

**Lao People's Democratic Republic  
Public Works and Transport Institute  
Ministry of Public Works and Transport**

**Preparatory Survey on  
Formulation of Basic Strategies for Regional  
Core Cities Development  
in  
Lao People's Democratic Republic**

**Final Report  
Summary**

**January 2009**

**Japan International Cooperation Agency (JICA)**

**PACET Corporation  
International Development Center of Japan (IDCJ)  
Oriental Consultants Co., Ltd.**

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*1 LAK = 0.010 JPY*

*1 USD = 89.98 JPY*

## **PREFACE**

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey on Formulation of Basic Strategies for Regional Core Cities Development in Lao People's Democratic Republic, and organized a survey team headed by Tadashi KUME of PACET Corporation and consist of International Development Center of Japan and Oriental Consultants Co., Ltd. from March, 2009 to December, 2009.

The survey team held a series of discussions with the officials concerned of the Government of Laos, and conducted field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Laos for their close cooperation extended to the survey team.

January, 2010

Kiyofumi KONISHI  
Director General,  
Economic Infrastructure Department  
Japan International Cooperation Agency



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## Abbreviations and Glossary

ACM	Advisory Committee Meeting
ADB	Asian Development Bank
BOD	Biochemical Oxygen Demand
CBD	Central Business District
CEPT	Common Effective Preferential Tariff
DHUP	Department of Housing & Urban Planning, Ministry of Public Works and Transport
DoIC	Department of Industry and Commerce, Ministry of Industry and Commerce
DoS	Department of Statistics, Ministry of Planning and Investment
DPI	Department of Planning and Investment
DPWT	Department of Public Works and Transport
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Products
GOJ	The Government of Japan
GOL	The Government of the Lao People's Democratic Republic
GRDP	Gross Regional Domestic Products
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit (German Technical Cooperation)
ISIC	Industrial Standard of Industrial Classification
JICA	Japan International Cooperation Agency
JST	JICA Survey Team
LDC	Least Development Country
LECS 3	Lao Expenditure and Consumption Survey 2002-03
MDGs	Millennium Development Goals
MoIC	Ministry of Industry and Commerce
MoE	Ministry of Education
MPI	Ministry of Planning and Investment
MPWT	Ministry of Public Works and Transport
NGD	National Geographic Department
NLMA	National Land Management Authority
OPWP	Office of Public Works and Transport
PIP	Public Investment Program
PMO	Prime Minister's Office
PTI	Public Works and Transport Institute, Ministry of Public Works and Transport
SEZ	Special Economic Zone
SHM	Stakeholder Meeting
SIDA	Swedish International Development Authority
STENO	Science, Technology and Environment Organization
UDAA	Urban Development Administration Authority
WREA	Water Resource and Environment Agency





# **1 Introduction**

## **1.1 Survey Background**

Major cities of The Lao Peoples' Democratic Republic (Lao PDR) consist of the capital city of Vientiane and the regional core cities: Kaysone Phomvihane, Pakse, Thakhek and Luang Prabang. With a national territory which lies to the north and south, for national development, a balanced regional development plan that would include the development of regional core cities, must be addressed. The Government of Lao PDR possesses the concept to promote industrial development within the regional core cities, and a national development target which aims to improve infrastructural services; such as water supply.

To achieve the development plan, and its target, there is a necessity to provide infrastructure such as; road networks, public transportation, water supply and solid waste management facilities to the cities which come under the urban master plans. In addition, it is necessary to improve the operation and management capacity of infrastructure service. However, the urban plans in Kaysone Phomvihane and Pakse have not been updated for years.

JICA has positioned "Improvement of urban environment" as one of the key development issues for Lao PDR, and has supported urban development projects in Vientiane. JICA also recognizes that the improvement of the urban environment within regional core cities is important to promoting regional economic development and a balanced development within the entire nation.

## **1.2 Survey Objectives**

The objectives of the Survey are:

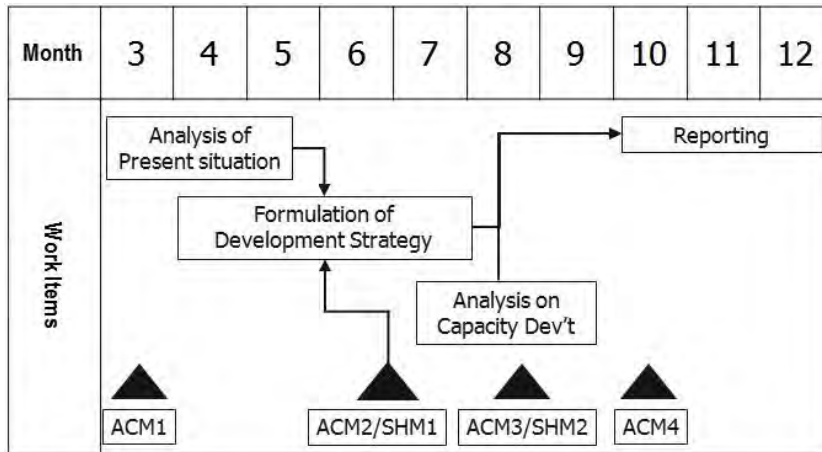
- The formulation of basic development strategies of Kaysone Phomvihane and Pakse
- Prepare future JICA cooperation programs (draft) which foster the above two cities in becoming regional economic centers.

## **1.3 Survey Area**

The survey covers Kaysone Phomvihane and Pakse. Target area for the basic development strategies and development policy of urban infrastructure is urban planning boundary set by PTI. A discussion and agreement has been made between the JICA Survey Team (JST) and Advisory Committee.

## **1.4 Survey Schedule and Organization**

The survey was commenced in March 2009 and was completed in December 2009. The major components of the survey were: an analysis of the current situation; the formulation of a development strategy; an analysis of capacity development and reporting. Four advisory committee meetings (ACMs) were held; two stakeholder meetings (SHMs) were held as indicated in Figure 1. The ACMs were held in three locations: Vientiane, Kaysone Phomvihane and Pakse. SHMs were held in Kaysone Phomvihane and Pakse.



Source: JST

**Figure 1 Survey Schedule**

## 2 Basic Strategies for Regional Cities

### 2.1 Necessity of the Basic Strategy for Urban Development

Development Strategies for Urban Development are indispensable, if a city is to be functional, secure, and sanitary, and be easy place to live. On a general basis, urban development progress is based upon regional or national strategies, plans as well as the real development targets and goals of the future cities. There is no comprehensive national and regional land development plans in conjunction with provincial or regional core cities development plans in Lao PDR. It can be concluded that, basic strategies for urban development regarding the roles and functions of the each city has not prepared yet.

Urban development in Lao PDR has been observed in the last two decades. In the past, the majority of urban centers in Lao PDR were quite small areas and with limited population accumulation except for Vientiane. For example, the population of Savannakhet urban center (Kaysone Phomevihane) in the 1980s was less than 10,000. Urban functions such as; public administration, commerce, education and related services was concentrated in the small urban center surrounded by the residential area. Similar urban structures can still be seen in the current district centers. One small urban center surrounded by small accumulation of homes that form a residential area is the typical district centers in the past.

The urban population growth rate has been much higher than the national population growth rate, and it has led to rapid urbanization in the last two decades. However, the majority of existing regional core cities have been developed lacking clear urban development strategies. As a result, cities have expanded without functional allocation plans and sufficient transport networking. Under such conditions, an urban sprawl has occurred in accordance with its population increase.

If this form of urban expansion continues, the future urban area will be spread out and, the center of the city will become congested due to the concentration of city functions. Environmental impacts with and without Basic Strategies are analyzed in the section 3.5 of the main report. Without Basic Strategies for Urban Development, disordered urbanization, deteriorating urban environment, decrease of green area, deteriorate of townscape, congestion will be proceed in the future. In addition, the city will not possess specific characteristics, making it unattractive for both of residents and visitors. Future cities should have a distinct character and image, and specific functional centers in the urban area, based on development targets and strategies.

### 2.2 Objectives of Urban Development

Through discussions on vision of Kaysone Phomvihane and Pakse with ACM and SHM members, JST has identified three objectives for urban development of the core cities in Lao PDR as indicated in Table 1. The first objective is “Supporting economic and social activities in the cities and the surrounding regions.” The second is “Organized urbanization for beautiful and ordered cities.” And the third is “Managing and controlling urban and living environment by infrastructure improvement/ development.”

**Table 1 Objectives and Measures of Urban Development**

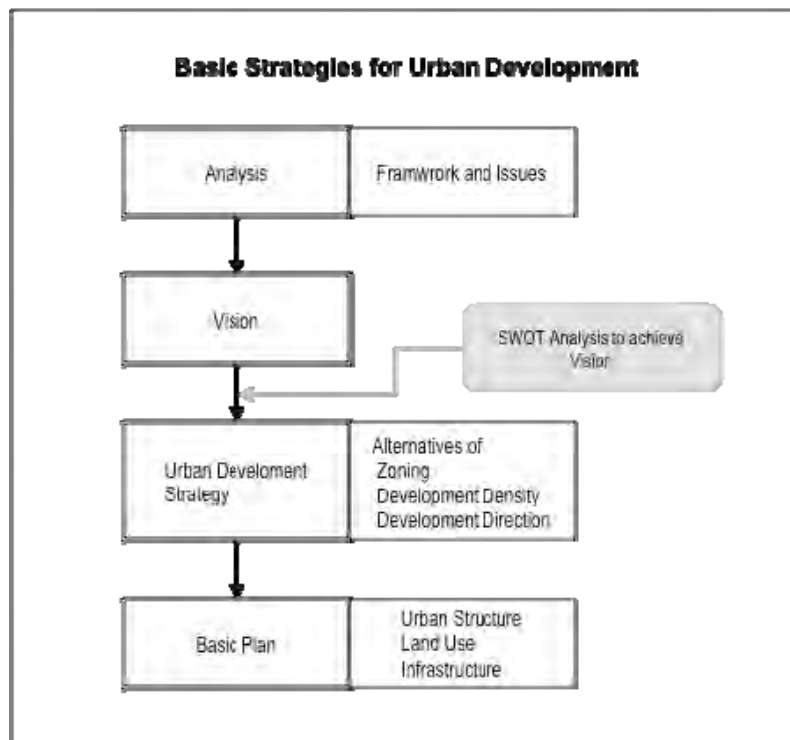
	Objectives	Measures	Contents in Basic Plan
Objective 1	Supporting economic and social activities in the cities and the surrounding regions	<ul style="list-style-type: none"> <li>- With appropriate urban functions</li> <li>- With certain axis of traffic and green</li> </ul>	Urban Structure Land Use
Objective 2	Organized urbanization for beautiful and ordered cities	<ul style="list-style-type: none"> <li>- With green area conserved</li> <li>- With historical townscape preserved</li> <li>- With appropriate density to meet Lao lifestyle and culture</li> </ul>	Land Use

Objective 3	Managing and controlling urban and living environment by infrastructure improvement/development	<ul style="list-style-type: none"> <li>- With improved road/road network and transport</li> <li>- With improved water supply</li> <li>- With wastewater treated</li> <li>- With flood prevented</li> <li>- With solid waste management</li> </ul>	Infrastructure
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Source: JST

Measures to achieve each objective are listed as 2<sup>nd</sup> column of the Table 1. Basic strategy for urban development is guidelines to address these objectives. It also leads an organized urbanization, and achieves the future vision of cities pictured by citizens and local authorities.

The basic strategies for urban development consists of four components: Analysis, Vision, Urban Development Strategy and Basic Plan as indicated in Figure 2.



**Figure 2 Structure of Basic Strategies for Urban Development**

### 2.3 Process to Formulate Basic Strategies for Urban Development

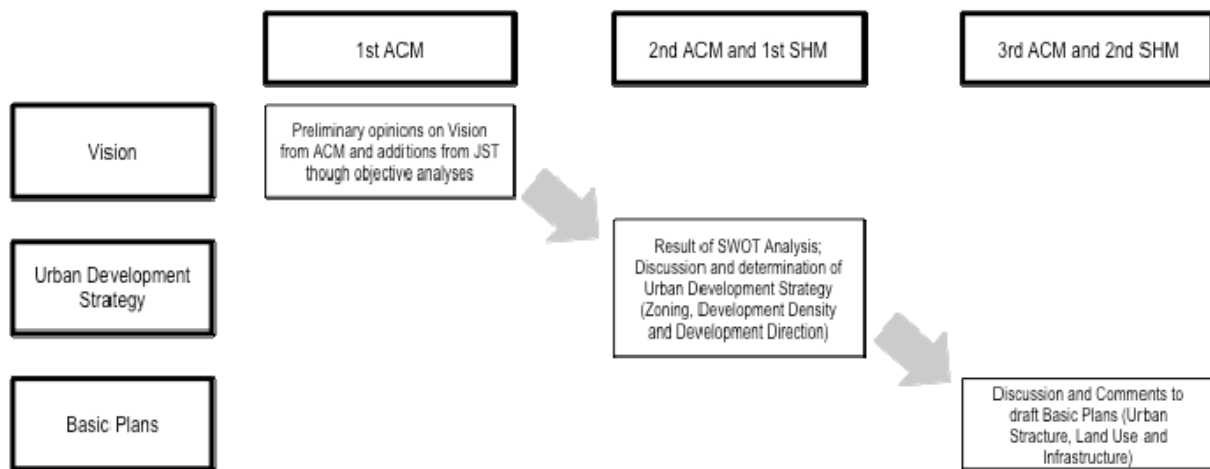
Figure 3 indicates the process for formulating Basic Strategies for Urban Development.

The process was initiated in March, when the first ACMs were held. After hearing the preliminary opinion on Vision from ACM members, JST commenced analyzing current situation of the both cities and context of national and regional development, etc through discussions with counterparts in PTI.

In the second ACMs and the first SHMs, JST presented results of the SWOT Analysis, alternatives of development density and development direction. These alternatives were discussed, and the ACM and SHM members decided preferable alternatives under moderation of JST. The following sections compile the comments, opinions from local government officials and stakeholders through ACMs and SHMs. JST prepared Basic Plan that is Urban Structure, Land Use and Infrastructure in line with selected Urban Development Strategy.

In the third ACMs and the second SHMs, draft Basic Plans (Urban Structure, Land Use and

Infrastructure) were presented and discussed. Opinion from the ACM and SHM members were reflected in the Basic Strategies for Urban Development from the next sections.



Source: JST

**Figure 3 Process for Formulation of Basic Strategies**



## 3 Kaysone Phomvihane

### 3.1 Socio-economic Framework

#### (1) Economic Activity at Savannakhet Province and Kaysone Phomvihane District

Savannakhet Province possesses the highest percentage share in rice production, and will continue to sustain this status for the coming 20 years. JST estimates that the population of Lao PDR will increase from 6.0 million in 2008 to 7.9 million by 2025, and urbanization will be advancing during the period. Under these circumstances, it is vital to sustain self-sufficiency in rice. In addition, it is also important to develop commercial crops following sugarcane. One example is pineapple, and it is important to process these commercial crops and add value.

The secondary industry; gold mining and copper production, will continue to be a major activity in Savannakhet Province for the next 20 years. One potential negative linkages of copper production is the production of electric cable for, currently more than 40 hydraulic power plants are being constructed, or are planned within Lao PDR. Another potential is labor-intensive manufacturing at Savan-Seno SEZ. It is reported that recently a major garment manufacturer has decided to move its factory from China to the SEZ. Transfer of the labor-intensive process from its Thai mother factory for the manufacturing of automobile and electrical parts, etc is also potential due to easy access from Thailand.

In the tertiary industry, tourism is expected to provide a major linkage effect in terms of employment. However, attractive tourism resources are limited in the Savannakhet Province. In spite of this, many Thai tourists visit cities in Vietnam such as Danang and Hue through NR9. Thus, reinforcing the necessity to develop a stopover point along the NR9 and fully utilize historical buildings in the old city center as tourist sites.

Kaysone Phomvihane is the center of the secondary and tertiary industries of Savannakhet Province which is the most populous province in Lao PDR. Due to the abundance of flatland, in the future, more residents within the province will relocate to Kaysone Phomvihane to receive supporting services in agriculture and public administration, as well as to conduct commercial activities. These demands will generate employment in administration services (education and public health) and within wholesale and retail trading. The development of the Savan-Seno SEZ will also generate direct and indirect employment for residents of the Kaysone Phomvihane District.

#### (2) Demographic Framework in Kaysone Phomvihane District and Urban Planning Boundary

JST established the demographic framework for Kaysone Phomvihane District and urban planning boundary as indicated in Table 2 and Table 3. The population in the urban planning boundary, including SEZ residents, will increase from 74,000 in 2005 to 147,000 in 2025. The number of households will also increase from 12,000 in 2005 to 24,000 in 2025.

**Table 2 Total Population of the Urban Planning Boundary in Kaysone Phomvihane**

Unit: 000 persons

	Population in Urban Planning Boundary	Residents in SEZ	Total Population
2005	74	-	74
2015	94	6	100
2025	133	14	147

Source: JST

**Table 3 Household Member and Household**

Unit: Persons

	Population in UPB (w/o SEZ)	No of Household member	No of household
2005	74,000	6.2	12,000

2015	94,000	5.8	16,000
2025	133,000	5.5	24,000

Source: Census 2005; JST

### 3.2 Development Issues

#### (1) Socio-economy

- (a) Addressing the double increase of population (from 74,000 to 147,000) and household (from 12,000 to 24,000)

The increasing population pressure will bring about impacts such as:

- Increase of houses: The number of households will increase from 12,000 in 2005 to 16,000 in 2015 and 24,000 in 2025;
  - Increase of economic activities: large-scale secondary and tertiary industries will be located in SEZ and along NR9, however, administrative offices and supporting industries will be located inside of Urban Planning Boundary;
  - Increase of vehicles: The numbers of motorbikes and privately-owned automobiles in Savannakhet Province will increase from 85,000 and 9,000 in 2007 to 405,000 and 41,000 in 2025.
- (b) Enhancement of urban functions (economic infrastructure service and logistics centers) in coordination with Savan-Seno SEZ

Savannakhet Province is expected to achieve 6 to 7% annual GDP growth until 2025 according to the socio-economic framework, making it necessary to promote the secondary and tertiary industries on a national level. Savan-Seno SEZ has an important role in this context, with the development of the secondary and tertiary industries in the SEZ a transmigration of the population from the rural areas of Savannakhet Province and surrounding provinces to Kaysone Phomvihane and the surrounding area, will introduce environmental impacts. In addition, it will become necessary to enhance urban functions such as; infrastructural services, logistics services and public services (school, health care and administrative services, etc) in coordination with SEZ developers.

#### (2) Land Use and Infrastructure

Through investigation and survey, JST has identified issues in Land Use and Infrastructure. JST also collected issues on infrastructure through ACMs and SHMs. The issues were finally compiled in the following sections.

**Table 4 Issues on Land Use and Infrastructure**

Land Use	<ul style="list-style-type: none"> <li>- Developments in unsuitable areas</li> <li>- Limited coordination with SEZ development</li> <li>- Low Interest in Historical Buildings</li> </ul>
Road and Transportation	<ul style="list-style-type: none"> <li>- No clear road hierarchy in the urban area and immature road network</li> <li>- Unsatisfactory road development</li> <li>- Lack of traffic axis in the urban area</li> <li>- No public transportation</li> <li>- No public parking in the urban area</li> <li>- Bus terminal in urbanized area</li> <li>- Airport in the urbanized area</li> </ul>
Water Supply	<ul style="list-style-type: none"> <li>- Limited water supply capacity for the future</li> </ul>
Sewerage and Sewer Treatment	<ul style="list-style-type: none"> <li>- Improper sewerage and sewer treatment system</li> </ul>
Drainage and Flood Mitigation	<ul style="list-style-type: none"> <li>- No proper development at stream banks</li> <li>- Erosion of Mekong riverbank and Xedong riverbank</li> <li>- No pump provided at stream mouths to Mekong River</li> </ul>
Solid Waste	<ul style="list-style-type: none"> <li>- Low solid waste collection rate</li> <li>- Insufficient public education for solid waste disposal</li> </ul>



	- Inadequate development of dumping site
Park and Town Beautification	- Few recreational parks - No green area

Source: JST

### 3.3 Vision

#### (1) Vision of Kaysone Phombihane

Vision of Kaysone Phomvihane was prepared with the following process. In the first ACM in March, ACM members stated “green” city and tourism promotion as the key elements of the vision. JST suggested additional ideas of making maximum use of development of the EWEC and the national and regional development context. Through the exchange of opinions with members of ACM and SHM, the Vision of Kaysone Phombihane

- International and regional core city having active exchange of people, goods and information.
- The crossroad of the EWEC (East-West Economic Corridor) and NR13.
- Charm and unforgettable place with full use of historical town and sunset over the Mekong River.

#### (2) SWOT Analysis

In order to achieve the Vision and introduce strategies, JST made a SWOT Analysis for Kaysone Phombihane as shown in Table 5.

**Table 5 Strengths, Weakness, Opportunities and Threats of Kaysone Phomvihane**

Strengths	Weakness
<ul style="list-style-type: none"> <li>- Availability of flat land</li> <li>- Rich agricultural &amp; mineral resources</li> <li>- Strong support by the central government</li> <li>- Full completion of the East-West Economic Corridor (EWEC)</li> </ul>	<ul style="list-style-type: none"> <li>- Insufficient skilled human resources for industrial development</li> <li>- Weak urban function regarding international trade and investment (limited banking and transport sectors, etc)</li> <li>- Limited level of urban infrastructure such as water and sewerage</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>- Progress of regional integration such as AFTA (ASEAN Free Trade Area) and GMS (Greater Mekong Sub-region) program</li> </ul>	<ul style="list-style-type: none"> <li>- Budget constraints for development</li> <li>- Dependency on international development partners</li> <li>- Limited coordination with Savan-Seno SEZ development</li> <li>- Uncertainty of Savan-Seno SEZ development initiated by private sector</li> <li>- Severe competition between local goods (such as automobile by Kolao) and imported goods under reduced CEPT (Common Effective Preferential Tariff)</li> </ul>

Source: JST

The following strategies are introduced from the result of SWOT analysis.

- By using strength of the location at a node of the EWEC, and an opportunity of integration of markets and production bases under ASEAN integration, setting out to develop as a base for logistics and information connecting growth centers (Development Strategy for Urban Economy).

- Getting away from missing development opportunity due to weak human resource and poor urban infrastructure, leading urban development so as to grab a development opportunity in accordance with development of the EWEC; in addition to that, preparing to conserve agricultural and green areas surrounding of the urbanized area for future attractiveness of the city (Urban Development Strategy).

### 3.4 Development Direction

The future urban population of Kaysone Phomvihane is projected to double by the year 2025. Expansions of the urban functions are indispensable and areas required for the urban service facilities will increase. JST studied the direction of development by comparing the Case 1 (expanding the existing city center) and Case 2 (creating a new city center), especially for the commercial center where most of the urban residents were attracted to as a part of their urban life.

**Table 6 Development Directions in Kaysone Phomvihane**

	Case 1: Existing city center expansion	Case 2: New city center development
Description	Expansion of existing city center continues with higher population density	A new city center near NR9 with medium population density
Advantage	<ul style="list-style-type: none"> <li>- Less investment cost for urban infrastructure</li> <li>- Consistent with compact city concept</li> </ul>	<ul style="list-style-type: none"> <li>- Less congestion at new city center</li> <li>- Conservation of colonial streetscape</li> <li>- Advantage in the accessibility (located near the EWEC)</li> </ul>
Disadvantage	<ul style="list-style-type: none"> <li>- Fear of damage colonial streetscape</li> <li>- Congestion at the city center (deteriorate tourism resources)</li> <li>- Disadvantage in the accessibility (distant from the EWEC)</li> </ul>	<ul style="list-style-type: none"> <li>- More investment cost for infra development</li> <li>- Declining existing city center</li> </ul>

Source: JST

ACM members have agreed to Case 2, develop the new commercial center at the designated location. However, the existing city center (old city center), in particular, along with the Mekong River side should be conserved and developed as a tourism promotion area.

### 3.5 Urban Structure

#### (1) Basic Policy

The urban structure plan designates the future urban functional areas indicated by centers of function. The location of each center is determined with consideration to the urbanization area, development density, and development direction. Also placed into consideration are the economic development direction, transport axis, geographical conditions and environmental aspects. Centers shown in this structure plan are rough areal designations. The actual size and shape of the area should be studied and determined through a further detailed master plan to be formulated. This structure plan indicates the guideline for urban land use and transport network strategy formulation.

#### (2) Formulation of Centers

Based on present urban development conditions, existing development projects implemented, urban development direction and framework, a center for each function is placed and developed intentionally.

Old City Center: The area located near the Mekong River had been developed over the course of more than a century before, and many historical old buildings still remain. An old city blocks/area has potential to attract citizens and tourists. At present, many Thai tourists visit cities in Vietnam such as Danang and Hue through NR9 after completion of the Friendship Bridge II. To attract and stop them over at Kaysone Phomvihane, an urban landscape and an atmosphere of this blocks/area should be

maintained. Therefore, this area will be designated as ZPP (Historical and Cultural Preservation Area) in a land use plan. Buildings and streets in this area should be repaired and constructed based on a regulation on development activity in a historical and cultural preservation area. A road and a river bank of Mekong near this area will also be improved and cleaned. These will contribute to attract people and tourists and stop them over this area. A district office designed to fit into the urban landscape of this area will be moved in from its present location.

Commercial Center<sup>1</sup>: Friendship Bridge II over the Mekong River had been constructed, connecting Thailand and Vietnam with the NR9 running through the north of Kaysone Phomvihane urban area. NR9 is a part of the EWEC. The area along NR9 had been designated as SEZ and many development plans already exist in this zone. Development plan of SEZ Site A, C and D are now being implemented. Therefore, an urban area will be expanded to the northeast. An area along the road connecting NR9 and an old city center has gradually been developed. This area should intentionally be developed as a New Commercial Center.

Industrial Center: SEZ Site C is now being developed as an industrial park having an area of more than 200 ha, and it has already succeeded in contracts with 17 firms. This area will become an Industrial Center of Kaysone Phomvihane.

Development of Administration Center: Savannakhet Provincial Office and other administrative offices exist at almost the center of Kaysone Phomvihane urban area. This area should advance its development as an Administration Center, not only of Kaysone Phomvihane but also of Savannakhet Province.

Transport Center: At present, an international and inter-provincial bus station exists in an urbanized area. This area will become a commercial center and a bus station will become an obstruction of this future development. According to ACM members, a new Transportation Center should be located at the outskirts of the future urban area and along NR9. Furthermore, ACM members prefer to have a single bus terminal which has international, inter-provincial and intra-provincial route to secure the smooth transit of buses. In this context, JST has proposed a site which is on the western side of SEZ Site C, this location was agreed to by the ACM members. A bus terminal for route buses to commercial facilities for the convenience of bus users should also be constructed within the transport center.

Education Center: There is a teachers' collage in the west of SEZ Site D, and in the future, the Savannakhet National University will be relocated to this location. An agricultural college and business college will also be established within Site D in the future. Thus, this area has been positioned as the Education Center by the ACM members.

Park and Green, Recreational/Tourism Center: Lake Va is located roughly 6 km east from an old city center of Kaysone Phomvihane and is a recreational place for its citizens. There are a number of bungalows and a small store surrounding the lake and a rich forest spreads at the north. This area should be intentionally developed as the Park and Green, Recreational/Tourism Center.

### (3) Formulation of Axis

Traffic Axis: Two traffic axes already exist. One is the NR9 running through the north of the urban area to NR13 and Vietnam, and the other is the NR9A which runs through the south of the urban area to NR13. Kaysone Phomvihane Road running north to south at the eastern part of the urban area should be developed as a new traffic axis connecting the two established axes.

Green Axis: Lake Va and its surrounding forest, paddy fields and wetland areas, and both sides of a river running north to south to the Mekong River should see development as a public parks and green area or should be designated as a conservation area. These parks, green and conservation areas should be connected to formulate a Green Network. The road from Lake Va to the Administration Center has a planted zone. Currently the road surrounding Kaysone Phomvihane Park and the

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<sup>1</sup> Commercial Center includes not only retail stores and commercial facilities but also office complex.

Provincial Office possesses a planted zone which is 10 meters in width and around 1 km in length. In addition to this, the road will be developed into a minor arterial road which has a planted zone on both sides. The road network with planted zones will continue on to a road along the Mekong River.

Based on the above ideas, and additional consideration on the road network, the urban structure was prepared as shown in Figure 4.



Source: JST

**Figure 4 Proposed Urban Structure in Kaysone Phomvihane**

### 3.6 Land Use Policy

#### (1) Land Use Policy

Initially, zoning for developable land and conservation area was prepared based on the existing land use and the land suitability evaluation (refer to Appendix 2.3). The eastern side of the city covered with agricultural land and forest is set for a preservation area. In addition, a suitable area has been selected as the “urbanization area up to 2025”, where urban development activities will be permitted until 2025.

Following the zoning of developable land and conservation area, JST analyzed existing development density and future alternatives. In 2005, buildup area was 2,440 ha with density of 31 persons/ha. JST set Case 1 (same area, higher density), which is 2,400 ha with the density of 55 persons/ha, and Case 2 (area expansion, same density), which is 4,200 ha with the density of 31 persons/ha, and asked local stakeholders which case they prefer after explaining advantages and disadvantages of the both cases in terms of cost for infrastructure development and environmental management.

Since Kaysone Phomvihane has enough developable land, SHM members insisted on Case 2, area expansion and same density development. On the other hand, ACM members preferred Case 1, same area and higher density development, to save infrastructure cost and easy control of urban environment. That is why JST finally proposed mixture of Case 1 and Case 2, and approved by the ACM and SHM members.

## (2) Land Use Zoning and Density Planning Policy

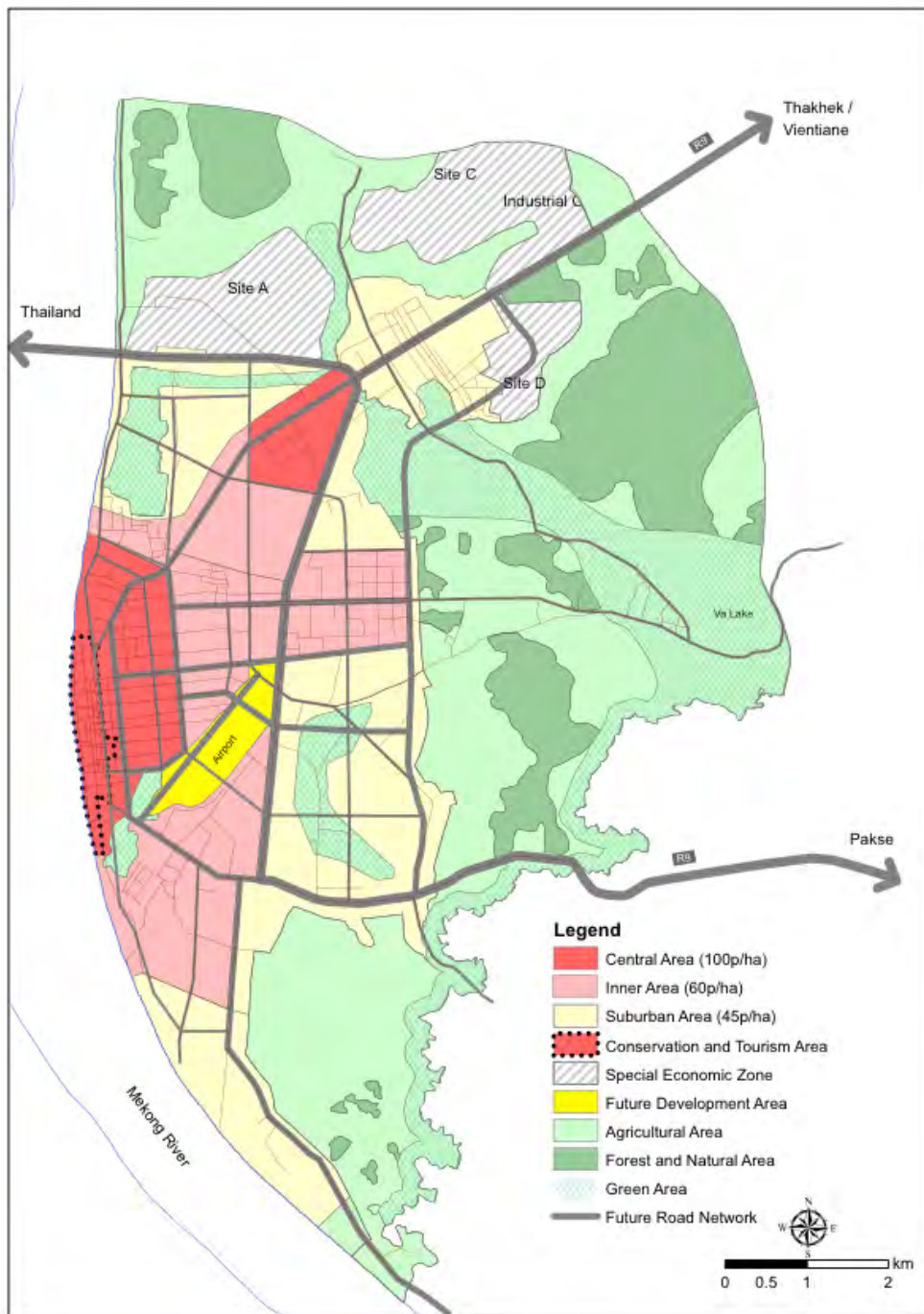
The proposed land use concept is prepared based on the situation of existing population density of each land use category in the survey area. The land use categories are divided into three: Central area, Inner area and Suburban area. The land use allocation by categories is determined by the following methods.

Central Area: Central Area is designated to the areas where is already accumulated high population density, and the area where is expected to be developed in high density, such as commercial center area. Population density is set as 100 persons/ha in the Central Area.

Inner Area: Inner Area is designated to the area where has a community with agglomerated buildings. It also includes the existing built up area and the area already starts developing. Population density is set as 60 persons/ha in the Inner Area.

Suburban Area: Suburban Area is designated to the areas where urban area expansion is expected in accordance with development of future road network. This area is basically located at outskirts of the Inner Area. Population density is set as 45 persons/ ha in the Suburban Area.

Figure 5 shows land use concept plan and Table 7 indicates land use area and development density. Total of these areas are 3,760 hectare in the year 2025. It is 37 percent bigger than the urbanized area (2,758 ha) in 2005, while population increases 80 percent in the same year.



Source: JST

**Figure 5 Land Use Concept Plan**

**Table 7 Population, Density and Land Use Area**

Land Use		Land Use Area (ha)		Population Density	Population	Household Member	No of Household
		Designated	Developed				
ZPP	Low density	77	77	45	3,465	5.5	630
Center Area	High density	300	285	100	28,500	5.5	5,182
Inner Area	Mid density	1,143	1,015	60	60,900	5.5	11,073
Suburb Area	Low density	1,539	820	45	36,900	5.5	6,709
SEZ		701	561	0	0	0	0
Total of Urban Area		3,760	2,758	-	129,765	-	23,594
Conservation Area		4,319	-	-	3,240	-	-
Airport		118	-	-	-	-	-
Total		8,197	-	-	133,005	-	-

Source: JST

### 3.7 Infrastructure Development

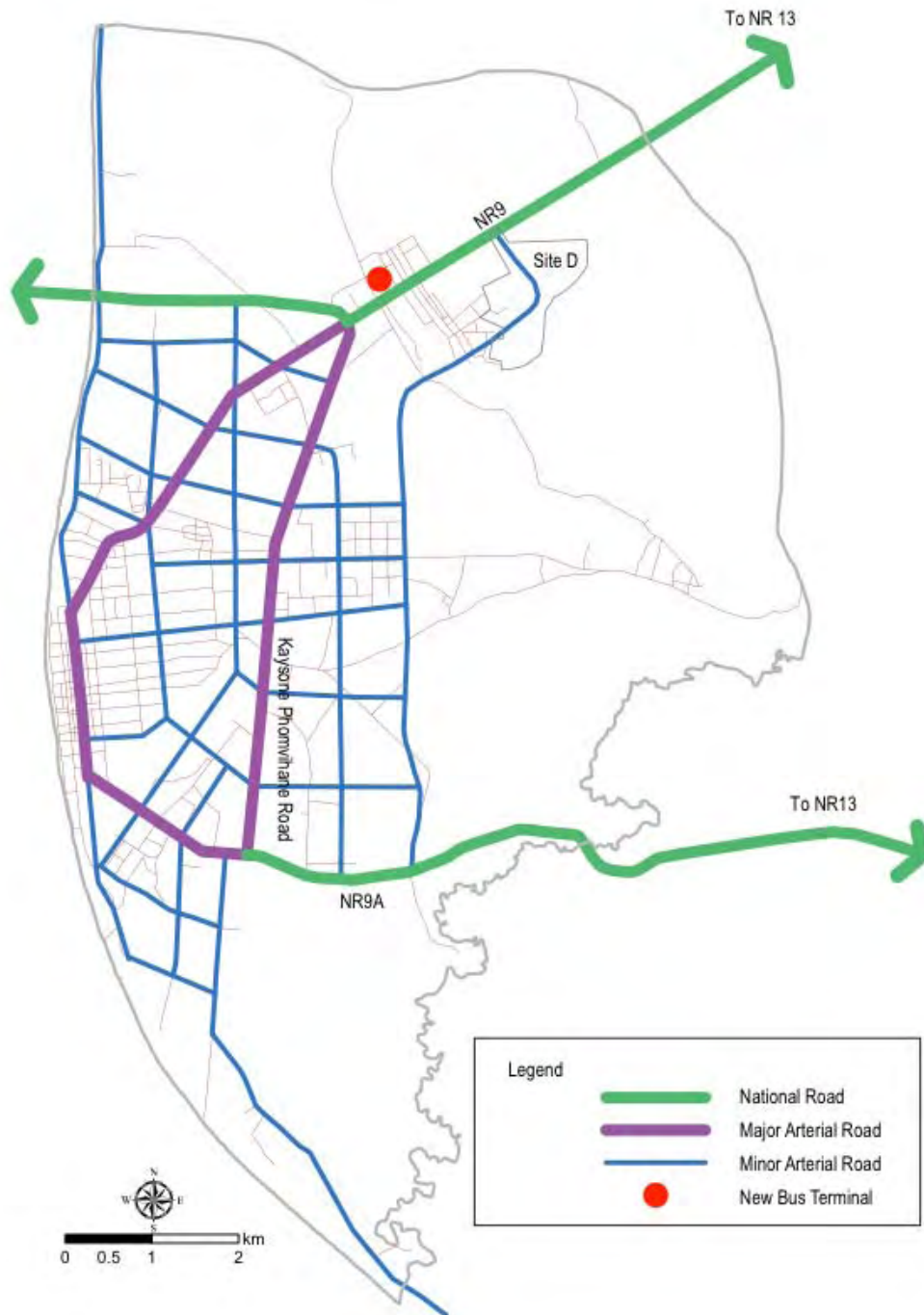
#### (1) Road and Transport

An existing grid road pattern will be followed and expanded to a newly urbanized area. Existing road networks in an urbanized area will be improved and upgraded for urban development toward 2025 and be utilized as much as possible. In addition, new roads such as; minor arterial, collector and local roads will be arranged and constructed to form a skeleton of a future urban area and new blocks considering the future population density of each land use. Table 8 shows road and transport related projects necessary for realization of urban structure toward 2025. These projects include study and design work. Road network is composed of major arterial road, minor arterial road, collector road and local road. Figure 6 shows future road network plan.

**Table 8 Projects of Road and Transport Sector toward 2025**

	Project Name	Implementing Agency	Project Location
1	Improvement and Construction of Collector and Local Road 1	DPWT/UDAA	Mainly urban inner area (53.5km)
2	Improvement and Construction of Collector and Local Road 2	DPWT/UDAA	Mainly urban suburban area (80km)
3	Improvement and Construction of Urban Minor Arterial Road 1	DPWT/UDAA	Mainly urban inner area and fringe of eastern part of urban area (27km)
4	Improvement and Construction of Urban Minor Arterial Road 2	DPWT/UDAA	Mainly urban suburban area (25.5km)
5	Improvement of Urban Major Arterial Road	DPWT/UDAA	Urban inner area (5km)
6	Improvement of Kaysone Phomvihane Road as Urban Major Arterial Road	DPWT/UDAA	Existing Kaysone Phomvihane Road (6.5km)
7	Improvement of a part of National Road 9A as Urban Major Arterial Road	DPWT/UDAA	Existing National Road 9A in urban inner area (2km)
8	Beautification of a road along Mekong River	DPWT	Thahe Road (500m from an old stadium to a temple)
9	Route bus network development	DPWT	Mainly an urban area of Kaysone Phomvihane
10	Public parking area development	DPWT/UDAA	Urban area of Kaysone Phomvihane
11	Development of a bus station	DPWT/UDAA	Between SEZ Site A and C, facing to NR9
12	Development of taxi pools	DPWT/UDAA	A bus terminal, a commercial center and an old city area

Source: JST



Source: JST

**Figure 6 Road Network in Kaysone Phomvihane**

Route bus system covering the urban area will be introduced to provide convenience to residents and tourists as well as to mitigate traffic congestion that will occur in the future. Public parking areas should be constructed in an urban area, especially in a commercial area. A new bus terminal with commercial facilities proposed to be constructed between SEZ site A and C facing to NR9. Taxi pools also proposed to be provided at places where many people come and go such as a new bus station, a new commercial center and an old city area for people's convenience.



## (2) Water Supply

Existing water supply capacity is 15,000m<sup>3</sup>/day. Water demand in the future urban area except SEZ Site A and D in 2015 and 2025 are estimated 25,900m<sup>3</sup>/day and 36,700m<sup>3</sup>/day, respectively. Therefore, additional water supply facilities with capacity of 11,000m<sup>3</sup>/day for year 2015 will be constructed within an existing water treatment site. The additional water supply facilities with capacity of 11,000 m<sup>3</sup>/day for year 2025 should be constructed at a new location because there is no space available in the existing water treatment plant site.

To supply water with enough pressure to the service area, an elevated water tank and related transmission pipeline and distribution pipeline should be installed.

**Table 9 Additional Water Supply Facilities needed**

Water supply facilities needed	Year 2015	Year 2025
Raw water intake tower		1
A bridge for a raw water pipe		1
Raw water intake pumps	2 sets	2 sets
Water treatment plant	11,000 m <sup>3</sup> /day	11,000 m <sup>3</sup> /day
Clear water & backwash reservoir	1,500 m <sup>3</sup>	1,500 m <sup>3</sup>
Transmission/Distribution Pumping Station	Three pumps	Three pumps
Transmission main; 500 mm	8 km	8 km
Transmission main; 400 mm		7 km x 2
Distribution main; 100-350 mm	12 km	25 km
Distribution pipe; 40-75 mm,	400 ha	1200 ha
Elevated water tank	1,000 m <sup>3</sup> x 1	1,000 m <sup>3</sup> x 3

Source: JST

**Table 10 Water Supply Projects in Kaysone Phomvihane**

Project Name		Implementing Agency	Project Location
1	Expansion of the existing water supply facility	Water Supply Company/ DPWT	Urban area
2	Construction of the new water supply facility for UC area	Water Supply Company /DPWT	Northern part of urban area

Source: JST

The provincial water supply company had minutes of understanding (MOU) with a private investor on 23<sup>rd</sup> July. According to the MOU, the private investor will conduct a feasibility study to provide water service in three months. The private company intends to set up a joint venture with the provincial water supply company, and provide the water service to the both urban area and SEZ sites.

## (3) Sewer and Sewerage Treatment Facility

Water, soil and air are polluted from improper sewer and sewerage treatment systems (septic tank). It can be predicted that the current level of pollution will heighten in the future due to the increase in population. Thus, the introduction of a new proper, sewer and sewerage treatment system is needed to properly cope with the problem. A full-centralized sewerage treatment system covering the entire urban area would be the ideal system; however, the system would require professional knowledge and an adequate budget that is needed to support and sustain the operations and maintenance of the facilities.

Currently, this treatment system does not exist in Lao PDR, and there are no qualified people with sufficient knowledge of the system. Consideration, in terms of economics and knowledge of operation/maintenance, an on-site and community (semi-centralized) system will be introduced instead of the full-centralized system. As an opportunity to absorb the skills and knowledge necessary for the proper operation /maintenance of sewerage treatment facilities, an initial pilot project to a market area, introducing the semi-centralized system is recommended. An estimated 80 to 100m<sup>3</sup> per day wastewater will be discharged from a market place.

Savanxay Market has a wide space for parking within the site, making this market a favorable location

for the implementation of this pilot project. This system will be operated and maintained until the year 2015. This project will also be utilized to increase awareness among residents of the importance of sewerage treatment.

After 2015, an expansion of this system will be made to villages in an urban area, especially to center and inner areas.

Table 11 shows sewerage treatment projects.

**Table 11 Sewerage Treatment Projects in Kaysone Phomvihane**

Project Name		Implementing Agency	Project Location
1	Development of Pilot Sewerage Treatment Facility at Savanxay Market including; - Capacity development on future operation and maintenance - Awareness to residents - Initiation of collection and treatment fee from the market	UDAA	Within Savanxay Market
2	Promotion and Extension of Sewerage Treatment Facilities including; - Capacity development on future operation and maintenance - Initiation of collection and treatment fee from residents	UDAA	The whole area of UDAA of Kaysone Phomvihane

Source: JST

#### (4) Drainage and Flood Mitigation

A flap gate had been installed at 3 stream mouths by the ADB Secondary Towns Urban Development Project. However, no drainage pump had been installed. To protect from flooding, a retention pond and drainage pumps, with a hut, should be installed.

The bank erosion of the Mekong River is a concern among the residents of Kaysone Phomvihane. Bank erosion is occurring slowly but surely. Thus, a bank of the Mekong River should be reinforced and protected to a certain degree. Table 12 shows drainage and flood mitigation projects.

**Table 12 Drainage and Flood Mitigation Projects in Kaysone Phomvihane**

Project Name		Implementing Agency	Project Location
1	Natural Stream Improvement Project	DPWT/UDAA	2 rivers, one near a water purification plant and the other near an airport Total length: about 2,000m
2	Installation of Drainage Pumps	DPWT/UDAA	3 locations where a flap gate had been constructed.
3	Prevention of Mekong River Bank Erosion	DPWT/UDAA	Along Thahe Road (500m)

Source: JST

#### (5) Solid Waste Management

The current solid waste collection ratio in the urban area in Kaysone Phomvihane is at roughly 40% due to the limitation of staff, equipment and budget, as well as the lack of proper access roads to the solid waste collection points, in addition to the low awareness of inhabitants toward solid waste collection.

Volume of solid waste in the future is summarized in Table 13. Table 14 shows solid waste related projects in Kaysone Phomvihane.

**Table 13 Volume of Solid Waste collected in the future**

Item		Year 2015	Year 2025	Remarks
1	Future Population	94,000	133,000	-

2	Number of Household Member	5.8	5.5	-
3	Number of Household	16,000	24,000	-
4	Collection Ratio (%)	60	90	-
5	3 x 4	9,600	21,600	-
6	Solid Waste Weight (kg/household/day)	3.5	3.8	-
7	Solid Waste Weight (t/day)	33.6	82.1	-
8	Unit Volume (m <sup>3</sup> /t)	0.7	0.7	-
9	Solid Waste Volume (m <sup>3</sup> /day)	23.5	57.5	-
10	Estimated Solid Waste Volume in a year (m <sup>3</sup> )	8,600	21,000	365day/year
11	Estimated Total Solid Waste Volume for 11 years (m <sup>3</sup> )	162,800		From 2015 to 2025
12	Estimated Total Volume including covering soil for 11 years (m <sup>3</sup> )	227,900		11 x 1.4
13	Landfill Cell Area needed (ha)	10.9		2.5m depth

Source: JST

**Table 14 Solid Waste Management Projects in Kaysone Phomvihane**

Project Name		Implementing Agency	Project Location
1	Solid Waste Management - Awareness program - Procurement of vehicles and equipments	UDAA	The whole area of UDAA of Kaysone Phomvihane
2	Improvement of Existing Landfill site	UDAA	Present landfill site

Source: JST

#### (6) Urban Park and Town Beautification

The provision of urban parks and town beautification together with a green network will create the image of a green city. The results will not only attract visitors but will also attract future urban residents. Therefore, urban parks and green area projects indicated in Table 15 and Figure 7 are planned toward 2025. Not only these project but also development of planted zones at major and minor arterial roads will improve image of green city. It is indicated as “Green Avenue” in Figure 7.

**Table 15 Park and Town Beautification Projects in Kaysone Phomvihane**

Project Name		Implementing Agency	Project Location
1	Improvement of the existing Kaysone Phomvihane Park	UDAA	The existing Kaysone Phomvihane park
2	Development of main urban park-1	UDAA	Near the existing water supply plant
3	Development of main urban park-2	UDAA	At a part of an existing airport (after relocation)
4	Development of green area	DPWT/UDAA	Along existing rivers and streams, and a surrounding area of Lake Vai

Source: JST



Source: JST

**Figure 7 Parks and Town Beatification Projects in Kaysone Phomvihane**

## 4 Pakse

### 4.1 Socioeconomic Framework

#### (1) Future Economic Activity at Champasak Province and Pakse District

The Champasak Province has potential in the primary industry. The Boloven Plateau, located 40km of Pakse is rich in soil for agricultural products, and the cultivation of commercial crops has been initiated by private investors. The province also has a high level in the production of rice and woods products. Champasak Province also enjoys a good location; it is located just 40km east of Ubonrachathani, one of major cities in Thailand. It also has the potential of access to Ho Chi Minh City which currently has a population of 6.3 million. Due to its abundant resources and market accessibility, the Province's agricultural and agro-processing industry will further develop supporting the continuation of Champasak Province being the center of economic activity.

Champasak Province is also rich in tourism resources which will attract international tourists. By improving the accessibility with other world-class tourism resources such as Siem Reap and Bangkok, it would be accepted and visited by more international tourists. In this context, the extension of the runway in Pakse Airport will make a significant impact.

As to manufacturing, it is reported that a Vietnamese investor will start developing an industrial estate in the designated area for industrial use, neighboring the urban planning area of Pakse District. Labor-intensive industries as seen in Vientiane Capital and Savannakhet, and the local resource-based industry have potential in this industrial estate.

Pakse will play important roles not only in the Champasak Province, but also in the southern region of Lao PDR. It will function as the center of administration services and commercial activities for Champasak Province and other provinces (Sekong, Attapeu, Saravan) as well. It is also a gateway for tourists visiting the southern region of Lao PDR. Although major economic activities of agriculture and manufacturing are conducted outside of the Pakse District, supporting industries will be located in the Pakse District. In the future, a percentage of the labor force of these industries will also live in the Pakse District.

#### (2) Demographic Framework in Pakse District

The population in urban planning boundary will increase from 73,000 in 2005 to 147,000 in 2025. Number of household will also increase from 12,000 to 27,000 in the same period indicated in Table 16 and 17.

**Table 16 Total Population in the Urban Planning Boundary in Pakse**

Unit: 000 persons

	Population	Proportion to District Population
2005	73	93%
2015	101	93%
2025	147	93%

Source: Census 2005; JST

**Table 17 Household Member and Household**

Unit: Persons

	Population in UPB	No of Household member	No of household
2005	73,000	12,000	6.1
2015	101,000	17,000	5.8
2025	147,000	27,000	5.5

Source: Census 2005; JST

## 4.2 Development Issues

### (1) Socio-economy

- (a) Addressing increase of urban population (from 73,000 to 147,000) and households (from 12,000 to 27,000)

Pakse is expected higher population growth than Kaysone Phomvihane due to rapid economic development in the surrounding region.

In the future, economic activities and population inflow to the urban areas will be accelerated. The increasing population pressure will bring impacts such as:

- Increase of houses: Number of households will increase from 12,000 in 2005 to 17,000 in 2015 and 27,000 in 2025,
- Increase of economic activities: Major economic activities around Pakse are high-value added agriculture at Boloven Plateau, labor-intensive industry at industrial zone at the south of Pakse and tourism at tourist sites. Pakse will have administrative and supporting activities for these economic activities,
- Increase of vehicles: Numbers of motorbike and private car in Champasak Province will increase from 42,000 and 5,000 in 2006 to 351,000 and 35,000 in 2025.

### (b) Enhancement of urban infrastructure service, logistics service and public service

The Champasak Province is expected to, according to socio-economic framework; achieve an estimated 8% GDP growth per annum until 2025. Thus, it is necessary to promote both the secondary and tertiary industries as well as high value-added agriculture. The development of these industries will trigger a transmigration of the population from rural to urban, which will bring about impacts. In addition, it will be necessary to enhance urban functions such as; infrastructure service (water supply, electricity, etc), logistics and public services (school, health care and administration service, etc).

### (2) Land Use and Infrastructure

JST identified issues on land use and infrastructure through its site surveys and also collected opinions on infrastructure improvement needs through ACMs and SHMs. The issues are compiled in Table 18.

**Table 18 Issues on Land Use and Infrastructure**

Land Use	<ul style="list-style-type: none"> <li>- Limited area for CBD expansion and urban area expansion</li> <li>- Land use and building construction against the urban master plan</li> <li>- Developments in unsuitable areas</li> </ul>
Road and Transportation	<ul style="list-style-type: none"> <li>- No clear road hierarchy in the urban area and Immature road network</li> <li>- Unsatisfactory road development condition</li> <li>- NR13 in the urban area</li> <li>- Limited transport capacity of French Bridge</li> <li>- No public transportation</li> <li>- No public parking in the urban area</li> <li>- Three bus terminals in the different places</li> </ul>
Water Supply	Limited water supply capacity for the future
Sewer and Sewer Treatment Facility	Improper sewerage and sewer treatment system
Drainage and Flood Mitigation	<ul style="list-style-type: none"> <li>- No gate and pump at stream mouths to Mekong River</li> <li>- No proper development at stream banks</li> <li>- Erosion of Mekong River and Xedong River</li> </ul>
Solid Waste	<ul style="list-style-type: none"> <li>- No dumping site in Pakse District</li> <li>- Inadequate development of a dumping site</li> <li>- Low solid waste collection rate</li> <li>- Insufficient public education for solid waste disposal</li> </ul>
Park and Town Beautification	- Few recreational parks

	- No green areas
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Source: JST

### 4.3 Vision

#### (1) Vision of Pakse

Through the exchange of opinions with members of ACM and SHM, the Vision of Pakse was confirmed as following descriptions. ACM members stated some key elements; location advantage of economic activities, value added agriculture and so on, and JST suggested additional ideas in the context of the national and regional development.

- Economic center based on tourism and value-added agriculture with rich green and history
- Southern Metropolis of Lao flourishing in the rich nature and history
- Optimized use of good location and rich natural resources

#### (2) SWOT Analysis

In order to achieve the vision and introduce strategies, JST prepared SWOT analysis for Pakse as shown in Table 19.

**Table 19 Strength, Weakness, Opportunities and Threats of Pakse**

Strengths	Weakness
<ul style="list-style-type: none"> <li>- Booming in agriculture and tourism industries</li> <li>- Rich and diversified agricultural resources</li> </ul>	<ul style="list-style-type: none"> <li>- Limited developable area for future expansion of the city in the existing district boundary</li> <li>- Low level of urban infrastructure services such as water and sewerage</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>- Progress of regional integration such as AFTA and GMS program</li> <li>- Access to mega cities of Thailand, Cambodia and Vietnam</li> <li>- Integration with the surrounding districts/villages (west side of Mekong River and toward Boloven Plateau) in accordance with expansion of city area</li> </ul>	<ul style="list-style-type: none"> <li>- Budget constraints for development</li> <li>- Dependency on international development partners</li> <li>- Disordered development due to rapid urbanization and industrialization at industrial zone</li> <li>- Difficulty of coordination with the surrounding districts/villages</li> </ul>

Source: JST

The following strategies are introduced from the result of the SWOT analysis.

- By use of rich natural, agricultural and tourism resources, and an opportunity of the ASEAN integration, aiming at economic growth as a base of the southern part of GMS (Development Strategy for Urban Economy)
- Carrying out effective urban development in the limited urban area, and leading urban development so as to be a development base for agriculture, industry and tourism in the surrounding area. In addition to that, avoiding disordered urban development in the limited urban area not so as to missing development opportunity in tourism and commerce (Urban Development Strategy)

#### 4.4 Development Direction

Urbanization is expanding to the east significantly due to the new industrial development, just on the east side of the urban planning area, and the easy access to the Boloven Plateau, which has a high potential in value-added agriculture. A new four-lane major street parallel to NR13 was recently constructed in the Pakse urban area. A new market was constructed and is expanding to become the new commercial center at the east side of road which connects to Pakse Bridge. With the aforementioned factors, JST studied the direction of development by comparing the Case 1 (expansion of existing city center) and Case 2 (creating a new city center) particularly for the administration and urban amenity centers.

**Table 20 Development Directions in Kaysone Phomvihane**

	Case 1: Existing city center expansion	Case 2: New city center development
Description	Existing city center spreads to the east and integrated with the new commercial center	Development of a new city center at the east of the existing city center
Advantage	<ul style="list-style-type: none"> <li>- Less investment cost for urban infrastructure</li> <li>- Consistent with compact city concept</li> </ul>	<ul style="list-style-type: none"> <li>- Less congestion at new city center</li> <li>- Conservation of colonial streetscape</li> </ul>
Disadvantage	<ul style="list-style-type: none"> <li>- Fear of damage colonial streetscape</li> <li>- Congestion at the city center (deteriorate tourism resources)</li> </ul>	<ul style="list-style-type: none"> <li>- More investment cost for infra development</li> <li>- Declining existing city center</li> </ul>

Source: JST

Establishment of the new city center (Case 2) was agreed by both ACM members and stakeholders. In addition, emphasis has been made that the old city center should be conserved and developed as a tourist base, and to have an urban amenity center and commercial functions for the local residents. The structure plan is formulated based upon this development direction.

#### 4.5 Urban Structure

##### (1) Basic Policy

The urban structure plan designates the future urban functional areas. The location of each center is determined in consideration with urbanization area, development density, and development direction. The economic development direction, transport axis, geographical conditions and environmental aspects are also factored in the plan. Centers shown in this structure plan in Figure 8 is rough areal designations. The actual size of area and shape should be studied and determined by master plan in the future. This structure plan indicates the guideline for urban land use and transport network strategy formulation.

##### (2) Formulation of Centers

Pakse will no longer be a core city in the future, but become a regional center of the southern region in Lao PDR. Based upon the present urban development conditions, other studies implemented such as; industrial and logistics development, urban development direction and framework, a center for each function should be designated and developed intentionally as a future regional center city.

**Old City Center:** The area located on the east bank of the Xedon River and surrounded by the Xedon and Mekong Rivers has been developed from the French colonial period. This area has many historically old buildings and is the most high-density area in Pakse District. A district office also exists in this area. This area should be developed as Old City Center while historical buildings in this area should be preserved.

**Commercial Center:** The area near Friendship Bridge I at Pakse District is a very important location, where the NR13 connects the northern and southern parts of Lao PDR and NR16 connecting the eastern and western parts of Lao PDR cross. A large new market and high-rise hotel structure has been constructed in this area. Many shops are now being constructed. This area should be developed as a Commercial Center of the regional core city.



Industrial Center: Industrial Zone is designated at the Pathouphom District (south neighbor of Pakse District). It is along NR13, and only 11 to 19 km from the center of Pakse. This location should be developed as an Industrial Center.

Logistics Center: The Pakse District is located at a strategic point in terms of traffic and logistics. Moreover, the surrounding area of the district is rich in agricultural products. Many goods are now imported from Thailand. Once the agro-industry is developed in Pakse and its surrounding area, the Pakse District will be a distribution center of goods. Thus, a Logistics Center should be strategically developed considering the flow of products and vehicles. Viewing the movement of products and vehicles, two logistics centers should be located on the outside of the urban area of Pakse. One will be established near the crossing point of NR13 and NR16 in southeastern part of Pakse. Another will be developed along NR16 on the other side of the Mekong River.

Administration Center: A provincial government office and other administrative arms are located between downtown and the new market. In the future, these areas are expected to become an old city center and a commercial center respectively. Currently, the area where administrative offices are located will, commercially, become a very valuable. An Administration Center should be relocated and developed near the center of the urban area of Pakse in the future and all the offices related to administration should conglomerate into this center.

Transport Center: Currently there are three bus stations in the Pakse District. These should be integrated for the convenience of passengers, and for the efficient operation and maintenance of the buses. A new bus station is proposed to be developed near the intersection of a new NR13 and expanded to NR16 as a Transport Center. A bus station for route buses and commercial facilities for the convenience of bus users should also be constructed within the transport center.

Education Center: There is a university for agriculture, a research institute on agriculture and an experimental farm, which straddles the southern part of Pakse and neighboring district. This area should be developed as an Education Center and universities and institutions should be invited to this area intentionally.

Sports Center: At the present, a stadium exists near the intersection of NR13 and NR16. In the future, this area will become a high-density area. The new stadium should be relocated to a low-density area. Certain areas, such as that near the administration center, or in the green area of Bang-Yo stream, should be developed as the Sports Center. The new sports center will be comprised of a main stadium, multi-purpose field, a pool, gymnasium, jogging, cycling courses and a park.

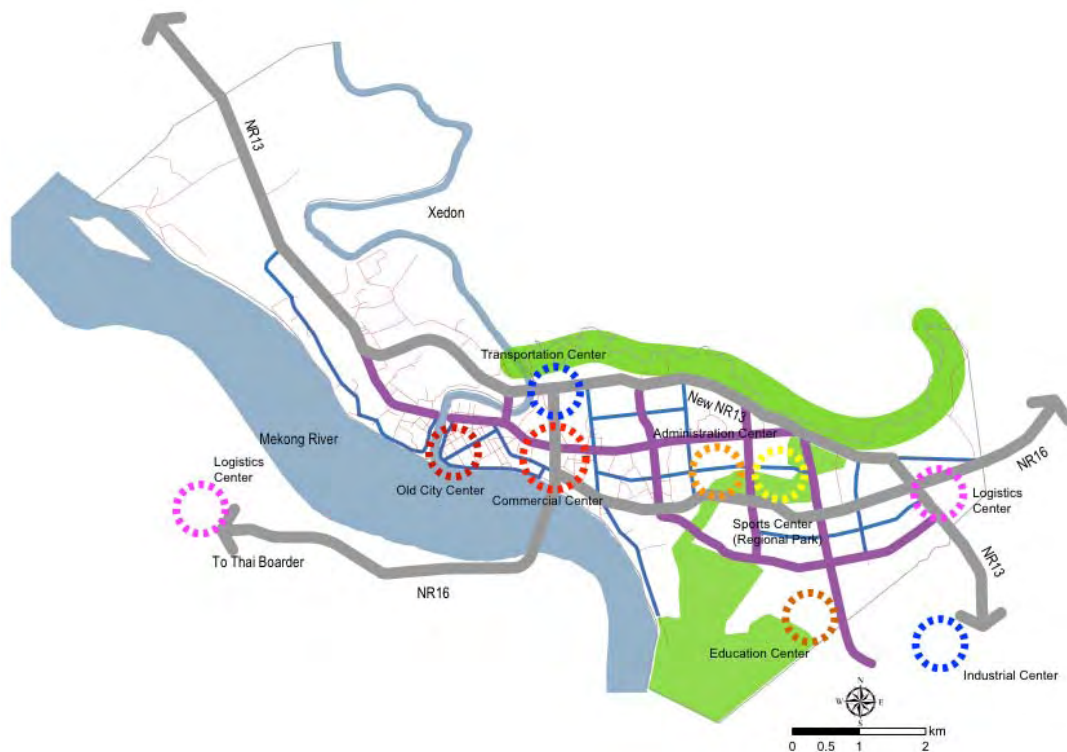
### (3) Formulation of Axis

Traffic Axis: Two traffic axes exist and will be strengthened. One is NR13 running through the north of the urban area connecting north and south. The other is NR16 connecting the east and west.

Green Axis: Gngang stream runs along north side boundary of the survey area of Pakse and flows east to west into Xedon River. Bang-Yo stream starts near from Km 7 Protection Forest and the Cultural Garden and runs north to south through a mid-part of the Pakse urban area and flows into the Mekong River at the southern part of Pakse. Appointed areas of both sides of the two streams should be developed as green areas and conserved. These green areas will form green axis.

Based upon the aforementioned ideas, and additional consideration on road network, the urban structure was prepared as shown in Figure 8, which also includes the layout of major urban facilities.

The most important factor of the urban structure is the new arterial road in the northern part of the city. The new road will function as a bypass, and formulate another backbone for the city.



Source: JST

**Figure 8 Proposed Urban Structure in Pakse**

#### 4.6 Land Use Policy

##### (1) Land Use Policy

Zoning for developable land and conservation area has been prepared based on the existing land use and land suitability evaluation (Appendix 2.3). After establishing developable land and conservation area, JST set the additional “Urbanization Area up to 2025,” which was mostly found in the eastern side of the city due to elevation.

In the following zoning of developable land and conservation Area, JST analyzed existing development density and future alternatives. In 2005, build-up area was 2,860 ha with density of 25 persons/ha. JST set Case 1 (same area, higher density), which is 2,860 ha with the density of 46 persons/ha, and Case 2 (area expansion, same density), which is 5,300 ha with the density of 25 persons/ha, and has asked local stakeholders which case they preferred after explaining the advantages and disadvantages of both cases in terms of cost for infrastructure development and controlling environmental mitigation. Local government officials preferred Case 2, same density development; on the other hand, most of SHM members insisted on Case 1, the same area and higher density development because they understood the limits to developable land in Pakse. JST proposed mixture of Case 1 and Case 2, which was approved by local stakeholders.

##### (2) Land Use Zoning and Density Planning Policy

The proposed land use concept is prepared based on the situation of existing population density of each land use category in the urban planning boundary. The land use categories are divided into three; Central Area having high population density and high commercial and other economic activities, Inner Area where usually surrounds Central area having mid density and Suburbs Area having low density. Proposed land use concept for each area is described as follows.

Central Area: Central area is designated to areas where is already accumulated high population density,

and areas where is expected to be developed in high density, such as commercial center area. Old city center and new commercial center area is designated to this category. Population density is 100 persons/ha.

**Inner Area:** Inner area is designated to areas where has already built up and exist communities with agglomerated buildings. It is designated to the existing built up areas and the areas starting developing by development plan. Population density is 60 persons/ha.

**Suburban Area:** Suburban Area is designated to areas where urban area expansion is expected in accordance with future transport axis, and conservation areas. This area is basically located at eastern part of the urban area. Population density is 45 persons/ha.

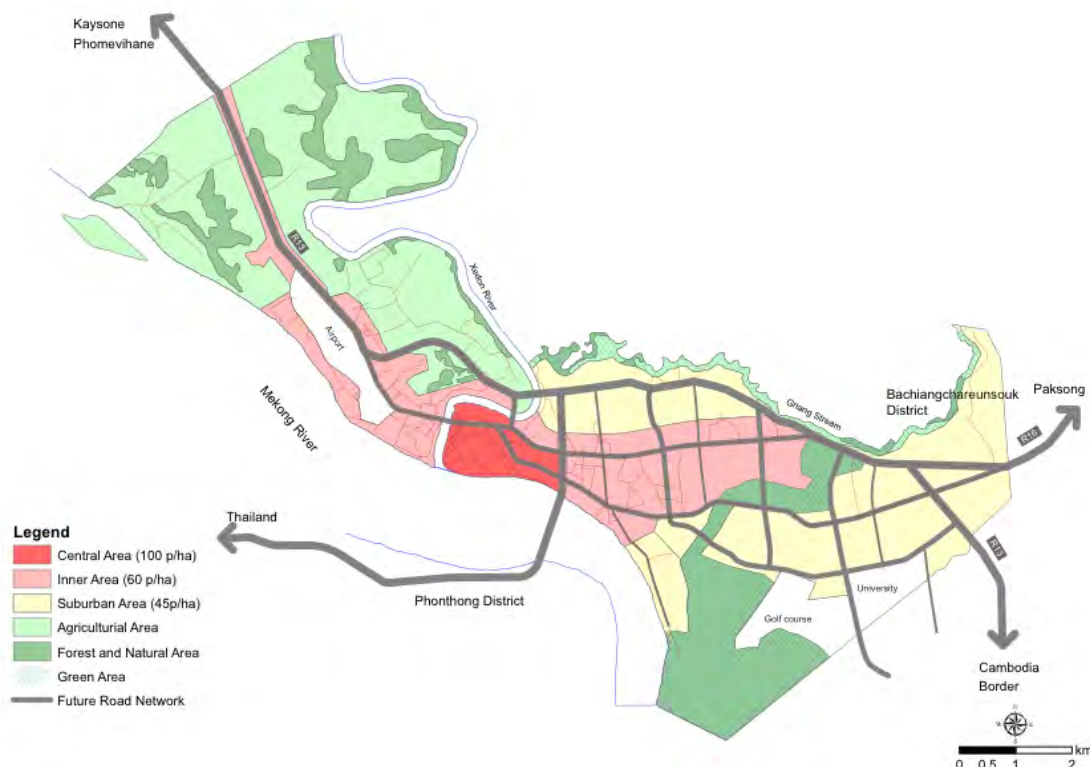
(3) Proposed Land Use Concept Plan until 2025

Table 21 shows population, population density and land use area, and Figure 9 shows the Land Use Concept Plan of Pakse until 2025.

**Table 21 Land Use Zoning and Density Planning Criteria**

Land Use		Land Use Area (ha)		Population Density	Population	Household Member	No of Household
		Designated	Developed				
Center Area	High density	201	201	100	20,100	5.5	3,655
Inner Area	Mid density	1,021	980	60	58,800	5.5	10,691
Suburb Area	Low density	1,831	1,491	45	67,095	5.5	12,199
Total of Urban Area		3,053	2,672	-	145,995	-	26,545
Conservation Area		2,750	-	-	1,000	-	-
Airport, Golf, others		458	-	-	-	-	-
Total		6,261	-	-	146,995	-	-

Source: JST



Source: JST

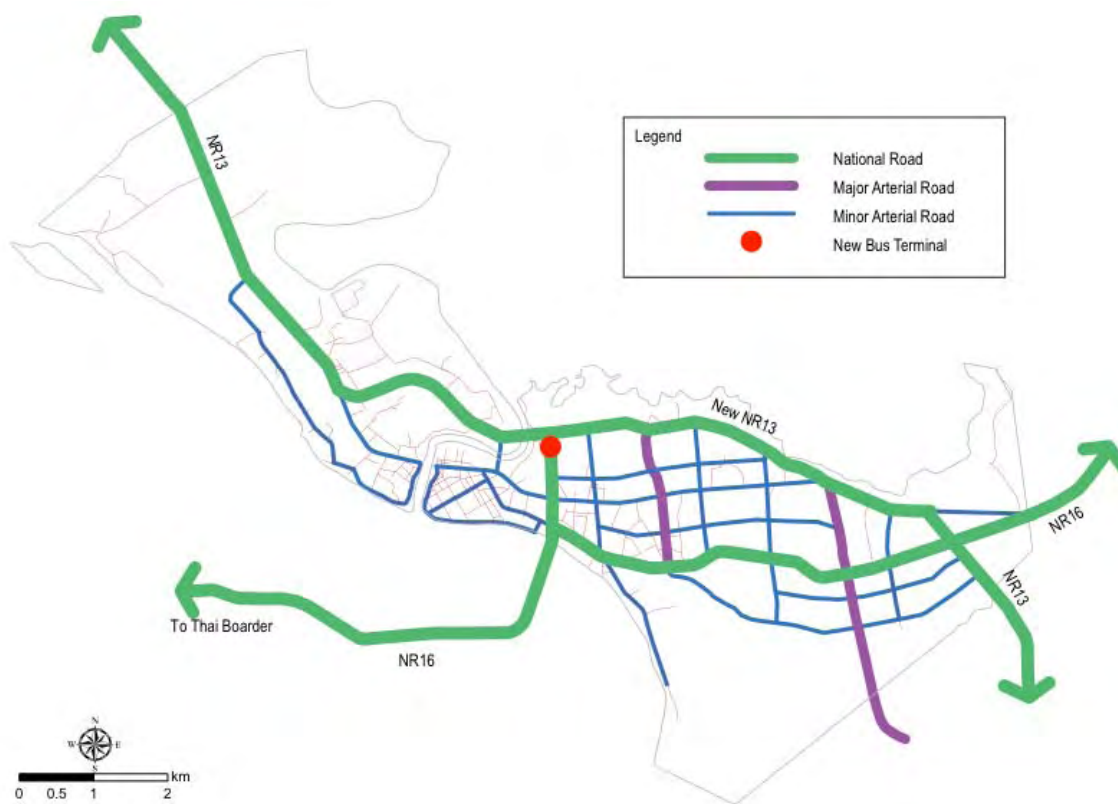
**Figure 9 Land Use Concept Plan in Pakse**

## 4.7 Infrastructure Development

### (1) Road and Transport Sector

Existing road networks in the urbanized area will be improved and upgraded in accordance to the urban development toward 2025, which will be utilized to its fullest. In addition, the new roads such as; minor arterial, collector and local roads that will formulate the framework of the future urban area. New blocks will be arranged and constructed considering the future population density of each land use. A grid type road pattern will be adopted in the urban area of Pakse. To avoid traffic directly passing through the urban area, and to establish a smooth flow of traffic within the urban area, the new NR13 with a 40 m right-of way should be constructed near the northern boundary of the urban planning area. A bridge on the new NR13, connecting the east and west bank of the Xedong River should be constructed on Xedong River.

Road network in 2025 is shown in Figure 10.



Source: DPWT Champasak

**Figure 10 Road Network in Pakse**

Route bus system covering the urban area is introduced for the convenience of residents and tourists, and to mitigate the predicted future traffic congestion. Public parking areas should be constructed in the urban area, particularly, a in the vicinity of commercial area. Existing three bus terminals are proposed to be integrated into one bus terminal near the intersection of new NR13 and NR16. Taxi pools are also proposed be provided at places where many people come and go such as a new bus station, a new commercial center and an old city area for people's convenience.

Table 22 shows road and transport related projects necessary for realization of urban toward 2025.

**Table 22 Projects of Road and Transport Sector toward 2025**

	Project Name	Implementing Agency	Project Location
1	Improvement and Construction of Collector and Local Road 1	DPWT/UDAA	Mainly urban inner area (22.0km)
2	Improvement and Construction of Collector and Local Road 2	DPWT/UDAA	Mainly urban suburbs area (87.5km)
3	Construction of Urban Minor Arterial Road 1	DPWT/UDAA	Mainly urban inner area (18.0km)
4	Construction of Urban Minor Arterial Road 2	DPWT/UDAA	Mainly urban suburban area (18.0km)
5	Improvement of existing NR13	DPWT/UDAA	Urban area at east and west bank of Xedong River (10km)
6	Construction of urban major arterial roads 1	DPWT/UDAA	Mainly urban inner area (1.5km)
7	Construction of urban major arterial roads 2	DPWT/UDAA	Mainly urban suburban area (4.5km)
8	Construction of new NR 13	DPWT	Eastern bank of Xedong Riber and northern part of the Survey Area of Pakse (5.5km)
9	Extension of NR 16 to new NR13	DPWT	Western bank of Xedong River (1km)
10	Beautification of a road along Mekong River	DPWT	Eastern bank of Xedong River (1km)
11	Route bus network development	DPWT	Mainly urban area
12	Public parking area development	DPWT/UDAA	Urban area of Pakse
13	Integration of bus terminal	DPWT/UDAA	Near an intersection of new NR13 and NR16
14	Development of taxi pools	DPWT/UDAA	A bus terminal, a commercial center and an old city area

Source: JST

## (2) Water Supply

Existing water supply capacity is 13,500m<sup>3</sup>/day. Water demand in 2015 and 2025 are estimated 28,500m<sup>3</sup>/day and 43,000m<sup>3</sup>/day, respectively. Therefore, additional water supply facilities with capacity of 15,000m<sup>3</sup>/day for year 2015 should be constructed. Additional water supply facilities with capacity of 14,500 m<sup>3</sup>/day will be needed for year 2025 considering the result of the study on water supply facility expansion in Pakse conducted by JICA.

In order to supply water to new development areas, two elevated water tanks with capacity of 1,000 m<sup>3</sup> are required and related transmission pipeline and distribution pipeline should be also installed. Table 24 shows water supply projects.

**Table 23 Additional Water Supply Facilities**

Water supply facilities needed	Year 2015	Year 2025
Raw water intake tower	-	1
A bridge for a raw water pipe	-	1
Raw water intake pumps	3 sets	3 sets
Water treatment plant	15,000 m <sup>3</sup> /day	14,500 m <sup>3</sup> /day
Clear water & backwash reservoir	1,500 m <sup>3</sup>	1,500 m <sup>3</sup>
Transmission/Distribution Pumping Station	Three pumps	Three pumps
Transmission main; 500 mm	16 km	L = 10 km,
Transmission main; 400 mm	-	L = 6 km
Distribution main; 100-350 mm	12 km	L = 25 km
Distribution pipe; 40-75 mm,	300 ha	800 ha
Elevated water tank	1,000 m <sup>3</sup> x 1	1,000 m <sup>3</sup> x 2

Source: JST

**Table 24 Water Supply Projects in Pakse**

	Project Name	Implementing Agency	Project Location
1	Expansion of the existing water supply facility	Water Supply Company/ DPWT	Urban area
2	Construction of the new water supply facility for UC area	Water Supply Company/ DPWT	East bank of Pakse

Source: JST

### (3) Sewer and Sewerage Treatment

Water, soil and air are polluted due to improper sewer and sewerage treatment system (septic tank) in the urban area. Future water, soil and air contamination is predicted to worsen due to the foreseen population increase. Thus, the introduction of a new sewer and sewerage treatment system is necessary to cope with this problem. A full-centralized sewerage treatment system covering the urban area is ideal. However, the new system would require technicians who have the knowledge to conduct maintenance, and a sufficient budget to ensure sustainable operation and maintenance. Currently, there are no technicians with the experience or knowledge of this system in Lao PDR. From the point of economical rationality and acceptance of technology, on-site and community (semi-centralized) system should be introduced instead of a full-centralized system in Lao PDR. To obtain skills and knowledge on the operation and maintenance of water treatment facilities, initially, this system should be introduced in the New Market near Pakse Bridge as a pilot project. The market is an ideal location for the implementation of this pilot project for the market discharges roughly 120 to 150m<sup>3</sup> of waste water daily, and has a wide parking lot which is more than adequate space to install the plant. This system should be installed, operated and maintained until the year 2015. This pilot project will have the additional effect of allowing workers and customers/residents to realize the importance of sewerage treatment.

This system will be expanded to the surrounding urban area, in particular, to the Central Area and the Inner Area after 2015. Table 25 shows sewerage treatment projects.

**Table 25 Sewerage Treatment Projects in Pakse**

	Project Name	Implementing Agency	Project Location
1	Development of Pilot Sewerage Treatment Facility at New Market including; - Capacity development on future operation and maintenance - Awareness to residents - Initiation of collection and treatment fee from the market	UDAA	Within new market
2	Promotion and Extension of Sewerage Treatment Facilities including; - Capacity development on future operation and maintenance - Initiation of collection and treatment fee from residents	UDAA	The whole urban area of Pakse

Source: JST

### (4) Drainage and Flood Mitigation

Three streams in the western bank and one in the eastern bank of Xedong River should be improved. Sets of a water gate and a pump will be installed at the mouth of three streams in the western bank and one in eastern bank of Xedong River.

Bank protection measures for the banks of these rivers surrounding an urban area of the western part of Pakse have not been implemented as yet. Bank erosion occurs slowly but surely. Thus, a bank of Mekong River and Xedong River, especially at the mouth of Xedong River, should be improved and protected by a certain measure. Table 26 shows drainage and flood mitigation projects.

**Table 26 Drainage and Flood Mitigation Projects in Pakse**

	Project Name	Implementing Agency	Project Location
1	Stream improvement Project	DPWT/UDAA	3 in western bank and 1 in eastern bank of Xedong River
2	Installation of Water Gates and Drainage Pumps	DPWT/UDAA	3 in western bank and 1 in eastern bank of Xedong River
3	Prevention of River Bank Erosion	DPWT/UDAA	approx. 800 m. along the west bank of Xedon River and approx. 1,000 m. along Mekong River bank in the western side

Source: JST

### (5) Solid Waste Management

Solid waste collection ratio, which is around 40% in the urban area at present, is expected to be 60% in year 2015 and 90% in year 2025 respectively, because of construction and improvement of roads and improvement of accessibility of solid waste collection point. Table 26 shows volume of solid waste collected in the future. Table 28 shows solid waste related projects in Pakse.

**Table 27 Volume of Solid Waste collected in the future in Pakse**

Item		Year 2015	Year 2025	Remarks
1	Future Population	101,000	147,000	
2	No. of Household Member	5.8	5.5	6.1 at 2005
3	No. of Household	17,000	27,000	
4	Collection Ratio (%)	60	90	
5	3 x 4	10,200	24,300	
6	Solid Waste Weight (kg/household/day)	3.5	3.8	3.2kg at 2007
7	Solid Waste Weight (t/day)	35.7	92.3	
8	Unit Volume (m <sup>3</sup> /t)	0.7	0.7	
9	Solid Waste Volume (m <sup>3</sup> /day)	25.0	64.6	
10	Estimated Solid Waste Volume in one year (m <sup>3</sup> )	9,100	23,600	365day/year
11	Estimated Total Solid Waste Volume for 11 years (m <sup>3</sup> )		179,900	From 2015 to 2025
12	Estimated Total Volume including covering soil for 11 years (m <sup>3</sup> )		252,000	11 x 1.4
13	Landfill Cell Area needed (ha)		12.1	2.5m depth
14	Area for a new Dumping Site (ha)		24.0	13 x 2.0

Source: JST

**Table 28 Solid Waste Management Projects in Pakse**

Project Name		Implementing Agency	Project Location
1	Solid Waste Management - Awareness program - Procurement of vehicles and equipments	UDAA	The whole area of UDAA of Pakse
2	Construction of a new Landfill site	UDAA	Within Pakse District

Source: JST

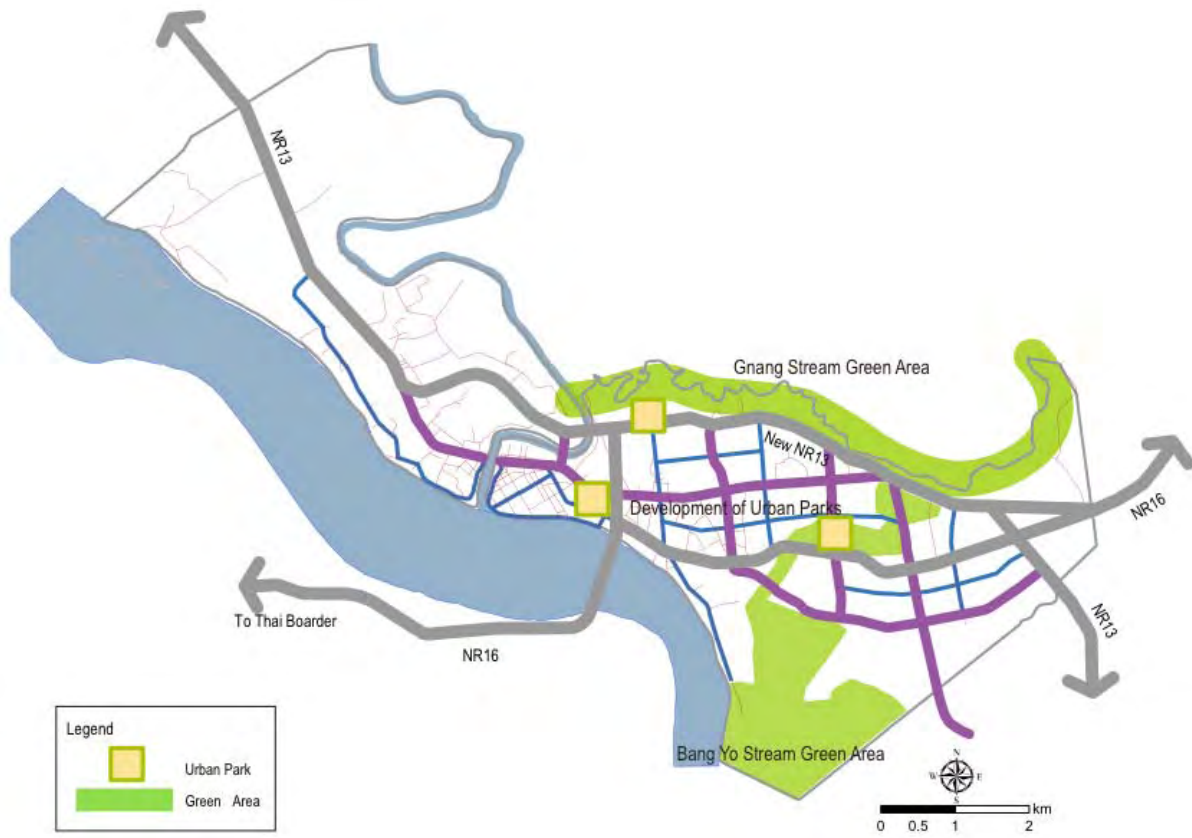
### (6) Park and Town Beautification

The provision of urban parks and town beautification together with green network will create image of green city and will attract visitors as well as urban residents in the future. Therefore, urban parks and green area developments indicated in Table 29 and Figure 11 are planned toward 2025.

**Table 29 Park and Town Beautification Projects in Pakse**

Project Name		Implementing Agency	Project Location
1	Improvement of the existing park (Community park)	UDAA	Existing not well-used public land at the west-side of the market
2	Development of main parks	UDAA	Near the mouth of Gngang River and the green area of Bang-Yo stream
3	Development of green area	DPWT/UDAA	South side of Gngang stream and both side of Bang-Yo stream at eastern bank of Pakse.

Source: JST



Source: JST

**Figure 11 Parks and Town Beautification Projects in Pakse**



## 5 Environmental Management Strategy

Making beautiful cities with an environmental principal, it is not adequate to focus on the preparation of a structure plan, land use plan and infrastructure improvement. Although the documents such as; legal framework and policies have been prepared, the key issue is the enforcement of legislation and policies to people and businesses. For the public sector as a regulatory body, and service provider, the capacity development for strengthening enforcement is necessary. This includes the facilitation to people and businesses to change their behavior and be compliant with the plans and regulations. For the people and businesses representing the private sector, compliance with urban plans and various regulations is mandatory through their behavioral change.

These are summarized in Table 30.

**Table 30 Summary of Environmental Management at Strategy Level**

Items	Infrastructure Improvement	Public Sector: Administration as Regulatory Body and Service Provider	Private Sector: People and Businesses
Urban Planning	Road network development guiding urbanization	Capacity development for the strengthening enforcement	-Participation in planning. -Compliance with urban plan and codes
Flood Control	Flood protection facilities	Education to people and businesses.	Awareness raising for no-littering to drainage
Sewerage Treatment	Treatment at pollution source	To People: -Environmental and sanitation education. -Preparing guidelines. -Support to septic tank installation. -Facilitation to people. To Businesses: -Identification of pollution source. -Preparing guidelines. -Monitoring of pollution sources. -Strengthening enforcement of emission standards and penalty.	-Awareness raising for environment and sanitation -Compliance with emission standards.
Solid Waste Management	Facilities improvement	-Strengthening collecting and treatment capacities. -Facilitation to people and businesses: Guidelines, Environmental education, Facilitation, etc.	-Awareness raising. -Compliance
Traffic Management	Road construction and improvement	-Setting traffic rule and enforcement. -Education to people and drivers. -Driver's license control.	-Compliance with traffic rule. -Awareness for traffic safety.

Source: JST



## 6 Capacity Development for Urban Management

### 6.1 Necessity of Capacity Development

In the course of formulating basic strategies for Kaysone Phomvihane and Pakse, JST identified issues related to urban planning and management, and have prepared action programs to address these issues. Both the issues and specific action programs are compiled into two categories; capacity development for urban planning, and capacity development for urban management. These issues and action program of the two categories are divided into three subjects; institutional, organizational and human resources.

### 6.2 Issues on Urban Planning and Urban Management

Through the formulation of basic strategies for Kaysone Phomvihane and Pakse, JST identified issues on urban planning and urban management. These issues are compiled into Table 31 and Table 32.

**Table 31 Issues on Urban Planning**

Institution	<ul style="list-style-type: none"> <li>- Necessity of high-level land development plan such as the national, regional and provincial development plan to prepare urban plan</li> <li>- Rationality to prepare urban master plans for all districts</li> <li>- Necessity to make clear differences of urban land use zones (UA, UB, UC and UD) and to prepare detailed land use classifications</li> <li>- Necessity of laws and regulations to conserve historical and cultural properties and old townscape</li> <li>- Necessity of development permit system to promote appropriate land development</li> <li>- Necessity of provision of a law on building code</li> <li>- Necessity of provision of a law on sewerage and review of standard on wastewater discharge and inspection of water quality discharged</li> <li>- Necessity of a law and a regulation on urban park development and management</li> </ul>
Organization	<ul style="list-style-type: none"> <li>- Limited organization capacity to prepare urban plan</li> <li>- Ineffective utilization of data and information on land use between urban planning agencies and NLMA/NGD</li> <li>- Limited training institutions for urban planner</li> <li>- No training and no education system for staffs in PTI</li> </ul>
Human Resource	<ul style="list-style-type: none"> <li>- Limited human resource for urban planning</li> <li>- Necessity of trainers' training regarding urban planning</li> </ul>

Source: JST

**Table 32 Issues on Urban Management**

Institution	<ul style="list-style-type: none"> <li>- Difference of urban planning boundary and UDAA jurisdiction</li> <li>- Limited enforcement of urban master plan</li> <li>- Limited information management on infrastructure development</li> <li>- Limited budget for infrastructure development and operation and maintenance of infrastructure</li> <li>- User tariff level and tariff collection in infrastructure service</li> </ul>
Organization	<ul style="list-style-type: none"> <li>- Overlapping development application process between UDAA and DPWT/OPWT</li> <li>- Shortage and inadequate maintenance of vehicle/machinery/equipment for infrastructure management and infrastructure service</li> </ul>
Human Resource	<ul style="list-style-type: none"> <li>- Shortage of human resource for urban management</li> </ul>

Source: JST

### 6.3 Action Programs for Urban Planning and Urban Management

Action programs to improve urban planning are summarized in Table 33.

**Table 33 Action Programs for Urban Planning**

Project Name		Implementing Agency	Project	
			Duration	Number of Experts
CD-PI-1-1	Preparation of national land development plan	MPI, MIC, PTI	2.0 years	10-12 foreign experts
CD-PI-1-2	Preparation of regional land development plan	DPIs, DoICs, DPWTs, PTI	1.5 years	10-12 foreign experts
CD-PI-1-3	Preparation of provincial land development plan	DPI, DoIC, DPWT, PTI	1.5 years	10-12 foreign experts
CD-PI-2	Urban master plan for provincial centers and major districts	DPWT, PTI	1.0 year	10-12 foreign experts
CD-PI-3	Revision of Articles related to Zoning or Land Use in the "Law on Urban Plans"	PTI	1.5 year	7-8 foreign experts
	Preparation of laws and/or regulations to conserve historical properties and historical townscape			
	Preparation of development permit system for urban development			
CD-PI-4	Preparation of a law on building code	MPWT	1.0 year	5-6 foreign experts
CD-PI-5	Preparation of a law on sewerage	MPWT, WREA	1.0 year	4-5 foreign experts
CD-PI-6	Preparation of a law and a regulation on urban park and green development and management	MPWT	1.0 year	4-5 foreign experts
CD-PO-1	Promotion of urban planning by DPWT	DPWT	1.0 years	4-5 foreign experts
CD-PO-2	Sharing data and information between an urban planning agencies and NLMA/NGD	NLMA, NGD, PTI	2.0 years	4-5 foreign experts
CD-PO-3	Strengthening and expansion of the urban planning department in other universities	MoE, MPWT	3.0 years	5-6 foreign experts
CD-PH-1	Development of human resource engaged in urban planning	DPWT, OPWT	1.0 years	4-5 foreign experts
CD-PU-2	Trainer's training	MoE	10.0 years	Cooperation with foreign education organizations

Source: JST

Action programs for urban management are summarized in Table 34.

**Table 34 Action Programs for Urban Management**

Project Name		Implementing Agency	Project	
			Duration	Number of Experts
CD-MI-1	Preparation of database on infrastructure development	DPWT, UDAA	1.0 years	5-6 foreign experts
CD-MO-1	Supplementation and renewal of vehicle/machinery/equipment	UDAA	1.0 years	2-3 foreign experts

## 7 Priority Sectors and Projects

Out of the infrastructure projects and programs proposed within the Basic Strategies, JST has selected priority sectors and projects based upon the following three perspectives:

### Projects immediately necessary to allay the anxieties of residents

- To protect residents from damage caused by annual natural disasters
- To improve sanitary conditions of residents (sewerage treatment and solid waste management)

### Projects necessary for the realization of basic concepts and visions of the cities

- To formulate a framework of the cities (particularly, national road layout, an urban arterial road and main parks)
- To attract residents and visitors

### Projects necessary to support the future of urban area and/or residents (year 2015)

- To meet demands in year 2015 (land development, water supply, etc)

Table 35 and Table 36 show priority sectors and projects in Kaysone Phomvihane and Pakse. Priority projects in capacity development are indicated in Table 37.

**Table 35 Priority Sectors and Projects in Kaysone Phomvihane**

No.	Project Name	Implementing Agency	Project Location
<b>Road &amp; Transport</b>			
KP-R-1	Improvement and Construction of Collector and Local Road 1 (53.5km)	DPWT/UDAA	Collector and distributor roads in Urban Inner Zone (UB)
KP-R-2	Improvement and Construction of Urban Minor Arterial Road 1 (37km)	DPWT/UDAA	Minor arterial roads in UB
KP-R-3	Improvement of Urban Major Arterial Road (5km)	DPWT/UDAA	Major arterial roads in UB
KP-R-4	Improvement of Kaysone Phomevihane Road as Urban Major Arterial Road (6.5km)	DPWT/UDAA	Existing Kaysone Phomevihane Road
KP-R-5	Improvement of a part of National Road 9A as Urban Major Arterial Road (2km)	DPWT/UDAA	Fringe of eastern part of an urbanized area
KP-R-6	Beautification of a road along Mekong River (500m)	DPWT	Thahe Road (500m from an old stadium to a temple)
<b>Sewerage Treatment</b>			
KP-S-1	Sewerage Treatment Facilities Development (Pilot Project)	UDAA	Savannxay Market
<b>Drainage and Flood Mitigation</b>			
KP-D-1	Natural Stream Improvement Project (2 rivers, total length: about 2,000m)	DPWT/UDAA	2 rivers, one near a water purification plant and the other near an airport
KP-D-2	Installation of drainage pumps (3 locations)	DPWT/UDAA	3 locations where a flap gate had been constructed.
KP-D-3	Prevention of Mekong River Bank Erosion (Along Thahe Road, L=500m)	DPWT/UDAA	Along Thahe Road (500m)
<b>Solid Waste Management</b>			
KP-SW-1	Solid Waste Management (Awareness program and preparation of vehicles and equipments)	UDAA	The whole area of UDAA of Kaysone Phomevihane
<b>Park and Green</b>			
KP-P-1	Improvement of the existing Kaysone Phomvihane park	UDAA	The existing Kaysone Phomvihane park

Source: JST

**Table 36 Priority Sectors and Projects in Pakse**

No.	Project Name	Imple-	Project Location
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		menting Agency	
<b>Road &amp; Transport</b>			
PS-R-1	Improvement and Construction of Collector and Local Road 1 (22km)	DPWT/UD AA	Collector and distributor roads in Urban Inner Zone (UB)
PS-R-2	Improvement and Construction of Urban Minor Arterial Road 1 (18.0km)	DPWT/UD AA	Minor arterial roads in UB
PS-R-3	Improvement of existing NR13 (10km)	DPWT	Eastern bank of Xedong Riber
PS-R-4	Construction of urban major arterial roads 1 (1.5km)	DPWT/UD AA	Major arterial roads in UB
PS-R-5	Construction of new NR13 (5.5km)	DPWT	Eastern bank of Xedong Riber and northern part of the Survey Area of Pakse
PS-R-6	Beautification of a road along Mekong River	DPWT	Eastern bank of Xedong Riber
<b>Water Supply</b>			
PS-W-1	Expansion of the existing water supply facility	Water Supply Company /DPWT	UA and UB area of Pakse
<b>Sewerage Treatment</b>			
PS-S-1	Development of Sewerage Treatment Facility in Pakse (Pilot Project at the Market)	UDAA	Market at commercial center in UA area of Pakse
<b>Drainage and Flood Mitigation</b>			
PS-D-1	Natural Stream Improvement Project (4 rivers, total length: about 2.4 km)	DPWT/UD AA	3 rivers in western bank and 1 river in eastern bank of Xedong River
PS-D-2	Installation of Drainage Pumps (4 locations)	DPWT/UD AA	3 in western bank and 1 in eastern bank of Xedong River
PS-D-3	Prevention of River Bank Erosion	DPWT/UD AA	0.8km along the west bank of Xedon River and 1 km along Mekong River bank
<b>Solid Waste Management</b>			
PS-SW-1	Solid Waste Management (Awareness program and preparation of vehicles and equipment)	UDAA	The whole area of UDAA of Pakse
<b>Park &amp; Green</b>			
PS-P-1	Improvement of existing park (Community park, 4ha)	UDAA	Existing well-used public park at the west-side of the market

Source: JST

**Table 37 Priority Projects in Capacity Development**

CDP	CD Project		Implementing Agency	Project	
				Duration	Duration
CDP-1	CD-PI-1-1	Preparation of national land development plan	MPI, MIC, PTI	2.0 years	10-12 foreign experts
	CD-PI-1-2	Preparation of regional land development plan	DPis, DoICs, DPWTs, PTI	1.5 years	10-12 foreign experts
	CD-PI-1-3	Preparation of provincial land development plan	DPI, DoIC, DPWT, PTI	1.5 years	10-12 foreign experts
	CD-PI-2	Urban master plan for provincial centers and major districts	DPWT, PTI	1.0 year	10-12 foreign experts
CDP-2	CD-PI-3	Revision of Articles related to Zoning or Land Use in the "Law on Urban Plans"	PTI	1.5 year	7-8 foreign experts
		Preparation of laws and/or regulations to conserve historical properties and historical townscape			
		Preparation of development permit system for urban development			
	CD-PI-4	Preparation of a law on building code	MPWT	1.0 year	5-6 foreign experts
	CD-PI-5	Preparation of a law on sewerage	MPWT, WREA	1.0 year	4-5 foreign experts
	CD-PI-6	Preparation of a law and a regulation on urban park and green development and management	MPWT	1.0 year	4-5 foreign experts
CDP-3	CD-PO-1	Promotion of urban planning by DPWT	DPWT	1.0 years	4-5 foreign experts
	CD-PO-3	Strengthening and expansion of the urban planning department in other universities	MoE, MPWT	3.0 years	5-6 foreign experts
	CD-PH-1	Development of human resource engaged in urban planning	DPWT, OPWT	1.0 years	4-5 foreign experts

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	CD-PU-2	Trainer's training	MoE	10.0 years	Cooperation with foreign education organizations
CDP-4	CD-PO-2	Sharing data and information between an urban planning agencies and NLMA/NGD	NLMA, NGD, PTI	2.0 years	4-5 foreign experts
	CD-MI-1	Preparation of database on infrastructure development	DPWT, UDAA	1.0 years	5-6 foreign experts
	CD-MO-1	Supplementation and renewal of vehicle/machinery/equipment	UDAA	1.0 years	2-3 foreign experts

Source: JST





## 8 Conclusion

The Preparatory Survey on the Formulation of Basic Strategies for Regional Core Cities Development was completed in December 2009. The Lao side accepted, in principle, the contents and recommendations presented.

JST have carefully studied the existing conditions of regional core cities, such as; Kaysone Phombihane, Pakse, Luang Prabang and Thakhek. Then, JST examined two cities, Kaysone Phombihane and Pakse, to prepare the basic strategies.

The Survey for preparing basic strategies focused upon the arguments of population densities. The density issue was significant for residents in the regional core cities in Lao PDR who, in the near future, will be facing problems associated with urbanization. The current lifestyle will inevitably alter with the progress of urbanization and industrialization. It was necessary for JST to explain the significance of the costs toward infrastructure within the current sparsely distributed life style. It is premature to conclude that all stakeholders fully understood the significance of the density argument - members of the advisory committee did however, fully comprehend and accept the proposals of JST.

During the process of formulating basic strategies, JST held intensive discussions with members of the ACM and SHM. JST has discovered that the stakeholders as well as advisory committee members possess high capabilities. Presentations, with graphics, conducted by the stakeholders reflected the planning capacity of the community leaders.

Although the potential of community leaders was recognizable; the structure of the local governance is in an immature stage. The infrastructure development projects, including the capacity development components, covered in Chapter 3 must be discussed with the Lao side in the future. All infrastructure development projects shall have capacity development components; the projects must be positioned within a framework of spatial planning that are stated within the legal framework. A human resource development component should be mandatory, in all infrastructure projects with specific organizational structure and operation procedures.

In closing, JST would like to call attention to several issues that require further consideration.

- SEZ Site A was planned as a commercial complex area and SEZ Site C is now being constructed as an industrial park. Currently, the UDAA and DPWT of Kaysone Phomvihane do not possess adequate information on the progress of these projects. It is the central government which is in control of the SEZ development and there are very limited opportunities of communication for local governments. In the future, the prosperity of SEZ will affect urban services and environment such as; solid waste management, health care, education, traffic congestion, air and water pollution. Thus, it is evident that opportunities for discussions between a local government and SEZs are necessary.
- Currently, the airport exists in the urbanized area of Kaysone Phomvihane. In the future, this facility will definitely hamper the further development of Kaysone Phomvihane. Local government has expressed an alternative of relocating this existing airport to an airport in Seno. However, nothing concrete in terms of an idea or plan exists. In the near future, a study into the possibility of relocating the existing airport is suggested.
- The speed of expansion of the urban area of Pakse is remarkable. It can readily be foreseen that in the very near future adjacent areas to this urban area will become part of the urban area of Pakse. The urban master plan of Pakse, including that of neighboring areas will become necessary. Negotiations between the Pakse district and neighboring districts will also be necessary for the preparation of the urban master plan.
- The expansion of the urban area of Pakse will soon reach an area located on the other side of the Mekong River. This will strongly affect the flow of NR16, which crosses the Mekong River and runs through the urban area of Pakse. To avoid further traffic congestion within the urban area, and ensure traffic safety, a study into a new by-pass road of NR16 running through the western

side of Pakse will be required.

- Any adjustment to user charges for social infrastructure such as; water supply and solid waste collection, is a politically sensitive and difficult issue to decide upon. It will require more consideration within the provincial government.
- The employment of staff and subcontracting infrastructure service is highly related to the budget of local governments. This will require added within the provincial government.

To address and solve the above mentioned issues, continuous discussions, further studies and added consideration will be required among the related organizations and agencies

