5 DETAILED PLAN OF C.V. THONG NHAT AND BACH KHOA STATION AREA DEVELOPMENT

5.1 Present Condition

5.1.1 General characteristics

501 C.V. Thong Nhat Station locates south-west side of Thong Nhat Park (c.f. “Cong Vien” means a park in English), near the intersection of Le Duan Street (NH-1) of north-south and Dai Co Viet Street of east- west. This Station will be an interchange station between Bach Khoa Station of UMRT Line 2, which will locate south of the park. This intersection is very congested which two trunk roads cross at the edge of center of Hanoi. But recently, the underpass and pedestrian tunnel of Dai Co Viet Street was developed, so congestion of this intersection will be relieved.

502 Land use of this area is diversified, and various types of urban facilities are clustered. Thong Nhat Park is one of the biggest parks in Hanoi City, and many citizens visit to enjoy running, fishing, playing in children’s playground in harmonization with green and Bay Mau Lake inside the park. Ba Mau Lake is located west side of NH-1. Though sidewalks and trees are developed around this lake, it has few attractions, because landscape of surrounding residential areas is not controlled well.

5.1.2 Population

503 As for residential area, Bach Khoa area around universities has been developed rapidly and modern buildings are clustered in front of Tran Dai Nghia Street, which is recently developed. On the contrary, the residential areas of west – south west to the station (Phuong Liet Commune and Phuong Mai Commune) are high-dense with amazing alleys. Kim Lien KTT is one of typical public apartment area in Hanoi. There is a big income gap between this old residential area and new residential area in Bach Khoa.

504 Estimated population of 500m radius from C.V. Thong Nhat Station is 19,000, while number of employees is app. 9,000 and of students is 17,000. The population density of Phuong Liet Commune where C.V. Thong Nhat Station and west side area are located is 352persons/ha.

5.1.3 Urban facilities

505 In south-east of the station, Bach Khoa University and Civil Engineering are famous and excellent, and there are dormitories nearby. Bach Mai Hospital and several hospitals are clustered in Phuong Mai Commune, west side of NH-1. Ocean Tower, a modern business and commercial building locates at the corner of intersection.

506 Kim Lien Temple is in Phuong Liet Commune. King Le had the temple made to worship Cao Son as protection in South of Thang Long, Hanoi. This is one of the cultural heritage complex of Thang Long, a candidate of UNESCO Cultural World Heritage.

5.1.4 Road network and transport condition

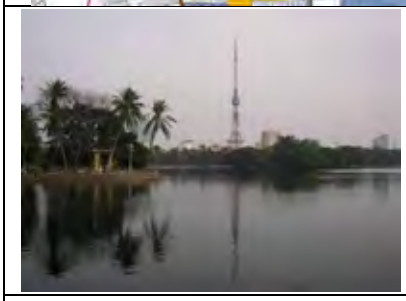
507 Two stations will locate nearby the intersection of NH-1 and Dai Co Viet Street, which was extended to west suburban area of Hanoi. This intersection is a south-west gateway of the city center. Recently, underground pass of Dai Co Viet was opened, and

pedestrian underground was also constructed. Congestion around the intersection was slightly improved, but it is still crowded with cars and motorbikes during rush hours.

Figure5.1.1 Present Condition of C.V. Thong Nhat and Bach Khoa Station Area

Socio-Economic Condition of Station Area		within 500m	500m -1km	Total
Population		13,352	82,656	96,008
Net Population Density (no./ha)		371	377	377
No. of Employment (workplace)		5,444	37,034	42,477
No. of Student (at school)		9,665	46,488	56,153
Socio-Economic Condition of Major Communes (2)	District	Dong Da	Dong Da	Hai Ba Trung
	Commune	Phuong Lien	Phuong Mai	Back Khoa
Average Household Size (persons)		3.6	3.8	4.2
Ave. Monthly HH Income (000VND)		2,540	3,248	4,844
HH with Self-owned Housing (%)		97.7	67.3	95.1
HH with Car/ Motorcycles (%)		87.4	92.2	92.7
Industry Structure (%)	Primary	3.6	1.1	0.0
	Secondary	15.7	22.6	11.1
	Tertiary	80.7	76.2	88.9
Bus facilities and network	No. of Bus Stops	4 (within 500m)		
	Bus Route Number	3, 6, 21, 23, 25, 26, 28, 32, 35, 41, 44, 51		

Related Plans and Projects
1) Under path construction of Dai Co Viet (completed)



(1) Bay Mau Lake in Thong Nhat Park

(2) Road around Ba Mau Lake

(3) Phung Duong Street (planned C.V. Thong Nhat Station location)

(4) Shop houses along railway

(5) Underpath of Dai Co Viet Street

(6) Dao Duy Anh Street

(7) Kim Hoa Street

(8) Kim Lien Pagoda

(9) Civil Engineering University

Source: JICA Project Team

5.2 Vision and Strategies for Integrated Station Area Development

5.2.1 Overall Development Vision and Orientation

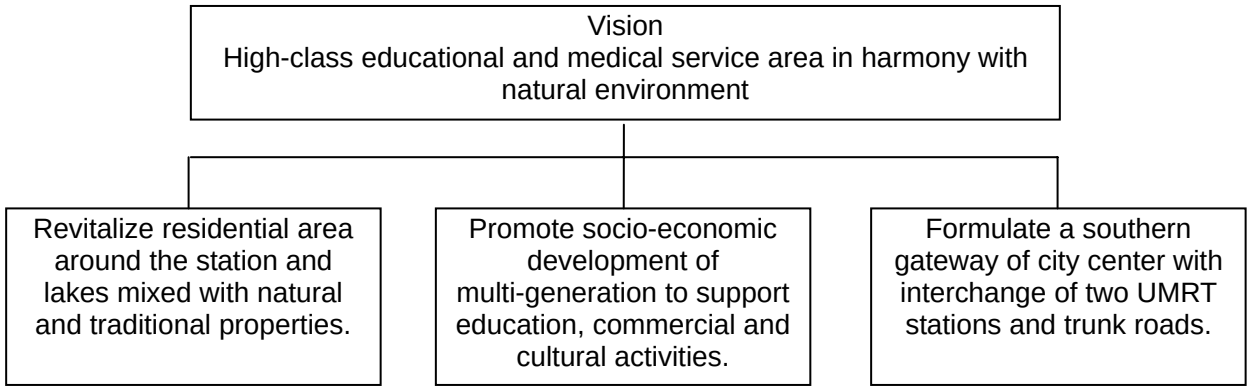
508 This station area aims to be “a high-class educational and medical service area in harmony with natural environment”. Thanks to clustered urban facilities, especially universities, hospitals and parks, these two stations will be highly expected by not only potential railway users but also facility users including hospitals and universities and parks. In addition, this area is a south gateway of center of city, and major intersection with underpass is located. The image of two stations will affect visitors from south.

509 On weekday, students and employees will use stations to go to universities and companies, and enjoy lunch time in Thong Nhat Park, and enjoy shopping and dinner at commercial facilities near station on way home from work.

510 Key development issues are: i) to secure connectivity between two stations, and ii) to formulate attractive urban node with convenient walkway and open space, taking account of discreet urban design as one of the most important urban node with famous urban park and university.

511 For convenient accessibility to stations and urban facilities located south of Dai Co Viet Street, interchange facilities elevated and underground are significant. To attract railway users, facility users as well as residents, living condition improvement projects and urban redevelopment projects of hospitals and universities will contribute to improve image of station area with educational and medical service promotion area with nature.

Figure 5.2.1 Vision and Goals of C.V. Thong Nhat and Bach Khoa Station Area Development



Source: JICA Project Team

Table 5.2.1 Strategies of C.V. Thong Nhat and Bach Khoa Station Area Development

Goals	Objectives	Strategies for Hanoi Station Area Development
1. Transport development	(1) Development station and related facilities	1) Develop interchange facilities between two stations of Line1 and Line2 2) Develop a skywalk under viaduct to cross intersection of trunk roads above ground 3) Design station facilities which is harmonized with landscape of parks
	(2) Improvement of accessibility	1) Develop a pedestrian deck to cross intersection of trunk roads. 2) Improve accessibility inside built-up area to residential areas and Kim Lien Temple 3) Utilize spaces under elevated railway and station for transport , public and commercial purposes
	(3) Development of public transport services	1) Provide feeder bus services along Dai Co Viet Street 2) Provide community bus services to access universities and hospitals 3) Improve traffic management around the intersection
2. Economic development and strengthening of competitiveness	(4) Commercial and business development	1) Promote commercial services which are convenient for students and visitors of parks 2) Develop a shopping mall along pedestrian underground 3) Collaborate with universities to develop new business and services
	(5) Revitalization of local socio-economic activities	1) Promote commercial street activities which connect to the station 2) Promote social and environmental activities in park and public facilities
	(6) Cultural preservation and promotion	1) Preserve Kim Lien Temple and other cultural properties 2) Create cultural and traditional atmosphere around temples and Ba Mau Lake
3. Living condition improvement	(7) Development and improvement of housings and infrastructure	1) Stabilize population density to mitigate negative impacts on urban infrastructure, traffic flow, environment, etc. 2) Provide new residential facilities mixed with commercial and business area to utilize high-potential land efficiently. 3) Rehabilitate and renew urban infrastructure and roads of existing built-up areas to improve living condition and accessibility
	(8) Improvement of amenity	1) Rehabilitate green and openspace around Ba Mau Lake 2) Utilize space of Thong Nhat Park to access to the station 3) Utilize a space of pedestrian deck to enjoy landscape
	(9) Improvement of security and safety	1) Improve Thong Nhat Park and openspace around Ba Mau Lake as disaster prevention facilities for evaluation 2) Redevelop commercial and residential districts to create a safe living environment

Source: JICA Project Team

5.2.2 Transport Development Strategies and Projects

(1) Development of Station and Related Facilities

512 Two lines of UMRT will connect in this station area. C.V. Thong Nhat Station of Phase1 of UMRT Line1 is elevated while Bach Khoa Station of Phase2 of Line2 is underground. It is necessary to take into account how passengers will transfer these two stations. Intersection of NH-1 and Dai Co Viet is a kind of southern gateway of the city center nearby Thong Nhat Park, a railway structure should be lightsome not to destroy scenery of the park.

513 The development strategies for development of station and related facilities are as follows:

1) Develop interchange facilities between two stations of Line1 and Line2
2) Develop a skywalk under viaduct to cross intersection of trunk roads above ground
3) Design station facilities which is harmonized with landscape of parks

(2) Improvement of Accessibility

514 Though there is a crossing point of two trunk roads, this is a barrier for pedestrian to cross. Since universities and hospitals are clustered on the other side of two stations, it is necessary to develop a facility to cross trunk roads safe. Residents use alleys and narrow a collector road at present, so it is important to formulate road network to access to station.

515 The development strategies for improvement accessibility are as follows:

1) Develop a pedestrian deck to cross intersection of trunk roads.
2) Improve accessibility inside built-up area to residential areas and Kim Lien Temple
3) Utilize spaces under elevated railway and station for transport , public and commercial purposes

(3) Development of Public Transport Services

516 It is expected university students and visitors of hospitals will use Bach Khoa Station of Line2, without transferring to C.V. Thong Nhat Station of Line1 to get off B.V. Bach Mai Station. In addition, there will be bus users from west suburban areas to use UMRT stations. Public bus services need to be considered for these facility users and bus users.

517 The development strategies for development of public transport services are as follows:

1) Provide feeder bus services along Dai Co Viet Street
2) Provide community bus services to access schools, universities and hospitals
3) Improve traffic management around the intersection

5.2.3 Economic Development Strategies and Projects

(1) Commercial and business development

518 At present, several commercial facilities are existed along NH-1 and Dai Co Viet Street, but these are not attractive and convenient for students. New commercial facilities with attractive services will be expected near C.V. Thong Nhat Station. In addition, underground space will be utilized for subway users.

519 The development strategies for commercial and business development are as follows:

1) Promote commercial services which are convenient for students and visitors of parks
2) Develop a shopping mall along pedestrian underground
3) Collaborate with universities to develop new business and services

(2) Revitalization of Local Socio-Economic Activities

520 At present, local commercial activities are gathered along Kim Hoa Street in Phuong Liet Commune. This is an important axis for local community to connect to Kim Lien Temple, but it is too congested with motorbikes.

521 The development strategies for revitalization of local socio-economic activities are as follows:

1) Promote commercial street activities which connect to the station
2) Promote social and environmental activities in park and public facilities

(3) Cultural Preservation and Promotion

522 Kim Lien Temple is one of the cultural properties for Hanoi City. It has been renovated, so more visitors will be expected. Cultural and environmental atmosphere will be promoted in this station area, which integrates lakes, parks and temples.

523 The development strategies for cultural preservation and promotion are as follows:

1) Preserve Kim Lien Temple and other cultural properties
2) Create cultural and traditional atmosphere around temples and Ba Mau Lake

5.2.4 Living Condition Improvement Strategy and Projects

(1) Development and improvement of housings and infrastructure

524 Except for two trunk roads, most of station users will come from built-up areas of Phuong Liet Commune, west of C.V. Thong Nhat Station. But the west station area is high-dense and is worsen infrastructure, such as unregulated narrow alleys, overloaded drainage and electricity, deteriorated water channels, etc.

525 The development strategies for improvement of housing and infrastructure are as follows:

1) Stabilize population density to mitigate negative impacts on urban infrastructure, traffic flow, environment, etc.

2) Provide new residential facilities mixed with commercial and business area to utilize high-potential land efficiently.

3) Rehabilitate and renew urban infrastructure and roads of existing built-up areas to improve living condition and accessibility

(2) Improvement of Amenity

526 C.V. Thong Nhat Station will be surrounded by Thong Nhat Park of east, and Ba Mau Lake of north. It is an advantage to promote station users with attracting beautiful landscape from the elevated station. Since Bach Khoa Station will be constructed under the park, entrance will be inside of the park in future. So entrance and facilities should be integrated with the park.

527 The development strategies for improvement of amenity are as follows:

1) Rehabilitate green and openspace around Ba Mau Lake

2) Utilize space of Thong Nhat Park to access to the station

3) Utilize a space of pedestrian deck to enjoy landscape

(3) Improvement of Security and Safety

528 Thong Nhat Park is a precious openspace for the city center of Hanoi City. Taking occasion of UMRT station development, functions and facilities of disaster prevention will be strengthened.

529 The development strategies for improvement of security and safety are as follows:

1) Improve Thong Nhat Park and openspace around Ba Mau Lake as disaster prevention facilities for evaluation

2) Redevelop commercial and residential districts to create a safe living environment

5.3 Proposed Station Area Development Program and Projects

5.3.1 Overall Development Framework

1) UMRT Station Utilization Framework

530 C.V. Thong Nhat Station and Bach Khoa Station will be the interchange station of south of the city center. It is estimated app. 32,800 passengers will use C.V. Thong Nhat station, and 24,300 passengers of Bach Khoa Station (see Table5.3.1 and Table5.3.2). More than half of passengers are transfer ones from another line.

531 It is expected many passengers use UMRT to go to schools, universities, hospitals and parks. In future, after urban redevelopment of station area, these facility users will be able to enjoy after work and study, as well as relax with fresh air and greens of the park.

Table 5.3.1 Estimated Passengers of C.V. Thong Nhat Station (per day)

Mode		By Mode		Total	
		No. of passengers	%	No. of passengers	%
Passenger from/to station area	Walking	6,200	18.9	13,600	41.5
	Bicycle	400	1.2		
	Motorbike	4,400	13.4		
	Car	2,500	7.6		
Transfer passenger	Bus	5000	15.2	19,200	58.5
	VNR	0	0.0		
	UMRT	14,200	43.3		
Total		32,800	100.0	**32,800**	100.0

Source: JICA Project Team

Table 5.3.2 Estimated Passengers of Bach Khoa Station (per day)

Mode		By Mode		Total	
		No. of passengers	%	No. of passengers	%
Passenger from/to station area	Walking	1,840	7.6	4,590	18.9
	Bicycle	360	1.5		
	Motorbike	1,620	6.7		
	Car	770	3.2		
Transfer passenger	Bus	2770	11.4	19,720	81.1
	UMRT	16,950	69.7		
Total		24,310	100.0	**24,310**	100.0

Source: JICA Project Team

2) Urban Development Framework

532 Future landuse around the C.V. Thong Nhat Station will be converted into Commercial and Mixed use, to maximize potential of the urban center of Hanoi City (see Table5.3.3). App. 8,200 persons will work in the new urban district of west of the station, which will serve for local communities as well as employees and students around the station. On the contrary, landuse around Bach Khoa Station will not be changed, since it is located under Thong Nhat Park, and there are universities south of the station.

Table 5.3.3 Estimated Population and Employees of C.V. Thong Nhat and Bach Khoa Station Area

	Whole Station Area (within 500m radius)		Urban Development Planning Area	
	Present	Future	Present	Future
Area (ha)	78.5	78.5	15.3	15.3
Population (persons)	19,000	14,400	3,700	3,200
Gross population density (per/ha)	242	183	242	209
Employment population (persons)	9,000	12,600	-	8,200

Source: JICA Project Team

5.3.2 Project Formulation

533 Based on the vision and strategies, urban development projects are proposed with taking into consideration of current urban structure and landuse (see Table5.3.4).

Table 5.3.4 Proposed Projects for C.V. Thong Nhat and Bach Khoa Station Area Development

	Transport Development Strategy	Economic Development Strategy	Living Condition Improvement Strategy
Station and related facilities	• Construction of C.V. Thong Nhat Station (elevated) • Construction of Bach Khoa Station (underground) • Construction of skywalk under viaduct • Development of station entrance spaces • Development o parking spaces and bus stops under railway	• Development of commercial and public facilities inside stations	• Develop public facilities inside stations
Within 100m	• Pedestrian underground development to transfer two lines • Construction of pedestrian deck to cross intersection	• Development of underground shopping mall along pedestrian underground	
Within 500m	• Development of road around Ba Mau Lake	• Construction of mixed-use commercial and business buildings	• Construction of mixed-use residential buildings • Improvement of surrounding area of Ba Mau Lake
Surrounding influenced area	• Operation of bus services	• Redevelopment of universities • Redevelopment of hospitals	• Preservation of Kim Lien Temple and cultural properties

Source: JICA Project Team

534 Based on proposed projects above, future landuse plan and projects are formulated as follows (see Table5.3.5 and Table5.3.6):

Table 5.3.5 Future Landuse Plan of C.V. Thong Nhat and Bach Khoa Station Area

	Residential	Mixed use	Commercial and Business	Special public use	Transport	Green and openspace	Military	Road	Total
ha	0.0	3.9	2,2	0.0	0.7	6.1	0.0		18.1
%	0.0	21.5	12.2	0.0	3.9	33.7	0.0	28.7	100.0

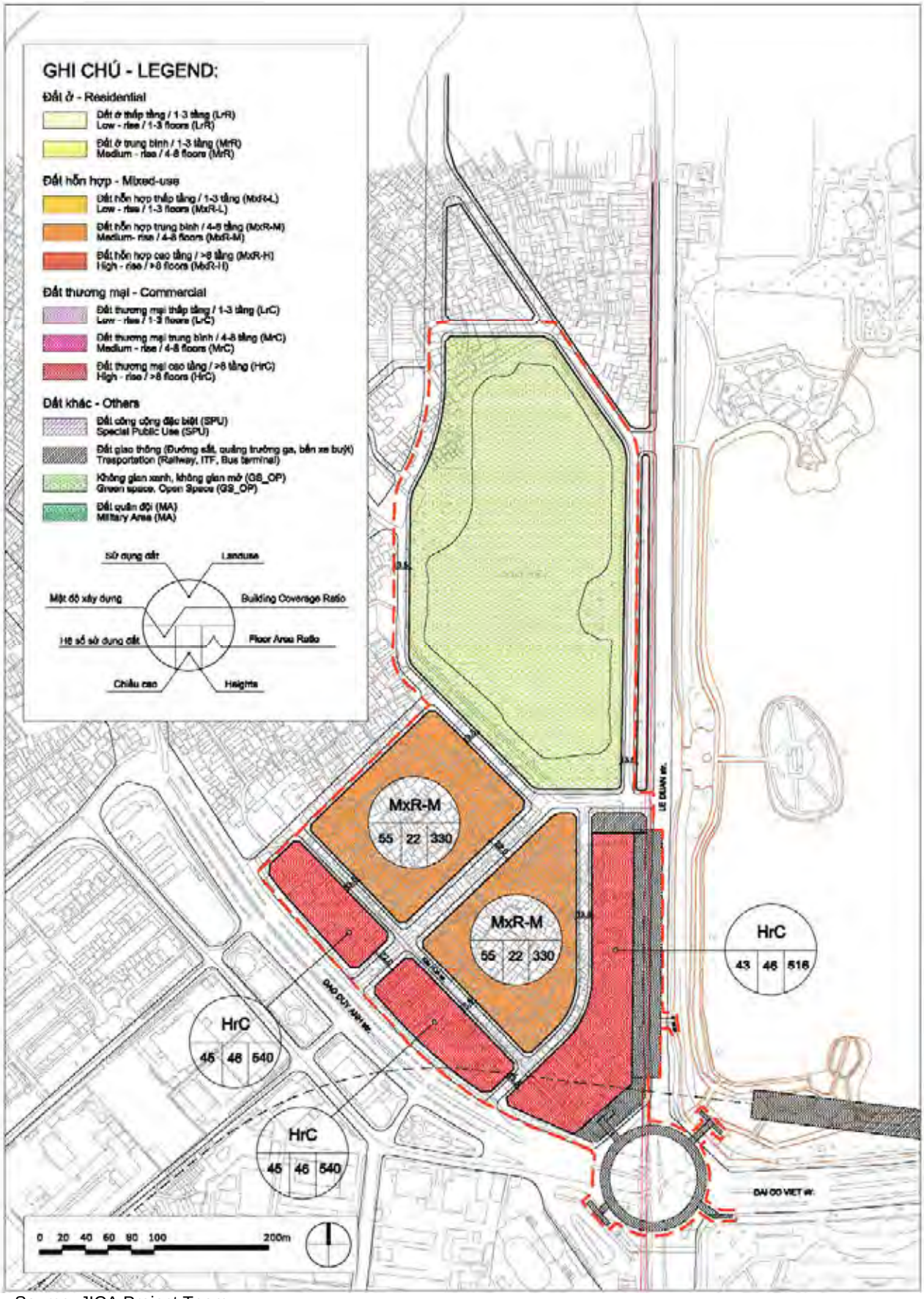
Source: JICA Project Team

Table 5.3.6 List of Project Packages for C.V. Thong Nhat and Bach Khoa Station Area Development

Project Type	Name of Project	Project ID	Scale (ha)	Schedule	Landuse
Station and related facility development	C.V. Thong Nhat Station[1)]	S1	0.7	Minimum	Transport
	Bach Khoa Station (underground)	S2	-	Minimum	Transport
	Station entrance space of C.V. Thong Nhat Station	S3	0.2	Minimum	Transport
	Pedestrian underground	S4	(0.1)	Minimum	Transport
	Skywalk and pedestrian deck[1)]	S5	-	Minimum	Transport
Road development	Circle-shaped pedestrian deck	R1	0.3	Short	Transport
	Development of road around Ba Mau Lake[2)]	R2	-	Short	Transport
	Widening of NH-1 (w=30m, l=800m)	R3	1.8	Minimum	Transport
Urban development project	Urban redevelopment of west of C.V. Thong Nhat Station	A	1.1	Medium	Commercial& Business
	Urban redevelopment of built-up area of Phuong Liet Commune	B	6.2	Long	Mixed use
Green and openspace development	Improvement of Ba Mau Lake	G1	7.8	Short	Green& openspace
Total Project Area			18.1		

1) Elevated station development project includes skywalk and pedestrian deck.
2) Road will be developed land acquisition (w=14m, l=180m)
Source: JICA Project Team

Figure 5.3.1 Proposed Detailed Plan of C.V. Thong Nhat and Bach Khoa Station Area



Source: JICA Project Team

Figure 5.3.2 Proposed Building and Landscape Plan of C.V. Thong Nhat and Bach Khoa Station Area

Source: JICA Project Team

Figure 5.3.3 Section Plans of C.V. Thong Nhat and Bach Khoa Station Area

Source: JICA Project Team

Figure 5.3.4 Development Image of C.V. Thong Nhat and Hang Dau Station Area (Example from other countries)

Image of C.V. Thong Nhat Station
(Daiba Station of Yurikamome Line, Tokyo, Japan)

Image of pedestrian deck to cross a trunk road
(Makuhari Station, Chiba, Japan)

Image of circle-shaped pedestrian deck
(Houston, USA)

Image of commercial facility along elevated railway
(Futakotamagawa Station, Setagaya-ku, Tokyo, Japan)

Image of pedestrian street
(Ohtaka no Mori Station of Tsukuba Express, Chiba, Japan)

Image of pedestrian underground for transfer
(Bashamichi Station of Minato Mirai Line, Yokohama, Japan)

Source: JICA Project Team

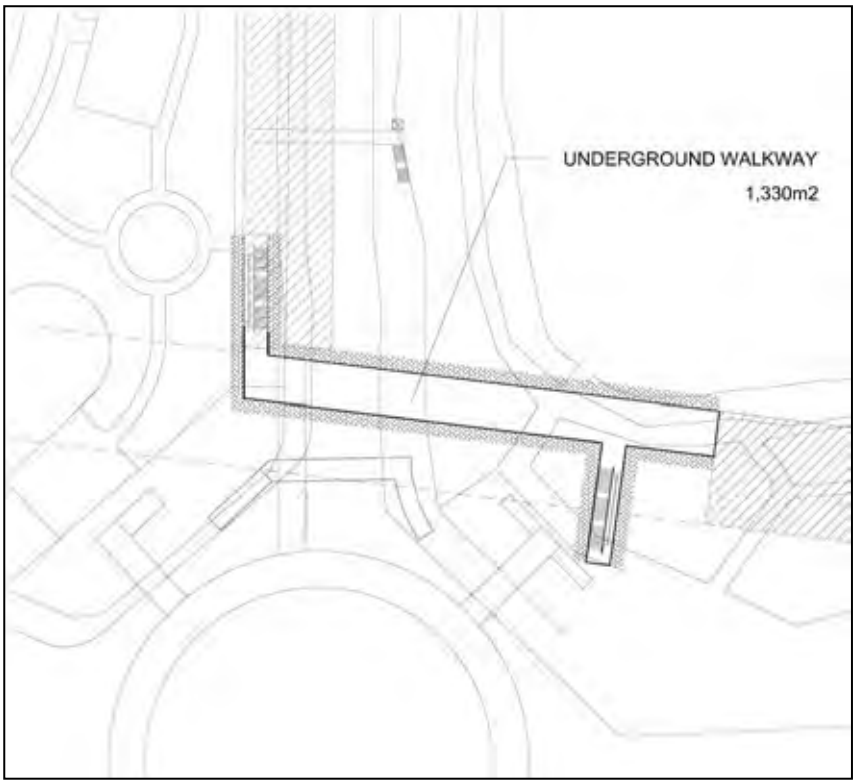
5.3.3 Station and Related Facilities Development Plan (Project S1, S2, S3, S4, S5, S6)

535 C.V. Thong Nhat Station Facility: Thong Nhat Station of elevated UMRT Line1 will be located along NH-1. The space under the elevated station, it will be utilized as pedestrian space and bus stops. From the platform of 3rd floor, passengers will be able to enjoy scenery of Thong Nhat Park. From the concourse of 2nd floor, skywalk will be developed under the viaduct to connect to the pedestrian deck, so people will be able to cross the intersection and access directly to the station. Station entrance spaces of north and south will be developed to improve accessibility to the station.

536 Bach Khoa Station Facility: Bach Khoa Station of underground UMRT Line2 will be located inside south-west of Thong Nhat Park. This station will be developed in Phase2 project of Line2. Since this station is located under the park area, it is necessary to propose mitigation measures of negative environmental impacts, and to plan appropriate locations and designs of entrances and facilities which will be harmonized with the park.

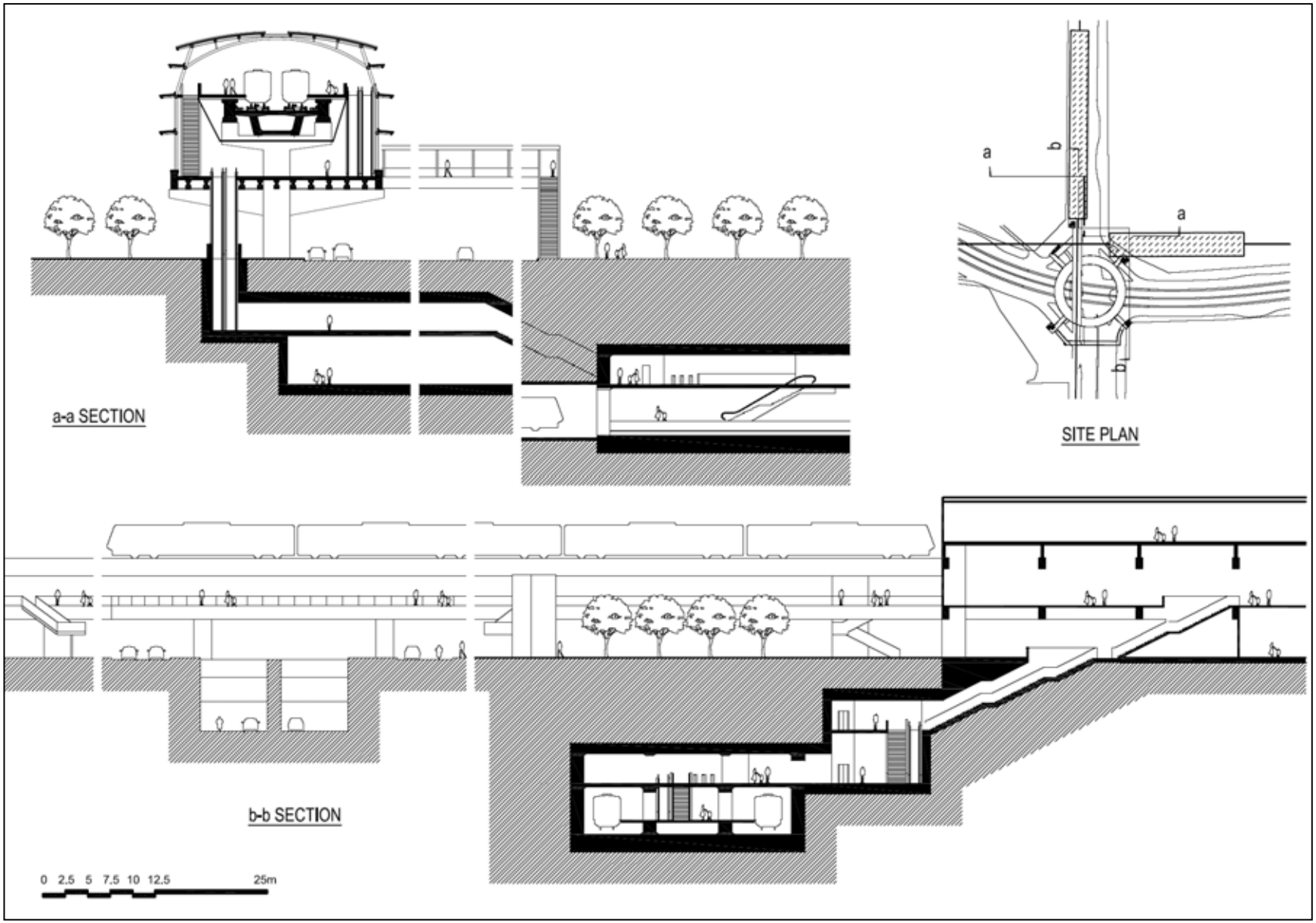
537 Transfer facilities: One of the issues is how to improve transfer accessibility between two stations, since i) the phase of project implementation is different, ii) there is NH-1 between two stations, and iii) there is a big vertical interval (app. 30m) between platforms of two stations. In addition, it has not been clarified which agency is responsible to plan and develop these transfer facilities of two lines. To improve transfer accessibility of two stations, pedestrian underground with elevator and escalator of UMRT Line2 will be developed to connect to the space under C.V. Thong Nhat Station (see Figure5.3.5 and Figure5.3.6). Passengers can transfer two lines keeping out of sunshine and rain.

Figure 5.3.5 Pedestrian Underground Plan



Source: JICA Project Team

Figure 5.3.6 Station and Related Facilities Development Plan of C.V. Thong Nhat Station and Bach Khoa Station



Source: JICA Project Team

5.3.4 Road Development Plan (Project R1, R2, R3)

538 To remove the barrier of crossing the intersections of NH-1 and Dai Co Viet Street as well as to improve accessibility between two stations, the skywalk under the viaduct of UMRT Line1 and the pedestrian deck around the intersection will be developed. Passengers can access to station and cross the intersection at the level of 2nd floor keeping out of traffic flow and signals. It is recommended to develop a circle-shaped pedestrian deck which connect four (4) corners of the intersection by stairs and elevators, so citizens including disabled and elderly can enjoy scenery of station, road and parks from the deck.

539 At present, roads and spaces around Ba Mau Lake are not well organized, road of north side is not connected because of some encroached housings. Since there are residential areas west of this lake, this area will be one of the main access roads to stations. It is proposed to improve road network around the lake and develop commercial streets to attract residents and station users.

540 There are several UMRT stations such as C.V. Thong Nhat, B.V Bach Mai of Line1, and Bach Khoa, Kim Lien of Line2 near this station area. Community buses will be operated which connects urban facilities such as schools in west, hospitals of Bach Mai area, and universities of Bach Khoa area. This is an important interchange node with crossing two UMRT lines and two trunk roads, so it is convenient for passengers to go to urban facilities by feeder buses without transferring another UMRT.

541 It is not necessary to develop parking spaces for station users, since it is estimated most of passengers come from another UMRT, buses or on foot. Though some parking spaces of two-wheel vehicles will be provided under the station, it is recommended commercial facilities are required to develop parking spaces for users.

5.3.5 Urban Redevelopment Plan of West of C.V. Thong Nhat Station (Project A)

(1) Present Condition

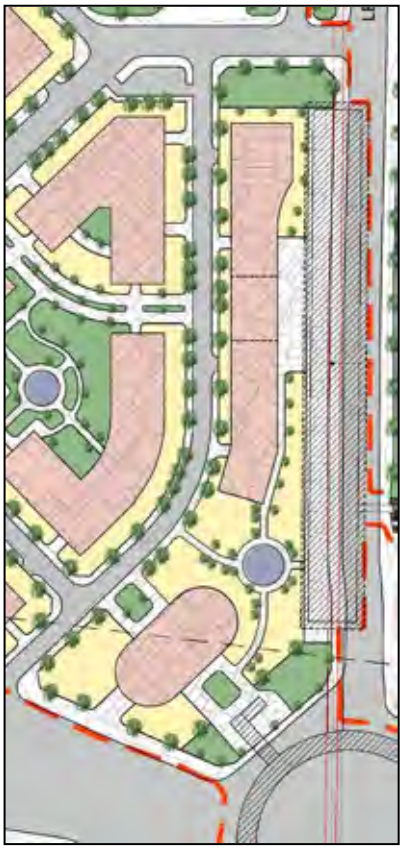
542 At present, many shop houses are clustered along the railway, and residents directly access to shops and houses from railway space. Residents inside the block access from narrow alleys. When UMRT Line1 will be constructed, buildings along the railway will be relocated, while the urban block inside will be remained.

(2) Proposed Functions and Facilities

543 Since the Block A is the nearest urban blocks from the station, it is proposed commercial and business facilities such as restaurants, shops, supermarkets for station users will be developed, especially of low-rise floors along the station and sidewalk under C.V. Thong Nhat Station. Passengers easily drop by these convenient facilities before and after using railway. A nursery facility is recommended to leave children in care for double carrier parents during working time.

544 In the mid and high-rise floors, commercial and business facilities will be located which people can enjoy landscape of station and parks. It is also recommended to develop educational and business facilities which support university students and employees.

Figure 5.3.7 Urban Redevelopment Plan of West of C.V. Thong Nhat Station



Source: JICA Project Team

5.3.6 Urban Development Plan of Built-up Area of Phuong Liet Commune (Project B)

(1) Present Condition

545 Block B is a high dense residential area without any trunk road networks. Along Kim Hoa Street, small shops and hospital are gathered. Since this is a collector road of this commune, many motorbikes rush into Kim Hoa Street during commune and shopping time. It is very weak for disaster preparedness, though there are Kim Lien Temple and Kim Lien Pagoda of cultural properties of Hanoi City in this district.

(2) Proposed Functions and Facilities

546 New mixed-use district with commercial, business and residential functions will be developed. Residents can enjoy traditional lifestyle with preserved temples and parks, and new commercial activities. The east blocks will be high-rise buildings which accommodate offices for business, and the east blocks will be mid-rise buildings with commercial facilities for daily commodities and public facilities for residents.

Figure 5.3.8 Urban Redevelopment Plan of Built-up Area of Phuong Liet Commune

Source: JICA Project Team

Table5.3.6 Project Profile of Block D and C of C.V. Thong Nhat and Bach Khoa Station Area Development

		A	B1	B2	B3	B4
Development Framework	No of Population	0	1,663	1,518	0	0
	No. of Employee	2,978	946	864	1,818	1,631
Construction plan	Land area (m2)	10,600	20,282	18,510	6,284	5,547
	Building area (m2)	4,558	10,141	9,255	2,783	2,496
	BCR (%)	43	50	50	45	45
	Total floor area (m2)	54,696	60,846	55,530	33,394	29,954
	No. of floor	12	6	6	12	12
	FAR (%)	516	300	300	540	540

Source: JICA Project Team

5.4 Social and Environmental Considerations

5.4.1 Current state of socio-environmental condition

547 The stations are planned to be located near the Bay Mau Lake and the Ba Mau Lake. Bach Khoa Station is planned underground of the southern corner of Thong Nhat Park. Le Duan Street (in the east of the planned CV Thong Nhat Station) and Dai Co Viet Street (in the south of the planned stations) have heavy traffic flow all day through. Water quality of the lakes is very bad. Valuable flora and fauna are unlikely existing in the area. Air ambient levels are still lower than the allowable maximum limits, but noise levels are exceeding the allowable maximum limits.

Table5.4.1 Condition of Ambient Air

Temper-ature	Humidity	Dust	CO	SO2	NO2	HC
(°C)	(%)	(μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)
24.4	77.5	95	11880	220	150	58
30.0	76.0	181	417	123	115	138

Table5.4.2 Condition of Ambient Air

Noise (day time: 6-18h)			Noise (night time: 18-22h)			Vibration	
Leq	Lamax	L50	Leq	Lamax	L50	Laeq	Lv
(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(m/s^2)	(mm/s)
63.8	80.6	59.5	62.1	79.5	57.8	na	na
72.4	82.4	68.5	66.5	76.1	62.2	0.0274	0.0087

Note: HC: Hazardous substances in ambient air
Air quality, noise, and vibration survey carried out by CEPT, in December 2006 (for the first line in the table), and in May-June 2007 (for the second line of the table)
Allowable maximum limit: Dust 300μg/m^3, CO 30,000μg/m^3, SO_2 350μg/m^3, NO_2 200μg/m^3, HC 5,000μg/m^3, Noise day time Leq 60dB, Noise night time Leq 55dB, Vibration Leq 0.030m/s^2
Source: EIA Report 2007, CEPT

548 Among the communes around the station area, Phuong Lien Commune is considered the one to be affected the most by the station area development projects. Phuong Lien Commune has relatively large water area (water area per 1000 population is 0.33 ha) but lack park/open space and green area.

Table5.4.3 Coverage of Public Service and Sanitation

Commune	District	Electri-city	Piped water con-nectivity	Toilet cover- age	Gas	Tele-phone	Solid waste collec- tion	Internet
		(%)	(%)	(%)	(%)	(%)	(%)	(%)
Phuong Lien	Dong Da	100.0	98.9	98.9	91.0	93.3	98.9	11.2

Table5.4.4 Coverage of Urban Amenity and Disaster Prevention Capacity

Commune	District	Road area ratio	Flood vulner-ability index	House-hold with secure tenure	Emer-gency response capacity	Water area per 1000 pop	Parks/ open spaces per 1000 pop	Green area per 1000 pop
		(%)		(%)	(m/ha)	(ha)	(ha)	(ha)
Phuong Lien	Dong Da	11.0	0.00	100.0	47.10	0.33	0.00	0.00

Source: Housing Interview Surveys (HIS 2005), HAIDEP Project

549 Population density of Phuong Lien Commune in 2003 is 394 persons per ha, while household size is relatively small (3.6 persons/HH) and income level is relatively low.

550 Current living conditions of Phuong Lien Commune are assessed as followings.

Table5.4.5 Living Condition Assessment of Hang Ma Commune

Overall	Living condition is fairly good with acceptable level of objective and subjective assessment. Amenity and capability condition downgrade living condition in Phuong Lien.
Convenience	Phuong Lien has convenient environment. Public transport is not frequently used. People are dissatisfied with traffic situation in the commune.
Safety & Security	Flood/ inundation is perceived as a threat for the commune. Traffic injury occurs quite often, hence traffic safety is one of the concerns.
Health & Wellbeing	Hospital is lacking in this commune, however, people feel rather satisfied, probably because adjoining communes have good hospital facilities.
Amenity	There are almost no cultural facilities, parks and greens. People are not happy with neighbourhood landscape, while they are satisfied with access to entertainment, parks and greens, probably because there is a large park across the road next to this commune.
Capability	Residents are satisfied with telecom condition, but internet usage is still at low level.

Source: Urban Karte, HAIDEP, 2005

5.4.2 Anticipated adverse impacts and mitigation measures

1) Anticipated adverse impacts

551 It is expected that the station area development projects will result in environmental improvement and upgrading of the quality of life of residents in the communities around the stations, especially for Phuong Lien Commune, through improved road system, drainage system, solid waste collection and disposal system, public facilities, amenity facilities, community disaster preparedness and response capacity, etc.

552 However, the station development projects would cause several adverse impacts to the local social and environmental environment. Results of the environmental scoping show that the station area development projects may cause the following serious negative impacts (rating “A”).

Table5.4.6 Anticipated Environmental and Social Impacts

Impact		Description
Socio-economic environment		
	Involuntary resettlement	A number of households in the western side of the CV Thong Nhat Station would be relocated to make land for the station entrance spaces, the access roads, etc.
Natural environment		
	Groundwater	The cut-and-cover construction of the Bach Khoa Station may cause decline of groundwater level and lead to damages to the adjacent structures if proper measures are not taken.
	Soil erosion	The cut-and-cover construction of the Bach Khoa Station may cause exposure of excavated soil and lead to the washout of soil by rain if suitable counter-measures are not taken.
Pollution		
	Air pollution	Operation of construction machinery and transportation vehicles may cause significant impact on ambient air quality of the localities.
	Water pollution	Waste water from construction activities and discharged water from the stations may cause deterioration of water quality of the vicinities.
	Soil contamination	Civil works and other construction activities during construction phase may cause contamination of soil.
	Waste (including waste soil)	Solid wastes and sewage from the construction sites and from the stations may cause adverse impacts to soil and adjacent water bodies.
	Accidents, traffic congestion	Serious traffic jam may be caused by construction machinery and transportation vehicles on Le Duan Street and Dai Co Viet Street during construction phase.
	Sunshine shading	The CV Thong Nhat Station is planned elevated (+12m) and therefore it may cause serious sunshine shading to the structures in its western side.

Source: Urban Karte, HAIDEP, 2005

553 Since the project will include the plans to build underground works (station and pedestrian road), it will require making an EIA (and a RAP) in accordance with Decree No. 21/3008/ND-CP.

2) Measures to mitigate impacts of land acquisition

554 During pre-construction phase, impacts caused by land acquisition and involuntary resettlement are considered significant. The development projects would require some lots of private land and cause temporary or permanent relocation of a number of houses/establishments, consequently. Scale of land acquisition and project-affected people and households are estimated as followings. Since project-affected households mentioned here would lose all or a great part of their residential land, they are considered as households to be relocated and resettled, temporarily or permanently.

Table 5.4.7 Scale of Land Acquisition and Project-affected Buildings by Minimum Project

ID	Project	Area of land to be acquired	Number of project affected building
		(m^2)	(buildings)
S1	C.V. Thong Nhat Station	Exclusion	Exclusion
S2	Bach Khoa Station (underground)	-	-
S3	Station entrance space of C.V. Thong Nhat Station	2,100	29
S4	Pedestrian underground	-	-
S5	Skywalk and pedestrian deck	-	-
R1	Widening of NH-1 (w=30m)	850	0
Total		2,950	0

Source: JICA Project Team

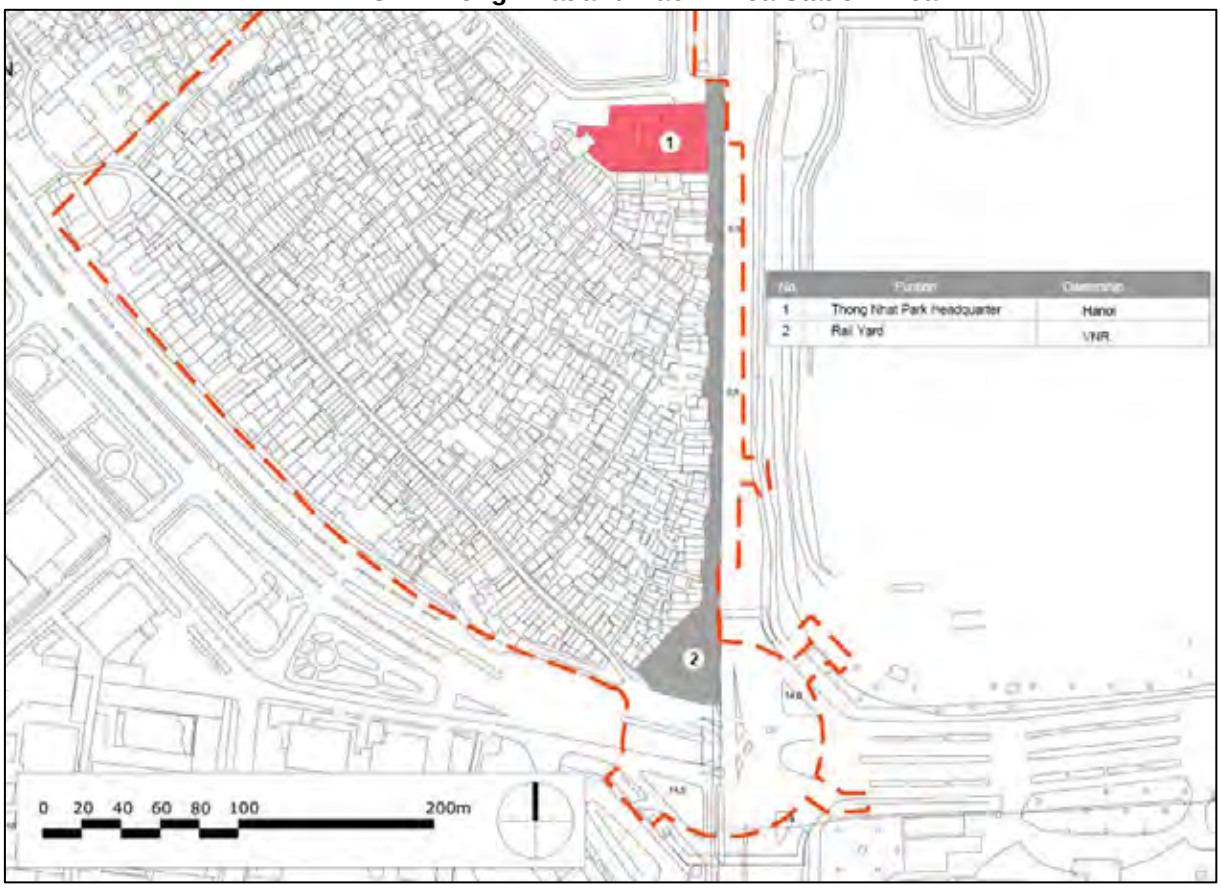
Table5.4.8 Scale of land acquisition and project-affected people and households by short, medium and long term project

ID	Project	Area of land to be acquired	Affected housing area	Population density	Number of project-affected people	Number of project-affected household
		(m^2)	(m^2)	(pers/ha)	(pers)	(HHs)
R2	Development of road around Ba Mau Lake	4,050	4,050	394	160	44
R3	Circle-shaped pedestrian deck	0	-	-	-	-
A	Urban redevelopment of west of C.V. Thong Nhat Station	10,600	10,600	394	418	116
B	Urban redevelopment of built-up area of Phuong Lien Commune	30,900	58,150	394	2,291	636
G1	Improvement of Ba Mau Lake	0	-	-	-	-
Total		45,555	68,750		2,869	796

Source: JICA Project Team
Note: Population density (394 pers/ha), and average household size (3.6 pers/HH) are referred to Urban Karte (HAIDEP, 2005), for Phuong Lien Commune

555 There are several facilities which public owned or related inside the planning area (see Figure 5.4.1). These facility areas will be potential lands for urban development with relocation and renewal old public facilities.

Figure 5.4.1 Location of Public owned Facilities in C.V. Thong Nhat and Bach Khoa Station Area



Source: JICA Project Team

556 In order to facilitate the relocation and resettlement of affected people, and to mitigate adverse impacts of relocation and resettlement, it is recommended that the following issues should be carefully considered.

a) Integrating urban development/redevelopment with resettlement

557 Resettlement should be treated as a development opportunity, and resettlement issues should be treated as an integral aspect in urban planning, whereas city-wide resettlement plans are developed as part of urban development.

558 For middle/ long term development, instead of applying common method of land acquisition (recovery of land, compensation for loss of land, and relocation of affected people to resettlement sites, etc.), it suggests that the “land readjustment system” and /or “urban renewal system” with transforming “land use right” to “floor right” would be useful for land acquisition measure.

b) Development opportunities and livelihood restoration

559 Consultations with affected groups and stakeholders can help identify innovative methods for restoring affected livelihoods and incomes. Steps such as identifying suitable resettlement sites, offering additional shop area at a premium, and vocational training can help strengthen livelihood restoration.

c) Public consultation, participation and information disclosure

560 Possibility of land acquisition and sustainability of resettlement depends largely on the affected people's sense of ownership over the issues on land price, compensation for loss of land and properties, and their new residence and neighborhood. This can be gained through active participation at the planning stage and through pre-investment by the beneficiaries. Consultation and participation will help minimize risks of resistance and conflicts, offer innovative local solutions, enhance community ownership, improve project quality, and facilitate timely completion of projects. Consultative processes help protect rights and address concerns of the affected people, and enable the implementing agency to explore innovative solutions. Information disclosure on all aspects of resettlement is important for ensuring transparency, enhancing credibility, and enabling informed choices. The role of NGOs is useful for bringing in social mobilization and community development skills into the implementation process.

d) Grievance redress, independent monitoring and evaluation

561 Mechanism for grievance redress is essential for addressing the concerns of the affected people, especially those in the vulnerable category. It is essential to institute an independent monitoring mechanism in order to make the resettlement process transparent and accountable. External evaluation of resettlement impacts is a useful tool for assessing effectiveness of the implementation strategy.

3) Measures to mitigate impacts on groundwater

562 The construction of underground station and other attached facilities would cause the decline of the groundwater level, due to leakage of groundwater at construction sites and excessive pumping of groundwater during the construction phase. This may cause land subsidence and other impacts to the Bay Mau Lake in Thong Nhat Park and its surrounding trees. During construction phase, the following measures should be implemented to mitigate impacts on groundwater.

- Appropriate design and construction technology such as water proof hard retaining wall would be used at underground construction sites.
- The area should be backfilled as soon as possible for recovery of the groundwater level.
- Monitoring the groundwater level and leak of groundwater at underground establishments.

4) Measures to mitigate impacts on soil erosion

563 During the construction phase, the cut-and-cover construction of the Bach Khoa Station may cause exposure of excavated soil and lead to the washout of soil by rain if suitable counter-measures are not taken. Run off from unprotected excavated areas, and underground station faces can result in excessive soil erosion, especially when the erosibility of soil is high. Exposure of loose soil to rain water will increase turbidity in the run-off, especially during the rainy season.

564 Erosion and siltation should be minimized by implementing preventive measures on a case-by-case basis, such as (i) appropriate compaction, (ii) placing of geosynthetics, and (iii) constructing berms, dikes, sediment basins, fiber mats, and drainage channels. Timing of cut and fill operations and re-vegetation should be carefully

planned. On completion of the construction activities, all unpaved areas should be paved to reduce soil erosion.

5) Measures to mitigate impacts of air pollution

565 Residents living in the area around the stations would be affected by air pollution and water pollution cause during construction phase.

566 During construction phase, the operation of construction machinery affects the ambient air quality by emitting pollutants. The magnitude of pollution will depend on the types of equipment and the operation time. Depending on wind conditions such as velocity and direction, emissions from construction equipment would affect the ambient air quality of neighboring areas. In addition, earth moving equipment during construction would also be a major source of dust emission. To mitigate impacts of air pollution, the following measures are recommended.

- Periodically cleaning and watering the project sites.
- Secure distance between the construction machinery and construction site boundary as much as possible.
- Using construction equipment and vehicles which comply with the latest regulations.
- Periodical inspection and maintenance of construction equipment and vehicles.
- De-concentrate construction activities.
- De-concentrate the flow of construction trucks.
- Use cover sheets for trucks carrying soil.
- Under the weather conditions such as strong wind, the construction activities are suspended temporally for prevention of dust scattering.
- Training construction equipment drivers and truck drivers.
- Monitoring the air quality at the project site during all of the project cycles.

6) Measures to mitigate impacts of water pollution

567 During construction phase, if the contaminated drainage from the construction activities flows into surface water without proper treatment, it would pollute surface water quality around the project areas. During operation phase, discharged water including sewage from the station would deteriorate water quality as well. The following treatment measures should be prepared for discharged water from the project.

- Build a small dike to prevent run-off water from construction sites.
- Consideration of separating construction areas with sheet piles.
- Mud should be dehydrated before discharged and reused as much as possible.
- Proper design and maintenance of drainage systems at station. The design includes a sewage facility with a proper capacity, sewage pipes locating lower than the water supply pipes, and if necessary, preliminary treatment facilities.
- Monitoring discharged water quality from stations, and surface water quality.

7) Measures to mitigate impacts of soil contamination

568 The construction of underground station and facilities would involve the excavation of soil. If the excavated soil is not treated appropriately, it may impact the environment through illegal dumping on private/public land, or pollution of the surrounding environment if the residual soil is contaminated by toxic materials. It is proposed that excavated soil should be carefully treated by the following measures.

- Analysis of toxic materials of soil to be excavated.
- Utilization of excavated soil within the project.
- Contracting out treatment/dumping/recycling of residual soil.
- Covers and walls to preventing run off of stockpiled soil.

8) Measures to mitigate impacts of wastes

569 The construction activities around the station, etc. would generate a variety of wastes, including construction and demolition waste from the houses, etc.. The volume of the wastes to be generated is unknown at present time. However, at the design phase, waste volume and type should be assessed quantitatively. And during the construction phase, they should be reused and recycled as much as possible. With respect to the waste which cannot be reused and recycled, they would be contracted to and collected by an authorized company.

9) Measures to mitigate impacts of traffic congestion and accident

570 Accident and traffic congestion are also considered as potential adverse impacts. As the roadway will be narrow during the construction activities, traffic congestion by various transport means (vehicles, construction machines, buses, cars, motorbikes, etc.) and material yards (sand, stones, irons, cements, etc.) around project site are likely to happen very often, especially on the streets with heavy traffic flow on Nation Highway No.1 and Dai Co Viet Street.

571 During construction phase, a traffic management plan should be implemented to prevent traffic congestion and accident due to construction activities. The plan should encompass several elements as follows:

- Specification of time for vehicles for construction activities.
- Identification of roads blocked by construction activities.
- Arrange detouring roads.
- Providing preventive methods of traffic obstruction such as pre-cast concrete slabs for cut and cover sections.
- Arrange by-pass roads for pedestrians.
- Deployment of personnel for traffic distribution direction and transporting at the night time.

572 In addition, the following mitigation measures should be duly implemented by the contractors to mitigate impacts of traffic congestion and accidents:

- Covering cut and cover sections with road deck plates.
- Prior notice of road occupation or closure by sign boards and mass media.
- Placement of personnel and sign boards for detouring.
- Secure paths and sign boards for people to access shops near construction areas.
- Prepare detailed construction plans to minimize areas and period of road occupation or closure, and de-concentrate vehicle volume.

5.5 Project Implementation Mechanism

5.5.1 Issues on Implementation of Nam Cau Long C.V. Thong Nhat and Bach Khoa Station Area Development

573 Overall project implementation schedule is divided into four stages of minimum by the UMRT opening in 2017, short term, middle term and long term. Each project in station development area is scheduled on these four stages from the viewpoint of synergy with station opening and difficulty of implementation, especially, land acquisition. Implementation issue in each stage are explained as following;

1) Issue on minimum project implementation

574 Minimum project in C.V. Thong Nhat Station area consist of four components of C.V. Thong Nhat station (S1), the Station entrance (S3), Skywalk and pedestrian (S5) and Widening of NH-1 (R3). These projects excluding (S5) need land acquisition and it is necessary to completed by the UMRT opening in 2017.

575 Besides, minimum project in Bach Khoa Station area consists of three components of Bach Khoa station (S2) and pedestrian underground (S4). Bach Khoa station and the entrance space occupy a part of Thong Nhat park. Regarding pedestrian underground between two stations, it is necessary to coordinate among related bodies. These projects need coordination among related bodies of HPC, VNR and HRB. Main issues of minimum development are shown as follows;

- Land acquisition in built-up area
- Coordination among HPC, VNR and HRB

2) Issue on short -term project implementation

576 Short-term project of C.V. Thong Nhat and Bach Khoa Station Area consists of three components of road development around Ba Mau Lake (R2), Circle-shaped pedestrian deck (R3) and improvement of Ba Mau Lake (G1). iThese three projects belong to HPC. It is necessary to schedule to meet station area development.

3) Issue on medium and long -term project implementation

577 Two urban redevelopment projects (A and B) are planned medium term project. These projects aim redevelopment for commercial and business use and living condition improvement in built-up area. It is expected to take a time and cost for project implementation for coordination and negotiation with residents. Main issues of medium and long-term development are shown as followings;

- Land acquisition in built-up area
- Consensus building among residents
- Encouragement of private investment

5.5.2 Project implementation Measures

1) Application of Public and Private Partnership (PPP) Scheme

578 A PPP scheme could be applied to both urban redevelopment of Project A and B. HPC should take an initiative for designing and implementing these PPP tenders. Use of LR and UR development measures are proposed in the above projects. However, considering the timing of implementation, especially for the Project A which is to be implemented in the short to medium term, possibility of applying conventional development measures should also be examined for implementing conversion of land use right to floor right.

2) Station and Related Facilities Development of C.V. Thong Nhat Station (S1, S3 and S5)

579 Station entrance (S3, skywalk and pedestrian deck (S5) are essential facilities for convenience and comfortableness for passengers and station users. These projects should be packaged and completed by the UMRT opening in 2017.

580 VNR will be in charge of station and related facility development, since VNR will be main receiver for benefit on the UMRT business. And land acquisition should be carried out using land recovery by VNR.

3) Station and Related Facilities Development of Bach Khoa Station (S2 and S4)

581 Pedestrian underground (S4) is essential facilities for convenience and comfortableness for passengers and station users. These projects should be completed by the UMRT phase II opening in 2020.

582 HRB will be in charge of station and related facility development.

4) Road development Plan (Project R1, R2 and R3)

583 Widening of NH-1 (R1) is planned as minimum project and should be completed by the UMRT opening in 2017. Road of Ba Mau Lake (R2) and Circle shaped pedestrian deck(R3) are planned as short-term project.

584 HPC will be in charge of these three projects of R1, R2 and R3. Land acquisition for R1 is carried out by transfer from Thong Nhat Park. Land acquisition for R2 is carried out by HPC.

5) Urban Redevelopment of west of C.V. Thong Nhat Station (Project A)

585 Project A is core urban development project in C.V. Thong Nhat station area from viewpoint of multiplier effect between station development and commercial and business development. For the consideration of early synergistic effect with station development, this project is implemented as medium-term project.

586 Land acquisition is most important issue for implementation of the project. It is necessary to prepare for resettlement development such as existing public apartment in Kim lien area under HPC facilitation.

6) Urban redevelopment of built-up area of Phuong Lien Commune (Project B)

587 Project B is planned as long term project because of the consideration of stepwise development concept and difficulty of land acquisition.

588 Project B is proposed alternative implementation measure using land readjustment (LR) and urban redevelopment (UR). The basic scheme is shown as figure 4.5.3 for project C in Hanoi station area development. LR consolidates land use right to meet land use right holder's demand by land re-plotting system. Existing small lands are combined into large-building lot for apartment. In addition, UR can develop apartment building with participation from small land right holders and provides adequate floor right by exchanging from original land use right. However, LR and UR system need legal scheme for land use right protection during implementation of the project. In existing legal framework in Vietnam, there is no legal measure for land use right protection for LR and UR. It will take a time to establish legal framework for alternative measures.

589 Regarding financial resource, it is expected to be invested by private sector. For the private participation, it is first priority to relocate of existing water factory. After project with LR and UR, private investor will acquire a part of floor right and makes the profit to sell the surplus floor area to the market.

7) Improvement of Ba Mau Lake (Project G1)

590 Improvement of Ba mau Lake (G1) is planned as short-term project. This project is implemented within existing park area and doesn't need land acquisition. HPC will be in charge of project G1 and will use public budget as financial resource.

Table 5.5.1 Implementation program of C.V. Thong Nhat and Bach Khoa Station Area Development

Project type	Name of project	ID	Schedule	Project area (ha)	Land acquisition area (ha)	Implementation method	Implementation body	Financial resource
Station and related facility development	C.V. Thong Nhat Station	S1	Minimum	0.7	Exclusion	Utilization of existing road and land acquisition from private land	VNR	ODA
	Bach Khoa Station	S2	Minimum (in 2020)	-	-	Utilization of land of Thong Nhat Park (no land acquisition)	HRB	ODA
	Station entrance space of C.V. Thong Nhat Station	S3	Minimum	0.2	0.2	Land acquisition from private land	HPC	HPC
	Pedestrian underground	S4	Minimum (in 2020)	(0.1)	0.0	None	HRB	ODA/HPC /Private[1)]
	Skywalk and pedestrian deck	S5	Minimum	-	-	None	VNR	VNR
Road development	Widening of NH-1 (w=30m)	R1	Minimum	0.3	0.1	Land recovery from park (no land acquisition	HDOT	HPC
	Development of road around Ba Mau Lake	R2	Short	-	-	Land acquisition from private land	HDOT	HPC
	Circle-shaped pedestrian deck	R3	Short	1.8	0.0	None	HDOT	HPC
Urban development	Urban redevelopment of west of C.V. Thong Nhat Station	A	Medium	1.1	1.1	Land acquisition from private land	HPC/Private	Private
	Urban redevelopment of built-up area of Phuong Lien Commune	B	Long	6.2	3.1	Land recovery from private land and development with LR and UR	HPC/Private	Private
Green and open space development	Improvement of Ba Mau Lake	G1	Short	7.8	0.0	Utilization of existing park and land acquisition from private land	HPC	HPC

Source: JICA Project Team

1) It has not been discussed and agreed which will be an implementation body and a financial resource for pedestrian underground development. JICA Project Team recommends HRB will develop a pedestrian underground to connect stations between Line1 and Line2 for accessibility of passengers. It is also possible private developers will develop it together with commercial facilities.

5.5.3 Implementation Schedule

591 Implementation schedule of C.V. Thong Nhat and Bach Khoa Station is shown as table 5.5.2.

1) Minimum development

592 Regarding station and related facility of C.V. Thong Nhat station (S1, S3 and S5), the land acquisition for ROW should be completed until 2012 and the construction should be completed until UMRT opening in 2017.

593 Regarding station and related facility of Bach Khoa station (S2 and S4), pedestrian underground should be completed until UMRT phase II opening in 2020.

594 Regarding road development, land acquisition for widening of NH-1 (R1) should be completed until 2015 for to meet UMRT opening in 2017.

2) Short term project

595 Road around Ba Mau Lake (R2) and Circle-shaped pedestrian deck (R3) should be finished the preparation by UMRT opening at late. Improvement of Ba Mau Lake (G1) should be at the same time of project R2.

3) Medium and Long term project

596 Urban redevelopment of west of C.V. Thong Nhat Station (A) is planned as medium term project. UMRT opening is good promotion for private investment. The preparation including land acquisition and legal procedure should be completed by UMRT opening in 2017 at the latest.

597 Urban redevelopment of built-up area of Phung Lien commune (B) need a long time for preparation of legal frame and coordination among residents. From viewpoint of stepwise development from project A, project B should be start the construction stage.

Table 5.5.2 Implementation Schedule of C.V. Thong Nhat and Bach Khoa Station Area Development

Project Type	Name of Project	Project ID	Implementation Schedule																
			Minimum							Short		Medium		Long					
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Station and related facility development	C.V. Thong Nhat Station	S1								UMRT Opening									
	Bach Khoa Station	S2										UMRT Opening (Phase II)							
	Station entrance space of C.V. Thong Nhat Station	S3																	
	Pedestrian underground	S4																	
	Skywalk and pedestrian deck	S5																	
Road development	Widening of NH-1 (w=30m)	R1																	
	Development of road around Ba Mau Lake	R2																	
	Circle-shaped pedestrian deck	R3																	
Urban development project	Urban redevelopment of west of C.V. Thong Nhat Station	A																	
	Urban redevelopment of built-up area of Phung Lien Commune	B																	
Green and open space development	Improvement of Ba Mau Lake	G1																	

○ Project Approval, Coordination, Land Acquisition, Construction/ Building

5.5.4 Project Investment and Operation Cost

598 Investment and operation cost of C.V. Thong Nhat and Bach Khoa station area development is summarized as following table 5.5.3. Station building and facility combined with railway structure are excluded from this cost estimation. Total investment cost of C.V. Thong Nhat and Bach Khoa Station is estimated at 222.1 million USD.

Table 5.5.3 Investment and Operation Cost of C.V. Thong Nhat and Bach Khoa Station Area Development

Project type	Name of project	ID	Investment cost (million USD)			Operation cost (million USD/year)
			Land acquisition	Construction	Total	
Station and related facility development	C.V. Thong Nhat Station	S1	Exclusion	Exclusion	Exclusion	Exclusion
	Bach Khoa Station	S2	Exclusion	Exclusion	Exclusion	Exclusion
	Station entrance space of C.V. Thong Nhat Station	S3	4.6	0.1	4.7	0.1
	Pedestrian underground	S4	0.0	3.6	3.6	0.4
	Skywalk and pedestrian deck	S5	Exclusion	Exclusion	Exclusion	Exclusion
Road development	Widening of NH-1 (w=30m)	R1	1.5	1.3	2.8	0.1
	Development of road around Ba Mau Lake	R2	5.8	1.0	6.8	0.1
	Circle-shaped pedestrian deck	R3	0	4.3	4.3	0.4
Urban development project	Urban redevelopment of west of C.V. Thong Nhat Station	A	23.3	38.5	61.8	3.9
	Urban redevelopment of built-up area of Phuong Lien Commune	B	43.9	93.0	136.9	9.3
Green and open space development	Improvement of Ba Mau Lake	G1	0.0	1.2	1.2	0.1
Total			79.1	143.0	222.1	14.4

Source: JICA Project Team

5.5.5 Financial analysis of urban development Project

599 Financial analysis of public and private Investment of urban development in C.V. Thong Nhat and Bach Khoa station area is summarized as following Table 5.5.4.

5100 Project A will have profitability indicated at 17% of Project IRR and 2.31 of B/C for private investor.

5101 Regarding project B, basically it is difficult to secure project profitability due to the height control being lower than project A. For securing project profitability, project B adapts a PPP project scheme that public sector provides infrastructure cost to private investor. In this case, project B will have profitability indicated at 16% of Project IRR and 2.06 of B/C which is still marginal but could solicit the participation of the private investors.

5102 In summary as far as the urban development projects are concerned there will be good possibility for private sector investor to secure sufficient profitability and PPP scheme could be possible.

. **Table 5.5.4 Financial analysis of urban development project of C.V. Thong Nhat and Bach Khoa Station Area Development**

Name of project	ID	Investment scheme	Public investment and revenue		Private Investment			
			Investment (million USD)	Revenue	Investment (million USD)	NPV (million USD)	Project IRR	B/C
Urban redevelopment of west of C.V. Thong Nhat Station	A	Private investment	-	-	50.9	21.9	17%	2.31
Urban redevelopment of built-up area of Phuong Lien Commune	B	Private investment and public support for infrastructure	14.2 (land acquisition cost for infrastructure)	-	141.3	35.0	16%	2.06

Source: JICA Project Team
Note IRR: Internal Rate of Return (Project IRR is a indicator to show the level of total project profitability), NPV: Net Present Value, B/C: Benefit per Cost
Interest rate is assumed of 12%/year, Calculation period: 15years since completion of project

6 DETAILED PLAN OF HOAN KIEM LAKE STATION AREA DEVELOPMENT

6.1 Present Condition

6.1.1 General characteristics

601 The Ngoc Son Temple ("Den Ngoc Son" in Vietnamese), called "Jade Mountain Temple" in English, is located inside Hoan Kiem Lake, and Ba Kiem Temple is located opposite side of Ngoc Son Temple along Dien Thien Hoang Street. Hoan Kiem Lake and Ngoc Son Temple are one of the most popular places for Hanoi citizens and tourists. This area is a south gateway to the Ancient Quarter and a lively area with commercial and tourism activities. Around the Hoan Kiem Lake, there are enough openspace with green where many citizens and tourists enjoy taking a walk, shooting photos, exercising, etc.

602 On the east of the lake and business district, Tran Quang Khai Street of the dyke road pass through north to south. Crossing over this road, many residential facilities are gathered in the out of dyke area of Phuc Tan Commune.

603 In general, environments and atmosphere is good enough thanks to the lake and green, and various urban facilities. According to the result of the interview survey, Hoan Kiem Lake Station is the most popular stations among UMRT Line1 and Line2.

6.1.2 Population

604 Estimated population of 500m radius from Hoan Kiem Lake Station is 23,500, while number of employees is app. 29,000 and of students is 7,500. Many employees of governmental organizations and private companies work in this area, so it is crowded with employees during commuting time and lunch time. Most of residents are clustered inside the AQ and out of dyke area, while there are few residential facilities around the lake.

6.1.3 Urban facilities

605 In the north and east area around the lake, there are many tourist and recreation places such as Water puppet theater, Ly Thai To Park, Trang Tien Plaza, etc. This area is also characterized that governmental and public related facilities are gathered, such as Hanoi City People's Committee, Hanoi Electricity Company, Central Post Office, Department of Culture, Sports and Tourism, Governmental Guest House, Ministry of Labor, Invalids and Social Affairs, etc.

606 West side of Hoan Kiem Lake is also a popular place for shopping and sightseeing. Around Joseph's Cathedral Church, there are many shops, restaurants, hotels are gathered.

607 Along Tran Quang Khai Street, some high-rise buildings have been built, such as BIDV (Bank for Investment and Development of Vietnam) building, Vietcombank building, etc.

6.1.4 Road network and transport condition

608 Hoan Kiem Lake is rounded trunk roads of Dinh Tien Hoang Street of east and north, Le Thai To Street of west, Hang Khay Street of south. These streets are one-way of anticlockwise rotation, except for Hang Khay Street of two-ways. Many commuters pass

through during commuting time in the morning, and at night, many young people enjoy riding motorbikes around the lake. Though many citizens like to walk and relax around the lake, pedestrian crossings are not enough, so many people cross trunk roads ignoring pedestrian crossings and signals.

609 Bo Ho Bus Terminal is located on the north of Hoan Kiem Lake. Next to the terminal, public parking area is designated. Several years before, this area was also a part of an openspace around the lake, but because traffic volume has increased, bus terminal and car parking space were developed with narrowing an openspace.

610 Around the lake, many trunk roads are formulated. Most of roads are one-way, Cau Go Street and Hang Gai Street, which are southernmost of the AQ, are always crowed with cars, motorbikes, cyclos and pedestrians. Some streets are not wide enough, while many car and motorbikes park along streets. In addition, buses pass through at speed. Though road network is well developed, utilization of roads and traffic management are not appropriate in tourist and business districts.

611 Though road width is enough, these roads often crowded because of several reasons. Water Puppet Theater is a popular tourist place, and many tourist buses park in front of the theater for picking up guests Buses often occupy road space. In addition, around the fountain in front of the terminal, events such as acrobatic performance, music concert, etc. are often held at night on holidays. Traffic flow is always stuck because audience of motorbikes.

Figure6.1.1 Present Condition of Hoan Kiem Lake Station Area

Socio-Economic Condition of Station Area		within 500m	500m -1km	Total
Population		23,516	79,876	103,392
Net Population Density (no./ha)		386	425	415
No. of Employment (workplace)		15,937	66,437	82,374
No. of Student (at school)		4,102	19,901	24,002
Socio-Economic Condition of Major Communes	District	Ly Thai To	Trang Tien	Hang Trong
	Commune			
Average Household Size (persons)		4.2	4.2	3.9
Ave. Monthly HH Income (000VND)		2,371	3,798	3,382
HH with Self-owned Housing (%)		69.5	27.8	77.4
HH with Car/ Motorcycles (%)		92.4	88.9	89.2
Industry Structure (%)	Primary	0.9	2.0	0.6
	Secondary	11.7	9.5	14.8
	Tertiary	87.4	88.6	84.7
Bus facilities and network	No. of Bus Stops	41 (within 1km)		
	Bus Route Number	1, 2, 3, 4, 8, 9, 10, 11, 14, 15, 17, 18, 19, 22, 23, 24, 31, 34, 35, 36, 38, 40, 45, 47, 49, 50, 51, 54, 55, 58, 203		

Related Plans and Projects
1) Relocation of Hanoi Electricity Company

(1) Hoan Kiem Lake

(2) Entrance of Hoan Kiem Lake

(3) Ba Kieu Temple

(4) Pedestrian space around Hoan Kiem Lake

(5) Dinh Tien Hoang Street

(6) Bo Ho Bus Terminal

(7) Roundabout around fountain

(8) Hanoi Electricity Company

(9) Water Puppet Theater

Source: JICA Project Team

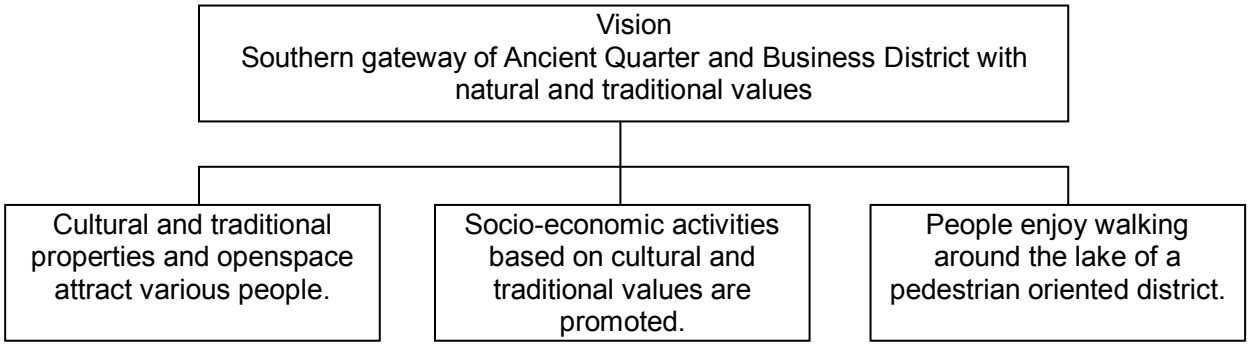
6.2 Vision and Strategies for Integrated Hoan Kiem Lake Station Area Development

6.2.1 Overall Development Vision and Orientation

612 The vision of Hoan Kiem Lake Station Area is “a southern gateway of Ancient Quarter and Business District with natural and traditional values”. Thanks to cultural properties like the Ancient Quarter, Hoan Kiem Lake, Ngoc Son Temple and Ba Kieu Temple, etc. this station will attract not only Hanoi citizens, but also domestic and international tourists. New business district will be formulated on the east of the lake with various government and private offices of the city center.

613 In future, this station area will be a pedestrian oriented district of Ancient Quarter and Hoan Kiem Lake area. Many people will be able to enjoy in this area for various purpose of commercial and business, sightseeing, refresh and religious. Hoan Kiem Lake Station will be a core for cultural exchange of citizens of Hanoi.

Figure 6.3.1 Vision and Goals of Hanoi Station Area Development



Source: JICA Project Team

Table 6.3.1 Strategies of Bac Cau Long Bien and Hang Dau Station Area Development

Goals	Objectives	Strategies for Hanoi Station Area Development
1. Transport development	(1) Development station and related facilities	1) Design station and related facilities to create environmental and cultural image of temples, green and lake 2) Develop distinctive small-scale service facilities inside openspace around the lake
	(2) Improvement of accessibility	1) Develop pedestrian underground to connect urban facilities Create pedestrian openspace around the lake and facilities 2) Develop pedestrian crossings and signals
	(3) Development of public transport services	1) Move Bo Ho Bus Terminal near to the Station inside new urban block 2) Reroute bus network around the lake 3) Traffic management to formulate a pedestrian oriented district
2. Economic development and strengthening of competitiveness	(4) Commercial and business development	1) Develop a commercial facility near the station 2) Formulate a new business district on the east of the lake 3) Develop a shopping mall inside station and along pedestrian underground s and transfer facilities
	(5) Revitalization of local socio-economic activities	1) Revitalize traditional commercial streets of the AQ 2) Develop a public openspace inside the new urban block for events and performance
	(6) Cultural preservation and promotion	1) Preserve cultural properties in a sustainable manner 2) Develop a public openspace inside the new urban block for events and performance
3. Living condition improvement	(7) Development and improvement of housings and infrastructure	1) Improve urban infrastructure to formulate a new business district 2) Promote rehabilitation activities of the Ancient Quarter
	(8) Improvement of amenity	1) Formulate a pedestrian oriented district of the Ancient Quarter and Hoan Kiem Lake area 2) Formulate an urban design to preserve skyline and urban views from the lake
	(9) Improvement of security and safety	1) Provide facilities for disaster prevention and community safety inside and around the station 2) Develop cultural and tourism service facilities to improve social welfare and environment for multi-generation

Source: JICA Project Team

6.2.2 Transport Development Strategies and Projects

(1) Development of Station and Related Facilities

614 Hoan Kiem Lake Station will be constructed under the openspace of Hoan Kiem Lake, in front of Hanoi Electricity Company. For planning and construction of the station, following issues should be carefully considered:

i) Not to have environmental and cultural negative impacts on Hoan Kiem Lake and Ngoc Son Temple

ii) Pay attention to safety around Hanoi People's Committee

iii) Harmonize structure of station entrances and related facilities with the openspace

615 The development strategies for development of station and related facilities are as follows:

1) Design station and related facilities to create environmental and cultural image of temples, green and lake

2) Develop distinctive small-scale service facilities inside openspace around the lake

(2) Improvement of Accessibility

616 Though there are enough openspace around the lake, accessibility to the lake is not good since pedestrian crossings are not enough and traffic volume is large around the lake. When the station is developed, passengers should cross Dinh Tien Hoang Street safe, or access to urban facilities directly.

617 The development strategies for improvement accessibility are as follows:

1) Develop pedestrian underground to connect urban facilities

2) Create pedestrian openspace around the lake and facilities

3) Develop pedestrian crossings and signals

(3) Development of Public Transport Services

618 Location of Bo Ho Bus Terminal is not appropriate, because parking buses spoil scenery of Hoan Kiem Lake, there are no bus shelters, and bus users need to cross the roundabout to go to the Ancient Quarter, where many cars and motorbikes come across. To create a pedestrian friendly district, bus terminal should be moved to safe place where is convenient for transferring to UMRT.

619 The development strategies for development of public transport services are as follows:

1) Move Bo Ho Bus Terminal near to the Station inside new urban block

2) Reroute bus network around the lake

3) Traffic management to formulate a pedestrian oriented district

6.2.3 Economic Development Strategies and Projects

(1) Commercial and business development

620 Commercial and business activities have already promoted in this area, but these are not consolidated to recognize as a business district, and supporting facilities and infrastructure of business are not enough. While the Hanoi Station Area is expected to be an extensive commercial and business center of Hanoi City, the Hoan Kiem Lake Station Area will be also a commercial and business sub center, in between the Ancient Quarter and the French Quarter.

621 The development strategies for commercial and business development are as follows:

1) Develop a commercial facility near the station
2) Formulate a new business district on the east of the lake
3) Develop a shopping mall inside station and along pedestrian underground s and transfer facilities

(2) Revitalization of Local Socio-Economic Activities

622 While new economic activities will be promoted on the east of the station in Ly Thai To Commune, traditional local socio-economic activities will be sustained on the north of the station in the Ancient Quarter. It is recommended that urban blocks between Hoan Kiem Lake and Cau Go Street, south-edge of the AQ will be renovated in long-term. Activities of vendors and cyclos will be registered and promoted around the lake, which create traditional images of Hanoi.

623 The development strategies for revitalization of local socio-economic activities are as follows:

1) Revitalize traditional commercial streets
2) Develop community openspace inside the urban blocks
3) Promote tourism events collaborated with utilization of UMRT

(3) Cultural Preservation and Promotion

624 Around the Hoan Kiem Lake Station, there are many cultural properties such as Ngoc Son Temple, Ba Kieu Temple and a statue, Hoan Kiem Lake and Tortoise Tower, Ly Thai To Park, etc. Design of station related facilities and construction methods need to be carefully planned which will not affect negative impacts on these properties.

625 The development strategies for cultural preservation and promotion are as follows:

1) Preserve cultural properties in a sustainable manner
2) Develop a public openspace inside the new urban block for events and performance

6.2.4 Living Condition Improvement Strategy and Projects

(1) Development and improvement of housings and infrastructure

626 At present, many urban infrastructure and residential blocks are deteriorated in the Ancient Quarter. When UMRT Line2 of subway will be constructed, underground infrastructure network will be rehabilitated. It is proposed to develop underground multi-purpose duct of water supply, drainage, heating, electricity, telecom, etc.

627 The development strategies for improvement of housing and infrastructure are as follows:

1) Improve urban infrastructure to formulate a new business district
2) Promote rehabilitation activities of the Ancient Quarter

(2) Improvement of Amenity

628 As already mentioned in transport strategy, it is recommend formulating a pedestrian oriented district of the Ancient Quarter and Hoan Kiem Lake area. Scenery around Hoan Kiem Lake is one of architectural values, so building height and façade design should be strictly controlled.

629 The development strategies for improvement of amenity are as follows:

1) Formulate a pedestrian oriented district of the Ancient Quarter and Hoan Kiem Lake area
2) Formulate an urban design to preserve skyline and urban views from the lake

(3) Improvement of Security and Safety

630 Since there are many governmental organizations around this area, public safe need to be strictly ensured. There are enough openspace such as the park around the lake, Ly Thai To Park, etc., so it is recommended to store emergency stock in the station and new urban block. In addition, many Tourists visit to this area, so it is recommended to provide a tourist service in or around the station to guide them and to consult with them in case of emergency.

631 The development strategies for improvement of security and safety are as follows:

1) Provide facilities for disaster prevention and community safety inside and around the station
2) Develop cultural and tourism service facilities to improve social welfare and environment for multi-generation

6.3 Proposed Station Area Development Program and Projects

6.3.1 Overall Development Framework

1) UMRT Station Utilization Framework

632 It is estimated app. 6,170 passengers will use the station (see Table6.3.1). Though the estimated number of passengers is not high, it will be a popular station for employees for commuting and tourists for sightseeing.

633 Cultural properties of temples, Water Puppet Theater, etc. will be preserved, and modern urban activities will be promoted near the station. Many employees will work public and private companies in a new business district, where is next to Hoan Kiem Lake. Citizens and tourists enjoy historical atmosphere and cultural events around the lake, and they have various opportunities to enjoy shopping and eating in new urban facilities, at lakeside, inside the Ancient Quarter, etc. By formulating a pedestrian and public transport oriented district, economic competitiveness and social and cultural activities will be promoted in safe and traditional atmosphere.

Table 6.3.1 Estimated Passengers of Hoan Kiem Lake Station (per day)

Mode		By Mode		Total	
		No. of passengers	%	No. of passengers	%
Passenger from/to station area	Walking	3,180	51.5	4,700	76.2
	Bicycle	60	1.0		
	Motorbike	1,050	17.0		
	Car	410	6.6		
Transfer passenger	Bus	1,470	23.8	1,470	23.8
	UMRT	0	0.0		
Total		6,170	6,170	100.0	6,170

Source: JICA Project Team

2) Urban Development Framework

634 Though most of areas have been built-up, it is planned that Hanoi Electricity Company will be relocated to another area in future. So this block has a big potential for urban redevelopment with integration of UMRT. This area should be developed as a cultural complex which embody cultural values of the Ancient Quarter and Hoan Kiem Lake. By this urban redevelopment of this area, app. 3,500 employees will be generated.

635 On the contrary, present residential areas will be converted into commercial and business facilities, because of high development potential and land values. While night population density will be reduced, density of daytime will be increased.

Table 6.3.2 Estimated Population and Employees of Hoan Kiem Lake Station Area

	Whole Station Area (within 500m radius)		Urban development planning area
	Present	Future	Future
Area (ha)	78.5	78.5	2.2
Population (persons)	23,516	16,238	0
Gross population density (per/ha)	300	207	-
Employment population (persons)	29,039	40,631	3,568

Source: JICA Project Team

6.3.2 Project Formulation

636 Based on the vision and strategies, urban development projects are proposed with taking into consideration of current urban structure and landuse (see Table6.3.3).

Table 6.3.3 Proposed Projects for Hoan Kiem Lake Station Area Development

	Transport Development Strategy	Economic Development Strategy	Living Condition Improvement Strategy
Station and related facilities	• Construction of Hoan Kiem Lake Station • Construction of pedestrian underground	• Development of commercial and public facilities inside of station	• Develop public service facilities inside of station
Within 100m	• Construction of pedestrian underground to connect new urban facilities • Relocation of Bo Ho Bus Terminal • Develop underground parking space	• Promotion of events inside openspace around Hoan Kiem Lake • Underground mall development	•
Within 500m	• Provision of pedestrian crossings and signals to cross trunk roads around Hoan Kiem Lake	• Construction of cultural and commercial buildings • Formulation of business district in Ly Thai To Commune	• Development of public openspace inside new urban block
Surrounding influenced area	• Traffic management of Ancient Quarter and Hoan Kiem Lake area	• Revitalization of traditional commercial streets of the AQ • Promotion of tourism activities around Hoan Kiem Lake	• Formulation of pedestrian oriented district of AQ and Hoan Kiem Lake area • Urban design control around Hoan Kiem Lake • Improvement of housings and urban infrastructure of the AQ

Source: JICA Project Team

637 Based on proposed projects above, future landuse plan and projects are formulated as follows (see Table6.3.4 and Table 5.3.5):

Table 6.3.4 Future Landuse Plan of Hoan Kiem Lake Station Area

	Residential	Mixed use	Commercial and Business	Special public use	Transport	Green and openspace	Military	Road	Total
ha	0.0	2.2	0.0	0.0	0.0	1.7	0.0	1.7	5.6
%	0.0	39.3	0.0	0.0	0.0	30.4	0.0	30.4	100.0

Source: JICA Project Team

Table 6.3.5 List of Project Packages for Hoan Kiem Lake Station Area Development

Project Type	Name of Project	Project ID	Scale (ha)	Schedule	Landuse
Station and related facility development	Hoan Kiem Lake Station[1)]	S1	-	Minimum	Transport
	Pedestrian underground	S2	-	Minimum	Transport
Road development	Redevelopment of Dinh Tien Hoang Street and openspace around the lake	R1	3.4	Short	Transport
	Relocation of Bo Ho Bus Terminal	R2	-	Medium	Transport
Urban development project	Urban redevelopment of Cultural and Commercial Complex	A	2.2	Short	Mixed use
Total Project Area			5.6		

1) Station development includes pedestrian underground development.
Source: JICA Project Team

Figure 6.3.1 Proposed Detailed Plan of Hoan Kiem Lake Station Area

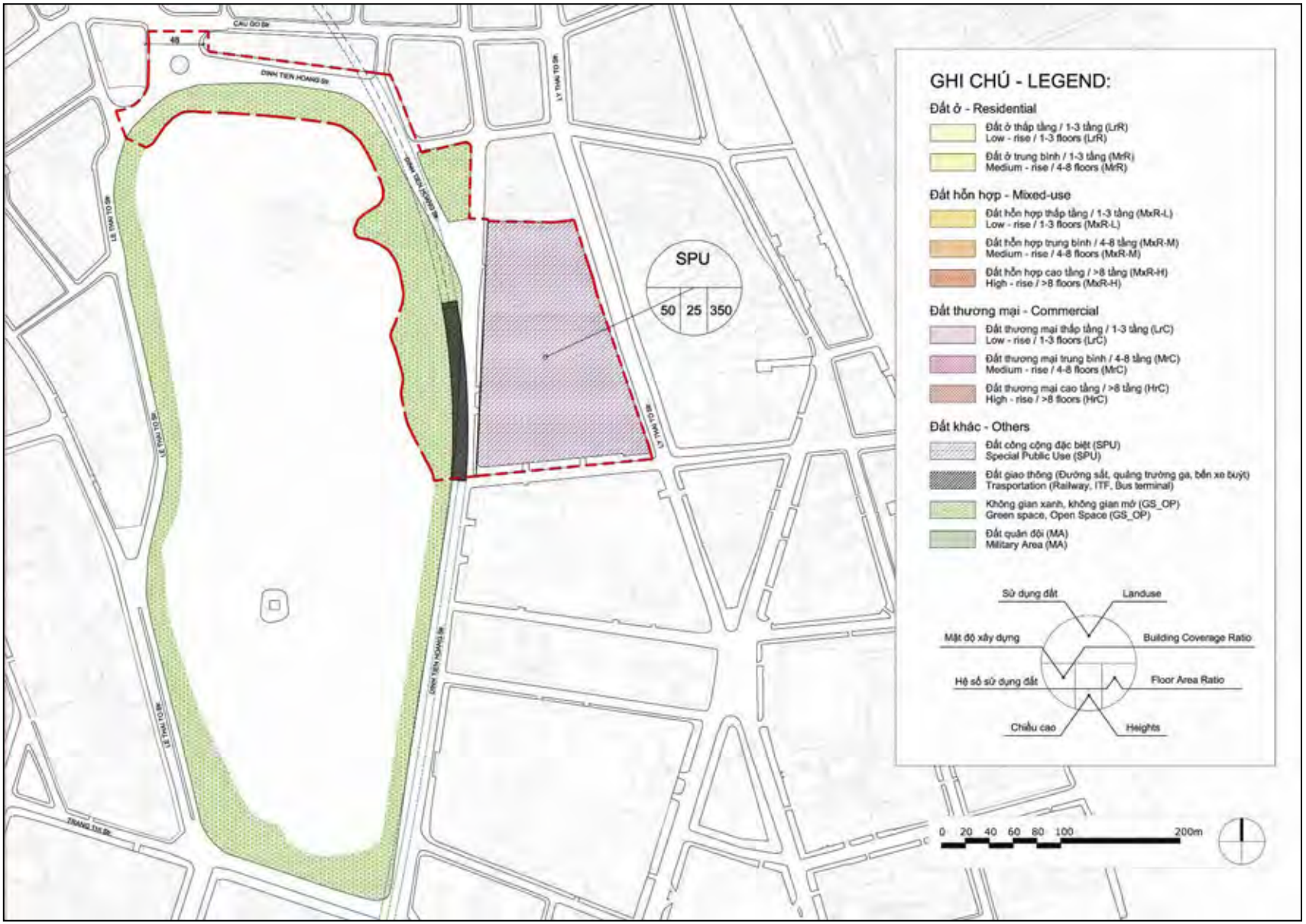
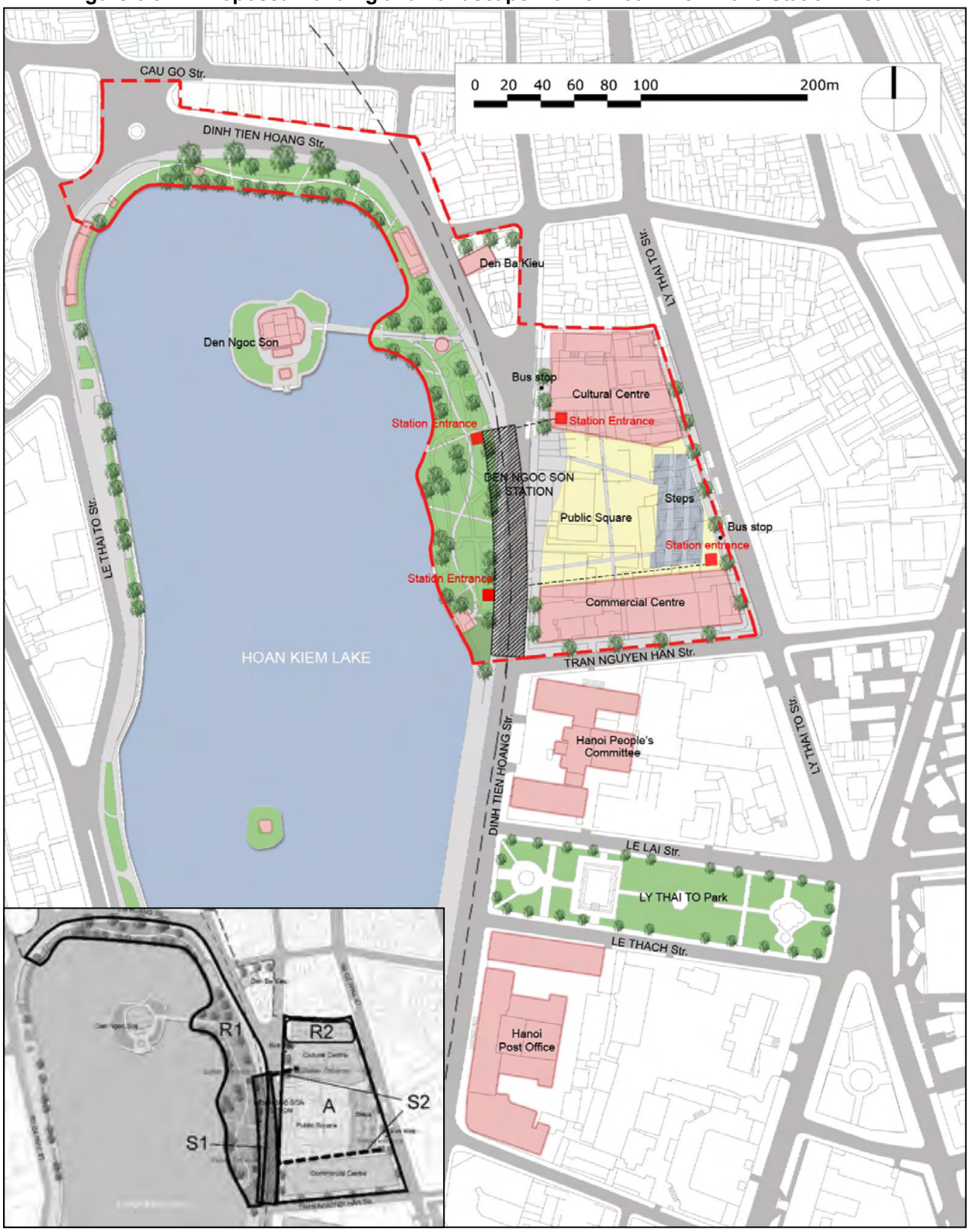
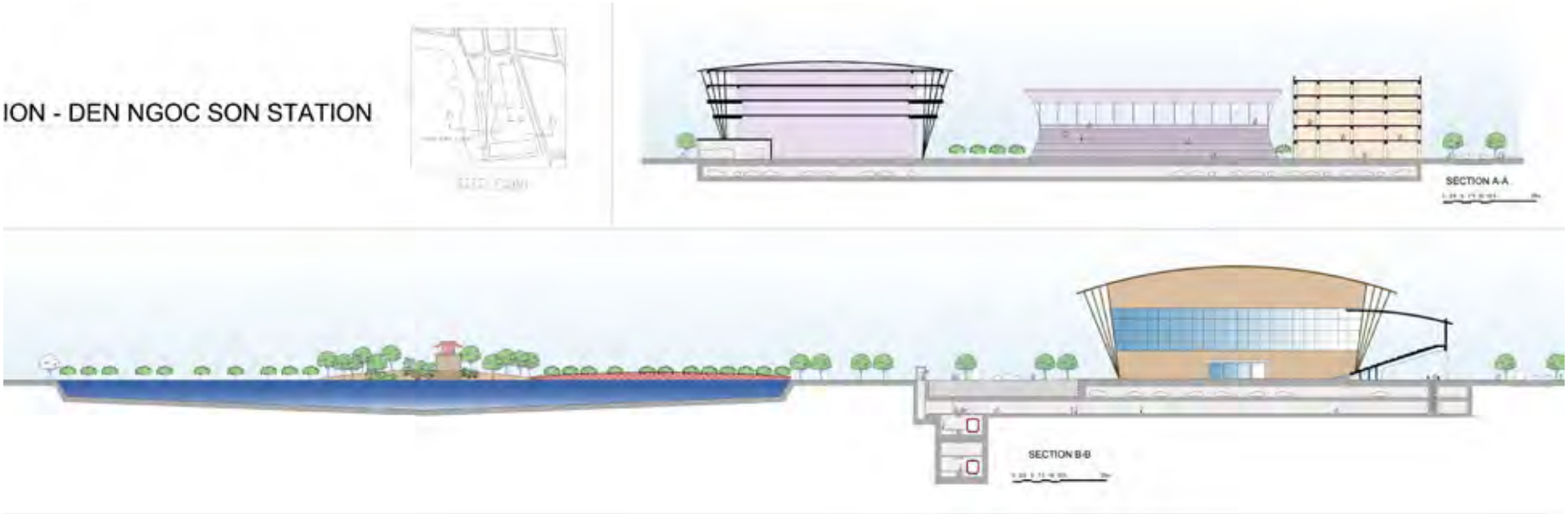


Figure 6.3.2 Proposed Building and Landscape Plan of Hoan Kiem Lake Station Area



Source: JICA Project Team

Figure 6.3.3 Section Plans of of Hoan Kiem Lake Station Area



Source: JICA Project Team

Figure 6.3.4 Development Image of Hoan Kiem Lake Station Area (Example from other countries)

Image of Entrance of subway of traditional design (Paris, France)

Image of café around the entrance of subway (Paris, France)

Image of cultural center in front of lake (Adelaide Convention Center, Australia)

Image of plaza and cultural center (Tokyo Metropolitan Artspace, Ikebukuro, Tokyo, Japan)

Image of foyer of cultural center (Tokyo International Forum, Yurakucho, Tokyo, Japan)

Image of open air grand staircase (Kyoto Station, Kyoto, Japan)

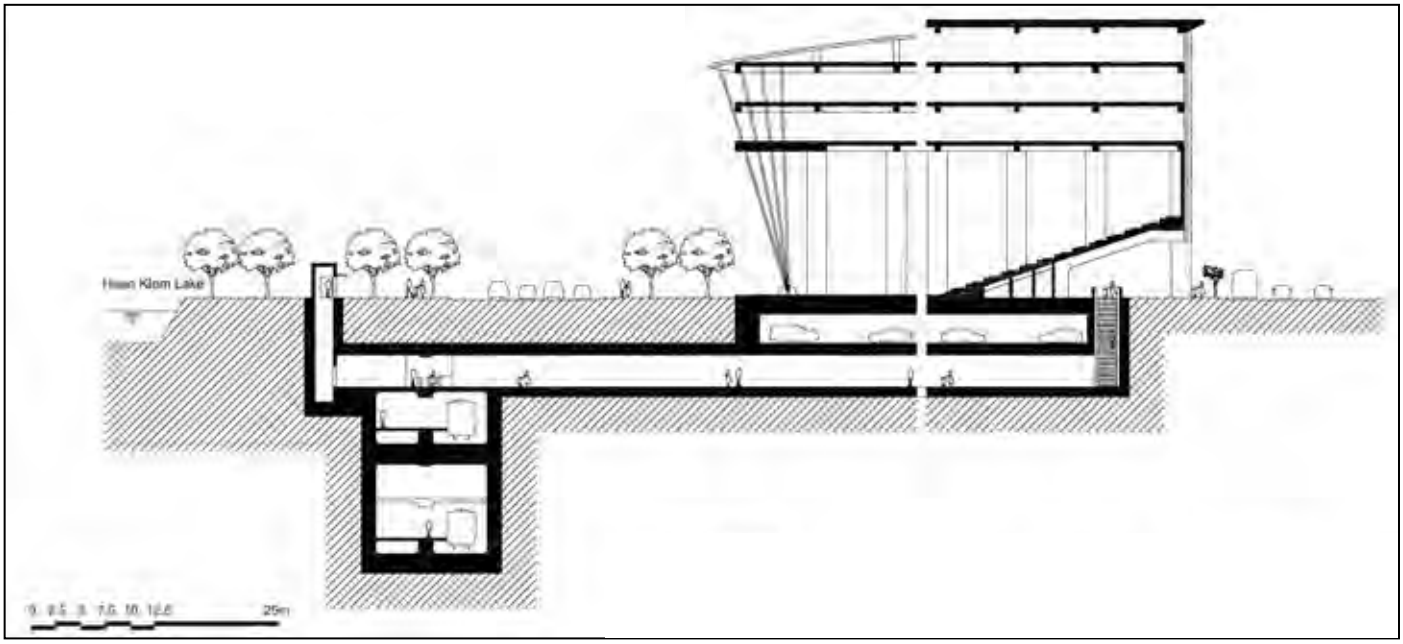
Source: JICA Project Team

6.3.3 Station and Related Facilities Development Plan (Project S1 and S2)

638 Station Facility: Hoan Kiem Lake Station of underground UMRT Line2 will be located under the openspace on east of Hoan Kiem Lake and Dinh Tien Hoang Street. Entrances and station related facilities should not be constructed within 100m-distance from Ngoc Son Temple to reduce impacts on cultural property. So the station entrances will be developed at north and south of station together with station construction, and constructed inside of new urban facilities when these facilities will be opened.

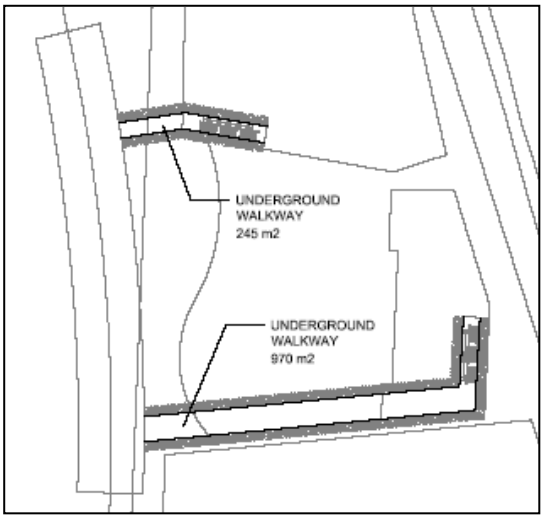
639 Pedestrian Underground: To reduce impacts on Hoan Kiem Lake and temples, pedestrian underground will not be extended. To cross Dinh Tien Hoang Street and access the underground mall and parking space of new urban facilities, two (2) pedestrian underground will be constructed (see Figure6.3.6).

Figure 6.3.5 Section Plan of Hoan Kiem Lake Station Area



Source: JICA Project Team

Figure 6.3.6 Pedestrian Underground Plan



Source: JICA Project Team

6.3.4 Road Development Plan (Project R1 and R2)

640 To formulate a southern gateway of the Ancient Quarter and a pedestrian oriented district of the AQ and Hoan Kiem Lake area, it is necessary to relieve traffic volume and congestion around the lake.

641 As for Dien Tien Hoang Street between Hoan Kiem Lake Station and the intersection of Cau Go Street, it is proposed to widen the openspace of the lake and sidewalk of northern urban block, while narrowing down the width of carriageway and removing Bo Ho Bus Terminal and car parking space along the lake. Pedestrian and visitors can enjoy taking a rest and eating and drinking next to the lake, and transport facilities such as a bus terminal and car parking space will be relocated into the new urban facilities near to Hoan Kiem Lake Station.

Figure 6.3.7 Road and Openspace Development Plan of north of Hoan Kiem Lake

Source: JICA Project Team

6.3.5 Urban Redevelopment Plan of Cultural and Commercial Complex (Block A)

(1) Present Condition

642 At present, Hanoi Electricity Company, Electricity Hotel, Department of Culture, Sports and Tourism (DOCST), and commercial facilities such as bank, fashion shop, etc. are located in the Block A. Though this area is a good place in front of Hoan Kiem Lake, it is not appropriate to utilize for a power company because it is not harmonized with cultural atmosphere, and it is not open to public.

643 When Electricity Company will be relocated into another area, this block will be developed as a citizen's recreation area which is open to Hoan Kiem Lake.

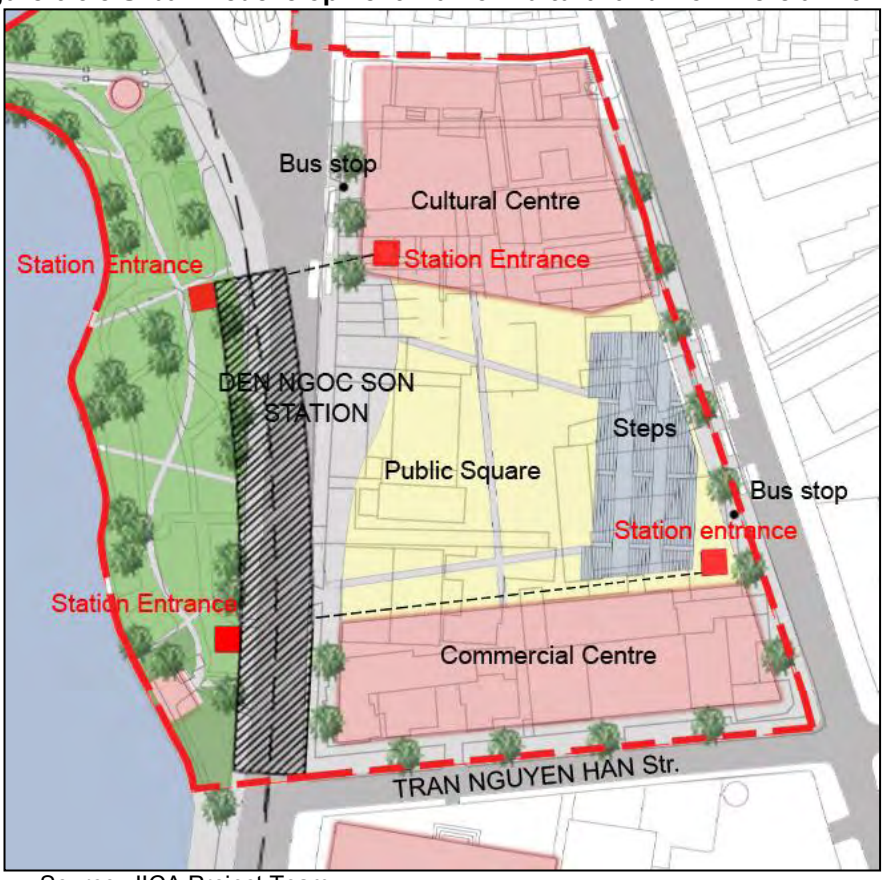
(2) Proposed Functions and Facilities

644 In the block A, cultural and commercial facilities will be developed, which all citizen's can access and enjoy cultural and environmental-friendly atmosphere of Hoan Kiem Lake and the AQ. It is proposed to construct two (2) facilities, and openspace, named "Lake View Plaza" in the middle which faces to Hoan Kiem Lake. The south facility will be commercial one, and the north facility will be cultural and public one.

645 DOCST will be moved into the new north facility, and will manage various cultural and art activities, such as music concert, performance, conference, etc. Open events can be held in the Lake View Plaza. Audience will enjoy watching a performance with scene of Hoan Kiem Lake.

646 Bo Ho Terminal will be moved into the 1st floor of the new facility. Parking spaces for tourist buses, especially for Water Puppet Theater and new facility, will be developed in the north-edge of the block. Transport facilities will be accommodated inside a new building, so traffic congestion around the lake will be calmed.

Figure 6.3.8 Urban Redevelopment Plan of Cultural and Commercial Complex



Source: JICA Project Team

Table6.3.1 Project Profile of Block A of Hoan Kiem Lake Station Area

		Block A
Development Framework	No of Population	0
	No. of Employee	3,568
Construction plan	Land area (m2)	21,845
	Building area (m2)	10,923
	BCR (%)	50
	Total floor area (m2)	76,458
	No. of floor	7
	FAR (%)	350

Source: JICA Project Team

6.4 Social and Environmental Considerations

6.4.1 Current state of socio-environmental condition

647 Hoan Kiem Lake Station is planned in a small park in front of the Ngoc Son Shrine, Hoan Kiem Lake, and near the Office of Hanoi People's Committee. The Ancient Quarter is located about 300m north of the station. Air and vibration ambient levels are still lower than the allowable maximum limits, but noise levels are exceeding the allowable maximum limits.

Table6.4.1 Condition of Ambient Air

Temper-ature	Humidity	Dust	CO	SO2	NO2	HC
(°C)	(%)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
31.1	76	71	389	90	71	207

Table6.4.2 Condition of Ambient Air

Noise (day time: 6-18h)			Noise (night time: 18-22h)			Vibration	
Leq	Lamax	L50	Leq	Lamax	L50	Laeq	Lv
(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(m/s^2)	(mm/s)
73.5	92.1	69.6	70.3	90.1	65.2	0.0278	0.0215

Note: HC: Hazardous substances in ambient air
Air quality, noise, and vibration survey carried out by CEPT, in May-June 2007
Allowable maximum limit: Dust 300$\mu g/m^3$, CO 30,000$\mu g/m^3$, SO_2 350$\mu g/m^3$, NO_2 200$\mu g/m^3$, HC 5,000$\mu g/m^3$, Noise day time Leq 60dB, Noise night time Leq 55dB, Vibration Laeq 0.030m/s^2

Source: EIA Report 2007, CEPT

648 Station area development projects around Hoan Kiem Lake Station may cause significant impacts to Ly Thai To Commune, which is known as an important area for institutions and businesses. Tertiary employment is high at 87%, and secondary at 12% as some factory is also located here. Daytime employment rate is high at 5.1%. However, low toilet coverage and low ratios of water area, park/open space, and green area are found in this Commune.

Table6.4.3 Coverage of Public Service and Sanitation

Commune	District	Electri-city	Piped water con-nectivity	Toilet cover-age	Gas	Tele-phone	Solid waste collec-tion	Internet
		(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ly Thai To	Hoan Kiem	100.0	100.0	71.6	89.7	84.5	97.4	12.9

Table6.4.4 Coverage of Urban Amenity and Disaster Prevention Capacity

Commune	District	Road area ratio	Flood vulner-ability index	House-hold with secure tenure	Emer-gency response capacity	Water area per 1000 pop	Parks/ open spaces per 1000 pop	Green area per 1000 pop
		(%)		(%)	(m/ha)	(ha)	(ha)	(ha)
Ly Thai To	Hoan Kiem	22.9	0.00	100.0	155.30	0.05	0.32	0.32

Source: Household Interview Survey (HIS 2005), HAIDEP

649 Gross population density of Ly Thai To Commune in 2003 is 290 persons per ha, while household size is relatively large (4.2 persons/HH). Current living conditions of Ly Thai To Commune are assessed as followings.

Table6.4.5 Living Condition Assessment of Ly Thai To Commune

Overall	People are generally satisfied with the living environment in Ly Thai To. Objective score result in negative due to poor capability, health and amenity condition in particular.
Convenience	With sufficient road ratio and wide bus service area coverage, this commune is very convenient. However people do not use pubic transport at all. Traffic situation dissatisfies residents greatly.
Safety & Security	This commune is free from flooding, which satisfies residents. Rate of traffic injury is high and people's assessment of traffic safety ranks low.
Health & Wellbeing	Vehicle is extremely heavily concentrated in this commune (almost double of district average). Almost 30% of households do not have toilet or sanitation facility. Hospitals or medical facilities need to be developed more.
Amenity	Amenity spaces are too insufficient for the number of the population. Average living space is very small, which dissatisfies people to a great extent.
Capability	Annual income of this commune is much lower than city's average although located in city centre.

Source: Urban Karte, HAIDEP, 2005

6.4.2 Anticipated adverse impacts and mitigation measures

1) Anticipated adverse impacts

650 It is expected that the station area development projects will result in environmental improvement and upgrading of the quality of life of residents in the communities around the stations, through improved road system, drainage system, solid waste collection and disposal system, public facilities, amenity facilities, community disaster preparedness and response capacity, etc.

651 However, the station area development projects may also cause several adverse impacts as followings. Since the project will include the plans to build underground works (station, car parking, and pedestrian road), it will require to make an EIA (and a RAP) in accordance with Decree No. 21/3008/ND-CP.

Table6.4.6 Anticipated Environmental and Social Impacts

Impact		Description
Natural environment		
	Groundwater	The cut-and-cover construction may cause decline of groundwater level and affect the hydrological system of the Hoan Kiem Lake.
	Soil erosion	The cut-and-cover construction may cause exposure of excavated soil and lead to the washout of soil by rain if suitable counter-measures are not taken.
	Hydrological situation	The cut-and-cover construction may cause decline of groundwater level, changes in groundwater movement, and affect the hydrological system of the Hoan Kiem Lake.
	Flora, fauna and biodiversity	The ecosystem of the Hoan Kiem Lake, and impacts to the endangered giant soft-shell turtles living in the lake should be carefully studied in detail. A number of green trees in the park would be removed during construction phase.
Pollution		
	Air pollution	Operation of construction machinery and transportation vehicles may cause significant impact on ambient air quality of the localities.
	Water pollution	Waste water from construction activities and discharged water from the stations may cause deterioration of water quality of the vicinities.
	Soil contamination	Civil works and other construction activities during construction phase may cause contamination of soil.
	Waste (including waste soil)	Solid wastes and sewage from the construction sites and from the stations may cause adverse impacts to soil and adjacent water bodies.
	Ground subsidence	The cut-and-cover construction of the station may cause the decline of groundwater and lead to damages to the establishments near the station.
	Accidents, traffic congestion	During construction phase, construction machinery and transportation vehicles may cause traffic congestion on the roads around the station

Source: Urban Karte, HAIDEP, 2005

2) Measures to mitigate impacts of land acquisition

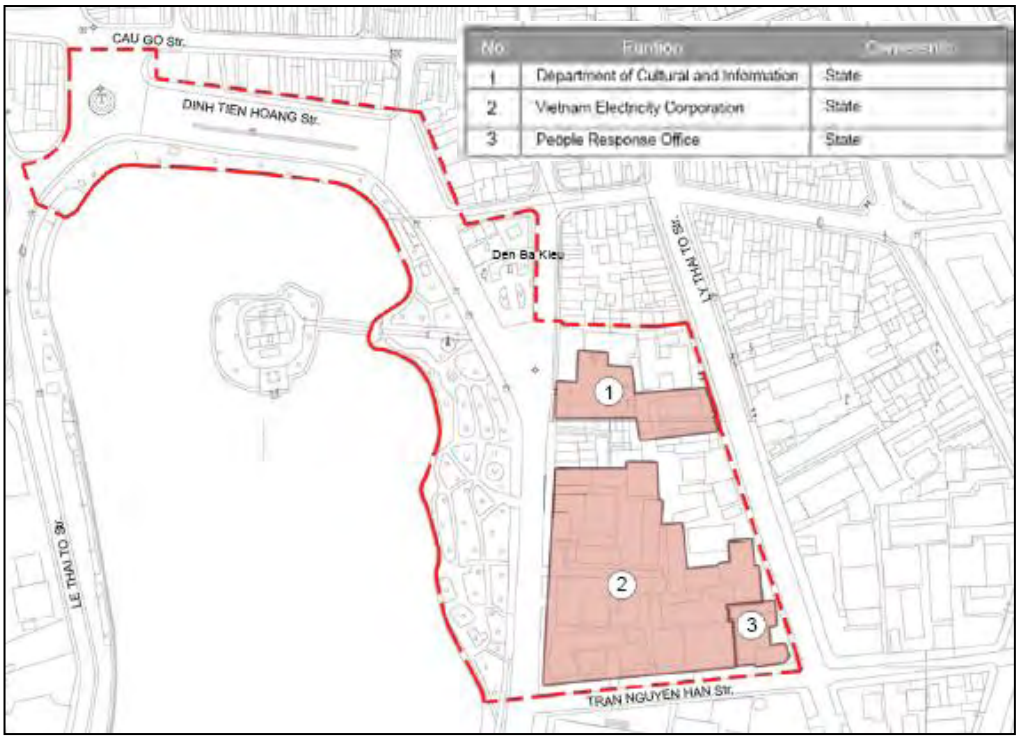
652 During pre-construction phase, impacts caused by land acquisition and involuntary resettlement are considered. Most of the project area is owned by public sectors. Scale of land acquisition and project-affected people and households are estimated as followings.

Table 6.4.7 Scale of Land Acquisition and Project-affected Buildings by Minimum Project

ID	Project	Area of land to be acquired	Affected housing area	Population density	Number of project-affected people	Number of project-affected household
		(m^2)	(m^2)	(pers/ha)	(pers)	(HHs)
A	Urban redevelopment of Cultural and commercial Complex	21,900	-	290	-	-
Total		21,900	0		0	0

Source: JICA Project Team
Note: Population density (290 pers/ha), and average household size (4.2 pers/HH) are referred to Urban Karte (HAIDEP, 2005), for Ly Thai To Commune

Figure 6.4.1 Location of Public owned Facilities of Hoan Kiem Lake Station Area



Source: JICA Project Team

3) Measures to mitigate impacts on cultural properties

653 Construction activities and new establishments around the station should also be carefully designed so as they can be harmonized with the landscapes of Hoan Kiem Lake, and Ngoc Son Temple.

654 Ministry of Culture, Sports and Tourism requested HRB that (i) not to build any facilities the buffer within 100m from Ngoc Son Temple, and (ii) construct entrances near the Hanoi Electricity Company to avoid impacts on Hoan Kiem Lake and green. HRB should further elaborate the location of station and entrances in the Detailed Design Stage.

4) Measures to mitigate other impacts

655 During construction phase, the construction of underground tunnels and stations may cause contaminated drainage and affect fauna and flora eco-system around the Hoan Kiem Lake, in which there exist endangered soft-shell giant turtles. These turtles are spiritually very important for the people of Hanoi and listed in the Vietnamese and IUCN's Red Data Book. The change in groundwater movements should be studied in more detail to ensure that water in the lake will not be affected by the project.

656 Besides, a number of old trees would be removed during construction phase. And green trees around the underground facilities might be impacted by groundwater loss. A construction management plan should include methods for least damage on trees and replanting. Monitoring of water quality and level of the lakes, and tree conditions is crucial during construction phase and operation phase. In a case of cutting trees, a contractor should need license from the authority in charge.

657 The operation of construction machinery during construction phase would also affect the ambient air quality by emitting pollutants. The magnitude of pollution will depend on the types of equipment and the operation time. Depending on wind conditions such as velocity and direction, emissions from construction equipment would affect the ambient air quality of neighboring areas. In addition, earth moving equipment during construction would also be a major source of dust emission. To mitigate impacts of air pollution, the following measures are recommended.

- Periodically cleaning and watering the project sites.
- Secure distance between the construction machinery and construction site boundary as much as possible.
- Using construction equipment and vehicles which comply with the latest regulations.
- Periodical inspection and maintenance of construction equipment and vehicles.
- De-concentrate construction activities.
- De-concentrate the flow of construction trucks.
- Use cover sheets for trucks carrying soil.
- Under the weather conditions such as strong wind, the construction activities are suspended temporally for prevention of dust scattering.
- Training construction equipment drivers and truck drivers.
- Monitoring the air quality at the project site during all of the project cycles.

658 If contaminated drainage from the construction activities flows into surface water without proper treatment, it would pollute surface water quality around the project areas. During operation phase, discharged water including sewage from the station would deteriorate water quality as well. The following treatment measures should be prepared for discharged water from the project.

- Build a small dike to prevent run-off water from construction sites.
- Consideration of separating construction areas with sheet piles.
- Mud should be dehydrated before discharged and reused as much as possible.
- Proper design and maintenance of drainage systems at station. The design includes a sewage facility with a proper capacity, sewage pipes locating lower than the water supply pipes, and if necessary, preliminary treatment facilities.
- Monitoring discharged water quality from stations, and surface water quality.

6.5 Project Implementation Mechanism

6.5.1 Issue on Implementation of Hoan Kiem Lake Station Area Development

659 Overall project implementation schedule is divided into four stages of minimum by the UMRT opening in 2017, short term, middle term and long term. Each project in station development area is scheduled on these four stages from the viewpoint of synergy with station opening and difficulty of implementation, especially, land acquisition. Implementation issue in each stage are explained as following;

1) Issue on minimum project implementation

660 Minimum project in Hoan Kiem Lake Station area consist of two components of Hoan Kiem Lake Station (S1) and pedestrian underground (S2). These projects need to complete by the UMRT opening in 2017.

2) Issue on short -term project implementation

661 Redevelopment of Dinh Tien Hoang Street (R1) and urban development of cultural and commercial complex (A) are planned as short term projects. This area usually congested with huge number of pedestrian and traffic. In scheduling, consideration should be given to examine the impact of the development on the traffic in the construction period.

3) Issue on medium and long -term project implementation

662 Relocation of Bo Ho Bus terminal (R2) is planned as medium term project. Bus terminal facility belongs to bus operation organization. It is necessary to coordinate with bus operation organization about Implementation of R2 project.

6.5.2 Project Implementation Measures

1) Application of Public Private Partnership (PPP) Scheme

663 Since the seed land for the commercial development is owned by the power company there will be not much PPP element involved in this development. However, HPC could form a strategic alliance with the power company to plan and develop this station area by soliciting other potential investors who has development expertise of both commercial and cultural center.

2) Station and Related Facilities Development Plan (Project S1, S2)

664 Station and related facilities development plan consist of two project components of station building (S1) and pedestrian underground (S2). Pedestrian underground should be developed by HRB because of the function of convenience and comfortableness for passengers and station users. S2 project should be completed by the UMRT opening in 2017.

3) Road development Plan (Project R1 and R2)

665 Redevelopment of Dinh Tien Hoang Street (R1) is planned as short-term project and is not necessary of any land acquisition. HPC will be in charge of R1 project.

666 Relocation of Bo Ho Bus Terminal (R2) is planned as medium term project. TRAMOC will be in charge of R2 project and this relocation project should be planned in overall bus network improvement plan in Hanoi city.

4) Urban Redevelopment of Cultural and Commercial Complex (Project A)

667 Urban Redevelopment of Cultural and Commercial Complex (A) consist of public facility and commercial function. For the development, it is necessary to coordinate private sector participation under HPC facilitation as mentioned in the beginning.

668 Land acquisition is implemented using land recovery by HPC or the power company will provide its own land as a seed land for development, and solicit participation of other potential investors who has development expertise of both commercial and cultural centers.

Table 6.5.1 Implementation Program of Hoan Kiem Lake Station Area Development

Project type	Name of project	ID	Schedule	Project area (ha)	Land acquisition area (ha)	Implementation method	Implementation body	Financial resource
Station and related facility development	Hoan Kiem Lake Station	S1	Minimum	-	0.0	Utilization of underground of road and park (no land acquisition)	HRB	ODA
	Pedestrian underground	S2	Minimum	0.1	0.0	Utilization of underground of road and park (no land acquisition)	HRB	ODA/Private[1)]
Road development	Improvement of Dinh Tien Hoang Street	R1	Short	3.4	0.0	None	HDOT	HPC
	Relocation of Bo Ho Bus Terminal	R2	Medium	0.2	0.0	(part of Project A)	TRAMOC	HPC/Private
Urban development project	Urban redevelopment of Cultural and Commercial Complex	A	Short	2.2	2.2	Land recovery from power company and development with UR	HPC/Private	Public/Private

Source: JICA Project Team
1) Pedestrian underground to access to public space will be developed as a station related facility by using ODA. Pedestrian underground to access to commercial facilities will be developed by private sector.

6.5.3 Implementation Schedule

669 Implementation schedule of Hoan Kiem Lake Station is shown as Table 6.5.2.

1) Minimum development

670 Regarding pedestrian underground of Hoan Kiem Lake Station (S2), it is necessary to coordinate with cultural and commercial complex project (A) about connection and entrance planning in preparation stage of project S2 and A

2) Short term project

671 Redevelopment of Dinh Tien Hoang Street (R1) is planned as short-term project. It is expected that cultural and commercial complex development (A) will affect increasing of no. of pedestrian in Hoan Kiem Lake area. R1 project should be completed at the same time of project A.

3) Medium and Long term project

672 Relocation of Bo Ho bus terminal (R2) is implemented after project A where is planned as new bus terminal location.

Table 6.5.2 Implementation Schedule of Hoan Kiem Lake Station Area Development

Project Type	Name of Project	Project ID	Implementation Schedule
			Minimum: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017 / Short: 2018, 2019 / Medium: 2020, 2021 / Long: 2022, 2023, 2024, 2025, 2026
Station and related facility development	Hoan Kiem Lake Station	S1	UMRT Opening
	Pedestrian underground	S2	
Road development	Redevelopment of Dinh Tien Hoang Street	R1	
	Relocation of Bo Ho Bus Terminal	R2	Coordination of planning
Urban development project	Urban development of Cultural and Commercial Complex	A	

○ Project Approval, Coordination, Land Acquisition, Construction/ Building

6.5.4 Project Investment and Operation Cost

673 Investment and operation cost of Hoan Kiem Lake station area development is summarized as following table 6.5.3. Station building and facility combined with railway structure are excluded from this cost estimation. Total investment cost of Deb Ngoc Son area is estimated at 127.4 million USD.

Table 6.5.3 Investment and Operation Cost of Hoan Kiem Lake Station Area Development

Project type	ID	Name of project	Investment cost (million USD)			Operation cost (million USD/year)
			Land acquisition	Construction	Total	
Station and related facility development	S1	Hoan Kiem Lake Station	Exclusion	Exclusion	Exclusion	Exclusion
	S2	Pedestrian underground	0	5.8	5.8	0.6
Road development	R1	Redevelopment of Dinh Tien Hoang Street	0	0.9	0.9	0.1
	R2	Relocation of Bo Ho Bus Terminal	0	0.1	0.1	0.1
Urban development project	A	Urban redevelopment of Cultural and Commercial Complex	89.3	31.2	120.6	3.1
Total			89.3	38.0	127.4	3.9

Source: JICA Project Team

6.5.5 Financial analysis of urban development Project

674 Financial analysis of public and private Investment of urban development in Hoan Kiem Lake station area is summarized as following Table 6.5.4. Project A will have difficulty to secure profitability of private investor because of the high land price and height control of up to 7 stories. In case I, Project IRR will be lower than 12% of interest rate and it is not profitable project for private investor. In case II, private sector leases lands from public sector for reduction of initial cost of private investor. In this case, private investor could acquire a 21% Project IRR. In summary there will be good possibility for private sector investor to secure sufficient profitability and PPP scheme could be possible.

Table 6.5.4 Financial analysis of urban development project of Hoan Kiem Lake Station Area Development

Name of project	ID	Investment scheme	Public investment and revenue		Private Investment			
			Investment (million USD)	Revenue (million USD/ year)	Investment (million USD)	NPV (million USD)	Project IRR	B/C
Urban redevelopment of Cultural and Commercial Complex	A	Case I: Private investment	-	-	113.1	-11.5	11%	2.13
		Case II: Lease of land	-	8.0	35.6	45.6	21%	1.69

Source: JICA Project Team
Note IRR: Internal Rate of Return (Project IRR is a indicator to show the level of total project profitability), NPV: Net Present Value, B/C: Benefit per Cost
Interest rate is assumed of 12%/year, Calculation period: 15years since completion of project
Lease fee: 12% of land price

7 PROPOSED PROJECT IMPLEMENTATION MECHANISMS AND MEASURES

7.1 Existing Legal system, Plans and Organizations for Urban Development

7.1.1 General

701 To propose implementation mechanism which will be applied to integrated UMRT and urban development, issues of present urban planning and development system are reviewed, mainly in the following aspects:

i) Legal system of urban planning and development

ii) Related plans and organizations of urban planning and development

iii) Approved Plan and organization

iv) Land acquisition and resettlement

v) Underground development

vi) Strategic Environmental Assessment (SEA)

vii) Information disclosure and public consultation

7.1.2 Legal system of urban planning and development

1) Urban Planning System under Construction Law and Urban Planning Law

702 Main planning system for spatial development of Vietnam are (i) “Socio-Economic Development Plan” (SEDP) and (ii) “Urban and Regional Development Plan” including Construction Master Plan. SEDP is managed by Ministry of Planning and Investment (MPI), while Urban and Regional Development Plan is managed by Ministry of Construction (MOC). In line with these main spatial plans, sector plans such as “Landuse Plan” of Ministry of Natural Resource and Environment (MONRE), “Transport Development Master Plan” of Ministry of Transport (MOT), “Industrial Development Plan” by Ministry of Industry are formulated.

703 Legal framework of urban planning was stipulated by Chapter 2 of “Construction Law”. Under Construction Law, urban plans were categorized into two layers of “General Plan” and “Detailed Plan”. From 1st January 2010, “Urban Planning Law” has been enforced, and overall urban planning framework is stipulated by Chapter 2 of “Urban Planning Law”. Under this law, urban plans are categorized into three layers of “General Plan”, “Zone Plan” and “Detailed Plan” (see Table 7.2.1).

Table 7.1.1 Statutory Urban Plans under Construction Law and Urban Planning Law

Plan, scale and outline under Construction Law		Plan, scale and outline under Urban Planning Law	
(a) General Urban Construction Plan (1/2,000-1/25,000)	General framework of urban space, urban infrastructure and facility	(A) General Plan (1/5000, 1/10,000, 1/25,000, 1/50,000)	Framework to allocate spatial elements, urban infrastructure, urban facility and housings
(b) Detailed Urban Construction Plan (scale of 1/2,000)	Detailed plan of General Plan which is a legal basis for investment, construction and land transaction	(B) Zone Plan (1/2,000, 1/5,000)	To implement General Plan, formulate zoning and specify indicators related to land, infrastructure, functions of urban facility and landuse
(c) Detailed Urban Construction Plan (scale of 1/500)		(C) Detailed Plan (1/500)	To implement General Plan and Zone Plan, i) specify condition and indicators related to landuse, construction management and urban design and ii) to allocate infrastructure
(d) Technical Infrastructure Plan	One of the part of (a), (b) and (c)	(D) Technical Infrastructure Plan	One of the part of (a), (b) and (c)

Source: JICA Project Team

2) Detailed Plan and Zone Plan

704 Before enforcement of Urban Planning Law, the Detailed Plan of 1/2,000 was formulated by district, and it indicated too much detail related landuse and buildings which was a long way from feasibility. The Zone Plan which was newly stipulated under Urban Planning Law is aimed to formulate long-term development orientation of 20 or 25 years period. And the coverage is not only district unit, but also specific zones covering several districts. It can be said that the Zone Plan is aimed to indicate landuse and development framework to control urban development activities properly.

705 In the Detailed Plan of 1/2,000 as well as the Zone Plan, following planning indicators are stipulated (Article 29 of Urban Planning Law):

i) Purpose of utilization of specific land lots

ii) Spatial, architecture & landscape structure principles of the planned area

iii) Population

iv) Landuse

v) Technical infrastructure indicators of each block

vi) Social infrastructure layout in line with the development demands

vii) Location and alignment of technical infrastructure and streets in compliance with development phases

viii) Strategic Environment Assessment (SEA)

3) Urban Design

706 As for Urban Design of Zone Plan, it is necessary to identify control indicators such as setback, urban landscape, openspace, landmarks and street blocks, etc. (Article 32&33, Urban Planning Law).

707 In addition, it is necessary to propose measures to realize urban plan and design, and City or local PC as a responsible body for plan approval need to issue regulation on management in compliance with urban plan and design (Article 34& 35 of Urban Planning Law). The contents of regulation covers following items:

i) Boundary, scope and characteristics of the planned area

ii) Location, boundary, characteristics and scope of specific zones in the planned area

iii) Building to land ratio, floor area ratio, and height, elevation of specific street blocks

iv) ROW, demarcation, elevation & detail specification of specific roads

v) Protective area and corridor of technical infrastructure

vi) Main spatial axes and urban landmarks

vii) Location, scale, and protective corridor of underground construction

viii) Reservation areas, historical and cultural relics, beautiful landscapes in the urban area and environment protection

7.1.3 Approved Plan and Organization

708 In accordance with Construction Law and Urban Planning Law, Urban Development Plan of City and District have been approved. Urban Planning Master Plan of Hanoi City till 2020 was approved by the Prime Minister in 1998. As of 2008, population of Hanoi City was more than 3.5 million. In August 2008, administration boundary of Hanoi City was expanded including former Ha Tay Province and some communes of Hoa Binh Province, and population was more than 6 million. At present, “Hanoi Capital Construction Master Plan” covering expanded city and adjoining urban areas has been formulated under management of MOC. The draft Master Plan will be submitted to the National Assembly in June 2010. In this Master Plan, transport network including UMRT lines and urban development plan of station vicinity area will be included.

709 The Detailed Plan and the Zone Plan of 1/2,000 and 1/500 is proposed by local district governments, and approved and managed by Hanoi Architecture and Urban Planning Authority (HAUPA). HAUPA also establish ordinances of construction standards approved by MOC, and implement review and approval of construction and urban development activities.

710 The approved Detailed Plan is a legal basis to control urban planning including road planning. It is reviewed and revised by 5 to 10 years. Most of Detailed Plans were approved in 2000, after approval of Hanoi City Master Plan in 1998. So these plans don’t reflect UMRT network, station locations and urban development around stations. For realization of integrated UMRT and urban development, it is necessary to coordinate with these approved plans and adjust plans especially road network and alignment, landuse around the station. Key of district plan modification and related project are listed into Table 7.1.2.

Table 7.1.2 Modification of District Plan (General Plan)

Station		District	District Plan			Related Project	
			Approved plan	Key of Modification			
				Road	Land Use	Road	Urban development
UMRT Line 1	1. Yen Vien	Gia Lam	●	●	●	-	-
	2. Cau Duong	Long Bien	●	●	●	●	●
	3. Duc Giang	Long Bien	●	●	●	-	●
	4. Gia Lam	Long Bien	●	●	●	-	●
	5. Bac Cau Long Bien	Long Bien	●	●	●	-	-
	6. Nam Cau Long Bien	Hoan Kiem/ Ba Dinh	●	●	●	-	-
	7. Phung Hung	Hoan Kiem/ Ba Dinh	●	●	●	-	-
	8. Hanoi	Dong Da/ Hoan Kiem	●	●	●	-	-
	9. C.V. Thong Nhat	Dong Da/ Hai Ba Trung	●	●	●	-	-
	10. B.V. Bach Mai	Dong Da/ Hai Ba Trung	●	●	●	-	-
	11. Phuong Liet	Thanh Xuan	●	-	-	-	-
	12. Giap Bat	Hoang Mai	●	●	●	-	-
	13. Hoang Liet	Hoang Mai	●	-	-	-	-
	14. Van Dien	Thanh Tri	●	●	●	-	-
	15. Vinh Quynh	Thanh Tri	●	●	●	-	-
	16. Ngoc Hoi	Thanh Tri	●	●	●	-	-
UMRT Line 2	1. Nam Thang Long	Tu Liem/ Tay Ho	●	●	●	●	●
	2. Ngoai Giao Doan	Tu Liem	●	-	-	-	●
	3. Tay Ho Tay	Tay Ho	●	●	●	-	●
	4. Buoi	Cau Giay	●	-	-	-	-
	5. Quang Ngua	Ba Dinh/ Tay Ho	●	-	●	-	-
	6. Bach Thao	Ba Dinh/ Tay Ho	●	-	●	-	-
	7. Ho Tay	Ba Dinh/ Tay Ho	●	-	●	-	●
	8. Hang Dau	Ba Dinh/ Hoan Kiem	●	●	●	-	-
	9. Hoan Kiem Lake	Hoan Kiem	●	●	●	-	-
	10. Tran Hung Dao	Hoan Kiem	●	●	●	-	●
	11. Cau Den	Hai Ba Trung	●	●	●	-	-
	12. Bach Khoa	Hai Ba Trung	●	-	-	-	-
	13. Kim Lien	Dong Da	●	-	-	-	●
	14. Chua Boc	Dong Da	●	-	●	-	●
	15. Nga Tu So	Dong Da/ Thanh Xuan	●	-	●	-	●
	16. Thuong Dinh	Thanh Xuan	●	-	●	-	●

●: Exist/ necessary, - :none/ unnecessary
Source: JICA Project Team

7.1.4 Building Code

711 The Vietnam Building Code in 1997 was replaced to the Building Code on Regional and Urban Planning, Rural Residential Planning (Decision 04/2008/QD-BXD of April 3, 2008). The Building Code stipulates maximum building density by construction height and land area (see Table 7.2.2 and Table7.2.3). Different from urban planning system in Japan which controls Building Coverage Ratio (BCR) and Floor Area Ratio (FAR) by zoning, BCR is controlled by height and land area, which does not depend on zoning or landuse. Number of floor can be converted from building height, FAR is automatically defined by BCR and number of floor. It means that in case if building height is high, construction area is narrow, but in case if building height is low, construction area is large.

Table 7.1.3 Maximum Building Density of Apartment Buildings

Construction height (m)	Maximum building density (%) by land area (m^2)			
	≤ 3,000^2	10.000^2	18,000^2	≥ 35,000^2
≤ 16	75	65	63	60
19	75	60	58	55
22	75	57	55	52
25	75	53	51	48
28	75	50	48	45
31	75	48	46	43
34	75	46	44	41
37	75	44	42	39
40	75	43	41	38
43	75	42	40	37
46	75	41	39	36
> 46	75	40	38	35

Source: Building Code on Regional and Urban Planning, Rural Residential Planning, Decision 04/2008/QD-BXD of April 3, 2008

Table 7.1.4 Maximum Building Density of Apartment Buildings

Construction height (m)	Maximum building density (%) by land area (m^2)			
	3,000^2	10.000^2	18,000^2	≥ 35,000^2
≤ 16	80	70	68	65
19	80	65	63	60
22	80	62	60	57
25	80	58	56	53
28	80	55	53	50
31	80	53	51	48
34	80	51	49	46
37	80	49	47	44
40	80	48	46	43
43	80	47	45	42
46	80	46	44	41
> 46	80	45	43	40

Source: Building Code on Regional and Urban Planning, Rural Residential Planning, Decision 04/2008/QD-BXD of April 3, 2008

712 In the Building Code, it is stipulated that urban design in Detailed Plan for urban construction of 1/2.000 should meet the following requirements:

- Determine the point in the work space area planned under the direction, the vision;
- Threshold specified by the maximum, minimum (or not specified) and the principle of correlation of the height of the building adjacent to each functional area and for the entire area;
- Determine which regulations around back of the building on Main Street and Main Street intersection;
- Guidelines prescribed shapes, colors, lighting, architectural forms of the dominant structures, systems of trees, water, squares;
- Identify the principles of spatial connectivity designs with the area surrounding space outside the area design;
- Prescribed construction management of urban architecture as the content of planning schemes and detailed construction 1/2.000 to rate management of common landscape architecture designed by the regional content;

- Prescribed norms to control land use such as building density, building height (depending on space requirements and control intentional and planned, correctly defined the construction height, upper middle average, or maximum height regulations and in accordance with the minimum of correlation between the height of buildings in the area or planning regulations controlling building height).

7.1.5 Underground Development

713 Underground development is one of the hot urban planning issues in recent years. In Ho Chi Minh City, underground parking spaces of openspace and park have been developed by private developers. Decree on urban underground construction, No.41/ 2007/ ND-CP, was approved. Planning permission of underground facility is implemented by Provincial or City People's Committee, which also permit buildings and infrastructure above ground facilities. In Hanoi City, HAUPA will approve the development of underground facilities.

714 Recently, MOC issued the Decree No. 39/2010/ND-CP dated 7th April 2010, Guiding on Management of Urban Underground Space, which will specify contents and indicators which need to be planned into urban development plans. MONRE also prepares regulation related to underground development, from viewpoint of potential of buried natural resources.

715 According to the Decree, Provincial levels People's Committee shall decide to allow domestic organizations; foreign organizations and individual to use land for construction of urban underground works as provided by laws. Ministry of Natural Resources and Environment shall lead, coordinate with relevant ministerial bodies to set up the land use and management mechanism for construction of urban underground works, and submit to the Prime Minister for decision.

716 As such, construction of urban underground works such as the underground pedestrian way to connect two UMRT stations may be implemented by investors, comprising not only the public sector but also of private sector.

717 Urban Planning Law stipulates that construction of underground facilities must comply with underground spatial plan provided in approved urban development plans, construction codes for underground facilities issued by MOC, planning permit and construction permit.

7.2 Legal and Institutional Framework on Environmental Protection and Assessment

7.2.1 Law on Environmental Protection

718 Legal and institutional framework on environmental protection, Environmental Impact Assessment (EIA), and land acquisition, compensation, supports, and resettlement relating to a development project is described in detail in Appendix B.

719 The New Law on Environmental Protection (LEP 2005) approved by the National Assembly on 29 November 2005 is the major legal that regulates environmental protection in Vietnam. In addition, there are several other legal documents related to environmental protection sector which need to be considered for the development projects. The following 3 sections of Chapter III of the LEP 2005 stipulate issues on environmental assessment.

Section 1: Strategic Environmental Assessment (SEA)
Section 2: Environmental Impact Assessment (EIA)
Section 3: Environmental Protection Commitments

720 Section 2 of the LEP 2005 has 6 articles (from Article 18 to Article 23) that define projects to be prepared EIA reports, elaboration and contents of the EIA report, appraisal and approval of the EIA report, implementation of the EIA report's commitments..

721 The projects stipulated in Article 18 of this Law may be approved and get an investment license, construction permit or operational permit only after the concerned EIA report is approved. (Article 22). Works may be commissioned for use only after the competent body has inspected and certified the performance of all environmental protection requirements. (Article 23).

722 Besides, the GOV has issued several legal documents related to the EIA, including the followings: (i) Decree 21/2008/NĐ-CP (dated 28/02/2008), (ii) Decree No. 80/2006/ND-CP (dated 09/08/2006), (iii) Circular No. 08/2006/TT- BTTMT (dated 08/09/2006).

723 Decree No. 21/2008/NĐ-CP includes a number of modifications and amendments of Decree No. 80/2006/ND-CP, including the list of projects subjected to prepare EIA report.

724 According to Decree No. 21/3008/ND-CP, projects subjected to prepare an EIA report include the followings (see Table 7.2.1).

Table 7.2.1 Projects Subjected to Prepare EIA Report

Project	Scale
Projects to build infrastructures in urban centers or residential areas	Covering 50 ha or more
Projects to build supermarkets of markets	With 200 business places or more
Projects to build sports centers	Covering 10 ha or more
Projects to build hospitals	With 50 hospital beds or more
Projects to build underground works	All
Projects to build houses with basements	Basement of 10m or more deep
Projects to build underground traffic works (subways and tunnels)	500 m or more in length
Projects to build grade-IV roads	100 km or more in length
Projects to build traffic works	Requiring resettlement of 1,000 or more people
Projects to build passenger car terminals	Covering 0.5 ha or more

Source: Decree No. 21/3008/ND-CP

725 Requirement for environmental monitoring is described relatively in detail in Circular 05/2008/TT-BTNMT (see Appendix B). According to this Circular, an EIA Report for a development project should include a chapter describing the environmental monitoring and management program. This chapter should propose an environmental monitoring program describing:

(i) Waste monitoring: It requires monitoring waste flow/volume and other specific parameters of waste disposals according to current criteria, norms and regulation of Vietnam, at a minimum frequency of three (3) times a month. Monitoring points or stations must be mapped with clear legends.

(ii) Monitoring surrounding environment: Only monitoring specific parameters of waste disposals according to current criteria, norms and regulation of Vietnam if there are no monitoring points or stations of State in the project areas, at a minimum frequency of six (6) times a month. Monitoring points or stations must be mapped with clear legends.

(iii) Other monitoring: Only monitoring such factors as: eroded, slide, collapsed, and sunk land; erosion of river, stream, lake and sea banks; raised level of river, stream, lake and sea bed; changes of surface water level and underground water; salt water invasion; alum water invasion; and other impacts on natural and socio-economic environment (if there are), at an appropriate frequency to enable the monitoring of spatial and temporal changes of these factors. Monitoring points or stations must be mapped with clear legends.

7.2.2 Land Acquisition and Resettlement

1) Law on Land

726 The Law on Land (issued in 1993 and revised in 2003) is the umbrella law that regulates issues on land administration, in general, and land acquisition, in particular. Besides, there are a number of laws and regulations relating to the issues on land acquisition for development projects. In addition, each People's Committee of local province/city has to stipulate its own regulations to govern issues of land acquisition in its own territory. Key points of the Law on Land in 2003, and several main regulations on land issues (i.e. Decree 197/2004/CP, Decree 17/2006/CP, and Decree 84/2007ND-/CP) are summarized in Table 7.2.2.

727 As stated by law and regulations on land management and land acquisition, the people's committee of province or city under direct control of the central government (PPC) is the body in charge of managing land within its administrative territory, planning and implementing land acquisition for the investment projects carried out within its territory. For large scale project, after its investment report is approved, the PPC shall issue the policy to recover land, and direct relevant agencies in carrying out the land acquisition, compensation and resettlement.

728 The formulation of a Comprehensive Plan on Compensation, Support and Resettlement (Comprehensive Resettlement Plan) is required to guide resettlement planning and implementation for the project requiring land acquisition. The Comprehensive Resettlement Plan should have overall objective to ensure that all people affected by the project are able to maintain and, preferably, improve their pre-project living standards and income-earning capacity through compensation for the loss of physical and non-physical assets and, as required, other assistance and rehabilitation measures.

Table 7.2.2 Main Laws and Decisions related to Land Acquisition and Resettlement

Law/ Decision	Contents
Law on Land 1st July 2004	• It establishes the regulation of land allocation, lease management, land acquisition for development purposes, changes of land value under market mechanisms, and gives people access to land through land-user rights via land use right certificates (LURCs) • Depending on the use purpose, land is classified into 3 groups (agricultural land, non-agricultural land, unused land) • The State has right to recover lands in several specified circumstances. In these cases, the land user will be compensated for loss of land or assets. • When land recovery for use for objectives of national defense and security, national interest or public interest (Article 39), the State shall pay compensation and carry out site clearance after land use zoning and planning have been proclaimed or when an investment project with land use requirements in conformity with the land use zoning and planning is approved by the competent State body.
Compensation and resettlement policy Decree 197/2006/CP, amendment of Decree 17/2006/CP	(1) The Government limits its scope of compensation, assistance and resettlement, and encourages project owners themselves to negotiate with affected people on compensation and resettlement; (2) Assign PPCs to prepare and implement resettlement schemes to provide relocated people with houses or residential land in advance to the acquisition of their lands. (3) Land prices used for compensation are prices based on existing land prices which are regulated and announced by PPC or City PC. Compensation shall not be made according to the price set for the newly-shifted land use purpose. At the time of issuance of decision on land acquisition, if these land prices are not reflecting actual market land prices, the PPC/City PC should decide definite, adequate land prices. (4) Affected people whose lands are acquired by the State will be compensated with lands of the same land use purpose. If there is not land available for "land for land" compensation, he/she will be compensated in cash with an amount similar to the value of land at the time of issuance of the decision on land acquisition; (5) Compensation for residential land is based on the actual land use. Agricultural land scattered in urban residential area, residential garden land and pond, etc., will be compensated with an amount as for agricultural land, and with an additional compensation amount equal from 20 to 50% of the actual value of the residential land of the same plot; (6) Affected houses and structures attached to the acquired land are compensated at replacement cost without depreciation; (7) Affected crops and trees are compensated at replacement cost respectively; (8) Relocated people can choose one of the following three options: a) compensation with housing, b) compensation with assignment of a new residential plot, c) compensation in cash for self relocation (9) The resettlement implementation organization assigned by PPC has to inform affected people on proposed relocation options and publicly announce the options at their offices and at local commune/ward PC offices where there are lands to be acquired by the project, and at the resettlement sites, at least 20 days before the competent authority approves the resettlement options; (10) Relocated people, who lose more than 30% of their agricultural lands directly-cultivated by themselves but are not compensated with appropriate replaced lands, should be subject to livelihood restoration programs. These programs should be a combination of job training and job-creating measures through provision of non-farm land at a location convenient for running non-farm activities or services; (11) The poor (classified based on criteria of the Ministry of Labors, Invalids and Social Affairs) affected by the project should be assisted to overcome poverty;
Decree 84/2007/ND-CP May 25 2007	• This decree makes provision for the grant of land use right certificates, house ownership and residential land use right certificates; exercise of land user rights; recovery of land and land related compensation and support; procedures for land recovery, compensation, support and resettlement upon land recovery by the State for defense and security purposes, economic development, etc.; and for the settlement of land-related complaints. • This decree applies to all agencies, organizations and individuals involved in land administration and land use, and to agencies performing the function of state management of land. In particular, this decree states a relatively-detailed procedure to be applied for land acquisition, compensation and resettlement for development projects.

Source: JICA Project Team

2) Urban Planning Law

729 Under the Urban Planning Law, preparation of land reserve for plan-based urban development is legalized in Article 62, as followings:

i) People's committee of competent level shall be responsible for organizing site clearance for areas covered in urban plan for construction of social and technical infrastructure in service of public interests and implementation of approved detailed plan.

ii) Land acquisition and compensation is executed in accordance with land legislations. Upon acquiring land, land user is compensated for legally created assets prior to announcement of approved detailed plan.

iii) People's committee at levels shall give favorable conditions for contractors to follow plan and investment programs properly.

iv) Upon rolling out road construction projects under approved plan, competent state organs shall at the same time organize land acquisition on roadsides as planned, organize bidding to select investors or contractors in accordance with applicable law.

v) Scope of investment projects must be identified on basis of relevance to existing land use conditions, harmonious satisfaction of project objectives and urban embellishment, avoidance of land areas failing to meet requirements of construction, or impacts on urban architecture and landscape.

vi) If the investment projects uses only one part of land lot but remaining area is too small to meet land use requirements or it affects urban architecture and landscape, the state shall acquire and compensate land users.

vii) After detailed plan gets approved and announced, if the state has not conducted land acquisition, organizations and individuals in the planned areas are permitted to continue using, repairing, building temporarily in accordance with construction legislations.

3) Current Issues of resettlement

730 At present, land acquisition and resettlement are the bottleneck to implement urban development and transport development projects. It is said that about 80% of total project cost is for compensation in Hanoi City. There are several reasons which land acquisition and resettlement is difficult, as followings:,

i) Resettlement housings are provided in suburban areas which is not convenient compared to original places

ii) Condition for compensation is not satisfied for households and business owners

iii) Onsite resettlement is not popular, which move residents near original sites

7.2.3 Strategic Environment Assessment

731 Strategic Environment Assessment (SEA) is a component of General Plan, Zone Plan, Detailed Plan and Technical Infrastructure Plan under Urban Planning Law. Contents of SEA are as follows:

i) Evaluation of the existing urban environment conditions in terms of hydrometeorology,

water quality, air quality, ecosystems, geology, land erosion, solid waste, wastewater, noise, natural resources exploitation and use, climate change, and issues related to social, landscape, cultural and heritages to provide the foundation for urban planning alternatives.

ii) Forecast of environment change in the urban planning implementation process.

iii) Proposals on environment impact prevention, mitigation and remedy measures and environment monitoring plan.

iv) The Government shall promulgate the detail contents of strategic environment assessment in urban planning

7.2.4 Information disclosure and public consultation

732 According to Decree 84/2007/ND-CP, the people's committees at district level and commune level shall be responsible to publicize the orientation of land recovery (chủ trương thu hồi đất), the decision on land recovery (quyết định thu hồi đất), and the Detailed Plan of Compensation, Support and Resettlement (Phương án bồi thường, hỗ trợ và tái định cư), etc.

733 However, experience from many projects in actuality shows that the process and method to disclose such information undertaken by the people's committees of districts and communes are generally not sufficient and proper. Therefore, in many cases, the project-affected people are not easy to access to such information and present their opinions. Moreover, the need to organize consultation meetings with project-affected people is not clearly stated in any Vietnam laws and regulations on land acquisition and resettlement.

734 For international cooperation agencies, the timely dissemination of information to, and consultation with the project-affected people including nongovernmental organizations (NGOs), are considered essential for the effective implementation and sustainability of projects. JICA, as an example, has policy to disclose information on environmental and social considerations in collaboration with the recipient governments, in order to ensure accountability and to promote participation of various stakeholders. In addition, in the case of Category A projects (i.e. projects with significant adverse impacts), JICA has policy to hold at least a series of discussions at each stage of scoping, preparing an outline of measures for environmental and social considerations, and the completion of a draft of the final report.

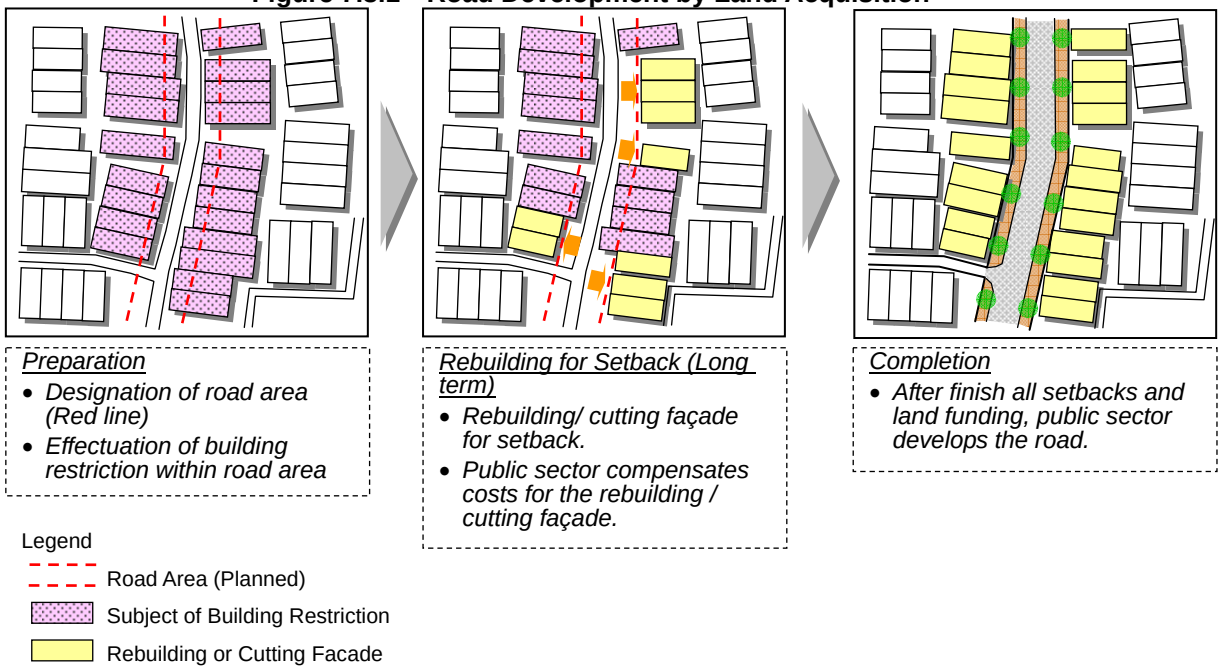
735 In several projects, the funding agency also urges the recipient country to prepare and distribute widely a booklet (or leaflet) of resettlement which generally includes the following contents: (i) Objectives of the project; (ii) Service area of the project and project site; (iii) Cost estimation and sources of capital; (iv) Project implementation planning (i.e., F/S, EIA, and basic resettlement plan preparation); (v) Project impacts; (vi) Definition of eligibility; (vii) Resettlement and compensation principles; (viii) Compensation policy; (ix) Subsidize allowances; (x) Settling complaints (grievance redress procedure).

7.3 Proposed Urban Development Scheme

7.3.1 Land acquisition under present legal system

736 At present, land acquisition by compensation or provision of resettlement housings is the only measure for road development and urban development (see Figure 7.3.1). Land acquisition measure by land recovery and compensation will be applied to UMRT development and integrated urban development project. However, it will be difficult to adapt land recovery for urban redevelopment/ urban renovation in built-up area. For instance, shortage of available lands for resettlement to the neighbors, low-profitability by increasing of land acquisition cost for the high amount of land price and compensation will make difficult to ensure the feasibility of project implementation.

Figure 7.3.1 Road Development by Land Acquisition



Source: JICA Project Team

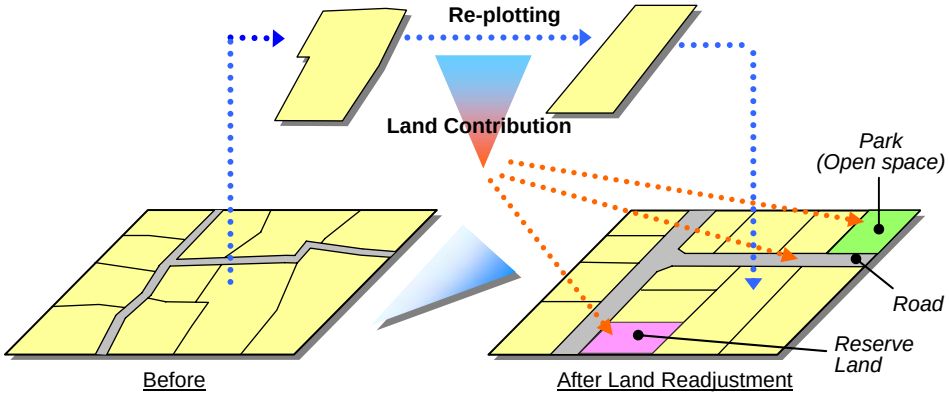
7.3.2 Proposed Land Redevelopment scheme

737 It is proposed that “Land Readjustment (LR)” scheme and “Urban Redevelopment (UR)” scheme with landuse right conversion. These new urban development schemes will be useful and effective for land preparation in addition to general land acquisition at present.

738 Land Readjustment (LR) is an integrated urban development measure including land re-plotting and infrastructure construction (see Figure 7.3.2). It is a well-known urban development measure in Japan and the same or similar system is adapted in more than ten countries such as Thailand, Indonesia, Germany, Turkey and Nepal. As typical function, it has land re-plotting system to consolidate land lots. Basically, land owners within the LR site can secure their own landuse rights during the project. In other words, LR is one of urban renovation measure by citizen participation with consensus building.

739 There is the “Land Contribution System” to secure lands for infrastructure, public open space and/ or reserved land for urban development. The project implementation body can secure reserved lands to sell for project cost as a self-financial system.

Figure 7.3.2 Schematic Model of Land Readjustment (LR)

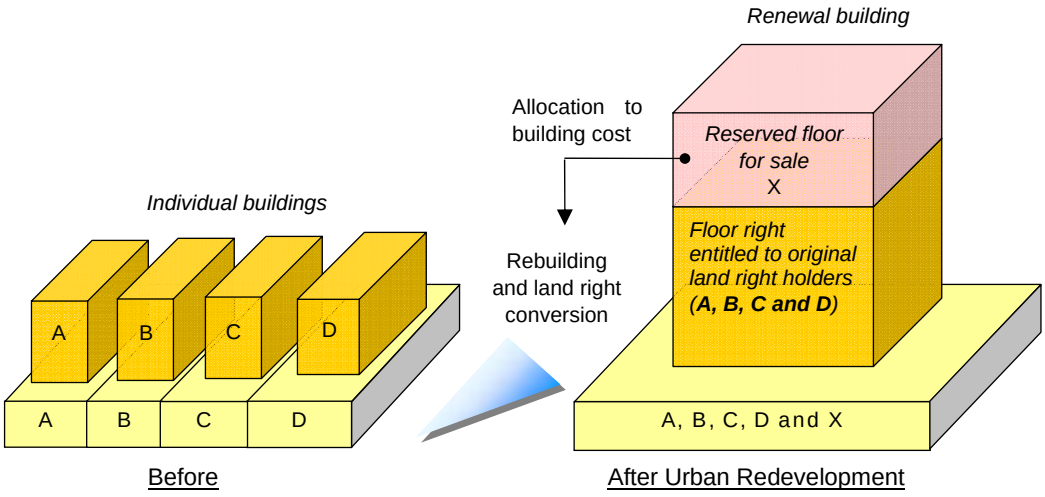


Source: JICA Project Team

7.3.3 Proposed Urban Redevelopment scheme

740 Urban Redevelopment (UR) is one of reconstruction measures using landuse right conversion system. This measure is used to combine of plural individual lands to a collective land to construct new apartments and large-scale buildings, which existing owners can resettle (see Figure 7.3.3). Original landuse right holders secure their landuse right during the project implementation period, and their landuse rights will be distributed to sectional ownerships of the new building. There is also a self-finance system to secure reserved floor for sale to recover the construction cost.

Figure 7.3.3 Schematic Model of Urban Redevelopment (UR)



Source: JICA Project Team

7.3.4 Proposed Land Banking system

741 To implement LR and UR effectively, “Land Banking (LB)” is a measure of priority land acquisition as an initial investment for future urban development. In case that private lands will be disposed by the owner, public sector acquires the land as an initial investment. In the future urban development, public sector uses the land as seed lot for consolidation of large land lot for urbanized land use and public facility.The measure is widely practiced in the world and proven an effective method to consolidate necessary land lot and to reduce the land acquisition cost of the public sector for the future urban development.

7.3.5 Proposed Urban development scheme using LR and UR

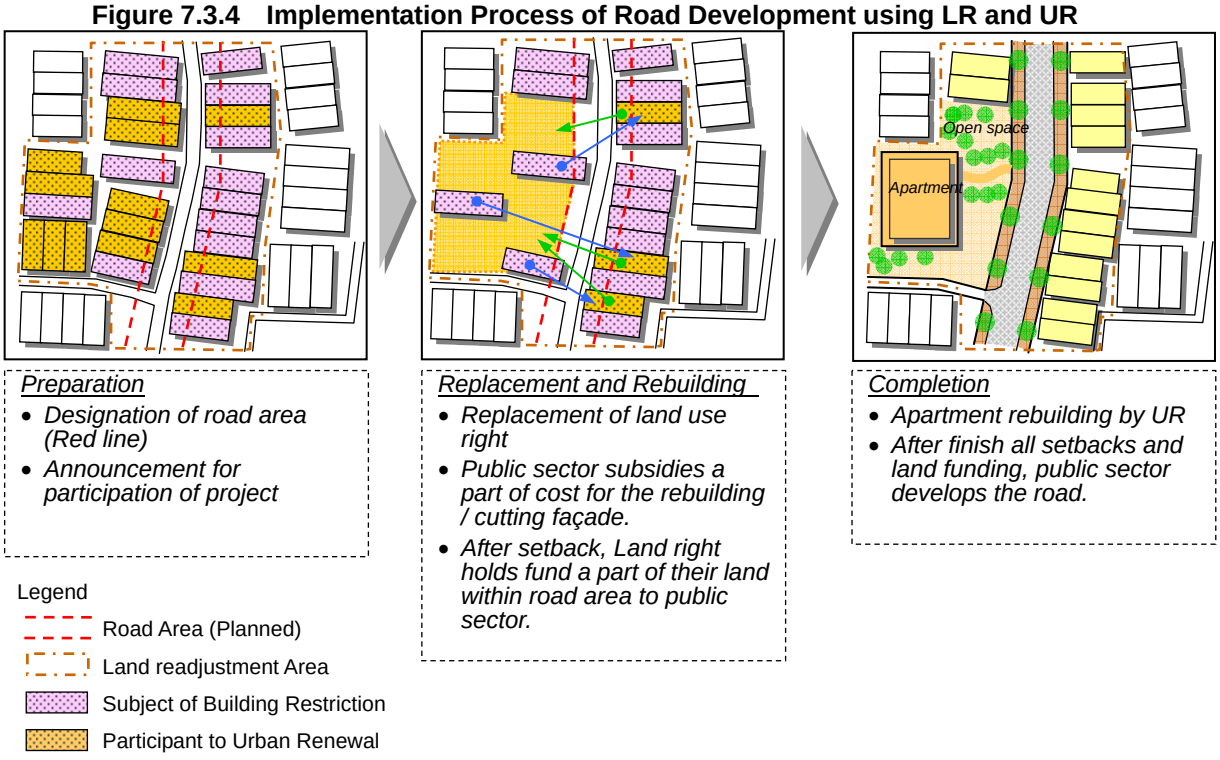
742 LR and UR schemes can be applied to urban development project with infrastructure development such as for road, ITF and railway. Proposed urban development scheme with land use right exchange with LR and UR aims at the following merits;

- Expand coverage area for land acquisition for infrastructure
- Provide options of on-site resettlement
- Encourage effective land use

743 The implementation process of proposed hybrid scheme of LR and UR is as follows (see Figure7.3.4):

i) Define a project boundary for road development, which is wider than ROW
ii) HPC announces and requests for participation of the project to landuse owners inside project boundary.
iii) Participants who agree with the project will convert landuse right to floor right of new apartment by Urban Redevelopment scheme
iv) Non-participants will exchange land with participants by Land Readjustment scheme
v) Participants will construct a new apartment and move to plotted housings
vi) Road will be developed by subsidy of public sector
vii) With using profits of Urban Redevelopment Project of new apartment, openspace will be developed.

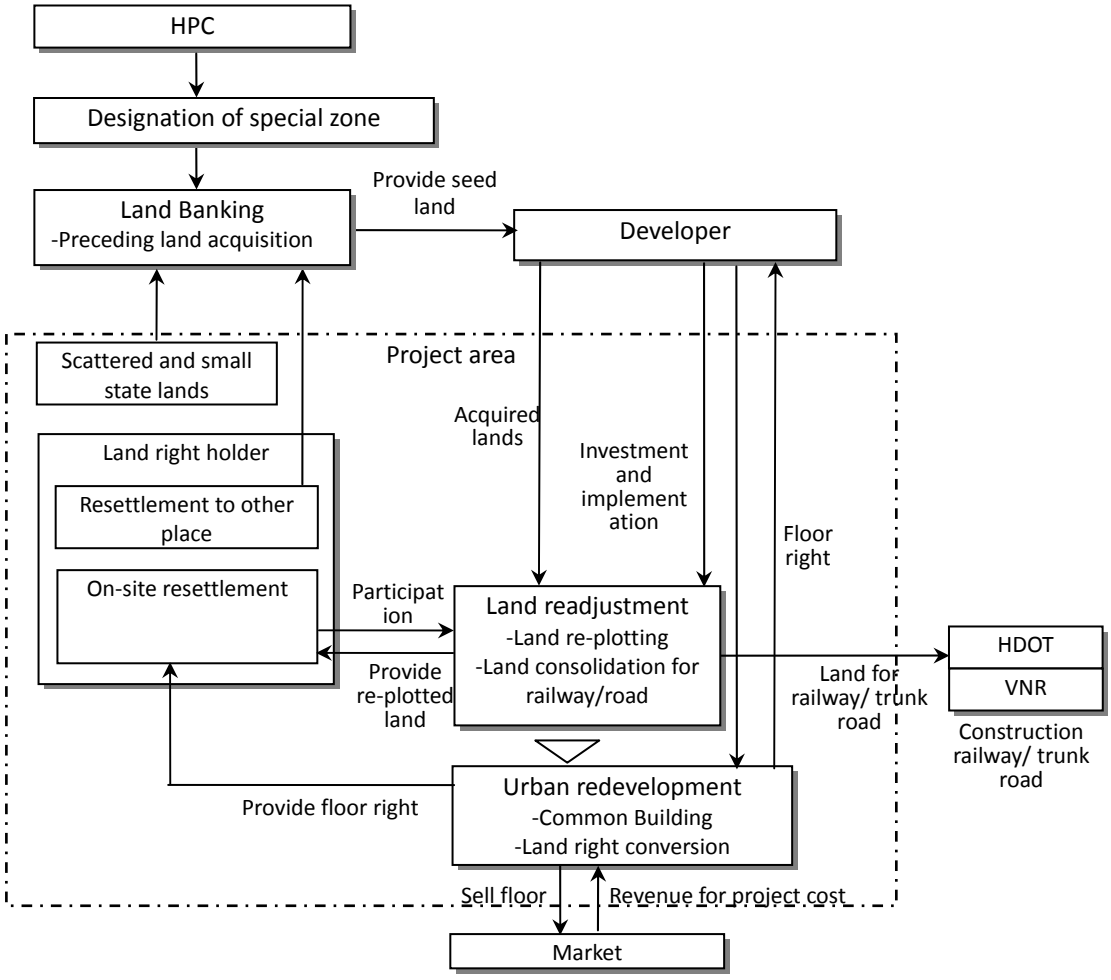
Figure 7.3.4 Implementation Process of Road Development using LR and UR



Source: JICA Project Team

744 The proposed urban development scheme using LR and UR is as follows (see Figure7.3.5):

Figure 7.3.5 Proposed Urban Development Scheme using LR and UR



Source: JICA Project Team

745 Proposed measures for land preparation and urban development will be applied to various types of project for UMRT and integrated urban development (see Table7.3.1).

Table 7.3.1 Implementation Measure for Integrated Urban Development in UMRT Station Area

Type of Project		Implementation Body			Measures for Land Preparation			Financial resource		
		Public sector	Private sector	PPP	Land acquisition	Land Readjustment	Urban redevelopment	ODA loan	Subsidy	Private
Minimum	Station and related facility	●	-	○	●	○	-	●	-	○
	ITF facilities	●	-	-	●	○	-	●	-	-
	Road/ Walkway improvement	●	-	-	-	-	-	-	●	-
	Road/ Walkway Development	●	-	-	●	○	-	-	●	-
Short/ Mid-long term	Road/ Walkway Development	●	-	-	●	○	-	-	●	-
	ITF facilities	●	-	-	●	○	-	-	●	-
	Feeder bus service	●	-	-	●	-	-	-	●	-
	Shifting Existing Bus terminal	●	-	-	-	-	-	-	●	-
	Urban Redevelopment	-	●	-	-	○	○	-	-	●
	New Urban Development	-	●	-	●	-	-	-	-	●
	Urban Renovation	●	○	-	●	○	○	-	●	○
	Living condition improvement	●	-	-	●	-	-	-	●	-

Legend ●: Basic measure, ○: Optional Measure, -: none
Source: JICA Project Team

7.3.6 Feasibility of proposed implementation scheme using LR and UR

1) Preceding Land Acquisition

746 Regarding land acquisition, proposed implementation measure adopts land banking system using preceding land acquisition. It is useful for securing seed of land for infrastructure and urban development and for managing and controlling development by private sector. However, in existing legal scheme, there are some legal issues as follows;

- Difficulty of land acquisition before project approval: In principle, it is necessary to acquire a project approval to carry out land acquisition. There is no legal basis for land banking and preceding land acquisition at present.
- Difficulty of land acquisition for combined purposes of infrastructure and urban development: In principle, infrastructure project and urban development project are separated in existing legal system. So that, the land acquisition should be separated into each project purpose. Therefore, it is difficult that one organization acquire lands for both purpose of infrastructure and urban development.
- Difficulty of land acquisition for urban development by HPC: HPC is permitted only public activities and not be able to implement profitable activities such as commercial development. Therefore, HPC cannot acquire land for urban development which generates profits. It needs to use umbrella organization or company to do this.

747 For land banking and preceding land acquisition, designation system of special zone will be proposed. This system includes following functions;

- To designate a project boundary of urban development project for public interest.
- To restrict construction activities and transaction of land use right within boundary.
- To permit HPC to acquire land use right in advance of project approval.

2) Exchange of Landuse Right (Land re-plotting and land right conversion)

748 Typical feature of LR and UR measure is exchange system of land use right using land re-plotting and land right conversion. Although there is no legal scheme for land re-plotting and landuse right conversion in existing legal system in Vietnam, there is a possibility to implement a proposed measure for on-site resettlement.

749 In general, there are three types of compensation and resettlement measures such as i) paying compensation money, ii) providing residential lands and iii) providing housings. Under present legal situation, land re-plotting and land right conversion will be implemented as resettlement of providing residential land and apartment. In this scheme, developer provides land lots or floor right after urban development as compensation to original landuse right. In other words, this scheme maybe similar with land pooling system rather than LR and UR. And it should be noted that under the current regulation compensation and resettlement measured could be designed based on contractual basis without being consistent with normal stipulated procedures.

750 However, existing resettlement scheme is only for residential purpose, but not for commercial and business purpose. Therefore, it is unclear to apply this scheme to commercial and business purpose lands at present. Asset right of apartment generally consists of sectional ownership. Each resident has sectional floor right and common land use right. However, sectional ownership scheme is only for apartment, there is no legal basis of sectional ownership for commercial and business use building. Therefore, it will be difficult to implement land use right conversion project for commercial and business building.

751 However, it is because there has been no preceding example of this right conversion. New system and methodology should be proposed and set a bench mark for the new way of right conversion in urban development.

3) Legal power of re-plotting and land right conversion plan

752 For the implementation of LR and UR, most important issue in legal aspect is how to secure land rights and land right exchange plan during project implementation. In Japan, securement of landuse right of individual owners during project implementation period is legalized by “Land Readjustment Law”, “Urban Redevelopment Law”, as well as a basic law of “Law on Land”. In case of Vietnam, it is possible to implement LR and UR only as a resettlement measure under existing legal system. In this case, the resettlement plan should be included as a part of approved urban development project plan and has legal power by the official decision.

4) Implementation body for LR and UR

753 Private developer will be able to implement the urban development project with LR and UR under the decision. VNR and Special Purpose Company (SPC) (see 7.7 in detail) who has right to implement urban development project are also able to implement LR and UR project. However, HPC is not permitted to implement profitable activities including urban development, but an umbrella company is permitted. Therefore, private developer, VNR and SPC with a HPC umbrella company would be able to implement LR and UR.

Table 7.3.2 Feasibility of proposed Implementation scheme with LR and UR

Proposed scheme	Feasibility in existing legal system	Proposal on legal improvement
Preceding land acquisition	• Difficult of land acquisition before project approval • Difficult of land acquisition with combined of purpose for public infrastructure and urban development • Difficult of land acquisition with commercial purpose by HPC	• Establish of project boundary designation system for land banking and preceding land acquisition before project approval. • Permission to HPC of land acquisition within designated special zone.
Land re-plotting	• Possible to implement as one of resettlement measure • Only for residential land • Unclear of commercial purpose resettlement	• Addition resettlement method for commercial and business purpose land • Or establish newly legal scheme for land re-plotting
Landuse right conversion	• Possible to implement as one of resettlement measure • Only for apartment project • No legal basis of sectional ownership for commercial building	• Addition resettlement method for commercial and business purpose land • Establish sectional ownership scheme for commercial and business purpose building • Establish new legal scheme for landuse right conversion
Legal power of land re-plotting and land right conversion plan	• Possible of provide legal power by official decision of urban development plan including resettlement plan	
Implementation body	• Possible of LR and UR by private sector, VNR and SPC with HPC umbrella company • Difficult for HPC to implement LR and UR project with commercial purpose	• Permission to HPC of land acquisition within designated special zone.

A: Possible, B: Possible with condition, C: impossible

Source: JICA Project Team

7.4 Proposed Project Implementation Mechanism

7.4.1 Phasing based on Time and Feasibility

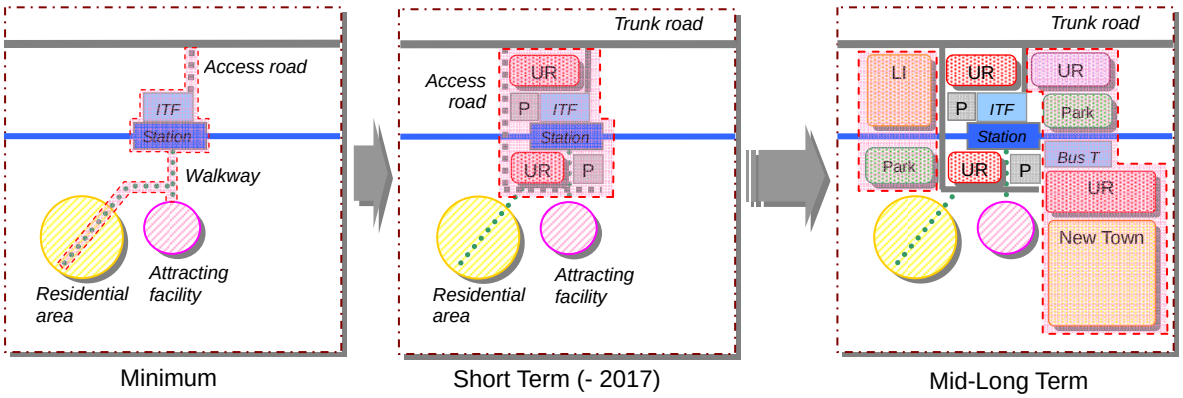
754 A long gestation period will be required to materialize any kind of full-fledged urban development. Furthermore, careful consideration should be given to the planning and development if it is integrated with the development of a UMRT system. Special attention should be given to the following aspects:

- Incorporation with existing urban construction plan;
- Adjustment with existing railway development plan;
- Coordination with the UMRT development;
- Complicated land acquisition and resettlement;
- Clear delineation and role sharing of public sector , railway developer and private sector;
- Combination of different financing sources

755 In order to cope with the above difficulties, a step-by-step approach must be taken to implement the proposed projects. The following phasing is proposed and the image of this phasing is illustrated in Figure 7.4.1:

- **Minimum Development:** It includes station and its related facilities, Inter-modal Transfer Facility (ITF) facilities and road/ walkway development for accessibility from/to UMRT station. They are minimum facilities to operate of UMRT and to use UMRT station. They must be developed by UMRT opening in 2016.
- **Short Term Development:** It includes small scale and/ or high feasibility project in perspective of land acquisition and urban development projects has high-synergistic effect by developing in time for the UMRT opening.
- **Mid/ Long Term Development:** it includes large scale and/ or time consuming projects in perspective of land acquisition, securing financial resources and tendency of private investment, infrastructure condition in surroundings, necessary institutional arrangement including new legislation.

Figure 7.4.1 Step-by-Step Development and Proposed Phasing



Source: JICA Project Team

7.4.2 Project Packaging

756 Packaging of different project elements is essential tool for project implementation. The following aspects should be carefully taken into consideration when packaging the projects:

- **Timing:** As illustrated above, timing of implementation for each project element is the most important aspect of project packaging;
- **Same Function and Objective:** Projects could be packaged together in accordance with same function and objective as adopted in this project as follows:
  - (i) Station and related facility development
  - (ii) Road development
  - (iii) Urban development project
  - (iv) Green and open space development
- **Priority on realizing railway function**: Projects should be implemented so as not to avoid realization of railway function. For example, underground commercial property development should not disturb construction of railway facilities or constraint accommodation of basic railway facilities such as sub station for railway operation. Absolute priority should be given, in the process of planning, to the realization of railway function so that integrated urban development would not negatively affect the railway operation.
- **Consideration on Private Sector Involvement:** When packaging the projects consideration on private sector involvement is specially important in the following aspects:
  - (i) Development of commercial/office/residential property integrated with station
  - (ii) Kiosk and other in-station business development
  - (iii) Integration of IC card ticketing and credit card/e-money business
  - (iv) Sharing of cost for infrastructure and related facilities development
  - (v) Financing the implementation of project package
  - (vi) Possibility of Public and Private Partnership (PPP) in implementing project package

7.4.3 Responsibility and Risk Sharing among Major Stakeholders

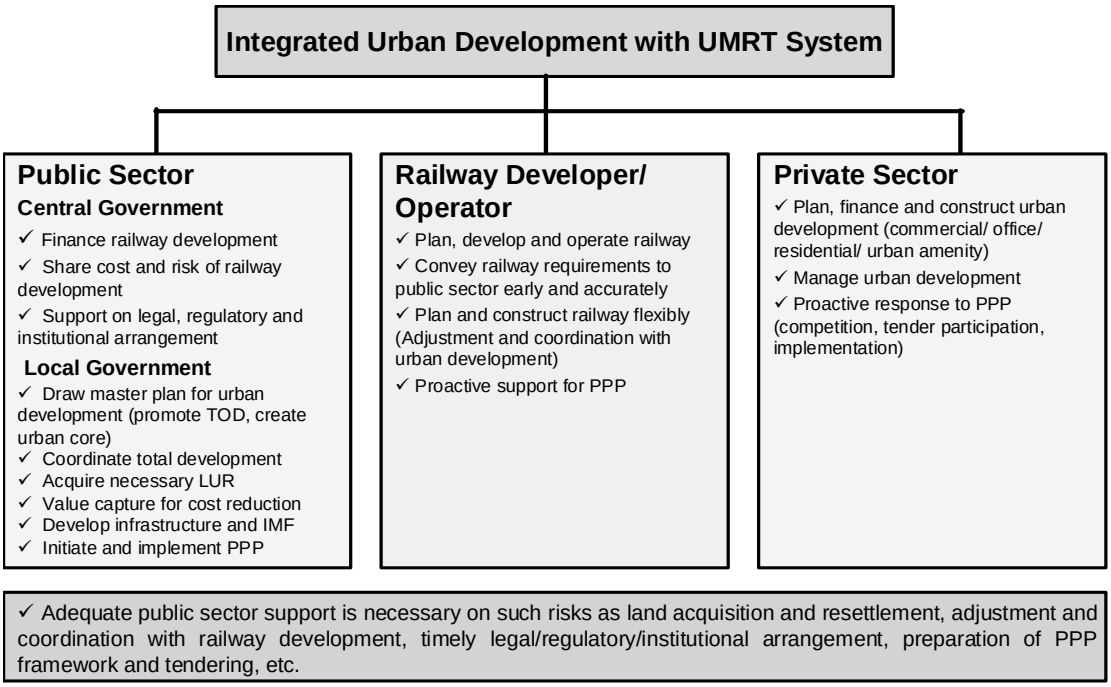
757 To accomplish a large scale integrated urban development with UMRT system, three major stakeholders will be involved, namely public sector, railway developer/operator and private sector. Responsibility and risk among these three stakeholders will be shared as follows and described in Figure 7.4.2. Details of the above will be described in the following sections.

- **Public Sector:** (i) Finance railway development, (ii) Draw up grand design of the development and coordinate implementation, (iii) Acquire necessary LUR, and (iv) Initiate and implement PPP;
- **Railway Developer and Operator:** (i) Plan, construct and operate railway, (ii)

Convey railway requirements to the urban development side, and (iii) Support PPP proactively;

- **Private Sector:** (i) Plan, finance, construct and manage the urban development, and (ii) Respond PPP proactively

Figure 7.4.2 Responsibility and Risk Sharing among Major Stakeholders



Source: JICA Project Team

7.4.4 Responsibility of Public Sector

1) Responsibility of Central Government

(1) Finance railway development

758 Since construction of UMRT system involves huge initial investment and it is generally very difficult to recoup this investment just by fare revenue, essential responsibility of the central government is to finance the UMRT development. Concessional funding with long term repayment period and low interest rate could be procured by the central government and used for initial investment. The initial investment cost could be shared with local government, in this case Hanoi PC, with part of it to be covered by cash flow generated through the UMRT operation.

(2) Support legal, regulatory and institutional arrangement

759 Some of the necessary legal, regulatory and institutional arrangement will also be the responsibility of the central government. To materialize the large scale urban development proposed in the previous chapters, the legal, regulatory and institutional arrangement related to the following aspects should be conducted by the central government:

(i) Underground property development

(ii) Legal framework and necessary regulations for land readjustment

(iii) Legal framework and necessary regulations for urban redevelopment

(iv) Legal framework and necessary regulations for private urban development

(v) Legal framework and necessary regulations for urban redevelopment under PPP format

2) Responsibility of Local Government

(1) Draw up grand design of the development

760 Most essential responsibility of the local government is to draw up a grand design (master plan) of the integrated urban development with total UMRT systems in the jurisdiction such as the one which this JICA Study is now supporting Hanoi PC to prepare. Basic orientation of this grand design is promotion and facilitation of the concept of Transit Oriented Development (TOD) and the formation of urban cores.

(2) Coordinate total development

761 Based on the above master plan, the local government is responsible to coordinate the total development among the development of public sector, railway developer and private sector in terms of timing, realized function, funding/budgeting, promotion of private sector participation, design and implementation of PPPs and so on. Detailed mechanism for coordination will be proposed in the later section of this chapter.

(3) Acquire necessary land use right

762 Since the management of land related matters is under the authority of local government, once the right of way (ROW) of UMRT is finalized, acquisition of necessary land use right (LUR) and resettlement will be conducted by the local government for the railway developer. In addition to that land banking (preceding land acquisition) of necessary seed land tracts in the vicinity of large scale station based urban development should be conducted in advance by the local government so as to facilitate formation of large development lot in the vicinity of the UMRT station by using and exchanging those seed land tracts. In this way early LUR acquisition could save the cost of total development. This method has been practiced in Japan and Singapore and proven effective.

(4) Value capture for cost reduction

763 Total value which a railway system brings about along its corridor is huge and grows in time as a network of railway forms. Fare revenue from the railway passengers is only a small portion of the total development value captured. The rest of the value created by the railway development resides in the increased value of property along the corridor. The value increase is especially large around the stations. The local government should capture and utilize this increased value to reduce its financial burden on the cost sharing of the railway development and related facility development such as access road, station plaza and Inter-modal Transfer Facilities (ITF). The following are the example of Value Capturing Methodology:

- Development charge
- Developer’s contribution
- Special assessment district
- Tax Incremental Financing (TIF)

- Land Readjustment
- Urban Redevelopment
- Land auction/sale of LUR/land lease
- Public and Private Partnership (PPP)

764 Some of the above-listed methodologies will be described in detail in the later section of this chapter. Ultimate value capturing for the local government is the tax revenue increase from the ownership and transaction of the value increased property along the corridor.

(5) Develop infrastructure and inter-modal transfer facilities

765 Access road and inter-modal transfer facilities are essential infrastructure for a railway station to function effectively as a railway station. Responsibility is basically with the local government and related local agencies. Cost of development could be shared and reduced by adopting the value capturing methodologies as described above. Since it is common element of station development for all the stations, development of ITFs could be bundled as one package for procuring concessional funding such as bilateral and multi lateral loan to finance a part of its development for all the stations of one UMRT line.

(6) Initiate and implement PPP

766 Public and Private Partnership is effective way to design and implement an integrated urban development with the development of UMRT system. PPP must be initiated by the local government which has total authority about the management of land use right, urban planning, building control and provision of infrastructure.

767 The local government should prepare a proper framework in which PPP for the integrated urban development is implemented. A task force unit specialized in promotion and implementation of PPP project should be established in the local government to design and manage the PPP process for implementing the integrated urban development under the PPP format. Details of PPP implementation will be described in the later section of this chapter.

7.4.5 Responsibility of Railway Developers/Operators

1) Plan, develop and operate railway

768 Responsibility of the railway developer/operator is to plan, develop and operate the railway system properly, and to provide efficient transportation service and linkage among urban cores so that mobility of people is increased and quality and value of urban environment along the corridor could be enhanced to a great extent.

769 One important issue is establishment of organization to control and manage total network of UMRT lines in Hanoi Metropolitan Area. As far as the urban development is concern, to what extent the railway developer and operator side could handle the property development will be important issue to determine.

2) Convey railway requirements to public sector early and accurately

770 It is a critical success factor for the railway developer to convey the important requirements to the urban development side, mainly the local government, as early and accurately as possible so that the requirements could be properly reflected to the urban development. The following are examples of such requirement:

(1) Construction Plan

- Right of way (ROW) for the railway development should be clearly delineated so that the boundary of the railway side and the urban development side could be identified in terms of planning and implementation: Since this will provide a base and will become an essential prerequisite for drawing up an integrated urban development plan for each station area, urgent negotiation and agreement on final ROW between VNR and HPC is necessary at this moment.
- Specification of construction (location, volume, timing, construction load, construction method, etc)
- Urban design (Station design, building height, etc)
- Land acquisition and resettlement policy

(2) Operation Plan

- Railway operation plan
- Station related facilities development (station plaza, car and motor bike parking, bicycle parking, pedestrian decks, etc) and whether they are developed by the railway side or not.
- Kiosk and in-station business, in station plaza business, etc.

(3) Demand Plan

- Major movement lines (station entrance/exit, major access from surrounding area: pedestrian, automobile, bus, taxi), service movement line.
- Forecast of railway passengers at each station for both boarding and alighting in each time segment in future years, and modal split.
- Transfer for other transport modes (UMRT, VNR, Bus, etc) and whether the ITFs will be developed by the railway side or not.

(4) Others

- Social and environmental assessments
- Land use plan for land tract owned by the railway side and used for non railway use

3) Plan and construct railway flexibly

771 Construction of railway is generally planned rather rigidly in terms of timing and specification whereas the progress of urban development would be largely dependent on such changing factors as property market cycle, availability of finance, business decision of anchor tenant and so on. Therefore, perfect orchestration of both the railway development and the urban development is very difficult.

772 One solution is to give some flexibility to the planning and construction of the railway. For example, station could be designed and constructed so that plausible but new future entrance or access walk way could be accommodated and opened when it becomes necessary in the future. Transferability with future UMRT lines could be secured when the hub stations are designed and constructed to accommodate such future linkages.

4) Support PPP proactively

773 Success factor for implementing PPPs is clear cut risk allocation between the public and the private. However, PPP in this integrated urban development will be

conducted by three some, the public, the railway and the private. So, we need to design proper risk allocation among the three as illustrated in the previous Figure. Since, at some major stations, the railway developer owns a large tract of land which could be used as a seed land for large scale urban development, the railway developer may take an initiative to lead the PPP project. It could even form a strategic joint venture with selected private sector partner to implement a large scale urban development which is fully integrated with the development of major UMRT station.

7.4.6 Private Sectors Involvement

1) What is PPP?

774 The term “public-private partnership” (“PPP”) has been in general use since the 1990s. However, there is no widely agreed, single definition or model of a PPP. The term “PPP” covers a range of different structures where the private sector delivers a public project or service. Concession-based transport and utilities projects have existed in EU member countries for many years, particularly in France, Italy and Spain, with revenues derived from payments by end-users. The UK’s Private Finance Initiative (“PFI”) expanded this concept to a broader range of public infrastructure and combined it with the introduction of services being paid for by the public sector rather than the end-users.

775 The use of PPPs has now spread to most EU country and some Asian countries such as Japan and Korea, and depending on the country and the politics of the time, the term can cover a spectrum of models.

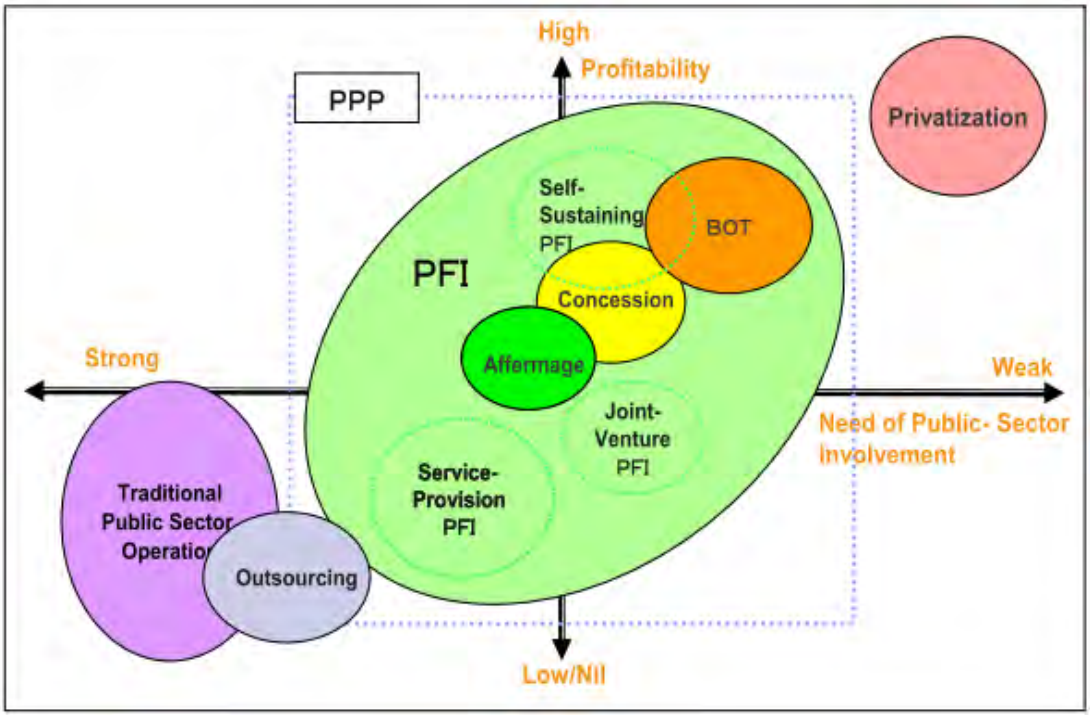
776 These range from relatively short term management contracts (with little or no capital expenditure), through concession contracts (which may encompass the design and build of substantial range of services and the financing of the entire construction and operation), to joint ventures and partial privatizations where there is a sharing of ownership between the public and private sectors (Figure 7.4.3).

777 Under traditional public sector approach, the public sector designs, builds, operates, and maintains infrastructure, and sets level of quantity and standards of service quality, while under privatization approach, the private sector conducts all of these aspects in place of the public sector. Under PPP approach, the public sector is ultimately accountable for service provisions, although the private sector designs, builds, operates and maintains infrastructure. PPP ensures provision of services to general public, but at lower cost and better quality by the use of private-sector management skills and finance capabilities.

778 Expected Benefits with PPP are as follows:

- Reduction in life cycle costs of the public service by PPP compared to the traditional public sector work.
- Better and less expensive service delivery by maximizing the use of private sector skills and allocating risks to the party best able to manage or absorb each particular risk.
- Contributing to private sector development by developing a new market for the private sector.
- Mitigating public budget constraints and making the project affordable for the public sector in the long term.

Figure 7.4.3 Positioning of PPP Options



Source: JICA Project Team

779 The following are the key requirements for PPP implementation:

- Strong political commitment and continuous government support for establishing sufficient PPP regulatory and institutional framework and gaining confidence from the private sector.
- Sufficient capacity of the public sector to design and manage the implementation of PPP projects
- Appropriate risk allocation in designing and implementing PPP projects
- Transparent and fair selection procedure of private sector proponents
- Mature and experienced domestic capital market and financial institutions for provision of long term project finance
- Certainty of the elements required to forecast project cash flow such as feasibility of fare increase, addition of competing projects, change of subsidy system, etc.
- Setting an appropriate counterpart for PPP in the public sector side to promote better coordination and dialogue between the public sector and the private sector.

780 In Vietnam, there has been a few examples of PPP projects implemented in power generation and telecommunication sectors in the past however there are also some examples in water treatment plant (bulk water supply) and expressway development with urban development concession along its right of way. HPC has experienced one of the expressway PPPs called Lang-Hoa Lac Expressway which has above mentioned urban development concession. However, MOT has taken an initiative for the implementation of the project, thus experience of HPC in the details of PPP project may be limited at present. Currently DPI with assistance from World Bank is preparing a PPP regulatory framework called “PPP financing framework” which includes viability gap funding mechanism. The framework has been drafted already and is scheduled for Prime Minister’s approval in the fall of 2010, which may be applicable

for PPPs in the urban development sector.

2) Implementation of PPPs in Urban Development

781 Land Readjustment (LR) and Urban Redevelopment (UR) schemes which are widely diffused in Japan are one form of PPP in urban development. Special characteristic of these schemes are as follows:

- Land related rights and floor area rights of the residents in specified area are pooled and redistributed based on the previous right in terms of property value under contractual arrangement.
- Increased property value due to the provision of proper infrastructure, road and commercial development is captured in terms of surplus land and floor area which are sold to the market to cover a part of investment.
- Power of implementing body and framework is backed up by special legislation to secure exchange of rights, implementation and financing.

782 The above characteristics are generally common for the PPPs in urban development. Therefore, critical success factor is to properly capture the increased value of the property and use it to cover and reduce the financial burden of public investment and attain sustainable management of the whole development. The value increase and value added will be further enhanced when the urban development is integrated with the development of station and UMRT corridor.

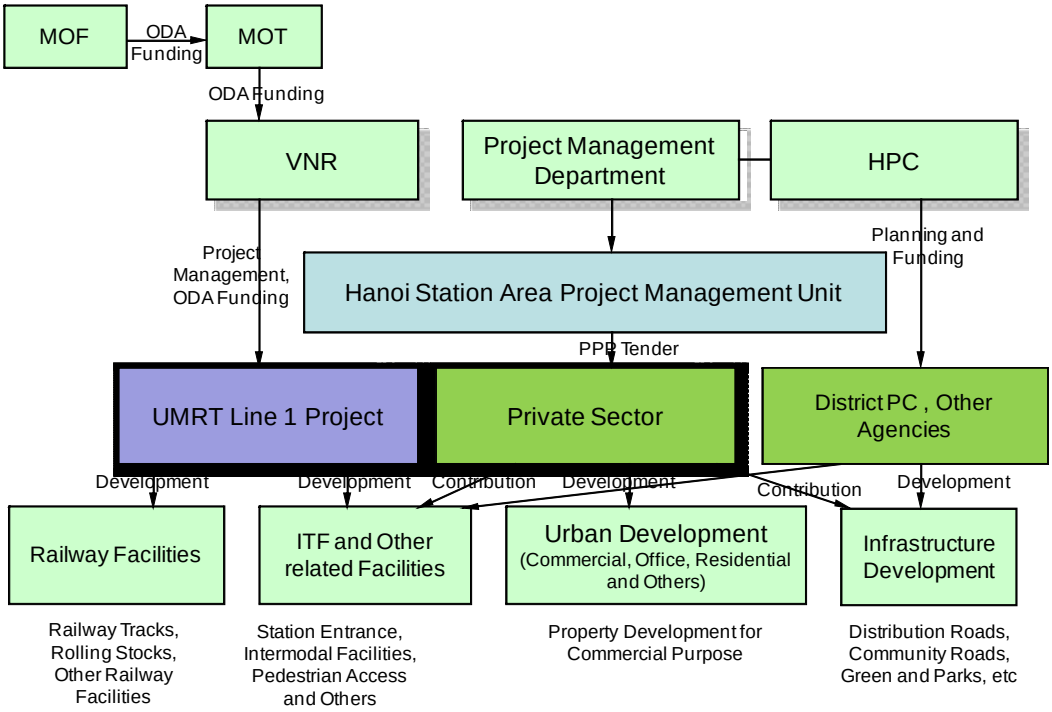
3) Plan, finance and construct urban development

783 Even though the framework is prepared by the public sector, main player of this PPP is by all means the private sector. They compete, plan, finance, construct and manage urban development based on their experience, know how, network, technical, financial and human resources to plan and maximize synergy benefit of railway and urban development and return the increased value to the locality for the benefit of residents.

784 This could be the only business model which makes railway business profitable and financially self-standing as has been proven in the history of Japanese private railway business development in which the railway business and urban development are integrated and enjoy synergy benefit under the same corporate umbrella.

785 Generally a PPP project is implemented on the basis of hybrid structure among the stakeholders as illustrated in Figure 7.4.4.

Figure 7.4.4 Example of Hybrid PPP Implementing Structure



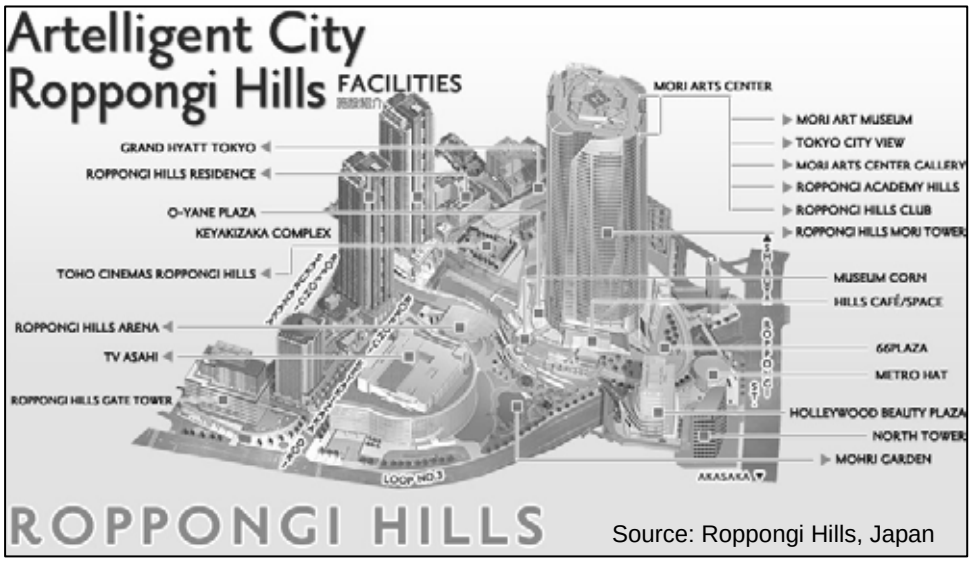
Source: JICA Project Team

4) Management of urban development

786 Management of developed commercial and residential facilities is source of sustainable profit for the private sector. In large scale urban development there are various facilities and properties to be managed as illustrated in Figure 7.4.5.

787 Part of the infrastructure and utility services such as district road, open space, area cooling and heating system, waste water treatment could be developed and managed by the area management organization established mainly by the initiative of the private sector developer to provide comprehensive and sustainable area management. This kind of private sector initiative could, as a result, reduce the total cost of the management to be shouldered by the public sector.

Figure 7.4.5 Facility Management of Roppongi Hills (Japan)



Source: Roppongi Hills, Japan

5) Respond to PPP proactively

788 Urban development at the major station could become very large in scale and have huge potential for commercial profit. Therefore, under the PPP format and the framework prepared by the public sector, private sector proponents will proactively participate in the PPP tender and compete in ideas, know how, network, technical, financial and human resources to come up with proposals of urban development at the global standards.

7.4.7 Financing

1) General orientation for financing integrated urban development

789 Financing of integrated urban development must be planned and implemented in an comprehensive manner by carefully considering important financing elements such as implementation body, method of procuring necessary land tracts and available funding sources. It is necessary for the public sector to lead the financing of the minimum elements such as station and related facility development, ITF facilities and road/walkway development so that potential of integrated urban development could be enhanced and trigger the private sector development in the vicinity of UMRT stations. For doing so, grant technical assistance could be procured for planning and packaging the project and concessional funding such as bilateral and multilateral loans may be utilized to finance the minimum development.

790 In the mid-long term development, various value capturing methodologies, which leverage market growth potential in the vicinity of UMRT stations and of the UMRT corridors, such as land readjustment, urban renewal, developers contribution, land banking and utilization of public LUR, Public Private Partnership and so on could be utilized to finance the integrated urban development. It is important concept for mid-long term development to capture the value created by the formulation of UMRT corridor and public transit accessibility (increased value of urban development potential) to cross-subsidize the development of necessary public facilities such as station related facility development, ITF facilities and road/walkway development so that the total financial burden on the public sector for the development of necessary infrastructure and community facilities could be reduced to a considerable extent.

2) Leveraging ODA funding to facilitate PPPs

791 Various financing sources must be combined to finance an integrated station area development as illustrated in Table 7.4.1. To initiate this combination of financing package, possibility of procuring concessional funding such as bilateral and multilateral loans may be examined for financing the development of inter-modal transfer facilities at each station which is packaged as one project to be funded. It is essential element for the functioning of railway station and should enhance active participation of private sector investors and developers in unsolicited development proposal and in the solicited PPP tender for the station area development.

Table 7.4.1 Implementation and Financing Program of Hanoi Station Area Development

Project type	Name of project	ID	Schedule	Implementation method	Implementation body	Financial resource
Station and related facility development	Station	S1	Minimum	Utilization of ROW and land acquisition from SOE land	VNR	ODA
	West ITF	S2	Minimum	Utilization of ROW and land acquisition from SOE land and private land	VNR	VNR/HPC[1)]
	East ITF	S3	Minimum	Utilization of ROW of VNR (no land acquisition)	VNR	VNR/HPC[1)]
	Underground parking and mall	S4	Short	Utilization of underground of VNR land, SOE land and private land	HPC/Private	Public/ Private
	Pedestrian underground and square	S5	Short	None	HRB	Public/ Private
Road development	New west access road (w=24m)	R1	Minimum	Land acquisition recovery from private land	HDOT	HPC
	Widening of NH-1 (w=30m)	R2	Minimum	Land acquisition from ROW of VNR, SOE land and private land	MOT	MOT
Urban development project	Urban development of VNR owned land	A	Short	Utilization of ROW and land recovery from SOE land and private land, and development with UR	VNR/Private	VNR/Private
	Development of district heating plant and distribution network	B	Short	Utilization of underground of station (no land acquisition)	Power company	Power company /private
	Urban redevelopment of Van Chuong KTT	C	Medium	Land recovery from private land, and development with UR	HPC/HUD/Private	Private
	Urban redevelopment of northern built-up area	D	Long	Utilization of ROW and land recovery from SOE land and private land, and development with LR and UR	VNR/Private	Private
	Urban redevelopment of surrounding area of water factory	E	Long	Land recovery from water factory area and private land, and development with LR and UR	Private	Private
	Urban redevelopment of cultural and public complex	F	Long	Land recovery from private land, and development	HPC/Private	Public/Private
Green and open space development	Development of Linh Quang Lake Park	G1	Medium	Land acquisition from private land	HPC	Public

Source: JICA Project Team

7.4.8 Proposed Procedures for preparation and implementation for Integrated UMRT Station Area Development

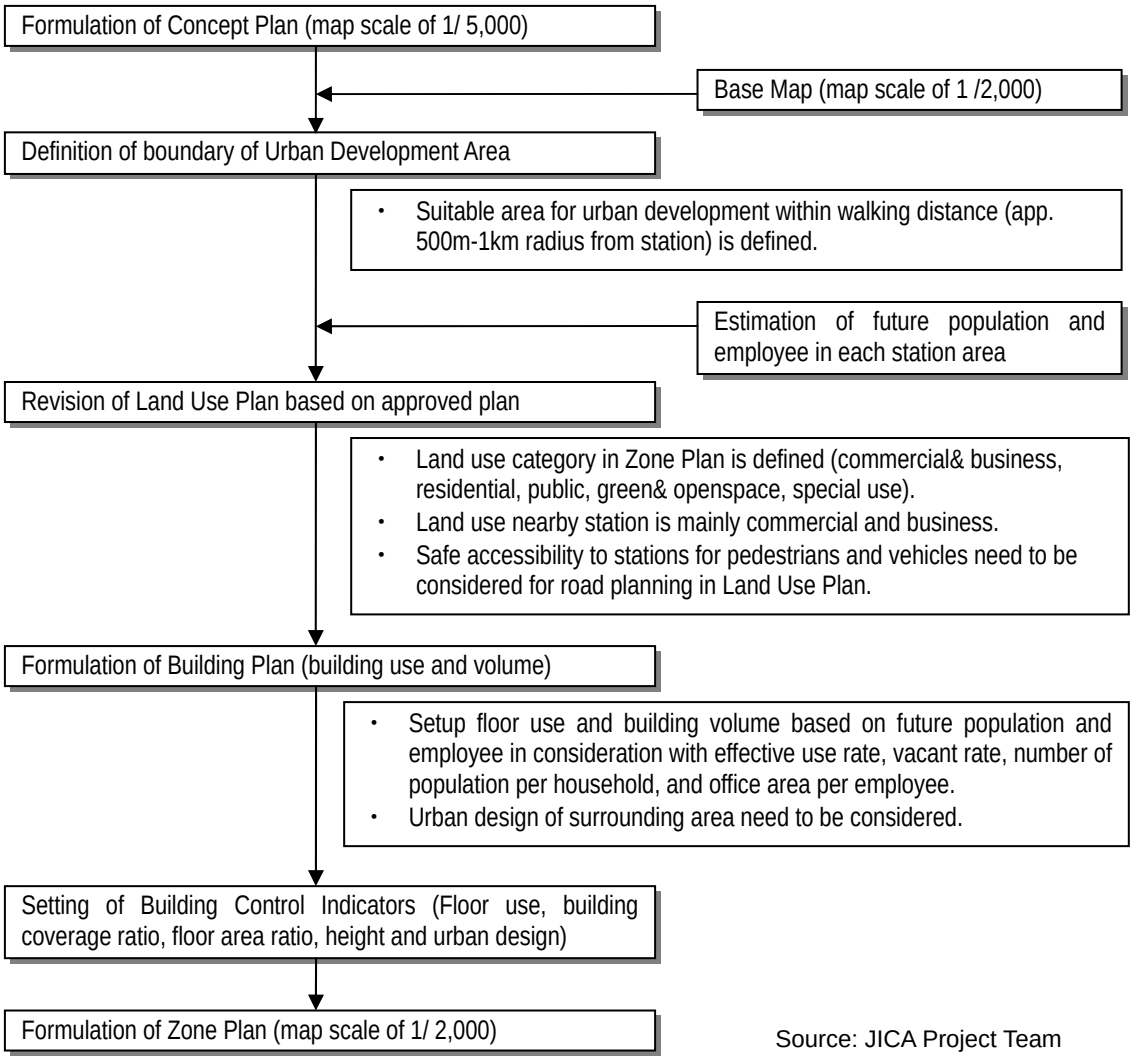
792 For implementation of integrated urban development project with UMRT and its surrounding areas, it is necessary to establish and improve the legal system related to urban planning and management of urban development. The following activities by HPC and institutional arrangements are proposed for preparation and implementation of the integrated urban development with UMRT system in Hanoi;

1) Formulation of Zone Plan

793 In this project, Detailed Plans in 5 station areas were formulated which can be reflected into Zone Plan in accordance with Urban Planning Law. For implementation of integrated urban development in all station area, Zone Plans covering integrated urban development area around the station will be formulated by local district governments and approved by HAUPA.

794 Urban Planning Law stipulates that Zone Plan has to be formulated by 1/2,000 scale and has to describe land use, road network and indicators in each block. Indicators are consisted of: (i) Building Coverage Ratio (BCR), (ii) Floor Area Ratio (FAR), (iii) building height, for building control and urban design consideration. Proposed formulation process of detailed planning for Zone Plan is shown as following figure

Figure 7.4.6 Process of Detailed planning based on Concept Plan



Source: JICA Project Team

2) Establishment Special Zone system and the designation

795 Special zone for Integrated UMRT station area development will be proposed for smooth implementation of urban development. Special zone is designated for urban development area with public purpose in every UMRT station area. It is proposed that HAUPA or higher authority has authority to decide of the special zone. Special zone has mainly the following functions;

- Restriction of private building and construction
- Limitation of purchasing and selling of private land
- Permission on preceding land acquisition for public purpose

796 Establishment of legal scheme for special zone is required before starting short term project. Preceding land acquisition is effective measure for securing land for infrastructure and control of disordered private development. Especially, it will be necessary to secure seed land for UMRT and integrated urban redevelopment such as Nguyen Thung Truc Commune in Nam Cau Long Bien station area.

3) Establishment of Project Management Department for Integrated UMRT Station Area Development under HPC

797 Establishment of project management department in HPC is proposed for promotion and management of whole urban development surrounding UMRT stations. This department has function of coordination among related organizations and facilitation of project management unit in each station area and implementation of infrastructure development and land acquisition.

798 This department will also design and prepare necessary PPP tenders for each station area development and assist each project management unit mentioned below for implementation of PPPs.

799 Establishment of this department is required before starting minimum term project.

7100 HPC plans to establish Public Transport Authority (PTA), which will be in charge of operation and management of public transport including five (5) UMRT Lines and BRT. It is said that TRAMOC will be restructured into PTA, and HRB might also be transformed into PTA. So it is proposed that two management departments of public transport operation and urban development of vicinity of UMRT stations will be established at the same time and fully coordinated to realize integrated UMRT and urban development.

4) Establishment Project Management Unit for Each Station Area

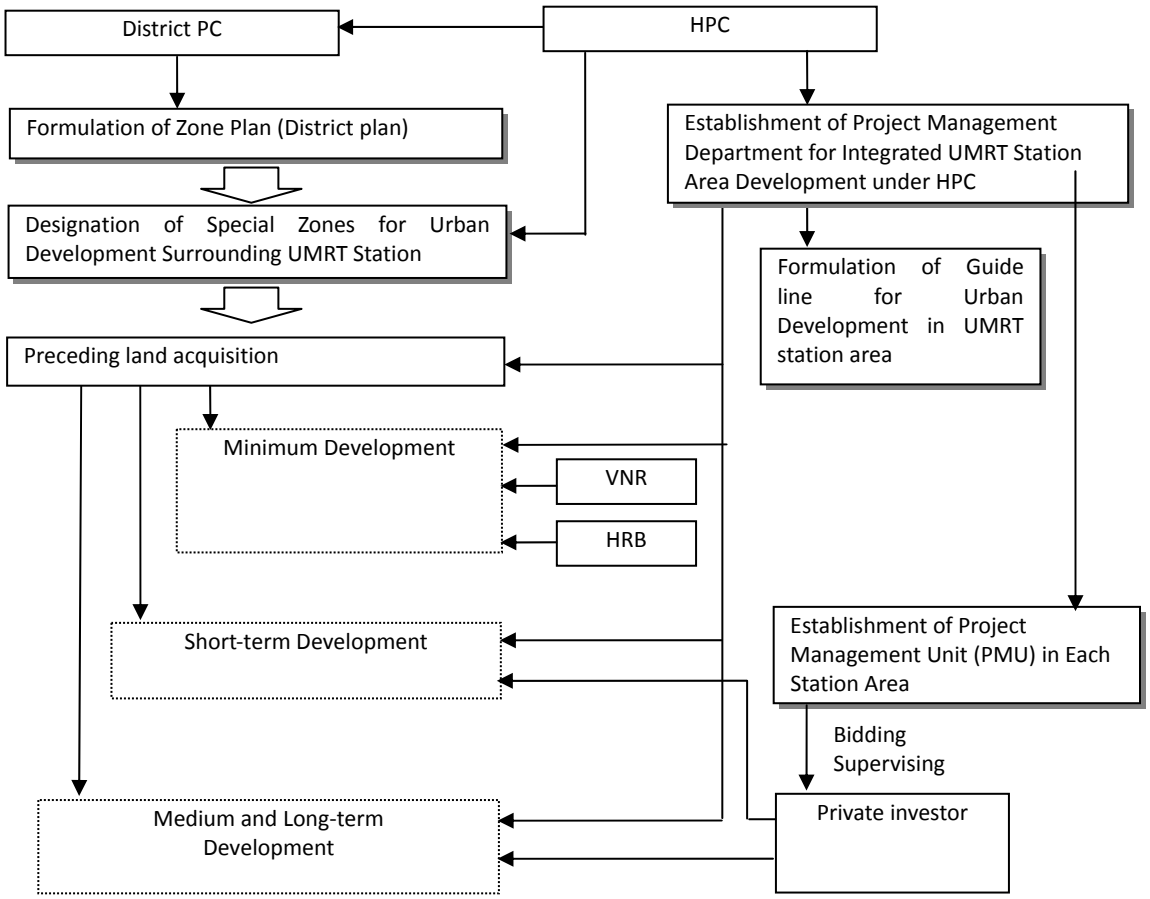
7101 Establishment of project management unit for each station area is proposed. This management unit has function of management urban development project, bidding and supervising private developer's coordination among related organizations. Establishment of these is required before starting short term project.

5) Formulation of Guide line for Urban Development in UMRT Station Area

7102 For the control and encouragement of integrated urban development along the UMRT corridor, Guideline for Urban Development in UMRT Station Area will be proposed. The Guideline guides designing of urban infrastructure, building and structure and specific land use and landscape for both private and public sector. In addition, it provides procedure and technical issue for project management and implementation. The guideline

will be formulated by Project Management Department as above mentioned.

Figure 7.4.7 Process for preparation and implementation for UMRT development



Source: JICA Project team

7.5 Proposed Sectoral Plans coordinated with UMRT Development

7.5.1 General

7103 After development of UMRT, urban structure of Hanoi City will be reformed in terms of landuse, transport network, living condition, etc. Since UMRT development is new for Hanoi City, there are many issues to be coordinated with. It is significant not only to prepare new plans of UMRT development and urban development of vicinity of station, but also to coordinate with and adjust of existing plans which are affected by UMRT development.

7104 In this context, (i) feeder bus service plan, (ii) underground space management plan, and (iii) resettlement plan of UMRT development, are preliminary proposed. These plans should be further studied and developed by relevant governmental agencies of HPC for approval.

7.5.2 Proposed Feeder Bus Service Plan

1) General

7105 It is expected that passengers on buses will decline as many would shift to the UMRT. This is particularly true for current bus routes that are parallel or nearly parallel to UMRT Line1 and Line2. On the other hand, the feeder routes will generally go up, especially when the overall bus route network is modified to form overall integration with that of the railway lines (see Figure 7.5.1).

7106 It is necessary to conduct a separate and more comprehensive study to re-structure the bus route network of Hanoi, or overall public transport study, since Public Transport Authority (PTA) will be formulated under HPC to operate all UMRT lines except for Line1 and buses. In this section, it can only be presumed as recommendatory to that larger study.

7107 To formulate public transport oriented city, it is necessary to promote UMRT and bus service as an integrated public transport network, rather than competing each other. For effective bus service both for UMRT transfer passengers and bus passengers, it is proposed to consider following issues:

i) Development of bus terminal in front of UMRT stations of suburban areas

ii) Improvement of transfer between bus and UMRT in CBD

iii) Modification of bus routes to provide feeder bus services from UMRT stations

Figure 7.5.1 Present Bus Route Map of Hanoi

Source: TRAMOC

2) Development of bus terminal

7108 At present, there are eight (8) bus terminals which will be affected by UMRT development namely: Nam Thang Long, My Dinh, Kim Ma, Bo Ho, Long Bien, Gia Lam, Giap Bat and Ha Dong (see Figure 7.5.2). Among them, Bo Ho, Long Bien, Gia Lam and Giap Bat are located near to UMRT stations: (i) Bo Ho bus terminal near to Hoan Kiem Lake station (C8), (ii) Long Bien bus terminal near to Nam Cau Long Bien station (V6), (iii) Gia Lam bus terminal near to Gia Lam station (V4), and (iv) Giap Bat bus terminal near to Giap Bat station (V12).

7109 To provide public transport service in the area out of UMRT service areas, it is proposed to improve feeder bus services from UMRT stations of suburban areas. At present, Gia Lam, My Dinh and Giap Bat are located new suburban districts to provide feeder bus services. TRAMOC plans to relocate Giap Bat bus terminal toward south. It is proposed that new bus terminal will be located in front of Hoang Liet station (V13) where factory is existed.

7110 Nam Thang Long station (C1) will be located inside of CIPTRA new town, where has been mostly developed with residential facilities. In future, the Tay Ho Tay urban governmental district will be developed as a new urban center of Hanoi City, and Tay Ho Tay station (C3) will be located in the center of this district. It is proposed to utilize the land for park under approved Detailed Plan for bus terminal development, which will be convenient to provide feeder bus services to the north districts of Red River. HPC also plans to develop City Air Terminal (CAT) in this station which has a function of transit and check in service to Noi Bai Airport.

3) Improvement of transfer between bus and UMRT stations

7111 As mentioned above, bus terminals of Bo Ho, Long Bien, Gia Lam and Giap Bat are located near to UMRT stations, in addition to proposed bus terminals of Hoang Liet and Tay Ho Tay. To improve connectivity and accessibility for public transport users, it is important to improve transfer condition.

7112 **Bo Ho bus terminal:** In the Detailed Plan of Hoan Kiem Lake station (C8), it is proposed Bo Ho bus terminal will be relocated inside the building of the Hanoi Electricity Company urban redevelopment area, where is directly connected to underground path of Hoan Kiem Lake Station. The proposed location is more convenient to transfer to UMRT, and to improve a landscape of Hoan Kiem Lake. The function of this bus terminal will not only be a feeder bus service, but also be a bus parking space of tourist buses, as a gate of Ancient Quarter.

7113 **Long Bien bus terminal:** In the Detailed Plan of Nam Cau Long Bien station (V6) and Hang Dau station (C8), it is proposed a skywalk under the viaduct will be constructed to connect to the Long Bien Bus Terminal along Yen Phu street. Bus transfer passengers will be able to access to UMRT stations without crisscrossing roads. To avoid traffic conjunction, pedestrian network of elevated skywalk among 2 UMRT stations and the bus terminal will be safe and effective.

7114 **Gia Lam bus terminal:** In the Detailed Plan of Gia Lam station (V4), it is proposed that existing Gia Lam bus terminal along NH-1 will be relocated in front of Gia Lam station. Urban redevelopment project of VNR railway facilities will enable to develop a station-front bus terminal.

7115 **Giap Bat bus terminal:** It is necessary to cross over NH-1 from Giap Bat bus terminal to Giap Bat station (V12). After relocation to Hoang Liet, the condition will be the same. It is proposed to develop a pedestrian deck to connect UMRT station and bus terminal directly for transit passengers.

Figure 7.5.2 Proposed bus terminal location map

Source: JICA Project Team

4) Modification of bus routes

7116 There are 60 bus routes in Hanoi, as of 2009, of which 57 crisscrossed or run alongside the proposed UMRT lines. Of the 57 bus routes, only six (6) can be considered as overlapping with UMRT Lines 1 and 2. Hence, they need to be terminated or drastically modified in order to avoid direct competition with the railway services. These lines are shown on Table 7.5.1.

Table 7.5.1 Bus Routes Overlapping with UMRT

No.	Route Name	Ave Length, Km	Degree of Overlap	Peak-Hr Frequency	Average Pax Load/Bus, 2008	Pilot Stations Affected
10	Long Biên - Từ Sơn	19.1	67%	6 x 80pax	99.9	V4
3	Giáp Bát - Gia Lâm	15.9	57%	6 x 80pax	126.0	V4, C12
21	Giáp Bát - Hà Đông	13.1	57%	4 x 80pax	107.9	
14	Bờ Hồ - Cổ Nhuế	15.2	51%	6 x 60pax	96.8	V6, C8
44	Trần Khánh Dư - Mỹ Đình	16.5	44%	4 x 60pax	57.3	C12
1	Long Biên – Hà Đông	14.2	43%	6 x 80pax	138.1	V6, V8

Source: Transport Survey, 2009, JICA Project Team

7117 Assuming a least-disruptive approach, the tentative adjustments for the above “parallel routes” are as follows:

Table 7.5.2 Proposed Changes in Parallel Bus Routes

No.	Current Path	To
10	Long Biên - Từ Sơn via Chuong Duong bridge, Nguyen Van Cu; Ngo Gia Tu; Ha Huy Tap.	Cut section from Long Bien to Yen Vien. Bus line 10 runs from Yen Vien station (V1) to Tu Son
3	Giáp Bát - Gia Lâm passing by Giai Phong, Le Duan, Kham Thien, Chuong Duong bridge; Nguyen Van Cu	Merge with Route 2: Long Bien - Tran Nhat Duat - Tran Quang Khai - Tran Khanh Du - Tran Hung Dao - Trang Tien - Hang Khay - Trang Thi - Dien Bien Phu - Tran Phu - Ton Duc Thang - Tay Son - Chua Boc - Dao Duy Anh - Le Duan - Tran Nhan Tong - Quang Trung - Tran Hung Dao – Hanoi (V8).
21	Giáp Bát - Hà Đông passing by Giai Phong, Dao Duy Anh, Pham Ngoc Thach, Chua Boc, Tay Son, Nga Tu So, Nguyen Trai	Re-route from Giap Bat (V12) to Hanoi (V8), as follows: Giap Bat (V12) - Giai Phong - Le Duan - Tran Nhan Tong - Quang Trung - Tran Hung Dao - Hanoi (V8)
14	Bờ Hồ - Cổ Nhuế via Quan Thanh,Thuy Khe, Hoang Quoc Viet, Hoang Hoa Tham, Phan Dinh Phung	For closure
44	Trần Khánh Dư - Mỹ Đình via Dai Co Viet, Dao Duy Anh, Chua Boc, Tay Son, Nga Tu So, Nguyen Trai	Khánh Dư - Trần Hưng Đạo - Tăng Bạt Hổ - Yecxanh - Lò Đúc - Trần Khát Chân - Đại Cồ Việt - Kim Lien keo dai - De La Thanh - Nguyen Chi Thanh - Trần Duy Hưng - Phạm Hùng - Mỹ Đình Bus Terminal.
1	Long Biên – Hà Đông via Hang Dau, Hang Cot, Hang Ga, Hang Dieu, Le Duan, Tay Son, Nga Tu So, Nguyen Trai	Hanoi (V8)- Kham Thien - Nguyen Luong Bang - Nga Tu So - Nguyen Trai - Yen Nghia Station

Source: JICA Project Team

5) Routes passing at/near priority stations of Detailed Planning

7118 The bus routes intersecting or passing near the seven (7) UMRT stations included in the 5 priority stations for Detailed Planning are shown on Table 7.5.3. The forecasted number of daily passengers in year 2020 that may require transfers to/from buses are also compared with current (i.e., year 2008 data) bus capacities at those stations. The transfer volumes suggest that bus reductions are likely only at Hoan Kiem Lake (C9). More buses will be needed at the twin stations of Nam Cau Long Bien (V6) and Hang Dau (C8).

7119 The number of bus bays indicated in the Table 7.5.3 assumes a dwell time of 5 minutes per bus, intended only for loading or unloading.

i) For Gia Lam station, most of the feeder buses will be inter-provincial, and destined for lay-over at the nearby bus terminal.

ii) For the twin stations of Nam Cau Long Bien and Hang Dau, 5 bus bays per direction are recommended – with 3 closer to Hang Dau (i.e., Line 2) and 2 nearer to Nam Cau Long Bien (i.e.,Line 1).

iii) The twin stations of CV Thong Nhat and Bach Khoa will need 3 bus bays – 1 bay along Line 2 and 2 bays along Line 1. Because of the forecasted decline in bus transfers at Bo Ho Bus Terminal at north of Hoan Kiem Lake, and considering the one-way road traffic in the area, a single bus bay near Hoan Kiem Lake Station will be sufficient to cater for both directions.

Table 7.5.3 Feeder Bus Service Requirements at Priority Stations of Detailed Planning

No.	Route Name	Priority Stations of Detailed Planning						
		Gia Lam	Nam Cau Long Bien	Hanoi	C.V. Thong Nhat	Hang Dau	Hoan Kiem Lake	Bach Khoa
		V4	V6	V8	V9	C8	C9	C12
2	Bác Cổ - H.Đông - Ba La						X	
8	Long Biên - Ngũ Hiệp						X	
9	Bờ Hồ - Bờ Hồ						X	
11	Ga Hà Nội - ĐH NN I	X						
18	Kim Mã - L.Biên - Kim Mã		X					
22	BX Gia Lâm - BV103		X			X		
23	Ng. C.Trứ - Ng. C.Trứ		X					
25	Nam TLong - Giáp Bát							X
30	Mai Động- HQ Việt			X				
31	Bách Khoa- Đ.H Mỏ							X
32	Giáp Bát - Nhổn			X				X
35	Trần .K. Dư - Nam TL							X
36	Yên Phụ - Linh Đàm		X			X		
38	N.T.Long - Mai Động			X				
41	Giáp Bát - Nghi Tàm							X
43	Ga Hà Nội - Đông Anh			X				
49	T.K. Dư - KĐT Mỹ Đình			X				
51	T.K. Dư - KĐT Trung Yên							X
	Bus-Rail Transfers in 2020	49,100	60,700	39,100	32,000	69,000	2,100	20,400
	Peak-Hr Bus Capacity							
	- Current, excluding overlap	240	942	1,600	n.a.	576	2,070	1,912
	- Required bus capacity in 2020	3,069	3,794	2,444	2,000	4,312	131	1,275
	Desirable No. of Bus Bays, per direction	2	2	2	2	3	1	1

Source: JICA Project Team

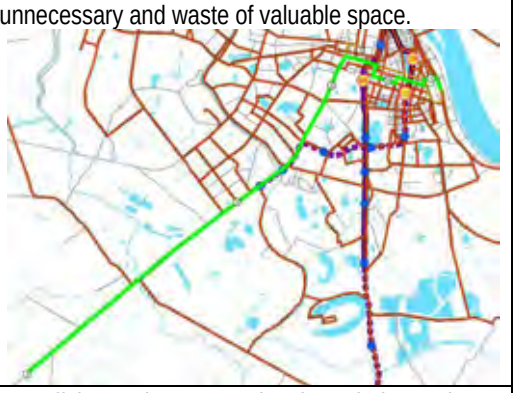
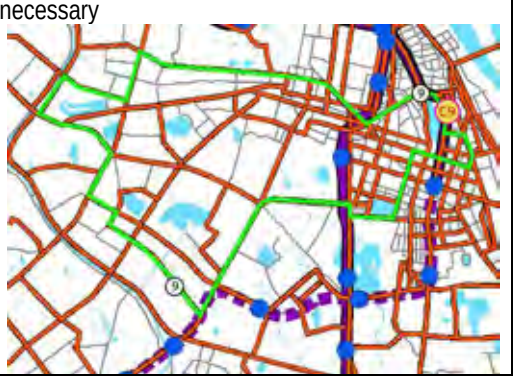
7120 The bus routes passing by or near the 7 stations were then analyzed, as to whether they would compete directly with the UMRT or complement the service. Modifications in the paths or circuits of these routes are then postulated – by removing or reducing competition, and improving the feeder roles of buses at those stations. The results are shown on Figure 7.5.3.

7121 It must be observed that the preceding adjustments in bus routes are partial and sub-optimal, in the sense that the network and secondary effects on other bus routes have not been taken into account. Hence, the analysis limited itself to route modifications – rather than a total re-design of the route structure. The key modifications were on sections of the routes within the central envelope formed by Line1 and Line2 (which is mainly the Ancient Quarter). As to the suburban nodes, only those routes terminating at Gia Lam (V4), Giap Bat (V12), and Nam Thang Long (C1), which are the terminals of UMRT Line1 and Line2, are affected.

7122 In so far as timing is concerned, there is no immediacy. The UMRT lines are scheduled to open only by 2017; neither will the two lines be opened for commercial service simultaneously. Hence, executing the changes in bus routes should be synchronized with the relevant Line or station. Also, to permit existing passengers to adjust, it is recommended to overlap the phased-out and phased-in over several weeks – so that the old and the new routes would still co-exist for a short period. Bus frequency or headways would necessarily change. In addition, it is recommended that the bus operators and TRAMOC conduct on-board ride-check surveys on the affected bus routes – to determine with more accuracy sectional traffic volumes.

Figure 7.5.3 Proposed Adjustments in Bus Routes

(1/5)

No.	Route Name	Current Orientation of Service	Proposed Adjustments
2	Bác Cổ - H.Đông - Ba La	Serves southwest areas of Hanoi, with northern section ending at Hoan Kiem Lake (C9). 	Essentially retain the route. However, lay-over area for Bo Ho Bus Terminal near Hoan Kiem Lake is unnecessary and waste of valuable space. 
8	Long Biên - Ngũ Hiệp	Serves north-south axis. Large overlap with UMRT Line1, from Giap Bat (V12) to Nam Cau Long Bien (V6) 	Cut-off the northern extension through the Ancient Quarter; route to end at and feed Tran Hung Dao (C10). 
9	Bờ Hồ - Bờ Hồ	Serves Ba Dinh District to Hoan Kiem, with minimal duplication with UMRT. 	No change. Additional buses or frequency not necessary 

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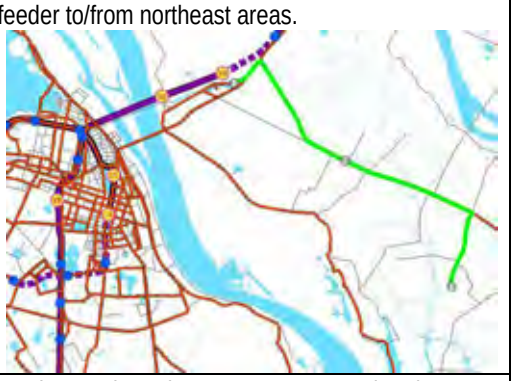
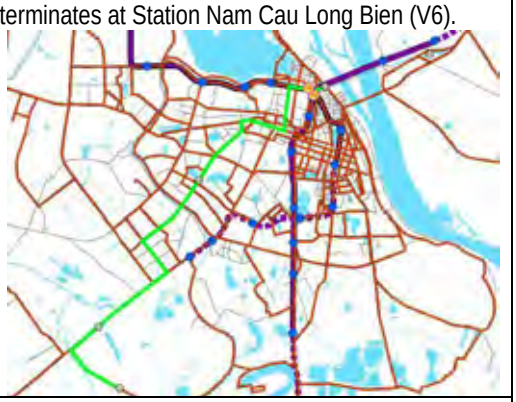
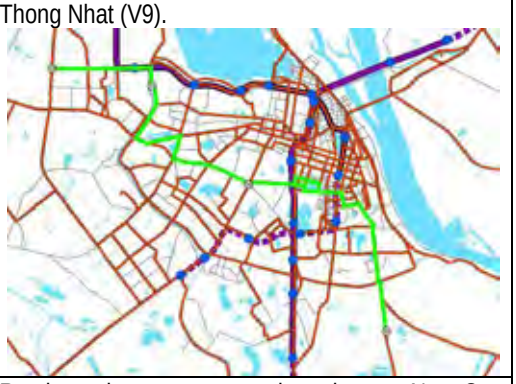
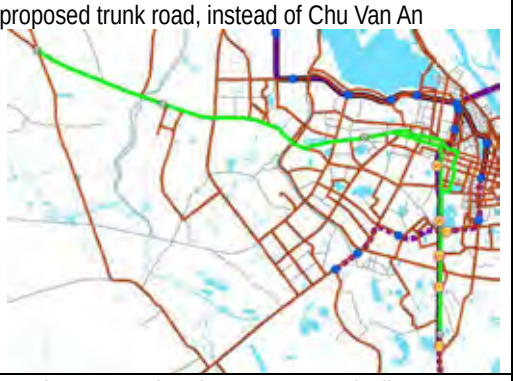
11	Ga Hà Nội - ĐH NN I	Overlap with UMRT 1, from Gia Lam (V4) to Hanoi (V8). 	Cut or terminate at Gia Lam (V4), to become main feeder to/from northeast areas. 
18	Kim Mã - L.Biên - Kim Mã	Follows Kim Ma corridor to Long Bien 	Maybe terminated at Trang Hung Dao (C10) to avoid duplication within Ancient Quarter. 
22	BX Gia Lâm - BV103	Similar corridor as Route 2 towards Ha Dong, but crosses Long Bien Bridge 	Cut-off sections that crosses the bridge, so line terminates at Station Nam Cau Long Bien (V6). 
23	Ng. C.Trứ - Ng. C.Trứ	Overlapping sections with UMRT Line 1, between Hang Dau (C8) and Nguyen Thai Hoc 	Remove Phung Hung section, shift to Hang Gai – Cau Go (Bo Ho Bus Terminal) 

(3/5)

25	Nam TLong - Giáp Bát	North-south axis with sharp turn to Cau Giay; overlapping sections with UMRT 1 from Giap Bat (V12) to Hanoi (v8), and with UMRT Line2 from Nam Thang Long (C1) to Cho Buoi. 	The section at CBD which passes Le Duan Street, can be shifted eastward to Pho Ba Trieu and terminate at Bach Khoa (C12). Its suburban section can be cut to end at Buoi (C4). 
30	Mai Động- HQ Việt	East-west axis complements UMRT 	No change, except to bring bus stop closer to CV Thong Nhat (V9). 
31	Bách Khoa- Đ.H Mỏ	Overlapping sections with UMRT Line1, from Bach Khoa (C12) to Nam Cau Long Bien (V6) 	Retain northern segment and terminate at Nam Cau Long Bien (V6). 

(4/5)

32	Giáp Bát - Nhổn	East-west axis linking Hanoi (V8) to western parts of city 	Retain route, but change turnback loop at Hanoi via proposed trunk road, instead of Chu Van An 
35	Trần .K. Dư - Nam Thang Long	East-west orientation thru Bach Khoa 	No change. But bus frequency may decline 
36	Yên Phụ - Linh Đàm		No change, except to relocate bus stop nearer to Tran Hung Dao (C10) 
38	Nam Thang Long - Mai Động	Circuitous north-south axis through the Ancient Quarter 	No change, except to bring bus stop closer to C10, at turnback loop 

(5/5)

41	Giáp Bát - Nghi Tàm	North-south axis with large overlaps with UMRT Line1, from Hanoi (V8) to Giap Bat (V12) 	Cut off southern sections/extensions, so that line becomes Hanoi (V8) – Nghi Tam 
43	Hà Nội - Đông Anh	Loop service around the Ancient Quarter 	Instead of Ga Hanoi, terminate at C.V. Thong Nhat (V9) until UMRT Line 2 gets extended 
49	T.K. Dư - Mỹ Đình	East-west axis, same corridor as Route 32 	Cur-off sections inside Ancient Quarter; loop back at C.V. Thong Nhat (V9) 
51	T.K. Dư - Trung Yên	East-west axis 	No change, feeds stations C.V. Thong Nhat (V9) and Bach Khoa (C12). 

Source: JICA Project Team

7.5.3 Proposed Underground Space Management Plan

7123 Urban development project in surroundings area of UMRT station include underground transportation facilities such as underground station, underground parking, underground pedestrian and underground mall. In addition, underground technical infrastructure such as water supply, sewerage, power cable, telecommunication cable and utility tunnel exist and are planned under arterial road. Therefore, intensive utilization of underground space will be expected in surrounding area of UMRT station.

7124 For the coordination and management of underground development, formulation of underground space management plan is proposed. Underground space management plan covers each special zone designated by HPC and consist horizontal plan and vertical plan indicated existing and planned major underground facility. A principle to develop underground facilities under arterial roads is proposed in Figure 7.5.4.

Figure 7.5.4 Principle to develop underground facilities under Arterial Roads (Proposed)

	Pedestrian Sidewalk	Carriageway		Pedestrian Sidewalk
GI + 0m	Zone A	Zone B		Zone A
	• Branch lines of supply and disposal, telecom facilities • *New supply and disposal, telecom facilities (area-wide air conditioning, etc.)*	• Trunk lines of supply and disposal, telecom facilities (incl. branch connection) • *Underground pedestrian facility (incl. underground arcade)* • *Underground road* • *Underground car parking* • *Branch lines of supply and disposal, telecom facilities* • *New supply and disposal, telecom facilities (area-wide air conditioning, etc.)*		• Branch lines of supply and disposal, telecom facilities • *New supply and disposal, telecom facilities (area-wide air conditioning, etc.)*
	Zone D			
-3m -5m	• Underground pedestrian facility (incl. underground arcade) • Subway (Station)	• Trunk lines of supply and disposal, telecom facilities (incl. common-use cable tunnel)	• Underground road • Underground car parking	• *Branch lines of supply and disposal, telecom facilities* • *Trunk lines of supply and disposal, telecom facilities (incl. branch connection)*
-6m-10m				
	Zone E			
	• *Underground road* • *Subterranean river*	• Subway (rail track) • *Subway (station)* • *Underground car parking*		• *Trunk lines of supply and disposal, telecom facilities (incl. common-use cable tunnel)*
Below -30m				
	Zone H			
		• Subterranean river • *Subway (rail track)* • *Subway (station)* • *Underground road*		• *Trunk lines of supply and disposal, telecom facilities (incl. common-use cable tunnel)*

Remarks: standard allocation zone in normal; *alternative allocation zone in italic*
Source: JICA Project Team

7.5.4 Proposed Resettlement Plan for Integrated UMRT and Urban Development

7125 Land acquisition and resettlement of existing entities and households constrain implementation of urban development and infrastructure projects. At present, there are two options for land acquisition: (i) to pay compensation, or (ii) to provide resettlement areas. It is said that more than half of project costs are for compensation. Because of difficulty of land acquisition, many approved projects have been delayed or not been implemented.

7126 One of the characteristics of UMRT development is to cover various types of lands for development, including CBD, peri-urban, and sub-urban areas extensively. In sub-urban areas, it is easier to develop residential areas converted from agricultural lands in sub-urban areas than in CBD and peri-urban areas where most of lands are built up. There are many New Town development projects in sub-urban areas and vacant lands which can be urbanized in future.

7127 To implement integrated development smoothly and effectively, it is proposed to develop a comprehensive resettlement plan for UMRT development. This plan is to utilize potential lands for housing development for resettlement especially in sub-urban areas, and to provide these housings to resettled households in CBD or peri-urban areas.

7128 The potential lands for housing development for resettlement can be identified following types of lands (see Table 7.5.4 and Figure 7.5.5):

a) Public related land: There are state owned companies (SOE), public housings which were disposed to war invalid and government staffs, etc. Many of these facilities occupy broad lands in city center, and facilities have been degraded.

b) Agricultural land: In sub-urban areas, there are broad agricultural lands. These lands around stations will be converted to urban purpose.

c) KTT (*Khu Kap Te*): KTT is a public apartment complex, and most of residents are low income and live in a narrow space with many family members including elderly. These KTT facilities have been deteriorated. Though several redevelopment projects of KTT have been proposed by private developers, most of them have not been implemented. It is difficult for low income households to resettle new apartments, and to pay necessary costs by themselves.

d) New Town project: There are many new town projects which are approved or planned by private developers in sub-urban areas. Though these new apartments modern facilities, road and public transport network is not well developed.

7129 In these potential lands, there are demands for urban development, especially for residential purposes. So it is proposed that HPC especially HAUPA will negotiate and coordinate with private developers to condition of development of resettlement housings as a part of projects when HAUPA will approve detailed plans.

7130 A comprehensive resettlement plan utilizing lands along UMRT lines will enable resettled households to use UMRT for commuting. This plan will be an incentive for land acquisition and resettlement both for railway developers, urban developers, and residents.

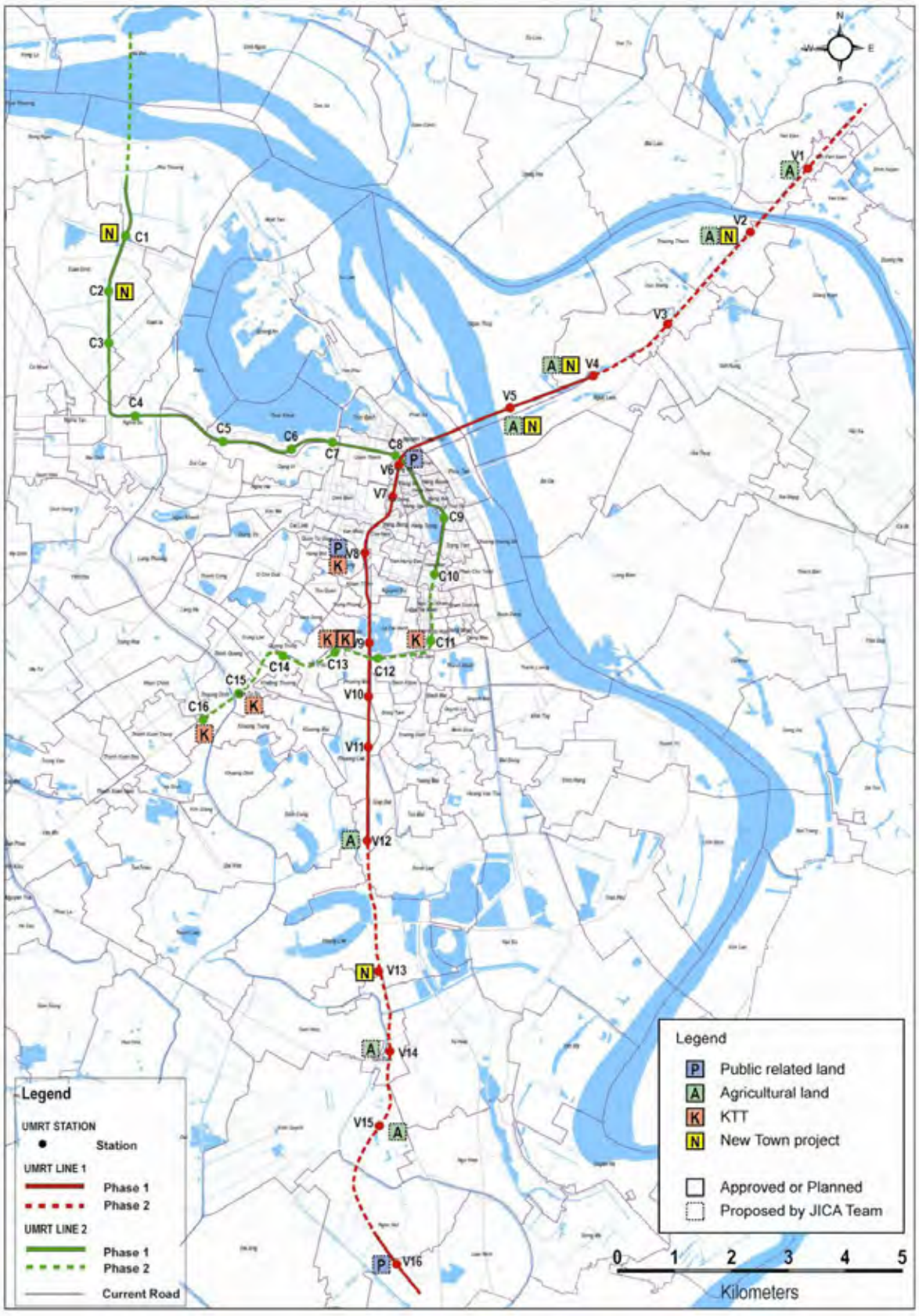
Table 7.5.4 Potential lands for housing development of resettlement

Phase	Station		Type of Land / Name of Project	Present Condition of Potential Land				Project Status	
				Public related land	Agricultural land	KTT	New Town project	Approved or Planned	Proposed by JICA Team
Phase2	V1	Yen Vien	New residential area		✓				✓
	V2	Cau Duong	Thuong Thanh New Town		✓		✓	✓	
			Viet Hung New Town		✓		✓	✓	
	V3	Duc Giang	-						
Phase1	V4	Gia Lam	Ngoc Thuy New Town		✓		✓	✓ 1)	
	V5	Bac Cau Long Bien							
	V6/ C8	Nam Cau Long Bien/ Hang Dau	Army related facilities (ex. newspaper company, cinema)	✓					✓
	V7	Phung Hung							
	V8	Hanoi	Hanoi Water Company	✓					✓
			Van Chuong KTT			✓			✓
	V9/ C12	C.V. Thong Nhat/ Bach Khoa	Kim Lien KTT			✓		✓ 2)	
	V10	Bach Mai	-						
	V11	Phuong Liet	-						
	V12	Giap Bat	New residential area		✓				✓
Phase2	V13	Hoang Liet	Phap Van – Tu Hiep New Town				✓	✓ 3)	
			New residential area						✓
	V14	Van Dien	New residential area		✓				✓
	V15	Vinh Quynh	New residential area		✓				✓
Phase1	V16	Ngoc Hoi	New residential area	✓					✓ 4)
Phase1	C1	Nam Thang Long	CIPTRA new urban area				✓	✓ 5)	
	C2	Ngoai Giao Doan	Ngoai Giao Doan new urban area				✓	✓ 6)	
	C3	Tay Ho Tay	-						
	C4	Buoi	-						
	C5	Quan Ngua	-						
	C6	Bach Thao	-						
	C7	Ho Tay	-						
	C9	Hoan Kiem Lake	-						
	C10	Tran Hung Dao	-						
Phase2	C11	Cau Den	Nguyen Cong Tru KTT			✓		✓	
	C13	Kim Lien	Kim Lien KTT			✓		✓ 2)	
			Trung Tu KTT			✓			✓
	C14	Chua Boc	-						
	C15	Nga Tu So	Vinh Ho KTT			✓			✓
	C16	Thuong Dinh	Co Khi Hanoi KTT			✓			✓

Source: JICA Project Team

1) It is necessary to coordinate with developers of new town (Hong Ha), HAUPA and Long Bien District PC.
2) Kim Lien KTT redevelopment detailed plan has been submitted to HPC and will be approved together with Kim Lien Station development.
3) It is necessary to coordinate with developer of the new town (HUD), HAUPA and Hoang Mai District PC.
4) JICA Project Team proposes to convert landuse of industrial of Ngoc Hoi Industrial Zone into residential/ mixed-use.
5) It is necessary to coordinate with developer of the new urban area (CIPTRA), HAUPA and Tu Liem and Tay Ho District PCs.
6) It is necessary to coordinate with developer of the new urban area (Hanoi Construction Co. Ltd., HAUPA and Tu Liem District PC.

Figure 7.5.5 Location of Potential Lands for Housing Development of Resettlement



Source: JICA Project Team

8 CONCLUSION, RECOMMENDATIONS, AND NEXT STEPS

8.1 Conclusion

(1) UMRT Development and Integrated Urban Development to Facilitate the Transit-oriented Development of Hanoi City

801 This JICA project aims to propose a transit-oriented development (TOD) for Hanoi City by introducing conceptual planning for and methodologies of an urban development integrated with the development of UMRT systems in densely populated urban environments.

802 The concept of TOD, which introduces: (i) fast, frequent, reliable, and comfortable transit services; (ii) intensive and efficient land use along the UMRT corridor; (iii) hierarchical transportation mode; (iv) pedestrian- and UMRT-user-oriented urban development; and (v) structured UMRT corridor development, will generate the following benefits for Hanoi City:

For the community:

- **Less automobile use** → reduced congestion, savings in road and parking costs, increased road safety, protected environment, and livable community
- **Affordable mobility and increased transport choices** → savings in consumer's time and money, and increased convenience
- **Efficient and intensive land use** → more choice of activities and higher residential and commercial property values

For UMRT:

- **Intensive land use around stations** → more UMRT passengers
- **Intermodal transfer facilities** → more UMRT passengers and convenient transfers for users
- **Structured UMRT corridor development -**→ smooth passenger movement along the corridor in terms of time and space by planning dense urban centers, university towns, residential new towns, etc.

803 The integrated urban development with UMRT systems based on this TOD concept, along with the growth in the number of UMRT lines in the future, will have significant effects on the urban structure of Hanoi City. The formation of multiple urban centers (sub-CBDs) along the UMRT corridors will bring about large and sustainable impact on the growth of Hanoi's urban economy by continuously integrating the urban development of more than a hundred UMRT station areas on the city's extensive UMRT network in the future, as experienced in Tokyo.

(2) Development Plan for 31 Station Areas for UMRT Line 1 and Line 2 to Promote Development of Structured UMRT Corridors

804 UMRT Line1 and Line 2 will cover various areas, such as the CBD which is mostly built-up and urbanized, peri-urban areas which are rapidly urbanizing and becoming increasingly congested, and suburban areas where mobility and accessibility to urban services have been difficult. In the CBD, the UMRT is expected to promote socio-economic activities around the stations, and in peri-urban areas, it is expected to reduce traffic congestion and make commuting and daily activities comfortable for people. Railway development in suburban areas will have much effect on land-use conversion from rural to

urban, promotion of urban development activities, promotion of settlements in new town, and others.

805 This JICA project proposed concept plans for 31 stations of UMRT Line 1 and Line 2. The plans indicate development concepts, future land use, and projects that will reflect an integrated development concept. In addition, development phasing based on time and feasibility is proposed to more easily understand the necessary projects toward UMRT development and operation, and recommended projects for integrated urban development at railway station vicinities. The concept plans are proposed based on the following hierarchy of urban center functions:

- Urban Center Core (CBD)
- Sub-Center in Urban Center Fringe
- Urban Core in Urban Center Fringe
- Key Urban Core in Suburban/Peri-urban
- Urban Core in Suburban/ Peri-urban

806 It is expected that the concept plans for 31 stations will be reflected in the new Hanoi City Master Plan. The formulation of the UMRT network will enable the development of a public-transportation-oriented city and promote urban development activities. UMRT development will play a significant role in achieving the vision for Hanoi City, which is that of becoming “a compact city with water, green and culture,” which was proposed in HAIDEP.

(3) Proposed Detailed Plans for Priority Station Area Developments deemed Implementable

807 In January 2010, the Urban Planning Law was enforced. The spirit of the law aims to regulate the urban planning system which plans, implements, and controls urban development activities with feasible approaches. Land use and urban development activities will be specified under the Zone Plan, which covers urban planning areas of neighboring administrative boundaries. In addition, new concepts for urban planning, such as urban design, Strategic Environmental Assessment (SEA), and public consultation, are also included in the system with specific methods and indicators.

808 In this project, in line with the trend of changes in the urban planning system of Vietnam, detailed planning was conducted covering five (5) station areas covering seven (7) stations: (i) Gia Lam Station of Line 1, (ii) Nam Cau Long Bien Station of Line 1 and Hang Dau Station of Line 2, (iii) Hanoi Station of Line 1, (iv) C.V. Thong Nhat Station of Line 1 and Bach Khoa Station of Line 2, and (v) Den Ngoc Son Station of Line 2. Priority stations were selected based on several criteria, such as: (i) potential for urban development, (ii) accessibility to station(s), (iii) interchange function, and (iv) necessity of socio-environmental consideration, etc.

809 For detailed planning, the following were carefully considered: (i) to improve accessibility to station(s) and convenience of transfer to another UMRT line and public transport, (ii) to promote socio-economic activities to maximize land potential around UMRT station(s), (iii) to harmonize with local characteristics and values, as well as promote the identity of each UMRT station, (iv) to propose appropriate implementation approaches and measures, in which Hanoi City, the private sector, and citizens can be motivated to involve themselves. Financial analyses were also conducted for various

project packages for each priority station area development on the basis of public-private partnership (PPP) schemes and assessed to be financially implementable with private sector participation.

(4) Proposed Implementation Mechanisms deemed Feasible and Effective based on Participatory Approach and PPP

810 Based on a review of the present conditions, appropriate implementation measures were proposed, which can be implemented under the present system, or using new approaches. As new legal and institutional mechanisms to implement the proposed urban development integrated with UMRT systems, the land readjustment (LR) and urban redevelopment (UR) systems are proposed in order to cope with complicated land-use rights conversion and resettlement issues in densely populated urban areas.

811 Project implementation mechanisms include phasing, project packaging, responsibility and risk sharing among major stakeholders (HPC, VNR, private sector, and community), PPP schemes, and financing mechanism. In addition, coordination within the public sector is essential. Urban development integrated with UMRT systems is more than a transport development project which can promote urban development, socio-economic development, and preservation of culture and environment. To implement a significant multisectoral project for Hanoi City, role sharing and coordination in the public sector is inevitable. Furthermore, public participation, especially of the local community, should be promoted. With a better understanding of the need to improve present conditions and of the future impact of an integrated UMRT and urban development, people will actively use and take advantage of the UMRT systems and associated urban development.

812 A preparation and implementation procedure is proposed which includes the formulation of a zone plan, establishment of special zones and designation systems, establishment of an Integrated Urban Development Project Management Department under the HPC, establishment of a project management unit (PMU) for each station area, and the formulation of guidelines on an integrated urban development in UMRT station areas.

8.2 Recommendations

(1) Establishment of a Special Unit on Integrated Urban Development

813 The impact of implementing a transit-oriented development and an integrated urban and UMRT development at station areas on the formation of Hanoi's urban structure and on the sustainability of the city's economic growth will be very significant for Hanoi City, as illustrated in the previous chapter. To effectively plan, implement, and manage such development, therefore, it is proposed that a special unit be established under the HPC to work on the integrated urban and UMRT development of all UMRT station areas in the future.

814 This special unit should coordinate with related departments, government bodies, and citizens, especially with VNR, HRB, and the future Public Transport Authority which are and will be responsible for developing and managing UMRT systems. The formation and involvement of this special unit should be concurrent with the construction of the UMRT system because coordinated planning and physical development are essential to achieving the integration of UMRT and urban development.

815 This special unit should be established as soon as possible together with the following institutional arrangements:

(i) Formulation of zone plans to reflect the concept plans for integrated urban and UMRT development at UMRT station areas;

(ii) Establishment of special zones and designation of each UMRT station area;

(iii) Establishment of a PMU for each station area to implement integrated urban development and necessary PPP projects; and,

(iv) Formulation of guidelines for integrated urban and UMRT development at UMRT station areas.

(2) Implementation of Minimum Development Projects

816 Minimum development projects refer to those which must be readily available when the UMRT lines commence operations to ensure smooth access to the stations through different types of transportation modes, especially walking and public transportation. Without these projects, users will encounter difficulties in accessing the stations.

817 After this JICA project, the Hanoi city government and railway implementation bodies (i.e., VNR and HRB) are encouraged to continue discussing and coordinating with each other to implement the proposed minimum projects (e.g., station entrance space, intermodal facility, station access roads, etc.) till the UMRT starts operation in 2017. The detailed design of UMRT Line 1 has been carried out. It has not been clarified whether ODA would cover the construction of station-related facilities such as intermodal transfer facilities, parking spaces, and station access roads. For UMRT Line 2 for which the Hanoi city government is the implementing body, it is recommended that not only stations and railways be planned and constructed using ODA, but related facilities as well.

818 For the effective implementation of proposed projects in this JICA project, as proposed in Chapter 7 of Part II, coordination should be conducted as soon as possible. While these proposals, of which there are many, will be reflected in the new Hanoi City Master Plan which is under preparation, "the master plan for integrated UMRT and urban development" (tentative) should be planned and approved by the government as a legally binding plan. In this process, not only the Hanoi city government, but also local

governments and private entities engaged in urban development, would be involved.

(3) Implementation of Pilot Projects

819 To establish effective implementation methods, such as land readjustment projects, urban redevelopment projects as well as financial mechanism including PPP scheme, the implementation of pilot projects for a selected station area is proposed. The proposed projects and station areas for piloting are as follows:

i) Accessibility improvement with verification of small-scale land readjustment project: Cau Duong Station (V2), Duc Giang Station (V3), and Quan Ngua Station (V5), and

ii) Intermodal transfer facility development and integrated urban development with verification of large-scale urban redevelopment and land readjustment projects: Nam Cau Long Bien Station (V6) and Hang Dau Station (C8), Hanoi Station (V8), C.V. Thong Nhat Station (V9) and Bach Khoa Station (C12), and Tay Ho Tay Station (C3)

820 Since each station area development package above covers various development elements and will offer essential experience in developing other station areas on the UMRT Line 1 and Line 2, only the minimum and short-term projects are proposed for implementation as pilot project packages.

821 Special zones should likewise be designated for this entire development and all possible resources should be tapped to implement this pilot project package which will include procurement of technical assistance and long-term, low-interest concessional finance from bilateral and multilateral financial institutions, as well as the preparation of possible PPP schemes to solicit the participation of national and international investors from Japan, USA, Europe, and other parts of Asia.

(4) Formulation of a Development Plan on Common Interline Transfer Facilities and Operating System

822 While five (5) UMRT lines have been planned, there are no authorities and integrated plans to integrate these UMRT lines. If nothing is done, there will be many physical barriers and inconveniences to users when transferring between lines. If there are common pedestrian underground paths and decks as interchanges, and passengers can use a common ticketing system for all UMRT lines (and bus also), passenger convenience will improve and ridership will dramatically increase.

823 At present, there is no agency that plans and coordinates these interline transfer facilities and operating systems, so railway developers should coordinate with each other to minimize unexpected barriers for users.

(5) Conduct of Detailed Social and Environmental Impact Assessment for Project Implementation

824 The assessment of social and environmental impacts should be carried out in further detail in the next development stages, especially after the construction plans for the station areas have been made. Appropriate measures to avoid or mitigate adverse impacts caused by the projects should be examined more closely.

825 Since the UMRT will be a new public transportation infrastructure in Hanoi City, it is necessary to pay attention to security and safety, especially in cases of emergency such as terrorism, accidents, and natural disasters such as flooding. The promotion of anticrime measures and evacuation plans should be done on a regular basis.

8.3 Next Steps

826 The next important step in pushing an integrated urban and UMRT development is to establish an appropriate organization that will lead and promote the concept in coordination with related organizations (i.e., MOT, VNR, HRB, HPC departments and districts, MOC, and other related project owners) and at two levels:

(a) Decision-making level: similar to the HAIMUD Steering Committee, and

(b) Project implementation level: PMU or an equivalent body to manage and implement the integrated projects.

827 The main activities for the next development phase comprises the following:

i) Planning and implementation of intermodal facilities/ access roads which must be ready when UMRT lines open (Line 1 in 2017);

ii) Planning and implementation of integrated urban development at and around UMRT stations;

iii) Establishment of an appropriate institutional framework to implement the integrated urban development projects with the participation of the private sector and communities; and

iv) Implementation of pilot projects to work out necessary arrangements and ensure the above projects can be effectively implemented.

828 One agency should be responsible for each activity not only to implement it, but also to coordinate it with other relevant agencies. The preliminarily proposed role sharing for implementation is shown in Table 8.1. It is recommended that the HPC should further coordinate and discuss these activities with the concerned agencies.

Table 8.1 Proposed Activities and Role Sharing (Preliminary)

Activity		Main	Secondary	Coordination
A. Planning and Implementation of Intermodal Facilities/ Access Roads	1) Concept plans	HAUPA (PMU)	HRB, VNR	DOT, DOC, District
	2) Detailed plans	HAUPA (PMU)	HRB, VNR	DOT, DOC, District
	3) Integration with urban plans	HAUPA	MOC, DOC	District
	4) Engineering/ implementation plans	DOT (PMU)	HAUPA, District	HRB, VNR
	5) Implementation/ monitoring	DOT (PMU)	HAUPA, District	HRB, VNR
B Planning and Implementation of Integrated Urban Development	1) Concept plans	HAUPA (PMU)	District	DOT, DOC, HRB, VNR
	2) Detailed plans	HAUPA (PMU)	District	DOT, DOC, HRB, VNR
	3) Revision of district plans	HAUPA	District	DOT, DOC, HRB, VNR
	4) Project preparation	HAPI (PMU)	HAUPA	HRB, VNR
	5) Invitation for investments	HAPI (PMU)	HRB, VNR	HAUPA
	6) Implementation/ monitoring	HAUPA (PMU)	HAPI	District, DOT, DOC, HRB, VNR
C. Institutional Arrangement	1) Organizational set-up	HPC	MOT	HAPI, HAUPA, DOT, HRB, VNR
	2) Related regulations	HPC (PMU)	MOT, MOC	HAPI, HAUPA, DOT, HRB, VNR
	3) PPP framework	HPC (PMU)	MOT, MPI	HAPI, Private sector
D. Implementation of Pilot Projects	1) Selection of pilot projects	HPC	HRB, VNR	HAPI, HAUPA, DOT
	2) PP implementing organization	(PMU)	HPC	HAPI, HAUPA, DOT, HRB, VNR
	3) PP implementation/ monitoring	(PMU)	HPC	HAPI, HAUPA, DOT, HRB, VNR

Source: JICA Project Team