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

January 2010

JAPAN INTERNATIONAL COOPERATION AGENCY

PACET CORPORATION
INTERNATIONAL DEVELOPMENT CENTER OF JAPAN (IDCJ)
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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

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Abbreviations and Glossary

ACM	Advisory Committee Meeting
ADB	Asian Development Bank
BOD	Biochemical Oxygen Demand
CBD	Central Buisiness 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

The Summary in Brief

1	The country	Lao People's Democratic Republic
2	Name of Survey	Formulation of Basic Strategies for Regional Core Cities Development in Lao People's Democratic Republic
3	Counterpart	Public Works and Transport Institute (PTI) , Ministry of Public Works and Transport (MPWT)
4	Survey area	Areas within the designated "Urban Planning Boundary" of Kaysone Phomvihane and Pakse
5	Objectives of the Survey	• The formulation of basic development strategies of Kaysone Phomvihane and Pakse. • Prepare priority projects and programs (draft) which foster the two cities mentioned above in becoming regional economic centers.
6	Contents of the Survey	• Analysis of present situations and identification of issues. • Formulation of basic development strategies of Kaisone Phomvihane and Pakse, including identification of priority projects and programs. • Analysis on capacity development.
7	Formulation of basic development strategies	Basic development strategies were formulated following process; • Socio-economic frameworks set by urban future population. Both cities are estimated to be almost double of present population in the year 2025. • Future image of the both cities are set by discussion in the Advisory Committee Meetings (ACM) and Stake Holders Meetings (SHM). ACM members were from local and central level government agencies. • Discussion of development alternatives among ACM and SHM were held. Development density and future urban center locations were discussed and set the development pattern for the future. • Based on the agreed development density and direction, the urban structure plans were formulated. • Land use concept plan were formulated based on the structure plan and Lao's urban development practices. • Necessary projects and programs to achieve the basic development strategies were identified. Based on the urgency, significance for the urban development, residents at present and in the future, priority projects and programs of urban infrastructure were selected. The sectors of selected projects and programs are 1) road and transport, 2) water supply, 3) sewerage treatment, 4) drainage and flood mitigation, 5) solid waste management, and 6) park and green network.
8	Analysis on capacity development	In the course of formulating basic development strategies for Kaysone Phomvihane and Pakse, JST identified issues related to urban planning and management, and have prepared action programs to address these issues. These issues and action program of the two categories are divided into three subjects; institutional, organizational and human resources. • Need of national, regional and provincial land development plan. (urban hierarchy and roles of cities) • Preparation of a law and regulation of urban development • Development of human resources engaged in urban planning • Enhancement implementation capacity of urban master plan; Building certification, O&M of infrastructure service.

Executive Summary

1 Introduction

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 Pranbang. 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.

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.

In this perspective, the Preparatory Survey on Formulation of Basic Strategies for Regional Core Cities Development (the Survey) has been conducted. The Survey was commenced in March 2009 and completed in December 2009.

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.

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.

Development Strategies for Urban Development are indispensable, if a city is to be functional, secure, and sanitary, and be easy place to live. 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 secondary 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. 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. This Survey has carried out to provide Basic Strategies for Kaysone Phomevihane and Pakse, based on analyses of existing socio-economic 5-year development plan, draft Urban Development Strategy until 2020, economic and demographic prospects until 2025, and so on.

2 Development density and future development direction

JST prepared alternatives of development density and future development direction to discuss future urban area and urban structure of both cities.

At first, JST studied alternatives of urban development density; those alternatives are Case 1: "compact city development" (same area, higher density) and Case 2: "spread development" (area expansion, same density). Through hearing opinions from officials and stakeholders in the ACMs and SHMs, JST prepared a mixture of two alternatives, and proposed settlement pattern which is described in the development strategies of each city in the later sections.

Second, JST studied future direction of development by comparing the "expanding the existing city center" and "creating a new city center" to meet the future demand of urbanization. As urbanization proceed in the future, it is necessary to strengthen the urban functions. JST made comparative analysis whether these urban functions are strengthened by expanding the existing city center or by creating a new city center and had discussions with ACM and SHM members. . In both of Kaysone Phomvihane and Pakse, ACM and SHM members suggested and agreed to conserve and develop the existing city center (Old City Center) to formulate attractive place, and develop a new city center to achieve functional and economical city.

3 Basic Development Strategy for Kaysone Phomvihane

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.

JST set demographic framework for Kaysone Phomvihane District and urban planning boundary as indicated the following table. The population in urban planning boundary, including SEZ residents, will increase from 74,000 in 2005 to 147,000 in 2025. Number of household will also increase from 12,000 in 2005 to 24,000 in 2025.

Table 1 Total Population in the Urban Planning Boundary

Unit: 000 persons

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

Source: JST

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 its vision. JST suggested additional ideas of making maximum use of development of the East-West Economic Corridor (EWEC) and the national and regional development context.

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

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 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, area of buildup area was 2,440 ha with density of 31 persons/ha. Based on this, JST set following two cases.

- Case 1 (same area, higher density) as 2,400 ha with the density of 55 persons/ha, and
- Case 2 (area expansion, same density) as 4,200 ha with the density of 31 persons/ha,

JST discussed with ACM members and stakeholders and finally proposed a mixture of Case 1 and Case 2, which met the approval of ACM and SHM members.

JST studied development direction by comparing the "expanding the existing city center" and "creating a new city center", especially for the commercial center where most of the urban residents attracted to as part of their urban life. The ACM members and stakeholders agreed to develop the new commercial center at the designated location. The old city center, built in the colonial period, should be conserved and developed as a symbol to create the image of the city and it should be a tourist/visitor center with urban amenities.

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. This structure plan indicates the guideline for urban land use and transport network strategy formulation.

Source:JST

Figure 1 Proposed Urban Structure in Kaysone Phomvihane

The proposed land use concept is based on the existing population density of each land use category within the survey area. According to past urban development experience, and the characteristics of urban development in Lao PDR, land use categories are divided into three. They are; the Central, Inner and Suburban areas, with the population density of 100persons/ha, 60 persons/ha and 45 persons/ha respectively. Total of these areas are 3,760 ha in the year 2025. It is 37 percent of urbanized area expansion form 2,758 ha in 2005, while population increases 80%.

25 projects and programs related to urban infrastructure development to realize the proposed urban development strategy were formulated in consideration with phased development. The projects consist of 12 for road and transport, 2 for water supply, 3 for drainage and flood mitigation, 2 for sewerage treatment, 2 for solid waste management and 4 for park and green network.

4 Basic Development Strategy for Pakse

Pakse will play important roles not only in Champasack Province but also in the southern region of Lao PDR. It will function as the center of administration service and commercial activities for Champasack Province and other provinces (Sekong, Attapu, Saravan) as well. It is also a gateway for tourists visiting the south region of Lao PDR. Although major economic activities of agriculture and manufacturing are conducted outside of Pakse, supporting industries will be located in Pakse. In the future, a percentage of the labor force of these industries will also live in the Pakse. JST set the demographic framework for Pakse as indicated in Table 2.

Table 2 Total Population, 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

Vision of Pakse was prepared in the same process as Kaysone Phombihane. In the first ACM in March, ACM members stated key elements of the vision, location advantage economic activities by tourism and value-added agriculture for future vision of Pakse.

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

Zoning for developable land and conservation area has been prepared based on the existing land use and land suitability evaluation. The west bank of Xedon River is low in elevation and not suitable for development. On the other hand, the east bank of Xedon River is high in elevation and mostly suitable for development except the area along the drainage channel. It means new urban development should be regulated on the eastern side of the city.

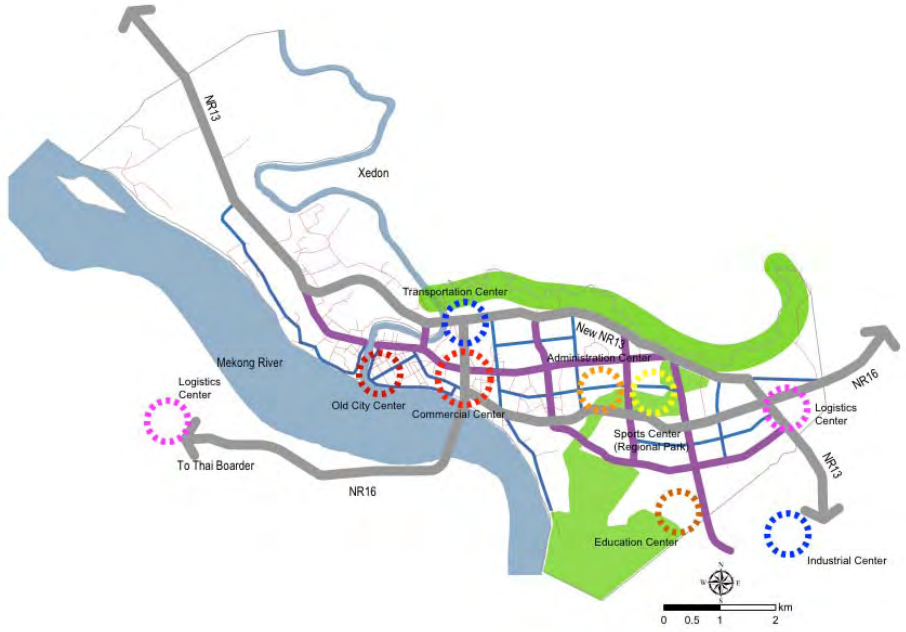
Following zoning of developable land and conservation area, JST analyzed existing development density and future alternatives as same method as Kaysone Phomvihane.

- Case 1 (same area, higher density) as 2,860 ha with the density of 46 persons/ha, and

- Case 2 (area expansion, same density) as 5,300 ha with the density of 25 persons/ha,

Local government officials preferred Case 2, same density development; on the other hand, most of participants of SHMs insisted on Case 1, the same area and higher density development because they understand limited developable land in Pakse. JST proposed mixture of case 1 and case 2, and it was approved by local stakeholders.

JST studied and discussed the development direction by comparing the "expansion of existing city center" and "creating a new city center" particularly for the administration and urban amenity center. Establishment of the new city center was agreed by both ACM and SHM members. 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. Following figure shows the structure plan of Pakse.



Source: JST

Figure 2 Proposed Urban Structure in Pakse

Land use concept plan is prepared as same manner as Kaysone Phomvihane. The land use categories are divided into three; Central Area, Inner Area and Suburban Area with the population density of 100 persons/ha, 60 persons/ha and 45 persons/ha respectively. Total of these areas are 3,053 ha in the year 2025. It is 14 percent of urbanized area expansion form 2,672 ha in 2005, while population will increase by twice.

26 Projects and programs related to urban infrastructure development to realize the proposed urban development strategy were formulated in consideration with phased development. The projects consist of 14 for road and transport, 2 for water supply, 3 for drainage and flood mitigation, 2 for sewerage treatment, 2 for solid waste management and 3 for park and green network.

5 Environmental Management

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 these 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 to 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 the following table.

Table 3 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
Wastewater 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	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

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 as shown in the following Table 4 and 5. To solve these issues, action programs are complied in Table 8.

Table 4 Issues on Urban Planning

Institution	- Necessity of high-level land development plan such as the national, regional and provincial development plan to prepare urban plan - Rationality to prepare urban master plans for all districts - Necessity to make clear differences of urban land use zones (UA, UB, UC and UD) and to prepare detailed land use classifications

	- Necessity of laws and regulations to conserve historical and cultural properties and old townscape - Necessity of development permit system to promote appropriate land development - Necessity of provision of a law on building code - Necessity of provision of a law on sewerage and review of standard on wastewater discharge and inspection of water quality discharged - Necessity of a law and a regulation on urban park development and management
Organization	- Limited organization capacity to prepare urban plan - Ineffective utilization of data and information on land use between urban planning agencies and NLMA/NGD - Limited training institutions for urban planner - No training and no education system for staffs in PTI
Human Resource	- Limited human resource for urban planning - Necessity of trainers' training regarding urban planning

Source: JST

Table 5 Issues on Urban Management

Institution	- Difference of urban planning boundary and UDAA jurisdiction - Limited enforcement of urban master plan - Limited information management on infrastructure development - Limited budget for infrastructure development and operation and maintenance of infrastructure - User tariff level and tariff collection in infrastructure service
Organization	- Overlapping development application process between UDAA and DPWT/OPWT - Shortage and inadequate maintenance of vehicle/machinery/equipment for infrastructure management and infrastructure service
Human Resource	- Shortage of human resource for urban management

Source: JST

7 Project and Programs

Out of 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 the residents
- Projects necessary for realization of basic concepts and visions of the cities
- Project necessary to support the future of urban area and/or residents (year 2015)

Table 6 and Table 7 show priority sectors and projects in Kaysone Phomvihane and Pakse. Priority project for capacity development is also shown in Table 8.

Table 6 Priority Sectors and Projects in Kaysone Phomvihane

No.	Project Name	Imple-menting Agency	Project Location
	Road & Transport		
KP-R-1	Improvement and Construction of Collector and Local Road 1 (53.5km)	DPWT/ UDAA	Collector and distributer 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)
	Sewerage Treatment		

KP-S-1	Sewerage Treatment Facilities Development (Pilot Project at the Market)	UDAA	Market at commercial center in UA area of Kaysone Phomevihane
	Drainage and Flood Mitigation		
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/U DAA	Along Thahe Road (500m)
	Solid Waste Management		
KP-SW-1	Solid Waste Management (Awareness program and preparation of vehicles and equipments)	UDAA	The whole area of UDAA of Kaysone Phomevihane
	Park and Green		
KP-P-1	Improvement of the existing Kaysone Phomvihane park	UDAA	The existing Kaysone Phomvihane park

Source: JST

Table 7 Priority Sectors and Projects in Pakse

No.	Project Name	Imple-menting Agency	Project Location
	Road & Transport		
PS-R-1	Improvement and Construction of Collector and Local Road 1 (22km)	DPWT/UD AA	Collector and distributer 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 N.R.13 (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 N.R. 13 (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
	Water Supply		
PS-W-1	Expansion of the existing water supply facility	W.S.C /DPWT	UA and UB area of Pakse
	Sewerage Treatment		
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
	Drainage and Flood Mitigation		
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
	Solid Waste Management		
PS-SW-1	Solid Waste Management (Awareness program and preparation of vehicles and equipment)	UDAA	The whole area of UDAA of Pakse
	Park & Green		
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 8 Priority Projects in Capacity Development

CDP	CD Project		Implementing Agency	Project	
				Duration	Number of Experts
CDP-1	CD-PI-1-1	Preparation of national land development plan	MPI, MoIC, PTI	2.0 years	10-12 foreign experts
	CD-PI-1-2	Preparation of regional land development	DPIs, DoICs,	1.5 years	10-12 foreign

		plan	DPWTs, PTI		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 year	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 year	4-5 foreign experts
	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 year	5-6 foreign experts
	CD-MO-1	Supplementation and renewal of vehicle/machinery/equipment	UDAA	1.0 year	2-3 foreign experts

Source: JST

8 Conclusion and Recommendation

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 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 exist. 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.

Chapter 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 Pranbang. 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 Lao Government 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.

In this perspective, it is essential to prepare a basic city development plan for Kaysone Phomvihane and Pakse which are positioned as the regional core cities in the southern part of Lao PDR.

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.

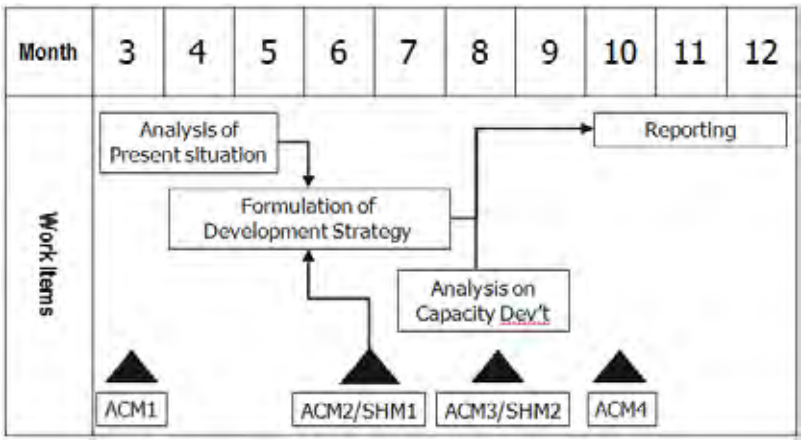
1.3 Survey Area

The survey covers Kaysone Phomvihane and Pakse. Target area for 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 October 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 (AMC) were held; two stakeholder meetings (SHM) were held as indicated in Figure 1.1. The ACMs

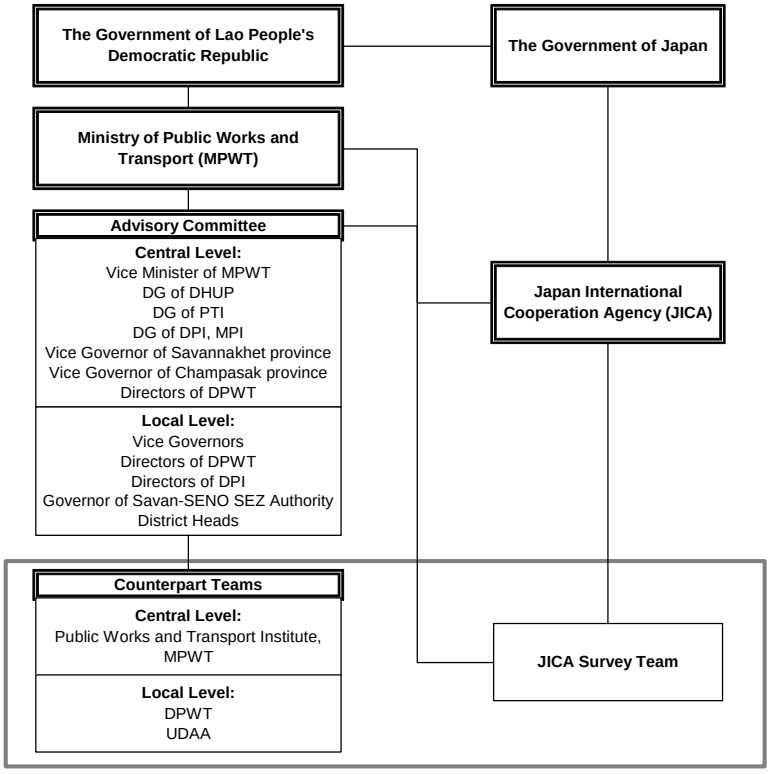
were held in three locations: Vientiane, Kaysone Phomvihane and Pakse. The SHMs were held in Kaysone Phomvihane and Pakse.



Source: JST

Figure 1.1 Survey Schedule

The survey organization has the following structure. The Japanese participation is composed of the Government of Japan, JICA and JST. The Lao participation is composed of the Ministry of Public Works and Transport (MPWT), and Advisory Committee. Initially, there were total nineteen members in the Advisory Committees in central and local level; however, after the involvement of the local administration was found to be significant, the number increased to sixty in total, which included the deputy directors of provincial level of administration.



Source: JST

Figure 1.2 Organization Structure for the Survey

The counterpart teams were the staff from PTI at the central level; DPWT and UDAA representatives work together with JST as counterpart members at the local level. The structure of the Survey is shown in Figure 1.2.

Table 1.1 Function and Members of the Advisory Committee

	Advisory Committee
Functions	- Review of implementation of the Survey and discussions of the basic concepts and visions of two cities - Advisory Committee meetings will be held twelve times: four times each in Vientiane, Kaysone Phomevihane, and Pakse.
Members (from central level)	Chairman: Vice Minister of Public Works and Transport Members: Director General of Department of Housing and Urban Planning, Ministry of Public Works and Transport (MPWT) Director General of Public Works and Transport Institute, MPWT Representative of Ministry of Planning and Investment (in charge of socio-economic plans) Vice Governor of Savannakhet Province Vice Governor of Champasak Province Director of Department of Public Works and Transport, Savannakhet Province Director of Department of Public Works and Transport, Champasak Province
Members (from provincial level)	Chairman: Vice Governor Members: Director of Department of Public Works and Transport Vice President of Urban Development Administration Authorities Director of Department of Planning and Investment Deputy District Head Governor of Savan-SENO Special Economic Zone Authority (only Savannakhet Province)

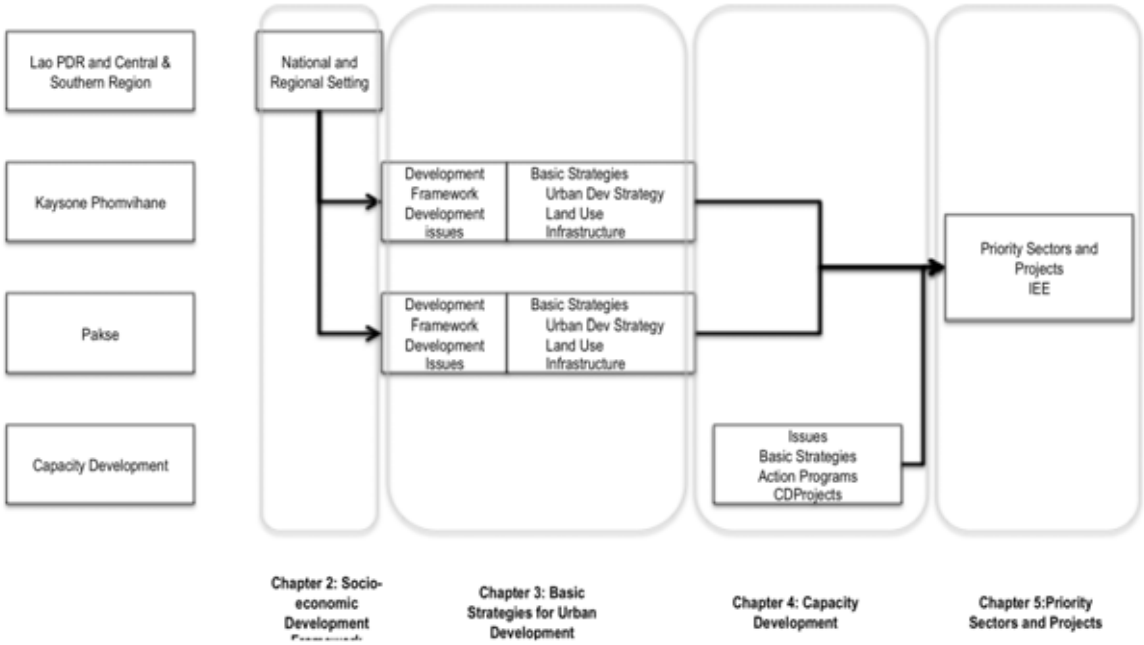
Source: JST

1.5 Structure of this Report

This report consists of six chapters. Logical flow of Basic Strategies for Urban Development is indicated in Figure 1.3.

Following an introduction in Chapter 1, the National and regional development framework is presented in Chapter 2. Chapter 3 is the centerpiece of this report, describing the basic strategies toward urban development for Kaysone Phomvihane and Pakse. Each basic strategy is prepared in separate sections to address the existing different situations and issues. Strategies of; urban development, land use and infrastructure development has been prepared separately. Chapter 4 describes Capacity Development to carry out Basic Strategies compiled in the previous chapter. Current issues on Capacity Development, Strategies for Capacity Development, action programs and Capacity Development Projects are included in this chapter. Chapter 5 compiles priority sectors and projects selected from infrastructure development strategies that are presented in Chapter 3 and Chapter 4. The Initial Environment Examination (IEE) which was conducted for the priority projects is also reported in this chapter. Chapter 6 compiles conclusions to progress to the next step of urban planning and move forward on the priority projects.

The current situation in regards to urban development on the national, regional level and Kayson Phomvihane and Pakse level are compiled in the Appendix. The current situation of relevant cities (Vientiane Capital, Luang Prabang and Thakhek) are also presented within the Appendix.



Source: JST

Figure 1.3 Structure of this Report

Chapter 2 Socio-economic Development Framework

2.1 National and Regional Development in the Future

2.1.1 Socio-economic Framework

(1) National Population

There are two future population projections available in Lao PDR. The first projection was prepared by the Steering Committee of the Population and Housing Census (hereinafter referred to as the "Steering Committee"), and the second prepared by the Population Division of the United Nations (hereinafter referred to as the "Population Division").

The Steering Committee prepared two scenarios: a normal scenario with parameters and a constant valuable scenario in which the basic parameters continue to be constant after 2006. On the other hand, the projection prepared by the Population Division is part of "World Population Prospects: The 2008 Revision", published on the Web (http://www.un.org/esa/population/unpop.html), consists of four scenarios: a low variant, medium variant, high variant and constant-fertility valiant.

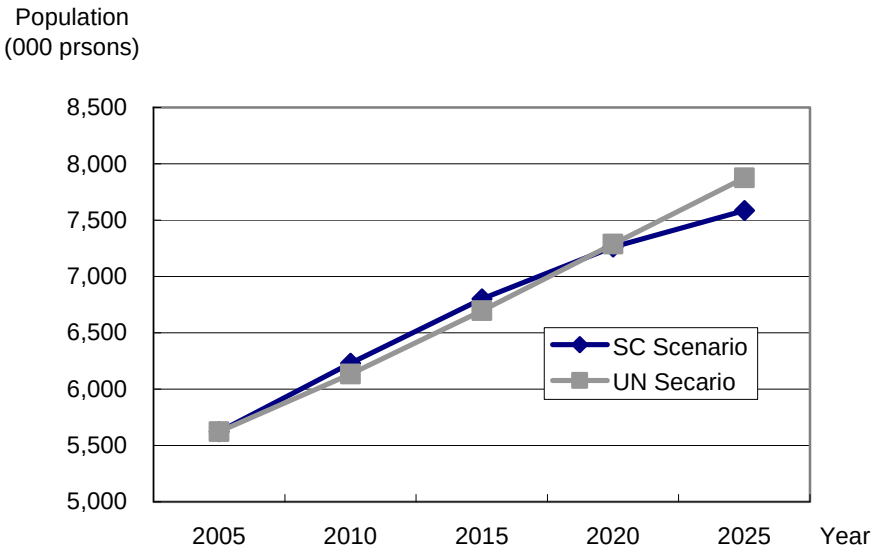
The Steering Committee's projection does not go beyond the year 2020; therefore, it is necessary to extend the projection to the target year of 2025. On the other hand, the population of recent years is not consistent with the real population in the Population Division's projection. It is necessary to re-calculate population projection by using the census data in 2005 and the same parameters.

Table 2.1 and Figure 2.1 indicate population projections re-calculated by JST, utilizing two scenarios: the normal scenario of the Steering Committee (SC Scenario) and the medium variant of the UN Population Division (UN Scenario).

Table 2.1 Population Projection until 2025

Scenarios/Year	Scenarios	2005	2010	2015	2020	2025
Population (000 persons)	SC Scenario	5,622	6,231	6,802	7,262	7,586
	UN Scenario	5,622	6,133	6,696	7,286	7,874
Average annual population growth rate (%)	SC Scenario	-	2.1	1.8	1.3	0.9
	UN Scenario	-	1.8	1.8	1.7	1.6

Source: JST



Source: JST

Figure 2.1 Two Population Projection Scenarios

In the UN scenario, Total Fertility Rate (TFR) the population will drop by 0.8 points, from 3.5 in 2005-10 to 2.7 in 2020-25. The annual growth rate is also predicted to drop from 1.8 to 1.6 percent, thus the projected population will be 7.8 million in the year 2025. In the SC scenario, the annual growth rate will drop rapidly from 2.1% in 2010 to 0.9% in 2030 due to rapid decrease of the TFR, which will be 2.1 in 2020. Although the estimated population is larger than that of the UN scenario up to 2020, it projects a decline in the following years. The total projected population in 2025 is 7.6 million in this scenario.

Of the two population growth scenarios, JST has selected the SC scenario as the optimum scenario. Considering the stage of economic development of Lao PDR in 2025, assumption of the SC scenario that TFR drops to 2.1 in 2020 can be viewed as a premature assumption, and braking of the growth ratio after 2020 may be considered as drastic. On the other hand, the declining pace of the population growth rate, and the population growth observed in Figure 2.1 of the UN scenario may be a more natural and likely outcome.

(2) Urban Population and Rural Population

To logically reflect a projection of future population statistics into provinces, JST utilized the following methodology:

- Step 1 - the total population is divided into urban population and rural population.
- Step 2 - an estimation is made of the urban population up to the year 2025.
- Step 3 - the urban population and rural population are broken down to the provincial level.

JST estimates that the urban proportion of the total population will increase to approximately 40% by the year 2025. According to UN's Food and Agriculture Organization (FAO) statistics, arable land per rural inhabitant is 0.19 percent, showing a level lower than that of Thailand, Cambodia and Myanmar (Table 2.3). Due to the demographic pressures, a population shift from the rural areas to the urban areas will continue. In addition, the increase of the workforce population who will ultimately become engaged in the secondary sector, needed to achieve higher economic growth, should be noted. The more rural villages will transform into urban villages, a result of future economic development and the provision of improved infrastructure and social services. This estimate is similar to that of the "World Urbanization Prospects", which describes the increase in percentage of the urban population from 27% of 2008 to 49% in 2025.

Table 2.2 Urban Population and Rural Population

Unit: 000 persons

Year	Total Population	Urban Population	Rural Population
1995	4,575	782	3,793
2005	5,622	1,523	4,092
2015	6,696	2,204	4,491
2025	7,874	3,149	4,724

Source: Census 1995 and 2005; JST

Table 2.3 Arable Land per Rural Inhabitant in 2004

	Arable land per rural inhabitant (ha)
Lao PDR	0.19
Thailand	0.37
Vietnam	0.10
Cambodia	0.32
Myanmar	0.28

Source: State of Food and Agriculture, Food and Agriculture Organization of the United Nations

(3) Population by Provinces

Table 2.4 shows the actual and projected population of major provinces from 1995 to the year 2025. The projected figures were calculated by breaking down respectively the urban population and rural population into provincial levels.

In the Savannakhet Province, in 2025, the population is predicted to amount to 1.1 million, becoming the second highest populated province in Lao PDR. In the same year, the predicted population of the Champasack Province will increase to 0.9 million.

Table 2.4 Population by Provinces up to 2025

Province	1995	2005	2015	2025
Total of Lao PDR	4,575	5,615	6,696	7,874
Vientiane Capital	524	692	927	1,244
Luang Prabang	365	407	470	504
Khammuane	272	337	380	441
Savannakhet	672	826	983	1,134
Champasack	501	607	760	913

Source: JST

(4) GDP Growth Forecast

(a) Three Development Scenarios

To project future GDP growth, JST prepared the following three GDP development scenarios: (i) high growth scenario, (ii) moderate growth scenario and (iii) low growth scenario as shown in Table 2.5. The growth rate of each scenario alters within the periods of: 2009-10, 2011-2020 and 2021-2025. As a result of the Global Financial Crisis from October 2008, it can be foreseen that global GDP growth will be limited in the immediate following years of 2009 and 2010. After 2011, a majority of nations, including Lao PDR are expected to return to their original economic growth rates.

It is generally known that when a nation's economic activities become sophisticated and mature, the GDP growth rate will be level out in accordance. Thus, the predicted GDP growth rate for the years of

2021-25 are moderate compared to the growth rate reflecting the years of 2011-2020.

Table 2.5 Three GDP Growth Scenarios until 2025

Unit: percent

	2009	2010	2011-20	2021-25
High growth scenario	5.5	6.0	9.0	8.5
Moderate growth scenario	5.5	6.0	7.5	7.0
Low growth scenario	5.5	6.0	6.0	5.5

Source: JST

In the high growth scenario, GDP growth rates will accelerate to 9.0% in the years 2011-20 and alter to 8.5% in 2021-25. In the recent five-year development plans, the Lao Government raised the GDP growth rate target from seven percent in the fifth five-year plan (2001-2005) to 7.5% in the sixth five-year plan (2006-2010). The GDP growth rate was recorded at 8.3% in 2006 and 7.9% in 2007 and 2008, and meets the expectations of the government. Therefore, it is natural that the government would set a higher target in the coming five-year development plan (2011-2015). In this scenario, the hydropower projects, which shall be carried out on schedule and the development of the new large-scale copper and gold mines such as; Sepon and Phu Bia, will become the elements that will accelerate economic development and growth.

The moderate growth scenario, where the GDP will record 7.5 % in 2011-15, and decline to 7.0 % in the years 2021-25. In this scenario, a number of power plant projects, currently in the planning stage, will not be carried out, and a number of new large-scale mining sites will not be developed or completed. The development level of remaining industries such as; agriculture, manufacturing and services, shows an extremely similar rate in both the moderate and high growth scenarios.

Growth rates in the moderate scenario are consistent with GDP projections by donors. Table 2.6 indicates GDP growth projection from 2008 to 2013 by the World Bank Vientiane Office. The GDP growth ratio recorded 5.0% and 6.5% in 2009 and 2010 respectively. In this projection, it will accelerate to more than 7% after 2011. Economic growth leaders will be services (around 4%), electricity (2-3%).

Table 2.6 Projection of GDP Growth by World Bank

Unit: percent

	2008	2009	2010	2011	2012	2013
GDR growth rate	7.0	5.0	6.5	7.2	7.4	7.6

Source: Lao PDR Economic Monitor June 2009, World Bank Vientiane Office

The International Monetary Fund (IMF) conducted an Article IV consultation, and reported its results in October 2008. The GDP projected here is the potential economic development without factoring in the Global Financial Crisis. Under this prediction, a 7-8% growth in GDP is expected up to 2013. Out of this 7-8% GDP growth, contributions from resource projects, which consist of the operation of new hydropower plants and the expansion of output from new mining sites, is expected to be 1-2% during the period.

Table 2.7 Projection of Future GDP Growth until 2013 (as of July 2008)

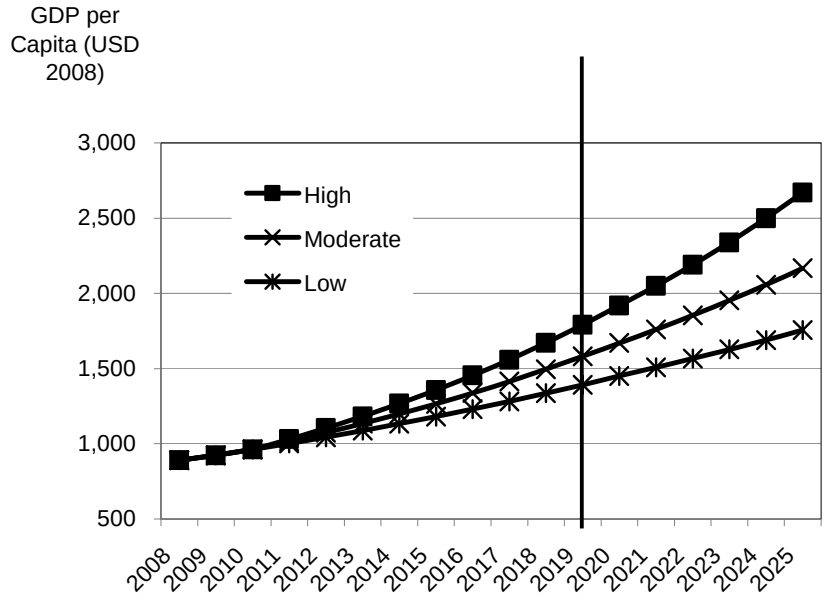
Unit: percent

	2008	2009	2010	2011	2012	2013
GDR growth rate	7.5	7.5	7.5	8.0	8.0	7.1
GDP growth rate excluding resource projects	4.6	5.5	5.8	5.9	6.1	6.1

Source: 2008 Article IV Consultation Report, International Monetary Fund

In the low growth scenario, GDP growth rates will record 6.0% in 2011-20, and slow to 5.5% in 2021-2025. The growth rates of this scenario will be the lowest level of economic performance after 1990, although the possibility of this scenario actually occurring is low; there remains a probability of occurrence, and that would be if and when; the Lao Government does not conduct reforms to actively invite Foreign Direct Investment (FDI) and stimulate economic activity, or there is limited FDI resulting from a prolonged and deepening stagnation of the global economy.

Even if Lao PDR follows the low scenario, it still can achieve the target of its national vision for 2020, through a graduation from LDC in terms of income per capita. As indicated in Figure 2.2, GDP per capita of the minimum scenario will reach USD 1,450 in 2020. The value of the high growth scenario and moderate growth scenario are USD 1,920 and USD 1,671, respectively. To graduate from LDC, GNI per capita must exceed USD 900.



Source: JST

Figure 2.2 Change of GDP per Capita in the Three Scenarios

(b) Selection of the Optimum Scenario

JST has selected the moderate growth scenario based upon; past performance, the consistency of GDP growth projections by donors, and the investment amount necessary to achieve each GDP growth target.

Table 2.8 Investment amount and Percentage share in GDP

	Investment Amount (bill kip in 2008)			Percentage in GDP (%)		
	High	Moderate	Low	High	Moderate	Low
2009	11,263	11,263	11,263	23	23	23
2015	30,058	23,372	17,429	38	32	25
2020	46,248	33,553	23,324	38	32	25
2025	65,678	43,923	27,943	36	29	23

Source: JST

Table 2.8 indicates the investment amount and the percentage share of investment within the GDP for each growth scenario. The investment amount is calculated from the basis that the incremental capital-output ratio is 4.2, the same value of the 6th 5-year plan (2006-2010). The percentage share of investment will record 36-38% in the high growth scenario, 29-32% for the moderate growth scenario

and 23-25% for the low growth scenario. In the 6th 5-year plan, the average percentage share of investment is set at 32%, and the expected investment amount is 16,189 billion kip in FY2008-09. In the FY2008-09, 14% of the total investment is expected to come from foreign funds (grants and loans), and 33% is expected to be from FDI. It is virtually impossible to sustain this level of high percentages if the investment amount increases by 3-4 times in the future.

In the optimum scenario, each industry will have the following performance:

- Agriculture: Production of cereal crops such as rice will increase to sustain self-sufficiency of the nation's food. Production of cash crops such as; vegetables, and fruit will increase across the country
- Manufacturing: Manufacturing of garments, wood & wood products will spread to major towns such as; Kaysone Phombihane and Pakse, and other cities. In Vientiane, new labor-intensive factories in the sectors of automobile and electronic equipment assembly will increase.
- Mining: Major mines such as; Sepon and Phu Bia will expand their production capacity, and a number of new mining sites for anthracite coal and potassium will commence operations.
- Power plants: All power plants will have completed construction as scheduled. A number of planned power plants will be carried out; however, there will be plants that will be terminated.
- Investment and trade: FDI will increase evenly with the balanced growth of; mining, power plants, plantations and manufacturing. Merchandise trade is balanced from the steady growth of exports consisting of; electricity, manufacturing goods, mining, and the import of various goods.

(5) GDP by Provinces

Official data of regional or provincial Gross Regional Domestic Products (GRDP) was not prepared in Lao PDR. Thus, JST estimated the provincial GRDP by utilizing "The Household Lao PDR Social and Economic Indicators Lao Expenditure and Consumption Survey 20002/03" (hereinafter referred as "LECS 3") and the "Report of Economic Census, 2006".

Table 2.9 indicates GRDP by major provinces in 2008, 2015 and 2025. Figures in 2008 were calculated with the methodology mentioned above. Vientiane Capital represents 23% of GRDP, followed by Savannakhet (12%) and Champasack (10%). The figures for 2015 and 2025 were established by JST from future development potential and other factors.

Table 2.9 indicates GRDP per capita in US dollars (USD). GDP per capita in Vientiane Capital and Champasack will exceed GDP per capita in the national level (USD 2,168) in 2025.

Table 2.9 Change of GRDP and GRDP per Capita

Province	GRDP (bill kip in 2008)			GRDP per capita (USD in 2008)		
	2008	2015	2025	2008	2015	2025
Lao PDR	46,215	74,196	149,397	891	1,266	2,168
Luang Prabang	3,448	5,194	8,964	925	1,264	2,032
Vientiane Capital	10,574	17,807	37,349	1,585	2,194	3,568
Khammuane	2,407	3,710	7,470	786	1,116	1,936
Savanakhet	5,499	8,904	16,434	720	1,035	1,656
Champasack	4,736	8,904	19,422	828	1,227	2,243

Source: JST

2.1.2 Urban Development Framework

(1) Urban Hierarchy and Centers

This section reviews the urban hierarchy of Lao PDR, and the spatial framework based on the city's

size rather than the provinces. Then, it will proceed to redefine the concept and roles of "Regional Cities."

There is no official definition for regional division; however, the national land is generally divided into three regions based on provinces as reflected in Figure 2.3.

Table 2.10 Region and Provinces

Region	Province	Population
North	Phongsaly	165,947
	Luangnamtha	145,310
	Oudomxay	265,179
	Bokeo	145,263
	Luang Prabang	407,039
	Huaphanh	280,938
Population:	Xayaboury	338,669
1,977,941	Xiengkhuang	229,596
Central	Vientiane Capital	698,318
	Vientiane	388,895
	Borikhamxay	225,301
Population:	Khammuane	337,390
2,475,806	Savannakhet	825,902
South	Saravane	324,327
	Sekong	84,995
Population:	Champasack	607,370
1,128,812	Attapeu	112,120
Special Region	Xaysomboon SR	39,423
Total		5,621,982

Source: 2005 Census.

Source: JST

Figure 2.3 Regional Division

As the figure above shows, Lao PDR is a geographically long stretch, north to south, nation. Thus the necessity to establish "regional centers" in order to maintain a certain level of public service

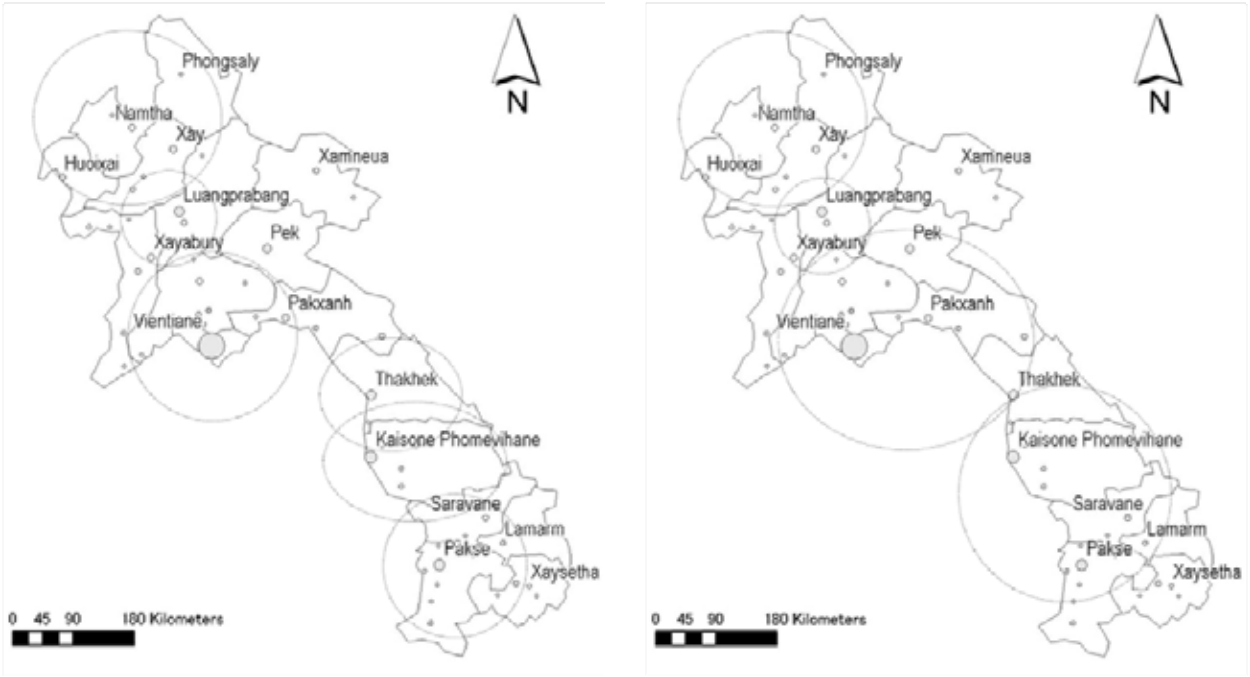
throughout the country. A regional city is defined as a provincial capital city smaller than the capital of Vientiane, however, larger than smaller provincial capitals. These regional cities also possess to an extent influence toward neighboring provinces.

From another viewpoint, it can be seen as a focus upon the urban hierarchy instead of the provincial hierarchy. Chapter 2 describes the current urban hierarchy in Lao PDR and Table 2.11 proposes the spatial framework based on the urban population.

Table 2.11 Options of Spatial Framework in Lao PDR

	Option 1	Option 2
Capital	Vientiane	Vientiane
Regional Core Cities	Luang Prabang, Thakhek, Kaysone Phomvihane, and Pakse Combination of Houixai and Namtha	Luang Prabang and Pakse Combination of Houixai and Namtha
Other Provincial	Other provincial capitals.	Other provincial capitals.
District Towns	District towns	District towns

Source: JST



Option 1 **Option 2**

Figure 2.4 Spatial Framework

In the figure, Option 1, the function of regional core cities is similar to that of provincial cities. Within Option 2, it is shown how the function of regional core cities carry added importance than in Option 1. The three regional core cities' coverage is close to the "regions" as can be seen in Figure 2.3. However, the location of Savannakhet Province is complicated. The province is supposed to belong to the Central Region while it is closer to Pakse.

As illustrated in Figure 2.4, the role of regional city Luang Prabang will get smaller. Regional core cities such as Houixai, and Namtha, located along North-South Corridor, possess the potential of economic development; on the other hand, the socio-economic development of Luang Prabang would be confined due to factors such as; the major economic activity is specialized in tourism industry and

the future population growth is controlled.

(2) Roles of Regional Cities

In addition to the discussion above, these regional cities have historically functioned as the centers on the north – south axis of the Mekong or NR13 serving its rural area. The roles of cities are gradually altering with the opening of the east – west axis for the regional cities are located on the intersections of important transportation networks in Indochina.

It is too early to establish which option is more suitable within the context of Lao's national development. However, the regional cities should be equipped with the following functions:

- International gateway (land and air)
- Import and export base
- Service provision for traders
- Destination of foreign direct investment
- Industry base
- Higher education (High School, College, and University)
- Higher medical service (Referral Hospital)
- Acceptance of immigrants from rural areas
- Service centers to rural areas

(3) Distribution of Population into Cities/Towns

An estimation of the population in Urban Villages and Rural Villages up to 2025 is shown in Table 2.2 (page 3). These Urban and Rural Villages population in 1995 and 2005 are distributed into Capital City, Regional Cities, Provincial Towns and others as indicated in the 2nd and 4th rows of Table 2.12 and Table 2.13.

Table 2.12 shows that the percentages of Capital City, Regional Core Cities and Others have declined from 42% to 37%, 21% to 15% and from 25% to 23%, respectively, between 1995 and 2005. On the other hand, the percentage of Provincial Towns has increased 11% to 25% in the same period. The increase of the percentage in Provincial Towns stems from the change of category from Rural Village to Urban Village due to factors such as; the increase of population, provision of infrastructure, etc. However, JST views that these changes have matured, and alteration in percentages would become contained in 2015 and 2025.

Table 2.12 Change of Urban Village Population by Kind of Cities/Towns

Unit: 000 persons

Year	Capital City	Regional Core Cities	Provincial Towns	Others	Total
1995	331 42%	167 21%	90 11%	194 25%	782 100%
2005	570 37%	232 15%	376 25%	346 23%	1,523 100%
2015	838 38%	331 15%	551 25%	485 22%	2,204 100%
2025	1,197 38%	472 15%	787 25%	693 22%	3,148 100%

Source: JST

Regarding the Rural Village population; a decrease in the percentages of population was seen for Capital City (5.1% to 3.0%), Regional Core Cities (4.1% to 3.0%) and Provincial Towns (11% to 10%), and has increased in others (80% to 87%). JST has established that this trend will continue until 2025. As a result, Rural Village population will alter as indicated in Table 2.13.

Table 2.13 Change of Rural Village Population by Category of Cities/Towns

Unit: 000 persons

Year	Capital City	Regional Core Cities	Provincial Towns	Others	Total
1995	193 5.1%	155 4.1%	413 11%	3,032 80%	3,793 100%
2005	122 3.0%	122 3.0%	412 10%	3,436 84%	4,092 100%
2015	90 2.0%	90 2.0%	449 10%	3,862 86%	4,491 100%
2025	50 1.1%	94 2.0%	472 10%	4,108 87%	4,724 100%

Source: JST

Table 2.14 reflects the growth and decline of the Urban Village population and Rural Village population. The population in Capital City, Vientiane Capital will increase 1.8 times from 690 thousand in 2005 to 1.25 million in 2025. In Regional Core Cities, the population will increase from 354 thousand to 567 thousand and from 788 thousand to 1.26 million for Provincial Towns. The ratio of increase will record 1.6 times for Regional Core Cities and Provincial Towns and 1.3 times for others during the same period.

Table 2.14 Change of Population by Category of Cities/Towns

Unit: 000 persons

Year	Capital City	Regional Core Cities	Provincial Towns	Others	Total
1995	524 11.4%	322 7.0%	503 11.0%	3,226 70.5%	4,575 100%
2005	692 12.3%	354 6.3%	788 14.0%	3,781 67.3%	5,615 100%
2015	927 13.9%	420 6.3%	1,000 14.9%	4,347 64.9%	6,696 100%
2025	1,246 15.8%	567 7.2%	1,260 16.0%	4,801 61.0%	7,874 100%

Source: JST

2.2 Socio-economic Framework in the Survey Area

2.2.1 Kaysone Phomvihane

(1) Population outside of Savan-Seno SEZ

The second and fourth rows of Table 2.15 represent the population in Urban Village and Rural Village of Kaysone Phomvihane in 1995 and 2005. The third and fifth rows indicate the percentage share of Kaysone Phomvihane to the total of Regional Core Cities. The share declined from 37% to 35% for Urban Village, and from 40% to 26% for Rural Village during 1995 and 2005.

JST established that the percentage share will be sustained for the next 20 years. As a result, the population will increase to 165 thousand for Urban Village and 25,000 for Rural Village in 2025. The total population in Kaysone Phomvihane will increase from 113 thousand in 1995 to 139 thousand in 2015 and 190 thousand in 2025.

Table 2.15 Change of Population outside of Savan-Seno SEZ

Unit: 000 persons

	Urban Village	Rural Village	Total
1995	62 37%	63 40%	125 39%
2005	81 35%	32 26%	113 32%
2015	116 35%	23 26%	139 33%
2025	165 35%	25 26%	190 34%

Source: Census 1995 and 2005; JST

The Change of Population shown in the above Table 2.15 does not consider the sectional economic development such as Sava-Seno SEZ. Request explanation! The transmigration of workers from the surrounding districts of Kaysone Phomvihane and the surrounding provinces would be observed when population increase at the SEZ sites. Therefore it is necessary to prepare the other methodology to estimate future population at the SEZ sites.

(2) Population in Savan-Seno SEZ

Savannakhet Province Office and two SEZ site operators are attracting companies to conduct economic activities in Site A and Site C. However, it is undetermined as to how quickly the SEZ sites will be filled with investing enterprises. Thus the necessity to prepare alternative development scenarios for each site as well as population frames.

Table 2.16 Development Scenarios and Employment Generations of Site A

Year	Full Development Scenario		Partial Development Scenario	
	Development Scenario	Employment Generation (Persons)	Development Scenario	Employment Generation (Persons)
2009		0		0
2010		0		0
2011		0		0
2012	Duty Free, Admin offices	1,500	Duty Free, Admin offices	1,500
2013		1,500		1,500
2014		1,500		1,500
2015	Siam park	2,500	Siam park	2,500
2016		2,500		2,500
2017		2,500		2,500
2018	Saha plaza	4,000		2,500
2019	Atherstone1	5,000		2,500
2020	Atherstone2	6,000		2,500
2021	Entertainment Complex	7,500		2,500
2022	Others1	8,500		2,500
2023	Others2	9,000		2,500
2024	Others3	9,500		2,500
2025	Others4	10,000		2,500

Source: JST based on information from concessionaire of Site A

Table 2.16 indicates full and partial development scenarios and the respective employment generated. A full development scenario (second and third columns) and a partial development scenario (fourth and fifth columns). Within the full development scenario, facilities planned for Site A will be developed by 2025; on the other hand, in the partial development scenario there is only a limited number of facilities with detailed construction plans prepared that will be developed by 2025.

Employment generation is estimated from the comparison with land area of an existing casino in the vicinity of Site A (Savanvegas), in which employment of 1,000 people was generated. Employment generation is 2,500 for both of the full and partial development scenarios in 2015, and 10,000 for the full development and 2,500 for the partial development scenario in 2025.

Table 2.17 Development Scenarios and Employment Generation of Site C

Year	Concessionaire's Development Scenario		Development Scenario prepared by JICA Survey Team (Industrial Zone Development)	
	Development Scenario	Employment Generation (Persons)	Development Scenario	Employment Generation (Persons)
2009		0		0
2010	Phase 1 (50ha)	2,800		0
2011		2,800	10ha	600
2012		2,800	10ha	1,100
2013	Phase 2 (70ha)	6,700	20ha	2,200
2014		6,700		2,200
2015		6,700		2,200
2016	Phase 3 (60ha)	10,100	50ha	5,000
2017		10,100		5,000
2018		10,100		5,000
2019	Phase 4 (50ha)	12,900	60ha	8,400
2020		12,900		8,400
2021		12,900		8,400
2022		12,900	70ha	12,300
2023		12,900		12,300
2024		12,900		12,300
2025		12,900	50ha	15,100

Source: JST based on information from concessionaire of Site C

Table 2.17 indicates development scenarios and employment generations in full development scenario and partial development scenario. In the full development scenario, land will be developed step-by-step as planned by the concessionaire of Site C. On the other hand, development area will be 40ha until 2015 and expanded to 270 ha gradually by 2025. This development speed follows the preliminary design of the JICA Preparatory Survey on Industrial Zone Development as of August 2009.

Employment generation is calculated from land area with the following conditions;

- Employment generated per 1 ha is 80 people.
- 30% of the site is utilized for public purposes; such as roads, green area, etc.
- As a result, employment generation per 1 ha is 56 people. The third and fifth columns of Table 2.17 are calculated from the development area of both scenarios in the second and fourth columns. In the concessionaire's development scenario, employment generation will be 6,700 people in 2015 and 12,900 persons in 2025, respectively. In the Industrial Study's development scenario, employment generation will be 2,200 persons in 2015 and 15,100 persons in 2025, respectively.
- In regards to Site D, an alternative scenario was not prepared due to the fact that the development of this site is far more established than that of Site A. Table 2.18 indicates the development scenario and employment generation in Site D. Employment generated here is considered to be academic lecturers and staff of two colleges (agricultural and business) and the staff of a bus terminal, traders and staff in markets. It is estimated that it will employ 200 people in 2015 and 700 in 2025, respectively.
- JST places that 60% of the employees will reside in the dormitory located in the SEZ site, that is to say these workers will come from remote areas in Savannakhet Province or surrounding provinces. Twenty percent of the employees will commute from the Urban Planning Boundary

of the Kaysone Phomvihane, and the remaining 20% will commute from other areas, for example, outside of the urban planning area of Kaysone Pomvihane District and Seno District, etc.

Table 2.18 Development Scenario and Employment Generation of Site D

Year	Development Scenario	Employment Generation (Persons)
2009		0
2010	60 houses	0
2011	60 houses	0
2012	60 houses	0
2013	60 houses	0
2014		0
2015	Opening of the 1st collage	200
2016		200
2017		200
2018		200
2019		200
2020	Opening of Bus terminal and the 2nd collage	400
2021	Market	700
2022		700
2023		700
2024		700
2025		700

Source: JST based on information from concessionaire of Site A and D

Table 2.19 shows the difference of the population in SEZ through a combination of development scenarios. In a combination of the full development scenario (Site A) and the concessionaire's development scenario (Site C), the number of residence in the SEZ will be 14,100 persons in 2025. The case example is referred to as Alt 1. The successive case examples are referred to as Alt 2, Alt 3 and Alt 4 as indicated in Table 2.19. The maximum residency amount is Alt 3 (15,500 people), and the minimum residence is Alt 2 (9,600 people). The difference in the number of residence is limited.

Table 2.19 Residence in SEZ by Different Combination of Development Scenarios in 2025

Unit: persons

Site C \ Site A	Full Development Scenario	Partial Development Scenario
Concessionaire's Development Scenario	Alt 1: 14,100	Alt 2: 9,600
Industrial Study's Development Scenario	Alt 3: 15,500	Alt 4: 11,000

Source: JST

JST selects Alt 1 as the most favorable case example. Through active investment promotion activities conducted by Savannakhet Province, and concessionaires, a number of companies decided to enter Site C. It is rumored that a world-class apparel company made the decision to relocate a factory from China to the SEZ.

Table 2.20 indicates employment in the SEZ and employees' residential area. The number of the workforce will be 9,400 in 2015 and 23,600 in 2025, respectively. The number of residence in the SEZ will be 5,700 in 2015 and 14,100 in 2025. The number of commuters from the Urban Planning Boundary will increase from 1,900 persons in 2015 to 4,700 persons in 2025.

Table 2.20 Employment in the SEZ Sites and Employees' Residential Area

Unit: Persons

Year	Employment in the SEZ Sites	Residence inside of SEZ	Commuting from Urban Planning Boundary
2015	9,400	5,700	1,900
2020	19,300	11,600	3,900
2025	23,600	14,100	4,700

Source: JST

(3) Population in Kaysone Phomvihne and Urban Planning Boundary

Table 2.21 reflects the population in Kaysone Phomvihane and its Urban Planning Boundary. In 2005, the population proportion in the Urban Planning Boundary to the population in the district accounted for 65%. The area of Kaysone Phomvihane District is 521 square kilometers; on the other hand, the area of the planning boundary is only 82 square kilometers. This is proof that future population increase will not be homogeneous throughout the district, and will concentrate on the Urban Planning Area. This is the basis of JST setting the gradual proportion increase to 70% by 2025. As a result, the population in the Urban Planning Boundary will be 94 thousand in 2015 and 133 thousand in 2025, respectively.

Table 2.21 Population in Urban Planning Boundary (without the SEZ)

Unit: 000 persons

	Population in Kaysone Phomvihane District	Population in Urban Planning Boundary	Proportion of UPB to KP District
2005	113	74	65%
2015	139	94	68%
2025	190	133	70%

Source: JST

Table 2.22 indicates the total population of the Urban Planning Boundary, the population in the Urban Planning Boundary (without the SEZ) and residents in the SEZ. The figures are rounded out to sustain a consistency with the population in the Urban Planning Boundary. Total population will increase to 100 thousand in 2015 and 147 thousand by 2025, respectively.

Table 2.22 Total Population in the Urban Planning Boundary

Unit: 000 persons

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

Source: JST

(4) Household Member and Number of Households

The second row of Table 2.23 indicates; population, the number of households and the number of household members in the Urban Planning Boundary (without residents in the SEZ) in 2005. The number of household members was 6.2 people per household. It is higher than the national average, which is 5.8 people per household.

In the same year, the number of household members in Vientiane Capital was 5.5 people per household. JST set an assumption that urbanization will advance in the Urban Planning Boundary, and the number of household members will gradually decrease similar to the Vientiane Capital in the

coming 15 years. JST places the number of household members at 5.8 people per household in 2015 and 5.5 people per household in 2025, respectively. As a result, the number of households will gradually increase to 16,000 in 2015 and 24,000 in 2025.

Table 2.23 Change of Household Members and Households

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

The number of households in 2025 will double that of 2005. This increase will result in the number of houses to double in 20 years time. It is necessary to prepare housing policies; such as a housing financing system and low cost housing for low-income households.

2.2.2 Pakse

(1) Population in Pakse and Its Urban Planning Boundary

The second and fourth rows of Table 2.24 are population in Urban Village and Rural Village of Pakse in 1995 and 2005. The third and fifth rows indicate the percentage share of Pakse to the total of Regional Core Cities. The share declined from 28% to 25% for Urban Village; contrary to this, the share increased from 11% to 17% for Rural Village and representing 20% to 22% for total population during 1995 and 2005. JST set that the percentage share will be increased gradually in coming 20 years due to vitalization of economic activities. As a result, population will increase 142 thousand for Urban Village in 2025. Total population in Pakse will increase from 65 thousands in 1995 to 108 thousand in 2015 and 158 thousand in 2025.

Table 2.24 Change of Population in Pakse

Unit: 000 persons

	Urban Village	Rural Village	Total
1995	48	18	65
	28%	11%	20%
2005	58	21	79
	25%	17%	22%
2015	93	15	108
	28%	17%	26%
2025	142	16	158
	30%	17%	28%

Source: Census 1995 and 2005; JST

Table 2.25 indicates the population in Pakse and its Urban Planning Boundary. In 2005, proportion of the Urban Planning Boundary population to that of the district accounted for 93%. The area of Pakse District is only 108 square kilometers, and the Urban Planning Boundary covers the majority of the district. Evidence that the future population increase would be homogeneous in the district and the Urban Planning Boundary. Thus, JST established that the proportion will be constant until 2025. As a result, the population in the Urban Planning Boundary will be 101 thousand in 2015 and 147 thousand in 2025, respectively.

Table 2.25 Change of Population in Urban Planning Boundary

Unit: 000 persons

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

Source: Census 2005; JST

(2) Household Members and Number of Households

Population, number of households and number of household members in the Urban Planning Boundary in 2005 are shown in Table 2.26. The number of household members was 6.1 people per household. This is higher than the national average of 5.8 people, and extremely close to the level of Kaysone Phomvihane (6.2 people per household).

In the same year, Vientiane Capital showed 5.5 persons per household. JST concluded that in Kaysone Phomevihane urbanization will advance within the Urban Planning Boundary, and the number of household members will gradually decrease as seen in Vientiane Capital in the coming 15 years. JST sees the number of household members as 5.8 people per household in 2015 and 5.5 people in 2025, respectively. As a result, the number of households will gradually increase to 17,000 in 2015 and 27,000 in 2025.

Table 2.26 Change of 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

The number of households in 2025 will increase by 2.3 times in comparison to 2005. This leads to the conclusion that the number of houses will more than double in 20 years. This leads into the necessity of preparing housing policies, such as; a housing financing system, and affordable low cost housing for low-income households, as well as Kaysone Phomevihane.

2.3 Methodologies to Estimate Future Land Area

There are two methodologies in estimating the future urban area.

Methodology 1: The area of respective land use such as; residential, commercial and industrial within a planning area is estimated and calculated. The total of each land use area is an urban area in the future. The residential area is estimated by utilizing the estimated future population and assumed population density. The industrial area is estimated through its industrial output and industrial output per area, or by using the number of employees and area per employee. The commercial area is estimated with population data, number of shops, amount of sales, and the area of commerce at a similar city.

Methodology 2: Future population in an urban area is estimated, as well as the future population density. A future urban area is calculated by utilizing future population and population density. There are two ways to establish population density. One is to predict the population density as an average urban area density in the future. Another method is to predict that an urban area in the future will be divided into two to three areas based upon the individual characteristics and population density of each area.

There is no existing data on industrial output, and industrial output per area at both the district level and national level. There is no data available in Lao PDR as well, on the number of shops, the amount of sales and area of commerce. Thus, the methodology of utilizing the predicted future population and population density was adopted in this survey.

In this survey, an urban area is divided into the following three areas: center area, inner area and suburb area, based upon the present land use category in Lao PDR, and previously provided urban master plan. Each population density forecast was reached by closely reviewing existing conditions and the individual characteristics of each area, as well as the predicted future population.

Chapter 3 Basic Strategies for Regional Cities

3.1 Introduction

3.1.1 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 was 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 regional 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 section 3.5.3. 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.

3.1.2 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 regional core cities in Lao PDR as indicated in Table 3.1. The first objective is "Supporting economic and social activities in the cities and the surrounding areas." The second is "Organized urbanization for beautiful and organized cities." And the third is "Managing and controlling urban and living environment by infrastructure improvement/ development."

Table 3.1 Objectives and Measures of Urban Development

Objectives		Measures	Contents in Basic Plan
Objective 1	Supporting economic and social activities in the cites and the surrounding regions	- With appropriate urban functions - With certain axis of traffic and green	Urban Structure Land Use
Objective 2	Organized urbanization for beautiful and organized cities	- With green area conserved - With historical townscape preserved - With appropriate density to meet Lao lifestyle and culture	
Objective 3	Managing and controlling urban and living environment by infrastructure improvement/development	- With improvedroad network and transport - With improved water access - With wastewater treated - With flood prevented - With solid waste management	Land Use Infrastructure

Source: JST

Measures to achieve each objective are listed as 2nd column of Table 3.1. Basic strategy for urban development is guidelines to achieve 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 consist of four components: Analysis, Vision, Urban Development Strategy and Basic Plan as indicated in Figure 3.1.

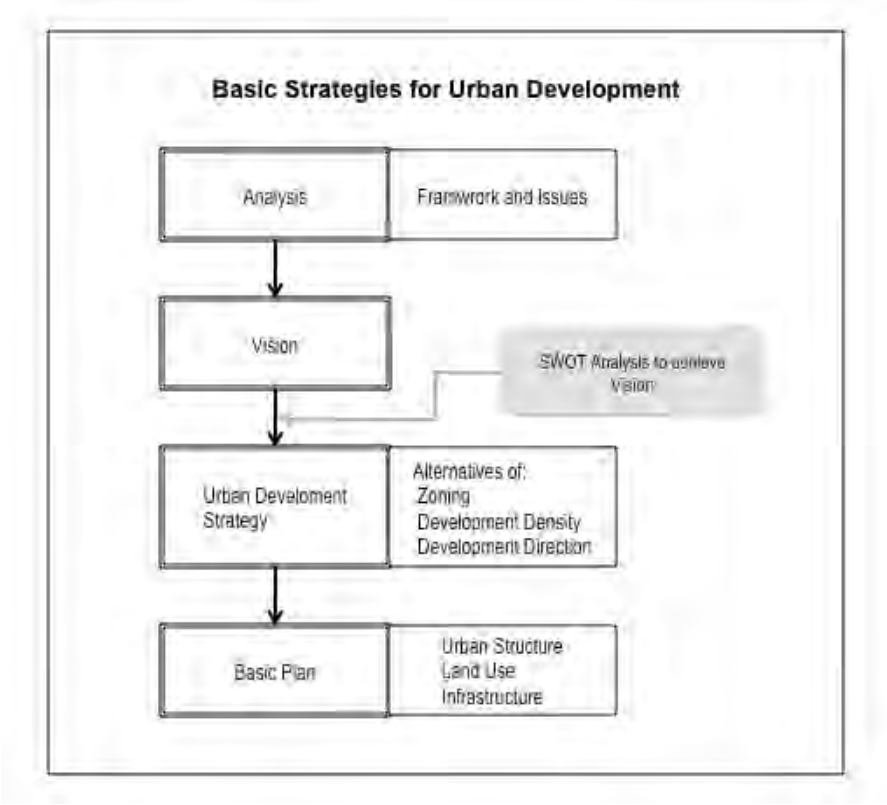


Figure 3.1 Structure of Basic Strategies for Urban Development

After analysis of development framework and development issues, Basic Strategies for Urban Development are developed as the following three steps. In the first step, Visions of Kaysone Phomvihane and Pakse are proposed from result of the first ACM. Vision is future images of the city that local authorities and residents illustrstes. JST added images through objective analysis such as developed direction of the nation and the region and growth strategy of the city.

In the second step, Urban Development Strategy is proposed based on SWOT (Strength, Weakness Opportunity and Threats) Analysis. Urban Development Strategy consists of Zoning (of developable land and conservation area), and Development Density and Development Direction; and selected Zoning, Development Density and Development Direction from alternatives set future orientation of urban development. Zoning is analyzed by use of GIS database, and appropriate Development Density and Development Direction are determined from alternatives at ACM and SHM.

In the third step, Basic Plan which realizes Urban Development Strategy is proposed. Basic Plan consists of Urban Structure, Land Use and Infrastructure. Urban Structure and Land Use will be designated in line with Urban Development Strategy at first, and concept of infrastructure development will be determined in the next step.

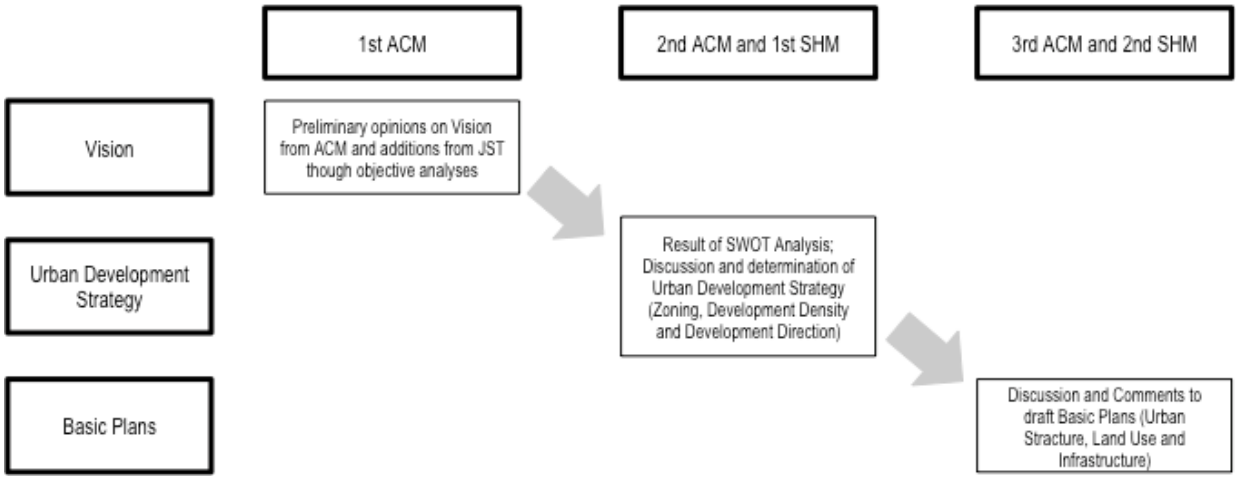
Urban Structure, Land Use and Infrastructure Development address objectives and measures of urban development. Urban Structure and Land Use address the objective 1 and the objective 2, and Land Use and Infrastructure address the objective 2 and the objective 3 as indicated in Table 3.1.

3.2 Process to Formulate Basic Strategies for Urban Development

Figure 3.2 indicates the process for formulating Basic Strategies for Urban Development. The process was initiated in March, when the first ACMs were held. After hearing their 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 and 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 3.2 Process for Formulation of Basic Strategies

3.3 Kaysone Phomvihane

3.3.1 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 of copper production is the production of electric cable, 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.

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

JST established the demographic framework for Kaysone Phomvihane and urban planning boundary as indicated in Table 3.2, Table 3.3 and Table 3.4. 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 3.2 Population in Urban Planning Boundary (without the SEZ)

Unit: 000 persons

	Population in Kaysone Phomvihane District	Population in Urban Planning Boundary	Proportion of UPB to KP District
2005	113	74	65%
2015	139	94	68%
2025	190	133	70%

Source: JST

Table 3.3 Total Population in the Urban Planning Boundary

Unit: 000 persons

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

Source: JST

Table 3.4 Change of 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

3.3.2 Development Issues

(1) Socio-economy

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

The population increase is remarkable in Kaysone Phomvihane. The population in urban planning boundary (with SEZ residents) will increase from 74 thousand in 2005 to 100 thousand in 2015 and 147 thousand in 2025. The population pressure in the rural areas and better access to the urban areas cause the population inflow to the urban areas for urban economic opportunities.

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 sector 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. Savsan-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 Svannakhet 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

(a) Opinions of ACM/SHM Members

Through investigations and surveys, JST has identified issues involved in Land Use and Infrastructure. JST also collected issues on infrastructure through ACMs and SHMs. Opinions from local government officials and stakeholders are listed in Table 3.5. The issues were finally compiled in the following sections.

Table 3.5 Opinions of ACM/SHM on Land Use and Infrastructure

ACM and SHM	Opinions from Members of ACM and SHM
1st ACM (March 2009)	- In order to keep a city clean, it is necessary to continue developing infrastructure such as sewerage, drainage, flood mitigation faculties, riverbank, parks, etc. - It is necessary to achieve such development vision by use of governments' financial resource, aid from foreign countries and financial resource of private sector.
2nd ACM (July 2009)	- Clear land use designation is necessary (conservation, agriculture, residential, etc.) - Provide green and open space within boundary. - Should follow the provincial land use plan. - Increase amenity for tourists to stay longer. - Need of reviewing master plan (1999) - Introduction of Public transportation
1st SHM (July 2009)	- Mekong riverbank erosion - Flooding and insufficient drainage system - Sewerage system improvement and solid waste collection and disposal - Road improvement and local road development - Fire hydrants installation - Expansion/ improvement of water supply system - Solid waste management is necessary
2nd ACM (August 2009)	- Should provide some activities along Mekong riverbank in term of tourist attraction. - Should have specific regulation for management and control for ZPP zone. - Should suggest for solid waste management by using 3 R methods. - The erosion bank proposed is too short a distance. - Should set up sport activities area in each urban parks particular exercise area. - Where should have communities treatment system? And how to manage waste? - Should propose bank erosion protection more then 2 km, which start from Nakair Village to Mekong Bridge. - Should expand WTP with 30,000m3/day capacity, which base on the estimation in the 5-year plan by the Water Supply Company.
2nd SHM (August 2009)	- Necessity of fire protection. - Necessity to prepare plan for Mekong riverbank. - Necessity to provide solid waste management in each collection points in urban areas. - Water supply is not enough all day, particular in Phonesavanh Village. - Rural road in village are not good condition. - Want to installation of wastewater in the communities, which based on photos on the presentation. - Improved and clean drainage system. - Agree on projects and programs proposed by JST.

Source: JST

(b) Land Use

Development in unsuitable areas: The urbanization of Kaysone Phomvihane had started at the area facing the Mekong River then expanded inland. Even now this area is the center of the city and possesses the beautiful scenery of the Mekong River. However, an area along the river is rather low and is potential to suffer floods during the rainy seasons. In addition, residents are under the threat of a riverbank erosion of the Mekong River.

Limited coordination with SEZ development: Although the progress of SEZ will influence the future society and economy of city, local administrations (Province, District and UDAA) have shown limited

involvement in the official process of SEZ development. Consequently, coordination between urban planning at existing urbanized area in Kaysone Phomvihane and Savan-Seno SEZ is limited. The DPWT, UDAA and a water supply company in the district are not aware of the details of the SEZ development plan (category of industry introduced, size and schedule of development) in the planning area. There is no coordination toward urban development considered or planned due to development being under different entities.

Low interest in historical structures: There is limited consideration toward the conservation of the numerous historical structures as an attraction of the city, that are located within present downtown along the Mekong River.

(c) Road and Transport

No clear road hierarchy in the urban area and immature road retwork: Excluding specific roads, such as NR9, the width of almost all roads in the urban area is almost the same, and there is no clear road hierarchy can be viewed at present. Furthermore, aside from a number of areas developed earlier, such as a historical area and its vicinity, many dead-end roads exist and the road network is immature.

Unsatisfactory road development: The pavement condition of main roads in the urban area is rather good. More than 80 of these main roads have been paved already. However, the pavement condition of minor roads is not satisfactory. The total length of minor roads developed in the urban area is roughly 124 kilometers. An estimated 65 of the minor roads are yet to be paved. Moreover, many roads are without sidewalks and streetlights exist in the urban area, particularly in residential areas.

Lack of traffic axis in the urban area: Two national roads run through the northern and southern part of the urban area of Kaysone Phomvihane respectively. However, there is no existing major road connecting these two. Thus, a traffic axis is not formulated in the urban area.

No public transportation: No public transportation operates within the urban area or its vicinity. Tuk-Tuks and Sonteos which are operated by individuals and families are the main mass transportation methods for residents and tourists.

No public parking in the urban area: A number of public and private buildings are equipped with parking facilities within their property for their customers and visitors. However, there is no public parking developed yet. Vehicles are parked on roads, particularly in commercial area. At times, understandably, this causes traffic congestion.

Bus terminal in the urban area: There is an existing bus station for international and inter provincial buses located in the urban area. In the future, this area is expected to develop into a new commercial center, one of the busiest areas in Kaysone Phomvihane.

Unpaved road in urban area

Bus station in urban area

Source: JST

Figure 3.3 Situation of Road and Public Transport

Airport in the urbanized area: Savannakhet Airport with a 1,650 m runway is located in the urban area. Initially it was constructed at the outskirts of the urban area but has since been surrounded by residences due to the increase in population and expansion of the urban area. The current environment makes it extremely difficult to extend the runway that will allow the operations of larger aircrafts. Furthermore, future construction to expand the airport will ultimately become an obstacle of expansion to the urban area and the construction of buildings.

(d) Water Supply

Limited water supply capacity for the future: The population within an urban planning boundary was around 74,000 in 2005. Of which, roughly 68,600 (92.7%) lived in a service area of water and an estimated 66,000 (89.2%) had received water from a water supply company in 2005. In 2008, roughly 75,000 residents resided within a water service area, and around 72,000 received water. A water supply area covers the majority of an urbanized area, except for a newly developed area, by means of like land adjustment located at the east of the existing urban area. Currently, the daily production capacity of water supply, and the daily consumption of water per person in Kaysone Phomvihane is around 15,700m^3 and about 150 litters respectively. The present water production and water consumption condition at Kaysone Phomvihane are relatively good. However, with the population in the urban planning boundary of Kaysone Phomvihane expected to become 94,000 in 2015 and 133,000 in 2025 respectively, the production capacity will not be sufficient for the future.

(e) Sewer and Sewerage Treatment

Improper sewer and sewerage treatment system: In 2007, a pour-flush or dry latrine with septic tank has been adopted as the existing sewer and sewerage treatment system for roughly 70% of the households in Kaysone Phomvihane. In cases, due to the improper construction of septic tanks at a number of buildings this has caused wastewater to leak into the nearby ground contaminating soil and groundwater. Moreover, kitchen and bathroom water is directly discharged to drainage channels near buildings.

(f) Drainage and Flood Mitigation

Improper development of stream banks: A bank of streams running within the urban area has not been developed or protected. Thus, portions of a bank are encroached and have collapsed.

Erosion of the Mekong riverbank: Bank erosion of the Mekong River is occuring slowly but surely. This is one of the concerns for residents.

No Pumps at stream mouths to the Mekong River: Although flap gates at 3 stream mouths had been placed in the ADB Project, no pumps have been installed. As the water level of the Mekong River rises, a flap gate is closed. Water from the Mekong River does not the stream, and vice versa. At times, floods do occur at these streams.

No development in stream bank

Flood gate without pump

Source: JST

Figure 3.4 Situation in Drainage and Flood Mitigation

(g) Solid Waste

Low solid waste collection rate: Collection rate of solid waste is extremely low. An estimated 10,400 households existed in the service area of UDAA during 2006-2007. However, the UDAA was limited to actual solid waste collection for only roughly 40% of the households due to insufficient road development and the shortage of staff and equipment.

Insufficient public education toward solid waste disposal: It has been noted that residents, at times, discharge solid waste into public spaces such as; streams and roads, or burn it in their yards. This is also one of reasons of the low collection rate.

Inadequate development of dumping site: Lining at the bottom of a cell and a leachate treatment facility had not been provided at an existing dumping site. Furthermore, solid waste discharged has not been covered.

Solid waste discharged at riverbank

Discharged solid waste without any covers

Source: JST

Figure 3.5 Situation in Solid Waste Management

(h) Park and Town Beautification

Few recreational parks: There are parks such as the Kaysone Phomvihane Park. However, there is no facility and recreation has been provided in a park except for a number of parks in Vientiane. In addition, the existing parks have been enclosed by fences, with only one or two entry/exit points available.

No green areas: Many green areas still exist within a boundary of the master plan, particularly along streams. However, these green areas had not received the designation as a protective area in the master plan. There is a total lack of intential green area protection, creation or development within the urban environment. These green areas will be developed the increase of population in the future.

Park with few visitor

Green area along stream

Source: JST

Figure 3.6 Situation of Park and Town Beautification

3.3.3 Vision

(1) Vision of Kaysone Phomvihane

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 its vision. JST suggested additional ideas of making maximum use of development of the East-West Economic Corridor (EWEC) and the national and regional development context.

Table 3.6 Opinion on Vision of Kaysone Phomvihane

ACM and SHM	Opinions from Members of ACM and SHM
1st ACM (March 2009)	- Although Kayson Phomvihane is one of centers in the central region, there are no future urban development vision shared by people - One of ideas future vision for Kaysone Phomvihane is "Beautiful City" which is a tourism destination - "Beautiful City" is a city with good living environment, a city with developed built-up area, a city people can relax, and a city attracting people, etc.
3rd ACM (August 2009)	- Should add the word of GREEN in the name of study such as Formulation of Basic Strategies for Regional Core Green Cities Development. - Should add TOURISM in the vision statement such as: international and regional core city having active exchange of people, goods, tourism and information. - Kayson Phomvihane will be upgraded to city like Vientiane Capital in future.
2nd SHM (August 2009)	- Should add one word in the future image of Kaysone Phomvihan as CITY of CHARM.

Source: JST

Through the exchange of opinions with members of ACM and SHM, the Vision of Kaysone Phomvihane was confirmed as the following descriptions.

- International and regional core city with active exchange of people, goods and information.
- The crossroad of the EWEC (East-West Economic Corridor) and NR13.
- Charming and attractive city with green, 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. Strength, Weakness Opportunities and Threats of Kaysone Phomvihane is compiled in Table 3.7. A draft version of the SWOT was prepared by JST and PTI at first, and final version was prepared after reflecting comments at the 2nd ACMs and the 1st SHMs.

Table 3.7 Strengths, Weakness, Opportunities and Threats of Kaysone Phomvihane

Strengths	Weakness
- Availability of flat land - Rich agricultural & mineral resources - Strong support by the central government - Full completion of the East-West Economic Corridor (EWEC)	- Insufficient skilled human resources for industrial development - Weak urban function regarding international trade and investment (limited banking and transport sectors, etc) - Limited level of urban infrastructure such as water and sewerage
Opportunities	**Threats**
- Progress of regional integration such as AFTA (ASEAN Free Trade Area) and GMS (Greater Mekong Sub-region)	- Budget constraints for development - Dependency on international development partners

program	- Limited coordination with Savan-Seno SEZ development - Uncertainty of Savan-Seno SEZ development initiated by private sector - Severe competition between local goods (such as automobile by Kolao) and imported goods under reduced CEPT (Common Effective Preferential Tariff)

Source: JST

(a) Strength

Historically, Kaysone Phomvihane has been operating as the agricultural trade center of the province. The major agricultural product is rice, but the province is also rich with other agricultural and mineral resources.

As a regional core city, the province has been receiving various forms of strong support from the central government as well as international donors. In particular, the roads and airport have been developed, with the fund from donors, to an international standard.

From an international viewpoint, Kaysone Phomvihane is located at the strategic crossroad of EWEC and it is the only city on the EWEC in Lao PDR. Thus, the full completion of the EWEC in the year of 2006 is improving the economic situation.

The town is located at a relatively high area in relation to the river, and people reside in a low population density. Thus, not only the residential area, but also the SEZ area, has large flat land available for development.

(b) Weakness

The foreign investors are attracted by the strategic location, but they are discouraged by the quantity and quality of skilled human resources required for their respective industries. At the same time, Kaysone Phomvihane has limited services for foreign investors. For example, the banking, lodging and freight forwarding services are noteably insufficient.

Not only investors but also residents are suffering from the insufficient level of urban infrastructure such as water supply. In some cases, a foreign investor is required to develop a water supply system individually.

(c) Opportunities

The integration of ASEAN countries is advancing, although slowly but steadily. AFTA is the symbol of the ASEAN integration. GMS is another endeavor of regional integration especially in the infrastructure sector. Such trade facilitation programs allow the free movement of people, trade and investment. For example, the number of tourists has increased from 190,000 in 2006 to 320,000 in 2007[1], and 53% of national exports were cleared through the customs office at Kaysone Phomvihane[2]. For Lao PDR, these programs will provide enhanced opportunities of Foreign Direct Investment (FDI) from other ASEAN nations.

(d) Threats

The national and provincial government has a limited development budget and the majority of public investment projects have been financed by donors such as ADB and Japan. Consequently, it is becoming difficult to prepare even recurrent budgets of completed infrastructure such as roads and airport. It is necessary to charge users fees for an appropriate maintenance fund.

[1] Refer to Table 2.4 of Appendix 2.

[2] Source is customs office data (C2000 data) from October 2007 to September 2008. Most of exported goods going through customs office at Kaysone Phomvihane are copper produed at Sepon mine and sugar produced in two factories at Savannakhet Province.

In Kaysone Phomvihane, development of SEZ will make large impacts on the existing urban area through the inflow of people and production activities. In this context, the lack of, or no coordination with the SEZ development would damage the natural and social environment. Unclear development prospects of the SEZ will also pose a potential threat for Kaysone Phomvihane.

The formulation of AFTA is also a double-edged sword for the Lao economy. On the negative side, Lao PDR should open its market to other member nations by reducing its CEPT. Through its CEPT reduction, the Lao Customs will impose less import duty for many products, including final products. In short, for example, the simple assembly factories of motorcycles no longer need to locate to Lao PDR allowing these firms to import the assembled motorcycles made in other ASEAN nations. This will expose the Lao PDR to more severe competition for imports.

Result of SWOT analysis is compiled as Table 3.8. Strength and weakness are internal factors, and it is possible to control these factors; otherwise, opportunity and threat are external factors, and it is impossible to control these factors. By combining these factors, strategies such as (1) Grabbing an opportunity by using strength, (2) Getting away from missing opportunity due to weekness, (3) Gurding from threat by using strength, and (4) getting away from bringing threat due to weakness will be prepared.

Table 3.8 Analysis of Strategies for Kaysone Phomvihane

	Strength	Weakness
Opportunity	Targeting ASEAN and GMS market by use of EWEC (manufacturing, tousrism)	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
Threats	Preparing to conserve agricultural and green areas surrounging of the urbanized area for future attractiveness	

Source: JST

The following strategies are introduced from 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).

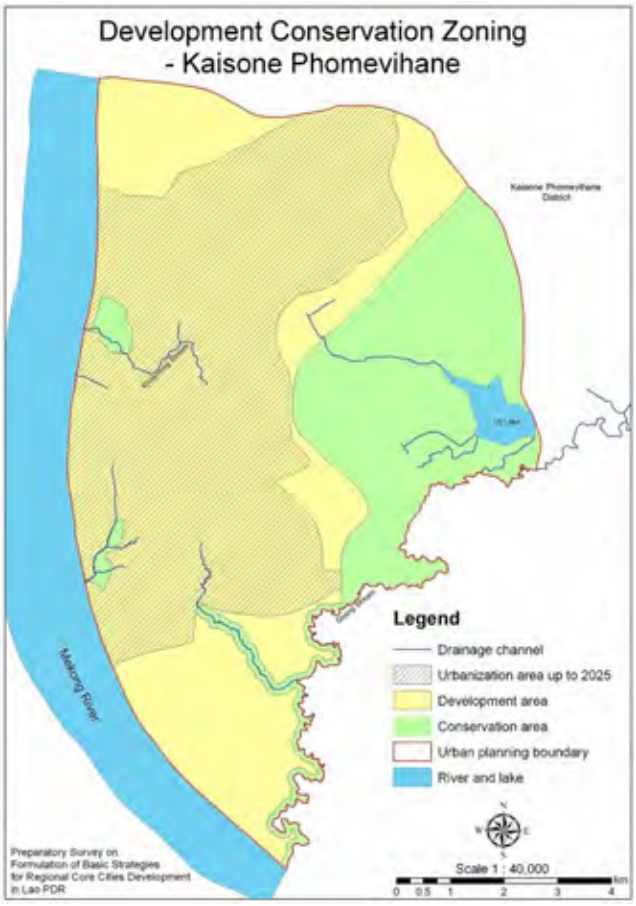
This survey covers urban development strategy, but does not cover economic development strategy; therefore, Basic Strategies for Urban Development proposes Urban Development Strategy which supports and leads development strategy for urban economy.

In order to realize the Urban Develop Strategies, it is necessary to study and comopare alternative strategies in the following three points: (1) zoning for developable land and conservation area, (2) development density of urbanized area, and (3) future development direction of the urbanized area. Regarding to the zoning, suitable land for future development was analyzed from GIS, and the development density and the development direction were determined by the Lao side and JST through discussion at the ACM/SHM. Such processes are described in the following sections.

3.3.4 Urban Development Strategy

(1) Zoning for Developable Land and Conservation Area

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 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.



Source: JST

Figure 3.7 Zoning of Developable Land and Conservation Area

(2) Development Density

Following the zoning of developable land and conservation area, JST analyzed existing development density and future alternatives.

As stated above, JST prepared alternatives of development density, and heard opinions from local stakeholders in both cities. JST also prepared advantages and disadvantages of infrastructure cost and the effect of environmental mitigation/difficulty of control in both alternatives, as indicated in Table 3.9.

In 2005, the buildup area was 2,440 ha with a density level 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 JST asked local stakeholders which case they preferred after explaining the advantages and disadvantages of both cases in terms of cost for infrastructure development and environmental management.

Table 3.9 Comparison of Two Alternatives

Infrastructure	Cost for Initial Public Investment and Operation & Maintenance		Environmental Impact Mitigation and Difficulty of Control	
	Same Area, Higher Density	Area Expansion, Same Density	Same Area, Higher Density	Area Expansion, Same Density
Road Transport/ and Traffic control	Road length is shorter and vehicle travel distance is less than Spread Type (construction cost) Public transport is necessary in some areas. (Bus)	Long road construction need and long vehicle travel distance Private transport means needed for most of households. (Car, motorcycle)	Less traffic generation and travel distance have less environmental impact. (air, noise, vibration) Mitigation and control required area is limited.	Large traffic generation and long travel distance. Higher travel speed and higher accident risk.
Water Supply	Pipeline length is shorter then, less earth work and less pipes required (construction & maintenance cost)	Long pipeline required then much earthwork and pipes required. Maintenance work needs for longer lines.	Environmental impact during the construction and maintenance work is depending on the length of pipeline. Shorter pipeline length has less impact Environment Impact at the construction stage and maintenance work is less.	Affect to the traffic during the construction stage and maintenance is higher than Compact City Type
Sewerage	Community/ areal sewerage system should be considered in the high population density area. Initial investment cost is higher than individual treatment system.	Individual sewerage treatment system should be provided by the residents in the most of the part of urban area. Less initial investment cost for public, but sludge collection and treatment cost will be higher	Environmental impact is high in general, because of higher concentration of population. Environmental management and mitigation is easier if community/ areal sewerage applied.	Environmental impact is low in general. Effluent quality control is difficult and cost high, when checking and monitoring system introduced to individual septic tank.
Solid Waste Management	Service area is concentrate. Therefore, efficient garbage collection is possible. Sufficient local road system for access to the household and residents cooperation is necessary in densely inhabited area.	Garbage collection trucks have to travel long distance and more number of trucks and personnel required than Compact City Type. Sufficient local road system for access to the household is necessary.	Easily cover the all inhabitant area in urban area. Less environmental Impact can be achieved.	Because of truck traffic increase and possibility of insufficient service area coverage, more environmental impact then Compact City Type can be generated.

Source: JST

Table 3.10 Alternatives of Development Density

Cases	Population Density (persons/ha)	Buildup Area (ha)
Situation in 2005	31	2,400
Case 1: Same Area, Higher Density	55	2,400
Case 2: Area Expansion, Same Density	31	4,200

Source: JST

Source: JST

Figure 3.8 Alternatives of Development Density

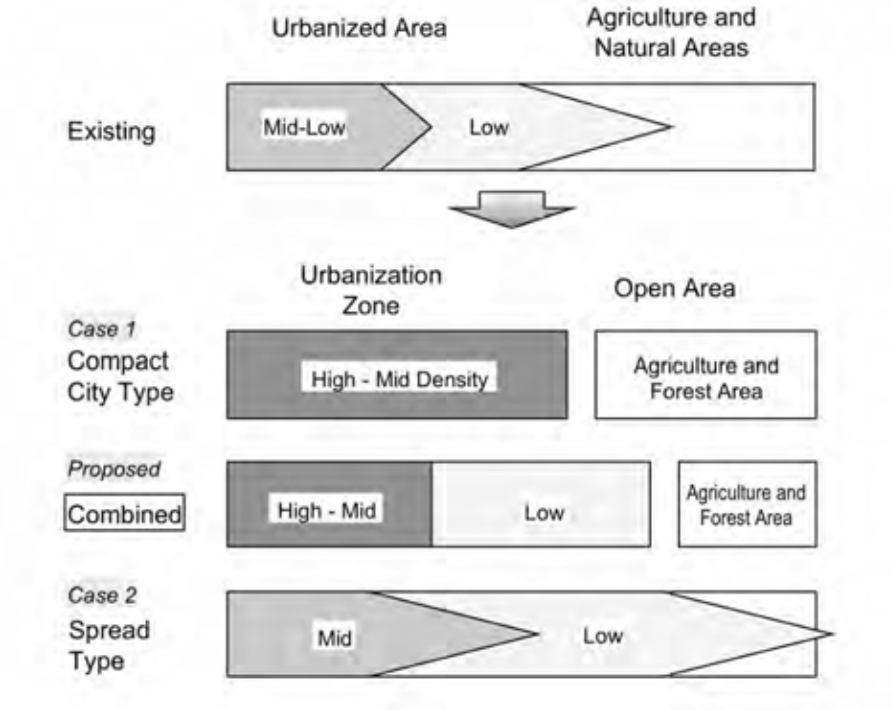
The opinions of local stakeholders are summarized in Table 3.11. In view that Kaysone Phomvihane possesses sufficient developable land, SHM members insisted on the area expansion, same density. On the other hand, the ACM members preferred the same area, higher density due to its savings in infrastructure cost, and the easier control over the urban environment. As a result, JST finally proposed a mixture of case 1 and case 2, which met the approval of ACM and SHM members.

Table 3.11 Opinion of ACM/SHM on Development Density

ACM and SHM	Opinion of Members of ACM and SHM
2nd ACM	Compact type urban development is preferable by two third of the attendants
1st SHM	Low-density development is preferable by two third of the attendants.
3rd ACM	Should make the balance of urban development density, which avoid congestion in urban area and traffic jam.

Source: JST

After discussions of development density, JST prepared an optimum settlement pattern. Figure 3.8 illustrates two urban development pattern alternatives (same area, higher density, which is translated into compact city development, and area expansion, same density which is translated into spread development) on infrastructure from the viewpoint of cost (both investment costs and O&M costs) and an environment impact mitigation and the difficulty of environment control.



Source: JST

Figure 3.9 Proposal of Settlement Pattern from Development Density

(3) Development Direction

The location of the city center in Kaysone Phomvihane, at present, is an old town center built in the colonial period. As described in the previous section, an urban sprawl has expanded the urban area. The urban functions and services have expanded in accordance with the urban growth. Also, the current location of the existing city center has become inconvenient for the residents of the town, particularly, for economic activities. The direction and location of new urban centers should be placed under consideration in accordance with the future expansion of the urban area. New city center will be determined in accordance with the geographical conditions, economic activities, and size of the future urban population and expansion of the urban area. In the case of Kaysone Phomvihane, development of the EWEC is a potential to establish a new city center along the NR9.

Two alternatives were discussed as urban development directions among stakeholders and administrative agencies. One was expanding the existing center, and the other was to develop a new city center near NR9 in accordance with the above-mentioned conditions.

The future urban population of Kaysone Phomvihane is expected to double by the year 2025. Expansions of the urban functions are indispensable and areas required for the urban services facilities will increase. JST studied the direction of development by comparing the "expanding the existing city center" and "creating a new city center", especially for the commercial center where most of the urban residents were attracted to as part of their urban life, and held discussions with administrative agencies and stakeholders. Two development directions are illustrated in Figure 3.10.

Two cases of Development direction in Kaysone Phomvihane		
	Case 1: Existing city center expansion	Case 2: New city center development
Description	Existing city center continues to expand and higher population density to be resulted	A new city center near NR9 and medium population density to be expected
Advantage	Less investment cost for urban infrastructure Consistent with compact city concept	Less congestion at old city center Conservation of historical streetscape Advantage in the accessibility (located near the EWEC)
Disadvantage	Fear of damage historical streetscape Congestion at the old city center (deteriorate tourism resources) Disadvantage in the accessibility (distant from the EWEC)	More investment cost for infra development Declining existing city center

Source: JST

Figure 3.10 Development Directions, Kaysone Phomvihane

A new city center (commercial center) is designated along EWEC within Case 2, for in the future, this area will be the center of economic activities of Kaysone Phomevihane and the newly developed SEZ sites. This location is ideal for further commercial facilities development such as; supermarkets, shopping malls, restaurants, coffee shops, cinemas, car dealerships, and offices with its good access and availability of large land along the NR9. In the future, the old city center is expected to become a tourist center with commercial functions for local residents. The renovation of old historical buildings and improvements to the streetscape has been planned and implemented portionately in this area.

The ACM members have agreed to develop the new commercial center at the designated location. Other comments and intentions from members of ACM and SHM are summarized below:

- The old city center, built in the colonial period should be conserved and developed as a symbol to create the image of the city and it should be a tourist/ visitor center with urban amenities. Heavy concentration of urban functions to the old city center and its surroundings will destroy the image and atmosphere of the area.
- The new city center should be developed in accordance with functions, cost of urban management and an environmental point of view.
- Conserve and develop old city center to formulate attractive place, and develop new city center to achieve functional and economical city.

Environmental impacts of alternative development densities and development directions are analyzed in 3.5.4. Figure 3.46 indicates environmental impacts in different selections of development density and development directions.

3.3.5 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 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.

Although the success of SEZ is the most important key to Kaysone Phomevihane's future, there are various unforeseen factors in the types and scale of industries for SEZ. Consequently, Kaysone Phomevihane possesses only a limited control element to the progress. Based on the Urban Development Vision, Strategy and Development Direction, JST prepared the Urban Structure Plan. The following conditions are considered to formulate the structure plan of Kaysone Phomevihane.

- The factories could be located not only within the SEZ but also along NR9. In addition, large-scale factories in the Urban Planning Boundary can also be relocated inside of the SEZ or along NR9. As a result, the industrial and residential area will be separated appropriately (reflected in the location of commercial center).
- Freight trucks will be restricted from entering the existing residential area (reflected in the location of major arterial road).
- Potential tourism areas in the downtown will be preserved.
- New residential development areas will be developed in low-density, which is favored by Lao people (reflected in expansion of new suburban area).

(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 area. A road and the 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[3]: 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.

[3] Commercial Center includes not only retail stores and commercial facilities but also office complex.

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, the urban area will be expanded to the northeast. An area along the road connecting NR9 and the 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 governmental 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 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 3.11.

Source: JST

Figure 3.11 Proposed Urban Structure

3.3.6 Land Use Policy

(1) Determination of Urbanization Area

The boundary of urbanization area in the target year of 2025 is delineated based on the structure plan in the previous section, and the study of population density allocation as mentioned later.

(2) Conservation and Creation of Green Area in the Urbanization Area

To realize future vision and urban development strategy, conservation and the creation of a green area in the urbanized area is proposed in the land use concept. For the creation of a green city through the development of urban parks in the urbanization area, three urban parks are proposed in the land use concept. One is at the existing Kaysone Phomvihane Park next to the provincial government office, another is at the lowland area near the Friendship Bridge II and the third is in the ex-airport (after closing existing airport in the future).

(3) Historical and Cultural Preservation Area (ZPP)

All provincial towns in Lao PDR have established its city centers along the Mekong River with

colonial type urban designs. These areas are considered as historical and cultural assets to characterize the city's image. It will be an attractive area, not only for the visitors, but also for the residents. This area will be conserved and developed as a visitor attraction area through the renovation of facilities and beautification of the area.

(4) New Development Area

For the realization of the urban structure concept, JST proposes the following new development areas.

- New urban center should be developed, especially a new commercial center. Land use category of the area, designated for new center, will be reflected to the density of the area.
- The existing airport is located in the near vicinity to the old city center, where there is a large potential for urban development in the future. The relocation of the airport is one of the issues for the government. In the land use concept, the existing airport is designated in the Future Development Area.

(5) Land Use Zoning and Density Planning Policy

The proposed land use concept is based on the existing population density of each land use category within the survey area. According to past urban development experience, and the characteristics of urban development in Lao PDR, land use categories are divided into three. They are; the Central, Inner and Suburban areas. The Central Area having a high population density as well as high commercial and other economic activities. The Inner Area is conventionally the surrounding area of the Central area, with mid density, and the Suburbs with a low population density. For land use zoning and density planning, the following method is applied in the proposed land use concept for each area.

The land use allocation by categories is determined by following method.

Central Area:

- Population density of the existing Central Area in Lao PDR was examined, and the average population density with rather good environments, were at approximately 100 persons/ha. This density is utilized for the land use concept plan formulation.
- Central Area is designated to areas where accumulated high population density exists, and areas where expectation of development into high density, such as a commercial center area.

Suburban Area:

- The population density of the Suburban Area is established through analyzing the land allocation to dwelling units and the guideline of "Building Area Ratio & Floor Area Ratio by Land Use Category" which is included in the Ministerial Order on Urban Planning Regulations. In the Suburban Area, it is estimated that 60% of the designated land is used for dwelling units. Applying the urban planning standard mentioned above, the population density to be 45 persons/ha is adopted for the Suburban Area.
- Suburban Area is designated to areas where urban area expansion is anticipated in accordance with future transport axis conservation points. This area is conventionally located on the outskirts of the urban area.

Inner Area:

- The population density of an Inner Area is placed as in between that of the Suburban and Central Areas and at a rather low density of 60 persons/ha is applied for density planning. In the future a portion of this area will transform into the Central Area category when the urban population increases and the urban functions expand after the Master Plan Period.
- Inner Area is designated to the areas where there are established and exististing communities with an agglomeration of buildings. Existing established areas as well as areas that have initiated developing by the development plan are designated to this category.

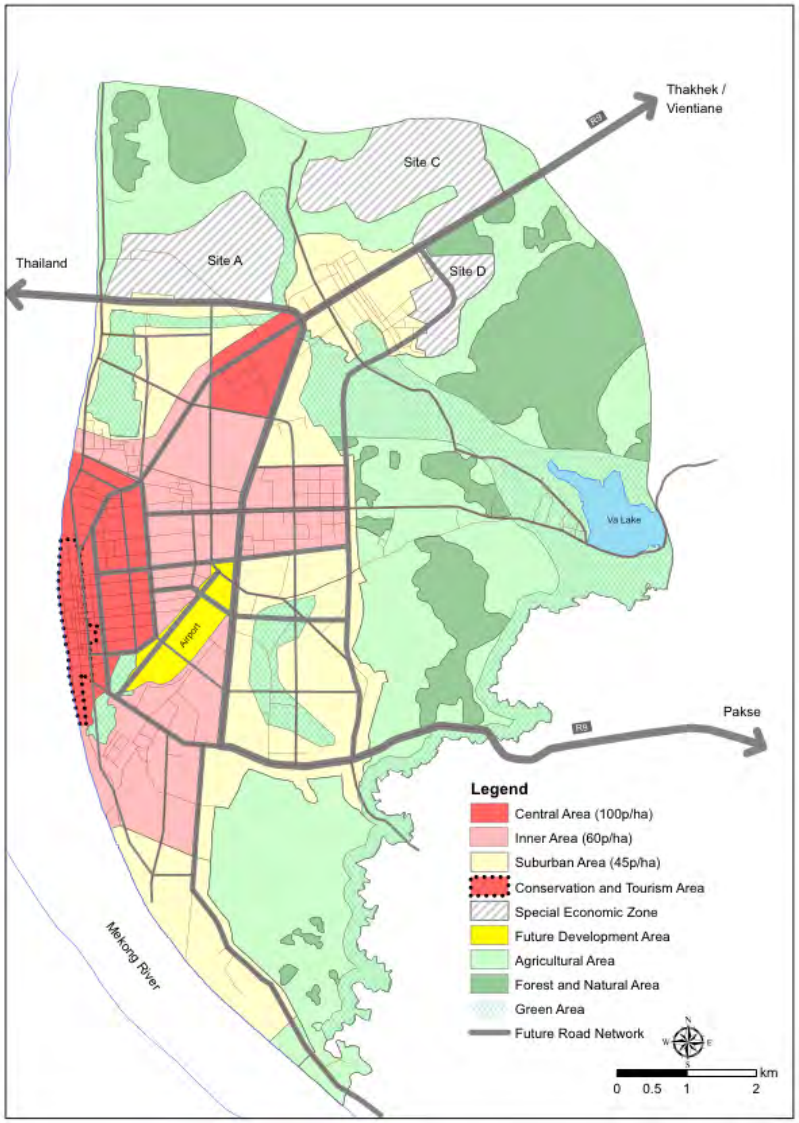
Table 3.12 reflects the land use zoning and density planning criteria which is applied to the Land Use concept formulation.

Table 3.12 Land Use Zoning and Density Planning Criteria

	Urban services (Infra)	Land use policy		Population Density*		Land use category in the concept plan	Land use category in Lao PDR
		Existing Plan	Proposed (2025)	Existing (2005)	Proposed (2025)		
Central Area	Almost already available	Mixed use	Mixed use	63 p/ha	100 p/ha	Central area (high density)	UA (Urban central zone)
Inner Area	Partially available	Mixed use	Mixed use	48 p/ha	60 p/ha	Inner area (mid density)	UB(Urban inner zone)
Suburban Area	Rarelyavail able	Mixed use	Residential dominant	7 p/ha	45 p/ha	Suburban area (low density)	UC(Urban suburbs zone)
Historical Building Area	Already available	Historical and preservation	Historical and preservation (Tourism)	45 p/ha	45 p/ha	Conservation and tourism development area	ZPP (Historical and Cultural preservation Area)
Future Development Area	(Partially available)	Airport	Residential, commercial and urban park	-	-	UD	UD

Note: * Population density in the built-up area. The gross population density is lower than these figures.
Source: JST

Figure 3.12 shows land use concept plan and Table 3.13 indicates land use area and development density.



Source: JST

Figure 3.12 Land Use Concept Plan

Table 3.13 Population, Density and Land Use Area

Land Use		Land Use Area (ha)		Population Density	Population	Household Size	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

The followings points are proposed as the land use concept.

- The land use concept plan is formulated based upon the Structure Plan, described in the

previous section, and the application of regulation for land use zones which is included in the Urban Planning Manual (Draft). The regulation provides land use, and building construction allowable in each type of urban area within the urban master plan. It designates six land use categories.

- To encourage and revitalize the urban center function in the old city center, priority should be placed on the conservation of historical buildings and the utilization of land be focused upon commercial and tourism use and not on residential within the Historical and Cultural Preservation Area.
- For the creation of a green city, the existing green areas, includes drainage areas in the west of the airport and the west of the proposed new commercial center. Forest and agricultural areas between the SEZ project sites and the eastern portion of the Urban Planning Area are designated as conserved green areas, as well as proposed parks in portions of the green area.
- Northern part of SEZ Site A and C, and both side of areas along NR9 are designated as agriculture and forest/natural area for control urban sprawl.

3.3.7 Infrastructure Development

(1) Road and Transport

Number of motorbike and car is estimated to be 167,000 and 20,000 in year 2015 and 406,000 and 41,000 in year 2025 in Savannakhet Province.

Table 3.14 No of Vehicle registered in Savanaket Province in the future

	Census 2005*2 (000 persons)		No of Registered Vehicles in 2007*1 (000 bikes/cars)	
	Population	Household	Motorbike	Car
2007	826	131	85	9
2015	983	167	167	20
2025	1,134	203	406	41

Source: JST

Kaysone Phomvihane is an administrative and commercial center of the Province. Therefore, many vehicles will converge to this area. Furthermore, NR9 connecting Thailand passes through a suburb of the urban area. Future traffic congestion is foreseen. To avoid traffic congestion, and to sustain a smooth flow of traffic, roads and an efficient road network should be developed.

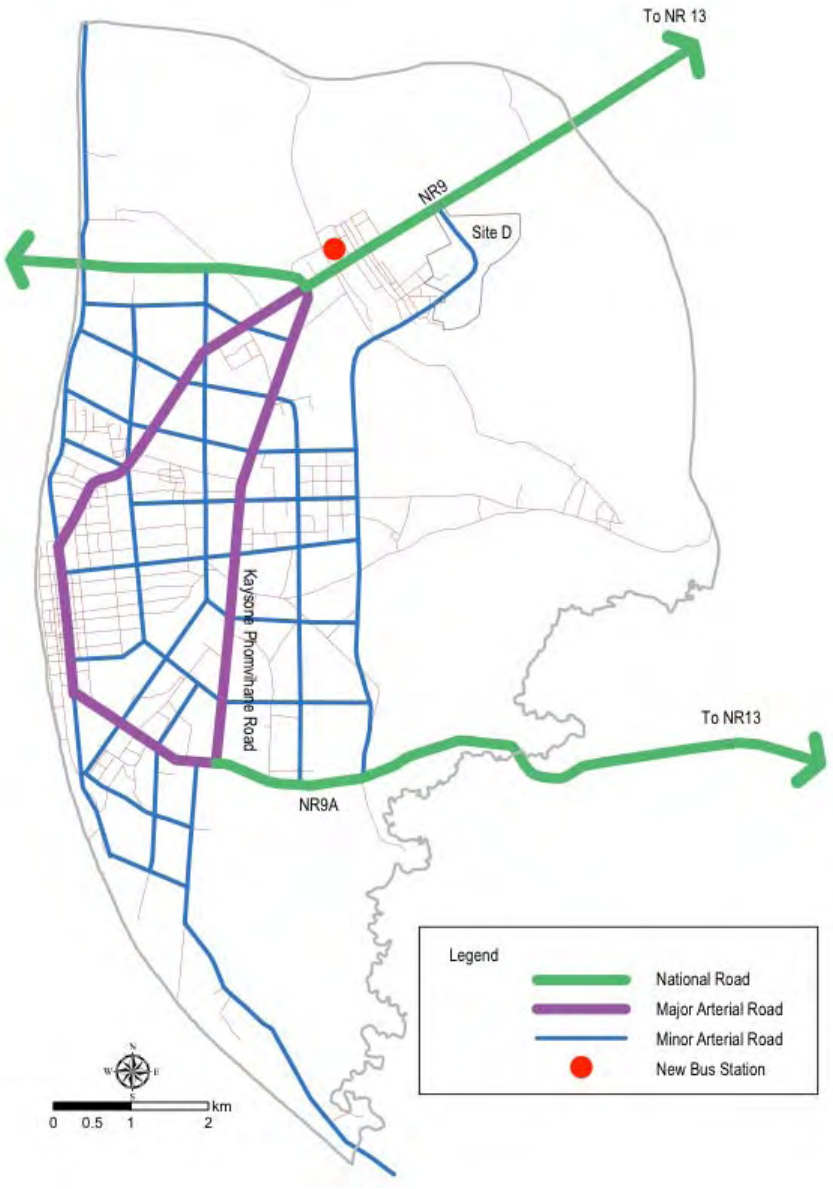
An existing grid road pattern will be followed and expanded to a newly urbanized area. Existing road networks in an urbanized area will be improved and upgraded for urban development toward 2025 and be utilized as much as possible. In addition, new roads such as; minor arterial, collector and local roads will be arranged and constructed to formulate a skeleton of a future urban area and new blocks considering the future population density of each land use. Especially, minor arterial roads formulate a skelton of a block in the urban area. Minor arterial roads will be layed out to formulate a block with length of approximately 1km x 1km.

Two national roads/inter-regional trunk roads exist at Kaysone Phomvihane. One is the NR9 running east to west to Thailand at the northern portion of an urbanized area. The other is NR9A running also east to west at the southern portion of an urbanized area. However, presently, there is no existing well-developed arterial road connecting the two truck roads. Therefore, an existing Kaysone Phomvihane Road should be improved as part of the National Route and connected to NR9 and NR9A. These three roads will formulate a traffic axis of the urban area of Kaysone Phomvihane.

A new minor arterial road connecting NR9 and NR9A will be constructed. This new road will path through an eastern fringe of the urban area and will be a boundary of a development area and a protection/conservation area.

Thahe Road is running parallel to the Mekong River. This road, except for an estimated 500m section between an old stadium and temple, had been improved and widened by ADB project. This undeveloped section will be improved and widened to attract residents and tourists.

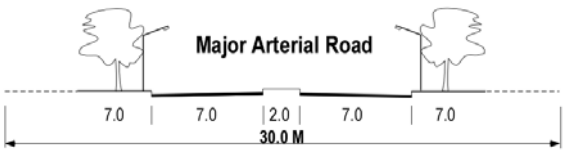
Road network in 2025 shown in Figure 3.13 consists of National Road, Major Arterial Road, Minor Arterial Road, Collector Road and Local Road.

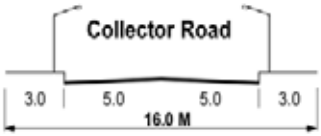


Source: JST

Figure 3.13 Road Network at Kaysone Phomvihane in 2025

Composition of road cross section of each road is indicated in Figure 3.14 and Table 3.15.





Source: JST

Figure 3.14 Typical Cross Section of Roads in Kaysone Phomvihane

Table 3.15 Composition of Road Cross Section

Road	Composition of Road Cross Section	Remarks
Major arterial road	W=30m (2x3.5m roadways at one side, a sidewalk at both side, 2m median)	Kaysone Phomvihane Road
Minor arterial road	W=22m (2x3.5m roadways at one side, a sidewalk at both side)	
Collector road	W=16m (3.5m roadway and 2.5m waiting bay at one side, a sidewalk at both side)	
Local road	W=13.5m (3.25m roadway and 1.5m waiting bay at one side, a sidewalk at both side)	

Source: JST

A 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. Route buses will be operated mainly on urban major and minor roads.

No public parking is provided in Kaysone Phomvihane. Vehicles are parked on road. It disturbs smooth traffic flow and causes traffic congestion especially at a commercial area. An increase of vehicles and the volume of traffic is foreseen in the future. Thus, public parking should be constructed in the urban area, especially a commercial area.

The existing bus station is already located at a built-up area. This and the surrounding area are expected to become a new commercial center and will become a busy area. A new station will not be limited to international and inter-provincial buses, but will be utilized by route buses also. For easy land acquisition for a new bus terminal, avoiding traffic congestion at a new commercial center, easy connection of international, inter-city bus and a route bus, keeping urban and living environment good condition, a new bus terminal for international, inter-city and route buses is planed at an outskarts of and an entrance to the urban area of Kaysone Phomvihane, facing to NR9. Commercial facilities will be prepared within the vicinity of a bus station for the convenience of bus users.

Taxi pools should also 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.

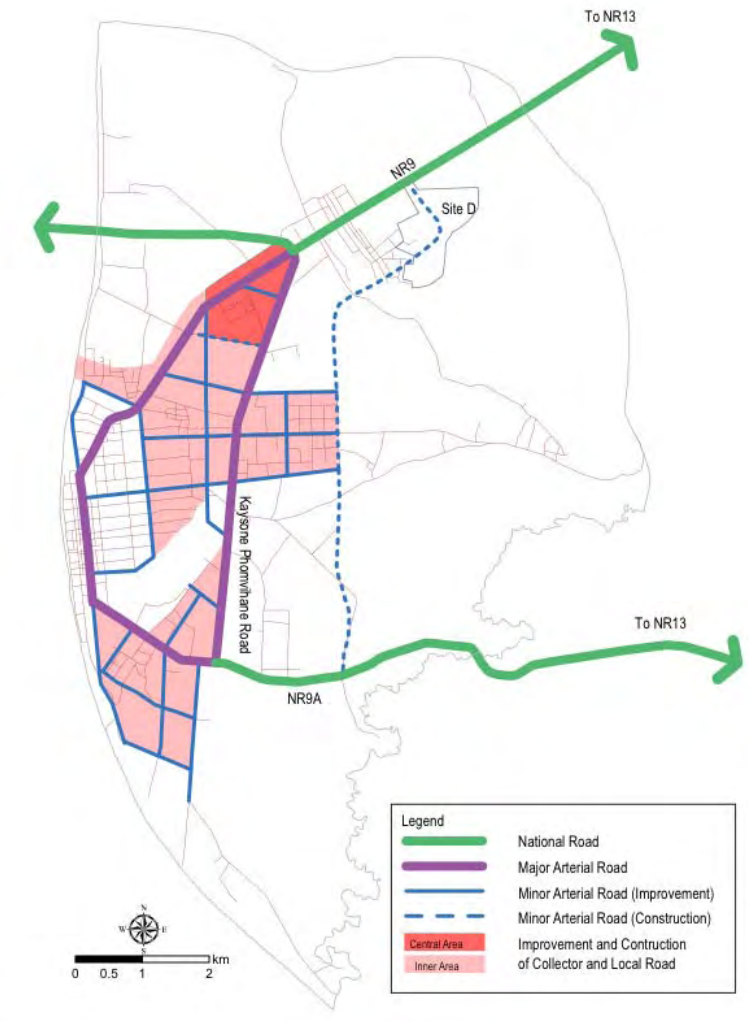
Figure 3.15 shows roads that will be developed until 2015. Table 3.16 shows road and transport related projects necessary for the realization of urban development toward 2025. These projects include a study and design work, also.

Table 3.16 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 center area and inner area (53.5km)
2	Improvement and Construction of Collector and Local Road 2	DPWT/UDAA	Mainly urban suburbs area (80km)
3	Improvement and Construction of Urban Minor Arterial Road 1	DPWT/UDAA	Mainly center area and 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 suburbs 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 the 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 3.15 Roads developed in Kaisone Phomvihane until 2015

(2) Water Supply

JST prepared a future water supply plan for residents in the urban area, and establishes a target that the majority of urban area residents will be able to receive water supply service from the Savannakhet

Water Supply Company. 100% of households or residents in ZPP, center, and inner areas will be supplied with water. 60% of households or residents in the suburban area will be supplied water in 2015, and 80% in 2025. Table 3.17 shows the population to be supplied with water in the years 2015 and 2025. Water supply service to SEZ sites is not included in Table 3.17 and Table 3.18.

Table 3.17 Water Supplied Population in Kaysone Phomvihane

Zone	Year 2015	Year 2025
ZPP	3,500	3,500
Center Area	23,735	28,528
Inner Area	52,894	61,182
Suburban Area	6,163 (10,271 x 0.6)	29,240 (36,550 x 0.8)
Total	86,292	122,450

Source: JST

Water demand in the future is estimated based on urban population, unit volume (200 liter/person/day), rate of water leakage (20%) and peak factor (1.2).

Table 3.18 shows water demand forecasts in 2015 and 2025, respectively.

Table 3.18 Water Demand Forecast

No.	Item	2015	2025
1	Unit water consumption (litter/cap/day)	200	200
2	Population	86,292	122,450
3	Water Demand = 1 x 2, (m^3/day)	17,300	24,500
4	Water leakage (20 %) = 3/(1-0.2), (m^3/day)	21,600	30,600
5	Peak Factor (1.2) = 4 x 1.2, (m^3/day)	25,900	36,700
6	Water Demand Forecast, (m^3/day)	25,900	36,700

Source: JST

Water demand in 2015 and 2025 are estimated at; 25,900 m^3/day and 36,700 m^3/day respectively. The existing water supply capacity is; 15,000 m^3/day. Capacity of required additional water supply facility is, therefore; 10,900 m^3/day and 21,700 m^3/day, around 11,000m^3/day and 22,000 m^3/day. In conclusion, a new water supply system with the capacity of 11,000 (25,900-15,000=10,900≒11,000) m^3/day for the year 2015, and 11,000 (36,700-15,000-11,000=10,700≒11,000) m^3/day for the year 2025 should be constructed.

There is space, at the existing site of a water treatment plant; to construct the new additional water treatment plant of 11,000 m^3/day needed for year 2015. There is also space to install additional pumps for year 2015 within the existing raw water intake tower. However, this existing water intake tower does not have the space to install the additional pumps necessary for the capacity of year 2025, and the existing site of a water treatment plant is also limited to its space capacity for the additional water treatment plant of 11,000 m^3/day needed for year 2025. Therefore, an examination should be made into an appropriate location along the Mekong River, downstream of the existing plant as a site for a new water intake tower and water treatment plant with the capacity of 11,000 m^3/day needed for year 2025. (Location of a new water treatment plant for year 2025 is shown in Figure 3.16 tentatively.)

Table 3.19 Additional Water Supply Facilities needed up to 2015

Water supply facilities needed	Year 2015	Remarks
Raw water intake pumps	2 sets	Within an existing water tower
Water treatment plant	11,000 m^3/day	Within an existing site of a water treatment plant
Clear water & backwash reservoir	1,500 m^3	Within an existing site of a water treatment plant
Transmission/Distribution Pumping Station	Three pumps	
Transmission main; 500 mm	8 km	
Distribution main; 100-350 mm	12 km	

Distribution pipe; 40-75 mm,	400 ha	
Elevated water tank	1,000 m^3 x 1	

Source: JST

To supply water with enough pressure to the service area, an elevated water tank and related transmission pipeline and distribution pipeline should be installed. Water supply facilities necessary to meet the water demand in 2015 and in 2025 are shown in Table 3.19 and Table 3.20, respectively. Table 3.21 and Figure 3.16 show water supply projects. These projects include study and design work. Table 3.52 indicates estimated environmental impacts with and without of water supply projects.

Table 3.20 Additional Water Supply Facilities needed up to 2025

Water supply facilities needed	Year 2025	Remarks
Raw water intake tower	1	At a new place
A bridge for a raw water pipe	1	A bridge connecting a tower and a bank
Raw water intake pumps	2 sets	1 set is for stand-by
Water treatment plant	11,000 m^3/day	At a new place
Clear water & backwash reservoir	1,500 m^3	At a new place
Transmission/Distribution Pumping Station	Three pumps	
Transmission main; 500 mm	8 km	
Transmission main; 400 mm	7 km x 2	
Distribution main; 100-350 mm	25 km	
Distribution pipe; 40-75 mm,	1200 ha	
Elevated water tank	1,000 m^3 x 3	

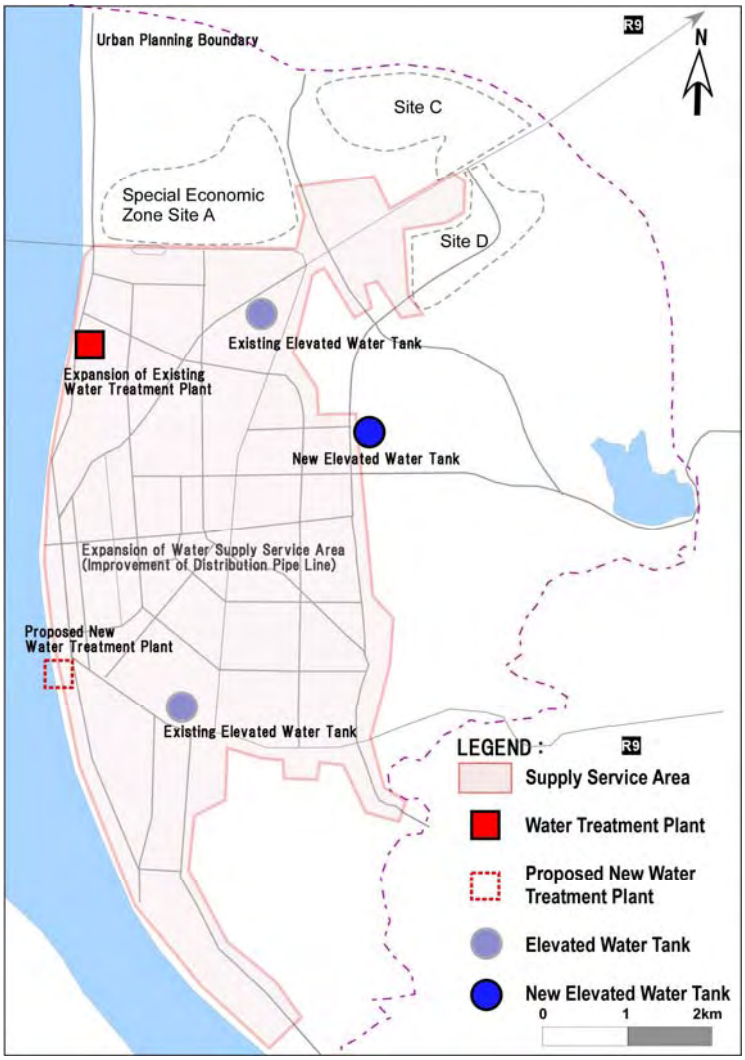
Source: JST

Table 3.21 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 in Kaysone Phomvihane

Source: JST

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



Source: JST

Figure 3.16 Water Supply Service Area and Location of Water Supply Projects

(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 address 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 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 will be recommended. An estimated 80 to 100m^3 per day wastewater is discharged from a market place.

Savanxay Market has a wide space for parking within its 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.

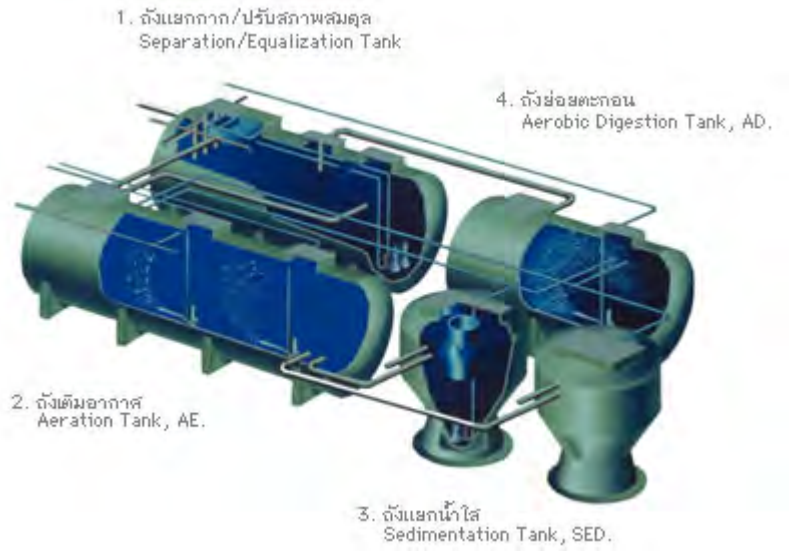
After 2015, an expansion of this system will be made to villages in the urban area, especially to center and inner areas.

Table 3.22 Sewerage Treatment Projects

	Project Name	Implementing Agency	Project Location
1	Development of Sewerage Treatment Facility (Pilot Project at Savanxay Market) including; - Capacity development on sewerage treatment facility operation and maintenance for further implementation - 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 building on future operation and maintenance - Initiation collection and treatment fee from residents	UDAA	The whole area of UDAA of Kaysone Phomvihane

Source: JST

Capacity of a sewerage treatment facility as a pilot project is approximately 80 to 100 m^3 per day (based on water consumption in the market) with the aerobic package treatment unit(s). A treatment facility will be installed under the parking area or green area in front of the market. A photovoltaic generation system will also be provided for the operation of the facility. Solar panels will be installed on a roof of the market. Figure 3.17 and Figure 3.18 show the system of community sewerage treatment proposed for the project. Table 3.22 and Figure 3.19 show sewerage treatment projects. These projects include a study and design work. Table 3.52 indicates estimated environmental impacts with and without sewerage treatment projects.

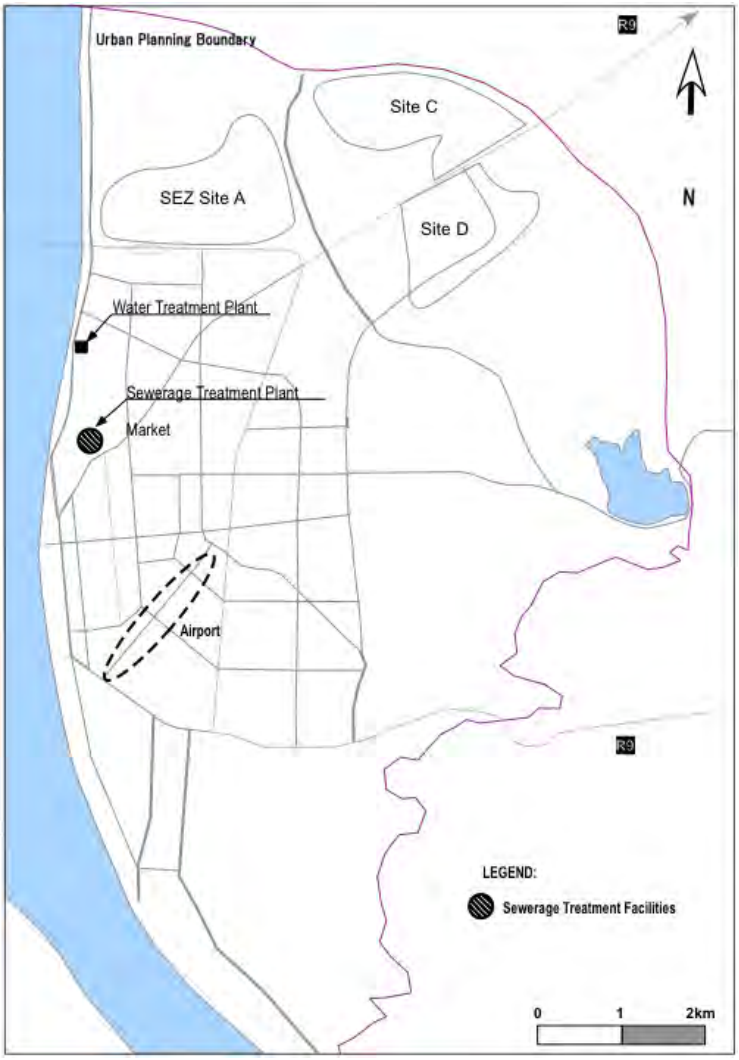


Source: Product Catalog of Package Wastewater Treatment Tank Supplier in Thailand – Premier Products for Aeromax Model

Figure 3.17 System of Community Sewerage Treatment

Source: Product Catalog of Package Wastewater Treatment Tank Supplier in Thailand – Premier Products for Aeromax Model

Figure 3.18 Installed Community Treatment Tank



Source: JST

Figure 3.19 Location of Sewerage Treatment Projects

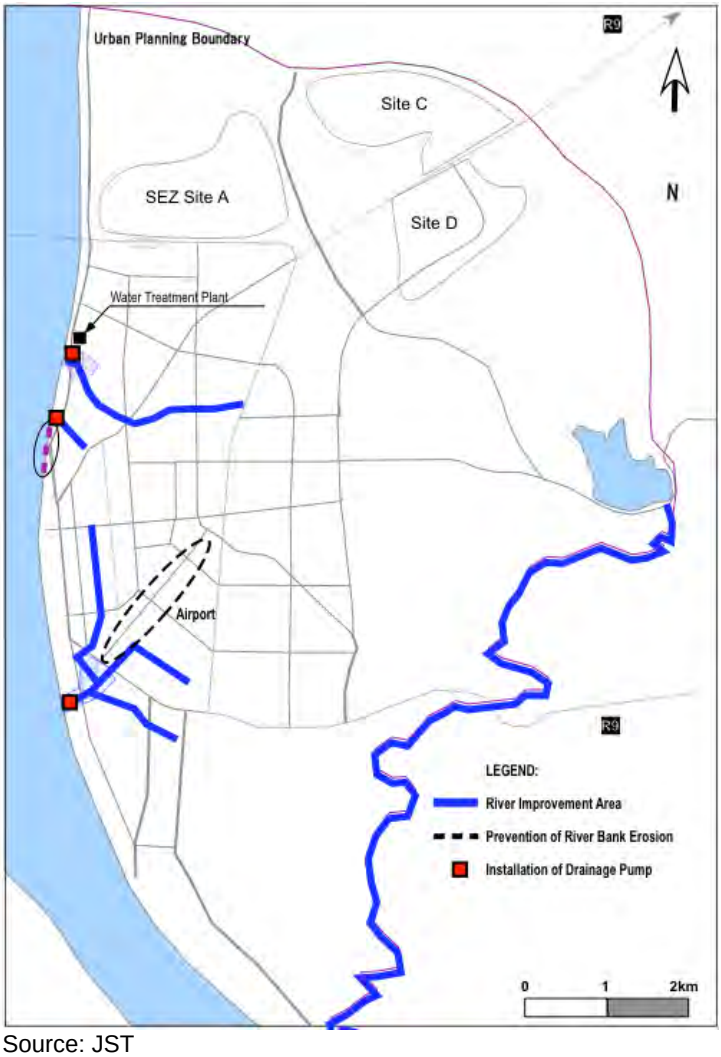
(4) Drainage and Flood Mitigation

Drainage and flood mitigation measures had been implemented in year 2000-2003 by the ADB Secondary Towns Urban Development Project. However, floods continue to be one of the severe problems in Kaysone Phomvihane. Floods, at times, occur in the urban areas reflecting the necessity of additional projects to further improvement the drainage system, flood mitigation and riverbank protection measures.

There are 2 natural streams in the urban area, one in the vicinity of the water purification plant, and the other near the airport. The banks of these streams should be reinforced and protected by grass, not with artificial material such as concrete. These locations will be part of the green network and one of the recreational areas for residents.

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 to mitigate damage.

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 3.23 shows drainage and flood mitigation projects. These projects include a study and design works.



Source: JST

Figure 3.20 Location of Drainage and Flood Mitigation Projects

Table 3.23 Drainage and Flood Mitigation Projects

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 of 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.

Accessibility to the solid waste collection points, including individual households, will be improved through the improvement and construction of roads in the urban area. To further improve the solid waste collection ratio, an awareness program on the importance of solid waste collection and treatment should be prepared and implemented toward residents. The solid waste collection ratio increase target will be 40% to 60% in the year 2015 and up to 90% by the year 2025. In addition, building awareness toward the importance of reducing solid waste volume through recycling and reusage should also be included in this program. Added to an awareness program, vehicles and equipment necessary for the collection and hauling of solid waste should be provided.

Table 3.24 Volume of Solid Waste collected in the future

Item		Year 2015	Year 2025	Remarks
1	Future Population	94,000	133,000	-
2	No. of Household Member	5.8	5.5	-
3	No. 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^3/t)	0.7	0.7	-
9	Solid Waste Volume (m^3/day)	23.5	57.5	-
10	Estimated Solid Waste Volume in a year (m^3)	8,600	21,000	365day/year
11	Estimated Total Solid Waste Volume for 11 years (m^3)	162,800		From 2015 to 2025
12	Estimated Total Volume including covering soil for 11 years (m^3)	227,900		11 x 1.4
13	Landfill Cell Area needed (ha)	10.9		2.5m depth

Source: JST

The weight of solid waste discharged is expected to increase from 12.4t/day in year 2007 to 33.6t/day in year 2015 and up to 82.1t/day in year 2025. The volume of solid waste discharged will become 23.5m^3/day in year 2015 and 57.5m^3/day in year 2025 respectively. The total volume of solid waste and covering soil for 11 years is estimated at roughly 227,900m^3. It will require an additional landfill cell area of around 11ha in the existing dump site. The existing dump site has no leachate treatment facility and no lining at the bottom of the cell. Resulting in the necessity to improve and expand the existing solid waste-dump site to meet the foreseen future solid waste discharge volume. A new cell complete with lining and leachate treatment facility should be provided within the existing site.

Table 3.25 shows solid waste related projects in Kaysone Phomvihane. These projects include a study and design work.

Table 3.25 Solid Waste Management Projects

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

Source: JST

(6) Park and Town Beautification

An attractive city in terms of visual townscape and functional amenities is vital in promoting to a variety of visitors, which would also include investors and tourists. 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. Cities with abundant greenery with relatively low rise, low-density buildings are the typical image of the urban area of Lao PDR.

The following urban parks and green area developments are planned toward 2025 in Kaysone Phomvihane.

Kaysone Phomvihane Park: located east of the Provincial Government Office at the future Administration center. Land area is approximately 10 ha, surrounded by a fence. Kaysone Phomvihane Statue stands where a small plaza with pavement is constructed at the main gate located on the north side of the park. Aside from this spot nothing has yet to be developed. An urban park development within this site is proposed as one of the park and town beautification project. This park will be enjoyed and utilized by residents as an area that provides recreation as well as relaxation; schools can also hold an open air class room for its school children. The following facilities and area will be developed through;

- The removal of the majority of the existing fence, provision of parking space around the park to provide open access to park visitors
- Improve and expand the existing museum into a multipurpose visitor center
- An open football ground
- Sports facilities such as; tennis courts, basketball courts, volleyball courts, etc.
- Forest area with a variety of native trees, flowers, shrubs with footpaths and lighting, benches, shelters and stalls.
- Pond area improvement for recreation and relaxation

Urban Park-1: located in the northern part of Kayson Phomvihane in the vicinity of the existing water treatment plant. The designated area is wetland and is functioning as a detention pond of the drainage system. The lowland area will be conserved as a flood prone basin cum park and during the dry season a multipurpose open field will be accessible and trees, shrubs will be planted. The developed area will be 4 to 6 ha.

Urban Park-2: located in the southern part of Kayson Phomvihane near the existing airport. The designated area is wetland and is functioning as a detention pond of drainage system. The lowland area will be conserved as a flood prone basin cum park and during the dry season a multipurpose open field with an area of trees and shrubs will be developed. The park land will be extended to the south

end of the existing airport area. This extended portion's landscape will be by service buildings and facilities, in the event the airport is relocated to another area. Development area will be 6 to 15 ha.

Green area conservation and development should be conducted by conserving the natural forest along the streams and main drainage channel. The Sompoy Stream green area development includes the green belt conservation along the Sompoy Stream. Width of the green belt will be 500 m from the centerline of the stream in general, making the total width 1000 m. The surrounding area of Lake Va will be conserved and developed as a recreational area for residents and visitors. Total designated green area will be approximately 1,500 ha.

In principal, no facilities development is allowed in the green area. A number of green areas are being utilized as agricultural land. A continuation of the present activities and land utilization can be conducted in the future.

As described in 3.3.5, roads from Lake Va to the Mekong Riverside through the Administration Center has a planted zone. It is positioned as "Green Avenue" of Kaysone Phomvihane.

Source: JST

Figure 3.21 Urban Parks and Green Area

Table 3.26 Park and Town Beautification Projects

Project Name		Implementing Agency	Project Location
1	Improvement of the existing Kaysone Phomvihane Park	UDAA	The existing Kaysone Phomvihane park for general Purpose park
2	Development of main park-1	UDAA	Near an existing water supply plant
3	Development of main 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 Va in the survey area

Source: JST

3.4 Pakse

3.4.1 Socioeconomic Framework

(1) Future Economic Activity

The Champasack Province has potentials 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. Champasack 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 the agricultural and agro-processing industry will further develop supporting the continuation of Champasack Province being the center of economic activity.

Champasack Province also has tourism resources which will attract international tourists. By improving the connectivity 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 Champasack Province, but also in the southern region of Lao PDR. It will function as the center of administration services and commercial activities for Champasack 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, supporting industries will be located in the Pakse. In the future, a percentage of the labor force of these industries will also live in the Pakse.

(2) Demographic Framework in Pakse District

In Chapter 2, JST set the demographic framework for Pakse and the urban planning boundary as indicated in Table 3.27 and Table 3.28. The population in the urban planning boundary will increase from 73,000 in 2005 to 147,000 in 2025. The number of households will also increase from 12,000 in 2005 to 27,000 in 2025.

Table 3.27 Change of Population in Urban Planning Boundary

Unit: 000 persons

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

2025	147	93%

Source: Census 2005; JST

Table 3.28 Change of 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

3.4.2 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 to show a higher population growth than Kaysone Phomvihane due to the rapid economic development of the surrounding region. The population within the urban planning boundary will increase from 73 thousand in 2005 to 147 thousand. The population pressure in the rural areas added to the improved access to urban areas will trigger a population inflow to the urban areas for further economic opportunities.

In the future, economic activities and the inflow of population to the urban areas will accelerate. 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 activity: Major economic activity around Pakse is high value-added agriculture at Boloven Plateau, labor-intensive industry at the 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 motorbikes and private cars in Champasack Province will increase from 42,000 and 5,000 in 2006 to 351,000 and 35,000 in 2025.

(b) Enhancement of urban infrastructure services, logistics and public services

The Champask 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

(a) Opinions of the ACM/SHM members

JST identified issues on land use and infrastructure through its site surveys and also collected opinions on infrastructure improvement needs from ACMs and SHMs. The needs heard were compiled and summarized in Table 3.29. The issues are compiled in the following sections.

Table 3.29 Opinions of ACM/SHM on Land Use and Infrastructure

ACM and SHM	Opinions from Members of ACM and SHM
1st ACM (March 2009)	Necessary improvements of infrastructure are - Riverbank at Mekong River and Xedon River, - Sewerage network, - Collector roads, - Flood mitigation, and - Solid waste management
2nd ACM (July 2009)	- Need of expansion of planning boundary (for new residential area and promotion of FDI) - Consideration of townscape and cultural conservation - New bypass location differs from their plan - Need of fire protection (hydrants) - Traffic safety and management (traffic signals & parking space)
1st SHM (July 2009)	- Old city center should be commercial & service area - Riverbank erosion (Mekong & Xedon) - Unpaved local roads - Solid waste collection and disposal - Waste water discharge to drainage system
3rd ACM (Aug 2009)	- Expansion of the city to the area beyond the airport will cause noise and vibration problems to the residents. It is better if the city expands to Bachiang Mountain. - This strategy has been defined some development centers such as sport, education, industrial, transport and logistics centers. It is possible to propose tourism center location for example in attraction areas such as temples, along Mekong river, cultural park, etc - To meet the future image of Pakse (tourist and agricultural base), how agricultural area should be defined in urban area. - Many facilities are included in infrastructure consideration. How about electricity issue? - In slide 18 mentioned landfill site in Champasack District, in reality it is located in Sanasomboun District. - The development of sanitary landfill site is proposed in this strategy. It is possible to give more detailed methodology or activity of sanitary landfill. - Add more topics regarding urban cleaning management. - The effects from urban development (road, drainage, park and other infrastructure) proposed in this strategy should be considered and analyzed. - Priority road development proposed by the team is focus on main network. While the minor network is not proposed.
2nd SHM (August 2009)	- Old city center should be commercial & service area - River bank protection may affect some residents. What kind of compensation can the affected residents receive? - Solid waste collection service is not securie in terms of collection date. This can cause environmental problems such as odor and filth. - No connection drainage system from community to public drainage. As a result of flooding. - New proposed bypass road may affect to the local residents and their properties such as houses, land and other. It is better if we offset the alignment close to Gnang River. - The local road width is defined about 13.5 m. While, the existing road width within village can be expanded 6m - 8m how could it applied in reality - Due to the insufficiency of solid waste collection, people are disposing the solid waste by themselves some time they are dumping in public are such as cultural park.

Source: JST

(b) Land Use

Limited area for CBD and urban area expansion: An appropriate area for the urban area within the urban master plan boundary is limited, which resulted in the urban area expanding to the east and encroaching upon a neighboring district.

Land use and building construction against the urban master plan: The booming tourism industry

requires large-scale hotels on scenic sites downtown. However, coordination with the master plan is insufficient and hotel investors can select their sites regardless of building regulations defined by the land use.

Developments in the unsuitable areas: The elevation of the land on the west bank of the Xedon River is too low and not suitable for human settlement. However, people build their elevated houses without land reclamation.

Hotel constructed at the riverside

Restaurant constructed at low land

Source: JST

Figure 3.22 Situation of Land Use

(c) Road and Transport

No clear road hierarchy in the urban area and immature road network: Excluding some roads such as; NR13 and NR16, the width of the majority of roads in the urban area is almost the same, and there is no clear road hierarchy can be seen at present. Furthermore, aside from some areas that have been developed earlier, many dead-end roads exist and the road network is immature.

Unsatisfactory road development: The pavement condition of main roads in the urban area is very good. All of the main roads have been paved. However, the pavement condition of minor roads is poor. Total length of minor roads in the urban area is roughly 73 kilometers. Around 66km of these minor roads have not been paved yet. Moreover, many roads are without sidewalks or streetlights exist in the urban area, in particular, residential areas.

NR13 in the urban area: The urban area of Pakse is located at the strategic intersection of two national roads, NR13 and NR16. NR13 is a very busy and important arterial road connecting the northern and southern region of Lao PDR, running through a less-urbanized area in Pakse at present. However, in the future, this locale is expected to become a central part of the urban area in Pakse.

Limited transport capacity of French Bridge: Severe traffic congestion regularly occurrs at the French Bridge on NR13 over the Xedong River. The source of this congestion is the permitted two-way traffic on the bridge which is only 3 meters in width.

No public transportation: No public transportation operates within the urban area or its vicinity. Tuk-Tuks and Sonteos operated by individuals and families are main source of mass transportation for residents and tourists.

No Public parking in the urban area: A number of public and private buildings have parking facilities within its property for customers and visitors. However, there are no public parking developed yet. Vehicles are ultimately parked on roads, particularly in commercial areas, leading to, at times, traffic congestion.

Three bus terminals at different locations: Three bus stations for international and inter provincial buses exist at three different locations along NR13 and within the Survey area. This is inconvenient for bus users and is also inefficient for bus operation.

NR13 passing through the urban area

Bus station at the east of Pakse

Source: JST

Figure 3.23 Situation of Road and Public Transport

(d) Water Supply

Limited water supply capacity for the future: The population within the urban planning boundary was around 73,000 in 2005. Of which, around 57,200 (78.4%) lived in a water service area and around 49,800 (68.2%) had actually received water from a water supply company in 2005. In 2008, roughly 60,500 residents live within a water service area and an estimated 56,200 (92.9%) received water. The water supply area covers the majority of the urbanized area. At present, the daily production capacity of water supply and daily consumption of water per person is roughly 13,200m^3 and about 150 litters, respectively. The present conditions of; water production and water consumption at Pakse is relatively good. However, in view that the population in the urban planning boundary of Pakse is estimated to become 101,000 in 2015, and 147,000 in 2025 respectively, the current production capacity will not be sufficient for the future.

(e) Sewer and Sewerage Treatment

Improper sewer and sewerage treatment system: Pour-flush or dry latrine equipped with septic tanks have been adopted as the sewer and sewerage treatment system in 100% of households in the urban area of Pakse in 2007. Due to the improper construction of septic tanks, wastewater from faulty septic tank leak into the nearby ground contaminating soil and groundwater at a number of buildings. Moreover, used water from kitchens and bathrooms is discharged directly into drainage channels near buildings.

(f) Drainage and Flood Mitigation:

No proper development in banks of streams: Banks of streams running within the urban area has not been reinforced and protected. Therefore, portions of a bank have been encroached and collapsed.

No gate and pump in stream mouths to the Mekong River: No flap gate and pump have been installed at 3 streams in western bank and also one steram in eastern bank of Xedong River. Therefore, flood sometime occurs at those streams.

Erosion of Mekong Riverbank and Xedong Riverbank: Bank erosion of the Mekong River and Xedong River is occurring slowly but surely. This is one of the concerns of residents.

Improper development of stream bank

Flood gate without pump

Source: JST

Figure 3.24 Situation of Drainage and Flood Mitigation

(g) Solid Waste

Low solid waste collection rate: Collection rate of solid waste is extremely low. Roughly 8,900 households existed in the service area of UDAA in year 2006-2007. However, the UDAA made contracts for solid waste collection with only about 40% of the households due to insufficient road development and the shortage of staff and equipment.

Insufficient public education for solid waste disposal: Residents are seen to discharge solid waste into public locations such as streams and roads, as well as burn it within their yards. This is also one of the reasons of the low collection rate.

Inadequate development of dumping site: Lining, at the bottom of a cell, and a leachate treatment facility had not been installed at an existing dump site. Furthermore, discharged solid waste has not been covered.

No dumping site: There are no dump sites developed in the Pakse District. Solid waste collected in Pakse is discharged into a dump site at the Xanasomboun District.

Solid waste discharged at a stream

Solid waste not covered

Source: JST

Figure 3.25 Situation of Solid Waste Management

(h) Park and Town Beautification

Few recreational parks: There are parks such as; the Red Square Revolution Park. However, no amenity facility or recreation has been provided in parks except some in Vientiane. Moreover, the parks have been surrounded by fences, with only one or two entry/exit points.

No green areas: Many green areas exist within the boundary of the master plan, especially along streams. However, these green areas have not specifically been designated as protected areas in the master plan. There are no intentionally developed green area for the protection of the urban environment and the creation of the urban landscape. Green areas will be developed prior to future

population increase.

Park with few visitor

Green area along a stream

Source: JST

Figure 3.26 Situation of Park and Town Beautification

3.4.3 Vision

(1) Vision of Pakse

Vison of Pakse was prepared in the same process as Kaysone Phomvihane described in 3.3.3. ACM members stated some key elements of the vision, and JST suggested additional ideas in the context of the national and regional development.

Table 3.30 Opinion on Vision of Pakse

ACM and SHM	Opinions from Members of ACM and SHM
1st ACM (March 2009)	- Pakse has a strong relationship in economy and culture with Ubon Ratchathani which is located at 40km west. Pakse also has good accessibility to Bangkok, Phnom Penh and Ho Chi Minh City - Pakse is the center of the southern region of Lao PDR. - Utilizing such advantages, provincial government wants to develop Pakse as a center of tourism base and commercial center. - Provincial government also wants to upgrade Pakse as a municipality like Vientiane Capital in the near future.

Source: JST

Through the exchange of opinions with members of ACM and SHM, the Vision of Pakse was confirmed as the following descriptions.

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

(2) SWOT Analysis

In order to achieve the Vision and introduce strategies, JST prepared a SWOT analysis for Pakse. Strengths, Weakness, Opportunities and Threats of Pakse were compiled as shown in Table 3.31. A draft version of the SWOT was prepared by JST and PTI, and final version was prepared after reflecting comments at the 2nd ACM and the 1st SHM.

Table 3.31 Strength, Weakness, Opportunities and Threats of Pakse

Strengths	Weakness
- Booming in agriculture and tourism industries - Rich and diversified agricultural resources	- Limited development area for future expansion of the city in the existing district boundary - Low level of urban infrastructure services such as water and sewerage
Opportunities	**Threats**
- Progress of regional integration such as AFTA and GMS program - Access to mega cities of Thailand, Cambodia and Vietnam - Integration with the surrounding districts/villages (west side of Mekong River and toward Boloven Plateau) in accordance with expansion of city area	- Budget constraints for development - Dependency on international development partners - Disordered development due to rapid urbanization and industrialization at industrial zone - Difficulty of coordination with the surrounding districts/villages

Source: JST

(a) Strengths

Pakse became one of the important tourism destinations with the World Heritage inscription of Vat Phou in 2001. In addition to the temple, there are various tourism resources such as the Mekong River, the Bolaven Plateau and other historically relevant sites. Also, the agriculture development projects invested by the private sector have just started in the Baloven Plateau, which is 20 km east of Pakse. Thus, tourism and agriculture are booming here.

Coffee and vegetables of Bolaven Plateau have been the typical export produce in Champasack Province. Not limited to coffee, there are other high value-added produce such as organic vegetables cultivated in the area as well. The natural conditions and recent economic environment enriched and diversified the agricultural resources of Pakse.

(b) Weakness

Pakse stands for "mouth of river" in the Lao language. Naturally, the central area is as low as the Mekong River and its tributary of Xedon. The western bank of Xedon is low and inundated in the rainy season - land for development is limited.

Similar with Kaysone Phomvihane, Pakse residents and businesses are suffering from its low level of infrastructural services. In particular, the city needs to invest in a water supply and sewerage system.

(c) Opportunities

The economic impact by AFTA and GMS is similar to that of Kaysone Phomvihane. Added to this, Pakse will receive the impact of tourism and agricultural investment.

Historically, Pakse has been open to Northeastern Thailand. The population of Ubon Ratchathani (1.8 million) is much larger than Nongkhai (90 thousand) near Vientiane and Mukdahan (30 thousand) near Kaysone Phomvihane. Recent road improvements and the opening of the national border with Cambodia will improve its access to Cambodia and Vietnam. In particular, access to large cities such as Ho Chi Minh City (6.3 million), which is almost the same distance from Pakse to Vientiane, and Phnom Penh (1.3 million) provides opportunities as a market destination.

Officials of the local government intend to upgrade Pakse to the status similar to Vientiane Capital in the future, and merge the surrounding villages in the near future. Further, Pakse has the potential to strengthen economic relations more with the surrounding districts such as the national border with Thailand (western side), value-added agricultural industry (east side) and the industrial zone (south side).

(d) Threats

The Lao people prefer the rural environment and introduce its life style in the urban life. It is important to foster traditional value and ethics. However, urbanization and industrialization requires adjusting to a lifestyle, which fits to international standards. The rapidly evolving society builds stress and conflict within it. Consequently, the society will have some negative impacts. Not limited to social aspects, to an extent environmental deterioration is also observed. In the surrounding area of Pakse, many foreign private investors have proposed agricultural development projects and manufacturing development projects. If these developments had been implemented in a uncontroled manner, a multitude of environmental problems would surface.

In fact integration with other districts/villages is an opportunity for Pakse, but it would become threats in the future. The process of merging the surrounding villages is unclear due to the fact that it is the first of its kind in this country. If Champasack Province does not possess the initiative, it will be difficult to cooperate and coordinate with other districts going forward.

Table 3.32 Analysis of Strategies for Pakse

	Strength	Weakness
Opportunity	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 the GMS	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
Threats	Avoiding disordered urban development in the limited urban area not so as to missing development opportunity in tourism and commerce	

Source: JST

Result of SWOT analysis is compiled as Table 3.32. The following strategies are introduced from 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)

This survey covers urban development strategy, but does not cover economic development strategy; therefore, Basic Strategies for Urban Development proposes Urban Development Strategy which supports and leads development strategy for urban economy.

In order to realize the Urban Develop Strategies, it is necessary to study and comopare alternative strategies in the following three points as well as Kaysone Phomvihane: (1) zoning for developable land and conservation area, (2) development density of urbanized area, and (3) future development direction of the urbanized area. Such points are analyzed in the following sections.

3.4.4 Urban Development Strategy

(1) Zoning for Developable Land and Conservation Area

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.

Source: JST

Figure 3.27 Zoning of Developable Land and Conservation Area

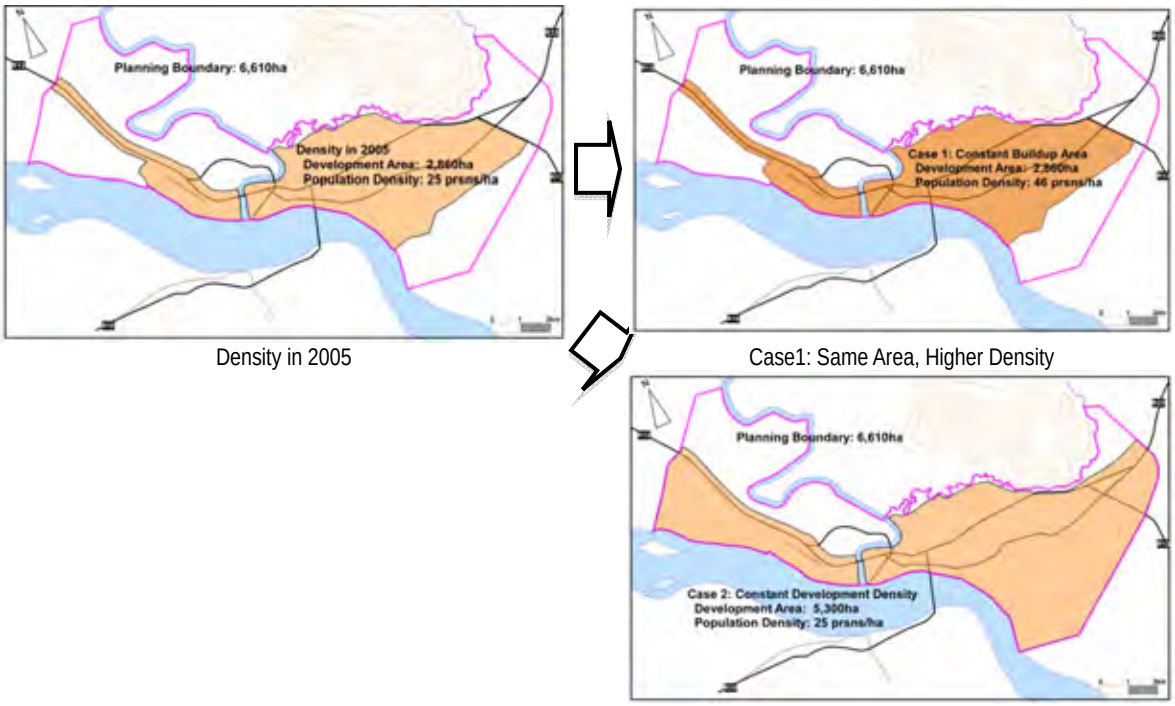
(2) Development Density

In the following zoning of Developable Land and Conservation Area, JST analyzed existing development density and future alternatives. In 2005, buildup area was 2,860 ha with density of 25 persons/ha. JST set Case 1 (same area, higher density) as 2,860 ha with the density of 46 persons/ha, and Case 2 (area expansion, same density) as 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 in Figure 3.28.

Table 3.33 Alternatives of Development Density

	Basic Idea	Design Population Density (person/ha)	Buildup Area (ha)
	Situation in 2005	25	2,860
Case 1	Same Area, Higher Density	46	2,860
Case 2	Area Expansion, Same Density	25	5,300

Source: JST



Density in 2005

Case1: Same Area, Higher Density

Case 2: Area Expansion, Same Density

Source: JST

Figure 3.28 Alternatives of Development Density

Opinions of local stakeholders are summarized in Table 3.34. Local government officials preferred same density development; on the other hand, most of SHM members insisted on the same area and higher density development because they understood the limits to developable land in Pakse. JST proposed a mix of Case 1 and Case 2, which was approved by local stakeholders.

Table 3.34 Opinion of ACM/SHM on Development Density

ACM and SHM	Opinion of Members of ACM and SHM
2nd ACM	Low-density development is preferable (wide spread urban area/ wide urban service) by two third of the attendants.
1st SHM	Compact city development is preferable by two third of the attendants.
3rd ACM	Fully agreed with proposed density development, which combine between case 1 and case 2 in according with Lao's life style.
2nd SHM	Compact city development is preferable

Source: JST

After discussions of development density, JST prepared an optimum settlement pattern. Figure 3.28 illustrates two urban development pattern alternatives on infrastructure from viewpoint of cost and environment impact mitigation and difficulty of environment control.

(3) Development Direction

The existing Pakse city center is expanding toward the east. 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 Plateu, 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 "expansion of existing city center" and "creating a new city center" particularly for the administration and urban amenity centers. Two development directions are

illustrated in Figure 3.29.

Two cases of Development direction in Pakse		
	Alt. 1: Existing city center expansion	Alt. 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	Less investment cost for urban infrastructure Consistent with compact city concept	Less congestion at new city center Conservation of colonial streetscape
Disadvantage	Fear of damage old city center streetscape Congestion at the city center (deteriorate tourism resources)	More investment cost for infra development Declining existing city center

Source: JST

Figure 3.29 Development Direction

The alternative of the new city center development aims to formulate a new administration center with Regional Park together with Sport Center. Administrative functions located in the old city center will be relocated and integrated at the new center. The Old City Center possesses a group of tourism related industries, as well as, a commercial center for local residents. Business administration functions exist, and the area holds a high potential to be developed, in the future, as a tourist base in terms of facility accumulation and an ideal townscape with a historical atmosphere. Urbanization trend of Pakse is expanding east and the new centers are relocating to the east. Establishment of the new city center 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.

Environmental impacts of alternative development densities and development directions are analyzed in 3.5.4. Figure 3.46 indicates environmental impacts in different selections of development density and development directions.

3.4.5 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 are 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. Following conditions are considered to formulate the structure plan of Pakse.

- Because the city is located at the junction of three National Routes, the road network should separate transit and local traffic appropriately.
- Current urban center is to be designated as a tourism destination. New urban functions are to be located in the eastern part of the city.
- Logistics center and SEZ, if any, should be located at a distance from the urban area.

- On the other hand, select light and agricultural industries may be located close to the city.

(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 core 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 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-raise 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 kilometers from the center of Pakse. This location should be developed as an Industrial Center.

Logistics Center: Pakse is located at a strategic point in terms of traffic 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, Pakse 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 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 Pakse. These should be integrated for the convenience of passengers, and for the efficient operation and maintenance of the buses. A new bus station should 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 institutes 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.

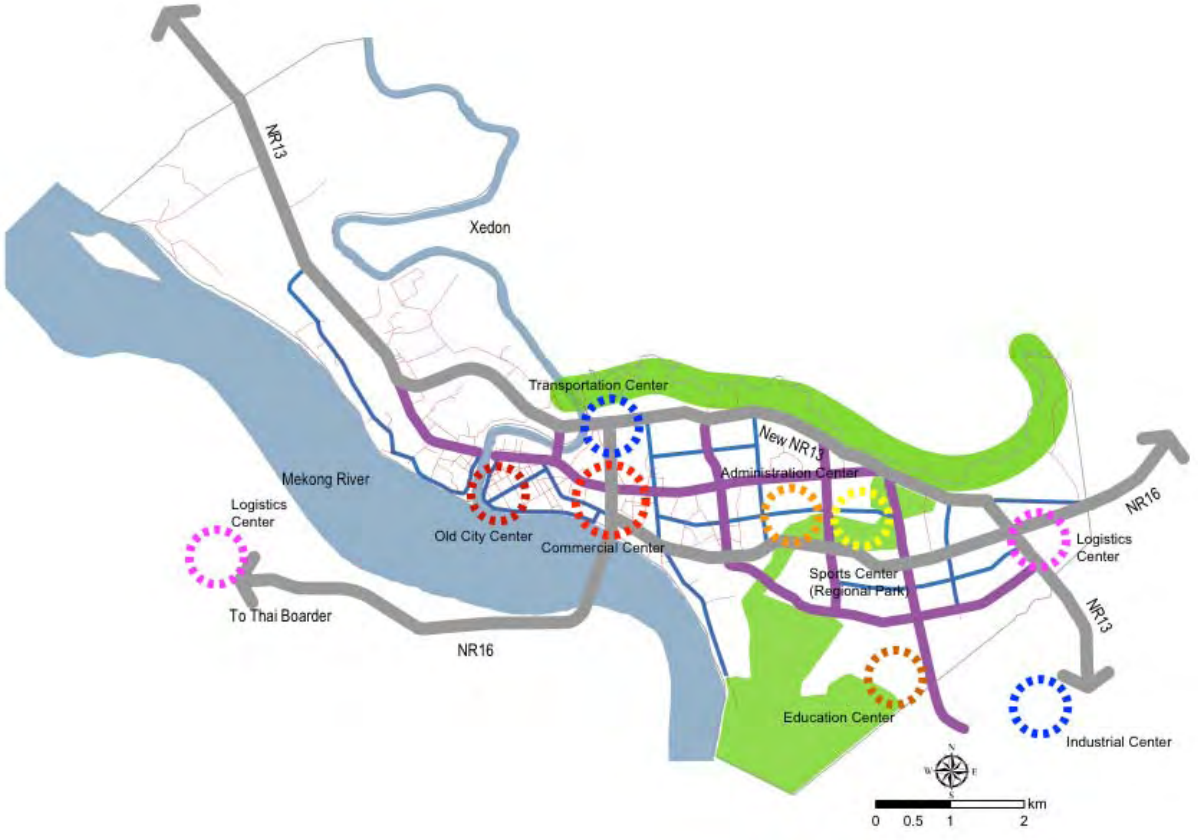
(3) Formulation of Axis

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

Green Axis: Gnang stream runs along north side boundary of the survey area of Pakse and flows from 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 formulate green axis.

Based upon the aforementioned ideas, and additional consideration on road network, the urban structure was prepared as shown in Figure 3.30, 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 3.30 Proposed Urban Structure

3.4.6 Land Use Policy

(1) Delineation of Urbanization Area

The boundary of urbanization area in the target year of 2025 is delineated based on land use designation policy in the section 3.4.5.

The final boundary of urbanization was established through the study of population density allocation as mentioned in later text.

(2) Conservation and Creation of Green Area in the Urbanization Area

To realize the future vision and urban development strategy, the conservation and creation of green areas in the urbanized area is proposed in the land use concept.

- Conservation of areas along rivers and drainage for flood mitigation, erosion control, natural environmental protection and to maintain a pleasant townscape by reinforcing the regulations of land use and building activity.
- Creation of green city through the development of urban parks. Three urban parks are proposed in the land use concept. One is at the existing Pakse Memorial Park, which fringes the urban center, another is located near Gnang Stream and the third is within the new city center. The proposed park in the new urban center should be developed to integrate with other proposed new structures, such as; the administrative center, sports center, commercial complex and housing development, and it should be large enough to accommodate not only the residents of Pakse, but also the residents of the southern region as a regional park.

(3) New Development Area

For the realization of the land use and urban structure concept, JST proposed the following new development areas:

- The urbanization direction of Pakse is east. The gravity pull to urbanize toward the east will continue in the future. A new city center as a new administrative center is proposed in the middle of the urban area of Pakse. Fortunately there is an abundance of vacant space available, JST propose an integrated development of a new administrative center, sports center, commercial complex and housing development and Regional Park.
- The majority of existing administrative facilities are located in the old city center area, where is a large area for potential commercial development. The relocation of the existing administrative buildings; including the hospital, is proposed in the land use concept. The area will be redeveloped for restaurants, shops, hotels, condominiums, city plaza (event) and other commercial facilities.

(4) 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 survey area. From past urban development experience, and the characteristics of urban development in Lao PDR, the land use categories are divided into three. They are; Central, Inner and Suburbans. Central Area, having high population density, commercial and other economic activities, then Inner Area, usually surrounding area of Central Area, having mid density and Suburbans having low density. For the land use zoning and density planning, the following method is applied in the proposed land use concept for each area.

The land use allocation by categories of land use is determined by following method.

Central Area:

- Population density of the existing Central Area in Lao PDR was examined and as a result the average population density of the central area, with good environmental areas, were approximately 100 persons/ha. This density is used for the land use concept plan formulation.
- Central Area is designated to areas where already are an accumulated high population density, and the areas are expected to develope into high density, such as commercial center areas.

Suburban Area:

- Population density of Suburban Area is set by analyzing the land allocation to dwelling units and the guide line of "Building Area Ratio & Floor Area Ratio by Land Use Category"

included in the Ministerial Order on Urban Planning Regulations. In the Suburban Area, it is assumed that 60% of the designated land is utilized as dwelling units. Applying the urban planning standard, mentioned above, the population density is to be 45 persons/ha. This unit is used for the planned suburban area population density.

- Suburban Area is designated to areas where the urban area expansion is anticipated in accordance with future transport axis conservation areas. This area is basically located at eastern part of the urban area.

Inner Area:

- Population density in the Inner Area is determined as in between, the suburban and central areas and are rather low in population density of 60 persons/ha is applied for planning density. In the future, a portion of this area will become a central area when the urban population increases and urban functions expand after the Master Plan Period.
- Inner Area is designated to an area where established community with agglomeration of buildings exists. Existing built up areas and the area already start developing by development plan is designated.

Table 3.35 shows the land use zoning and density planning criteria applied for Land Use concept formulation.

Table 3.35 Land Use Zoning and Density Planning Criteria

	Urban services (Infra)	Land use policy		Population Density*		Land use category in the concept plan	Land use category in Lao PDR
		Existing Plan	Proposed (2025)	Existing (2005)	Proposed (2025)		
Central Area	Already available	Mixed use	Mixed use	70 p/ha	100 p/ha	Central area (high density)	UA
Inner Area	Partially available	Mixed use	Mixed use	41 p/ha	60 p/ha	Inner area (mid-density)	UB
Suburban Area	Rarelyavail able	Mixed use	Residential dominant	25 p/ha	45 p/ha	Suburban area (low density)	UC
Future Development Area	(Partially available)	Airport	Residential, commercial and urban park	-	-	UD	UD

Note: * Population density in the built-up area. The gross population density is lower than these figures.
Source: JST

(5) Proposed Land Use Concept Plan until 2025

Figure 3.31 shows the Land Use Concept Plan of Pakse up to 2025 and Table 3.36 shows the population, density and land use area. The followings points are the contents of the land use concept.

- Land use concept plan is formulated based upon the Structure Plan described in the previous section, and the application of the regulation for land use zones which is included in the Urban Planning Manual (Draft). The regulation stipulates that land use/building is allowed to construct in each type of urban area in the urban master plan. It designates six categories of land use.
- To encourage and revitalize urban center functions in the old city center, the relocation of existing government buildings, such as; the various agencies of the provincial government facilities, and hospital, to proceed into redeveloping the area for commercial and tourism use.
- For the creation of green city, the existing green areas include the drainage areas in the proposed new city center area, and west of the proposed new commercial center. The green area along the Gnang Stream, and the west part of the Urban Planning Area, are designated as conserved green areas, and proposed the parks together with sport center.

Source: JST

Figure 3.31 Land Use Concept Plan

Table 3.36 Population, Density and Land Use Area

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

3.4.7 Infrastructure Development

(1) Road and Transport Sector

The number of motorbikes and cars is estimated to be 110,000 and 17,000 in year 2015 and 352,000 and 35,000 in year 2025 in the Champasack Province. 20 to 30% of vehicles are predicted to be registered in the Pakse.

Table 3.37 No of Vehicle registered in Champasack Province in the future

	Census 2005*2 (000 persons)		No of Registered Vehicles in 2007*1 (000 bikes/cars)	
	Population	Household	Motorbike	Car
2007	607	105	52	6
2015	760	138	110	17
2025	913	176	352	35

Source: JST

Pakse is not only an administrative and commercial center of the province but also a southern regional center. Therefore, a large number of vehicles will come to this area. Furthermore, NR13 and NR16, connecting Thailand, passes through the urban area. It is logical to predict that in the future traffic congestion will occur. To avoid further traffic congestion and to sustain a smooth flow of traffic, roads and road networks should be developed.

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. Minor arterial roads formulate a skelton of a block in an arban area. Therefore, minor arterial roads will be layed out to formulate a block with length of approximately 1km x 1km.

Two national roads/inter-regional trunk roads, NR13 and NR16, exist at Pakse. NR13, which connects the north and south region of Lao PDR, is one of the busiest roads, running through the east to west at the northern part of the less-urbanized area in Pakse. Currently the area where NR13 is running through is expected to become an urbanized area in the future. In the future, NR13 will run through a central part of the urban area in Pakse as well. 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 40m right-of way should be constructed near the northern boundary of the Survey area. A bridge on the new NR13, connecting the east and west bank of the Xedong River should be constructed on Xedong River.

NR16 connects to the existing NR13. The new NR13 will be constructed 1km north of the existing location. Thus, the existing NR16 should be extended 1km to connect to the new NR13. The existing NR13 which passes through the urban area should be improved as one of the urban minor arterial roads.

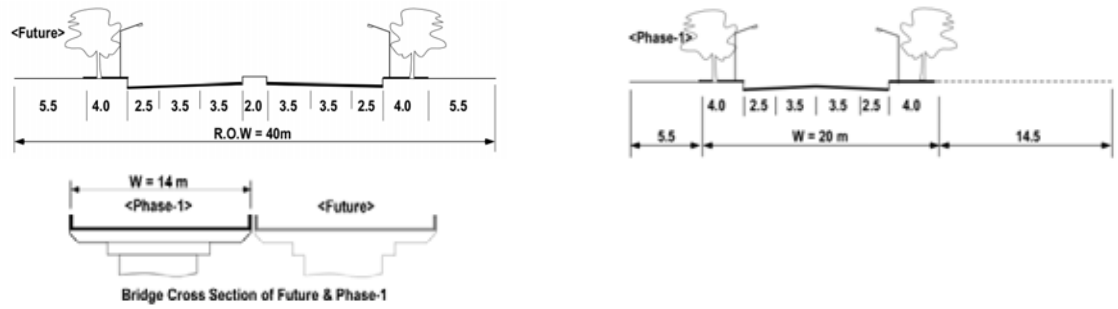
Source: DPWT Champasack

Figure 3.32 Road Network at Pakse in 2025

A road running parallel to the Mekong River, at the east bank of Xedong River has been improved and widened by ADB project. However, roughly 1km down to the Friendship Bridge I has not been improved. This undeveloped section will be improved and widened to attract residents and tourists.

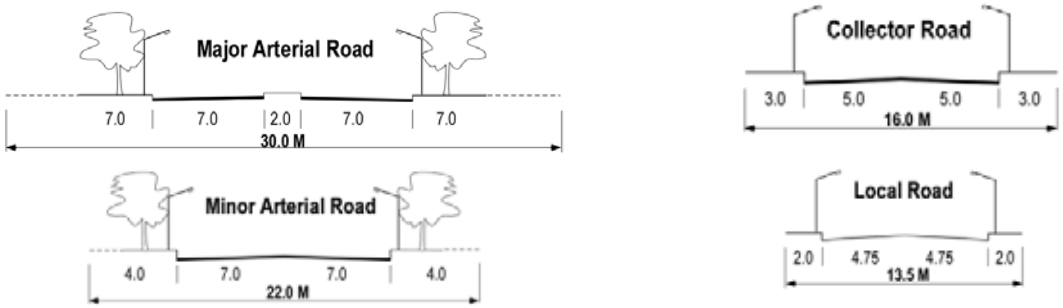
Road network in 2025 shown in Figure 3.32 consists of National Road, Major Arterial Road, Minor Arterial Road, Collector Road and Local Road.

Composition of road cross section of each road is indicated in Figure 3.33, Figure 3.34 and Table 3.38.



Source: JST

Figure 3.33 Cross Section of New NR13 and Bridge



Source: JST

Figure 3.34 Typical Cross Section of Roads in Pakse

Table 3.38 Composition of Road Cross Section

Road	Composition of Road Cross Section	Remarks
National Road (full scale)	W=40m (2x3.5m roadways and 2.5m bikeway at one side, a sidewalk at both side, 2m median)	New NR13
National Road (tentative)	W=20m (3.5m roadways and 2.5m bikeway at one side, a sidewalk at both side)	New NR13
Major arterial road	W=30m (2x3.5m roadways at one side, a sidewalk at both side, 2m median)	
Minor arterial road	W=22m (2x3.5m roadways at one side, a sidewalk at both side)	
Collector road	W=16m (3.5m roadway and 2.5m waiting bay at one side, a sidewalk at both side)	
Local road	W=13.5m (3.25m roadway and 1.5m waiting bay at one side, a sidewalk at both side)	

Source: JST

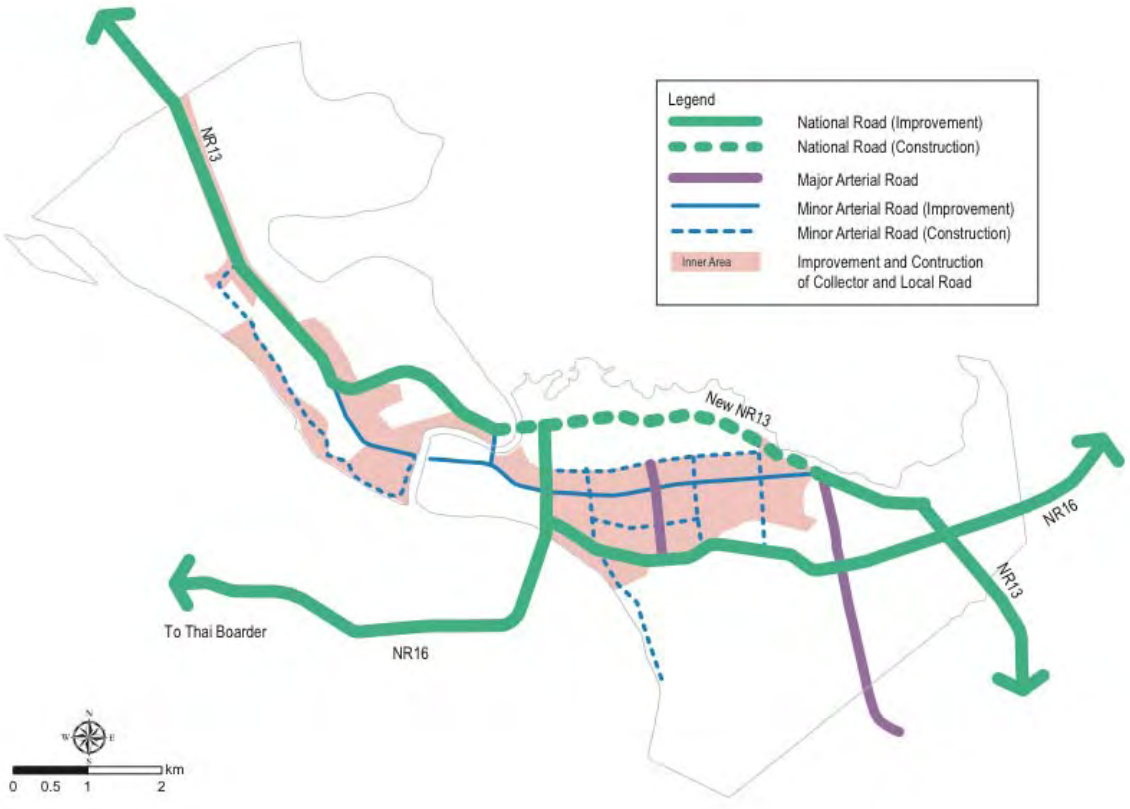
Route bus system covering the urban area will be introduced for the convenience of residents and tourists, and to mitigate the predicted future traffic congestion. Route buses will be operated mainly on the major and minor urban roads.

There is no public parking available in Pakse. A large majority of vehicles are parked on the roads, resulting in a disturbance to the traffic flow, and congestion, especially at commercial areas. With the expected future incearse in the volume of vehicles, public parking should be constructed in the urban area, particularly in the vicinity of commercial areas.

Three bus stations exist at eastern, central and western part of the Survey area along NR13. These stations should be integrated into one to be located in the vicinity of the intersection of the new NR13 and NR16. This new station will be utilized not only for international and inter-provincial buses, but for route buses as well. Commercial facilities will be prepared in the vicinity of this new bus station for the convenience of bus users.

Taxi pools will also 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.

Figure 3.35 shows the roads that will be developed until 2015. Table 3.39 shows road and transport related projects necessary for the realization of urban development toward 2025. These projects include a study and design work.



Source: JST

Figure 3.35 Roads developed in Pakse until 2015

Table 3.39 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 suburbs 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 suburbs area (4.5km)
8	Construction of new NR13	DPWT	Eastern bank of Xedong Riber and northern part of the Survey Area of Pakse (5.5km)
9	Extension of NR16 to connect new NR13	DPWT	Western bank of Xedong River (1.0km)
10	Beautification of a road along Mekong River	DPWT	Eastern bank of Xedong Riber (1.0km)
11	Route bus network development	DPWT	Mainly the urban area of Pakse
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

In principal, the vast majority of people residing in the urban area of Pakse will be able to receive water supply service from the Champasack Water Supply Company.

100% of households or residents in the center and inner area will be supplied with water. 60% of households or residents in the suburban area will be supplied with water in 2015, and 80% in 2025. Table 3.40 shows population to be supplied in 2015 and 2025, respectively.

Table 3.40 Water Supplied Population in Pakse

Zone	Year 2015	Year 2025
Center Area	18,223	20,068
Inner Area	50,414	58,220
Sub-total 1	68,637	78,288
Suburban Area	30,413	66,212
Golf Course	500	1,000
University	200	500
Sub-total 2	18,668 (31,113 x 0.6)	54,170 (67,717 x 0.8)
Total	87,305	132,458

Source: JST

Water demand in the future is estimated based upon urban population, unit volume (200liter/cap/day), rate of water leakage (20%) and peak factor (1.3). Table 3.41 shows water demand forecasts in 2015 and 2025, respectively.

Table 3.41 Water Demand Forecast in Pakse

No	Item	2015	2025
1	Unit water consumption (liter/cap/day)	200	200
2	Population	87,305	132,458
3	Water Demand = 1 x 2, (m^3/day)	17,500	26,500
4	Water leakage (20 %) = 3/(1-0.2), (m^3/day)	21,900	33,100
5	Peak Factor (1.3) = 4 x 1.3, (m^3/day)	28,500	43,000
6	Water Demand Forecast, (m^3/day)	28,500	43,000

Source: JST

Water demand in 2015 and 2025 are estimated 28,500m^3/day and 43,000m3/day respectively. An existing water supply capacity is 13,500m^3/day. Capacity of required additional water supply facility is 15,000 (28,500 - 13,500 = 15,000) m^3/day and 29,500 m^3/day. Therefore, a new water supply system with capacity of 15,000m^3/day for year 2015 and 14,500 (43,000 - 13,500 - 15,000 = 14,500) m^3/day for year 2025 should be constructed.

There is space at the existing water treatment plant to construct the new water treatment plant with the capacity of 15,000 m^3/day in the future. There is also space available to install additional pumps in the existing raw water intake tower. In order to supply the water to the new development area, Suburbs-1 and Suburbs-3, it will require two elevated water tanks with capacity of 1,000 m^3 as well as the installation of related transmission pipeline and distribution pipeline. Water supply facilities needed to meet water demand in 2015 are shown in Table 3.42.

Table 3.42 Additional Water Supply Facilities up to 2015

Water supply facilities needed	Year 2015	Remarks
Raw water intake pumps	3 sets	Within an existing raw water tower
Water treatment plant	15,000 m^3/day	Within an existing site of a water treatment plant
Clear water & backwash reservoir	1,500 m^3	Within an existing site of a water treatment plant
Transmission/Distribution Pumping Station	Three pumps	
Transmission main; 500 mm	L = 8x2=16 km	
Distribution main; 100-350 mm	L = 12 km	
Distribution pipe; 40-75 mm,	300 ha	
Elevated water tank	1,000 m^3 x 2	

Source: JST

Table 3.43 Additional Water Supply Facilities up to 2025

Water supply facilities needed	Year 2025	
Raw water intake tower	1	At a new place
Bridge for raw water pipe	1	A bridge connecting a tower and a bank
Raw water intake pumps	3 sets	1 set is for stand-by
Water treatment plant	14,500 m^3/day	At a new place
Clear water & backwash reservoir	1,500 m^3	At a new place
Transmission/Distribution Pumping Station	Three pumps	
Transmission main; 500 mm	L = 10 km,	
Transmission main; 400 mm	L = 6 km	
Distribution main; 100-350 mm	L = 25 km	
Distribution pipe; 40-75 mm,	800 ha	
Elevated water tank	1,000 m^3 x 2	

Source: JST

However, the existing water intake tower does not have the necessary space to install additional pumps excessing 15,000 m^3/day. When an additional water treatment plant of 14,500 m^3/day will be needed for year 2025, it is necessary to find a site for a new water intake tower and water treatment plant with the capacity of 14,500 m^3/day. A water resource survey is supposed to be impremented based on

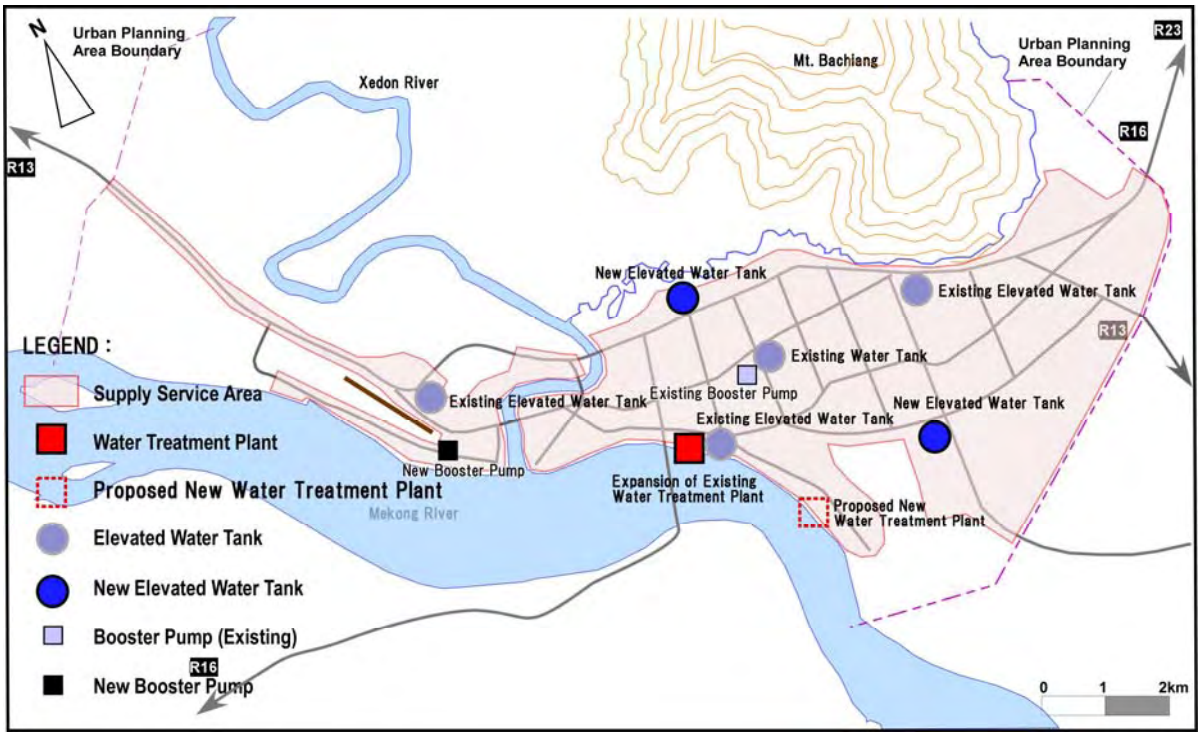
agreement between JICA and Lao PDR signed on December 2008 for the study on water supply facility expansion in Pakse. Location of an additional water supply facility for year 2025 should be decided based on a conclusion of the study. Table 3.43 shows additional water supply facilities needed to meet the water demand in 2025.

Table 3.44 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

Table 3.44 and Figure 3.36 show water supply projects. These projects include a study and a design work. Table 3.53 indicates estimated environmental impacts with and without of water supply projects.



Source: JST

Figure 3.36 Water Supply Service Area and Location of Water Supply Projects

(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 address 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^3 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 added effect of allowing workers and customers to realize the importance of sewerage treatment.

This system will be expanded to villages in the urban area, in particular, to the Central Area and the Inner Area after 2015.

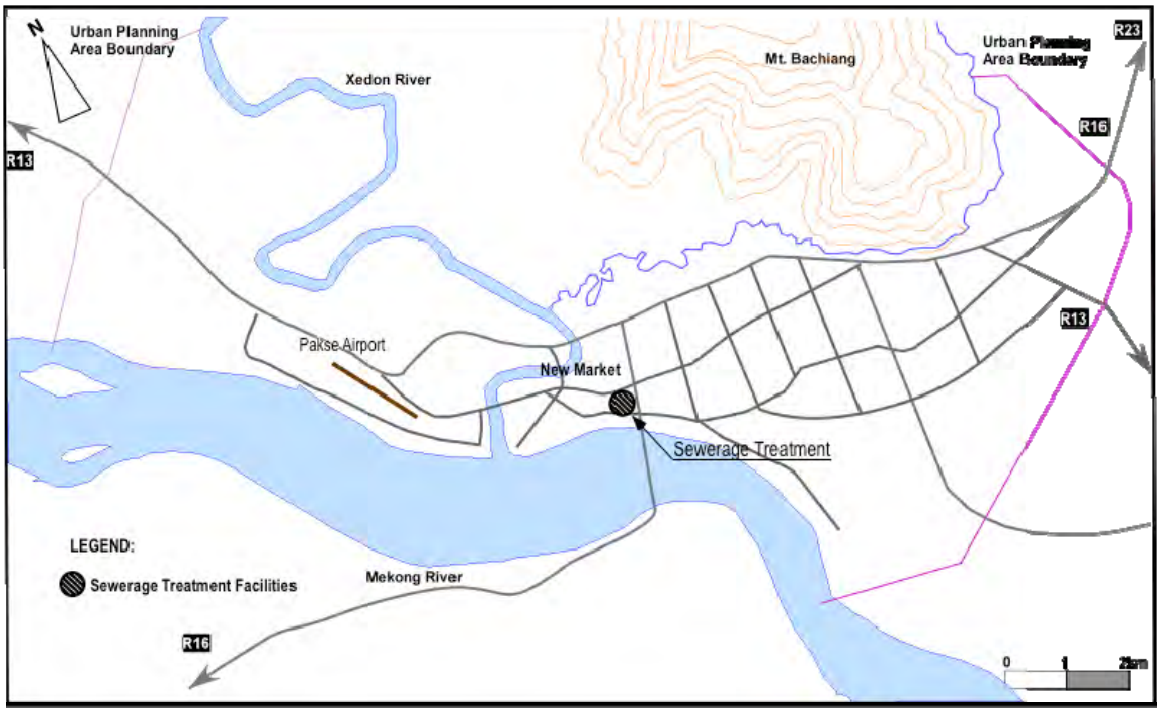
Capacity of a sewerage treatment facility as a pilot project is approximately 120 – 150 m^3 per day (based on water consumption in the market) with the aerobic package treatment unit(s). A treatment facility will be installed under the parking area, or in a green area in front of the market. A photovoltaic generation system will also be provided for the operation of the facility. Solar panels will be installed on a roof of the market.

Table 3.45 and Figure 3.37 show sewerage treatment projects. The projects include a study and design work. A Community Treatment System proposed for this project is shown in Figure 3.17 and Figure 3.18. Table 3.53 indicates estimated environmental impacts with and without of wastewater projects.

Table 3.45 Sewerage Treatment Projects in Pakse

	Project Name	Implementing Agency	Project Location
1	Development of Sewerage Treatment Facility (Pilot Project at New Market) including: - Capacity development on sewerage treatment facility operation and maintenance for further implementation - 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 building on future operation and maintenance - Initiation collection and treatment fee from residents	UDAA	The whole urban area of Pakse

Source: JST



Source: JST

Figure 3.37 Location of Sewerage Treatment Projects

(4) Drainage and Flood Mitigation

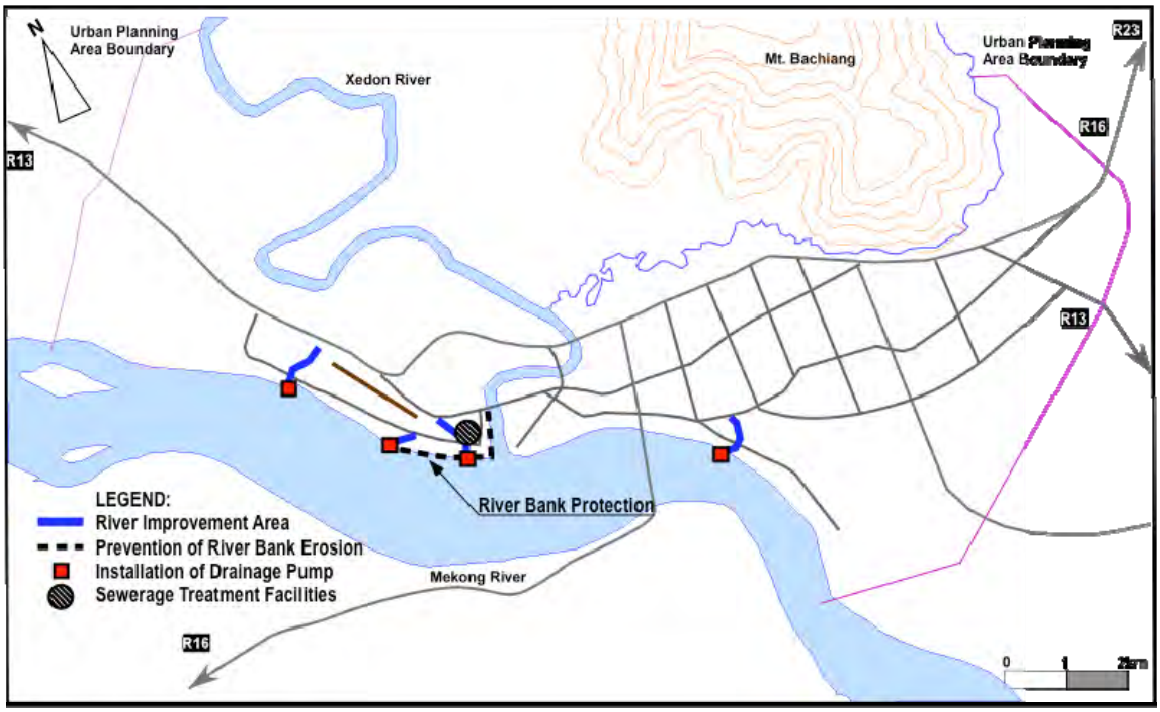
A drainage and flood mitigation measure, with a gate and a pump, had been implemented at streams running into the Mekong River through the urban area located at west bank of Xedong River in year 2000 – 2003 by ADB Secondary Towns Urban Development Project. However, no measures have been undertaken at the three streams running in the urban area located west bank of Xedong River, floods sometimes occur in this area. In addition, there is one stream running north to south to the Mekong River near NR16. This area having rather high population density will be developed as an urban inner area. Therefore, projects to improve the drainage system (improvement of streams) and flood mitigation (installation of water gates at the outlets to the Mekong and Xedon Rivers as well as construction and installation of drainage pump houses) are needed at these four streams.

Bank protection measures of the Mekong River, and the Xedong River, especially banks surrounding the urban area located on the east bank of Xedong River, have been implemented by ADB Secondary Towns Urban Development Project. However, bank protection measures for the banks of these rivers surrounding the 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 3.46 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	800 m. along the west bank of Xedon River and 1,000 m. along Mekong River bank in the western side

Source: JST



Source: JST

Figure 3.38 Location of Drainage and Flood Mitigation Projects

Table 3.46 and Figure 3.38 show the drainage and flood mitigation projects. These projects include a study and design work.

(5) Solid Waste Management

Currently, the solid waste collection ratio in the urban area in Pakse is less than 40% because of the limitation of staff, equipment, budget and lack of proper access road to collection points, and the low awareness of inhabitants on solid waste collection.

Table 3.47 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^3/t)	0.7	0.7	
9	Solid Waste Volume (m^3/day)	25.0	64.6	
10	Estimated Solid Waste Volume in one year (m^3)	9,100	23,600	365day/year
11	Estimated Total Solid Waste Volume for 11 years (m^3)		179,900	From 2015 to 2025
12	Estimated Total Volume including covering soil for 11 years (m^3)		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

Access to solid waste collection points, including each household, will be improved through the construction of roads in the urban area of Pakse. An awareness program toward the importance of

solid waste collection and treatment targeting residents should be prepared and implemented to succeed in increasing the solid waste collection ratio from 40% to 60% in year 2015 and to 90% in year 2025. The importance of reducing the volume of solid waste through recycling and reusage should also be included in this awareness program. Vehicles and equipments necessary for the collection and transport of solid waste should be provided.

The weight of solid waste is predicted to increase from 11.0t/day in year 2007 to 35.7t/day in year 2015 and to 92.3t/day in year 2025. The volume of solid waste will become 25.0m^3/day in year 2015 and 64.6m^3/day in year 2025 respectively. Total volume of solid waste and covering soil for 11 years is estimated at roughly 252,000m^3. This will require an additional landfill cell area of approximately 12.1ha in the existing dumping site. However, the existing dump site has no leachate treatment facility or no lining at the bottom of the cell. Moreover, the existing solid waste landfill site is located at the wasteland in Xanasomboun District, not in Pakse District. Therefore, a new solid waste-dumping site should be constructed within Pakse District to meet the foreseen future solid waste volume. An area of roughly 24ha will be needed for the new dump site to use for 11 years from year 2015 to year 2025. The new dumping site should have a lining and leachate treatment facility.

Table 3.48 shows solid waste related projects in Pakse. These projects include a study and a design work.

Table 3.48 Solid Waste Management Projects in Pakse

	Project Name	Implementing Agency	Project Location
1	Solid Waste Management - Awareness program - Preparation 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

Park and Town beautification, in recent years, has increased in importance for regional core cities of Lao PDR as described in previous section. Cities with abundant green with rather low rise and low density buildings are the typical image of an urban area of Lao PDR.

Following urban parks and green area development are planned toward 2025 in Pakse.

Improvement of an existing park: An existing urban park at the west side of the new market will be developed as a community park. This park is approximately 6 ha with a memorial tower and statue, however it is not openly utilized by the public. In view that, in the future, this area will become a commercial center, the provision of a park for the residents of Pakse and visitors will create an attractive urban amenity at the center of the city. Shade trees, a pedestrian path, benches and lighting, multipurpose open field, plaza, toilets, kiosks, parking space and a maintenance office should be developed.

Development of green area: Administration center area and sports center area is located along the Bang-Yo Stream green area. A Sports Center and a new Regional Park will be integrated in the complex. Total Park and sports center area will be 50 to 80 ha. Also a cultural garden and public forest area will be interconnected. Sports facilities such as; a stadium, swimming pools, a field track and tennis courts are developed within the sports center area. An emphasis on natural and recreational and educational facilities will be developed in the regional park. A part of wetland area will be developed as a pond for recreational use.

Source: JST

Figure 3.39 Urban Parks and Green Network in Pakse

Development of Main Park: Green area development in Pakse is basically along the stream and wetland area conservation and development. Existing cultural garden and forestland will be integrated as a part of green network. Flood plain of the Gnang Stream will also be conserved as a green area width of the green belt varied and depending on the bank conditions and existing residential development. 100 m from centerline of the stream will be designated as a green area. Main Park will be developed beside the flood plain (so called Kasenjiki in Japan) near the mouth of Gnang Stream to Xedong River. Football fields and picnic grounds will be developed for residents of the city. A play ground for small children and a multipurpose open field and trails in the forest will also be developed. Park area will be 20 ha.

Table 3.49 Park and Town Beautification Projects in Pakse

Project Name		Implementing Agency	Project Location
1	Improvement of an 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 a mouth of Gnang River and the green area of Bang-Yo stream
3	Development of green area	DPWT/UDAA	South side of Gnang stream and both side of Bang-Yo stream at eastern bank of Pakse.

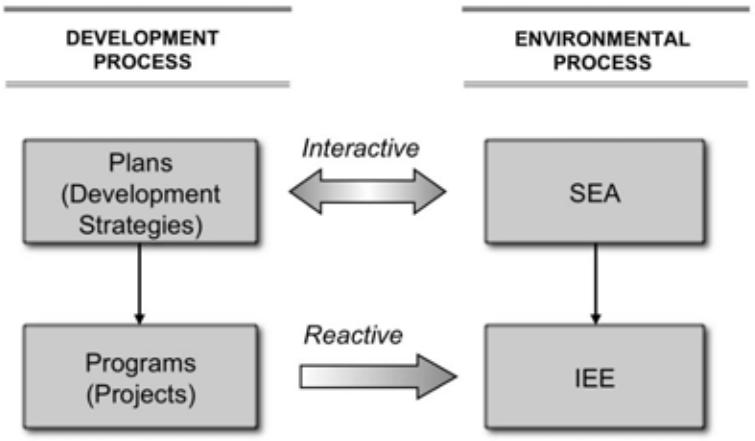
Source: JST

3.5 Environmental Impacts of Basic Structures

3.5.1 Necessity of Strategic Environmental Assessment

Environmental and social considerations are undertaken in the Survey in accordance with the *JICA Guidelines for Environmental and Social Considerations April 2004* as well as the legal framework in

of the Lao PDR. The Survey prepared Urban Development Strategies and Projects. In the process of the planning, viewpoints of environmental and social sustainability are incorporated proactively, rather than interactively, introducing the idea of Strategic Environmental Assessment (SEA) where the sustainability viewpoints are considered at the levels of Plans (Development Strategies) and Programs (Projects)[4].



Source: JST

Figure 3.40 Environmental and Social Considerations of the Survey

Environmental and social considerations have two steps in the Survey process.
Firstly in the process of preparing Urban Development Strategy, JST studied the development alternatives from the viewpoints of sustainability, and proposed the development pass with less environmental loads and impacts by introducing the concept of a compact city.
Secondly, in the process of preparing Programs and Projects, JST undertakes the Initial Environmental Examination (IEE) of the priority projects.

3.5.2 Environmental Issues

Environmental issues are centered in the urban environment for both Kaysone Phomvihane and Pakse. Environmental awareness increased compared to that of 1997. The major environmental issues are:

- Disordered urbanization, which triggered a reduction in green areas. A deteriorating townscape, and disorder in urban density which introduces negative impacts on the Lao lifestyle and culture,
- Environmental consciousness altered: Toward a beautiful city,
- Floods,
- Wastewater and water pollution, and related sanitation issues, and
- Solid waste.

These issues are described below.

(1) Disordered urbanization

The growth of economic activities and population has advanced urbanization. Despite the fact that there is an urban plan, that includes zoning stipulations, the urbanization progress has not followed the zoning rules in an orderly fashion. Evidence of this can be seen in houses that are built on land that

[4] Strategic Environmental Assessment (SEA) considers the environmental and social sustainability at Policies, Plans and Programs (PPP) levels. This Survey addresses the sustainability of Strategies as Plans level and Projects as Programs level.

has been loaned for roads, or riverside recreation areas and operating household industries in residential area.

People and local authorities are concerned about the degradation of the urban environment caused by unorderly urbanization such as; reduction of green areas, the deteriorating townscape, destruction of the Lao lifestyle and culture, congestion caused by high population density towns. The aforementioned were confirmed in the SHMs.

Source: JST

Figure 3.41 House along Mekong River

(2) Environmental consciousness altered: toward a beautiful town with historical townscape and abundant green areas

Compared to 1997, the people and local authorities have raised their environmental consciousness. It was at this period when the study for the Secondary Towns Urban Development Project (STUDP: 1998-2005) by ADB was carried out. At the time of this ADB 1997 study, the main concern by the public and authorites was the sanitary environment in the cities. However, currently, they have expressed that their main concern is the beautification of the town, as expressed in the ACMs and SHMs in both cities. By making a city clean, green and beautiful, they wish to attract tourists, make investments to boost the economy as well as to make an orderly city with abundant greenery. Local stakeholders are also concerned in the preservation of the historical townscape as well as the conservation of green areas.

(3) Floods

Unusual rainfall causes flooding in both cities as experienced in 2002. Despite the fact that flood protection infrastructures, in both cities, were improved by the STUDP funded by ADB, it was found that there is a need to improve the capacities and functions.

(4) Wastewater

The volume of wastewater has increased from households and other sources such as; markets, hotels, guesthouses, public institutions, and household industries. STUDP introduced improved septic tank to treat domestic wastewater; however this was conducted to only 30 % of the planned households. As growth in economic activity and population occur, the volume of wastewater increases. An outflow of used wastewater flows; some untreated, into sewers, roadside drainage ditchs or near by low areas, and rivers. This causes water pollution in drainage and rivers, becoming a sanitation issue as well as giving off an offensive odor during the dry season.

Drainage in Pakse

Flood Protection Gate in Savannakhet

Source: JST

Figure 3.42 Situation of Drainage and Flood Mitigation Facility

(5) Solid waste

As the population and economic activities increases, so does the amount of solid waste. A portion of this solid waste is collected, but others find its way into and remain in roadside gutters and vegetation. This causes a variety of issues; offensive odor, breeds insects, and creates sanitation issues.

Collected solid waste is dumped in landfills. The landfill facilities of both cities are inadequate; without leachate collection or a monitoring well, which results in scattered solid waste in the vicinity of the landfills, offensive odor, and leachate, which creates sanitation problem.

Solid Waste along Mekong River

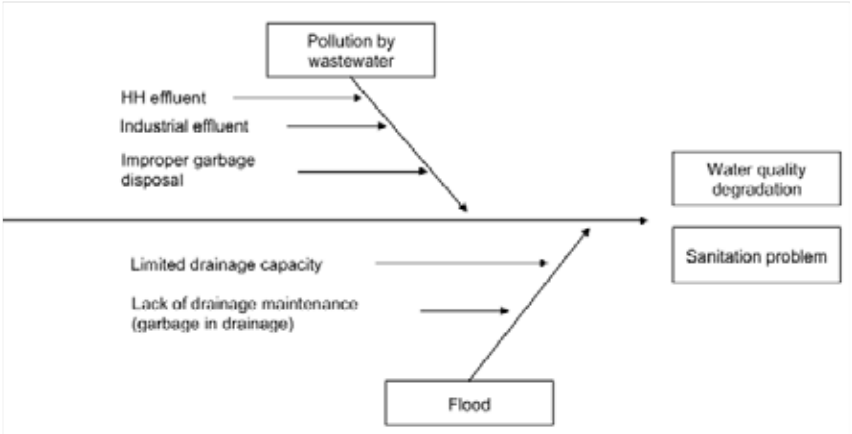
Landfill Site at Savannakhet

Scavengers at Landfill Site

Source: JST

Figure 3.43 Situation of Solid Waste Management in the Survey Area

The relationship among flooding, wastewater and solid waste issues and environmental problem such as water quality and sanitation is shown in Figure 3.44.



Source: JST

Figure 3.44 Environmental Issues Related to Water Quality and Sanitation

3.5.3 Analysis of Environmental Impacts with and without Basic Strategies

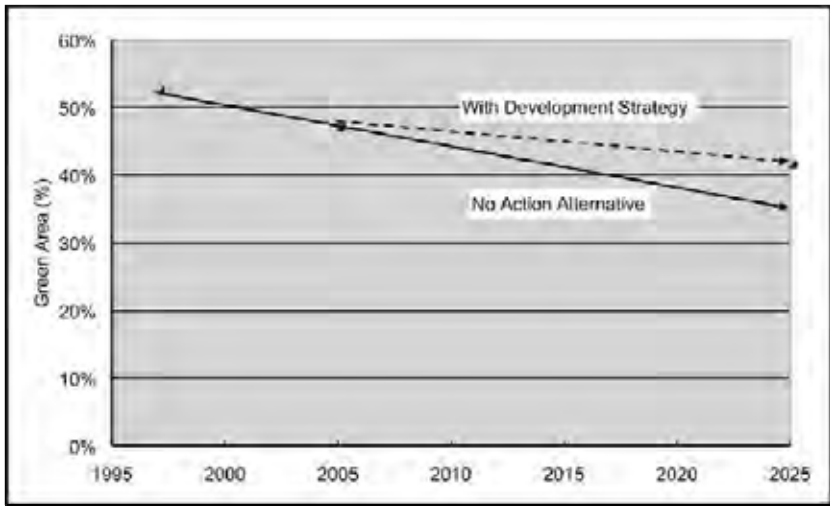
Alternative analysis on the environmental impacts between "With Development Strategy for Urban Development" and "Without Development Strategy for Urban Development" was made. With the Strategy, organized urbanization will achieve beautiful and orderly cities, as well as, an improved living environment with conserved green areas, preserved historical townscape, and appropriate urban density with less congestion. It also increases the management, control of disaster and pollution. These are summarized in Table 3.50.

Table 3.50 Summary of Environmental Impacts

	With Basic Strategies for Urban Development	Without Basic Strategies for Urban Development
Urbanization	Organized urbanization lead to cities with beautiful and organized	Disordered urbanization deteriorating urban environment
Green areas	Conserved and form Green Network	Decrease
Townscape	Preserved	Deteriorate
Density	Organized with appropriate density to meet Lao lifestyle	Disordered with mixed density
Congestion	Less congestion	Congested
Pollution and Disaster, Sanitation	Prevent disaster, control pollution and sanitation improved	Disaster not controlled, pollution not managed leading to sanitation problem
Water access	Improve water access	Deteriorate water access rate
Wastewater	Wastewater treated	Discharge wastewater into drainage and river
Flood	Prevent flood	Flooding
Solid Waste Management	Increase collection rate	Low collection rate, scattered in town
Others: Air pollution	Dust reduced. Exhaust gas not concentrated in the center.	Dust along the unpaved roads. Exhaust gas concentrated in the city centered

Source: JST

Figure 3.45 shows an example of green areas. It is the change of green areas in 1997 and 2005 and simple linear estimates in the target year 2025 by comparing with and without Basic Strategy for Urban Development in Pakse. Without the Strategy, green areas are encroached by people who do not value the zones, thus reducing the green area gradually.



Source: JST

Figure 3.45 Change of Green Areas in Pakse

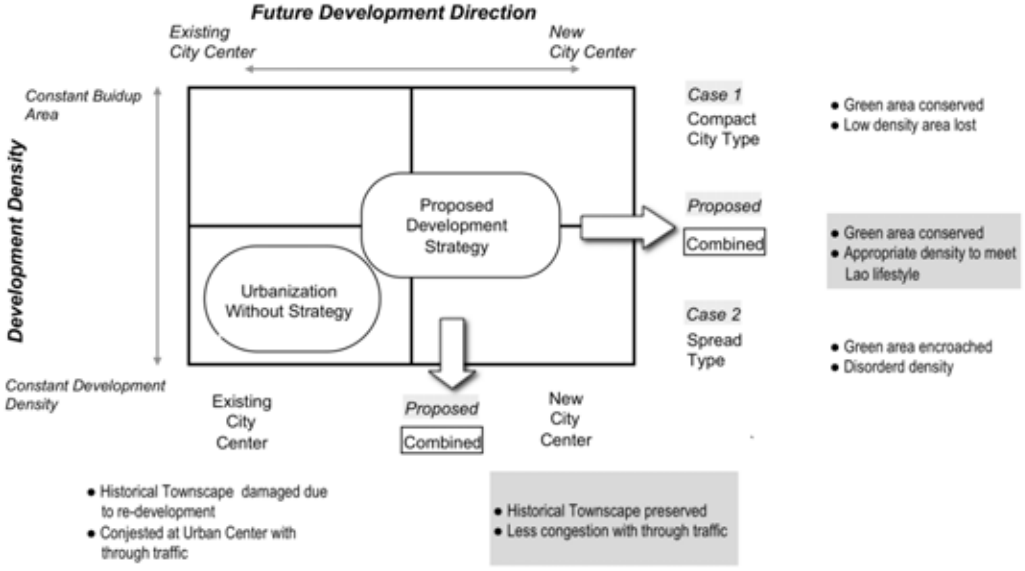
3.5.4 Environmental Impacts of Urban Development Strategy

JST analyzed and prepared alternative development directions from two viewpoints after zonig for developable land and conservation area in order to set direction of urban development in section 3.3.4

and 3.4.4. The first one is the development density, and the second one is future development direction of cities. This alternative analysis process is shown in Figure 3.46.

Firstly, JST studied two cases of urban development density; those alternatives are same area and higher density development and area expansion and same density development. Through hearing the opinions of officials and stakeholders in the ACMs and SHMs, JST proposed a combination of these alternatives, and proposed settlement pattern in this survey.

Secondly, JST studied the future direction of development, by comparing the "expanding the existing city center" and "creating a new city center" to meet the future demands of urbanization. As urbanization proceeds in the future, it is necessary to strengthen urban functions. JST made a comparative analysis as to whether these urban functions are strengthened by expanding the existing city center, or by creating a new city center, and heard the opinions from local stakeholders, as well.



Source: JST

Figure 3.46 Alternative Analysis for Urban Planning

3.5.5 Environmental Management Strategy

Making beautiful cities with an environmental principal, it is not adequate to focus on the preparation of a structure plan and land use plan (3.3.5, 3.3.6, 3.4.5 and 3.4.6) and infrastructure improvement (3.3.7 and 3.4.7). 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 3.51.

Table 3.51 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	Educating people and businesses.	Raising awareness: no-littering to drainage
Sewerage	Treatment at pollution	To People:	Raising awareness to

Treatment	source	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.	environment and sanitation Compliance to emission standards.
Solid Waste Management	Facilities improvement	Strengthening collecting and treatment capacities. Facilitation to people and businesses: Guidelines, Environmental education, Facilitation	Raising awareness. 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

3.5.6 Estimated Environmental Impacts

With Urban Development Strategy including infrastructure development plans, environmental impacts are estimated in comparison with "No Action Alternative". Water access rate, BOD discharged by introducing sewerage treatment, and solid waste collection rate is estimated with and without cases. Obviously, with the Strategy, environmental impacts will be reduced. Waste collection rate will be improved by strengthening the capacities of solid waste management, as well as improvement of access road proposed by the road development plans.

Table 3.52 Environmental Impacts Estimated in Kaysone Phomvihane

				2008	2015	2025
With Projects						
Water access	Population with water access			71,984	79,800	108,480
	Water access in served area		%	96	93	94
	Water access in District		%	61	60	62
Wastewater	BOD discharged	Market	kg/day	24	2	2
		UA, UB	kg/day	2,347	2,728	535
		UC	kg/day	246	560	439
		Others	kg/day	292	472	800
		Total	kg/day	2,909	3,762	1,776
Solid waste	Collection rate		%	40	50	70
Without Projects						
Water access	Population with water access			71,984	71,984	71,984
	Water access in served area		%	96%	84%	62%
	Water access in District		%	61%	52%	38%
Wastewater	BOD discharged	Market	kg/day	24	24	24
		UA, UB	kg/day	2,347	2,728	3,056
		UC	kg/day	246	560	1,464
		Others	kg/day	292	472	800
		Total	kg/day	2,909	3,784	5,344
Solid waste			%	40	40	40

Source: JST

Table 3.53 Environmental Impacts Estimated in Pakse

				2008	2015	2025
With Projects						
Water access	Population with water access			56,214	87,305	132,459
	Water access in served area		%	75	88	91
	Water access in District		%	70	81	84
Wastewater	BOD discharged	Market	kg/day	24	2	2
		UA, UB	kg/day	1,565	2,746	548
		UC	kg/day	984	1,217	795
		Others	kg/day	58	78	100
		Total	kg/day	2,632	4,042	1,444
Solid waste	Collection rate		%	40	50	70
Without Projects						
Water access	Population with water access			56,214	56,214	56,214
	Water access in served area		%	75	56	38
	Water access in District		%	70	52	36
Wastewater	BOD discharged	Market	kg/day	24	24	24
		UA, UB	kg/day	1,565	2,746	3,132
		UC	kg/day	984	1,217	2,648
		Others	kg/day	58	78	100
		Total	kg/day	2,632	4,064	5,904
Solid waste			%	40	40	40

Source: JST

Chapter 4 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. The categories are; 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.

4.1 Issues on Urban Planning

4.1.1 Institution

(1) There is the necessity of a higher-level land development plan such as; a national, regional and provincial development plan as a basis in preparing the urban plan

Land development plans prepared on a national, regional and provincial level, will reflect the future image, vision and direction of industrial developments. These plans are vital, not only for establishing the development direction of the regions and provinces, but also for urban development. Hierarchy, as well as the various roles and positions of cities will be an element of the plans. However, to date, land development plans, similar to the aforementioned, have not been prepared in Lao PDR. The results are that, current urban master plans are being prepared, without clearly defining the roles, positions and characteristics of the land area to be developed.

SIDA, in cooperation with WREA, is preparing a manual on integrated spatial planning in the "Strengthening Environmental Management Phase II" project, as an effort to develop a district level spatial plan. However, the majority of this effort is concentrated on the classification between developable and conserved/protected areas, and does not address on how to develop the developable areas. Although there are Land Management Authorities in the national and provincial levels, however, they do not possess the role in preparing a comprehensive spatial plan in their respective levels. Thus the necessity to, as an initial step, designate organizations that will be fully responsible for the preparation of the land development plans.

(2) The rational in preparing urban master plans for all districts

Article 10 of the "Law on Urban Plans", states that urban master plans for districts belonging to levels; 1, 2 and 3 shall be prepared. There are 140 districts in Lao PDR including four level 1 districts (Vientiane Municipality) and fifteen level 2 districts (provincial centers). Of this, 116 districts including four level 1 districts and fifteen level 2 districts possessed urban master plans which were prepared between 1991 and 2007. In addition to this, 20 urban master plans have already been revised. It took between 12 to 18 months for the provision of an urban master plan of level 1 districts, 8 to 12 months for level 2 districts, and 6 to 8 months for level 3 districts, respectively. In the Law on Urban Plans, MPWTs or PTI are responsible for preparing urban master plans for the level 1 and level 2 districts, and OPWTs are responsible for preparing urban master plans in the level 3 districts. However, in reality, PTI has prepared almost all of the urban master plans to date. The number of staff dedicated to working toward urban master plans within PTI is only 30. Recognition is needed to the fact that the majority of districts are still very small. Therefore, it is important to consider the

rational in preparing urban master plan for all districts in Lao PDR.

(3) Necessity to make clear distinction of urban land use zones (UA, UB, UC and UD) and to prepare detailed land use classifications

Article 13 of the "Law on Urban Plans" states that urban land, in urban planning areas, is divided into 2 to 4 urban land use zones, such as; UA (city center), UB (surrounding area of city center), UC (suburb area) and UD (future expansion area). However, a clear distinction of each land use zone has not been defined yet. It is feasible to classify major land use zones such as; residential, commercial, administrative, recreational/amusement, education, services, industrial (small scale), and park/greenery. The differences of these zones are; the density of buildings and population, the ratio of buildings to land space, and the floor area of respective buildings. A standard ratio of building to land space, and floor area of a building by urban land use zone should be established. It should also be noted that, to date, there is no provision of a specific standard for the density of building and population. Moreover, no detail land use plan was prepared in urban master plans. It is a known practice to prepare a detailed urban plan that reflects the planned arrangements, and details of land use; infrastructure and public facilities in specific areas, as a complimentary plan an urban master plan for an urban area. However, detailed urban plans in Lao PDR are provided for the following objectives: (1) development in a portion of an urban area to improve existing infrastructure, facilities and create conditions for new socio-economic activities, (2) relocation and rehabilitation of specific areas, and (3) land allocation for new sub-divisions. Thus, in the event detailed urban plans are provided, the details on land utilization are not arranged in terms of an entire area of the urban master plan. To address the above mentioned issues, Article 13 of the "Law on Urban Plans" should be revised to reflect detailed land use of an entire area within an urban master plan.

(4) Necessity of laws, regulations to conserve historical, cultural properties and old townscape

Urban land use zone of ZPP (Historical and Cultural Preservation Area) is not defined within the Law on Urban Plans; however, old urban areas are designated as ZPP in the urban master plans of Kaysone Phomvihane and Vientiane. Urbanization of districts had started from old urban areas in each district. There are numerous important historical and cultural buildings and locations within old urban areas. These buildings and locations are valuable elements that create a specific townscape and atmosphere unique to the area. Conservation of such buildings and locations not only maintain the unique townscape and atmosphere but also contributes to revitalization of the area, as well as, reflecting the identity of the district. However, laws and/or regulations to conserve historical and cultural properties, as well as old townscapes have not been established. Conservation activity, stated in the existing regulation, is limited for record in maps/plans in the process of urban planning. The regulation does not address the repairs and restoration works of old buildings. Also, the regulation mainly addresses new developments and construction work in ZPP. Under these circumstances, it is necessary to prepare laws and/or regulations for the conservation of historical, cultural properties and old townscapes as soon as possible.

(5) Necessity of a development permit system to promote appropriate land development

Article 27 to 29 of the "Law on Urban Plans", states; permission, certificate and administration of construction, and major repair activities in the urban planning area. Construction and major repair activities consist of (1) building construction and repair, (2) digging or filling of land, and (3) installation of electricity poles, telephone poles, pylons, water towers, fly-over bridges, and others. The law does not address a land development permit system with technical standards related to infrastructure/utilities, or standards on project location, to establish proper urban land use in or outside an urban planning area and control/protect disordered urbanization. Large-scale development projects such as; industrial parks, commercial complexes, sport complexes and golf courses were, to date, very rare in Lao PDR. However, as economic development progressed, large-scale land development projects will commence in many locations of the urban master planning areas. Thus, the necessity is evident to prepare a land development permit system to establish proper urban land use

within and outside of the urban planning area, to avoid disordered urbanization.

(6) Necessity to provide a law on building codes

Currently in Lao PDR, there is no existing law, or regulation to ensure that the authorities investigate the safety standards of a structure within a building code, which now consists mainly of the standard on a building, and on securing the urban function and proper urban environment of a city. The UDAA and DPWT, acting on a regulation included in the urban master plan, only inspect the size, location of a building based on the standard of building-to-land ratio, floor area ratio, set back, building height, etc. This practice is standard on securing urban function and proper urban environment of a city. However, they never investigate into the safety of a building structure due to the absence of a safety standard or regulation that stipulates the need to adhere to fundamental safety standards. Thus, the provision of such a law or regulation within a comprehensive building code that addresses not only standards on securing urban function, and environment, but the safety of the structure itself is vital.

(7) Necessity of a law or regulation encompassing sewerage, wastewater discharge standards, and discharged water quality.

There is no direct law on sewerage in Lao PDR. However, there does exists a regulation on post-treatment wastewater discharged from each building addressed in the "Regulation on Monitoring and Control of Wastewater Discharge" prepared by STENO/WREA. There is a very wide range regarding the standard value of each parameter of wastewater discharged within this regulation. For example, the standard value of Biochemical Oxygen Demand (BOD) of wastewater discharged into drainage or streams, in an urban area, is between 20 and 200 mg/lit depending on the size and type of building. Due to the size of existing buildings, a value of 40 and 50 mg/lit of BOD is mainly applied. However, in reality, the actual value of BOD in discharged wastewater is predicted to be far worse than standard value for only wastewater from toilets are treated, and kitchen/bathroom wastewater is untreated and directly discharged to drainage or streams. In Japan, less than 30 mg/lit of BOD is applied to wastewater discharged from a water-purification tank installed within each house and building. Inspection into the quality of discharged wastewater from a treatment facility is not implemented in Lao PDR.

As a pilot project, a centralized sewerage treatment system will be introduced to both cities. Not only wastewater from toilets, but that from kitchens and bathrooms will also be treated by this system. Thus, a law encompassing the various aspects of Sewerage to include, among others; the standard of planning, installation of systems, maintenance, inspection and quality of discharged wastewater will be necessary.

(8) Necessity of a law or regulation on urban park development and management

The development and management of urban parks and greenery, from the standpoint of urban environmental development, will be far more important in the future than the present. Many parks and greenery are to be planned, designed and managed within many districts. However, there is no law or regulation in Lao PDR, aggregating the various aspects of urban parks and greenery, such as the initial development and ensuing management or the planning, design, operations and maintenance that will need to be overseen and addressed.

Therefore, the necessity to prepare a law or regulation that encompasses the above mentioned aspects of urban park development and management is evident.

4.1.2 Organization

(1) Limited organization capacity to prepare urban plan

Article 10 of the "Law on Urban Plans", states; responsible agency to prepare urban plans. The MPWT/PTI is responsible in preparing urban plans for level 1 districts, the DPWT for level 2 districts, and the OPWT for level 3 districts, respectively. However, the majority of urban plans were prepared by PTI due to the shortage of experts in DPWT and OPWT. The Office of Housing and Urban Planning within DPWT is responsible for the preparation of an urban plan. However, Office of Housing and Urban Planning in DPWT of Savannakhet and Champasack has only 10 and 8 staff respectively. Their expertise and training are in the fields of architecture and engineering, and not urban planning. They do not possess urban planning experience, thus do not possess the knowledge or expertise required to prepare urban plans. The majority of their responsibilities are to control development such as; building confirmation/inspection. They restrict their support to PTI in the event PTI prepares an urban plan. On the other hand, PTI has 15 staff within its urban engineering division and 11 staff in its town planning division, who responsible for the preparation of urban plans. In spite of its limited number of staff, PTI has prepared the urban master plans of all local governments in Lao.

Bring to surface the necessity to enhance the capacity of DPWTs which would enable the preparation of urban master plans for provincial centers in the future. The initial step would be to train experts of urban planning within DPWT, this should be coordinated with human resource development for urban planning.

(2) Ineffective utilization of data and information on land use between urban planning agencies and NLMA/NGD

The National Land Management Authority (NLMA) and National Geographic Department (NGD) have prepared special data. NLMA has produced cadastral maps that cover the urban area of Vientiane Capital City. NGD also possesses digital maps at a scale of 1/5,000 covering the urban areas of the secondary cities. To date, such data and information has not been utilized for urban planning. It is necessary to develop a system that opens the sharing of data and information between the urban planning agencies as well as NLMA/NGD.

(3) Limited training institutions for urban planners

National Universities in Vientiane, Savannakhet, Pakse and Luang Prabang possess Engineering and Architectural Departments; however, the Lao National University in Vientiane is the only institution that has a Department of Urban Planning, with graduate programs to train urban planning professionals in Lao PDR. The Department has just started in 2007. This limitation reflects the necessity to establish similar departments in other national universities, to provide urban planning education.

(4) No training or education system for staff in PTI

At present, PTI possess no system for the training and/or education of its staff. Resulting in the total lack of opportunity for its staff to receive much needed urban planning training and education on a regular basis. The opportunities and chances for further training and education arise only in the event international cooperation agencies such as; JICA and ADB conduct projects. At times, senior and experienced staff train junior, less-experienced staff in PTI. For staff, especially junior staff, who realize the necessity of furthering their education on urban planning, make the decision to travel abroad on their own expense. PTI fully recognizes the necessity for establishing a regular program to train and educate its staff. Thus, it is necessary to establish such a program in PTI and the Office of Housing and Urban Planning within DPWT.

4.1.3 Human Resources

(1) Limited human resources for urban planning

The Department of Urban Planning in Lao National University has just started in 2007. The authorized number in each class is roughly 30 students. Currently, total numbers of students training to become professionals in the field of urban planning are only 100. Prior to 2007, very few students in the Department of Architecture had access to some programs on urban planning. Graduates of the Department of Civil Engineering or those who majored in Architecture entered PTI and other administrative organizations, where they came in contact with, and started to learn urban planning. PTI, the main administrative arm in the provision of an urban plan, is comprised of six divisions with a total number of 60. The Town Planning Division and Urban Engineering Division only have 11 and 15 staff, respectively. Similar administrative organizations related to urban planning and management such as the DPWT, OPWT and UDAA are limited in the number of staff, and have a very low capacity for urban planning and management. The aforementioned lack of resources results in their strong reliance upon PTI for the preparation of urban plans. Thus, it is evident that there is a necessity to increase the number of students learning urban planning in universities. In addition, there is a necessity to prepare and provide on-the-job training programs for the staff in related administrative organizations.

(2) Necessity of trainer's training regarding urban planning

As mentioned above (1), Department of Urban Planning in Lao National University is the only institution training urban planning professionals, currently there are only 100 students in three grades. There are 7 teachers, currently responsible for the department. It is necessary to train trainers (both professors and lecturers) in terms of quantity and quality, thus allowing the increase of students majoring in courses on urban planning.

4.2 Issues on Urban Management

4.2.1 Institution

(1) Difference of urban planning boundary and UDAA jurisdiction

The urban planning area and the UDAA jurisdiction areas are different. The urban planning areas consist of conservation areas such as; agricultural land and forest areas and urban land use areas as development promotion areas. On the other hand, the UDAA jurisdiction areas cover only a portion of the urban land use area in the urban planning areas. The rights and duties of the UDAA stated in Article 36 of the "Law of Urban Plans" states that they are: (1) to prepare implementation plans, and administrate, inspect urban development activities, (2) to construct, restore and renovate urban infrastructures, and to provide services, and (3) to administrate and control the implementation of construction work. Therefore, UDAA jurisdiction area should cover the entire urban planning area.

(2) Limited enforcement of the urban master plan

Urban master plans are provided to guide the development and conservation of; urban, communal and related areas within the urban planning boundary. Areas of the urban planning boundary are divided into seven zones. These zones consist of four urban land use zones, such as; UA, UB, UC and UD, and Industrial zone (I), Agriculture zone (A) and Forest and Natural Protection zone (F/N). There are 12 detailed land uses: residential, commercial, administrative, hotel/restaurant/bar, recreation/amusement/entertainment, education/cultural/religious, services, transportation, public utilities, storage/warehousing, industrial, and natural. These detailed land uses are established through the land use zones. However, in reality, the construction of buildings and land development projects are being conducted regardless of the land's status of agriculture and natural protection zones. Introducing the necessity to closely examine building applications, perform diligent inspections of construction work, as well as enforcing penalties to those who neglect, or disobey the "Law on Urban

Plans".

(3) Limited information management on infrastructure development

Underground utilities infrastructure such as water pipes are virtually invisible. It is extremely difficult to identify the location, depth, type, size and quality of material of a specific pipe without access to accurate data and information. Data and information of a constructed water pipe are in the possession of a water supply company. However, this data and information is not shared jointly with other organizations related to utility development and construction. Resulting, at times, in the damage to underground water pipes by construction on roads, buildings and/or other related work. Currently, these mishaps occur especially in Vientiane, and in the future, they will also frequently occur at the regional cities. Therefore, to avoid needless repair and inconvenience, it is important to share data and information among agencies/companies related to utilities and construction.

(4) Limited budget for the development, operation and maintenance of infrastructure

As described in Appendix 1.2.3, the national budget, in particular, investment budget relies heavily upon grant aid and loans from donors. 60 to 90% of the total amount for Public Investment Program (PIP) is financed by international donors.

One of the most important development goals for Lao PDR is to achieve the Millennium Development Goal in 2015, and to graduate from the LDCs by 2020. In this context, poverty reduction is a higher priority than urban development. In interviews with DPWT of both provinces, officials pointed out that their priority was to provide infrastructure to the impoverished district. Aid from international donors is also prioritized to the impoverished areas. According to the "Mid-term Review of The 6th National Socio-economic Development Plan (2006-2010)," per capita PIP was 252,000 kip in the northern region which has many impoverished districts; on the other hand, it was 144,000 kip in the southern region. The reason came from difference in ODA flows by each region according to the mid-term report. Under such circumstances, budget allocation for urban development and urban management is limited.

In interviews with DPWT and UDAA, officials pointed out, that there is major shortage in the budget for the operation and maintenance of roads in particular.

To address the budget shortage issue, both provincial offices have started introducing privately financed projects. In Savannakhet Province, the provincial government invited private inventors to provide water supply to Savan-Seno SEZ. As of October 2009, a private company is conducting a feasibility study of providing water to both of the SEZ sites, and existing urbanized area. In Champasack Province, a new four lane road running parallel with NR13 was constructed by a private firm, and the provincial government, for a span of seven years, is repaying the construction cost and interest. A BOT project connecting the west side of Pakse Bridge and Champasack Province is also prepared.

(5) User charge level and users' fee collection for infrastructure service

As described in the previous section, budgets, in the regional cities, for the operation and maintenance of infrastructure service are extremely limited. Therefore, it is financially vital to collect charges according to the service provided directly from users.

In regards to solid waste management, there exists a vicious cycle of low-level services, due to the low user charges established in the both provinces, as well as the law collection rate of both provinces which was only 40%. It is necessary to establish and sustain an appropriate user charges, as well as increase efforts to the raise collection rate. With the collected user charges, upgrading can be made to the collection equipment and improvements made to access roads. For water supply services, both water supply companies are able to record a profit prior to depreciation. In particular, the Savannakhet Water Supply Company after acknowledging a recommendation from the ADB TA team initiated a increase in its price to secure a 2% to 5% profit for operation and maintenance costs. The

UDAA of the both provinces could benefit from the method taken by the water supply companies.

4.2.2 Organization

(1) Overlapping development application process between UDAA and DPWT/OPWT

DPWT and UDAA are the implementation bodies of infrastructure development and maintenance. All types of infrastructure in urban areas are managed by UDAA and outside of the urban areas are management is conducted by DPWT. However, both organizations process development applications within urban areas depending upon the scale of development. A development application with a floor area of less than 200 m^2 is processed by UDAA and that with a floor area over 200 m^2 is processed by DPWT. DPWT, in addition, processes development applications with a floor area over 200 m^2 outside urban areas. A development application with a floor area less than 200 m^2 outside urban areas is processed by OPWT. This method of segmenting the application process depending upon area and floor area size is confusing to applicants. Therefore, it is advised that an application process be merged into, and processed by a single administrative organization.

(2) Shortage and inadequate maintenance of vehicle/machinery/implements for urban management

The UDAA, DPWT and OPWT are responsible for the management of; roads/bridges, sewerage treatment, drainage/flood mitigation and solid waste in and outside urban areas of the district. They possess vehicles, machinery and conduct the development/maintenance of infrastructures and civil services. However, these vehicles, machinery and tools were not provided in a sufficient quantity, and they are not well maintained. There are a number of this equipment are not functioning and are stored in garages or abandoned at sites. Repairs and/or replacement of equipment will be needed for good urban management.

4.2.3 Human Resource

(1) Shortage of human resource for urban management

The lack of, and/or the poor condition of necessary equipment are one of the elements of inefficient urban management operations. Urban management bodies find that they must rely heavily upon manpower instead of vehicles and machinery. This reliance ultimately causes a shortage in staff for urban management, especially working at sites or the front line in UDAA and DPWT. Repairing and/or replacing the inoperable equipment will need to be addressed to improvement the shortage of manpower. In addition, it is highly predictable that a shortage of staff to process building development applications, will occur in the event a merger into one organization is completed. It is necessary to address the increase of staff in the future.

4.3 Action Programs for Urban Planning

4.3.1 Institution

(1) Preparation of national, regional and provincial spatial plan

A National land development plan will be prepared to reflect the direction of spatial development with a mid and long-term perspective. The plan will include the future image, vision and industrial development direction of the nation, as well as, reflect the national socio-economic development plan prepared by MPI. It also addresses the hierarchy of major cities and roles of the cities in the context of national development.

The plan should be prepared with the cooperation of MPI, MIC and MPWT, in collaboration with related sectors and provincial governments. Within the plan, the national territory of Lao PDR will be divided into four regions; the north, central region, south and Vientiane Capital, and the regional core province, and/or, district should be designated. The roles, position, characteristics and industrial

development direction each region and regional core province/district targets to be achieved will also be presented within the national plan. The plan will be revised every 5 to 10 years with consideration to the socio-economic situation of the nation.

From the point of view of capacity development, the first national land development plan will be provided in cooperation with a team of experts (roughly 10-12 people: in the fields of regional/urban planning, land use, transport, industrial development, economic, health, education, etc.) and the staff of MPI, MIC and PTI. An estimated timeline will be two years for the provision of the plan.

A regional land development plan will be prepared based upon the national land development plan. The plan will reflect the mid- and long- term development direction of each region. The plan will include the future image, vision and industrial development direction of a region, and will consist of the regional socio-economic development plan and the regional spatial plan. The plan will be provided by provincial governments which formulate the region, in collaboration with related sectors. Roles, position, characteristics and industrial development direction targets that each province should achieve will also be presented in the regional plan. The plan will be revised every 5 to 10 years with consideration of the nation land development plan and socio-economic situation of the region.

In capacity development, a land development plan of a specific selected region, from the three regions, will be provided in cooperation with a team of experts (roughly 10-12 people: in the fields of regional/urban planning, land use, transport, industrial development, economic, health, education, etc.) and the staff of DPIs, DoICs, DPWTs and PTI. An estimated 1.5 years will be necessary to provide the plan.

A provincial development plan will be prepared based on the regional land development plan. The plan will show mid- and long-term development directions of each province. The plan will have the future image, vision and industrial development direction of the province and will consist of the provincial socio-economic development plan and the provincial spatial plan. The plan will be provided by the provincial government in collaboration with related sectors and district governments. The role, position, characteristics and industrial development direction targets which each district should achieve will also be presented in the provincial plan. The plan will be revised every 5 to 10 years with consideration of the regional land development plan and socio-economic situation of the province.

From the capacity development point of view, a development plan of a specifically selected province from the 14 provinces, except Vientiane Capital, Savannakhet and Champasack, will be prepared and provided in cooperation with a team of experts (an estimated 10-12 people: in the fields of regional/urban planning, land use, transport, industrial development, economic, health, education, etc.) and the staff of DPI, DoIC, DPWT and PTI. An estimated 1.5 years will be necessary to provide the plan.

(2) Urban master plan for provincial centers and major districts

There are 140 districts in Lao PDR. However, aside from provincial centers and a number of major districts, the majority of districts are extremely small in terms of population and economic activity. On the other hand, the number of staff allotted for urban planning in PTI and DPWT is very limited. Therefore, districts to have urban master plans will be limited to 16 provincial capitals, except Vientiane Capital, and 16 major districts that have or will have more than 10,000 in population until the number of experts assigned to urban planning in the DPWT and OPWT increase to a certain level.

An urban master plan will be prepared based upon the provincial land development plan. The plan will reflect mid- and long-term development directions of the urban area. The plan will also include the future image, vision and geographical development directions of the urban planning area. The plan will be provided by the provincial government in collaboration with related sectors and district government. The plan will be revised every 5 to 10 years with consideration to the provincial land development plan.

With capacity development in consideration, an urban master plan of a specifically selected province

established as noted in paragraph (1) will be provided in cooperation with a team of experts (roughly 10-12 people: in the fields of urban planning, land use, transport, infrastructures, environment, landscape, economic, health, education, etc.) and the staff of DPWT and PTI. A timeframe of approximately one year will be necessary to provide the plan.

(3) Revision of Articles related to Zoning or Land Use in the "Law on Urban Plans"

The description on urban land use zones stated in the "Law on Urban Plans" and Urban Planning manual should be reviewed and revised. The current land use zoning system stated in the "Law on Urban Plans" should be abolished, and replaced with detailed land use zones such as; residential, commercial, administrative, industrial, education, recreation/amusement, and park/green, etc. Residential, commercial/business and industrial areas should be divided into a number of categories by building to land ratio, and floor area of a building, height of building, etc. These revisions will contribute to a salutary and orderly urban development.

(4) Preparation of laws and/or regulations to conserve historical properties and historical townscape

The protection, conservation, restoration and rehabilitation of historical heritage sites, such as; sacred buildings (ancient temples), are stated in the "Law on National Heritage". However, there is a total absence within the law of; specific descriptions, concrete details, methods to be taken, to responsibly conduct the conservation, restoration and rehabilitation of any, or all, historical/cultural old building(s), properties and/or townscape. Thus, it is vital that the "Law on National Heritage" be amended.

Old urban areas where numerous historically/culturally valuable buildings and locations exist have been designated as ZPP in a number of urban master plans. However, a definition of ZPP is not found in the "Law on Urban Plans". The law will be amended, and stipulate ZPP as a conservation area of historical/cultural properties and old townscape is to be added.

(5) Preparation of development permit system for urban development

The "Law on Urban Plans" will be amended, and Article(s) on development permit system will be included in the law, to achieve proper urban land use inside or outside of the urban planning area, and to avoid disorderly urbanization. Outline of development permit system is listed as Table 4.1.

Table 4.1 Outline of Development Permit System

Purpose	Achieving proper urban land use inside or outside of urban planning area and avoiding disorderly urbanization
Development Activities	- Land development with earth work (cutting/filling) for housing, commercial complex, factory(s), leisure/recreation/sport and others - Conversion of original land use to other use
Issuer of Permit	Governor or district head of land/place where development/building activity is planned and implemented.
Controlled Area	Whole area in Lao (development scale needed permission is different at a place where a development activity is planned and implemented.)
Standard for Permission	- Technical: for development of infrastructures/utilities and for disaster prevention - Location: limitation of permissible development activities at area other than urban areas

Source: JST

For an effective and transparent development permit process, establishing a working group for to address development permits in a district or a provincial government will be needed. In addition, seamless coordination between the working group and related departments such as; urban planning, building permission, infrastructure development, transportation, agriculture, education, environment, etc will be needed. Thus, the "Law on Local Administration" should be amended, to address the duties and rights of a district head/governor, in relation to permitting a specific development activity.

Preparations toward developing a permit system, which will include drafting an amendment to the law that addresses urban plans and local administration, will be conducted by a group of experts (7-8 individuals) staff in PTI. The experts will be in the fields of urban planning, land development,

infrastructure planning design, and administration, representing nations which possess and operate with this, or similar system. This process will also include revisions to cover issues stipulated in paragraph (3) related to zoning or land use and to that in paragraph (4) preparation of laws and/or regulations to conserve historical properties and historical townscape. It will take an estimated 1.5 year to provide a permit system and drafts to amend the current laws and regulations.

(6) Preparation of a building code law

Urban area expansion can be summarized as a notable growth in both concentrated population and economic activities. This expansion, of course, results in a highly accelerated rate of numerous construction projects within the urban area. However, currently within Lao PDR, there is no building code law to ensure that fundamental structural safety measures are undertaken by the contractor, or owner. To secure urban functions, and protect the urban environment of a city, proper structural safety standards are vital.

Thus, a law encompassing aspects such as; structural and safety standards for buildings, standards toward urban functions and ensuring that a proper urban environment is maintained, should be established.
Structural and safety standards should address a structure's fire prevention criteria (material/equipment), resistance, durability, building material, etc. The urban functions and environment addresses the relation of a structure with its purpose and land use, the building-to-land ratio, floor area ratio, setback, limitation of a building height, etc.

A law will be drafted and submitted in cooperation with team of experts (5-6 individuals) in the fields of building design and urban planning hailing from nations which possess stringent building code laws and architects (staff in MPWT). The timeframe will be approximately one year for the submission of a draft building code law.

(7) Preparation of a sewerage law

A centralized sewerage treatment system will be introduced in both cities as a new system that is expected to gain popularity throughout Lao PDR. This system will not only treat the wastewater from toilets, but also from the kitchens and bathrooms. A notable improvement will be made on the quality of post-treatment discharged wastewater. The current standard value of each parameter of discharged wastewater in the regulation will not apply. This system is quite new, thus, currently there are no standards, regulation on planning design, installation details, maintenance stipulations, designated inspection process and quality of discharged wastewater.

Therefore, a Law on Sewerage which will include, address and regulate the aforementioned standards, will be drafted by a group of experts related to sewerage treatment (4-5 individuals: in the fields of planning, design, operation and maintenance, etc.) from nations that have adapted and have full experience on a centralized sewerage treatment system such as Japan. It will require approximately one year for the draft of the law to be submitted.

(8) Preparation of a regulation and/or law on urban park and green development/management

As noted within a previous segment, the development and management of urban parks and greenery, from the stand point of urban environment development, will become vitally important in the future than accredited in the present. Numerous parks and greenery will be planned, designed and managed in numerous districts. However, there is no existing law or regulations in Lao PDR which addresses, or encompasses the various aspects need to sustain and maintain these parks or greenery. Aspects such as; the fundamental development, management, planning, design, operations and maintenance need to be addressed.

Thus, establishing a regulations or law which encompass the aforementioned urban park development

and management is vital. A draft of this will be provided by a group of experts in the field of park and greenery development and urban planning. An estimated 4-5 individuals: contributing on aspects such as; planning, design, operation and maintenance, etc. These experts will be from nations that possess the knowledge and experience in urban park and greenery development/management. A draft will be submitted in approximately one year.

Table 4.2 shows capacity development projects related to institutions at the planning phase.

Table 4.2 Planning Phase - Institutional Capacity Development Project

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

Source: JST

4.3.2 Organization

(1) Promotion of urban planning by DPWT

DPWTs are well aware of the situation and condition of provinces. Therefore, provincial land development plan and urban master plan should be provided by the DPWT. The number of staff engaged in urban planning at the DPWT will increase through the strengthening, expansion of urban planning organizations and the promotion of human resource development. On-the-job training to current staff assigned to urban planning in the DPWT will also be implemented. As a result, the urban planning capacity within the DPWT will be strengthened in the future. The DPWT, in the future, will have the capability to provide an urban plan of districts in a province.

As well, PTI, in the future, will be a supporting agency in the preparation of urban plans.

A project for on-the-job training to staff members related to urban planning within DPWTs will be implemented in cooperation with foreign urban planning experts (4-5 individuals) and PTI when the number of staff related to urban planning in DPWTs increases. The implementation of this project by foreign experts will take approximately one year. It must be noted, however, that the training to staff members within DPWTs should be implemented by PTI staff on a regular basis.

(2) Sharing data and information between an urban planning agencies and NLMA/NGD

Spatial data and information collected by NLMA and NGD are useful for urban planning, and will be shared with urban planning agencies such as PTI, DPWTs and other related agencies. As an initial

step, the necessity to establish a common data format, coding and classifications of these spatial data and information is to be addressed.
A project on data and information sharing between urban planning agencies and NLMA/NGD will be implemented in cooperation with foreign experts (4-5 individuals) specialists in the fields of urban/rural planning and mapping and the staff of NLMA, NGD and PTI. Approximately two years will be required for setting up the process and system.

(3) Strengthening and expansion of urban planning departments in other universities

A Department of Urban Planning should be established in the national universities in Savannakhet, Pakse and Luang Pranbang as well as Vientiane. The authorized number of students in each grade within the Department of each university should be roughly 30, however, this number should be decided in unison with the progress of the training of teachers.

A project strengthen and expand urban planning departments within universities will be implemented in cooperation with foreign teachers and experts (5-6 individuals) related to urban planning and the staff of the Ministry of Education (MoE) and MPWT. This project will consist of; the preparation of teaching material and the structuring of a curriculum, the employment of teachers, recruiting students, and establishing a planning department. A timeframe of approximately 3 years will be required.

Table 4.3 shows capacity development projects related to organization at planning phase.

Table 4.3 Planning Phase - Organizational Capacity Development Project

Project Name		Implementing Agency	Project	
			Duration	Number of 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

Source: JST

4.3.3 Human Resources

(1) Development of human resources engaged in urban planning

Currently, there is one capital, 16 provincial governments and 140 district governments in Lao PDR, and each local government possesses a department related to urban planning. To adequately supply urban planners necessary to meet future demands, the regulated number of students in each grade in the Department of National University of Luang Prabang, Kaysone Phomvihane and Pakse should be 30. On-the-job urban planning training will also be performed regularly for local government officials in each DPWT/OPWT.

Development of human resources engaged in urban planning, in particular, increasing the number of students and supplying experts of urban planning, will be conducted within the CD-PO-3 project. Urban planning on-the-job training at the Departments will also be carried out within the CD-PO-1 project.

(2) Trainers' training

At least seven teachers at each university may be necessary to conduct courses in urban planning at the National Universities of Luang Prabang, Kaysone Phomvihane and Pakse. In short-(5 years) and mid- (10 years) term, teachers will be invited from foreign universities. In view that the language, customs, traditions and culture of Lao is close to Thailand, it is recommended to invite

teachers/professors from that nation. Selected graduates of the Urban Planning Departments will be sent to foreign universities to further obtain master's or doctor's degree in urban planning, becoming teachers in the national universities in the future.

A trainer's training project will be implemented in cooperation with foreign educational organizations (especially in Thailand) and the MoE simultaneously with the CD-PO-3 project. This training project will continue for approximately 10 years even after the completion of the CD-PO-3 project.

Table 4.4 shows capacity development projects related to human resource at planning phase.

Table 4.4 Planning Phase - Human Resource Capacity Development Projects

Project Name		Implementing Agency	Project	
			Duration	Number of 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

4.4 Action Programs for Urban Management

4.4.1 Institution

(1) Expansion of UDAA jurisdiction area to the same level as urban planning area

At present, the management area of UDAA is smaller than that of the urban planning area. To improve urban management, the UDAA jurisdiction area should be expanded to a corresponding level as that of the urban planning area by amending the regulations of UDAA establishment.
Amendments to regulations of establishment of UDAA will be implemented within the project of CD-PI-3.

(2) Implementing and strengthening public announcements, the perusal of urban plan contents, and strengthening penal regulations against illegal development/building activity

Public announcements and the perusal of urban plan contents (maps, plans, reports and regulations) will be implemented by the local government to ensure proper land use within the urban planning area, and control, protect against disorderly urbanization. Public announcements will be implemented through publications. People can view the detailed contents of an urban plan at the local government offices.

Penal regulations against illegal development/building activities stated in the Law on Urban Plans will be amended and strengthened to control illegal development/building activities in an urban master plan area.

A project addressing public announcements and the perusal of urban plan contents and the strengthening penal regulations against illegal development/building activity will be implemented within the project of CD-PI-2 and CD-PI-3.

(3) Preparation of database on infrastructure development

An inventory of roads, and water supply pipes under roads, should be prepared in collaboration between DPWT, UDAA and the water supply company. This inventory will include detailed data and information of; width of road/sidewalks, pavement type, location and depth of pipe, size and quality of material of pipe. Every agency/company related to utilities and construction will be able to have access to this inventory. Establishing this inventory will contribute to minimizing operation and

maintenance cost of infrastructure.

This project will be implemented in cooperation with foreign experts (5-6 individuals) related to road, water supply and mapping and staff of DPWT and UDAA. Approximately one year will be necessary to conclude this segment.

(4) Increase of budget for urban development and utilization of private finance

The reduction of poverty is the most important issue of this nation; there are difficult issues surrounding a possible change to budget allocations. However, it is necessary to gain new understanding toward the importance of urban development, in particular, the development of Vientiane Capital and regional core cities. True, it is vital to address the reduction of poverty; however a clear level of urban development is also vital as it becomes a generator of economic activities much needed in the urban areas, thus reducing poverty. In this context, it is essential to allocate a sufficient budget toward urban development to avoid a possible limitation to urban economic activities. In the long term, per capita PIP should be balanced between the urban and rural areas.

Privately financed projects are the key to addressing the investment budget shortage; however, this tactic will not succeed if the appropriate project plan and appropriate user tariff are not firmly established. This is why it is necessary to absorb and learn from the experience of surrounding nations, and prepare laws, regulations and guidelines which set the demarcate roles of public and private sector and procedures to progress privately financed projects, etc.

Solving this particular issue is difficult and sensitive. Enhanced consideration from the government of Laos will be necessary.

(5) User charges adjustment and increase of collection ratio

The major goal of infrastructure service such as; water supply and solid waste management is to sustain a certain level of service. Therefore, it is essential that a collection of user charges be made to become revenue which can cover the costs of operations and maintenance of the service. The user charges should be subjected to a raise in accordance with the increase of the cost of living, or economy in general. Both UDAAs should learn from the experience of the water supply companies of both provinces which have successfully earned a profit before depreciation continuously. Within the UDAA service area; there is a possibility to collect water charges and solid waste management charges in the same system.

Adjusting (raising charges) user charges is understandably a political matter, and is not a decision easily made. Added consideration must be made by the provincial government.

Table 4.5 shows capacity development projects related to institution at management phase.

Table 4.5 Management Phase - Institutional Capacity Development Projects

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

Source: JST

4.4.2 Organization

(1) Management of urban planning area by UDAA

Jurisdiction area of UDAA should be expanded to a corresponding level as the urban planning area. The development and maintenance of infrastructure in the urban planning area will be conducted by

UDAA. The UDAA will also process development applications of buildings, regardless of size, and development permits of land within the urban planning area.

Implementation will be made within the project of CD-PI-3.

(2) Supplementation and renewal of vehicle/machinery/equipment for urban management

Parts necessary for the repair to current vehicles/machinery/equipment will be provided, in addition, old vehicles will be replaced with new vehicles to ensure efficient and effective infrastructure services.

This project will be implemented by foreign aid organizations and simultaneously an implementation of a study on the present condition of vehicle/machinery/equipments at UDAAs. This will require approximately one year.

Table 4.6 shows capacity development projects related to organization at management phase.

Table 4.6 Management Phase - Organizational Capacity Development Projects

Project Name		Implementing Agency	Project	
			Duration	Number of Experts
CD-MO-1	Supplementation and renewal of vehicle/machinery/equipment	UDAA	1.0 years	2-3 foreign experts

Source: JST

4.4.3 Human Resource

(1) Development of human resources engaged in urban management

In accordance with improvements made on the equipment needed for urban management, the shortage of human resources in UDAA will also be improved. Experts such as; architects, civil engineers and urban planners should be recruited from universities, the general staff are to receive on-the-job training. In the long term, the possibility of subcontracting infrastructure services such as; road maintenance, solid waste management, etc. to private sectors should be considered.

The employment of staff and subcontracting infrastructure service weighs highly on the budget of local governments. Added consideration must be made within the provincial government.

4.5 Classification of Capacity Development

Capacity development projects can be classified following 4 programs.

- CDP-1: Program for preparation of development plan
- CDP-2: Program for development/amendment of laws/regulations related to urban planning, development and management
- CDP-3: Program for training and education of urban planner and urban management staff
- CDP-4: Program for strengthening of organizations related to urban management

Table 4.7 shows programs and projects of capacity development.

Table 4.7 Capacity Development Programs and Projects

CDP	CD Project		Implementing Agency	Project	
				Duration	Number of experts
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
	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

Chapter 5 Priority Sectors and Projects

5.1 Selection of 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)

5.2 Priority Sectors and Projects

Table 5.1 and Table 5.2 show priority sectors and projects in Kaysone Phomvihane and Pakse.

Table 5.1 Priority Sectors and Projects in Kaysone Phomvihane

No.	Project Name	Imple-menting Agency	Project Location	Project Description
	Road & Transport			
KP-R-1	Improvement and Construction of Collector and Local Road 1 (53.5km)	DPWT/ UDAA	Collector and distributer roads in Urban Inner Zone (UB)	-Study and Design work -Land acquisition and compensation -Construction of new collector and local roads with sidewalks, street lightings and drainage -Road length: Local: Improvement=13.0km, Construction=27.0km, total=40.0km Collector: Improvement =5.0km, Construction=8.5km, total=13.5km -Construction width: Collector=16m (3.5m roadways, 1.5m waiting bay, 3m sidewalk)x2 with drainages Distributer=13.5m (3.25m roadways, 1.5m waiting bay, 2m sidewalk)x2 with drainages
KP-R-2	Improvement and Construction of Urban Minor Arterial Road 1 (37km)	DPWT/ UDAA	Minor arterial roads in UB	-Study and Design work -Land acquisition and compensation -Improvement of minor arterial roads (sidewalks, street lightings, plants and drainage): Road length=26.0km -Improvement width=8~15m (4m x 2 sidewalk with drainages only or 3.5m x2 roadway and 4mx2 sidewalk with drainages) -Construction of minor arterial roads (roadway, sidewalks, street lightings, plants and drainage): Road length= 10.0km -Construction width=22.0m (3.5m x 2 roadway and 4m sidewalk) x 2 with drainages
KP-R-3	Improvement of Urban Major Arterial Road (5km)	DPWT/ UDAA	Major arterial roads in UB	-Study and Design work -Land acquisition and compensation -Improvement of roads (roadway, sidewalks, street lightings, plants and drainage) -Road length=5.0km -Improvement width=30m (3.5mx2 roadway, 7m sidewalk) x 2 and 2m median with drainages

KP-R-4	Improvement of Kaysone Phomevihane Road as Urban Major Arterial Road (6.5km)	DPWT/ UDAA	Existing Kaysone Phomevihane Road	-Study and Design work -Improvement of sidewalks, lightings, plants and drainage -Road length=6.5km -Improvement width=30m (3.5mx2 roadway, 7m sidewalk) x 2 and 2m median with drainages
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	-Study and Design work -Land acquisition and compensation -Construction of new major arterial roads (roadway, sidewalks, street lightings, plants and drainage -Road length=2.0km -Improvement width=30m (3.5mx2 roadway, 7m sidewalk) x 2 and 2m median with drainages
KP-R-6	Beautification of a road along Mekong River (500m)	DPWT	Thahe Road (500m from an old stadium to a temple)	-Study and Design work -Land acquisition and compensation -Improvement of a roadway, on-street parking, sidewalks, lightings, plants, benches, view decks, and drainage - Awareness programs for public & users -Road length=0.5km -Improvement width=20m (3.5mx2 roadways, 5m parking space, 5m (river side) and 3m sidewalk)
	Sewerage Treatment			
KP-S-1	Sewerage Treatment Facilities Development (Pilot Project at the Market)	UDAA	Market at commercial center in UA area of Kaysone Phomevihane	-Detail study, survey, technical design -Construction of community sewerage treatment plant(s) with sewerage pipe collection and facilities for the wastewater generating from Savanxay Market. -Approx. 80m3 per day with the aerobic package treatment unit(s). - Photovoltaic power generation system having generation capacity of 10kw (solar panels will be on the roof of the market) -Demonstration in sewerage treatment facility operation and maintenance for further implementation and awareness -Capacity building on future operation and maintenance.
	Drainage and Flood Mitigation			
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	-Detail study, survey, landscaping design -Clearing of debris with riverbank improvement and protection by grassing. -Approx. 2,000 m. total length of 2 rivers to be improved. -Environmental Awareness Program for people to keep river clean.
KP-D-2	Installation of drainage pumps (3 locations)	DPWT/ UDAA	3 locations where a flap gate had been constructed.	-Study, survey and detail design -Rehabilitation of the existing flap gates and installation of additional sliding gates (if necessary). -Provision of retention ponds with construction and installation of 3 pump houses and drainage pumps near the existing flap gates -Provision of electrical system and automatic operation control of drainage pumps. -Environmental Awareness Program for people to keep river clean.
KP-D-3	Prevention of Mekong River Bank Erosion (Along Thahe Road, L=500m)	DPWT/U DAA	Along Thahe Road (500m)	-Study, survey and detail design -Construction of wire mesh gabion box with mattresses -Length=500m
	Solid Waste Management			
KP-SW-1	Solid Waste Management (Awareness program and preparation of vehicles and equipments)	UDAA	The whole area of UDAA of Kaysone Phomevihane	-Promotion program on solid waste reduction and proper management -Provide sufficient and proper solid waste bin in public area and market -Purchasing more vehicles trucks to increase collection and transport waste within the urban area including required facilities and equipments. - Awareness programs to beneficiaries
	Park and Green			
KP-P-1	Improvement of the existing Kaysone Phomvihane park	UDAA	The existing Kaysone Phomvihane park	-Study and detail design -Construction of a soccer field, a gymnasium and a general purpose field, toilets and some kiosk areas -Park area=10ha

Source: JST

Table 5.2 Priority Sectors and Projects in Pakse

No.	Project Name	Imple-menting Agency	Project Location	Project Description
	Road & Transport			
PS-R-1	Improvement and Construction of Collector and Local Road 1 (22.0km)	DPWT/UDAA	Collector and distributer roads in Urban Inner Zone (UB)	-Study and design work -Land acquisition and compensation -Construction of new collector and distributer roads with sidewalks, street lightings and drainage -Road length: Collector=11.4km, Local=10.5km -Construction width: Collector=16m (3.5mx2 roadways, 1.5mx2 waiting bay, 3mx2 sidewalk with drainages) Distributer=13.5m (3.25m roadways, 1.5m waiting bay, 2m sidewalk) x 2 with drainages
PS-R-2	Improvement and Construction of Urban Minor Arterial Road 1 (18.0km)	DPWT/UDAA	Minor arterial roads in UB	-Study and Design work -Land acquisition and compensation -Construction of arterial roads with sidewalks, street lightings, plants and drainage -Road length=18.0km -Construction width=22m (3.5mx2 roadways and 4m sidewalk) x 2 with drainages)
PS-R-3	Improvement of existing NR13 (10km)	DPWT	Eastern bank of Xedong Riber	-Study and Design work -Construction of sidewalks, lightings, plants and drainage -Road length=11.5km -Improvement width=22m (3.5mx2 roadways, 2.5mx2 parking lanes, 4mx2 sidewalk and 2m median with drainages)
PS-R-4	Construction of urban major arterial roads 1 (1.5km)	DPWT/UDAA	Major arterial roads in UB	-Study and Design work -Land acquisition and compensation -Construction of an urban major arterial roads with sidewalks, street lightings, plants and drainage -Road length=1.5km -Construction width=30m (3.5mx2 roadway, 7m sidewalk) x 2 and 2m median with drainages
PS-R-5	Construction of new N.R. 13 (5.5km)	DPWT	Eastern bank of Xedong Riber and northern part of the Survey Area of Pakse	-Study and Design work -Land acquisition and compensation -Construction of a new N.R.13 with a bridge, sidewalks, lightings, plants and drainage -Road length=5.5km (including 150m of a bridge having 14m width over Xedong River) -R.O.W.=40m -Construction width of Phase I=20m (3.5m roadways, 2.5m motor bicycle lane and 4m sidewalk) x 2 with drainages
PS-R-6	Beautification of a road along Mekong River	DPWT	Eastern bank of Xedong Riber	-Study and Design work -Land acquisition and compensation -Construction a roadway, on-street parking, sidewalks, lightings, plants, benches, view decks, and drainage - Awareness programs for public & users -Road length=1km -Road width=20m (3.5mx2 roadways, 5m parking space, 5m (river side) and 3m sidewalk)
	Water Supply			
PS-W-1	Expansion of the existing water supply facility	W.S.C /DPWT	UA and UB area of Pakse	- Study and Design work -Installation of additional three intake pumps -Expansion of WTP with capacity of 15,000 m3/day -Construction of Clear and Backwash Reservoir with capacity of 1,500 m3 in WTP -Installation of 3 transmission pumps -Construction of transmission, 500 mm pipe with length of 16 km, and distribution pipeline -Construction of two elevated water tanks with volume of 1,000 m3 -Construction of booster pumping station
	Sewerage Treatment			
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	-Detail study, survey, technical design -Construction of community sewerage treatment plants with sewerage pipe collection and facilities for the wastewater generating from Pakse New Market -Approx. 100-120m3 per day with the aerobic package treatment units - Photovoltaic power generation system having generation capacity of 10kw (solar panels will be on the roof of the market) -Demonstration in sewerage treatment facility operation and maintenance for further implementation and awareness -Capacity building on future operation and maintenance
	Drainage and Flood Mitigation			

PS-D-1	Natural Stream Improvement Project (4 rivers, total length: about 2.4 km)	DPWT/UDAA	3 rivers in western bank and 1 river in eastern bank of Xedong River	-Study and Design work -Land acquisition and compensation -Bank protection with grass - Awareness programs for public & users
PS-D-2	Installation of Drainage Pumps (4 locations)	DPWT/UDAA	3 in western bank and 1 in eastern bank of Xedong River	-Study, survey and detail design -Installation of 4 sliding gates -Construction of pump houses at the 3 outlets in the western bank and 1 outlets in the eastern bank of Xedon river -Installation of 4 drainage pumps in the pump houses near the flood gate locations. -Provision of electrical system and automatic operation control of drainage pumps. -Environmental Awareness Program for people to keep river clean.
PS-D-3	Prevention of River Bank Erosion	DPWT/UDAA	0.8km along the west bank of Xedon River and 1 km along Mekong River bank	-Study, survey and detail design -Approx. 800 m. along the west bank of Xedon River and approx. 1,000 m. along Mekong River bank in the western side -Construction of wire mesh gabion box with mattresses -Length=1,800m
	Solid Waste Management			
PS-SW-1	Solid Waste Management (Awareness program and preparation of vehicles and equipment)	UDAA	The whole area of UDAA of Pakse	-Promotion on solid waste reduction and proper management program -Provide sufficient and proper solid waste bin in public area and market -Purchasing vehicles and equipment for collection and transport waste within the urban area - Awareness programs for beneficiaries
	Park and Green			
PS-P-1	Improvement of existing park (Community park, 4ha)	UDAA	Existing well-used public park at the west-side of the market	-Study and detail design -Improvement of an existing park (green area general purpose open field, a foot-ball field, foot path, benches, lighting, kiosks, shaded multi-purpose building) -Park area=4ha

Source: JST

5.3 Priority Sectors and Projects in Capacity Development

Development of institution, organization and human resource at planning and management phase is very important and fundamental. Projects in programs identified in the capacity development needs analysis in Chapter 4, therefore, will be selected as priority projects and be implemented as fast as possible and be continued for certain periods. In addition, human resource development shall be included in a number of infrastructure projects.

Table 5.3 Priority Sectors and Projects in Capacity Development

CDP	CD Project		Implementing Agency	Project	
				Duration	Number of Experts
CDP-1	CD-PI-1-1	Preparation of national land development plan	MPI, MoIC, 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 year	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 year	4-5 foreign experts
	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 year	5-6 foreign experts
	CD-MO-1	Supplementation and renewal of vehicle/machinery/equipment	UDAA	1.0 year	2-3 foreign experts

Source: JST

5.4 Environmental and Social Considerations at Project Level – Initial Environmental Examination (IEE) of Priority Projects

This section compiles the results of Initial Environmental Examination (IEE) of the proposed priority projects. It includes (i) the proposed project description, (ii) potential environmental and social impacts, (iii) environmental management plan and (iv) process of public involvement.

5.4.1 Project Descriptions

The proposed priority project descriptions in Kaysone Phomvihane and Pakse are summarized in Table 5.1 and Table 5.2. None of the projects are located in environmentally sensitive areas.

5.4.2 Environmental and Social Impacts

The priority projects aim at improving the urban environment. The projects have environmental and social impacts within three periods: design, construction, and operation periods. The majority of priority projects have positive environmental impacts in the operational period. Only roads and solid waste management projects have adverse impacts in the operational period. However, all projects have adverse impacts in the designing and construction periods.

In the designing period, location and land acquisition is crucial. Significant environmental impacts are expected if projects sites are located in environmentally sensitive areas. Land acquisition forces people to resettlement, alters economic activities, and alters land use.

In the construction period, all projects have adverse environmental and social impacts. A framework of the potential environmental and social impacts analysis is summarized in the following table.

Table 5.4 Analytical Framework of Potential Environmental and Social Impacts

Period	Project Activities	Environmental Impacts																												
		Social Environment												Natural Environment								Pollution								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
		Involuntary Resettlement	Local economy such as employment and livelihood, etc.	Land use and utilization of local resources	Social institutions such as social infrastructure and local decision-making institutions	Existing social infrastructures and services	The poor, indigenous and ethnic people	Misdistribution of benefit and damage	Cultural heritage	Local conflict of interests	Water Usage or Water Rights and Rights of Commons	Sanitation	Hazards (Risk), Infectious diseases such as HIV/AIDS	Topography and Geographical features	Soil Erosion	Groundwater	Hydrological Situation	Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)	Flora, Fauna and Biodiversity	Meteorology	Landscape	Global Warming	Air Pollution	Water Pollution	Soil Contamination	Waste	Noise and Vibration	Ground Subsidence	Offensive Odor	Bottom sediment	Accidents
Design period	Location: Environmentally sensitive areas																													
	Cultural/heritage areas								X																					

	Protected area																	X											
	Wetland																X												
	River													X		X													
	Ethnic minority						X																						
	Special significance to local people																												
	High scenic value		X																X										
	Land acquisition																												
	Land acquisition	X	X	X																									
	Restrictions on land use		X	X														X											
Construction period	Mobilizing workers; labor camp								X			X																	
	Site clearance, digging							X										X											
	Transport of materials																					X			X	X			X
	Stockpiles of materials/ Workshop/fuel depots/ Warehouses/ Asphalt plant																						X	X			X		
	Borrow pits, quarries, rock crushing plant, removal of materials												X	X	X														
	Using toxic chemicals or explosive																					X	X						
	Operation of construction plant and vehicles																					X				X		X	X
	Construction waste																						X		X				
Operation period	Road		++																			X			X	X			X
	Water supply										++																		
	Sewerage Treatment										++																		
	Natural Stream Improvement										++												++						
	Drainage Pumps																												
	Prevention of River Bank Erosion													++															
	Solid Waste Management																								++				
	Park																	++		++									

Note: X indicates potential adverse impacts, and ++ indicates Potential positive impacts
Source: JST

By using this framework, the potential impacts of the priority projects on the environment and societies are identified and summarized in Table 5.5.

Table 5.5 Potential Impacts by Priority Project in Kaysone Phomvihane

No.		K-R-1	K-R-2	K-R-3	K-R-4	K-R-5	K-R-6	K-S-1	K-D-1	K-D-2	K-D-3	K-SW-2	K-P-1
		Improvement and Construction of Collector and Local Road 1	Improvement and Construction of Urban Minor Arterial Road 1	Improvement of Urban Major Arterial Road	Improvement of Kaysone Phomvihane Road as Urban Major Arterial Road	Improvement of a part of National Road 9A as Urban Major Arterial Road	Beautification of a road along Mekong River	Development of Sewerage Treatment Facility in Kaysone Phomvihane	Natural Stream Improvement Project	Installation of Drainage Pumps	Prevention of Mekong River Bank Erosion	Solid Waste Management	Improvement of the existing Kaysone Phomvihane park
	Social Environment												
1	Involuntary Resettlement					B							
2	Local economy such as employment and livelihood, etc.	B/+		B/+	B/+	B/+	B/+				C		
3	Land use and utilization of local resources	B		B		B	B				C		
4	Social institutions such as social infrastructure and local decision-making institutions												
5	Existing social infrastructures and services												
6	The impoverished, indigenous and ethnic people	C											

7	Misdistribution of benefit and damage												
8	Cultural heritage												
9	Local conflict of interests	C	C	C	C	C	C		C	C	C		C
10	Water Usage or Water Rights and Rights of Commons												
11	Sanitation							++				++	
12	Hazards (Risk), Infectious diseases such as HIV/AIDS	C	C	C	C	B	C	C	C		C		C
	Natural Environment												
13	Topography and Geographical features												
14	Soil Erosion						B				++		
15	Groundwater												
16	Hydrological Situation									B			
17	Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)												
18	Flora, Fauna and Biodiversity		B	C	C	C							
19	Meteorology												
20	Landscape	++					++	C	++		++		++
21	Global Warming					C							
	Pollution												
22	Air Pollution	B/+	B/+	B	B	B	B		C	C	C	C	C
23	Water Pollution						C	++	CC				
24	Soil Contamination												
25	Waste	C	C	C	C	C	C		C	C	C	++	C
26	Noise and Vibration	B	B	B	B	B	B	C	C	C	C	C	C
27	Ground Subsidence												
28	Offensive Odor												
29	Bottom sediment												
30	Accidents	B	B	B	B	B	B	C	C	C	C	C	C

Note: A: Significant adverse impact on the environment and society; B: Some impact on the environment and society; C: Minimum and no impact on the environment and society; ++: Significant positive impact on the environment and society; +: Some positive impact on the environment and society; No mark: No impact

Source: JST

Table 5.6 Potential Impacts by Priority Project in Pakse

No.		P-R-1	P-R-2	P-R-3	P-R-4	P-R-5	P-R-6	P-W-1	P-S-1	P-D-1	P-D-2	P-D-3	P-SW-1	P-P-1
		Construction of Collector and Local Road 1	Improvement and Construction of Urban Minor Arterial Road 1	Improvement of existing N.R.13	Construction of urban major arterial roads 1	Construction of new N.R. 13	Beautification of a road along Mekong River	Expansion of the existing water supply facility	Development of Sewerage Treatment Facility in Pakse	Natural Stream Improvement Project	Installation of Drainage Pumps	Prevention of River Bank Erosion	Solid Waste Management	Improvement of an existing park
	Social Environment													
1	Involuntary Resettlement					B	C							C
2	Local economy such as employment and livelihood, etc.	B/+		B/+	B/+	B/+	B/+					C		
3	Land use and utilization of local resources	B	B		B	B	B							
4	Social institutions such as social infrastructure and local decision-making institutions													

5	Existing social infrastructures and services													
6	The impoverished, indigenous and ethnic people	C												
7	Misdistribution of benefit and damage													
8	Cultural heritage													
9	Local conflict of interests	C	C	C	C	B	C	C		C	C	C		C
10	Water Usage or Water Rights and Rights of Commons													
11	Sanitation							++					++	
12	Hazards (Risk), Infectious diseases such as HIV/AIDS	C	C	C	C	B	C	C	C	C	C	C		C
	Natural Environment													
13	Topography and Geographical features													
14	Soil Erosion						B					++		
15	Groundwater													
16	Hydrological Situation										B			
17	Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)													
18	Flora, Fauna and Biodiversity		B		B	C		C						
19	Meteorology													
20	Landscape	++					++			++		++		++
21	Global Warming					C								
	Pollution													
22	Air Pollution	B/+	B/+	B	B	B	B	C		C	C	C	C	C
23	Water Pollution						C		++	C	C			
24	Soil Contamination													
25	Waste	C	C	C	C	C	C	C		C	C	C	++	C
26	Noise and Vibration	B	B	B	B	B	B	C	C	C	C	C	C	C
27	Ground Subsidence													
28	Offensive Odor													
29	Bottom sediment													
30	Accidents	B	B	B	B	B	B	C	C	C	C	C	C	C

Note: A: Significant adverse impact on the environment and society; B: Some impact on the environment and society; C: Minimum and no impact on the environment and society; ++: Significant positive impact on the environment and society; +: Some positive impact on the environment and society; No mark: No impact
Source: JST

(1) Impacts in the Design Period

Land Acquisition and Restriction of Land Use - Resettlement, Impacts on Land Use and Consequent Local Economy: Road projects except K-R-2 require land acquisition. Two projects, K-R-5 and P-R-5 have the potential to require resettlement; however, the sites where these roads are planned are scarcely populated. Remaining road projects will acquire land by enacting land readjustment; where every resident provides a small piece of land to improve the roads. Through this process, residents will benefit in the long-term. If there are structures such as; restaurants and small shops, they will be relocated. This places an impact on the local economy. The projects K-R-1 and P-R-1 are located in the center of a town where a variety of people reside; a potential impact on the impoverished residents.

(2) Impacts in the Construction Period

Mobilizing Workers - Local Conflict with Communities: Construction projects require the mobilization of workers; bringing on the potential of conflict with communities, the spread of STIs and HIV/AIDS. These impacts become significant for the project P-R-5 that has a bridge construction component, introducing the possibility of the establishment of a worker camp. In

addition, a worker camp has high potential of generating waste and wastewater pollution.

Impacts on the Natural Environment: Road construction projects require the removal of vegetation. Especially, K-R-2, P-R-2, and P-R-4 pass through vegetated areas; significant impacts on trees are expected. The beautification of the road along the Mekong River, projects K-R-6 and P-R-6, have potential impacts of soil erosion of river banks.

Construction Work and Environmental Impact - Pollution: The majority of the projects have potential impacts that are related to construction work. By establishing stockpiles of materials/ workshop/fuel depots/ warehouses/ asphalt plant, it carries with it impacts such as dust and offensive odor. The operation of construction plants and vehicles will be the source of adverse impacts such as; dust and other air pollutants, noise/vibration from heavy machinery/vehicles, workers, traffic jams, and accidents. Construction waste is generated if not properly treated.

Impacts in the Operation Period: Road projects are the source of potential adverse impacts such as; noise/ vibration, dust/air pollutants, traffic accidents, traffic jams, solid waste generated by passengers. Solid waste management projects also have adverse impacts, by operating garbage collection vehicles, the potential occurrence of traffic accidents. However, road projects are also the source of numerous potential positive impacts such as; the creation of economic opportunities, improvements to the landscape and reducing air pollution with a smoother flow of traffic.

5.4.3 Environmental Management Plan

Environmental Management Plan includes preventive or mitigating measures, of environmental impacts, institutional arrangements, and an environmental monitoring program. The preventive and mitigation measures in the construction period shall be included in the specifications in the bidding documents. The environmental management plan is summarized in Table 5.7.

Table 5.7 Environmental Management Plan

Period	Activities	Potential Impacts	Preventive/ Mitigating Measures	Responsibility	
				Imple-mentation	Monitoring
Design Period	Land Acquisition & Restriction on Land Use	Resettlement	Resettlement action plan with compensation	PO	DPRA
		Relocation of structures such as shops and restaurants.	Careful design avoiding relocation; compensation	PO	DPRA
Construction Period	Mobilizing workers	Conflict with communities	Public consultation with communities	Contractor	PO
		Spread of STIs and HIV/AIDS	Education to workers	Contractor	PO
		Waste generation	Awareness building	Contractor	PO
	Land clearance	Removal of vegetation	Minimizing vegetation removal; Planting trees and bushes along the road sides	Contractor	PO
		Soil erosion along the rivers	Preventive construction; river training	Contractor	PO
	Stockpiles	Dust, offensive odor	Properly covered	Contractor	PO
	Operation of machinery	Dust and air pollution	Water spraying for earth roads.	Contractor	PO
		Noise and vibration	Announcement to communities and agreement; proper maintenance of machinery	Contractor	PO
		Impacts on workers	Health instruction to workers,	Contractor	PO
		Traffic jam	Proper signage and annoucement	Contractor	PO
		Traffic accidents	Appropriate traffic control and management plan	Contractor	PO
	Construction	Waste generation	Proper disposal	Contractor	PO

	waste				
Operation Period	Roads	Dust and other air pollution	Water spraying	PO	DPRA
		Noise and vibration	Planting trees and bushes along the road sides as noise protection barriers	PO	DPRA
		Traffic jam	Traffic signal	PO	DPRA
		Traffic accident	Road safety awareness and campaigns	PO	DPRA
		Solid waste generation	Public awareness	PO	DPRA
	Solid Waste Management	Traffic accidents	Education to drivers; public awareness	PO	DPRA

Notes: PO: Project owner; DPRA: Development Project Responsible Agency.
Source: JST

5.4.4 Public Involvement

In the Survey process, JST held a series of SHMs, as well as, ACMs. A couple of SHMs held in Kaysone Phomvihane and Pakse were conducted as public involvement activities. Representatives of communities, groups, provinces, and districts participated in the SHMs, and their voices were incorporated within the Survey.

ACMs were held three times each at Kaysone Phomvihane, Pakse, and Vientiane which were opportunities for the survey team to receive advice on the survey proposal and its results. These valuable comments were also incorporated in the survey results. The record of these meetings is shown in Table 5.8.

Table 5.8 Public Involvement and Meetings

Meeting	Date	Venue
1st Advisory Committee	18 March 2009	Kaysone Phomvihane
	19 March 2009	Pakse
	27 March 2009	Vientiane
2nd Advisory Committee	2 July 2009	Pakse
	8 July 2009	Kaysone Phomvihane
	15 July 2009	Vientiane
3rd Advisory Committee	17 August 2009	Kaysone Phomvihane
	19 August 2009	Pakse
	28 August 2009	Vientiane
1st Stakeholder Meeting	2 July 2009	Pakse
	8 July 2009	Kaysone Phomvihane
2nd Stakeholder Meeting	18 August 2009	Kaysone Phomvihane
	19 August 2009	Pakse

Source: JST

Chapter 6 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 sparely 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 exist. 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.