulation and standards.	Part of detailed design cost	DDIS	DOT/IA
	g) Take into consideration soil permeability in the design and specifications for fuel storage tanks to avoid contamination of soil and water resources.	Part of detailed design cost	DDIS	DOT/IA
	h) Ensure that refuelling facility will include: i. Fuel tanks that are fitted with overfill protector . ii. Provisions to avoid spillage and leaks during loading of materials into fuel tanks. iii. Leak detector for underground fuel tanks and pipeline. iv. Monitoring well (groundwater quality) for each underground tank.	Part of detailed design cost	DDIS	DOT/IA
	i) Ensure that the refuelling areas and bus/equipment maintenance area design include a roof and impermeable floor, provisions to contain spillage and leaks of fuel and hazardous substances (e.g., bund or dyke), and provisions (e.g., oil-water separator, etc.) for collection and treatment of used oil and oil-contaminated wastewater.	Part of detailed design cost	DDIS	DOT/IA
	j) Prior to construction, undertake baseline groundwater monitoring at the bus depot and IMMC refuelling areas. Parameter to be tested in total petroleum hydrocarbons (TPH); and benzene, toluene, ethylbenzene, and xylenes (BTEX).	Part of detailed design cost	DDIS	DOT/IA
3. Lack of mechanism to resolve environmental complaints due to project	Prior to start of site works; the DOT/IA, contractors and DDIS will undertake the following: a) establish a grievance redress mechanism (GRM), as described in the IEE	Part of project cost	DOT/IA, Contractor, DDIS	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
implementation	b) through public awareness campaigns, make public the existence of the GRM	Part of project cost	DOT/IA, Contractor, DDIS	DOT/IA, DDIS
	c) ensure that names and contact numbers of representatives of DOT/IA, contractors and DDIS are placed on the notice boards outside the construction site	Part of project cost	DOT/IA, Contractor, DDIS	DOT/IA, DDIS
4. Disruption to community services due to relocation of facilities (e.g., water supply)	a) In coordination with utility companies, relocate water supply pipelines, power supply, communication lines and other utilities before construction works commence	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Make provisions to preserve the operation of current facilities (e.g., water supply, etc.) in sufficient quantity and in agreement with the local community,	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	c) Notify affected households and establishments well in advance of disruptions.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
5. Tree cutting	a) Obtain necessary tree cutting permit from concerned agency prior to start of site works.	Part of project cost	DOT/IA	DDIS
	b) Undertake planting of around 3,500 trees in the non-motorized transport (NMT) area	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
6. Establishment of construction-related facilities	The following measures will be implemented by the contractor prior to establishment of the following construction-related facilities. Such facilities include concrete batch plants, borrow areas, worker's camps, equipment maintenance area, etc. a) Secure the necessary environmental approvals and permits prior to establishment and operation of construction related facilities.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Concrete batch plants and other facilities that will result to emission of high dust and noise levels shall be located at least 300 m from sensitive receptors such as residential/housing areas, medical facilities, schools,	Part of bid cost for civil works	Contractor	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	religious and cultural sites, etc. and at least 100 m from surface water courses (e.g., rivers, streams).			
Construction				
1. Air quality impacts due to gaseous and dust emissions	a) Store excavated materials and stockpiles outside road reserve, and cover or keep these moist, but where there is no available area, spoils will be loaded and transported immediately to disposal sites approved by the DDIS (Engineer) and local authority.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Undertake regular water spraying on roads, work areas and other construction-related facilities near or within populated areas and other sensitive receptors.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	c) Prohibit use of equipment and vehicles that emit visible smoke in excess of acceptable limits.		Contractor	DOT/IA, DDIS
	d) Provide trucks transporting construction materials with covers to minimize spills and dust emission.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	e) Impose speed limits for project vehicles to minimize dust emission along populated areas and other sensitive receptors.		Contractor	DOT/IA, DDIS
	f) Prohibit burning of all types of waste generated at the construction sites, workers' camps, and other project-related facilities and activities.		Contractor	DOT/IA, DDIS
	g) Regularly clean roads used by construction traffic to remove mud, cement, etc.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	h) Ensure that storage areas for construction materials that generate dust such as cement and aggregates, have dust suppression provisions such as cover/dust barrier, etc.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	i) Install temporary fencing or barriers around dusty activities in vicinity of sensitive receivers to minimize dust emission	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	j) Provide prior notification to communities on schedule of construction activities.	Part of bid cost for	Contractor	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
		civil works		
2. Noise and vibration impacts due to operation of construction equipment/ vehicles and various construction activities	a) Install suitable noise control measures, such as noise barriers/walls around the construction site at the IMMC and VDES , near schools, temples and other construction sites (where necessary) to reduce construction and equipment noise levels to acceptable levels based on applicable National Standards on Noise	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Operation of noisy equipment and construction works during night time (19:00-06:00) in populated areas will only be undertaken after prior notification and consultation have been carried out with affected people and local officials, and suitable noise attenuation measures are implemented.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	c) Prohibit noisy construction activities at the VDES training center and in other construction sites near schools during examination period.		Contractor	DOT/IA, DDIS
	d) Position any stationary equipment that produce high noise levels (e.g., portable diesel generators, portable concrete mixer, compressors, etc.) as far as is practical from sensitive receptors;		Contractor	DOT/IA, DDIS
	e) Prohibit use of vibration-generating equipment near vibration sensitive structures.		Contractor	DOT/IA, DDIS
3. Wastewater from concrete batch plants (CBP)	a) Prior to operation of CBP, construct a series of settling/retention ponds that are lined with clay or concrete and with sufficient specifications/ capacity for treatment of wastewater (e.g., from washing of equipment such as mixer drums, trucks and chute, contact storm water, etc.)	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Properly operate and maintain settling/retention ponds to ensure effluent quality meets applicable national standards.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
4. Potential contamination of soil and water resources due to use of fuel	a) Prior to installation, fuel storage tanks (for construction and phase and for the refueling facilities of the bus depot and bus staging area) will be thoroughly inspected for damage and necessary repairs will be done.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
and other hazardous substances.	b) Store fuel and hazardous substances in paved areas with embankment and roof.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	c) If spills or leaks do occur, undertake immediate clean up.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	d) Ensure availability of spill clean-up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	e) Train relevant construction personnel in handling of fuels and spill control procedures.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	f) Ensure all storage containers are in good condition with proper labeling.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	g) Regularly check containers for leakage and undertake necessary repair or replacement.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	h) Store hazardous materials above flood level and away from water course.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	i) Provide equipment maintenance areas with drainage leading to an oil-water separator that will be regularly skimmed of oil and maintained to ensure efficiency.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	j) Prohibit discharge of oil contaminated water.		Contractor	DOT/IA, DDIS
	k) Place waste oil, used lubricant and other hazardous wastes in tightly sealed containers and store in a location with roof, impermeable floor and bund.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	l) Transport and off-site disposal of waste oil/lubricant and other hazardous substances will be carried out through a government-accredited/authorized firm and consistent with national and local regulations.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	m) Ensure that maintenance and repairs of equipment and vehicles are only undertaken in areas with impermeable surface.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	n) Use drip pans to catch fuel/oil leaks during repair and maintenance of equipment and vehicles.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	o) Ensure that the hauler and supplier guarantee that the trucks to be used for transport are approved by local authorities for the transport of bitumen and are also in accordance with the supplier's instructions for transport.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	p) The truck driver must be familiar with the safe loading and unloading procedures of the bitumen products, including the emergency procedure during spillage.		Contractor	DOT/IA, DDIS
	q) Trucks will be provided with tools and materials for handling bitumen spills.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	r) In case of a small bitumen spill during transport, allow the bitumen to cool and solidify in order to be removed mechanically into containers for disposal.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	s) For large spills, prevent bitumen from spreading by making a trench or barrier with sand, soil or other materials. Remove the spill mechanically into containers for disposal.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
5. Drainage obstruction/ flooding	c) Provide and maintain temporary drainage, as necessary, to prevent flooding and waterlogging.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	d) Ensure watercourses are not obstructed.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	e) If obstruction to drainage is unavoidable, provide alternative temporary or permanent channels of sufficient capacity to avoid flow restriction.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	f) Regularly inspect and maintain all drainage channels to ensure that continue to function as required.	Part of bid cost for	Contractor	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
		civil works		
6. Generation of solid wastes	a) Provide garbage bins with cover and facilities within the project site and worker's camp for temporary storage of construction waste and domestic solid waste.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Separate solid waste into hazardous, non-hazardous and reusable waste streams and store temporarily on site in areas that are protected from the elements.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	c) Ensure that wastes are not indiscriminately dumped within the project site and adjacent areas.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	d) Undertake regular collection and disposal of wastes to sites approved by local authorities.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	e) Disposal of excavation waste/spoils and reclaimed asphalt/pavement will not cause sedimentation and obstruction watercourses, damage to agricultural land, aquaculture ponds and densely vegetated areas.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	f) Spoils disposal sites will be protected from erosion by avoiding formation of steep slopes and implementation of suitable measures such as grassing, etc.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
7. Damage to community facilities and properties	a) Immediately repair any damage caused by the Project to community facilities and properties such as water supply, power supply, communication facilities, structures/houses, and the like.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Access roads damaged during transport of construction materials and other project-related activities will be maintained to at least it's pre-project condition and to ensure that it remains passable to pedestrians and vehicles.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	c) Damaged access roads will be reinstated upon completion of construction work.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
8. Impacts due to operation of borrow pits and quarries	a) Only licensed quarries and crushers will be used for the Project.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	b) Borrow pits will be covered by required government permits/approvals and/or signed agreements with land owners	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	c) Topsoil will be saved for rehabilitation during closure of the borrow pits	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	d) Borrow pits will be provided with adequate drainage to avoid localized flooding and formation of stagnant water	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	e) Upon completion of extraction activities, borrow pits will be dewatered, fences and warning signs will be installed, as appropriate to avoid impacts to public health and safety	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	f) Borrow pits will be left in a tidy state with stable side slopes and proper drainage.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
9. Traffic congestion	a) Closely coordinate with local authorities for any closure of roads or rerouting of vehicular traffic, if required.		Contractor	DOT/IA, DDIS
	b) As much as possible, allow one side of the road to be open to two-way traffic		Contractor	DOT/IA, DDIS
	c) Provide road signs indicating lane closures and detours	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	d) As much as possible, schedule delivery of construction materials and equipment as well as transport of spoils during non-peak hours		Contractor	DOT/IA, DDIS
	e) Ensure access in areas to be closed temporarily or partially by provision of alternative access.		Contractor	DOT/IA, DDIS
10. Hazards to health and safety of workers due to construction works	a) Provide personnel with appropriate safety equipment such as safety boots, helmets, gloves, protective clothes, welding helmets, dust masks, goggles, ear protection, safety line, fall prevention measures, etc,	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Ensure that workers use appropriate safety equipment properly at all times while at the work sites.		Contractor	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	c) Prohibit workers from entering work sites without the appropriate safety equipment.		Contractor	DOT/IA, DDIS
	d) Conduct orientation for construction workers regarding health and safety measures, emergency response in case of accidents, fire, etc.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	e) Provide first aid facilities that are readily accessible to workers such as the workers' camp and work sites.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	f) Provide fire-fighting equipment at the work areas, as appropriate, and at construction/workers' camps.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	g) Provide adequate drainage in workers camps to avoid accumulation of stagnant water	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	h) Provide adequate, clean and well-ventilated housing, with separate sleeping quarters for male and female workers, at the workers'/construction camps.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	i) Provide a reliable and safe supply of potable water and water for washing and bathing purposes at the workers' camps.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	j) Provide separate hygienic sanitation facilities and bathing areas with sufficient water supply for male and female workers.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	k) Ensure that all wastewater emanating from workers camps, construction camps and other project-related activities and facilities is adequately treated to meet applicable national standards prior to discharge.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	l) Ensure proper collection and disposal of solid wastes within the workers'/construction camps consistent with local regulations.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
11. Hazards to public safety due to construction works	a) Install barriers to keep the public away from hazardous areas such as constructions sites and excavation sites	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Install signage at the periphery of the construction site	Part of bid	Contractor	DOT/IA,

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	advising road users and the general public that construction is in progress	cost for civil works		DDIS
	c) Strictly impose speed limits on construction vehicles along residential areas and where other sensitive receptors such as schools, temples and other populated areas are located		Contractor	DOT/IA, DDIS
	d) Provide adequate lighting at night within and in the vicinity of construction sites,	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	e) Provide security personnel in hazardous areas to restrict public access.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	f) If necessary, provide safe passageways for pedestrians crossing the construction site and for people whose access has been disrupted due to construction works.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
12. Potential damage to undiscovered archaeological relics	a) Cease operations on a road section where artifacts or archaeological finds are discovered and immediately inform the DDIS		Contractor	DOT/IA, DDIS
	b) The DDIS to notify DOT, who will then notify the relevant Government agency (e.g., Ministry of Information, Culture and Tourism) to obtain advice regarding the next steps	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	c) Work to recommence only after the relevant Government agency has provided official notification accordingly		Contractor	DOT/IA, DDIS
13. Social conflicts due to presence of workers	a) As much as possible, locate the workers' camps away from communities in order to avoid social conflict	Part of bid cost for civil works	Contractor	DOT/IA, DDIS
	b) Maximize number of local people employed in construction works.		Contractor	DOT/IA, DDIS
14. Additional environmental mitigation measures	The Contractor shall implement corrective and/or additional measures to avoid, mitigate or compensate for adverse environmental impacts due to construction works and other project-related activities performed by the Contractor and its subcontractors.	Part of bid cost for civil works	Contractor	DOT/IA, DDIS

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
Operation				
1. Air quality impacts due to operation of the project buses	a) Prohibit idling of buses at the depot and bus staging areas		Project owner/operator	DOT
	b) Conduct monthly emission testing of buses	Part of operation cost	Project owner/operator	DOT
	c) Undertake regular maintenance of buses to ensure that emission standards are met	Part of operation cost	Project owner/operator	DOT
2. Noise emission due to movement of buses at the bus depot and bus staging areas, and noise from maintenance activities	a) Install noise barriers that will reduce noise levels to meet national noise standards for residential areas (for bus depot and IMMC site) and quiet areas (for VDES site)	Part of project cost	Project owner/operator	DOT
	b) strictly impose speed limits for entry and exit of buses		Project owner/operator	DOT
	c) prohibit unnecessary use of horn, to be used only for safety/emergency purposes		Project owner/operator	DOT
	d) undertake noise monitoring during operation to determine and provide additional noise abatement measures, as necessary.	Part of operation cost	Project owner/operator	DOT
3. Solid waste generation	a) Provide garbage bins with cover within the project areas (such as at the bus depot, bus staging area, BRT stations, etc.)	Part of operation cost	Project owner/operator	DOT
	b) Separate solid waste into hazardous, non-hazardous and reusable waste streams and store temporarily on site in areas that areas that are protected from the elements	Part of operation cost	Project owner/operator	DOT
	c) Ensure that wastes are not indiscriminately dumped within the project site and adjacent areas	Part of operation cost	Project owner/operator	DOT
	d) Undertake regular collection and disposal of wastes to sites approved by local authorities	Part of operation cost	Project owner/operator	DOT
4. Potential contamination of soil and water resources	a) Prior to operation, leak and pressure tests will be conducted on tanks and pipelines to ensure integrity an necessary repairs will be done.	Part of operation cost	Project owner/operator	DOT

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
due to use of fuel and other hazardous substances.	b) Provide a roof, impermeable floor and provisions to contain leaks and spills (such as bund or dyke) at refuelling areas and storage areas for other hazardous substances	Part of project cost	Project owner/operator	DOT
	c) Ensure availability of spill clean up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored.	Part of operation cost	Project owner/operator	DOT
	d) Contaminated materials, e.g., absorbent materials used for clean-up operations, etc., will be disposed to sites approved by local authorities and such disposal will not cause pollution of the environment.	Part of operation cost	Project owner/operator	DOT
	e) Train relevant personnel in handling of fuels and spill control procedures.	Part of operation cost	Project owner/operator	DOT
	f) Ensure all storage containers are in good condition, with proper labelling and leak-proof lid.	Part of operation cost	Project owner/operator	DOT
	g) Regularly check fuel tanks, dispensers and containers for leakage/damage and undertake necessary repair or replacement.	Part of operation cost	Project owner/operator	DOT
	h) Store hazardous materials above flood level and away from watercourse.	Part of operation cost	Project owner/operator	DOT
	i) Provide equipment maintenance areas with drainage leading to an oil-water separator that will be regularly skimmed of oil and maintained to ensure efficiency.	Part of operation cost	Project owner/operator	DOT
	j) Prohibit discharge of oil contaminated water.		Project owner/operator	DOT
	k) Place waste oil, used lubricant and other hazardous wastes in tightly sealed containers and store in a location with roof, impermeable floor and bund.		Project owner/operator	DOT
	l) Undertake transport and off-site disposal of waste	Part of	Project	DOT

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	oil/lubricant and other hazardous substances through a government-accredited/authorized firm and consistent with national and local regulations.	operation cost	owner/operator	
	m) Ensure that maintenance and repairs of equipment and vehicles are only undertaken in designated areas with adequate provisions to avoid contamination of the environment.	Part of operation cost	Project owner/operator	DOT
	n) Use drip pans to catch fuel/oil leaks during repair and maintenance of equipment and vehicles.	Part of operation cost	Project owner/operator	DOT
	o) Ensure that the hauler and supplier guarantee that the trucks to be used for transport of fuel are approved by local authorities and are also in accordance with the supplier's instructions for transport.	Part of operation cost	Project owner/operator	DOT
	p) Undertake collection and disposal of oil, grease and sludge from the wastewater recycling facility consistent with national requirements to avoid pollution.	Part of operation cost	Project owner/operator	DOT
	q) Ensure that an emergency response plan is in place and adequately resourced to address emergency situations such as accidents/spills during transport of fuel, fire, explosion, and the like.	Part of operation cost	Project owner/operator	DOT
5. Water supply reliability	a) Construct, operate and properly maintain a water recycling facility to allow for re-use of wastewater from washing of buses.	Part of operation cost	Project owner/operator	DOT
6. Hazards to health and safety of workers and the public due to depot operation	a) Install separate male and female sanitation facilities/hygienic toilets at the BRT stations, bus depot and bus staging areas for employees/workers.	Part of project cost	Project owner/operator	DOT
	b) Provide appropriate safety equipment for workers such as safety boots, helmets, gloves, protective clothes, welding helmets, goggles, ear protection, etc. and ensure that these are properly used as required.	Part of operation cost	Project owner/operator	DOT
	c) Conduct orientation of workers regarding health and	Part of	Project	DOT

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	safety measures, emergency response in case of accidents, use of fire-fighting equipment, etc.	operation cost	owner/operator	
	d) Provide first aid facilities at the work sites.	Part of operation cost	Project owner/operator	DOT
	e) Provide sufficient fire extinguishers and other fire-fighting equipment and supplies at all times at the refuelling area, other locations where flammable substances are present, offices and other work areas.	Part of operation cost	Project owner/operator	DOT
	f) Prohibit smoking, welding and other ignition sources in the vicinity of the refuelling area and in other sites were flammable substances are present.		Project owner/operator	DOT
	g) Designate trained signallers to guide drivers of backing buses and other vehicles at the bus depot and bus staging areas.	Part of operation cost	Project owner/operator	DOT
	h) Ensure proper collection and disposal of solid wastes consistent with local regulations.	Part of operation cost	Project owner/operator	DOT
7. Hazards to public safety safety	a) VDES employees, trainees and the general public will be prohibited from entering the bus staging are through provision of a barrier/fence.	Part of project cost	Project owner/operator	DOT
	b) A personnel will be designated to ensure that public access to the bus depot and bus staging areas is prohibited.	Part of operation cost	Project owner/operator	DOT
	c) Speed limits will be strictly implemented for buses entering and exiting the bus depot and bus staging areas, such as along access roads located in residential areas.		Project owner/operator	DOT
	d) Trained signallers at the depot and bus staging areas will guide drivers during entry and exit of buses.	Part of operation cost	Project owner/operator	DOT
	e) Warning signs and traffic calming devices such as speed humps will be provided, where appropriate, on village access roads in residential areas close to the bus depot	Part of project cost	Project owner/operator	DOT

Table 7. Environmental mitigation plan				
Environmental Aspect/Concern	**Proposed Mitigation Measures**	**Estimated Cost**	**Responsibility**	
			Implementation	**Monitoring**
	and bus staging areas.			
	f) As part of the design, the lay-out of the refuelling area will ensure that fuel tanks, storage of flammable substances, fuel dispensers, and vent pipes of fuel tanks will be positioned as far away as possible from surrounding houses, buildings and property boundary.	Part of project cost	Project owner/operator	DOT
8. Traffic congestion	a) undertake close coordination with traffic authorities/local officials with regard to entry/exit schedule of buses and implementation of other measures to avoid traffic congestion in the vicinity of the bus depot and bus staging areas.	Part of operation cost	Project owner/operator	DOT

C. Environmental Monitoring Plan

1. Compliance Monitoring

62. During project implementation, DOT/IA and DDIS will monitor compliance with the various mitigation measures specified in the EMP for the pre-construction and construction phase. DOT/IA will ensure that that the DDIS incorporates in the project design the environmental measures specified in the EMP's design phase provisions. Monthly site visits will be carried out by the environment specialist(s) of the DDIS and environmental staff of DOT to assess compliance of contractors with the pre-construction and construction mitigation measures.

63. Within six months from commencement of civil works, the DDIS will design and conduct a training program for DOT staff on how the environmental aspects of the project will be monitored during construction and operation phases and preparation of corresponding reports; supervision responsibilities; interaction with contractors; and documentation, resolution and reporting of non-compliance issues and complaints.

64. During operation phase, the project owner/operator will undertake environmental monitoring to determine compliance with the operation phase provisions of the EMP.

2. Environmental Effects/Ambient Monitoring

65. The table below presents the ambient sampling program to be carried out for the project.

Table 8. Ambient sampling program.

Parameter	Location	Sampling Frequency	Cost	Responsibility
Pre-construction				
1. Groundwater quality : total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and xylenes (BTEX)	Refuelling area at the bus depot and IMMC bus staging area	Once, before start of site works	Part of detailed design cost	DDIS
Construction				
2. Ambient noise	Project site	To validate complaints	Part of construction supervision cost	DDIS
Operation Phase				
3. Noise levels	Bus depot and VDES site (same	Semi-annual for the first 2	Part of project operation cost	Project owner/operator

Parameter	Location	Sampling Frequency	Cost	Responsibility
	sites sampled during IEE preparation)	years of operation, and as necessary to validate complaints		
4. Groundwater quality : total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and xylenes (BTEX)	Refuelling area (monitoring wells) at the bus depot and IMMC bus staging area	Semi-annual for the first 2 years of operation, and after spills of petroleum products	Part of project operation cost	Project owner/operator

D. Reporting

66. Semi-annual environmental monitoring reports (SEMR) will be prepared by the DDIS. The SEMR will be based on the monthly monitoring conducted by the DDIS and DOT. The SEMR will provide detailed findings and recommendations with regard to environmental performance (compliance monitoring) and environmental effects/ambient monitoring. Annual environmental monitoring reports will be submitted by MPWT/DOT/project operator to ADB for the first two years of operation. Upon ADB's receipt of the reports, these will be publicly disclosed on ADB's website.

IX. CONCLUSION

67. The project components such as BRT stations, bus depot, bus staging areas/temporary bus parking areas and improvement works for non-motorized transport will not involve major civil works. Various adverse impacts, such as elevated noise levels, dust emission, traffic disturbance, and other construction-related impacts will be experienced in the vicinity of the project sites. These impacts, however, are considered minor being short-term and localized in nature. The proposed on-street parking and traffic management system will involve minor works such that associated environmental impacts are considered negligible.

68. During operation, the over-all all environmental impact of the Project would be beneficial. The proposed improvements to the transport system will contribute to reduced traffic congestion, improved conditions for walking and cycling, improved community liveability and better air quality. Potential adverse impacts that may result due to operation of the bus depot and bus staging areas are considered not significant and can be addressed through good design of the facilities and implementation of mitigation measures specified in the environmental management plan (EMP) included in the IEE. The EMP includes environmental mitigation measures for the pre-construction, construction and operation phases for various project components as well as monitoring requirements and responsibilities for EMP implementation.

ANNEXES

Annex 1. Minutes of workshop with residents inside the Core Area – 5 April 2013

TA7964 (LAO): Vientiane Sustainable Urban Transport Project
Consulting Services (45041-001)

HIGHLIGHTS OF 5 April 2013 MEETING with Residents INSIDE the Core Area

PREPARED BY:	REVIEWED AND APPROVED BY:	REFERENCE NO:
Minavanh Pholsena		
DATE OF MEETING:	**VENUE AND TIME:**	
05 April 2013	VUDAA Meeting room from 8:30 to 12:00	

PARTICIPANTS :

MPWT:	3 (female 1)
VIENTIANE CAPITAL PWT:	6
VUDAA:	1
ADMINISTRATIVE OFFICE OF VIENTIANE CAPITAL :	1
COMMUNITY LEADERS:	18 (female 9)
CONSULTANTS:	5 (female 1)
STUDENTS	4 (female 3)

(See Annex 1 for details)

BACKGROUND AND OBJECTIVES OF THE MEETING:

- To introduce the background and objectives of the project
- To construct one shared assessment with the community leaders
- To obtain preliminary ideas and proposals for the draft Social/Gender and Resettlement Action Plan and
- To obtain preliminary ideas and proposals for the overall "Vientiane Sustainable Urban Transport Project TA 7964"

METHODOLOGY:

- Power point presentation of the project's background, objectives, initial findings and challenges
- Brainstorming on the main traffic challenges in Vientiane Capital core area.
- Group discussions on traffic challenges and propose solutions
- Presentation of group work

DISCUSSION HIGHLIGHTS AND AGREEMENTS REACHED:

Traffic challenges and proposed solutions:

1. ***Vientiane Center Core Area – Central Part:***

Challenges:

- **Sidewalks:** Vendors sell food and other goods blocking sidewalks
- **Parking**: Illegal parking between 5 pm to 9 pm particularly around Vangthong Night

Plaza. Vehicle drivers stop to buy things along the road cause slow traffic flow.

Proposed solutions:

Vangthong Night Plaza Area:

- Set up sufficient parking area
- Put up more traffic sign boards
- Prohibit vendors on sidewalks

Morning Market Area:

- Set up sufficient parking areas for private cars and public transport vehicles (Tuk Tuk, Song Teo, Van and taxi)

Nam Phou Fountain Area:

- Set up sufficient parking area
- Enforce the law on illegal parking
- Increase parking fees

2. Vientiane Center Core Area - East Part:

Challenges:

- **Sidewalks:** Vendors on sidewalks
- **Parking:** Tourist buses from Thailand block the road in front of Simeuang Temple, regulate parking fees collection for evening parking particularly in front of Mahosot hospital
- **Schools:** There are schools from Beungkhayong Road to the core area. The vehicles sending and picking the students block the road during pick hours in the morning from 7:30 to 8:30 am, at noon from 12:00 to 12:30 and in the afternoon from 4:00 to 5:00
- **Unpaved and deteriorated feeder roads:** bring dust to the main roads in the core area

Proposed solutions:

-
- Put traffic warning light at the schools along Simeuang Road
- Build more car parks around Khouvieng, Talad Xao Mall areas and along the road section from Donechanh to Mahosot Hospital
- Improve parking service in the evening particularly in front of Mahosot Hospital
- Rehabilitate feeder roads to the main roads
- Build pedestrian bridge from Vientiane Commercial Building to Talad Xao Mall.
- Build pedestrian bridge from Talad Xao Mall to the Central Bus Station.

3. Vientiane Center Core Area - West Part:

Challenges:

- **Sidewalks:** Vendors on sidewalks around China town area and in front of BCEL

blocking vehicle flow.

- **Parking:** Insufficient parking area on Pangkham Road in front of BCEL, around the Nam Phou Fountain, Hengboun and Anou Roads**,** people park on sidewalks
- **Trucks:** Big trucks carrying construction materials, loading goods to the shops blocking the roads in the core area.
- **Feeder roads within the village:** Small roads with no sidewalks, with no traffick sign board in Anou village
- **Pedestrian crossing:** Insufficient allocated area for pedestrian crossing on Samsenthai Road . People cross the road where it is convenient for them.

Proposed solutions:

- Regulate street vendors
- Regulate trucks for entry into the core area to prevent blocking traffic flow
- Reinforce the laws and regulation on sidewalk parking
- Build underground parking area
- Set more zebra crossing on the roads in the core area
- Awareness raising campaign through visual IEC materials on traffic moral through big screen in the core area
- Put up traffic light for pedestrian crossing between the Nam Phou fountain and Sethathirath Road to facilitate crossing of the children/elderly/tourists.

COMMENTS OF THE SOCIAL/GENDER/RESETTLEMENT SPECIALISTS:

- There are plans to move some public offices outside the core area, but with no clear timing and funding
- Growing pedestrian-car conflict and pedestrian safety is in danger. More walking space in the streets for pedestrians was requested
- Traffic congestion affects specially to eldery and childen's mobility. Some stakeholders requested for special low speed traffic areas close to the schools
- There is not school bus system, and some schools in the core area are huge (one of them has more than 4,000 students)
- Stakeholder requested for a general improvement of the traffic signals, public transport stops (including tuk-tuks), parking facilities and one-way direction streets
- Some stakeholders requested to change the offices and school starting time, so the opening hours do not coincide (generating traffic jams in the early morning)
- Stakeholders requested for an awareness campaign to improve respect of the traffic rules and traffic safety

NEXT STEP:

The consultant team informed the participants that field survey will be carried out to identify social issues related to the project and a follow up workshop will be organized to disseminate findings of the field surveys and discuss proposed solutions with the participants.

TA 7964-Lao Vientiane Sustainable Transport Project

5 April 2013, VUDDA

Name and Surname/ ຊື່ ແລະ ນາມສະກຸນ	Organization/ອົງການຈັດຕັ້ງ	Contact number/ເບີໂທ	E-mail/ ອີເມວ	Signature/ ລາຍເຊັນ
Ms. Khamsamsouk Phanalikhan	Ban Anou	021 723833		
Mr. Veing La Phone Laingsavang	Ban Phiawat	5665 5917		
Mr. Vongsavanh Inthapanya	DPWT Sikhot	2224 1913		
Mr. Thavone Sisouvanh	DPWT	5570 0707		
Mr. Sone Vongsavanh	Ban Saingyuen	5821 2121		
Mr. Bounleua	Ban Saingyuen	7449 7782		
Ms. Phone Saengdeuane	Ban Sailom	5578 5524		
Ms. Daengchi Phommathep	Ban Sy meuang	2265 5322		
Mr. Khampheng Sengsavang	Ban haysok	2546 6424		
Mr. Chanthavone Vilasit	Ban xixay	5538 0334		
Ms. Phouvan Silalard	Ban mixay	7787 0558		
Mr. Thavisay Xaysavad	DPWT	2220 2420		
Mr. Phitheun	Vientiane Administrative Office	222 1 0582		
Ms. Feuathesouan	Ban Hoyod	7751 8715		
Mr. Khamshi	Ban Phon			

TA 7964-Lao Vientiane Sustainable Transport Project
5 April 2013, VUDDA

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Bounthong Souksamay	office DPWT	22405015		
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phoukhao sulivoung	—	55051386		
Thong phanxhom	[illegible]	55007191		
khampet phoungbuxay	VUDDA	55889310		
ledthaxone manxhaluc	NUOL	97084721		
Nokoulai keovolachack	NUOL	77701555		
Tidavhan phothomtiom	NUOL	98000096		
Sung phouttivoung	Ban Anon	55618406		
Anaphan none	Ban Phiawat	77777825		
Daivone ledthana	Ban haysok	55427985		
Laithong penhomthavong	Ban [illegible]	93067193		
hongthong chanthavongsa	Ban Saybom	55900556		
Boud thaxay	[illegible]			
khandavone	[illegible]			

TA 7964-Lao Vientiane Sustainable Transport Project

5 April 2013, VUDDA

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ທ: Khamphong Phisuphan	Ban Pawat	77710985		
Thongphan Sounthavong	ກຸ່ມລົດ	22222453		
ທ: Koungmalai Xayyavong	Ban Siang yenen	22224959		
Khamphou Khamphanesong	Ban Saylome	5651555		
Sysomephu Vongsachit	Ban Khao yod	22216601		
Kham pheng Thamma	Ban khao yod	97935920		
Tuma yiathao	Ban watchan			
Eonn Sylavong	DpuT - Vte			
Pounta Eonenavong	DoT			
ທ: Viengkham	Ban wat chan			

Pictures

Annex 2. Minutes of workshop with residents inside the Core Area – 8 April 2013

TA7964 (LAO): Vientiane Sustainable Urban Transport Project
Consulting Services (45041-001)

HIGHLIGHTS OF 8 April 2013 MEETING with Residents OUTISDE the Core Area + Business operators in the Core Area

PREPARED BY:	REVIEWED AND APPROVED BY:	REFERENCE NO:
Minavanh Pholsena		
DATE OF MEETING:	**VENUE AND TIME:**	
05 April 2013	VUDAA Meeting room from 8:30 to 12:00	

PARTICIPANTS :

MPWT:	**5** (female 1)
VIENTIANE CAPITAL PWT:	3
VUDAA:	1
EDUCATION DEPARTMENT:	1
TRAFFIC POLICE DEPARTMENT:	1
ADMINISTRATIVE OFFICE OF VIENTIANE CAPITAL :	1
BUSINESS OPERATORS:	9 (female 2)
COMMUNITY LEADERS:	21 (female 2)
CONSULTANTS:	5 (female 1)
STUDENTS	3 (female 3)

(See Annex 1 for details)

BACKGROUND AND OBJECTIVES OF THE MEETING:

- To introduce the background and objectives of the project
- To construct one shared assessment with the community leaders
- To obtain preliminary ideas and proposals for the draft Social/Gender and Resettlement Action Plan and
- To obtain preliminary ideas and proposals for the overall "Vientiane Sustainable Urban Transport Project TA 7964"

METHODOLOGY:

- Power point presentation of the project's background, objectives, initial findings and challenges
- Brainstorming on the main traffic challenges in Vientiane Capital core area.
- Group discussions on traffic challenges and propose solutions
- Presentation of group work

DISCUSSION HIGHLIGHTS AND AGREEMENTS REACHED:

Traffic challenges and proposed solutions:

1. ***Vientiane Center Core Area – Central Part:***

Challenges:

- **Congestion:** Traffic congestion in late afternoon around Vangthong Night Plaza and Talad Xao Mall

- **Parking**: Insufficient parking, Illegal parking, no bus stop sign board around Talad Xao Mall

Proposed solutions:

- Awareness raising on traffic moral to residents, business operators and vehicle drivers
- Regulate vendors around Vangthong Night Plaza Area
- Identify parking area around Talad Xao Mall
- Build elevated roads on Nongbone and Khouvieng roads
- More traffic sign boards and must be posted where people can see them
- To solve traffic congestion around Namphou fountain, Sethathirath Road
- Bus drivers must stop at the bus stops not at non-designated spots.

2. Vientiane Center Core Area - East Part:

Challenges:

- **Congestion:** during pick hours along Donechanh and Khouvieng roads,

Proposed solutions:

- Build sufficient parking area around Talad Xao and Khouadin Market.
- Prohibit parking along the road or set up time for permission of parking along the road
- Identify parking and stops for public transport
- Public transport must provide efficient service on the main roads
- Reinforce regulations that buses coming from other provinces must park at the designated bus stations
- Strictly prohibit vendors on sidewalks

3. Vientiane Center Core Area - West Part:

Challenges:

- **Traffic rules:** Vehicle users don't follow traffic rules.
- **Parking:** Insufficient parking area in the core area to accommodate increased number of vehicles

Proposed solutions:

- Raising awareness of vehicle users on traffic moral through visual IEC materials
- Include traffic rules education in the curriculum of primary level school
- Put more traffic sign boards along the roads
- Improve parking concession
- Move government offices and shopping centers from the core area
- New buildings in the core area must include parking space
- Build diverted road for the trucks to avoid driving in the core area.
- Set up school bus

COMMENTS OF THE SOCIAL/GENDER/RESETTLEMENT SPECIALISTS:

- There is no clear parking areas for public transport (including tuk-tuks)
- The public transport system (buses) does not work properly. The buses do not run on time, its frequencies are not good and the waiting spots are low quality. The buses are too big, smaller buses (25 people) are needed
- The hotels use important parking areas in the streets at the core area, so it is important that the hotels have its own parking areas
- People already pay for parking in some areas. Specially in the market area, parking pay stations can be created
- Reinforce the regulations and control of the street vendors, because they occupy streets making more difficult the pedestrian mobility and they use the existing parking areas
- More space for pedestrians will improve mobility of women, children and elderly
- In the morning, the schools cause the traffic jams. It is important to change the school starting hour

NEXT STEP:

- The consultant team informed the participants that field survey will be carried out to identify social issues related to the project and a follow up workshop will be organized to disseminate findings of the field surveys and discuss proposed solutions with the participants.

TA 7964-Lao Vientiane Sustainable Transport Project

9 April 2013, VUDDA

Name and Surname/ຊື່ ແລະ ນາມສະກຸນ	Organization/ອົງການຈັດຕັ້ງ	Contact number/ເບີໂທ	E-mail/ອີເມວ	Signature/ເຊັນ
[illegible]	Tuk Tuk Association	[illegible]		
Chanthon [illegible]	Ban [illegible] Tai	[illegible]		
Soungid [illegible]	Ban [illegible]	[illegible]		
Phongkay [illegible]	Taxi Association	55612550		
[illegible]	[illegible]	[illegible]		
Phonthaysan [illegible]	Urban Planning TPU	[illegible]		
[illegible]	Ban Saphangmuek	[illegible]		
[illegible]	Ban Saphanthong	[illegible]		
[illegible]	Ban Thongkhankham	[illegible]		
[illegible]	Ban Phonthong	[illegible]		
Somsuong [illegible]	Ban Phontiang	[illegible]		
[illegible]	[illegible]	[illegible]		
Phoudthaxay	[illegible]	[illegible]		
Somvan	Ban Saphanthong			
[illegible]	Ban Phonsavan Neua	[illegible]		

TA 7964-Lao Vientiane Sustainable Transport Project

8 April 2013, VUDDA

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TA 7964-Lao Vientiane Sustainable Transport Project

8 April 2013, VUDDA

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[illegible]	Department of Urban Planning	[illegible]		
[illegible]	VUDDA	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]			

TA 7964-Lao Vientiane Sustainable Transport Project

8 April 2013, VUDDA

Name and Surname/ຊື່ ແລະ ນາມສະກຸນ	Organization/ຈາກພາກສ່ວນ	Contact number/ເບີໂທ	E-mail /ອີເມວ	Signature/ລາຍເຊັນ
Sivonh Khamsphenh	Education and [illegible] department	[illegible]	[illegible]	[illegible]
Syphai Meung [illegible]	Ban [illegible]	[illegible]		
Somphong Boumala	Ban Phonkheng [illegible]	[illegible]		
Vengxay Viphakone	[illegible] Association	[illegible]		
Phonkham		[illegible]		
Thavanh Sihanama	[illegible]	[illegible]		
Chitphasong [illegible]	[illegible]	[illegible]		
Salermsphon	Ban Phonxay	[illegible]		
Nakhilai [illegible]	NBOL	[illegible]		
Thidavan [illegible]	NUOL	[illegible]		
Laithavon [illegible]	NUOL	[illegible]		
Nouhon [illegible]	Ban Thalluang	[illegible]		
Xomchan Phengxay	[illegible] Company	[illegible]	[illegible]	
Bounma	Ban Thalluang			
[illegible] Phonxaymany	Ban Phonsavanh			

Pictures


Vientiane Centre Core
Area - East Part
ADB
idom

Annex 3. Minutes of interim workshop with stakeholders – 9 July 2013

TA – 7964 LAO: Vientiane Sustainable Urban Transport Project

Interim Workshop Meeting Minutes

CONTENTS

TA – 7964 LAO: Vientiane Sustainable Urban Transport Project

Interim Workshop Meeting Minutes

ABBREVIATIONS

ADB	Asian Development Bank
DPWT	Department of Public Works and Transport
JICA	Japan International Cooperation Agency
Lao PDR	Lao People's Democratic Republic
MPWT	Ministry of Public Works and Transport (Lao PDR)
MNT TA	Non-motorized transport TA
TA	Technical Assistance
VESTA	Vientiane Capital Environmental Sustainable Transport Authority
VUDAA	Vientiane Urban Development Administration Authority
VCSBE	Vientiane Capital State Bus Enterprise

2. INTERIM WORKSHOP MEETING MINUTES

2.1. GENERAL INFORMATION

9. Date: 8:30-16:00, 9/07/2013

10. Vientiane Plaza Hotel, Saylom Rd., Hatsady Neua Village, Vientiane, Laos.

11. Participants:

1. Mr. Tiengdavanh Keobouavanh, Ministry of Information, Culture and Tourism, tel. 22414222
2. Mr. Keopaseuth Xaypanya, Chanthabouly district, tel. 22215552
3. Mr. Thanongsack Vongvilay, Cabinet Office Vientiane Capital, tel. 22244774
4. Mr. Bounhkong, Ban Watchanh, tel. 22204046
5. Mr. Thavone Sisoumane, DPWT-VC, tel. 55700707
6. Mr. Phonethevanh Malaythong, DPWT-VC, tel. 98529998
7. Mr. Rene S. Santiagn, JICA LBTSEV
8. Mr. Viengsavanh Dethvongsa, Tax Department-MOF, tel. 22418855
9. Mr. Yajima, Almec
10. Mr. Itti R., Almec
11. Mr. Phouthasom Inthavong, DHUP-MPWT, tel. 55408339
12. Mr. Phongpaseuth Kanlagna, M-Point Mart, tel. 55599689
13. Mr. Bounta Nonehoun, Information, culture and Tourism, tel. 59895733
14. Ms. Patnone, DoT-MPWT, tel. 22217279
15. Mr. Phoukhao Soulivong, ADB TA 9764-LAO, Idom/LCG, tel. 55051386
16. Mme Davone Rattana, Ban Haisok, tel.55424985
17. Ms. A. Mishima, JICA Project Team-Katahira & Engineers
18. Mr. Syvone Subthavy, DPWT-VC, tel. 55332288
19. Mr. Khamsing, DPWT-VC, tel. 55508386
20. Mr. Khamphai, Minivan association, tel. 55627179
21. Mr. Khamphon, Ban Sikhottabong, tel. 586148511
22. Mrs. Viengxay Nola, Ban Mixay, tel. 55658475
23. Mr. Saychit, B.C.E.L, tel.55522448
24. Mr. Phetsamone Phetphouvong, MOHA, tel. 55695559
25. Ms. Minavanh Pholsena, Consultant TA 9764-LAO,tel. 55599221
26. Ms. Pipong Phimphachanh, LCG, tel. 22221024
27. Mr. Khamphet Phongratsasy, VUDAA, tel. 55889210
28. Mr. David Baringo, resettlement/Gnder/Social SP, Idom
29. Mr. Phomma Chanthireath, ADB-LRM, tel. 22226305
30. Mr. Khamla Phouthachith, Ban Sihome, tel.55495259
31. Mr. Khamsy Thongpathoum, Ban Anou, tel. 22200989
32. Mr. Souvanny Ratanavong , DDG Dept. Personnel-Organization MPWT, tel. 22222032
33. Mr. Somnuck Mektakoun, DoT- Road Safety-MPWT, tel. 22210977

34. Mr. Souvanthong Aphayalat, Rep. District Chief Sisattanak, tel. 22070671
35. Mr. Sone Vannasack, Ban XiengNhune, tel. 58212121
36. Mr. Chonesinh Oudomvimon, Customs dept. MoF, tel. 22225315
37. Mr. Khamphoune Temelath, Director VCSBE,+ VC Chamber of Commerce and Industry tel. 55512183
38. Mr. Phanthaphap Phounsavath, DoT-MPWT, tel. 56344434
39. Mr. Sibounheuang Xoumpholphakdy, President Tuk-tuk Association, tel.55509536
40. Mr. Souksomdy Senglangsy, Songtheow Association, tel. 55516773
41. Mr. Detsongkham Thammavong, Director General DPWT-VC, tel.55528748
42. Ms. Somphachanh Sihakhamfong, Deputy Head Village Saylom, tel. 22433252
43. Mr. Phoutthavong, consultant TA 9764-LAO, tel. 98888417
44. Mr. Chanthavong Bounsombath, Department of Planning-MPWT, tel.22432432
45. Ms. Phouthippachanh Vongvichith, Ban KaoNhot, tel. 54065155
46. Ms. Souksaychay Khenvongdala , Prime Minister Office (PMO), tel. 95528511
47. Dr. Bounta Onnavong, Director Division Planning & Budgeting, DoT-MPWT
48. Mr. Bouapheth, DDG, DoT-MPWT
49. Mr. Juan López Redondo, Team Leader TA 9764-LAO, Idom
50. Mr. Pablo de la Puente, Urban Transport Engineer, Idom
51. Mr. Goyo Nieves Abaunza, Staff Consultant, Idom
52. Mr. Wojciech Gaweda, Resident Engineer, Idom, tel 99807883
53. Dr. David Baringo, Social/Gender/Resettlement Specialist, Idom
54. Mr. Jeffrey Miller, ADB Mission Leader
55. Mr. Robert Anderson ADB staff consultant
56. Dr. Sudhisakdi Manibhandu, ADB staff consultant
57. Mr. Phoutthaxay, Division Planning-Budgeting-DoT-MPWT
58. Mr. Phongsavanh, consultant TA 9764-LAO

12. Agenda

Start	End	VSUT Interim Report Meeting Agenda
08:00	08:30	Registration
08:30	08:50	Opening session
08:50	09:20	Interim Report
09:20	09:35	Questions and general comments
09:35	09:50	Workshop explanation and group creation
09:50	10:05	Coffee Break
10:05	11:50	Discussion groups
11:50	13:20	Lunch Break
13:20	14:50	Conclusion of discussion groups
14:50	15:05	Coffee Break 2
15:05	15:35	General discussion
15:35	15:50	Workshop conclusions and next steps
15:50	16:05	Chairman closing speech

13. Meeting goal: VSUT Project Interim Report Draft presentation and discussion.

2.2. COURSE OF THE MEETING

14. The meeting started with the Chairman warm welcome and speech. Then the presentation of the project progress took place.
15. Comments after the presentation:

16. **VSBC (Katahira):**

17. The core area is too small and narrow to allow the system to grow up. In case of bigger area the project would be more effective.
18. TL agreed and answered that this is the first step; the project will start with two bus loops within the Core Area and a feeder bus line from outskirts to Core Area (current line No 29). In the future there will be developed a public transport network.

19. **VUDAA:**

20. Showed pleased with this idea and commented that the study have many components already included, but warned there will be some additional challenges during the implementing stage. He also commented on the following topics:

21. Two bus loops are OK in first stage of the project but more lines should be considered in the future in order to serve people travelling from outside of the core area.
22. People living outside core area have to buy a car to come to the center right now. People are used to use cars with Air Conditioning which will probably be a hurdle for capturing traffic from private transport sector with no air conditioned buses.
23. Parking enforcement will be included in the project.
24. Stops should be located in front or near to malls in order to get people to actually use the public transport system. It is also important that the public transport should have high quality of service.
25. Smart cards are very convenient.
26. Assuming the success of the project, and in order to better define the next steps, short, medium and long term developing plans are needed.

27. **VCSBE comments:**

28. Laos has never had a P&R system, which is a key component of the project. Other countries have multi-storey parking buildings, but Vientiane doesn't have such facilities.
29. The change from private car's trip to a three stage trip involving private car, P&R and bus, will be very difficult for Lao people as they have never had such a system. It is expected that the success of the project will depend upon the quality of the system as a whole.
30. Electric buses are expensive to acquire and present certain issues with Air conditioning, however, VCSBE has experience with electric buses and found them very convenient and cheap from maintenance point of view.
31. The cost of operating and maintaining has not been estimated yet, it is thus possible that there will be financial deficit leading to some kind of subsidy would be necessary.
32. Regarding PPP, the private sector is noted to care only for its own profit. TL acknowledged the fact that the private sector seeks the profit of the project, there are several ways to satisfy both the interests of the private and public sectors. The private sector income can be referenced to the quality of the service provided and its availability ant not only with the net operating revenue.

33. VESTA could define the service standard and be in charge of the fee collection. All those issues will be discussed in detail in the round tables with the discussion groups that will follow.

34. **DPWT-VC commented:**

35. Traffic jams usually occur outside the city center during rush hour, being this is a key issue.
36. The traffic jams are caused by cars coming from outside of the core area. Bus loops are convenient for people living at the core area but not so for the people living outside.
37. There is a concern about the funds available for the project, since historically, many projects have not being implemented after the study stage because of the lack of funds. The Mission Leader (ADB) answered that the bus acquisition and other expenses will be fund from ADB loan and that there is also the possibility of financing bus loops with parking fees. Additionally, Director Division Planning & Budgeting (DoT-MPWT) answered that The ADB is committed to finance the project by 2014, 20 million USD will be supported by the ADB and that 15 million USD will be given by the Government of Lao PDR (land contribution). The Mission Leader (ADB) added that other funds will come from other Donors like JICA, EIB and other institutions.
38. The TL, Juan Lopez Redondo, explained the organization, planning, topics and participants of the round tables with the discussion groups that would take place after the following coffee break.

3. DISCUSSION GROUPS, CONCLUSIONS AND GENERAL DISCUSSION

3.1. GROUP 1: CREATION OF VESTA, SOURCES OF FUNDING AND PRIVATE SECTOR PARTICIPATION

3.1.1. GROUP CONCLUSIONS

39. Regarding the creation of VESTA:

- The group unanimously agreed to create VESTA as previously presented.
- The organizational structure would be modeled after VUDAA. The role and functions of VESTA should be clearly defined.

- Those functions would focus on the general organizational works and planning while operational tasks and further services should be outsourced as much as possible.

40. Regarding the sources of funding, the group agreed the following:

- The Government can apply policies relating to customs and taxes (customs tax exemption and tax break, for example).
- Sources of funding could also come from the population contribution, considering that four large districts of Vientiane Capital would benefit directly from the services provided by VESTA.
- Additionally, many important and big companies, hotels, restaurants, and tourist operators located in the core area and its outskirts could contribute to the viability and sustainability of VESTA.
- VESTA should not rely on government or VCA subsidies as main sources of funding. This kind of subsidies should be seen as the last resource.

41. The Private Sector Participation

- The group agreed the participation of the private sector.
- Further details of the terms and conditions of this participation, as well as other related issues would be discussed on a case by case basis.

42. Optimization of the traffic management is important.

3.1.2. GENERAL DISCUSSION

43. Considering VESTA will be a big agency, it was asked whether it should work under MPWT or DPWT VC, or even be created as a government agency.
44. David Baringo, Social/Gender/Resettlement Specialist (Idom), asked whether Vientiane City should be in charge or if the national government should be involved.
45. The TL, Juan Lopez Redondo, presented the proposal of institutional structure for each step of project implementation.
46. The Mission Leader (ADB) asked about the proposed relationship between Vientiane City and VESTA, and whether it would be only part of supervisory board.
47. Gregorio Nieves, Staff Consultant (Idom), answered that two institutional structures alternatives were presented: one under MPWT and another under DPWT VC.

48. Dr. Sudhisakdi Manibhandu (ADB Consultant) stated that MPWT will provide technical support, but that the city area, the city functioning and improvements are responsibility of the city of Vientianne.
49. DGD MPWT asked about the relationship between DPWT and VESTA, and whether it would be substitute of DPWT.
50. Gregorio Nieves, Staff Consultant (IDOM), answered that VESTA would ideally be the Public Transport Authority in the whole Vientiane, thus being important to transfer all the responsibility to it in order to make it capable of managing the transportation system on its own.
51. DGD MPWT then asked Gregorio Nieves, Staff Consultant (IDOM), about whether DPWT holds any responsibility.
52. Gregorio Nieves, Staff Consultant (IDOM), answered that he wasn't denying the current responsibility of the DPWT, but highlighted the fact that responsibility is currently divided among different units, which leads to difficulties identifying a unique responsible for the whole transport system.
53. Director Division Planning & Budgeting (DoT-MPWT) insisted on the question of DGD MPWT about DPWT. He acknowledged the responsibility overlapping. He also wanted to express its concern about the assignment of resources and staff in order to create VESTA and what would happen to them after the project is over.
54. DGD MPWT questioned the sense of VESTA creation and asked about the future of VUDAA and DPWT.
55. VUDAA noted that VESTA would be a new agency that would take the responsibility of the project execution and that it success and sustainability will depend on its implementation and the technical and financial support received. VUDDA highlighted the importance of further discussing the institutional and financial aspects of VESTA creation and the sources of its revenue.
56. Pablo de la Puente, Urban Transport Engineer (Idom), outlined that one of the problems of VESTA creation is the possible overlapping in duties, since VESTA would have to take some responsibility that is currently distributed among different agencies. He also put the focus on the sustainability of the project and its legal framework. It is crucial to find a new way to sustain the new agency with the help of a legal specialist.
57. Robert Anderson (ADB Consultant) agreed with DGD MPWT and explained the project background and need for VESTA creation. He stated that the objective of consultant is to point out all the overlapping areas.

58. Dr. Sudhisakdi Manibhandu (ADB Consultant) highlighted the importance of keeping in mind that the final outcome of the project is to have an integrated transport system in Vientiane, which doesn't currently exist, that will hopefully help reduce the growth of private transport.
59. Robert Anderson (ADB Consultant) pointed out the importance of the integration of the Transport System in Vientiane, outlining the lack of satisfactory alternatives for the city. He stated that the integration of the different responsibilities in only one entity is key to the success of the project.
60. A member of the workshop stated the need of deep studies about creation of VESTA and to report it to higher authorities.
61. Gregorio Nieves, Staff Consultant (IDOM), justified the proposed agency creation with the almost 20 meetings held with all involved institution and departments, including a participatory workshop and the current discussion group, in which everybody agreed to create this agency. Gregorio Nieves, Staff Consultant (IDOM), also agreed for a further deeper study and pointed out that VESTA would be created only for transport purposes.
62. Pablo de la Puente, Urban Transport Engineer (Idom), noted that this participation process is being documented and presented in a MoU. This document should be further discussed by the stakeholders, who should make its own conclusions to feedback the Consultant team.
63. Gregorio Nieves, Staff Consultant (IDOM), added that VESTA will employ a reduced number of professionals specialized in transport, and will outsource most of its operations. The idea of VESTA is not to create a parallel agency with the duties of the existing departments, but a new one that would centralize those responsibilities.
64. DOT MPWT stated that it hadn't been decided whether VESTA would depend on any of the existing agencies. He also expressed its concern about the terms of VESTA creation regarding its functions, rights and duties to avoid the overlapping of duties and responsibilities that occur right now.

3.2. GROUP 2. URBAN TRANSPORT SYSTEM / P&R FACILITIES / SUITABLE VEHICLES TO OPERATE VSUTP / SMART CARDS

3.2.1. GROUP CONCLUSION

65. Presented Loops are OK but only for the pilot project, bigger loops will be needed in the future.

66. Frequency: agreed to have the bus every 5 minutes in rush hours.
67. Agreed to have 9 seats buses, the small buses will be more convenient for the passengers and for the small streets, moreover with high frequency line capacity is expected to be high enough.
68. Need to have buses equipped with air conditioning as Laos is a hot country.
69. The distance between bus stops should be between 200 and 300 meters. It is important to have strong enforcement of car parking at bus stop. The schedule and bus information at bus stops is needed.
70. Proposed P&R facilities locations are adequate, however, there is additional information about new multi-storey parking buildings in the core area, which is important: there is a new multi- storey parking planned in Khouvieng Road.
71. Smart cards are very convenient for passenger. This technology is new in Laos, but popular worldwide.
72. Flat rate of 3 000 KIP per one ride would be reasonable. In case of parking the fee should start from 3 000 KIP per 3 hours. For daily, monthly and yearly parking, a special rate should be proposed.

3.2.2. GENERAL DISCUSSION

73. The Mission Leader (ADB) asked about the mentioned multi-storey parking and whether it was a new development.
74. TL, Juan López Redondo (Idom), answered affirmatively, outlining that this information was received during the discussion group. It is located next to Vientiane Plaza Hotel, in Khouvieng Road.

3.3. GROUP 3. TRAFFIC AND PARKING MANAGEMENT-PARK AND RIDE FACILITIES

3.3.1. GROUP CONCLUSIONS

75. There were 4 main issues discussed: parking, pedestrian area, traffic lights and traffic management.
76. The consultant`s proposal was generally accepted. The consultant was asked to focus on motorbike parking problem.
77. It was agreed that traffic lights should be adjusted and traffic control center reinstalled. The traffic should be specially controlled during the peak hours.

78. It was suggested that government officers could pay fees for parking on government facilities, however, members did not agree, because most of the cars belong to the Government.

3.3.2. GENERAL DISCUSSION

79. VUDAA intervention:
80. There is a plan to have one-way road instead of two-way road at Fang Ngun Road (along Mekong River). It will be a pilot experience, with the objective of reducing the traffic. Vientiane Capital governor already approved this project. The study team was asked to investigate this project with VUDAA.
81. The Vientiane Capital is considering the construction of new parking facilities, mostly with participation of private sector, which is a big challenge.
82. A strong parking enforcement will be needed to prevent people from parking in bus loops roads during peak hours.
83. A police officer from traffic department requested many sectors to be involved. He highlighted the importance of education before law enforcement, the common misbelief that traffic management is exclusively a traffic police duty and the lack of sufficient operatives to manage the current congestion level. He added that the inner district there should be at least four parking facilities.
84. TL, Juan López Redondo (IDOM) agreed that education and social awareness is crucial, and stated the importance of schools in teaching traffic ruling and driving behavior. As a result, a special proposal was included in the study.

3.4. GROUP 4. SAFEGUARDS / PEDESTRIAN IMPROVEMENT / ENFORCEMENT / EDUCATION AND AWARENESS

3.4.1. GROUP CONCLUSIONS

85. The groups agree to make Pangkham street pedestrian-only but note the need to allow cargo vehicles accessibility to the street during certain periods of the day for delivery purposes.
86. It is agreed to keep the actual road lines and to arrange and manage the existing footpaths.
87. It is proposed to construct underground pedestrian's way on LaneXang Avenue at Hatsady road point.

88. Parking arrangement should be made for Taxis, Tuk tuk, Jambos and others. Appropriate measures should be applied.
89. Regarding the parking along road sides, design made by JICA study should be served as base for further study.
90. Regarding enforcement, education and awareness, the group gave the following:

- The campaign should target main locations in Vientiane Capital, with especial consideration to the urban management (transport, urban planning and driver behavior).
- Appropriate communications equipment will be required in order to effectively implement the public awareness campaign (Large public advertising screens, for example).

91. The location at Lao National Front for Reconstruction is not suitable for a multi-storey parking facility.
92. For parking areas, coordination is advised to provide the drivers with updated information on parking availability, such as CBS, Nongchanh South, Nongchanh North and others.

4. OVERALL INTERIM MEETIGN CONCLUSIONS

93. The Mission Leader (ADB) gathered the main topics considered:

- Setting up of VESTA
- Institutional arrangements for VESTA, considered especially challenging.
- Traffic management and signaling.
- Parking in the urban area.

94. DGD MPWT:

- Was pleased with the discussion held among all the stakeholders.
- IDOM was asked to bring all comments from participants together for improving the Project.

Annex 4. Minutes of meeting with MONRE representative – 4 November 2013

1. FINAL REPORT MEETING MINUTES

1.1. GENERAL INFORMATION

1. Date: 09:00, 4/11/2013

2. Environment and Social Impact Assessment Department (ESIA), Ministry of Natural Resources and Environment (MONRE)

3. Participants:

a. Mr. Xayaveth Vixay, Director General.

b. Mr. Somvang Thammavongsa, TA Environmental Specialist,

c. Mr. Wojciech Gaweda, TA Transport Engineer.

4. Meeting goal: To inform to MONRE about the VSUTP and to expose them the key findings from the REA and the draft IEE.

1.2. COURSE OF THE MEETING

5. After greeting, Mr. Somvang Thammavongsa presented scope of the project and IEE conclusions.

6. Mr. Xayaveth suggested that according to laws and regulation relating to the environment issued by the Lao Government. The proposed activities for the VUSTP would only need to do Initial Environmental Examination (IEE) due to all the proposed construction works such as road improvement and construction of Park and Ride and maintenance buildings will be implemented along existing roads and existing compounds respectively, which will not create any adverse impact upon environmental condition. Therefore, the project has to prepare only IEE and then need to submit the IEE report to Department of Natural Resources and Environment, Vientiane Capital for review and issue Environmental Compliance Certificate for the project.

7. A similar type of the proposed project may need to do Environmental Impact Assessment (EIA) if it is a new road construction which passes through protective/conservative areas or is likely to cause major environmental impact. Impact

from the proposed VSUTP's activities will create temporary impacts during the construction only such as traffic congestion and dust pollution near the proposed Park and Ride buildings.

8. The proposed VUSTP will play a key role to reduce traffic congestion in the city as well as carbon reduction emitting from motored vehicles aiming to reduce numbers of private vehicle on city roads and introducing new buses for public transport. The proposed improvement of the public transport system will also act as a Clean Development Mechanism (CDM).

Annex 5. Minutes of participatory workshop with stakeholders – 14 January 2014

Highlights of 14th January, 2014 Participatory Workshop

(including resident population at the core area and people who usually travel every day from the outskirts to Vientiane Capital core area).

PREPARED BY:	**REVIEWED AND APPROVED BY:**	**REFERENCE NO:**
David Baringo, Social/Gender/Resettlement Specialist	Juan López Redondo, Team Leader	
DATE OF MEETING:	**VENUE AND TIME:**	
14th January 2014	Vientiane Plaza Hotel from 8:30 to 12:00	

PARTICIPANTS :

56 PEOPLE, INCLUDING COMMUNITY LEADERS AT VILLAGE LEVEL AND OFFICIALS FROM MPWT, VIENTIANE CAPITAL PWT, VUDAA AND THE ADMINISTRATIVE OFFICE OF VIENTIANE CAPITAL.

(See Annex 1 for details)

BACKGROUND AND OBJECTIVES OF THE MEETING:

This workshop was one of the last activities for the Social/Gender and Resettlement Action Plan. Taking into consideration the previous participatory activities done by this project, including the two participatory workshops held on April 2013 and the Interim Report revision's workshop on July 2013, the main goal of this new workshop was to present and discuss with the main stakeholders the draft results and proposals of the project:

- Presentation of the main analysis and proposals included at the Draft Final Report
- Discussion of the activities included at the draft Social/Gender and Resettlement Action Plan
- Collect the main stakeholders' comments to the Draft Final Report of the "Vientiane Sustainable Urban Transport Project TA 7964", including to the draft Social/Gender and Resettlement Action Plan

METHODOLOGY:

- Power point presentation of the Draft Final Report of the project
- Plenary discussion and clarifications of the Draft Final Report of the project
- Group discussions to review and discuss in a more detailed way the following 5 topics: public transport, parking and enforcement, walkability and traffic safety, environmental safeguards of the project and social/gender and resettlement safeguards of the project
- Presentation of the conclusions of each of the 5 groups to the plenary for final discussion

DISCUSSION HIGHLIGHTS AND AGREEMENTS REACHED:

Public Transport:

The participants mostly agreed with all the project's proposals on public transport. In particular, the main agreements were:

- 15-seat buses in current use were considered as an appropriate size
- Agree with 5 minutes head-way per bus during the rush hour
- Fare range around 3,000 kips (1 000 LAK with P&R discount)
- Agree with the use of smart card for payment

The improvement proposals were:

- New traffic light on Samsenthai road at FaNgum Park should be made into a roundabout, because it reduce accident risks
- The group proposed some skywalk, mostly near the Vientiane High School and Central Bus Station
- Make pedestrian the adjacent road to the Morning Market
- The bus service should start from 6:00 am to 10:00 pm
- The bus routes and parking should be link to shopping mall projects, hospitals and other concession parking areas
- Combined system with smartcard and paper tickets
- Tuk-Tuks and Jumbos should be allocated outside the VSUTP (No Core Area ???)

Parking and Enforcement:

The participants agree with the proposed parking schemes. They specially agreed with the restriction on roadside merchants blocking of bus parking and parking on walkway and there should be enforcement and fine for those offences. In particular, the main agreement were:

- Improvement of one way traffic direction
- Agree with the idea of the introduction of road side parking fee collection (but should not exceed 3 hours)
- Agree to have the proposed P&R facilities.

The additional suggestions of this group were:

- No parking between 7:00 - 8:30 am and 4:00 - 6:00 pm
- Suggest additional parking zones at the Core Area, because “Those who drive the cars can can afford for toll parking”
- Fa Ngun Rd. one way character is already done and works fine
- Roadside loading and unloading of goods should be limited to 4:00-6:30am and 6:00-8:00pm
- The Public Works and Transport Department of Vientiane should control merchants selling and Police should control cars parking on walkways.

Walkability and traffic safety:

The participants mostly agreed with all the project’s proposals on walkability and traffic safety. Specially, the participants agree with transforming Pangkham road (from the junction of Lao Plaza Hotel – Nampou) into a pedestrian area, and a agree with the proposal to make “Vientiane China Town” into a pedestrian zone.

The improvement proposals on this topic were:

- Road adjacent to Morning Market could be pedestrianized
- New roundabout at Samsenthai Road and new traffic light
- Modify to two-way traffic the road starting from the junction at 450-year Market to the section with the shops on Khounboulom Blvd
- Inpeng Temple and Thatluang Junction (near Huakhuan Market) traffic lights should be adjusted for longer duration
- Lane Xang Avenue and Setthathirath Road should have skywalks

Environmental Safeguards:

The participants agreed with the proposed activities, including the project's proposals about the construction, the environmental impact assessment during the construction and operation periods, the compensation budget for land acquisition and resettlement and the proposed activities to reduce the noise and air pollution upon nearby residents.

The improvement's comments from this group were

- Propose to use the existing park opposite Xieng Nheun Temple as a parking area
- Include consultations with local residents about the most suitable hours of operation of the proposed P&R facilities
- Awareness campaign to promote respect among road users at village level
- Campaign to encourage walkability through allocation of new pedestrianized areas and removal of current obstructions for the walking areas

Social/gender and resettlement safeguards:

The participants of this group mostly agreed with the project's proposals. The participants said that this project is an opportunity to reduce traffic congestion at the Core Area, reduce accidents and health improvements of the population due to the reduction of traffic pollution.

The group also said that this project will increase orderliness of the city, reduce travel times, increase the confidence of the parents to use the project's buses and increase safety for elderly and children.

The topics for improvement were:

- Make sure that the concerned Ministries agree with the project, particularly the resettlement work
- Selected locations by the project (specially P&R locations) should be secured
- Proposed buses for the project should have high level of service standards. For example: clean, safe and with air conditioning

COMMENTS:

- General agreement with the project's proposals from the five discussion groups: public transport, parking and enforcement, walkability and traffic safety, environmental safeguards of the project and social/gender and resettlement safeguards of the project
- Special interest of the participants in the interest of reducing accidents and traffic congestion
- The improvement proposals have to do will participalar changes into the Draft Project proposals. Major part of the participants agreed to limit parking in some parts of the Core Area, to built the P&R facilities and to implement the new bus lines
- The activities proposed by the Environmental and Social/Gender and Resettlement Safeguards were discussed and approved by the stakeholders

NEXT STEPS:

The consultant team informed to the participants that this was the last participatory activity at grass root level of the project. The comments done by the stakeholders will be technically discussed for its inclusion into the last version of the Draft Final Report that will be presented to the Authorities by February 2014.

Table 1. Highlights of 14 January, 2014 Workshop with Residents Inside and Outside the Core Area. Source: IDOM

TA 7964(Lao) Participatory Workshop for the Vientiane
Sustainable Urban Transport Project on 14th January , 2014

No.	Name and surname	Organization	Contact number	E-mail	Signature
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TA 7964(Lao) Participatory Workshop for the Vientiane
Sustainable Urban Transport Project on 14th January , 2014

No.	Name and surname	Organization	Contact number	E-mail	Signature
1	Somnuk MEKTAKUL	TMD / DoT	22210977	somnuk@laopdr.com	S. Mek.
2	Sounenilundon	Vientiane Times	55699779	[illegible]@gmail.com	[illegible]
3	Phouma Chanthirath	ADB	22226305	pchanthirath@adb.org	[illegible]
4	[illegible]	[illegible]	98857272		[illegible]
5	Pheng Phet Phommavong	[illegible]			[illegible]
6	[illegible]	[illegible]	23069113	[illegible]	[illegible]
7	[illegible]	[illegible]	59968396	[illegible]	[illegible]
8	[illegible]		82226199		[illegible]
9	[illegible]		58849925	[illegible]	[illegible]
10	[illegible]	[illegible]	55424988		[illegible]
11	[illegible]	[illegible]	98665236	[illegible]	[illegible]
12	[illegible]	[illegible]	55710071	[illegible]	[illegible]
13	[illegible]	[illegible]	54349189	[illegible]	[illegible]
14	[illegible]	Consultant	55599221	LCG	[illegible]
15	[illegible]	[illegible]	22224265		[illegible]

TA 7964(Lao) Participatory Workshop for the Vientiane
Sustainable Urban Transport Project on 14th January , 2014

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TA 7964(Lao) Participatory Workshop for the Vientiane
Sustainable Urban Transport Project on 14th January , 2014

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Photos

Figure 1. Images of workshop 14 January, 2014. Source: IDOM

Figure 2. Images of workshop 14 January, 2014. Source: IDOM

Annex 6. Minutes of public consultation at Ban (Village) Phokham (Bus Depot) – 29 May 2014

Minutes of the public consultation meeting on the Vientiane Sustainable Urban Transport Project, held at Ban Phokham (new Bus Depot), on Thursday, 29th may 2014

ATTENDANCE:

Government:
Mr. Oun Neua Silavong, Deputy Director of DWPT of Vientiane Capital
Mr. Thavone Sisouman, Technical officer, DWPT of Vientiane Capital
Mr. Phoutthasay, Technical officer, Ministry of Public Works and Transport

ADB:
Phomma Chanthirath
Souphavanh Phonmany (Pack)

ADB Consultants:
Arnold Marseille
Namchaythip Souvannavong (Judy), Lao interpreter
Somvang, Environment expert

Village authority of Ban Phokham
Mr. Bounnian, Village Chief and his staff, and Mass organization of Ban Phokham

and 61 Villagers. (See a list of attendants attached).

THE MEETING COMMENCED AT 7.30PM

The Chair, Mr. Oun Neua Silavong, welcomed and thanked the public for attending and introduced the Consultants, ADB staff and staff in attendance.

The Chair briefly outlined the objectives of the meeting and the Vientiane Sustainable Urban Transport Project, and opened the floor for the Consultant to present the project in details.

General comments and questions from attendants/villagers after the presentation are as follows:

Comments/questions/issues raised by public:	**Project Team's Response:**
Can other buses from other provinces, for example from Pakse, Champasack and Attapue, use this bus depot?	Other public buses can park here so there will be about 250 buses in the depot. ***NOTE: The above information has been updated, that is, only the 96 buses to be purchased for the VSUTP will use the depot.***
You will bring new 250 buses, I'm afraid that people will not chose to	…

travel with these buses…	
I agree with this project because it will improve the traffic in Vientiane Capital in the future and thank you for having such a project. My first concern is 'road safety' as we live along this main road/high way and there are children/students around here… 250 buses will run in and out our village, so I want to know how you will plan to make sure that our children will be safe. Secondly, how will you deal with air, noise and generally environmental pollution? I would like you and the project to think carefully about these issues as long-term effects that may have an impact to our villagers' lives, health and so on…	One of our important strategies is speed limit. Certain speed limit signs will be installed and all bus drivers will have to strictly follow and they will be trained on this issue, especially they will have to know when they enter near the bus depot, how fast they can drive and/or they should stop or give priority to children and other pedestrians to cross the road. To the question on health, we will use all brand new buses that use less energy, there will be good maintenance like changing engine oil to reduce pollution that may be caused by the buses. This will make the buses less polluting. Secondly, to prevent visual and noise pollution, we would like also to ask for your opinion on what kind of fence do you prefer, for example, concrete wall or see-through fence. Again, speed limit can also reduce air and noise pollution. Using clean fuel is also one of the measures/interventions to reduce the environmental pollution. In other wealthy countries, they also use the same interventions.
Mostly the buses from provinces are private buses; can private buses use this bus depot?	This bus depot is not a bus station but it is a place where the buses will be cleaned, washed, etc. This bus depot is not for passengers. The bus passengers will still use the existing bus stations. The pictures of buses that you have seen from the presentation are only the examples from other countries. We still have to study more about what kinds of buses we will use, for example, the buses that use electricity or fuel etc. The actual number of Project buses that will run in the city is only about 100 (96)buses not 250 buses. These new buses will run only in the city, that is, from the airport and around the city. If you have a car, you will have to park your car somewhere outside the city center and catch this new bus to travel in the city. These new buses will serve mainly travelers in the

	city to ease the traffic jams in the city. The project will take into consideration the public's preference and will minimize adverse impacts during and after the construction and also during the operation.
Village Chief: On behalf of the people of Ban Phokham, I would like to suggest that the new buses should use electricity. As we all know, if we use diesel, there will be certainly a bad impact on our health and environment. Personally, I prefer the see-through fences, as it may be visually better…	…
Can people around here catch the new buses from the bus depot? On the way to the City, will the buses stop and get the passengers at the current bus stops?	No, the BRT will serve only the City center to reduce/ease the traffic in the City. Passengers cannot catch the bus on the bus depot, they will have to go to the bus stations.
Villager: From this project, I do not see it covers Don Noune. But I want you to know that nowadays there's always traffic jam from Phonekeng to Don Noune, the traffic is very bad. In the plan that you have just shown us is happening only in the city like in other foreign countries… so why don't you expand your project up from the stadium to the city?	The Government already has a plan include Dongdok. Future expansion will cover this area.

List of Participants

ກອງປະຊຸມປຶກສາຫາລືແບບມີສ່ວນຮ່ວມກັບລັດຖະບານກັບປະຊາຊົນຜູ້ໄດ້ຮັບຜົນກະທົບ

ໂຄງການຂົນສົ່ງແບບຍືນຍົງນະຄອນຫລວງວຽງຈັນ

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ລົງທະບຽນລາຍຊື່ຜູ້ເຂົ້າຮ່ວມ

	ຊື່ ແລະ ນາມສະກຸນ	ຊື່ບ້ານຢູ່ປະຈຸບັນ	ຄຸ້ມ	ໜ່ວຍ	ລາຍເຊັນ
1	[illegible]	ໂພຄຳ		13	[illegible]
2	[illegible]	ໂພຄຳ		12	[illegible]
3.	[illegible]	ໂພຄຳ		10	[illegible]
4	[illegible]	ໂພຄຳ		10	[illegible]
5	[illegible]	—//—		02	[illegible]
6	[illegible]	—//—		2	56302588.
7	[illegible]	—//—		12	[illegible]
8	[illegible]	ໂພຄຳ		04	[illegible]
9	[illegible]	—//—		08	[illegible]
10	[illegible]	—//—		3	[illegible]
11	[illegible]	—//—		1	[illegible]
12.	[illegible]	ໂພຄຳ		13	[illegible]
13	[illegible]	ໂພຄຳ		6	[illegible]
14	[illegible]	—//—		12	[illegible]
15	[illegible]	—//—		11	
16	[illegible]	—//—		7	[illegible]
	[illegible]			10	[illegible]

ກອງປະຊຸມປຶກສາຫາລືແບບມີສ່ວນຮ່ວມກັບລັດຖະບານກັບປະຊາຊົນຜູ້ໄດ້ຮັບຜົນກະທົບ

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	ຊື່ ແລະ ນາມສະກຸນ	ຊື່ບ້ານຢູ່ປະຈຸບັນ	ຄຸ້ມ	ໜ່ວຍ	ລາຍເຊັນ
1	ນ. ອອນແສງ	ໂພຄຳ		18	[illegible]
2	ທ. ຄຳແພງ	ໂພຄຳ		19	
3	ທ. ຄຳຫຼ້າ	〃		18	
4	ທ ອຸ່ນທອງ	ໂພຄຳ		06	
5	ທ ສວນປະເສີດ	〃		12	ສວນ
6	ທ ຄຳເຮືອງ	〃		12	[illegible]
7	ທ ໜ່າງ	〃		12	ໜ່າງ
8	ນ. ພີນ	〃		12	[illegible]
9	ທ ພອນສາວ	〃		11.	ພອນສາ
10	ທ. ວອນເພັດ	〃		2+	[illegible]
11	ທ. ອານຸສັກ	〃		6	[illegible]
12	ທ. ສົມແກ້ວ	〃		6	ສົມແກ້ວ
13	ທ ບຸນພອນ	〃		10	ບຸນພອນ
14	ທ ສອນແກພູ	〃		6	[illegible]
15	ທ ພອນສະຫວັນ	〃		9	[illegible]
16	ທ. ຄຳຕາ	〃		4	[illegible]
17	ທ ພອງ	〃		2	[illegible]
18	ນ ອ່ອນ	〃			
19	ວັນໄຊ	〃		11	[illegible]
2	ນ. ມະນີວັນ			15	[illegible]

ກອງປະຊຸມປຶກສາຫາລືແບບມີສ່ວນຮ່ວມກັບລັດຖະບານກັບປະຊາຊົນຜູ້ໄດ້ຮັບຜົນກະທົບ

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	ຊື່ ແລະ ນາມສະກຸນ	ຊື່ບ້ານຢູ່ປະຈຸບັນ	ຄຸ້ມ	ໜ່ວຍ	ລາຍເຊັນ
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3.	ທ. ແສງແກ້ວ [illegible]	ໂພຄຳ		10	[illegible]
4	ທ. [illegible]	ໂພຄຳ		10	[illegible]
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6	ທ. [illegible]	—〃—		2	55302588.
7	ທ. [illegible]	—〃—		12	[illegible]
8	ທ. [illegible]	ໂພຄຳ		04	[illegible]
9	ທ. ຄຳ	—〃—		08	[illegible]
10	ພ. [illegible]	—〃—		3	[illegible]
11	ພ [illegible]	—〃—		1	[illegible]
12.	ທ. ສອນເພັດ	ໂພຄຳ		13	[illegible]
13	ພ. [illegible]	ໂພຄຳ		6	[illegible]
14	ພ. [illegible]	—〃—		12	[illegible]
15	ພ. [illegible]	—〃—		11	
16	ທ້າວ [illegible]	—〃—		7	[illegible]
	ພ. [illegible]			10	[illegible]

ກອງປະຊຸມປຶກສາຫາລືແບບມີສ່ວນຮ່ວມກັບລັດຖະບານກັບປະຊາຊົນຜູ້ໄດ້ຮັບຜົນກະທົບ

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	ຊື່ ແລະ ນາມສະກຸນ	ຊື່ບ້ານຢູ່ປະຈຸບັນ	ຄຸ້ມ	ໜ່ວຍ	ລາຍເຊັນ
1	[illegible]	[illegible]		18	[illegible]
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5	[illegible]	[illegible]		12	[illegible]
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8	[illegible]	[illegible]		2	[illegible]
9	[illegible]	[illegible]		6	[illegible]
10	[illegible]	[illegible]		11	[illegible]
11	[illegible]	[illegible]		1	[illegible]
12	[illegible]	[illegible]		13	[illegible]
13	[illegible]	[illegible]		10	[illegible]
14	[illegible]	[illegible]		10	[illegible]
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17	[illegible]	[illegible]		1	[illegible]
18	[illegible]	[illegible]		3	[illegible]
19	[illegible]	[illegible]		2	[illegible]
20	[illegible]	[illegible]		2	[illegible]
21	[illegible]	[illegible]		01	[illegible]

Annex 7. Minutes of focus group discussion for the IMMC site (Bus Staging Area) – 25 June 2014

Brief consultation meeting with residents adjacent to IMMC

The meeting was conduct on 25 June 2014 using small focal group discussion. There were 6 residents had been interviewed, 2 were from Ban Kao Nhot and other 4 were from Ban Symeuang.

No	Name	Village	Contact number
1	Mr. Souk Vilayphet	Kao Nhot	020 55725435
2	Mr. Singthong Mr.Ounkhamphanyavong	Kao Nhot	020 55340485
3	Mr. Sompheng Phommavong	Symeuang	020 22561282
4	Ms. Sotsada Kongmany	Symeuang	020 22228142
5	Ms. Tui Kongmany	Symeuang	020 5400948
6	Ms. Chansouk Keopaseurt	Symeuang	020 2213001

Before the discussion basic information relating to the project at the proposed location was presented to local residents including:

- Objectives of the project
- Construction and operational activities and at the IMMC
- Facilities to be built in the IMMC compound
- Number of temporary parking buses and operational hours during each day
- Standard buses to be used for the project
- Potential environmental concerns might be occurred during the construction and operation associated with proposed project activities

Public concerned	**Public suggestion**
Ban Kao Nhot In general people supported the proposed project to be constructed in the IMMC compound as this would reduce traffic congestion in the city , but they also voiced concern for main problems as follows: - Road accident: the existing road that proposed buses will use for access to the IMMC where it will used as a bus staging area is very narrow and there are many cars park on both sides of the	• The buses should not be allowed to park on road sides.

road. This condition might lead to a road accident during the construction and operation period without having proper management system put in place by responsible parties.	• Awareness campaign and necessary trainings shall be carried out for local communities and bus drivers as well as traffic signs
- Air pollution from sand, soil and dust released from construction trucks transport construction materials to the site during the construction	• All trucks come to and go out from the site should have been well sealed/covered to control materials not to drop on the roads • Dirt wheels should be properly clean before coming or movement from the site • Mud and dust on roads in the area must be regularly clean
- Noise pollution: previous experience in the area from the under construction of Vientiane World Trade Center (opposite the village on Nong Chanh wetland), excessive noise from construction activities and horn caused huge impact to local people in this area particularly in the night as people cannot sleep.	• Construction work should carry during 07:00-19:00 only and night time construction must not be allowed • Handling/loading construction material should be done with care to avoid excessive noise
- Conflict/fighting between construction labors itself and with local resident: it is very common to see workers for a project fighting with each other when they are drunk and tend to cause problem for someone (local people) who try to stop them fighting	• No construction labor or worker for the project should be allowed to live in the construction site • The project should appoint a person to be responsible/monitor the problem during the construction
- Solid waste problem: currently there are lot of solid wastes being dumped on back yards of local residents from parking area along the Khouvieng Road, hence the waste might be problematic for the during construction and operation period as a result from people who work for the proposed	• Provide sufficient garbage bin for the site • Regularly consult with local residents if the solid waste problem still appear in the area due to the project

project	activities to solve the problem • The project should strong carry out public awareness campaign to encourage or change cultural behavior of local people in terms of social responsibility and their duty for the society.
Ban Symeuang All participants do support the project as this is a government priority project aiming to solve out traffic dilemma in the city, but they also raised concerns as below:	
- Their safety associated with refilling station: if there is an explosion as a result from refilling station this would cause a severe impact to local residents as the project area is almost next to their houses	• The filling station must be ensured for the safety of local residents relating to explosion risk
- Dirty road associated with transportation of construction materials during the construction	• Dirt wheels should be properly clean before coming or movement from the site • Mud and dust on roads in the area must be regularly clean • Materials transport trucks that will lead to air pollution should be properly sealed/covered
- Their safety related to construction activities: construction materials such as steel bars, metal or concrete pieces/debris might potentially fly from the site during the construction and would lead to an injure of local residents	• The construction should have a properly fence/net to control risk associated with flying material from the site during the construction that will lead to damage or injure to local people/property
- Safety of children: There are many children usually do cycle on access roads in the area everyday but the roads are very small and	• Speed limits • Awareness campaign to drivers and local community

narrow. This might lead to serious accidents during the construction and operation period if there is not any proper measure putting in place. - Traffic jam in the area: at the moment traffic jam already taken place on Khouvieng road during the rush hours hence if there will be more increase of vehicles and buses during both construction and operational phase, the situation may be worsen if without a proper traffic planning	• Traffic management plan during the construction and operational phase

Photos of interviewees

Discussion with resident in Ban Kao Nhot, Mr. Souk Vilayphet

Talking to Mr. Singthong Ounkhamphanyavong (right)

Access road condition to IMMC in Ban Kao Nhot boundary

Resident of Ban Symeuang, Ms Chansouk Keopaseurt

Small focal group discussion with residents of Ban Symeuang, Ms. Tui (left), Ms. Sotsada (middle) and Mr. Sompheng (right)

A child ride her bicycle on the road in front of the IMMC compound

Residence of local people living near the IMMC compound