

Chapter 4: A Master Plan for Urban Planning Area

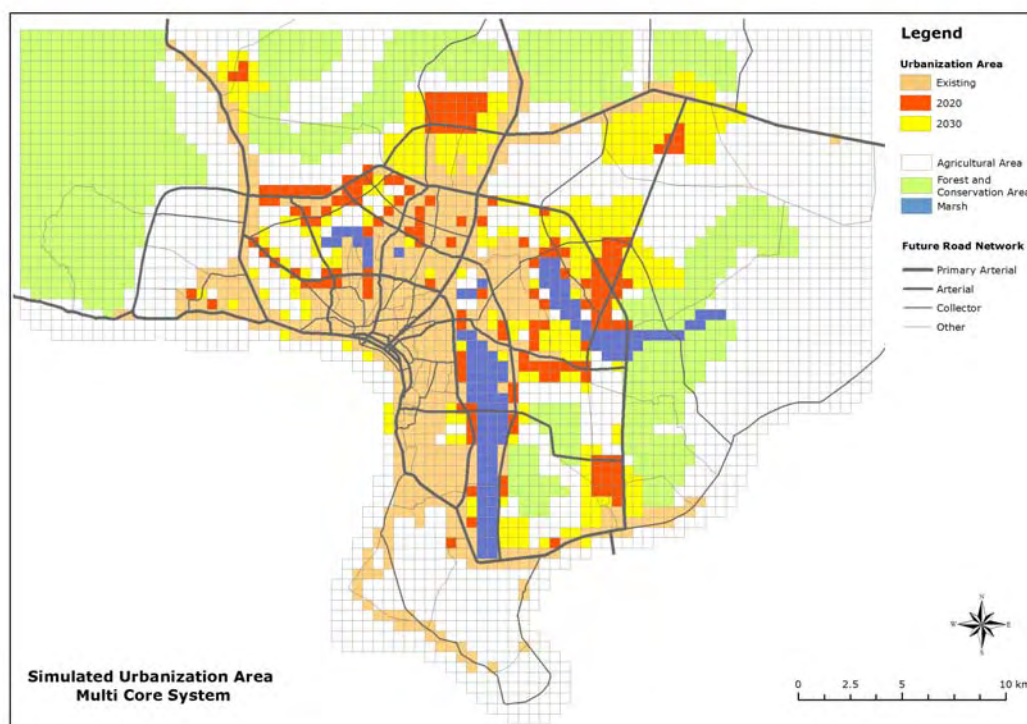
4.1 Land Use Plan

4.1.1 Urbanization Simulation

Land Potential Evaluation: Land potential evaluation aims at identifying the urbanization process of Vientiane Capital. Land potential evaluation was carried in terms of three categories; natural condition, accessibility, and convenience of living environment. The evaluation adopted a scoring system by 500 meter grid columns covering the core urban area of the urban planning area.

Urbanization Simulation: Based upon the result of land potential evaluation and analysis, the urbanization simulation model is developed. For the calibration the simulation model in current condition must fit with actual urbanization area as much as possible.

Future Urbanization Simulation: Future urbanized areas in 2020 and 2030 are simulated in accordance with future population. In order to accommodate the future urban population of 610,000 in 2020 and 895,000 in 2030 which include inner urban zone and outer urban zone, the urbanized area needs to be 17,430 ha in 2020 and 25,570 ha in 2030. This area has been calculated on the basis of population density of 25 person/ ha which is almost the same level as of present urban population density. Accordingly, the newly built-up areas were calculated as 4,230 ha between 2009 and 2020, and 8,140 ha between 2020 and 2030. The future urbanization simulation was demonstrated by multi-core structure as shown in Figure 4.1.

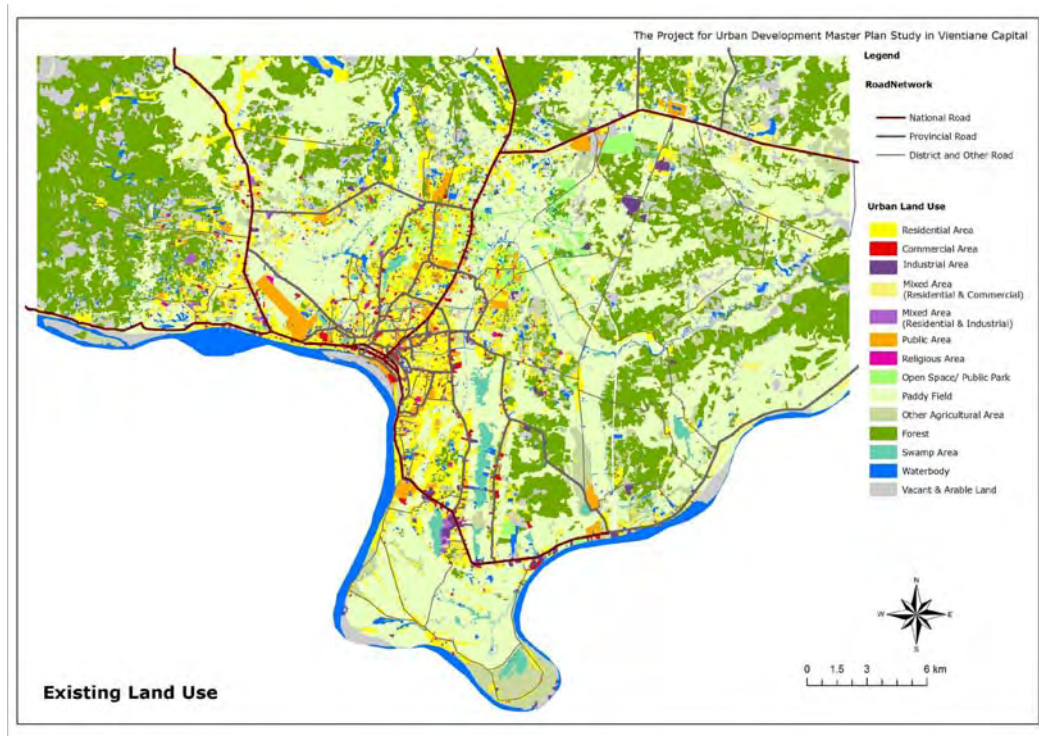


Source: JST

Figure 4.1: Urbanization Simulation for 2030

4.1.2 Land Use Plan of Core Urban Area

Zoning Concept: For the land use plan, a zoning concept was adopted. The zones were defined and classified in three major zones; 1) inner urban zone, 2) outer urban zone, and 3) outskirts zone and urban clusters.



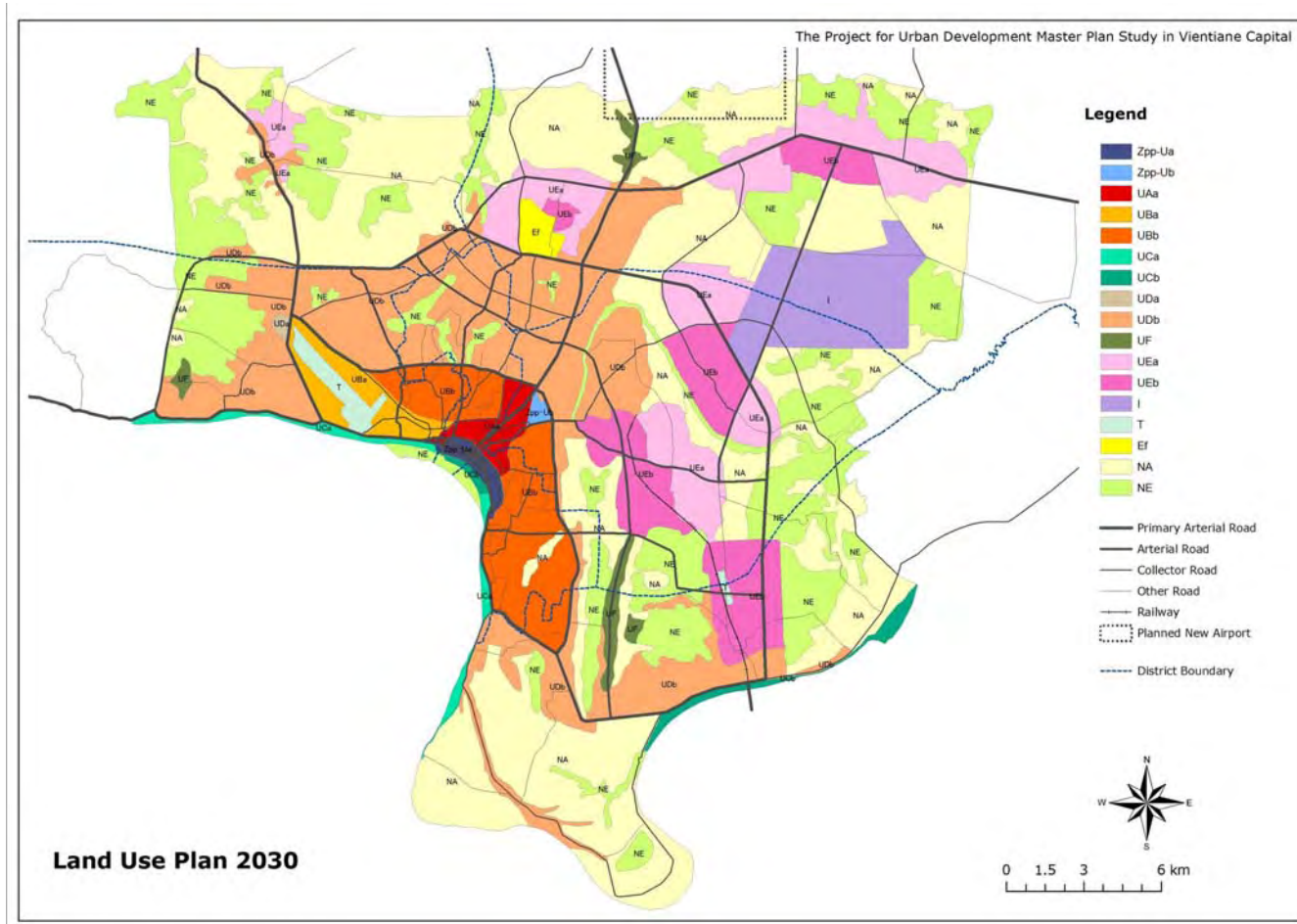
Source: JST

Figure 4.2: Existing Land Use

Table 4.1: Zoning Concept of Land Use Plan

Major Zoning	Function	Land Use
Inner urban zone (Including Historic conservation zone)	<ul style="list-style-type: none"> Center of Administration Regional hub of business and service Commerce Urban residence International gateway and tourism hub Cultural heritage of Lao people 	<ul style="list-style-type: none"> Historical landscape and buildings conservation: [ZPP-Ua] and [ZPP-Ub] Natural conservation: [NE] More Higher density for accelerating redevelopment for business and commerce: [UA] Housing oriented area in the inner urban area : [UB]
Outer urban zone (Including Sub-center zone)	<ul style="list-style-type: none"> Sub-centers Residential area Conservation of lower land and swamp land and paddy field for flood control and recreation 	<ul style="list-style-type: none"> Sub-centers: [UEb] and [UEa] VIP: [I] and VLP: [T] etc Residential oriented area in outer urban area: [UD] Conservation of forest and water areas: [NE] Conservation of agricultural area: [NA] (accepting minimum housing development in existing settlements)
Outskirts zone (Including Sub-center zone)	<ul style="list-style-type: none"> Conservation of naturally important areas and agricultural land with higher yield Sub-centers 	<ul style="list-style-type: none"> Conservation of forest and water areas: [NE] Conservation for agricultural area: [NA] (accepting minimum housing development of existing settlements)

Source: JST



Source: JST

Figure 4.3: Land Use Plan of Core Urban Area 2030

Land Use Plan: By taking in account of the basic policies for the future urban structure as explained above, the future land use plan of the core urban area for 2030 was established. This land use plan is based upon “Urban Development Master Plan 2000-2010”, satellite image analysis, existing land use and other plans of relevant projects. The land use plan for the outer urban zone, outskirts zone and sub-centers follows the concept of multi-core structure. Therefore the land use plans of these areas are spatially coordinated not only with the existing land use but also with the urbanization simulation model of multi-core structure. The land use of agricultural and conservation areas follows the current land use conditions without any significant modifications.

Land Use Category: Area of future land use plan in 2030 by category is calculated in Table 4.2. Future urbanization area achieves approximately 48.0% of the total land in urban planning area, whilst the combined agricultural and conservation areas comprise approximately 52.0%. With this land use, there will be a ample scope for further development even after 2030 to accommodate the future population growth and economic activities.

Table 4.2: Area by Land Use Category

Category		Area (ha)	%
Urbanized Area			
	Zpp-Ua	250	0.4%
	Zpp-Ub	80	0.1%
	UAa	540	0.9%
	UBa	890	1.4%
	UBb	2,920	4.7%
	UCa	480	0.8%
	UCb	390	0.6%
	UDa	50	0.1%
	UDb	11,510	18.7%
	UEa	4,960	8.0%
	UEb	3,670	5.9%
	UF	560	0.9%
	I	2,640	4.3%
	T	400	0.6%
	Ef	290	0.5%
	sub-total	29,630	48.0%
Agricultural and Conservation Area			
	NA	20,460	33.2%
	NE	11,610	18.8%
	sub-total	32,070	52.0%
Total		61,700	100.0%

Source: JST

New Zone “UEb”: The detailed zoning categories basically comply with the current land use master plan as well. One category, “UEb”, is however added to the zoning system to take account of the necessity of higher dense development in sub-centers in accordance with growth of population and business activities in future.

4.1.3 Land Use Plan of Sub-centers

(1) KM21 Sub-center

Current Conditions: KM21 area is the area around Xaysetha District and Xaythany District. The land is covered mainly with low bush forest limited areas of paddy field and upland crop area. The KM21 area currently has industrial zone, which is 60 ha of land owned by Vientiane Capital. Out of 60 ha, 54 ha is utilized for leasing land, while the remaining land is for roads. The development potential of the area is improved with 450 years road as an important truck transport network as well as improved local road (DR-109).

Development Framework: KM21 area has approximately 18,701 persons of population in 2005. Population distribution plan based on the availability of land and urbanization potential analysis indicates that KM21 sub-center shall accommodate 48,000 persons of population in 2020 and 150,000 persons of population in 2030. Necessary area to accommodate those population is 625 ha in 2020 and 3,150 ha in 2030.

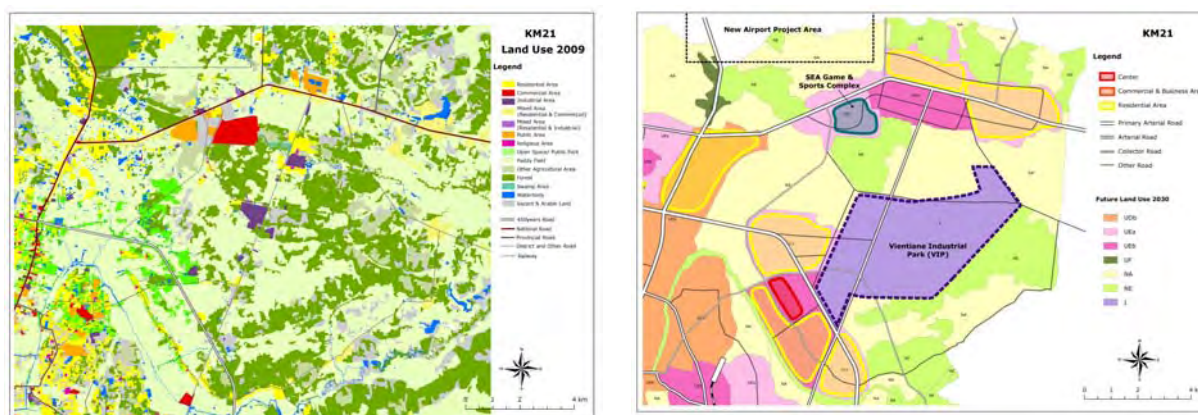
Development Concept: Development of KM21 Sub-center is conceptually and preliminarily delineated with the following points of view:

Table 4.3: Development Concept of KM21

Items	Concepts
Function and Role	<ul style="list-style-type: none"> - Sub-center to decentralize urban functions in CBD of Vientiane - New administration center, industrial zone - Suburban residential area for working at Sub-center
Core Facilities	<ul style="list-style-type: none"> - Vientiane Industrial Park (VIP) and Chinese industrial estate - Sports Complex area - Chinese university

Source: JST

Land Use Plan: The area shall be roughly divided into three compact zones: residential zone, new administration zone and Industrial zone to avoid disordered and sprawl development. The new administration zone and the industrial zone shall be a self-sufficient zone with balance working and residential areas. Center zone is planned to locate at west side of the industrial zone to access all three zones but mainly service to industrial zone which expects more living and working populations. The surrounding area shall be reserved as buffer zone and natural conservation area.



Source: JST

Figure 4.4: Current Land Use and Land Use Plan of KM21

(2) Thanaleang Sub-center

Current Conditions: Thanaleang area is the area around Xaysetha District and Hadxaifong District. Thanaleang area is a flat land along riverbank of Mekong River. Paddy field play as retention area. Dong Phosy forest, which is located near to Mekong River, is designated as Reserve Forest. The development potential of the area is improved with 450 years road as an important truck transport network as well as several development projects such as Vientiane Logistics Park (VLP) and Thanaleang Commercial Complex.

Development Framework: Thanaleang area has approximately 3,800 persons of population in 2005. Population distribution plan based on the availability of land and urbanization potential analysis indicates that Thanaleang sub-center shall accommodate 16,000 persons of population in 2020 and 35,000 persons of population in 2030. Necessary area to accommodate those population is 325 ha in 2020 and 575 ha in 2030.

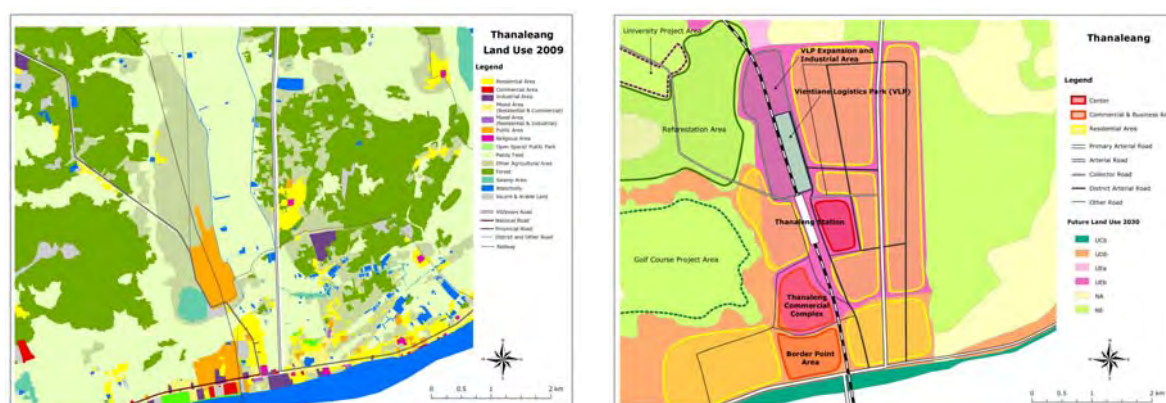
Development Concept: Development of Thanaleang Sub-center is conceptually and preliminarily delineated with the following points of view:

Table 4.4: Development Concept of Thanaleang

Items	Concepts
Function and Role	<ul style="list-style-type: none"> - Sub-center to decentralize urban functions in CBD of Vientiane - Border trade, logistics and commerce - Suburban residential area for working at Sub-center
Core Facilities	<ul style="list-style-type: none"> - Thanaleang Railway Station - Vientiane Logistics Park (VLP) - Thanaleang Commercial Complex (SEZ) - Thanaleang Border Point

Source: JST

Land Use Plan: Sub-center development should be based on location of existing and planned core facilities in the area such as VLP, railway and 450 Years Road. Sub-center development should carefully and widely utilize land development potentials to be rise due to development of those facilities. Center zone is planned to locate at east side of Thanaleang railway station to keep good access to railway station and 450Years Road. VLP and surrounding area shall be reserved to expand VLP and to concentrate logistics businesses and distributive processing factories in near future. Residential area locates around the center zone and along 450 Years Road to keep good accessibility to the core facilities and the arterial transport network.



Source: JST

Figure 4.5: Current Land Use and Land Use Plan of Thanaleang

(3) Dongdock Sub-center

Current Conditions: Dong Dock area is in Xaythany District. Dong Dock area is located north-eastern suburban area of Vientiane. The area is flat land and is traditionally covered with paddy field and upland crop areas however, the area is currently quickly urbanizing. Dong Dock area is well known as academic town with National University of Lao and many research institutes. Currently, residential development occurs in the area due to proximity to the downtown with relatively good living environment.

Development Framework: Dong Dock area has approximately 19,000 persons of population in 2005. Population distribution plan based on the availability of land and urbanization potential analysis indicates that Dong Dock sub-center shall accommodate 56,000 persons of population in 2020 and 80,000 persons of population in 2030. Necessary area to accommodate those population is 550 ha in 2020 and 1,200 ha in 2030.

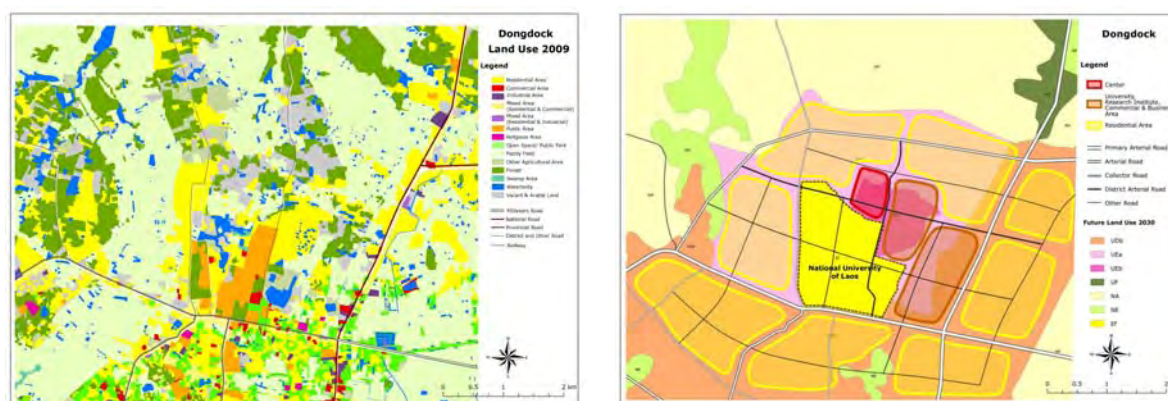
Development Concept: Development of Dong Dock Sub-center is conceptually and preliminarily delineated with the following points of view:

Table 4.5: Development Concept of Dongdock

Items	Concepts
Function and Role	<ul style="list-style-type: none"> - Sub-center to decentralize urban functions in CBD of Vientiane - Relocation and concentration of academic and research institutes - Suburban residential area for working at Sub-center
Core Facilities	<ul style="list-style-type: none"> - National University of Lao - Public research institutes

Source: JST

Land Use Plan: The area naturally has higher development potential without public intervention, comparing to the other sub-center areas. It is accordingly important to utilize and well control natural urbanization pressure at the area. Minimum infrastructure provision is also important for inviting private investor to take care of a part of sub-center development. The core facility of the area is existing National University of Lao. There are several research institutes and offices nearby the university. With utilizing existing those facilities, center zone shall be located at the northern part of the university to rise centrality of the sub-center. The center zone should have commercial, local public service functions. The new residential areas shall be developed surrounding the center area by utilizing development potentials.



Source: JST

Figure 4.6: Current Land Use and Land Use Plan of Dongdock

(4) Naxaithong Sub-center

Current Conditions: Naxaithong area is in Naxaithong District. The area is agricultural area mainly with paddy field and upland crop area. The area will have a development potential to be residential satellite town centering local public and commercial service functions in the suburban Vientiane based on the good accessibility, existing small urban accumulation.

Development Framework: Naxaithong area has approximately 2,500 persons of population in 2005. Population distribution plan based on the availability of land and urbanization potential analysis indicates that Naxaithong sub-center shall accommodate 7,000 persons of population in 2020 and 20,000 persons of population in 2030. Necessary area to accommodate those population is 75 ha in 2020 and 400 ha in 2030.

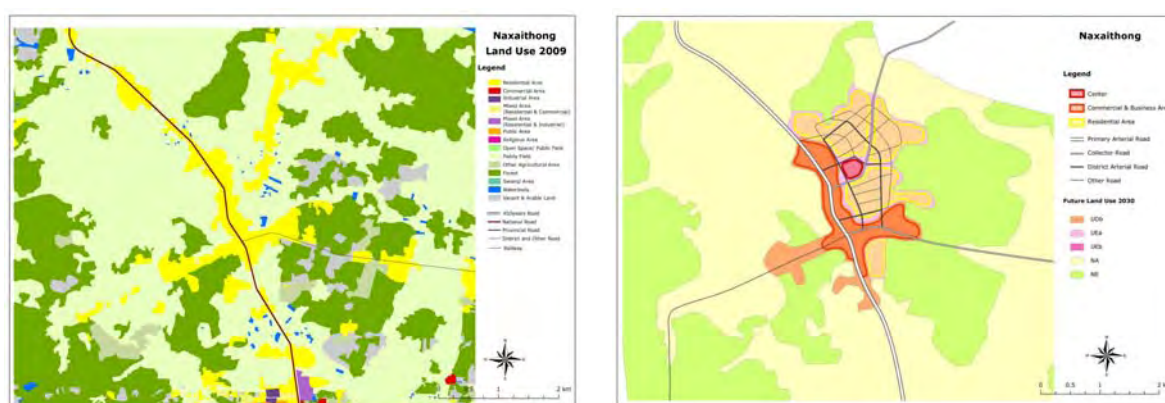
Development Concept: Development of Naxaithong Sub-center is conceptually and preliminarily delineated with the following points of view:

Table 4.6: Development Concept of Naxaithong

Items	Concepts
Function and Role	- Sub-center to decentralize urban population of inner urban area of Vientiane - Suburban residential town for commuters to Vientiane
Core Facilities	- Existing local center functions - Suburban commercial center

Source: JST

Land Use Plan: Sub-center development should be based on location of existing local town. It is indispensable for the development of Naxaithong Sub-center area to carefully and widely utilize improved land development potentials due to development of those facilities. Since there is limited attractiveness to Naxaithong due to limited size of town, it is of great important to develop center area with core shopping facilities to gather more peoples in the sub-center as well as to improve image of the Naxaithong area to be higher standard residential area. Minimum infrastructure provision is also important for inviting private investor to take care of a part of development of the sub-center. The center zone should have commercial, local public service functions. The new residential areas shall be developed surrounding the center area by utilizing development potentials.



Source: JST

Figure 4.7: Current Land Use and Land Use Plan of Naxaithong

(5) Railway Town Sub-center

Current Conditions: Railway Town area is in Xaysetha District. The area is agricultural area with mainly paddy production. Although there is some parts of suburban residential area in the area, the population is still limited. It is noted that the area has a plan to locate Vientiane Central Station, which is expected to work as a railway transport hub/ gateway connecting to Thailand. The station will be a key facility of new economic activities in the area, in particular commercial development and residential development.

Development Framework: Railway Town area has approximately 3,800 persons of population in 2005. Population distribution plan based on the availability of land and urbanization potential analysis indicates that Railway Town sub-center shall accommodate 16,000 persons of population in 2020 and 30,000 persons of population in 2030. Necessary area to accommodate those population is 350 ha in 2020 and 550 ha in 2030.

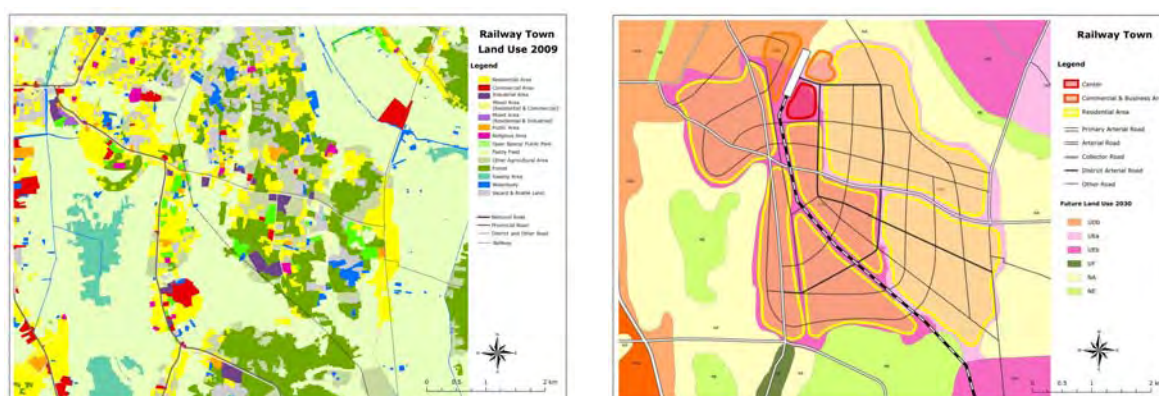
Development Concept: Development of Railway Town Sub-center is conceptually and preliminarily delineated with the following points of view:

Table 4.7: Development Concept of Railway Town

Items	Concepts
Function and Role	- Sub-center to decentralize population of inner urban area of Vientiane - Gateway and transport center of Vientiane
Core Facilities	- Vientiane Central Railway Station

Source: JST

Land Use Plan: Sub-center development should be based on location of existing local town. It is indispensable for the development of Railway Town Sub-center area to carefully and widely utilize improved land development potentials. Since the area is currently a fringe area of urbanization in the eastern Vientiane, the construction of railway, especially central railway station and station plaza will accelerate urban development potential here. Minimum infrastructure provision must be useful to guide urban development by private investor. The core facility of the area is Vientiane Railway Station and station plaza. With utilizing them, center zone shall be located at nearby area with commercial, local public service functions. The new residential areas shall be developed surrounding the center area by utilizing development potentials.



Source: JST

Figure 4.8: Current Land Use and Land Use Plan of Railway Town

4.1.4 Land Use Plan of Urban Clusters

(1) Tha Ngon Urban Cluster

Current Conditions: Tha Ngon is a capital city of Xaythany district. The population of Tha Ngon was approximately 5,100 in 2009. Tha Ngon is located in a northern part of Vientiane Capital roughly 20 km from the central Vientiane Capital. Tha Ngon lies on a fertile plain beside the Nam Ngum River and Nong Seuam lake.

Development Framework: Tha Ngon is expected to be one of three urban clusters. The future population has been estimated to be 13,000 in 2020 and 20,000 in 2030.

Land Use Policy: Land use policy is formulated as follows:

- urbanization area will be concentrated mainly along the national road No.10 in consideration of high mobility of people and commodities
- a centre of urbanization will be set-up near the Nam Ngum river in consideration of current condition and proximity to water resource and landscape
- middle to low density will be appropriate in the urbanization area
- agricultural area and natural resource shall be conserved as much as possible in order to encourage the agricultural and tourism industries

Land Use Plan: The zoning concept of land use in Tha Ngon is illustrated in Figure 4.9. The “urban area” major function will be of a service center, the “residential area” function will be to accommodate current and future population, and the “agriculture and conservation area” will play a role of maintaining the current land use and providing a green belt in Tha Ngon. Based on this concept, the land use plan of Tha Ngon in 2030 is shown in Figure 4.9.



Source: JST

Figure 4.9: Land Use Concept and Plan of Tha Ngon

(2) Ban Phao Urban Cluster

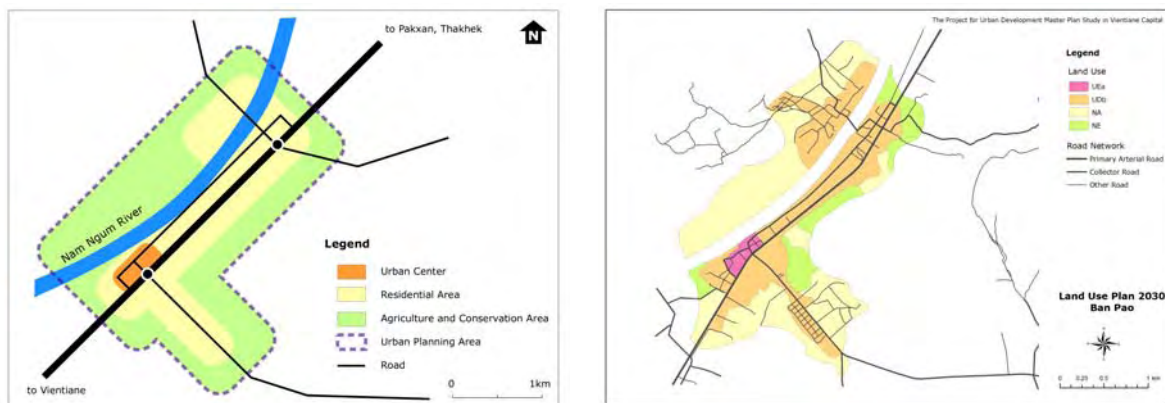
Current Conditions: Ban Phao is one of major towns in Mayparkngum district in terms of the location and size of the town. The population of Ban Phao was approximately 2,100 in 2009. Ban Phao is located in the northeastern part of Vientiane Capital roughly 50 km from the central Vientiane Capital. This town is located next to Pak Ngum, which is the capital city of the district. Ban Phao lies on a fertile and flat plain beside the Nam Ngum River.

Development Framework: Ban Phao is expected to be one of three urban clusters. The future population of Ban Phao has been estimated to be 4,000 in 2020 and 5,000 in 2030. Considering the population growth, the urban function of Ban Phao needs to be improved for the town itself and for the supporting Pak Ngum town as well.

Land Use Policy: Land use policy is formulated as follows:

- urbanization area will be concentrated along the national road No.13S in consideration of mobility of people and commodities
- urbanization area will also be set-up along the Nam Ngum river in consideration of the current land use pattern and proximity to water resource
- middle to low density is considered appropriate for the urbanized area
- agricultural area and natural resource shall be conserved as much as possible in order to encourage the agricultural and tourism industries

Land Use Plan: The zoning concept of land use in Ban Phao is illustrated in Figure 4.10. The “urban area” major function will be of service center, the “residential area” function will be to accommodate the existing and future population, and the “agriculture and conservation area” will play a major role in maintaining keeping the current land use and providing a green belt in Ban Phao.



Source: JST

Figure 4.10: Land Use Concept and Plan of Ban Phao

(3) Khok Hae Urban Cluster

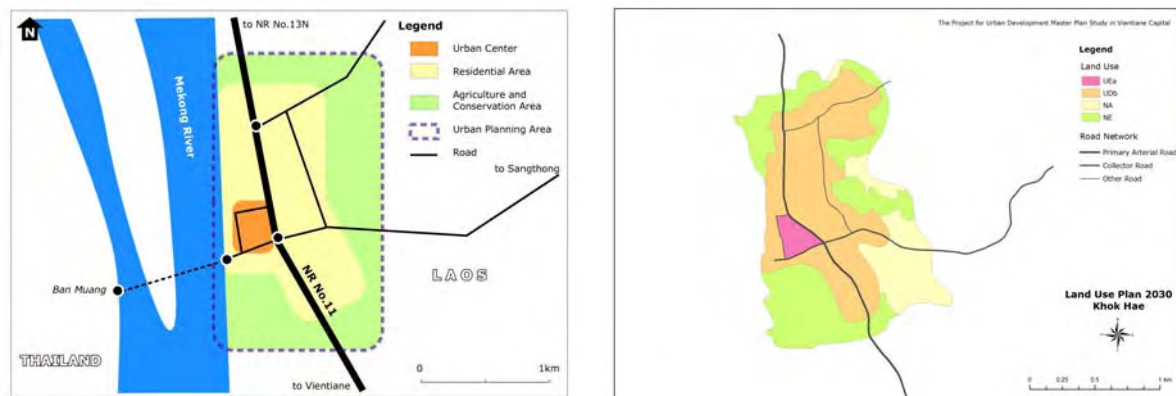
Current Conditions: Khok Hae is one of the border towns in Sangthong district. The population of Khok Hae was approximately 850 in 2009. This town is located in a northwestern part of Vientiane Capital roughly 50 km from the central Vientiane Capital. Khok Hae lies between large forests and the Mekong River. The opposite side of Mekong River is Thailand and there is a town called Ban Muang. Major activities of Khok Hae are plantation, industrial crop and rice production.

Development Framework: Khok Hae is expected to be one of three urban clusters. The future population of Khok Hae is estimated to be 2,000 in 2020 and 10,000 in 2030.

Land Use Policy: Land use policy is formulated as follows:

- urbanization area will be concentrated along the national road No.11 and local road to Sangthong town in consideration of mobility of people and commodities
- urbanization area will also be set-up along the Mekong river in consideration of the current land use pattern and future development of border trade with Thailand
- middle to low density is considered appropriate in urbanized area
- agricultural area and forest shall be conserved as much as possible in order to encourage the agricultural industries and protect the forest which acts as buffer area for the Phou Phanang national Protection Area in the hinterland

Land Use Plan: The zoning concept of land use in Khok Hae is illustrated in Figure 4.11. The “urban area” major function will be of a service center, the “residential area” function will be to accommodate the current and future population, and the “agriculture and conservation area” will play a major role in maintaining the current land use and providing a green belt in Khok Hae.



Source: JST

Figure 4.11: Land Use Concept and Plan of Khok Hae

4.2 A Basic Strategy for Urban Development

4.2.1 Changes of Land Use Parameters

UAa and UAb: It was argued that for UAa and UAb, the maximum Plot Ratio (COS) of 5.0 may allow the buildings to be too voluminous and as a result this may narrow down the view of sky from the streets. Considering this, it was decided to lower the COS slightly to 4.0 instead of 5.0 as earlier.

I zone: In the industrial area, as the current COS is already small (1.5), it is proposed to increase the coverage ratio so as to meet the maximum COS. Accordingly the coverage ratio (E) has been adjusted to 40% instead of 30% as earlier.

Table 4.8: Summary of Recommended Revision in Coverage Ratio, Height of Building and Plot Ratio

Zones	Description of Zone	Coverage ratio (%)	Height of Building (m)	Plot Ratio (COS)
ZPP-Ua	- Historical town conservation zone	75%	12	<u>2.0</u>
ZPP-Ub	- Ancient site conservation zone	50%	7	0.7
UAa	- Administration and trade central zone	<u>60%</u>	26	4.0
UAb	- New central zone	<u>60%</u>	26	4.0
UBa	- Urban inner zone within aircraft flying zone	60%	Referring to relevant org.	1.5
UBb	- Urban inner zone	60%	20	3.0 *
UCa	- Mekong River bank zone with aircraft flying zone	50%	10	1.0
UCb	- Mekong River bank zone	50%	10	1.0
UDa	- Urban Surrounding Zone with aircraft flying zone	40%	7	0.7
UDb	- Urban Surrounding Zone relevant to agricultural activities	50%	15	2.0 *
UDc	- Urban Surrounding Zone and suburb	50%	15	2.0 *
UF	- Village surrounded by rice field	40%	10	1.0
UEa	- Urban expansion zone	50%	23	3.0 *
UEb	- Urban expansion zone (Sub-center)	50%	23	3.0 *
I	- Industrial zone	40%	15	1.5
T	- Transport zone	**	**	**
Ef	- Education zone	**	**	**
Em	- Military zone	**	**	**
Eh	- Public health zone	**	**	**
NA	- Agricultural zone	**	**	**
A	- Rice field has been surrounded by build up area	**	**	**
NE	- Public preservation zone	**	**	**

Source: JST

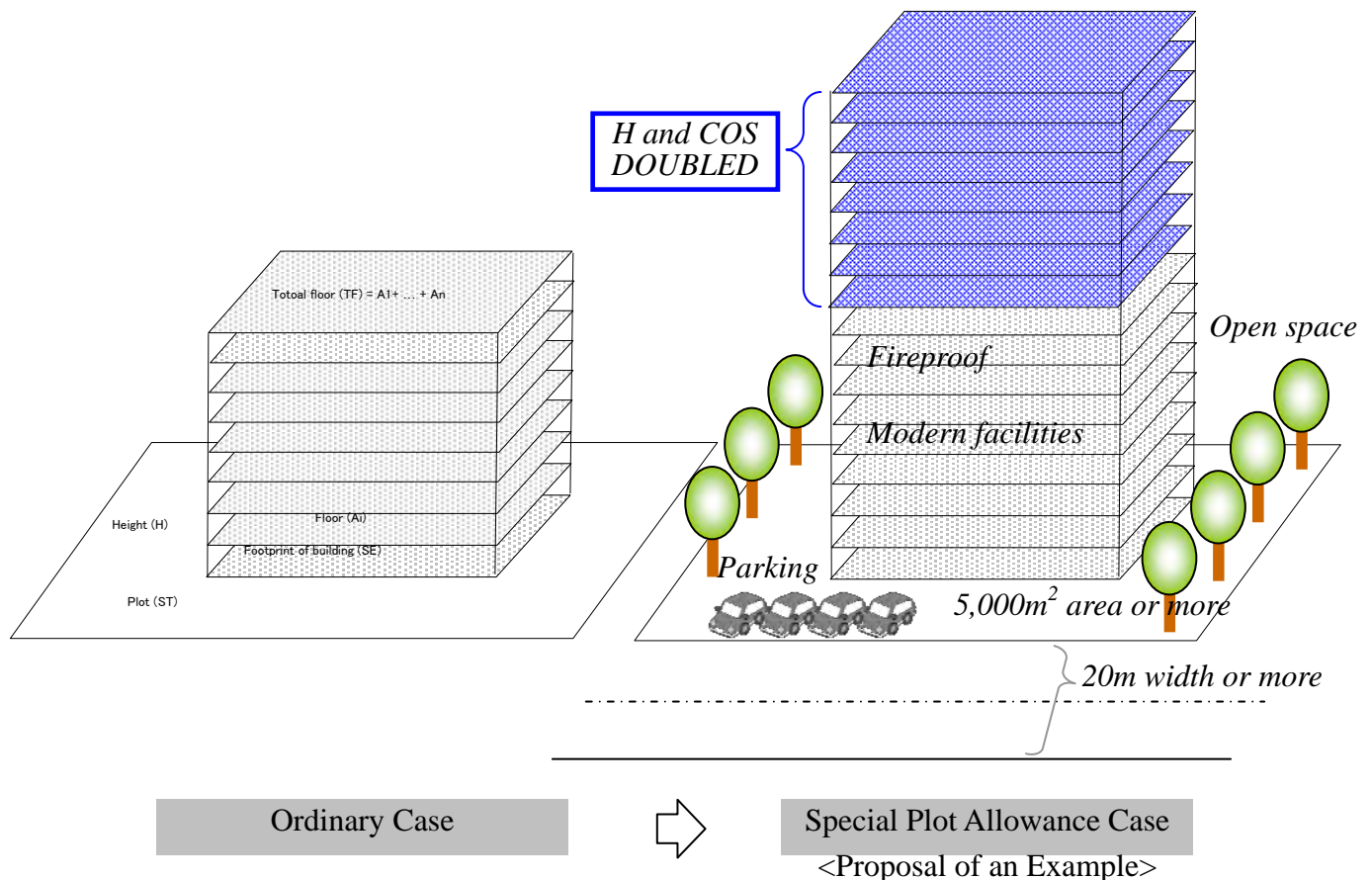
Note; Underlined figures indicates decrease from the present regulations; **Figures in bold** indicates increase from the present regulations. **Shadowed** row is a proposed additional zoning category

* Special Plot Allowance Case

** As these subdivide/specific land use zones are not for residential use, building construction is permissible at minimal.

Special Plot Allowance Case: For areas where high building are necessary, special plot allowance case is proposed that some of the regulations on Height of Building (H) m; and Plot Ratio (COS) could be “Doubled” if the following conditions are satisfied;

- Plot faces arterial road (for example, with minimum width 20 m)
- Plot has minimum area requirement (for example, 5,000 m²)
- Plot has enough parking spaces for tenants (Parking space requirement must be specified for type of development)
- Plot has open space/park (for example, 20% of plot area)
- Plot has modern water supply and sewerage treatment plant.
- Plot has fireproof facilities.
- Plot is located in UBb, UDb, UDC, UEa and UEb.



Source: JST

Figure 4.12: Proposal of Special Plot Allowance Case

4.2.2 Architecture Control and Relocation

Building Construction Permit: It is recommendable that Lao authorities should carefully check the details of sizeable new buildings prior to granting any permission, especially for the buildings that have a plan with four (4) or more floors or have a floor area of 500 m² or more. In case that the building does not meet the height or volume regulations, the construction will not be permitted.

Appropriate Placement: The proposal for an appropriate placement of industrial and logistic facilities is as follows:

- To prohibit any kind of new factory/industry construction in the Historic Conservation zone and the Inner Urban zone.
- To prohibit new logistic facilities construction in the certain areas of the Historic Conservation zone and the Inner Urban zone.
- To direct the factories and logistic facilities for relocation to the Outer Urban zone and the Sub-center zone.

Relocation: Relocation of Public Facilities is proposed as follows:

- The Table 4.9 describes the direction of movement or relocation of governmental offices and educational facilities located in the Historic Conservation zone and Inner Urban to other zones.
- To create systematic (a) government office district(s) and (an) educational zone(s) in the “Sub-center”

Table 4.9: Basic Relocation Policy for Governmental and Educational Facilities

Facilities to be relocated		Actual Location	Shall be induced to move to
a	Governmental Offices	1. Historic Conservation	2. Inner Urban 3. Outer Urban 4. Sub-Center
b	Universities, Collages	1. Historic Conservation 2. Inner Urban	3. Outer Urban 4. Sub-center

Source: JST

4.3 A Basic Strategy for Urban Landscape

General: “Middle-rise Urban with Traditional Greenery Vientiane Capital” is identified as the future image of Urban Landscape. In order to realize the future image in Vientiane Capital, four basic policies are proposed for the landscape improvement.

Basic Policy: Basic Policies are proposed as follows;

- To maintain the traditional urban image.
- To protect National Heritages and conserve surrounding historic and traditional urban landscape.
- To improve and up-grade streetscape and tourism environment for the enhancement of international tourism in Historic Conservation Zone.
- To strengthen a sense of arrivals at the gateways (airport, etc.) and establish the feature of future urban image of Vientiane Capital.

4.4 A Basic Strategy for Infrastructure Development

4.4.1 Road and Transport

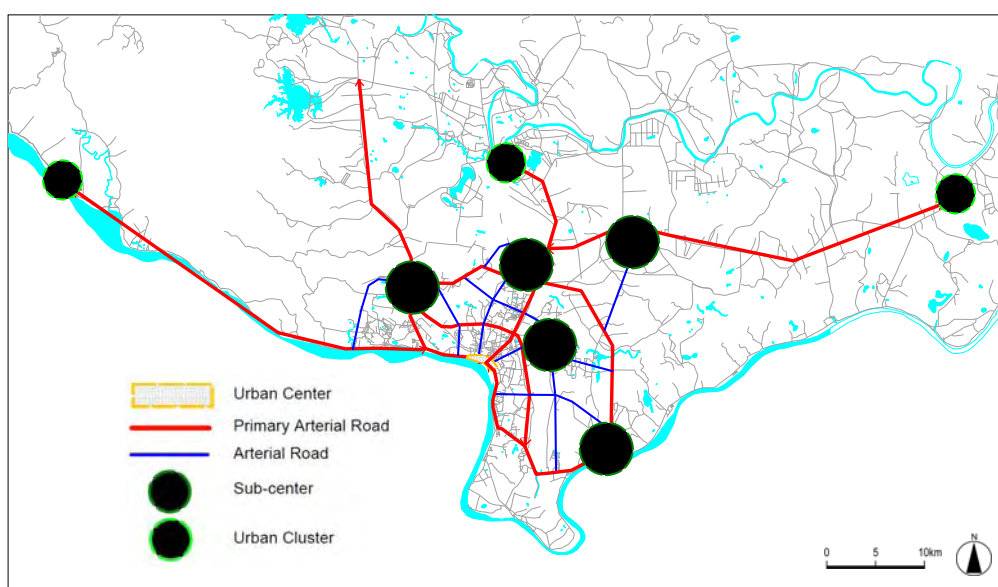
Functional Road Classification: The road classification in Vientiane Capital is mainly based on the administrative responsibility rather than on functional use. At the moment, six types of roads exist; namely, the national road, provincial road, district road, urban road, rural road and special road. The national road is under the control of MPWT, and the provincial, district, urban and rural roads are managed by DPWT of each province except the roads in the urban area of Vientiane Capital that are controlled by VUDAA. A newly defined scheme is proposed that consists of the primary arterial road, arterial road, and collector road. The main characteristics of each functional class are summarized in Table 4.10.

Table 4.10: Proposed Road Functional Road Classification

Classification	Application	Intent
Primary Arterial Road	Entire province Link to primary arterial roads in other provinces	- Form structure of province - Link to international road - Connect major attractions- Accommodate longer trips and freight trips - Introduce BRT lanes
Arterial Road	Between districts Link to primary arterial road	- Link to primary arterial roads - Accommodate travel demand between cities and villages - Provide bus services
Collector Road	Between neighboring cities and villages Link to primary arterial road and arterial road	- Provide access to major roads - Accommodate local demand for circulation - Can be used for public transport and feeder services

Source: JST

Road Network Master Plan: In order to cope with the increasing road traffic, road development should be accelerated to expand a capacity of road section.



Source: JST

Figure 4.13: Concept for Road Network Master Plan

Road Development Program:

(a) Road Development Program between 2010 and 2020

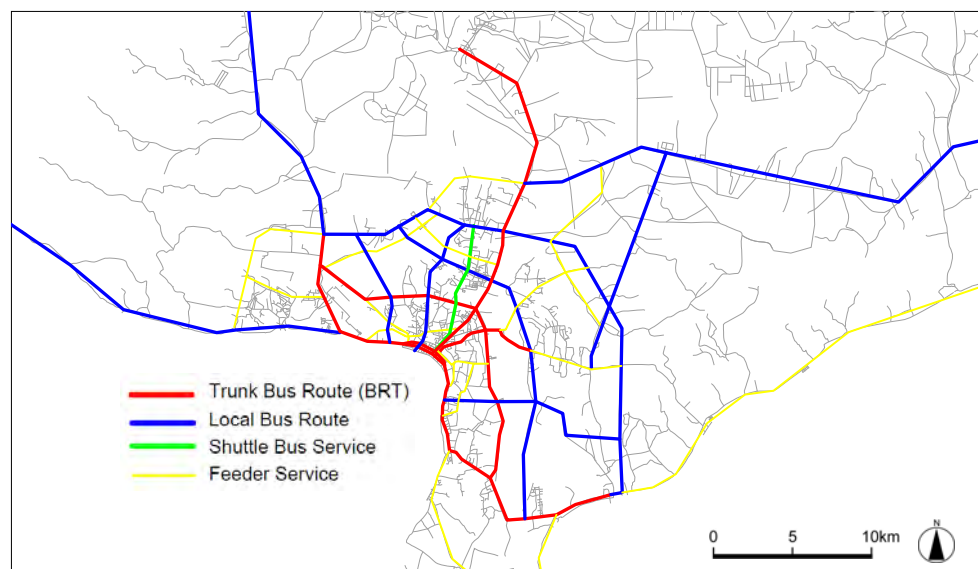
Existing resource must be used efficiently. Two important ring roads i.e. 450 Year road and Dongdock Road should be completed by 2020. In addition, inner ring road connecting National Road 13 North with National Road 10 and bypassing central area of the City should also be constructed by 2020. In the eastern area, a new radial road should be developed. (Refer Figure 4.15)

(b) Road Development Policy between 2020 and 2030

A new ring road should be constructed between the inner and outer ring roads. Two new important radial roads should also be constructed. Two arterial roads; one north of Dongdock and the other west of Phonsavat area, also need to be constructed. (refer to Figure 4.15)

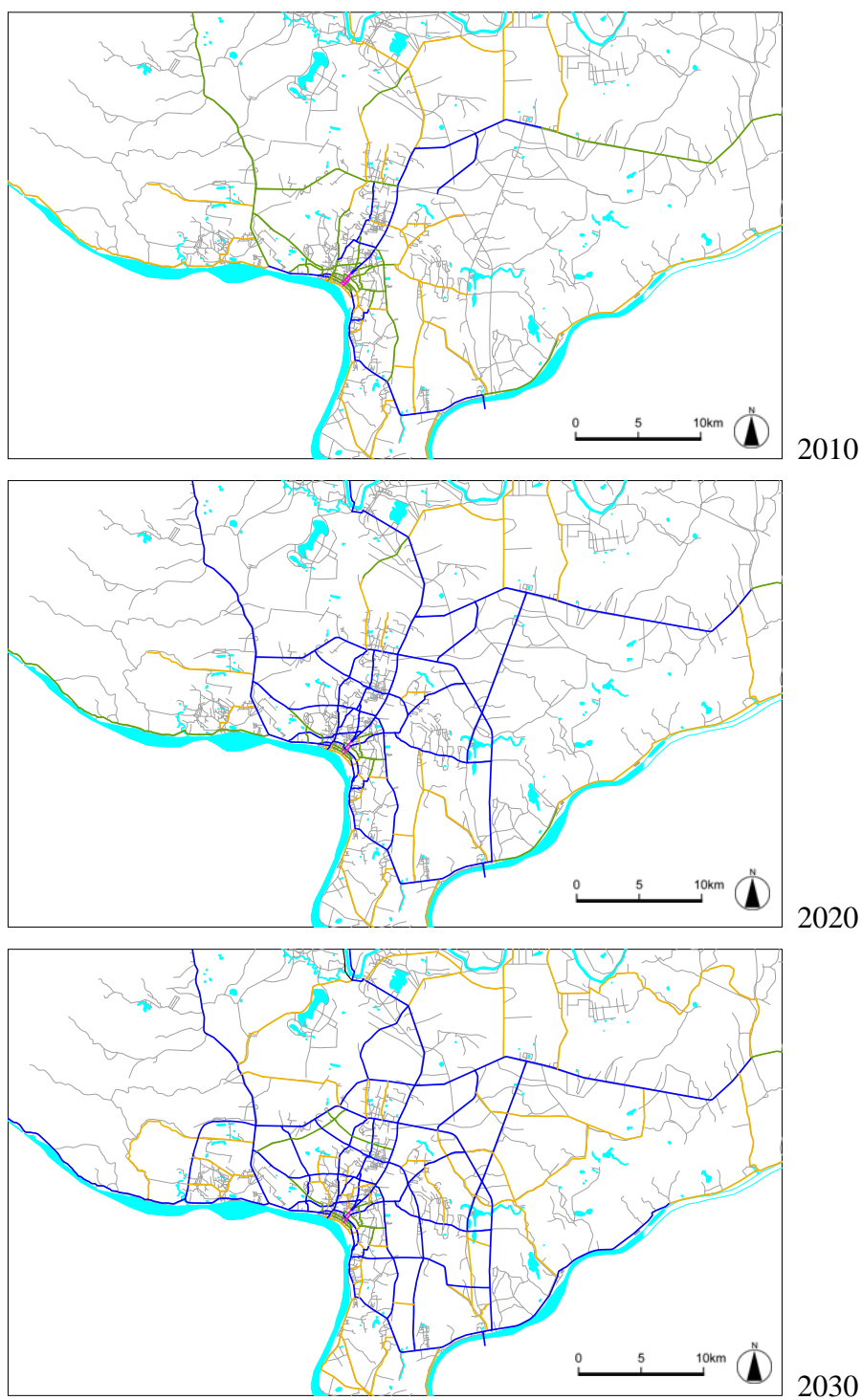
Reasonable Modal Share: The average VCR on the entire network will be 0.86, which is worse than the existing, 0.77. This means that congestion will worsen as compared to the existing condition even after the development of road network as suggested in Master Plan. Thus to avoid such situation and mitigate the congestion, modal shift from private vehicle use to public transport will be necessary.

Public Transport Network: On the basis of forecasted traffic demand, the public transport network has been proposed. In short-term, the bus network should be improved based on current 8 bus routes. In long-term, the road sections of the arterial roads with higher demand should provide trunk bus route serving BRT (Bus Rapid Transit), with bus priority lanes or bus exclusive lanes. BRT lines should be introduced in three radial corridors and the inner ring road. It is proposed to provide local buses in the rest of arterial roads such as the outer ring road, the middle ring road, national roads, and two radial roads which are proposed as new construction. Paratransit modes; *Tuk-tuk* and *Sonteo* will play a role of a feeder service and will provide access to the trunk bus routes and local bus routes to the bus users.



Source: JST

Figure 4.14: Proposed Public Transport Network (Long-term)



Source: JST

Figure 4.15: Road Development Program

4.4.2 Water Supply

Policy and Target: JST sets a target of water service ratio of urban area in the city center of Vientiane Capital as 97% in 2015 and 100% in 2020 as it normally takes more time to increase the ratio from the 90s to 100%. DPWT, Vientiane Capital, also set the target of 100% in 2020. The planned target will overcome the national policy. At present, Khok Hae and Ban Phao Urban Clusters have no water supply system, but as they are proposed as Urban Clusters, these two sites will be considered as the urban area. For these two sites, the water service ratio has been set to 80% in 2020 and this matches with the National policy too.

Table 4.11: Water Service Ration

Item	Area	Detail Area / Remark	2009	2015	2020	2030
Planning Policy in this Master Plan	Urban Area	Core urban area of Vientiane Capital including Tha Ngon	92%	97%	100%	100%
		Khok Hae and Ban Phao of Urban Clusters, excluding Tha Ngon	0%	-	80%	100%
National Policy	Urban Area	-	-	-	80%	-
Vientiane Capital Policy	Urban Area	-	-	100%	-	-
	Rural Area	-	-	90%	100%	-

Source: DHUP under MPWT, DPWT under Vientiane Capital and JST

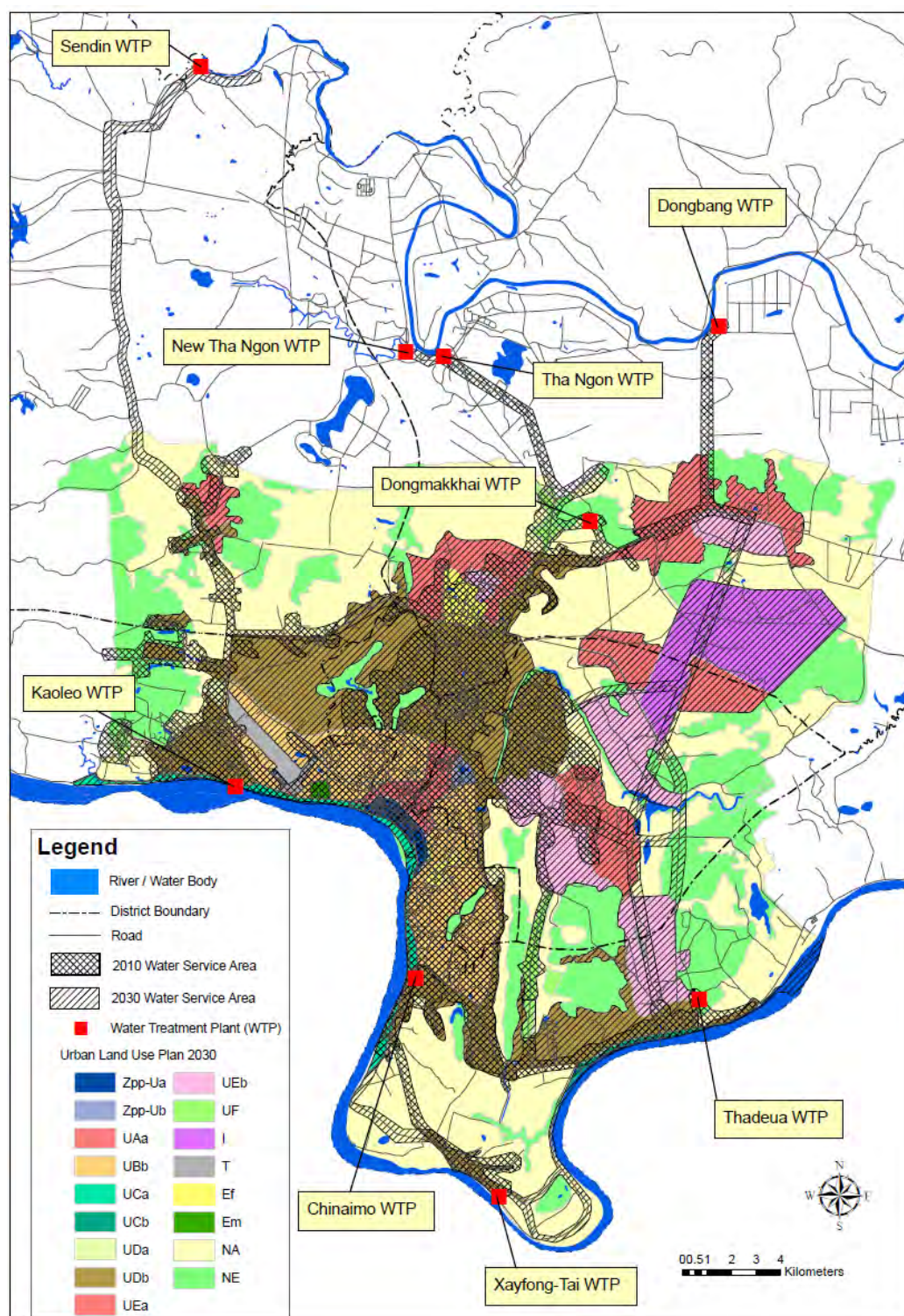
Water Treatment Plants: In 2009 the daily maximum water demand or the required water production capacity was 176,000 m³/ day and total WTP capacity was 161,260 m³/ day, meaning that the treatment capacity is already in shortage. In 2030, the required water demand and treatment capacity is 343,200 m³/ day and 376,260 m³/ day respectively. This means that the water supply demand will be secured if appropriate measures for the WTP development are taken. Urgently required are the expansion of Dongmaklai WTP, expansion of Don Ban WTP and new construction of Sendin WTP. Though NPVC set this plan on high priority but considering the location of Sendin WTP which is at a distance from center of Vientiane Capital, the implementation plan need to be studied carefully. Thus, it is suggested that instead of the Sendin WTP construction, the further expansion of Dongmaklai WTP or construction of new Tha Ngon WTP can be taken up first or at an early stage of higher priority plan.

Water Service Area: The water service area in 2030 was prepared based on the future land use plan for 2030 as prepared during this study. Water service area covers future urban area and industrial area as shown in Figures 4.16. It is expected that the water service area expands from 172 km² in 2009 to 337 km² in 2030.

Transmission and Distribution Facilities: Transmission and distribution facilities of water supply system include transmission pipes, reservoirs, distribution pipes and pumping stations. To have a better control on water flow, it is recommended to supply water to users from distribution pipes instead of direct supply from transmission pipes. However, currently in certain areas, some users receive the water directly from transmission pipes. It is thus recommended to divide the water service area by reservoir service areas and each reservoir utilizing the transmission pipes receives the water supply for WTP. And distribution facilities must be designed to supply necessary water from the reservoirs to users.

Development Plan of Reservoir: Capacity of the reservoir is about 5.0hr with WTP reservoir capacity to the water supply in 2010. It is generally recommended to withhold a reservoir capacity of more than 6hrs in order to secure stable water supply and to balance the hourly peak water demand to customers within the daily maximum water supply capacity of WTP.

Human Resources: NPVC is the public water enterprise in Vientiane Capital. It has high level staffs but abilities of NPVC staff on water supply system are not high enough to properly operate, maintain and manage the water supply system. Thus, it is vital to improve the technical, institutional and financial capacity in NPVC.



Source: JST

Figure 4.16: Water Service Area (Core Urban Area)

4.4.3 Sewerage/Wastewater

Policy: The parameters for the various uses based on quality of water for the different water bodies was set up by drawing the examples of water quality criteria and its use from similar or other Asian countries and from the aquatic biological survey result obtained from “The Study on Improvement of Water Environment in Vientiane City” . The Table 4.12 describes the water quality and its uses.

Table 4.12: Water Quality Target

River / Canal Stretch	Water Quality Requirement in BOD	Remarks
Down-most Stretch of Mak Hiao River (Near Rivermouth)	≤ 5 mg/l	Best requirement for fisheries
Middle Stretch of Mak Hiao including That Luang Marsh	≤ 8 mg/l	Allowable lowest requirement to sustain fisheries production.
Urban Drainage System: Hong Xeng and Hong Ke	8-12 mg/l	Expected requirement for restoration of inhabitable environment for fish

Source: ITR - The Study on Improvement of Water Environment in Vientiane City, Lao PDR., JICA 2010

Wastewater Generation: The volume of sewerage or wastewater generation in 2030 in Vientiane Capital from the domestic and non-domestic source will be directly related with the growth of population, industrial and commercial development. According to the proposed land use, wastewater will also be generated from the urbanized area and new proposed core urban or sub-centers. The projection of wastewater generation in urban areas up to year 2030 is shown in Table 4.13. This is based on the assumption that 80% of the water demand for people becomes wastewater.

Table 4.13: Estimation of Wastewater Generation in Core Urban Area

Description	Unit	1995	2005	2009	2020	2030
Total Population in Vientiane Capital	Person	514,082	691,731	787,647	1,074,000	1,439,000
Water Served Population in Center of V.C.	Person	276,776	354,573	404,175	620,000	915,000
Domestic Wastewater Generation	m3/day	26,400	42,400	52,000	84,000	124,800
Non-Domestic Wastewater Generation	m3/day	14,000	26,400	34,800	56,000	87,200
Total Wastewater Generation	m3/day	40,400	68,800	86,800	140,000	212,000

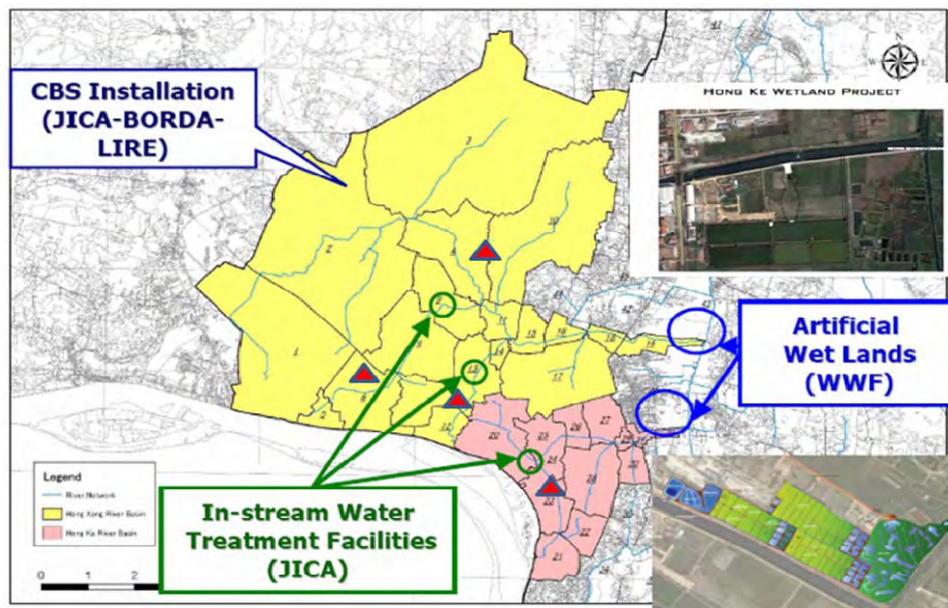
Source: JST, based on the water supply demand estimation in Core Urban Area and Tha Ngou

Facility Plan: In a short term plan for Vientiane Capital, on-site and communal (decentralized) systems might be favorable in consideration of low construction cost and operation and maintenance cost, which are lesser than the centralized system. In addition, the limited institutional and financial capacities, also favors the concept of on-site and communal (decentralized) systems or Community Based Sanitation (CBS). The centralized sewerage system should be considered in a long term plan. However, in a short term, it is recommended to study and plan for the rehabilitation of the present pilot sewerage system in Vientiane. The proposed location of the treatment system is shown in Figure 4.17 and Figure 4.18. The proposed wastewater treatment facility is summarized in the Table 4.14.

Table 4.14: Proposed Wastewater Treatment Facility to Future Land Use

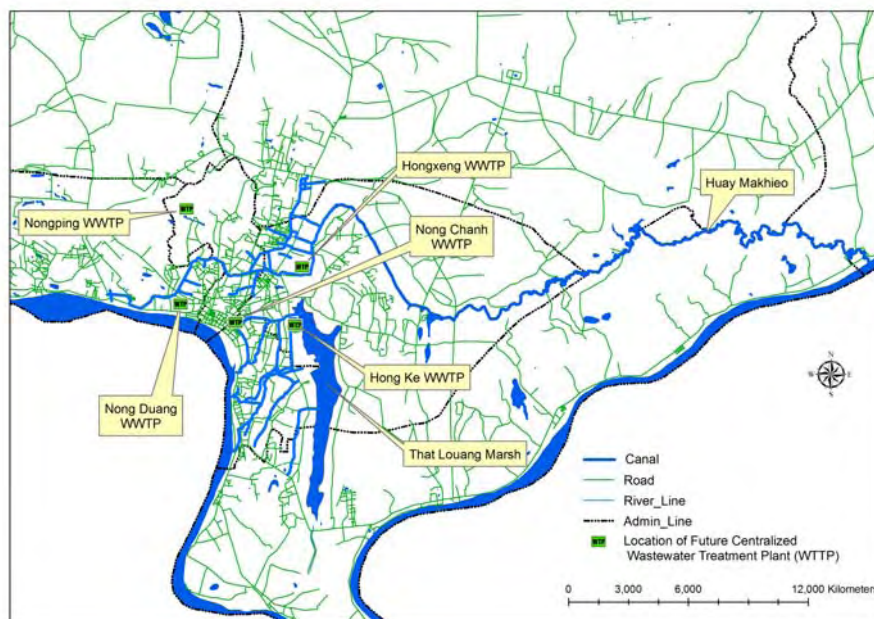
Land Use Area	Land Use Policy	Proposed WWTP
1. Historic conservation zone	Conservation of historic building and culture for tourism purpose	Improved septic tank or decentralized treatment system and partial wastewater collection to WWTP at Nong Chan and Nongduang
2. Inner urban zone	High density commercial use	Same as historic downtown area
3. Outer urban zone	Expansion of residential area and new town center	Provide overall treatment by on-site or decentralized system to new housing and new development.
4. Outskirts zone	Urban cluster, agriculture area	Overall wastewater treatment by improved septic tank and grease trap.

Source: JST



Source: Modify from ITR – The Study on Improvement of Water Environment in Vientiane City, JICA 2010.

Figure 4.17: Proposed location of Wastewater Treatment Plant for Short and Medium Term Plan



Source: JST

Figure 4.18: Proposed location of Wastewater Treatment Plant for Long Term Plan

Operation and Maintenance: Preparation of a proper operation and maintenance plan is a key factor for successful planning, implementation and sustainability of a wastewater management system. In the initial stages, the construction of wastewater treatment facilities and initial supervision can be conducted with foreign assistance, however, in a long term and after the completion of construction and installation of all facilities, local authority will be the main body for its operation and maintenance. In such case, VUDAA will play an important role together with NPVC which is also responsible for water supply services.

4.4.4 Drainage

Policy: The clear drainage channel and marsh will be the part of flood control beautification, greenery and recreation for the city. The strategy for the development of drainage system is summarized as shown in the Table 4.15:

Table 4.15: Strategy in Drainage system and Action Plan

Development Strategy	Detail Action Plan
1. Diversion of runoff	<ul style="list-style-type: none"> • Runoff needs to be diverted partly to relieve the pressure on existing drain • Diversion of runoff is also partially possible by interconnecting canals.
2. Improving existing channel	<ul style="list-style-type: none"> • Improving the carrying capacity of existing drains by widening & increasing slope. Many secondary drains need improvement. • In areas where there are no man made secondary drains of sufficient capacity, new drains are to be provided. • Improving broken cover of drainages/ ditches used as pedestrians.
3. Regulatory Pumping Systems	<ul style="list-style-type: none"> • Provision of pumping facility may have to be considered in problematic areas where natural flow alone cannot create rapid discharge. Pumps are more effective at drain outlet for discharging and to prevent back water.
4. Providing Silt Pits	<ul style="list-style-type: none"> • If deposition of silt and solid waste can be controlled, stagnation will be brought down considerably. Provisions of silt pits at all discharge end of tertiary, secondary drains to be considered.
5. Controlling Land Development	<ul style="list-style-type: none"> • At present regulations of land use and land development is not done properly, so formation levels of each zone/sub zones to be fixed and land development to be regulated to ensure positive area drainage (i.e. no obstruction to current drainage system or no change in run-off pattern)
6. Separate System of Storm Water and Sewage	<ul style="list-style-type: none"> • Drainage carrying sewerage / wastewater and effluent combined together can cause severe health and environmental problems. Septic tanks may directly discharge the effluents by overflow to open drainage due to high water table, low permeability of soil. • Segregating sewage or wastewater and effluents from open drains by sewerage system should be considered.
7. Upgrading Solid Waste Management	<ul style="list-style-type: none"> • Large quantity of solid waste contaminates and clogs the drains. Hence a system for proper collection of solid waste has to be developed, together with the implementation of a public awareness program.
8. Eviction and Rehabilitation of Encroachment	<ul style="list-style-type: none"> • The natural river or marsh has encroachment in a number of places along its stretch. Removal of encroachments and providing resettlement / rehabilitation as required should be done to maintain the river or marsh area.

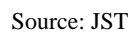
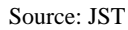
Source: JST

Catchment Area: Most of the existing drainage channels can accommodate a 2-year probability rainfall with natural retention ponds. Implementation of the above mentioned actions will improve the drainage system.

Flood Management Plan: A flood management plan shall be prepared by using GIS map and data. Special attention should be paid to the frequent flood area as shown in Figure 4.19, which is mainly from the effect of the Mekong River. A flood management plan shall be prepared by using GIS map showing facilities and flood condition and data base. Special attention should be paid to the frequent flood area which is from two main reasons as 1) overflow from the Mekong River and 2) lack of sufficient drainage system in the City for internal flooding.

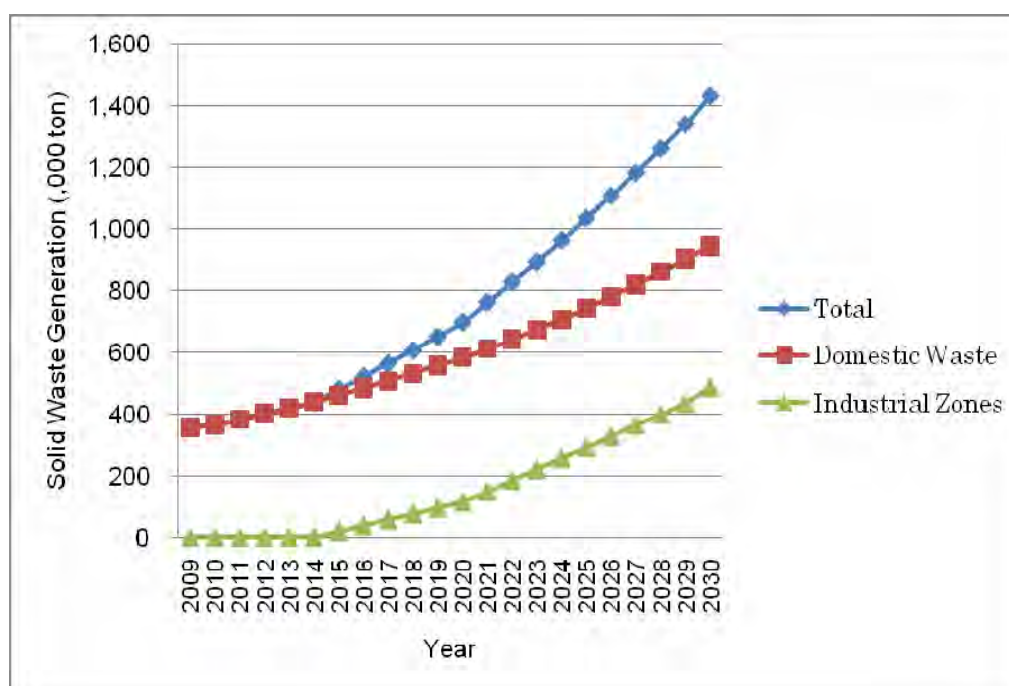
Facility Plan: The future drainage system for urban area in Vientiane Capital is shown in Figure 4.20, in which a retarding pond or marsh with a water gate and drainage pump station should be provided for more efficient discharge of rain water out of the natural river or pond inside the city.

Operation and Maintenance, and Institution: VUDAA is the main body responsible for operation and maintenance of drainage channels in urban area of Vientiane. Regular maintenance in sediment and garbage removal from drainage channel is important to keep the drainage system efficient. Public awareness and participation in keeping channels, marshes and rivers clean should be promoted. And regulation in keeping the marsh or pond area as retarding basin or wetland should be issued.



4.4.5 Solid Waste

Solid Waste Generations: The waste generations were estimated as shown in Figure 4.21 and it would drastically increase. Waste collection rate were assumed to increase up to 100% in 2030.



Source: JST

Figure 4.21: Estimation of Annual Volume of Solid Waste Generation

Landfill requirement: The existing landfill pits can be used up to 2013. Additional 10 landfill pits in the existing sites can be used with the cell method up to 2022. For the expansion phase-1, the service life of new site is expected to be 5 years i.e. from 2022 to 2027. For the expansion phase-2, the service life is expected to be 3 – 4 years i.e. from 2027 to 2030. It is to be noted that in future the increasing amount of waste disposal will shorten the service lives, even after the capacities of pits are increased.

Table 4.16: Estimation of Annual Solid Waste Disposal

Year	2008	2009	2010	2015	2020	2025	2030
Total disposal (ton/year)	57,033	68,089	75,987	153,151	356,514	755,095	1,271,786

Source: JST

Basic Strategy: Based on the basic policies and demand of solid waste management, scenarios for solid waste management are outlined and the basic strategy is summarized in Table 4.17. Main actors for the management strategy are WREA and MOH for legislation in collaboration with VUDAA. International donors are also indispensable collaborators both technically as well as financially. The organizations like VSWCS (Vientiane Solid Waste Collection Service) and SWMDS (Solid Waste Management and Disposal Section) along with VUDAA, WREA, MOH, international donors and NGOs are the main actors for solid waste management in Vientiane Capital. The short-term strategy targets the existing built-up area: Historic conservation zone & Inner urban zone and Outer urban zone. The medium to long-term strategy expands the target area to new urban area: Sub-centers and Urban clusters & Outside of the urban planning area.

Table 4.17: Summary of Basic Strategy

Short-term Strategy	Subjected Area	Medium to Long-term Strategy	Subjected Area	Main Actors	Collaborators
1. Management Strategy					
1-1 Legislation					
<ul style="list-style-type: none"> - Provide guidelines to define types of waste with responsible parties - Provide wastes management ordinances of Vientiane Capital - Provide industrial and hazardous wastes management guidelines 	VC	<ul style="list-style-type: none"> - Legislate industrial and hazardous wastes management laws - Regulate inappropriate waste management activities 	VC	WREA MOH VC	VUDAA Donors
1-2 Organization					
<ul style="list-style-type: none"> - Strengthen the organization of VSWCS to expand the service areas - Strengthen the organization of SWMDS to improve the operation of KM32 	HC/IU OU	<ul style="list-style-type: none"> - Further reinforce VSWCS and SWMDS to manage increasing wastes 	HC/IU SC/OU/OS UL/OA	VUDAA VSWCS SWMDS	VC Government Donors
1-3 Finance					
<ul style="list-style-type: none"> - Awareness-raising for Vientiane Capital and the government to obtain further public supports 	HC/IU OU	<ul style="list-style-type: none"> - Continuous awareness-raising for Vientiane Capital and the government 	HC/IU SC/OU/OS UL/OA	VUDAA VSWCS SWMDS	VC Government Donors
2. Technical Strategy					
2-1 Generation and Discharge					
<ul style="list-style-type: none"> - Community awareness raising for sanitary waste discharge 	HC/IU OU	<ul style="list-style-type: none"> - Continue community awareness raising and environmental education 	HC/IU SC/OU/OS UL/OA	VUDAA	WREA MOH Donors NGOs
2-2 Collection and transportation services					
<ul style="list-style-type: none"> - Design plans of service area expansion including VIP & VLP, KM7 maintenance shop/transfer point - Provide community collection points with their involvement - Promote privatization 	HC/IU OU	<ul style="list-style-type: none"> - Design plans of service area expansion for new urban areas - Expand KM7 maintenance shop/transfer point 	HC/IU SC/OU/OS UL/OA	VSWCS VUDAA	VC Donors
2.3 Intermediate treatment					
<ul style="list-style-type: none"> - Promote individual and corporate recycling 	HC/IU OU	<ul style="list-style-type: none"> - Further promote individual and corporate recycling - Regulate inappropriate recycling activities 	HC/IU SC/OU/OS UL/OA	VSWCS VUDAA	VC Donors
2.4 Final disposal					
<ul style="list-style-type: none"> - Design the facility/operation plan and conduct an EIA - Establish Level 2 landfills - Expand landfills in the existing site - Capacity development for the sanitary operation and management 	VC	<ul style="list-style-type: none"> - Establish Level 3 & 4 landfills (Construct new landfill sites) - Safety closure of the existing site - Conduct environmental monitoring 	VC	SWMDS VUDAA	VC Donors

Note: VC (Vientiane Capital), HC/IU (Historic conservation zone & Inner urban zone), SC/OU/OS (Sub-centers & Outer urban zone & Outskirts zone), UL/OA (Urban clusters & Outside of the urban planning area), VSWCS (Vientiane Solid Waste Collection Service), SWMDS (Solid Waste Management and Disposal Section)

Source: JST

4.4.6 Parks, Open spaces and Greenery

Green Spaces Coverage: To maintain and improve green spaces in the urban areas, three (3) steps of administrative direction; namely “Required”, “Strongly recommended” and “Preferred”, should be introduced according to the location and/or scale of a development activity. In the case of urban development projects of more than 20ha, green spaces must be maintained on the site along with a proposed green spaces coverage ratio through the administrative “Required”.

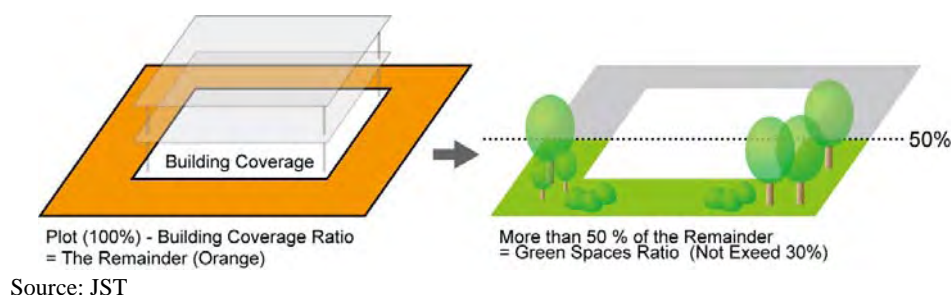


Figure 4.22: Proposed Green Spaces Coverage Ratio in Development site

NE Zone: NE Zone is important for forming Greenbelt of the Capital city. Therefore, basic principle in NE zone is to stop any destruction of current natural environment, or “No Net Loss of Greenery Policy”. If a development activity is unavoidable in NE zone, than the development construction should be harmonized with the natural environment as much as possible. Project of more than 20 ha must conserve more than 50% of the existing natural environment in the site.

Table 4.18: Administrative Obligation and Green Spaces Coverage Ratio

Size of Development Site	Administrative Obligation	
	Conserving Natural Environment	Making Parks and Greenery
20ha -	Required for Conserving Natural Environment in a Whole Development Site <Ratio: more than 50%>	Required for Making Parks and Greenery in the Built-up Site <Ratio: more than 30%>
- 20ha	-	Required for Making Parks and Greenery in a Whole Development Site <Ratio: more than 50%>

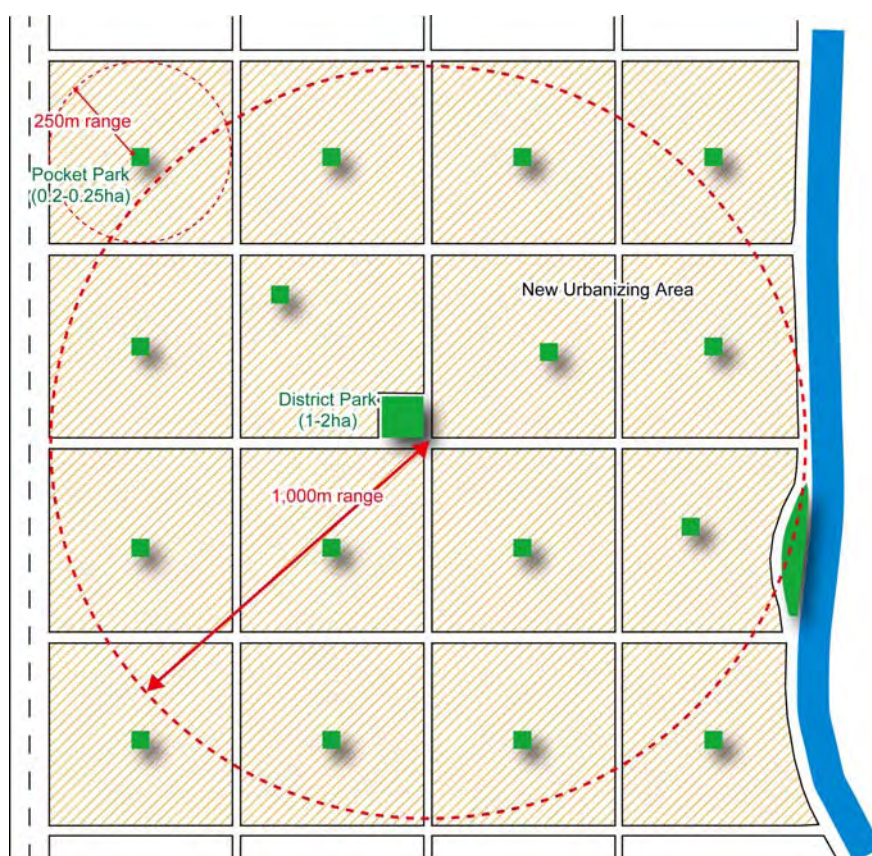
Source: JST

New Public Parks: In new urbanizing areas, two (2) types of public parks, namely “District Park” and “Pocket Park”, should be developed. This will be according to the size and function of the parks. By 2030, the area of these parks should increase by 375ha in total.

Table 4.19: Service Distance to Use of District Park and Pocket Park

Type of Park	Service Distance for Use			Standard Size
	Round Distance	Block Size to be Made	Estimation Time to Access the Park	
District Park	1,000m range	Square of 2km length	Within 20 min on foot	1-2ha
Pocket Park	250m range	Square of 500m length	Within 5 min on foot	0.2-0.25 ha

Source: JST



Source: JST

Figure 4.23: Service Distance for Use of District Park and Pocket Park

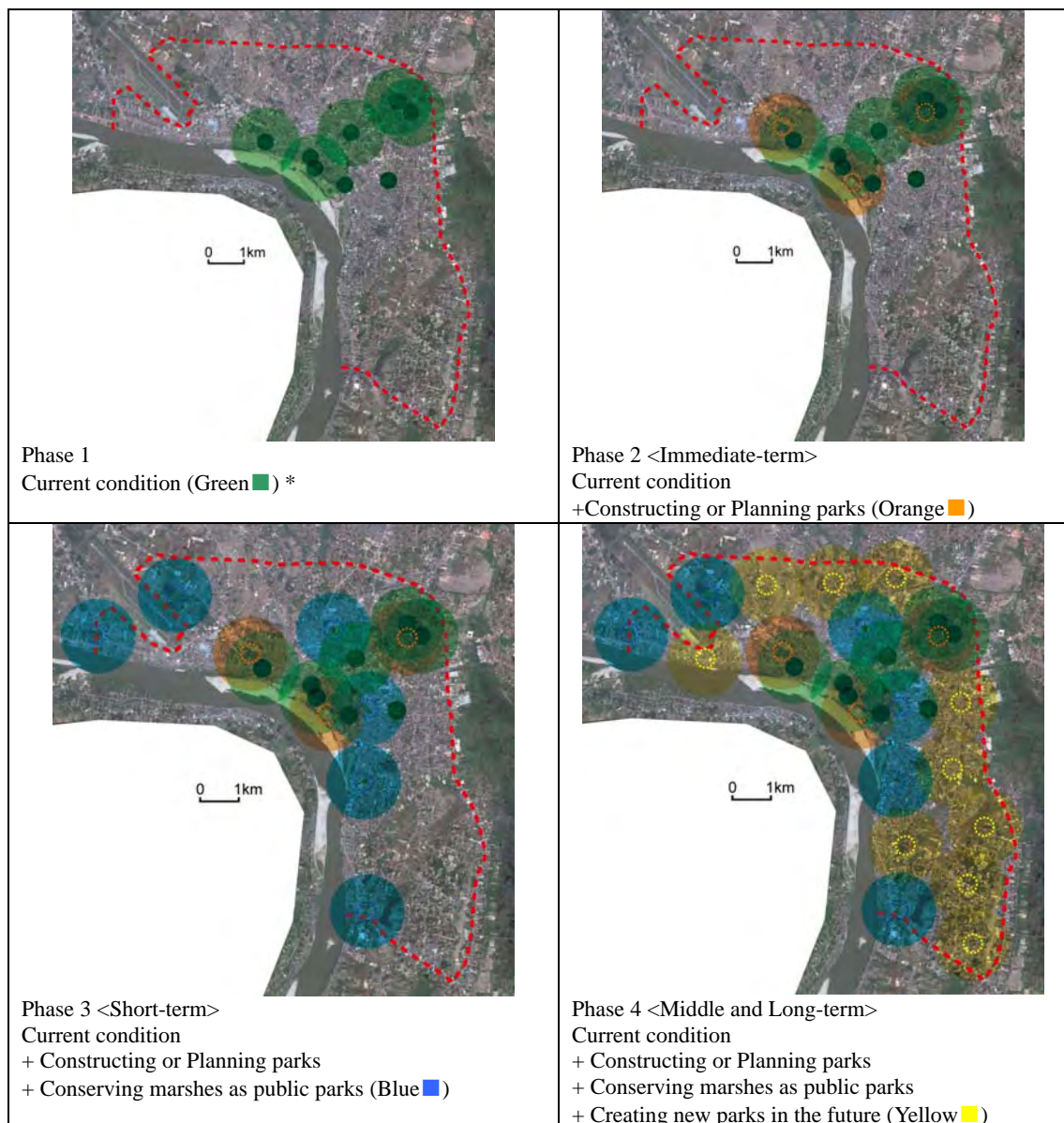
Table 4.20: The Area Estimation of Public Parks for 2030

Type of Park	Block Size which one park is constructed (A)	New Urbanizing Area (B)	Number of new public parks to be constructed (C=A/B)	Standard Size of one park (D)	Total area of new public parks (E=C*D)
District Parks	4km ²	249km ²	62	1 to 2ha	125ha
Pocket Parks	0.25km ²	249km ²	1,000	0.25 ha	250ha
Total Area					375ha

Source: JST

Inner Urban Area: Figure 4.24 presents a proposed scenario of developing District Parks in inner area mainly in four (4) phases. First phase is the current condition. In the second phase 3 parks are added. In the third phase 6 marshes are added as new parks. Finally, in the fourth phase new parks are added. The parks in inner area will be developed considering the high development cost and high appeal effect of the citizens.

Renovate Parks: Public parks should not only be for the tourists or for memorial use, but also for the citizen's use, and thus should satisfy the basic functions (recreation, landscape, mitigation of disaster and nature conservation) that are expected from a typical public parks such as provision of large trees for shades, trails for jogging, running and walking and others facilities.



*Existing small parks (less than 1ha) do not have service distance for use, so some parks have no surrounding big circle (right green color) in the figure.

Source: JST

Figure 4.24: Proposed Scenario of Making District Parks in Inner Area

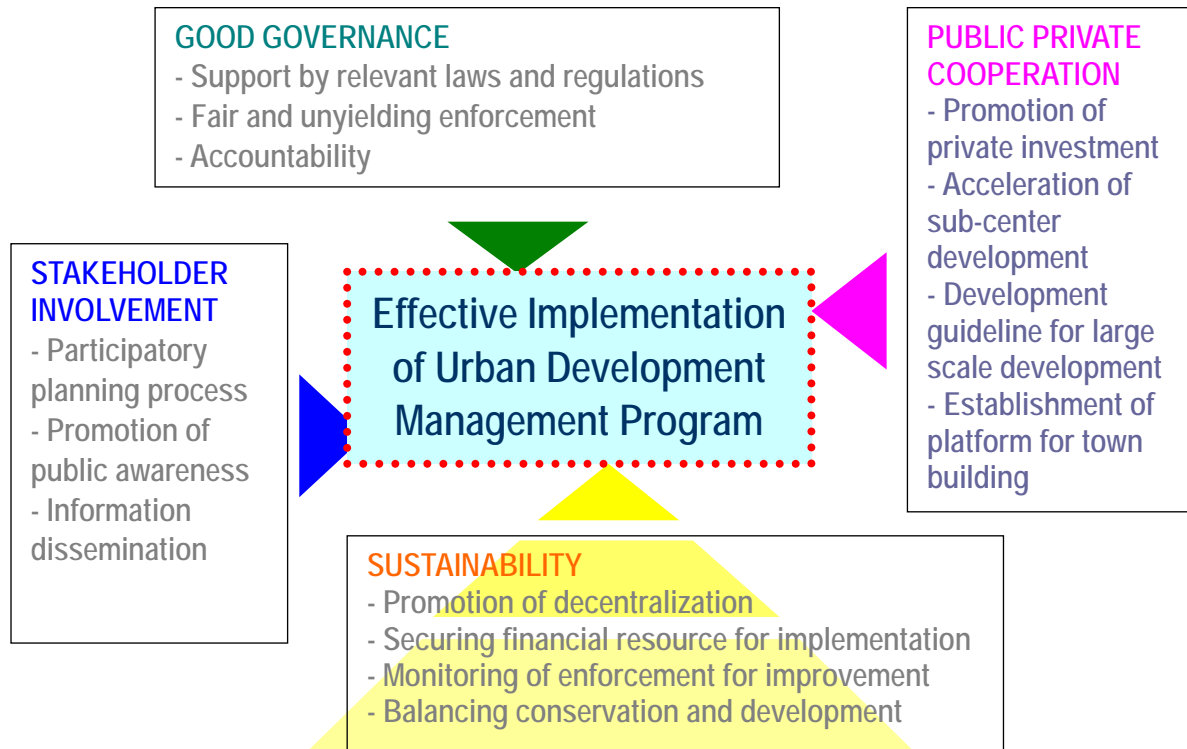
Major Urban Arteries: Improving green scenery by means of planting roadside trees, flowers plants and grasses along the major urban arteries should be carried out. Providing roadside trees normally use linear planting method at regular intervals but sometimes partial or irregular planting to utilize small spaces could also be considered.

Private Spaces Greenery: Mainly two (2) strategies should be adopted, one is about promotion and dissemination of information related to greenery and the other is establishing a system that can provide suggestions, guidance and support for greenery.

Chapter 5: Urban Development Management Program

5.1 General Principles for Urban Development Management Program

General: The real task comes after the formulation of the urban master plan – that is the enforcement and implementation of the urban master plan, namely the urban development management program.



Source: JST

Figure 5.1: Principles for Effective and Implementation of Urban Development Management Program

Good Governance: Good governance is considered to be an indispensable element in UDMP, and it is also important in Lao PDR. The concept of good governance in urban planning generally relates to the democratic process and transparency in plan formulation, decision and enforcement.




Stakeholder Involvement: An urban master plan pertains to a city inhabited by people there, and thus in the first place, it should reflect opinions and perceptions of the people about their city. Stakeholder involvement shall provide the urban master plan the strength it needs to implement in sustainable manner over a long period of time.


Public and Private Cooperation: In general, a large part of the city is built for and by the private sector with the private funding. It is always impossible for the public sector to build a city alone, but rather require extensive collaboration and/or cooperation with the private sector.




Sustainability: The effects of urban master planning are gradual and cumulative. This is why the implementation of urban development master plan has to be sustainable in the sense that the effects of the plan continues to take place over the long period of time.


5.2 Sub-program for Urban Development Management

General: It is important to introduce an integrated programming approach to implement projects from different sectors and to keep mutual linkages. Therefore, proposed projects from different sectors shall be integrated as a package of sub-programs. The sub-programs are classified as per the five (5) planning zones as described below.

Sub-programs in Historic Conservation Zone			
Location	Inside the ancient ramparts	Zone Area	250 ha
Main Building Use	Public offices, Private offices, Embassies, Hospitals, Large & tourist hotels, Restaurants, Cafés, Souvenir stores, Retail shops, Colleges, Temples	Population 2030	11,000 persons
		Density 2030	44 pop/ha
Landscape	<div></div>		
Problems/Constraints - Policy - Sub-programs			
<div><div>Problems and Constraints</div><div>Urban Development Policies</div><div>Sub-programs</div></div> <div><div><div>Losing historic heritages, buildings and attraction of landscape</div><div>Increase of international tourists</div><div>Maintenance and improvement of urban infrastructure</div><div>Increase of traffic volume and traffic jam</div><div>Limited space for car parking</div><div>More over-concentration of buildings</div><div>Increase of high-rise and illegal buildings</div></div><div><div>Conservation of historic heritages and buildings</div><div>Development of the attractiveness as tourist resources</div><div>Improvement of environment and urban transport</div><div>Restriction of building control regulation</div><div>Relocation of public facilities toward the Suburbs</div></div><div><div>H1 Historic Heritage Conservation</div><div>H2 Heritage Tourism Development</div><div>H3 Environment Improvement</div><div>H4 Urban Transport Improvement</div><div>H5 Landscape and Land use Improvement</div></div></div>			

Sub-programs in Inner Urban Zone			
Location	Outside the Historic Conservation Zone and inside the Inner Ring Road	Zone Area	5,120 ha
Main Building Use	Houses, Commercial buildings, Public offices, Private offices, Embassies, Hotels, Restaurants, Collages	Population 2030	219,000 persons
		Density 2030	43 pop/ha
Landscape			
Problems/Constraints - Policy- Sub-programs			
<div><div><div>Problems and Constraints</div><div><div>Necessity of intensive land use for commercial and business function</div><div>Insufficiency of competitive functions in GMS</div><div>Limited space for new large-scale development</div><div>Improvement of living environment in residential area</div><div>Increase of traffic volume and traffic jam</div><div>Maintenance and improvement of urban infrastructure</div><div>Losing marshes and lacking parks and green</div></div></div><div><div>Urban Development Policies</div><div><div>Acceleration of urban redevelopment for business intensification</div><div>Relocation of large-scale factories, logistic facilities</div><div>Improvement of living environment</div><div>Encouragement of environment-friendly residential developments</div><div>Conservation of the existing natural environment</div></div></div><div><div>Sub-programs</div><div><div>I1 Business Area's Land Use Intensification</div><div>I2 Living Environment Improvement</div><div>I3 Inner Urban Road Network Improvement</div><div>I4 Public Transport Improvement</div><div>I5 Marshes Conservation and Ecological Park Improvement</div></div></div></div>			

Sub-programs in Outer Urban Zone			
Location	Mainly between the Inner Ring Road and the Outer Ring Road	Zone Area	14,540 ha
Main Building Use	Houses, Commercial buildings, Roadside stores, Hotels, Factories, Conference halls, Collages	Population 2030	300,000 persons
		Density 2030	21 pop/ha
Landscape	<div></div>		
Problems/Constraints - Policy- Sub-programs			
<div><div><div>Problems and Constraints</div><div><div>Insufficient residential area for future</div><div>Expansion of urban area without control</div><div>Land speculation without control</div><div>Unpaved dirt feeder road</div><div>Requires improved living environment in the residential area</div><div>Requires development of urban infrastructure (water supply, sewerage, drainage, solid waste)</div><div>Losing large-scale marshes and existing protected areas</div><div>Losing forests and agricultural land</div></div></div><div><div>Urban Development Policies</div><div><div>Acceleration of new urbanizing area</div><div>Improvement of road network</div><div>Improvement of living environment</div><div>Conservation of the existing natural environment</div></div></div><div><div>Sub-programs</div><div><div>O1 New Urbanizing Area Development</div><div>O2 Living Environment Improvement</div><div>O3 Water-front Conservation and Ecological Park Improvement</div><div>O4 Road Network Improvement</div><div>O5 Public Transport Improvement</div></div></div></div>			

Sub-programs in Sub-center Zone			
Location	Specific zones in the Outer Urban zone and the Outskirts zone	Zone Area	10,780 ha
Main Building Use	Houses, Private offices, Roadside stores, Stadium, Universities	Population 2030	315,000 persons
		Density 2030	29 pop/ha
Landscape			
Problems/Constraints - Policy- Sub-programs			

Problems and Constraints

Necessity of creating sub-centers

Insufficiency in competitive functions in GMS

Expansion of urban area without control

Land speculation without control

Insufficient industrial and logistic functions

Requires development of urban infrastructure

Needs an improvement of living environment in new urbanizing area

Urban Development Policies

Clarification of characteristics, land use, specific functions

Investment promotion, development inducement and PPP acceleration

Development of an industrial estate and a logistics park

Relocation of public facilities

Development of infrastructure for each sub-center

Sub-programs

S1 Investment Promotion

S2 Sub-centers' Core Area Development

S3 Infrastructure Development


Sub-programs in Urban Cluster Zone			
Location	Small-scale urbanized areas separately located outside the “Core Urban Area”	Zone Area	3,080 ha
Main Building Use	Houses, Roadside stores, Agriculture-related buildings	Population 2030	35,000 persons
		Density 2030	11 pop/ha
Landscape			
Problems/Constraints - Policy- Sub-programs			
<div><div><div>Problems and Constraints</div><div><div>Necessity of creating urban clusters</div><div>Inefficiency of public functions in rural area</div><div>Expansion of urban area without control</div><div>Losing highly productive agricultural land</div><div>Needs an improvement of agricultural markets</div><div>Needs development of urban infrastructure and utility</div></div></div><div><div>Urban Development Policies</div><div><div>Improvement of urban clusters' and local public service</div><div>Development of agriculture and green tourism center</div></div></div><div><div>Sub-programs</div><div><div>C1 Local Public Service Improvement</div><div>C2 Agricultural Center Development</div><div>C3 Green Tourism Center Development</div></div></div></div>			

Table 5.1: List of Sub-programs and Projects

Sub-programs		Projects		Schedule		
				S	M	L
Historic Conservation Zone						
H1	Historic Heritage Conservation Sub-program	H1-1	National Heritage Registration Project			
		H1-2	Historic Landscape Conservation Sub-Zoning Project for Surroundings of Heritages			
H2	Heritage Tourism Development Sub-program	H2-1	Heritage Tourism Development Project			
		H2-2	Community Base Tourism Road Development Project			
		H2-3	Tourism Promotion Project			
H3	Environment Improvement Sub-program	H3-1	Drainage Improvement Project			
		H3-2	Sewerage System Construction Project			
		H3-3	Solid Waste Disposal Improvement Project			
		H3-4	Park Large-Trees Planting Project			
H4	Urban Transport Improvement Sub-program	H4-1	Primary Roads Improvement Project			
		H4-2	Secondary Roads Improvement Project			
		H4-3	Public Transport Improvement Project			
		H4-4	BRT Development Project			
H5	Landscape and Land use Improvement Sub-program	H5-1	Building Control Regulations Refinement Project			
		H5-2	Public Facility Relocation Project			
Inner Urban Zone						
I1	Business Area's Land Use Intensification Sub-program	I1-1	ICT Infrastructure Strengthening Project			
		I1-2	Urban Redevelopment Acceleration Project			
		I1-3	Public Facility Relocation Project			
I2	Living Environment Improvement Sub-program	I2-1	Water Infrastructure Improvement Project			
		I2-2	Solid Waste Disposal Improvement Project			
I3	Inner Urban Road Network Improvement Sub-program	I3-1	Primary Roads Improvement Project			
		I3-2	Secondary Roads Improvement Project			
		I3-3	Streetscape Improvement Project			
I4	Public Transport Improvement Sub-program	I4-1	Public Transport Improvement Project			
		I4-2	BRT Development Project			
I5	Marshes Conservation and Park Improvement Sub-program	I5-1	Nong Douang Ecological Marsh Park Construction Project			
		I5-2	Nong Chan Ecological Marsh Park Construction Project			
		I5-3	Existing Marsh Conservation Project			
		I5-4	Park Large-Trees Planting Project			
Outer Urban Zone						
O1	New Urbanizing Area Development Sub-program	O1-1	Nong Ping Area Development Project			
		O1-2	New Residential Area Development Project			
O2	Living Environment Improvement for Residential Area Sub-program	O2-1	Water Infrastructure Improvement Project			
		O2-2	Solid Waste Disposal Improvement Project			
O3	Water-front Conservation	O3-1	Large-scale Marshes Conservation Project			

	and Park Improvement Sub-program	O3-2	River-front Improvement Project			
		O3-3	New Public Park Construction Project			
O4	Road Network Improvement Sub-program	O4-1	Primary Roads Improvement Project			
		O4-2	Secondary Roads Improvement Project			
O5	Public Transport Improvement Sub-program	O5-1	Public Transport Improvement Project			
		O5-2	Railway Extension Project			
Sub-center Zone						
S1	Investment Promotion Sub-program	S1-1	Sub-center SEZ Development Project			
		S1-2	PPP Acceleration Project			
S2	Sub-centers' Core Area Development Sub-program	S2-1	KM21 VIP Development Project			
		S2-2	Thanaleang VLP Development Project			
		S2-3	Relocation of Higher Education Institutes Project to Dongdock			
		S2-4	Commercial Complex Development Project at Naxaithong			
		S2-5	Vientiane Central Station Development Project			
S3	Infrastructure Development Sub-program	S3-1	Infrastructure and Sanitation Development Project			
		S3-2	Secondary Roads Improvement Project			
		S3-3	ICT Infrastructure Strengthening Project			
		S3-4	New Public Park Construction Project			
Urban Cluster Zone						
C1	Local Public Service Improvement Sub-Program	C1-1	Community Center Development Project			
C2	Agricultural Center Development Sub-program	C2-1	Agricultural Center Development Project			
		C2-2	Road side station Development Project			
C3	Green Tourism Center Development Sub-program	C3-1	Green Tourism Development Project			
		C3-2	Local Border Market Development Project			

Note: Schedule S: Short (-2015), M: Middle (-2020) and L: Long (-2030).

Source: JST

5.3 Urban Development Management Governance of Lao PDR

General: Effective and sustainable implementation and management of urban development will be realized only by good cooperation of functional organization, strategically designed legal framework and well coordinated human resource development. Problems and constraints have been highlighted in Chapter 2 through the analysis of related organization, legal framework and human resource. Each aspect could have its own solutions and capacity development plans. With inconsistency and uncooperative working situation, it is a time to promote the concept and set urban development management governance in Lao PDR which will be the base for all policies and measures related to development planning and construction. With this concept in place, it is anticipated that the issues related to organization, legal framework and human resources will be resolved.

Concept: The concept of urban development management governance consists of three (3) main measures, which are;

- Systematically organized laws and regulations,
- Fair and unyielding enforcement & monitoring, and
- Accountability.

Measures: To achieve the above three (3) measures, the good linkages will be required among the following three (3) categories, which are;

- Good cooperation of functional Organization,
- Strategically designed Legal Framework, and
- Well coordinated Human Resource Development.

Legal Framework: Legal framework for urban development management should consist of systematically organized Building Standard and Grouping Regulations for urban development management. Fair and unyielding enforcement & monitoring shall be guaranteed by concrete and insistent building confirmation system. Accountability will be realized by License system of Architect and Engineer authorized by Lao Government and well organized public participation system.

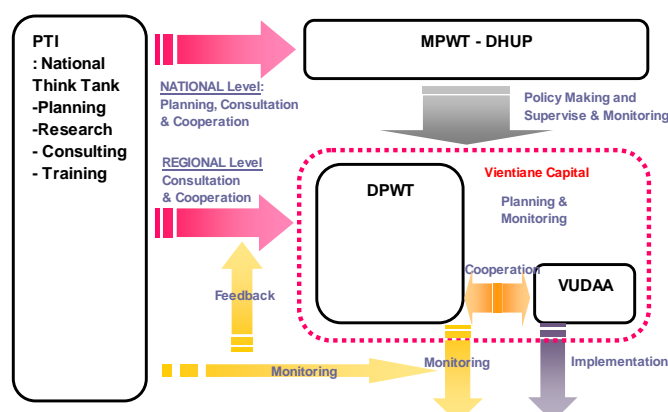


Source: JST

Figure 5.2: Concept of Urban Development Management Governance

5.4 Organization Strategy

Relation and Cooperation System: Ideal relation and cooperation system among related organizations in terms of urban development management is shown below.



Source: JST

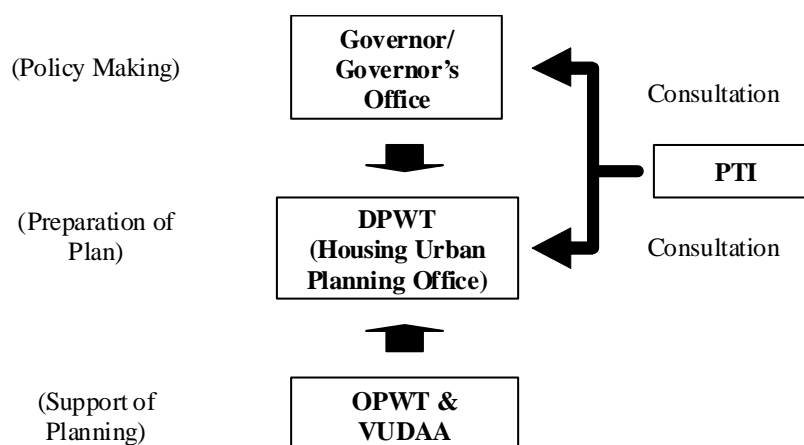
Figure 5.3: Ideal Relation and Cooperation System among Related Organizations

Urban Planning Phase: Proposed main functions (MPWT, PTI and DPWT in Vientiane Capital) of each organization for urban planning are as follows:

Table 5.2: Proposed Main Function of Each Organization on Urban Planning

Organizations	Main Function
PTI	<ul style="list-style-type: none"> - Consultation to the Minister on MPWT and Governors for policy making for National and Regional Urban Plan - Formulation of National and Regional Urban Plan - Consultation to Provincial Governors for provision of Provincial and District Urban Plan - Consultation to DPWT for preparation of Urban Plan - Study and Research on Urban Planning - Training for Persons related to Urban Planning in Public and Private Sector - Support of DHUP in MPWT
DPWT	<ul style="list-style-type: none"> - Advice to the governor for preparation of provincial and district urban plan in a province - Preparation of provincial and district urban plan in a province
OPWT	<ul style="list-style-type: none"> - Support of DPWT for provision of district urban plan
VUDAA	<ul style="list-style-type: none"> - Support of DPWT for provision of district urban plan

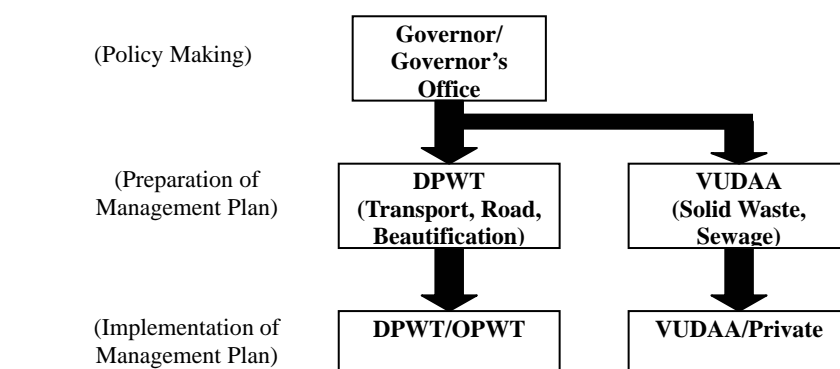
Source: JST



Source: JST

Figure 5.4: Correlation with Each Organization on Urban Planning Phase

Management Phase: DPWT, OPWT, and VUDAA are responsible for urban and infrastructure management (development, operation and maintenance) in Vientiane Capital. In accordance with the urban growth, volume of urban infrastructures such as road, drainage, solid waste, park and others are currently managed by DPWT and VUDAA. To strengthen capacity for urban and infrastructure management, consolidation and closure of present organizations especially DPWT and VUDAA in Vientiane Capital will be needed. It is suggested that functions of solid waste management, urban beautification and cleaning should remain with VUDAA. Other duties such as housing urban planning, bridge and road management and social and urban management should be transferred and consolidated to DPWT.



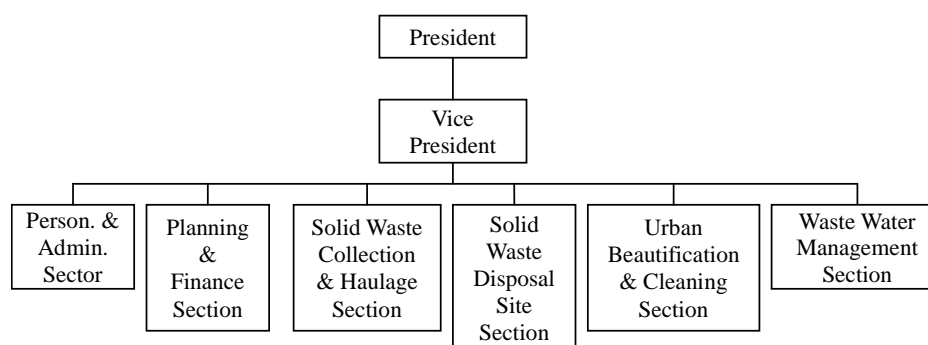
Source: JST

Figure 5.5: Correlation with Each Authority on Management Phase

Table 5.3: Proposed Duty of VUDAA

Items	Contents
Solid Waste	<ul style="list-style-type: none"> - Collection and Transportation of Solid Waste and Night Soil - Management of Solid Waste Disposal Site - Study, Research and Planning on Solid Waste Management and Waste Water Management - Collection of Fee for Solid Waste Management
Cleaning	<ul style="list-style-type: none"> - Cleaning of Public Place (Roads and Parks) - Management of Waste Water Treatment Facility

Source: JST



Source: JST

Figure 5.6: Proposed Organization of VUDAA

5.5 Legal Framework Strategy

Revision of Law on Urban Plan:

- Revision of Articles on Urban Planning Implementation Agencies at Provincial and District Level: JST proposes that MPWT or PTI should be responsible for the preparation of the urban plan at national and regional level while DPWT should formulate urban plan at provincial and district level. Thus, in line with this, Article 9, 10, 34, 35 and 36 needs a revision.
- Revision of Articles on Allocation of Urban Land in the Urban Plan: JST proposes land use zones as shown in Table 5.4 below. It is suggested that the land use zones should be revised and added in the Law and Order for prevailing among persons and authorities related to urban planning in Lao PDR.

Table 5.4: Proposed Land Use Zone for amendment of Law on Urban Plan

Level of City	Law on Urban Plan and Ministerial Order on Urban Planning Regulations	
	Legend	Land Use Zone
Level 1 & 2 (city under the central and provincial level)	ZPP	Historical and preservation zone
	UA	Urban central zone
	UB	Urban inner zone
	UC	Urban inner zone with special condition
	UD	Urban suburbs or surrounding zone
	UE	Urban expansion zone (Future development zone)
	UF	Village surrounded by rice field
	I	Industrial zone
	T	Transport zone
	NA	Agriculture zone
	NE	Forest and natural zone
	E	Service zone (Education, Health, Military, etc.)
Level 3 (city under the district)	UA	Urban central zone
	UE	Urban expansion zone (Future development zone)
	I	Industrial zone
	NA	Agriculture zone
	NE	Forest and natural zone

Source: JST

Development Permission System: Urban development management system is needed for orderly development of land in both urbanization promotion area as well as in urbanization control area as shown in the urban master plan. JST proposes the draft of development permission system in Lao PDR. Article on the development permit should be added in the Law on Urban Plan and the Order.

VUDAA: VUDAA should be an agency responsible for management of solid waste, night soil, urban beautification and cleaning in the Capital.

Table 5.5: Amendment of Articles in Decree on VUDAA

Article	Proposed Contents
Article 1	The VUDAA that cover the whole area of Vientiane Capital ...
Article 2	VUDAA that works in, has the role in planning, implementing activities of the management urban in the scope of the whole area of Vientiane Capital that ...
Article 3	2, Construct, improve and repair the infrastructure and the service in the urban that will include: Keep and eliminate the garbage, Clean and keep the environment...
Article 5	Organizational Framework of VUDAA:

Source: Decree on the Implementation and Activities of VUDAA

Development Guideline: For contribution to formulation of good urban area and maintenance of good living environment, the development guideline, which consists of development criteria of public facilities and necessary matters concerning large scale land development activities, should be provided for promotion of public facilities development.

Building Standard: These should be consolidated to one new Decision named the Building Standard. In addition, some new items and contents should be added in the Building Standard.

Coverage Ratio, etc: JST proposes ramified and unified 12 land use zones for revision of land use mentioned in the Law on Urban Plan. Considering the Ministerial Order on Urban Planning Regulation, the Regulation of Zoning Control of Vientiane Capital and the draft Urban Development Master Plan of Vientiane Capital 2030, coverage ratio, maximum height of building and plot ratio of 12 land use zones are proposed as a standard on a building size in Lao PDR. This standard should be added in the Building Standard.

Building Confirmation System: Flow from building confirmation to certificate of construction completion has been proposed based on the building confirmation system proposed by JST.

Table 5.6: Confirmation Items and Contents of Building Confirmation

Items of Confirmation	Contents of Confirmation
<i><Document Confirmation Phase></i>	
Documents	Application letter for construction confirmation Residence certificate of applicant Certification documents on legal land use right of applicant Location plan and picture of the site
Description Report	Zone classified in the urban master plan, use of a building Type of activity, earth volume, area of building floor, building height, etc. Coverage ratio, plot ratio, building height, building line, set back Provision of parking Structure calculation (Level 2 only)
Drawings	Seal of design company stamped on drawings Layout plan, elevation plan, front view, cross sections and profile
Site Inspection	Location and condition of site, adjacent buildings, road and river/drainage
<i><Construction Phase></i>	
Interim Inspection	Conformity to drawings certified
Final Inspection	Conformity to drawings certified

Source: Decision of the Minister of MCTPC on Building Management, Draft Decision of the Minister of MPWT on Building Control and JST

5.6 Human Resource Development Strategy

Officials: Since 1991, the 11 officials in PTI have prepared more than 100 master plans. In other words on an average 5 plans/year has been prepared by 11 officials signifying the overload of work on them. DPWT have only 6 official's in-charge of planning with no experience in formulating master plan. In 2008, in VUDAA around 12 and 8 staffs are responsible for managing 350km length of road and 280 buildings respectively. In other words, 35 buildings are to be managed by each staff per year. Considering such shortages of human resources, it is suggested to recruit and train mid-careers professionals/experts and graduates on a priority basis.

Technical Personnel: VUDAA despite being the leading organization for technical management and implementation of projects on site in districts, it lacks in technical human resource. As per the statistics, only 44.2% of the officials possess 'High Diploma' and training while only 14.9% possess the professional education in college. Thus, considering the lack of technical knowledge and management skills, it is vital to conduct technical training and formulate training manuals to enhance the skills of the officials in OPWT and VUDAA.

Table 5.7: General Information of Human Resources of Major Organizations

Organization (Total Number of officials)	Ratio of Female Official (%)	College Graduates (Professional Education) (%)	Officials with Degree from Foreign Institute (%)	Professional Field (%)				
				Urban Planning and management	Engineering	Architecture	Transportation	Law
PTI (59)	17	71.2	45.2	15.2	32.9	22.8	1.3	0
DPWT (136)	15.4 (21.3 VTC)	32.4 (88.2 with High Diploma)	-	4.3	52.5	5.0	13.9	0
DHUP (56)	25	78	51.7	13.6	42.4	19.7	1.5	1.5
VUDAA (101)	17.3	14.9 (44.2 with High Diploma)	-	1.0	35.3	9.8	0	0

Source: "Statistic Government Official working for 2006-2007" by PTI, "Statistic Government Official working for 2009-2010" by DHUP, "Statistic Government Official working for 2009-2010" by DPWT, "Statistic Government Official working for 2007-2008" by VUDAA, and JST

Technical Manual or Guideline: The technical manual on urban planning as created by GTZ is excellent and is utilized on regular basis for routine tasks and activities especially in PTI. However, there is no manual especially for the infrastructure management in districts which is managed by technical officials.

Professional Field: The personnel of the four (4) organizations varies in expertise and are from more than 15 professional fields².

- PTI as a national Think Tank shows fairly good balance in terms of professional expertise/ fields except for Transportation Planning for which currently there is only one official in-charge.
- DHUP is a Policy Maker for urban development and planning but with only 1 official in a department with legal background is insufficient for effective sustainable implementation and management. Also same as of PTI, there is only one official with Transportation Planning background.

² A single official may hold several professions.

- DPWT is an overall Planner and Manager for implementation but there are no official in a department with legal background, which is insufficient for effective sustainable implementation and management.
- As a public service company VUDAA should be good in operation management with enough technical level to maintain on site.

Table 5.8: Professional Field of Personnel of PTI

Professional Field	No. of Officials
Urban Planning	11
Urban Planning and Management	1
Urban Environmental Management	11
Architecture	18
Civil Engineering	14
Civil Engineering and Environment	1
Economic Construction	1
Road-Bridge	8
Road-Bridge Design	1
Bridge Design	1
Transportation	1
Hydrology	1
Survey	4
Statistic Planning	1
Accounting	2
English	1
Other	1

Source: “Statistic Government Official working with government organization for 2006-2007” by PTI

Training Program: The largest training program was held by ADB in 1998–2000. Dispatch of individual officials in abroad has been held and is organized quite often. In Japan, 6 officials studied in the field of Environment, Urban Planning and Building Code in recent five (5) years.



Source: “Statistic Government Official working 2006-2007” by PTI, “Statistic Government Official working 2009-2010” by DHUP, and JST

Figure 5.7: Country to Study Abroad of Personnel in PTI and DHUP

Professional Education System: Main Educational Institution, National University of Lao PDR is major institute for technical official in-charge of urban planning. The Faculty of Architecture and Faculty of Engineer are expecting 1,196 students to graduate next year.

5.7 Capacity Development Plan

Goal: General Goal of Capacity Development Plan is to develop and strengthen the capacity for effective and sustainable implementation and management of urban development master plan.

Target Organization: PTI, DHUP, DPWT-OPWT, and VUDAA






Analysis of Present Condition: The issues identified during the initial surveys are as follow:

- No or limited control on the urban development management activities following the current master plan and land use zoning. As result, development is inconsistent.
- Difficulties to implement the planned infrastructure projects completely.
- No implementation plan and system for socioeconomic development, which is based on the 6th Five-Year Socioeconomic Development Plan for Vientiane Capital. Thus in the absence of such mechanism, coping with preservation and formulation of urban environment plan and urban design.

Plan and Activity: Six (6) Activities as Capacity Development Plan have been proposed:

- Activity-1: Set an initial working committee in the organizations
- Activity-2: Set a working committee for legal framework
- Activity-3: Recruiting and training plan for new graduates and mid-carriers in related organizations
- Activity-4: Training System for the technical Officials of OPWT and VUDAA
- Activity-5: New Division for New Criteria
- Activity-6: Set a working group of Human Resource Development and Management in Private Sector

Table 5.9: Formation Flow of Capacity Development Plan

Initial Issues	-No or limited control on the urban development management activities following the current master plan and land use zoning. As result, development is inconsistent. -Difficulties to implement the planned infrastructure projects completely. -No implementation plan and system for socioeconomic development, which is based on the 6th Five-Year Socioeconomic Development Plan for Vientiane Capital. Thus in the absence of such mechanism,, coping with preservation and formulation of urban environment plan and urban design				
	 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">System</div>		 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Ability</div>		
	 Organization	 Legal Framework		 Human Resource	
Causes	- No continuous coordination between relevant organizations. Therefore, many organizations are managing and dealing with same task without well cooperation system.	<Legal Framework> Legislative structure on urban planning and management is unsystematic and incomplete.	< Laws and Regulation > Laws and regulations are unclear, hard to understand and showed difficulties during implementation or impossible to be implemented.	- Short of number of officials - Imbalance of professional Field	Limited experiences of systematic team work for planning project - insufficient number of technical personnel to follow the construction - Lack of technical manual or guideline on urban planning and management

Solutions	Formulation of General Scheme of Governance : Urban Development Management Governance			Recruiting	Training Program for Mid-careers in cooperation with Faculty of Engineering and Law in NUOL
	Clear determination of task of each organizations and good communication among them.	- establish some new law and regulation matching with the modern requirements and complete legislative structure on urban planning and management	- improve existing law and regulation for better clarity, easy understanding, and easy for implementation.		
CD Plan	A-1 : Setting the Initial Working Committee among organizations; - to establish the structure for Development, Construction and Governance of Laos in cooperation with Faculty of Architecture, Engineering and Law in NUOL, - to clarify the tasks and responsibilities in detail among each organization, - to share the result of monitoring, and - to share the scope of next stage.	A-2: Set working Committee for legal framework of construction and development to; - revise Building Code and other related laws and regulations, - set up the concrete Building Confirmation System and procedure, and - set up the National License System and procedure for architect and engineer.	► Revise Building Code ► Set up the concrete Building Confirmation System and procedure ► Set up the National License System and procedure for Architect and Engineer	A-3: Recruiting and training plan for new graduates and mid-carriers especially in the field of - Transportation - Planning, - Urban Planning and - Law A-5: Setting up New Division for Urban Design and Landscape Design in PTI	A-4: Training System for OPWT and VUDAA Technical Officials; - to formulate District Development Master Plan, - to be able to maintain urban infrastructure in a District in cooperation with private construction companies, and - to be able to manage private construction companies. For these; i) Training Program and Manual for District Officer - Content: 5 District officials / year in PTI Training Program ii) Training Program and Manual for Private Construction Companies - Content: Monitoring and Guidance iii) TOT Program in PTI for above and for New Graduates A-6: Working Group of Human Resource Development and Management in Private Sector

Source: JST

5.8 Priority Programs

General: In this section the first step of Master plan to be implemented will be proposed as Priority Program. Priority Program consists of projects on different stages and categories. Because Sub-program by Zoning has been proposed with Urban Development Management Program as a methodology to realize Master Plan, Priority Program should be set with component containing each element on each stage so that the program has a strategic flow from management program to implementation of each project.

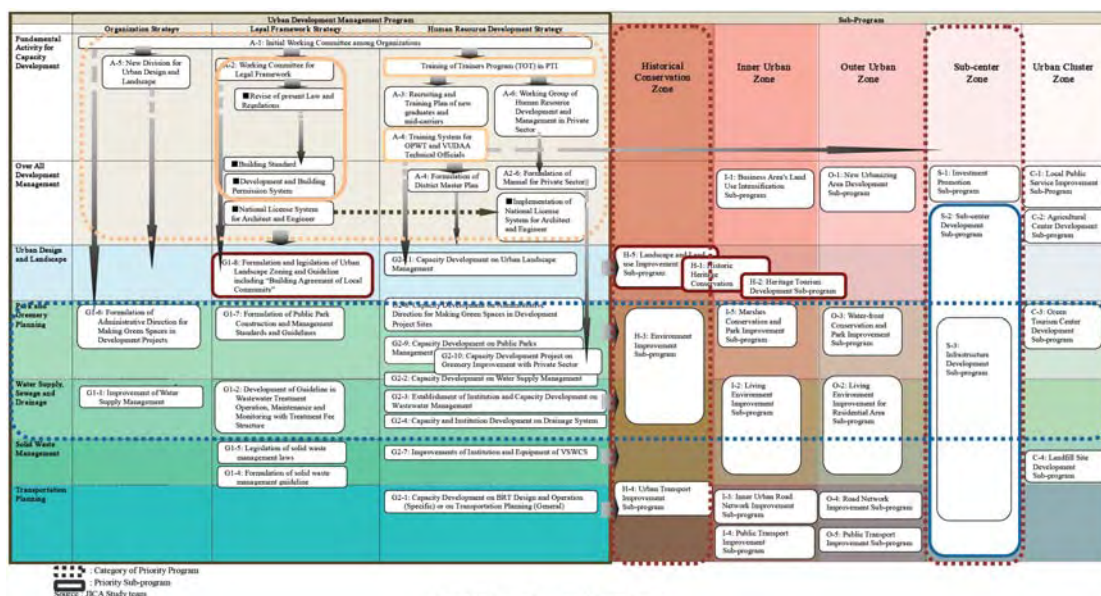
Priority Programs: Figure 5.8 shows the relationship and concept of Program Approach as a whole. Urban Development Management should be the fundamental base of all Programs. Based on this Urban Development Management Program, Urban Development Management Sub-Program by Sectors works well. Each project of Sub-Programs by Zoning can not be implemented successfully without Urban Development Management Sub-Program by Sectors. Figure 5.9 shows this concept with all programs and projects.

Based on this structure, from the view point of urgency, vision of the ideal future capital, and urban growth, the four (4) programs have been picked up as Priority Program as follows. Priority Program consists of projects on different stages and categories. Because Sub-program by Zoning has been proposed with Urban Development Management Program as a methodology to realize Master Plan, Priority Program should be set with component containing each element on each stage so that the program has a strategic flow from management program to implementation of each project.



Source: JST

Figure 5.8: Structure of Program Approach



Source: JST

Figure 5.9: Program Approach and Priority Program

PP 1: Urban Development Management

Vision and Objectives	<ul style="list-style-type: none"> ➤ Improvement and Formulation of legal framework to give the fundamental guideline for all in charge both of development and management. ➤ Setting new system, guideline and standard to implement Urban Development Management Governance. ➤ Sustainable implementation of urban development management.
Program Contents	<p>PP 1-1 Revision on Law and Decree</p> <ul style="list-style-type: none"> (1) Articles on Urban Planning Implementation Agencies at Provincial and District Level (2) Articles on Allocation of Urban Land in the Urban Plan (3) Building Standard <p>PP 1-2: Formulation of New System for Urban Development Management</p> <ul style="list-style-type: none"> (1) Development Permission System (2) Development Guideline <p>PP 1-3: Capacity Development for Urban Development Management</p> <ul style="list-style-type: none"> (1) Setting the Initial Working Committee among Organizations for implementation of Training Program (2) Basic Capacity Assessment (3) Schooling Program for PTI, DPWT and OPWT officials (4) OJT Program for PTI, DPWT and OPWT officials (5) Training of Trainers Program (TOT) in PTI for training OPWT Officials (6) Recruiting new graduates and mid-carriers in major in law. (7) Training in Japan
Implementation Organization	<p>Main : PTI</p> <p>Related & Cooperative : DPWT, DHUP, VUDAA, NUOL</p>
Implementation Schedule	

Component	Contents	Short(-2015)				
Establishment of Implementation Body	Setting the Committee					
Revision on Law and Decree	Revision of Articles on Urban Planning Implementation Agencies at Provincial and District Level					
	Revision on Articles on Allocation of Urban Land in the Urban Plan					
Formulation of New System for Urban Development Management	Formulation of Development Permission System					
	Formulation of Development Guideline					
	Formulation of Building Standard					
Capacity Development for Urban Development Management	Basic Capacity Assessment					
	Training (Lecture and Technical)					
	PTI, DPWT, DHUP					
	OPWT					
	Training in Japan					
	PTI, DPWT, DHUP					
	OPWT					

Source: JST

PP 2: Urban Infrastructure Development

Vision and Objectives	<ul style="list-style-type: none"> ➤ Improvement of water supply condition to support the sustainable development in Vientiane Capital (VC) by enlarging WTP capacity, transmission and distribution network. ➤ Improvement of wastewater and drainage condition for people in VC to provide clean water environment in public water and less flooding. ➤ Awareness-raising for the importance of collection and reduction of generation and discharge. ➤ Improve community collection system with their involvement in the built-up area. ➤ Improve and promote sustainable urban development with wetland conservation for urban nature.
Program Contents	<p>PP 2-1: Urban Transport Improvement</p> <p>(1) Primary Roads Improvement Project: Improvement and completion of NR 13</p> <p>(2) Public Transport Improvement Project</p> <ul style="list-style-type: none"> - Formulation of a Traffic Management Plan - Introduction of route bus and park & ride system - Development of Car Parking <p>PP 2-2: Water Supply Development</p> <p>(1) Urgent Water Supply Facility Development</p> <p>(2) Improvement of Soft Portion</p> <p>PP-2.3: Wastewater and Drainage Development</p> <p>(1) Urgent Wastewater and Drainage Facility Development</p> <p>(2) Improvement of Soft Portion</p> <ul style="list-style-type: none"> - Establishment of Institution, regulation and Planning - Controlling Land Development <p>PP-2.4: Solid Waste Disposal Improvement</p> <p>(1) Community awareness campaign for sanitary solid waste discharge</p> <p>(2) Construction of community collection points</p> <p>PP-2.5: Marshes Conservation and Ecological Parks Improvement</p> <p>(1) Survey on Existing Marsh Conditions</p> <p>(2) Establishment of Ecological Marsh Parks (Nong Chan Marsh, etc.)</p> <ul style="list-style-type: none"> - Planning for establishment of ecological marsh parks - Establishment Proposal of Nong Chan Ecological Marsh Park
Implementation Organization	MPWT, DPWT, NPVC, PTI, VUDAA, VSWCS, DAF
Implementation Schedule	

Component	Contents	Short (-2015)	Mid	Long
Urban Transport Improvement	Primary Roads Improvement Project			
	Public Transport Improvement Project			
Water Supply Development	Urgent Water Supply Facility Development			
	Water Supply Facility Development			
	Improvement of soft portion			
Wastewater and Drainage Development	Urgent Wastewater Facility Development			
	Improvement of soft portion			
Solid Waste Disposal Improvement	Community awareness campaign			
	Construction of community collection points			
Marshes Conservation and Ecological Parks Improvement	Survey on Existing Marshes Conditions			
	Establishment of Ecological Marsh Parks			

Source: JST

PP 3: Historic Area Conservation and Revitalization

Vision and Objectives	<ul style="list-style-type: none"> ➤ To set targets and formulation of measures to realize the urban landscape improvement and sustainability of national heritages and urban heritages for sustainable urban development. ➤ To set targets and measures to enhance participation of local communities and citizens to create calm and beautiful urban scenery in Vientiane Capital. ➤ To enhance and motivate awareness of heritages conservation on local communities through earnings of additional family income based on International Heritage Tourism Development. 												
Program Contents	<p>PP 3-1: Registration of the part of Identified Urban Heritage</p> <p>(1) Coordination of categories of identified urban heritages to be registered as local level of National Heritage between the related Government Agencies</p> <p>(2) Registration of Local Level of National Heritage on Vientiane Capital by DIC under guidance of MIC</p> <p>PP 3-2: Sub-Zoning of ZPP-Ua for Historical and Traditional National Heritage Conservation</p> <p>(1) Formulation of Sub-Zoning Plan with Guidelines</p> <p>(2) Public Hearing and Modification of Sub-Zoning Plan</p> <p>PP 3-3: Formulation of International Tourism Development Plan for ZPP-Ua</p> <p>(1) Questionnaire Survey for Local Stakeholder in the ZPP-Ua</p> <p>(2) Identification of existing and potential tourism resources</p> <p>(3) To Set-up Tourism Development Direction and Products</p> <p>(4) Tourism Development Plan by Public and Private Collaboration and Partnership</p> <p>(5) To promote "Building Agreement of Local Community</p> <p>PP 3-4: Implementation of Model Project of Historic Zone Conservation and Revitalization.</p>												
Implementation Organization	<p>Main : DIC and MIC</p> <p>Related & Cooperative : Vientiane Capital, DPWT, DHUP, and PTI</p>												
Implementation Schedule	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 70%;">Component</th><th style="width: 30%;">Short (-2015)</th></tr> </thead> <tbody> <tr> <td>Establishment of Implementation Body</td><td><div style="width: 100%; height: 15px; background-color: #2e8b57;"></div></td></tr> <tr> <td>Registration of the part of Identified Urban Heritage</td><td><div style="width: 100%; height: 15px; background-color: #2e8b57;"></div></td></tr> <tr> <td>Sub-Zoning of ZPP-Ua for Historic and Traditional National Heritage Conservation on the National Heritage Law</td><td><div style="width: 100%; height: 15px; background-color: #2e8b57;"></div></td></tr> <tr> <td>Formulation of International Tourism Development Plan for ZPP-Ua</td><td><div style="width: 100%; height: 15px; background-color: #2e8b57;"></div></td></tr> <tr> <td>Implementation of Model Project of Historic Zone Conservation and Revitalization.</td><td><div style="width: 100%; height: 15px; background-color: #2e8b57;"></div></td></tr> </tbody> </table> <p>Source: JST</p>	Component	Short (-2015)	Establishment of Implementation Body	<div style="width: 100%; height: 15px; background-color: #2e8b57;"></div>	Registration of the part of Identified Urban Heritage	<div style="width: 100%; height: 15px; background-color: #2e8b57;"></div>	Sub-Zoning of ZPP-Ua for Historic and Traditional National Heritage Conservation on the National Heritage Law	<div style="width: 100%; height: 15px; background-color: #2e8b57;"></div>	Formulation of International Tourism Development Plan for ZPP-Ua	<div style="width: 100%; height: 15px; background-color: #2e8b57;"></div>	Implementation of Model Project of Historic Zone Conservation and Revitalization.	<div style="width: 100%; height: 15px; background-color: #2e8b57;"></div>
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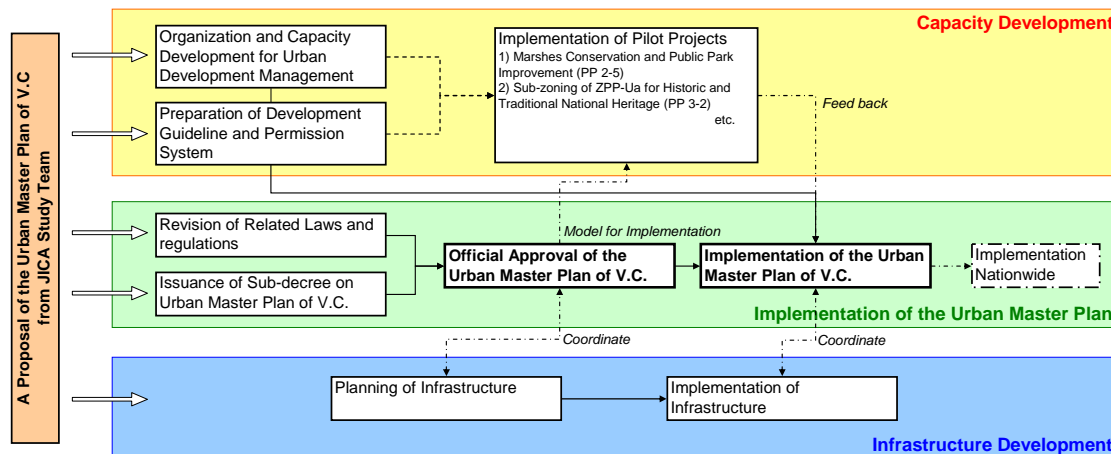
PP 4: Sub-center Development

Vision and Objectives	<ul style="list-style-type: none"> ➤ Managing new urban growth for the future ➤ Leading appropriate development with improvement of Sub-center
Program Contents	<p>PP 4-1: Establishment of Implementation and Coordination Body</p> <p>(1) Planning Stage</p> <p>(2) Implementation Stage</p> <p>PP 4-2: Planning for Implementation Scheme under PPP</p> <p>(1) Investment Promotion</p> <ul style="list-style-type: none"> - Incentives for investment-Designation as SEZ - Provision of Extra Land to equivalent with Infrastructure Development - Linkage with other development projects <p>(2) Core Area Development</p> <p style="padding-left: 20px;">* refer to the Implementation Schedule as follows</p> <p>(3) Infrastructure Development (at Minimum by Public Sector)</p> <p style="padding-left: 20px;">* refer to the Implementation Schedule as follows</p>
Implementation Organization	DPWT, MOIC, MPWT, Lao National Railway Authority, VUDAA, OPWT
Implementation Schedule	

Component	Contents	Short (-2015)	Mid (-2020)	Long (-2030)
Establishment of Implementation Body	Planning Stage			
	Implementation Stage			
Planning for Implementation Scheme under PPP and Implementation of Sub-Center Sub-programs	Investment Promotion			
	Sub-center SEZ Development Project (S1-1)			
	PPP Acceleration Project (S1-1)			
	Core Area Development			
	KM21 VIP Development Project (S2-1)			
	Thanaleang VLP Development Project (S2-2)			
	Relocation of Higher Education Institutes Project to Dongdook (S2-3)			
	Commercial Complex Development Project at Naxaithong (S2-4)			
	Vientiane Central Station Development Project (S2-5)			
	Infrastructure Development			
	Secondary Roads Improvement Project (S3-1)			
	Infrastructure and Sanitation Development Project (S3-2)			
	ICT Infrastructure Strengthening Project (S3-3)			
	New Public Park Construction Project (S3-4)			

Source : JST

Immediate Steps: Making a draft urban development master plan is only the beginning of the long-lasting implementation phase of the urban master plan. The urban master plan has no value unless it is put to actual use for the regulation, control, construction and rehabilitation of the city with its dynamic and integrated spheres and facets. For Vientiane Capital, there are roughly three parts in the implementation of urban development master plan.



Source: JST

Figure 5.10: Implementation of Urban Master Plan

Implementation of the Urban Master Plan: The implementation of the urban master plan encompasses 1) regulation of individual buildings; 2) control of large scale development applications; 3) urban area improvement; 4) new urban area development and urban redevelopment and 5) urban environment improvement. These activities shall be carried out by Vientiane capital following the proposed master urban development master plan. The development of Sub-Centers will be an important first step for the realization of the future visions of the Master Plan. Amongst many of the proposed Sub-Centers, Vientiane Logistics Park (VLP) within Thanaleang Sub-Center zone and Vientiane Industrial Park (VIP) within KM21 Sub-Center zone should be implemented in an early stage to serve as a model for other Sub-Center plans.

Capacity Development: The implementation assistance denotes the activities for providing guidance and preparing new systems necessary for the implementation of the master plan. Also, the capacity development to strengthen the organizational capacity for effective implementation of the urban master plan will be essential. In order for the capacity development, introduction of pilot projects shall be essential as part of the on-the-job training. The focus of the pilot projects are proposed as the detail zoning scheme for the historic conservation area and the planning of marshes conservation and park development plan. The outcome of the pilot projects need to be returned as “feed-back” to the implementing body of the master plan.

Infrastructure Development: Urban development is always coupled with the related infrastructure development, such as road network, water supply, drainage, sewerage, solid waste etc. It often happens that the implementer of specific infrastructure may be different from the implementer of the master plan (which is ordinarily the city government), coordination needs to be established between different implementing bodies.

Chapter 6: Conclusions and Recommendations

The following are the conclusions and recommendations for the sustainable development of Vientiane Capital of Lao PDR.

1. Vientiane is the capital city of Lao PDR, and is endowed with high potential for economic development in the future as well as a gateway to the Greater Mekong Sub-Region (GMS).
2. In the last 10 years, Vientiane Capital has seen rapid urbanization in and around the city, and consequently the city's rich farm land has been sacrificed to make room for urbanization, and the areas on the fringe of the existing urban area has been urbanized quickly.
3. Under such circumstances, the JICA Study Team together with PTI and Vientiane Capital examined the present conditions, analyzed the future prospects and formulated the urban development master plan for Vientiane Capital through the close collaboration amongst concerned organizations and in consultation with the broad stakeholders.
4. Consequently the future vision for Vientiane Capital were formulated with three pillars; namely 1) a regional hub in Greater Mekong Sub-Region, 2) center for Nation, and 3) comfortably-livable and beloved hometown for all.
5. According to the socio-economic projection, the population of Vientiane Capital will become 1.4 million in 2030, and during the same period, GRDP of Vientiane Capital will grow at an annual average growth rate of 8%.
6. In order to accommodate the increasing population and growing urban economy, spatial structures of Vientiane Capital was scrutinized with two scenarios; single-core structure and multi-core structure, and the multi-core structure was adopted as desirable, in which the growth of the central city will be regulated and sub-centers in the suburbs will be developed as new urban centers to absorb growing population and economy.
7. The land use plan for 2030 was proposed in consultation with PTI and Vientiane Capital as a result of rounds of revisions and modifications and the adopted spatial structure. The land use zoning plan has to be considered by Laotian side for approval and should be announced for implementation without delay with proper legal power for enforcement.
8. In all, five planning zones are proposed following the specific characters of Vientiane Capital; namely 1) Historic Conservation Zone, 2) Inner Urban Zone, 3) Outer Urban Zone, 4) Sub-Center Zones, and 5) Urban Cluster Zone.
9. With regard to the infrastructure development in line with the urban master plan, the followings are recommendable;
 - For road and transport, two important ring roads, namely the inner and outer ring roads, must be completed by 2030, together with one more ring road and two important radial roads;
 - For water supply the service ratio is set at 97% of total population in 2015 and 100% in 2020, and the capacity development for sustainable implementation is essential;
 - For sewerage, wastewater treatment system should be provided in the long term to prevent deterioration of water environment and preparation for this has to started by Vientiane Capital;

- For drainage, retarding ponds such as marshes and river channels should be protected as much as possible and appropriate gates and pumps shall be provided as necessary for efficient discharge of rain water;
 - For solid waste the generation is projected to increase rapidly and waste collection rate will be increased to 100% by 2030 and community awareness program for solid waste collection and promotion of 3R (Reduce, Reuse and Recycle) is necessary;
 - For parks and greenery new parks will be created mainly in newly urbanized area to reach 10 times of the current level by 2030 and pilot scheme with high demonstration effect such as Nong Chang Marsh Ecological Park scheme is necessary for immediate implementation in consideration of retaining and enhancing its environmental effects;
10. For effective implementation of Urban Development Management (UDM) program, four important principles are proposed to be respected, namely 1) Good Governance, 2) Stakeholder Involvement, 3) Public Private Partnership and 4) Sustainability.
11. In order to achieve the overall goals and visions of the urban development master plan, 3 to 5 sub-programs are proposed for each of the five planning zones reflecting the issues and prospects of each planning zone, which constitute the body of the UDM to be implemented based on the proposed Master Plan of Vientiane Capital..
12. For the implementation of UDM for Vientiane Capital, there are basically four organizations, namely PTI, DHUP, DPWT and VUDAA, which should share the mandate for various phases of implementation, including 1) policy making, 2) planning & research, 3) implementation and 4) monitoring.
13. As the duties and roles of each of the four organizations related to UDM are fairly well demarcated, the current issue of lack or insufficiency in coordination amongst the concerned organizations has to be rectified in collaborative efforts of the concerned organizations.
14. With regard to the legal framework, the following tasks should be given immediate focus for improvement;
- Law on Urban Plan shall need to be amended in part in line with the results of this study, such as the implementation organization at respective levels of urban planning
 - Law on Urban Plan shall need to newly add stipulation on the development permission system to secure the zoning of the city planning area, to encourage the formation of favorable and safe urban areas, and to prevent unregulated urbanization.
 - The role of VUDAA shall need to be readjusted by revising the relevant Decree to focus mainly on the solid waste and night soil collection and urban beatification and cleaning, while other urban service functions of VUDAA shall be integrated with those of DPWT.
 - The Development Guideline shall need to be prepared to clarify the responsibility of developers of large scale development in maintaining good living environment and provision of public facilities.
 - The outstanding Building Standard shall need to be consolidated with relevant articles and necessary revision of parameters such as maximum height, coverage ration and plat rations shall be done to cope with the proposed urban development master plan.
15. There are essentially four main issues identified with regard to the human resources development, namely; 1) shortage of officials, 2) insufficient technical personnel to follow the construction, 3) lack of technical manual and/or guideline on urban planning management, and 4) imbalance of professional field.
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16. Capacity Development Plan (CDP) is thus proposed for effective and sustainable implementation and management of UPD, and the targets of CDP are 1) PTI, 2) DHUP, 3) DPWT – OPWT, and 4) VUDAA.
17. The proposed plan and activity of CDP is composed of 6 steps; 1) initial working committee among organizations, 2) working committee for legal framework, 3) recruiting and training plan of new graduates and mid-carriers in related organizations, 4) training system for OPWT and VUDAA technical officials, 5) new division of new criteria, and 6) working group of human resource development and management in private sector.
18. For the commencement of the implementation of the MP and UDM, four Priority Projects (PP) were proposed, namely; PP1: Urban Development Management, PP-2: Urban Infrastructure Development, PP3: Historic Area Conservation and Revitalization, and PP4: Sub-Center Development for immediate action over the next 5 years or more.
19. Master Plan is not a fixed plan over a long period of time, and need to be modified regularly in consideration of various internal and external conditions of the city, and this regular modification and updating shall be the main task of the Laotian side.
20. New projects such as Trans Laos Railway Project or Nong Ping Urban Development Project need to respect the Development Visions and the Structure Plan of Vientiane Capital, and be harmonized as much as possible with the specific stipulation of the Master Plan. The Master Plan on the other hand will need to be adjusted as necessary in the future to adapt to evolving situations and needs.
21. The Laotian side, particularly Vientiane Capital and PTI must lead the sustainable and unyielding implementation of the MP and UDP in collaboration with related organizations and agencies, and the capacity development is considered to be an important aspect for facilitation.