JAPAN INTERNATIONAL COOPERATION AGENCY
HANOI PEOPLE'S COMMITTEE (HPC)

Project for Studying the Implementation of Integrated UMRT and Urban Development for Hanoi in Vietnam

Final Report
TOD Guideline

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TOD Guideline

1 INTRODUCTION

1.1 Background

1.1 Hanoi intends to shift from private vehicle based city to public transport based city through development of a total of more than 300kms of UMRT including eight lines. Bus system including BRT is also being expanded. However, in order to develop public transport based urban areas in the most effective manner, construction of UMRT lines alone will not be sufficient. As it is practiced in many successful cities in the world. Proper introduction and practice of TOD (Transit Oriented Development) are important to promote development of public transport based urban area.

1.2 TOD intends to achieve the following:

(i) To enhance UMRT ridership by improving convenient, safe and comfortable access to the stations: coverage of UMRT is rather limited that improvement of accessibility to UMRT stations and provide UMRT users with smooth interchange between UMRT and access transport modes including walking, bicycle and other public and private transport modes in a critical factor for enhancement the ridership and satisfaction of UMRT users

(ii) To promote compact urban area and local economic development by facilitating urban development at and around the stations as well as UMRT influence area: Improved accessibility to high quality public transport will generate opportunities to promote housing and commercial development and around the stations and within their influence area. TOD can provide ample opportunities for private sector investments and communities participation.

(iii) To contribute to enhancement of social and environment conditions at localities through the above TOD measures: when TOD is properly planned, it will also contribute to the improvement of local social and environmental conditions in a way that the people who do not use UMRT can also be benefited.

(iv) To contribute to enhancement of capture increase in value of land and space due to TOD for cost recovery of UMRT investments: Value of land and space at and around UMRT stations will be enhanced through TOD. When TOD is properly implemented in integration with UMRT development the increase in value can be captured to recover a portion of investment cost of UMRT.

(v) To accelerate realization of target sustainable urban development of Hanoi through the above: TOD will promote development of more effective landuse and compact urban areas, without creating traffic conflicts and congestions on the roads.

1.2 Purpose of TOD Guideline

1.3 While TOD plans have been prepared for the stations included in the phase 1 of sections of UMRT Line 1 and Line 2, there are many more lines and stations which are being implemented and planned. It is considered more appropriate and effective to promote development of public transport based urban areas when the concept of land approach to TOD are shared among all UMRT lines and stations.

1.4 TOD is a new concept to Hanoi and should be properly planned and incorporated in existing urban planning and development institution. As TOD can potentially generate significant economic, social and environmental impacts, the benefits should be properly tapped and the costs should be shouldered equitably among stakeholders including governments, private sectors and local communities.

1.5 TOD Guideline is expected to provide knowledge and methods of TOD planning and management as well as for successful implementation of TOD projects. TOD Guideline is prepared:

- as a reference to provide general concept and knowledge of TOD
- as a planning and management tool (institutional framework, implementation methods, funding and PPP opportunities, alternative approach to urban area redevelopment).
- to provide a reference for shared understanding of the concept and related knowledge of TOD
- to provide a technical approach in formulating TOD plan and design of TOD projects
- to provide a reference for plan management and implementation of TOD projects including institutional arrangements, finding PPP opportunities and alternative approach to urban area development/redevelopment.

1.3 Structure and Use of the Guideline

1.6 TOD Guideline is composed of five chapters including chapter 1 explaining the necessity and purpose of the guideline, chapter 2 explaining the concept and cases of TOD practiced in other cities based on which approach to TOD for Hanoi UMRT, chapter 3 explaining step-wise planning methodology, chapter 4 explaining useful reference and considerations to formulate TOD concepts and chapter 5 explaining implementation and management methods of TOD.

1.7 This guideline is the first draft and needs farther elaboration in consultation with relevant organizations and with reference to existing urban planning and design guidelines.

The draft is composed of following chapters:

Chapter 1: Introduction

Chapter 2: Concept and Practice of TOD

Chapter 3: TOD Planning Steps

Chapter 4: Useful Reference in TOD Concept Planning

Chapter 5: Institutional Arrangement for TOD Promotion

2 CONCEPT AND PRACTICE OF TOD

2.1 Concept of TOD

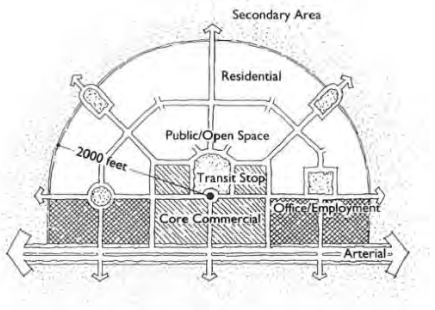
2.1 Main purposes of developing UMRT in large urban areas include: (i) to provide the people with competitive public transport services which are convenient, fast, safe, comfortable and affordable, (ii) to facilitate transfer of the people who reside in congested substandard living quarters to outer areas with better living conditions and good accessibility to the city center where they used to work or be engaged in activities, and (iii) to promote new developments that can become feasible due to the improvement of accessibility at and around the stations both in existing city center as well as along the UMRT corridors.

2.2 A transit-oriented development (TOD)[1] was initially conceived as counter-approach to shift the auto-oriented to a rather compact urban form. TOD contributed to creation of environmentally friendly society, because a shift to public transportation from private motorized transportation modes lessen energy consumption and CO_2 emissions, leading to "smart growth". At the same time, a shift to public transportation also reduces space occupancy per passenger, thus, enabling more efficient urban space usage.

2.3 TOD can bring about significant and positive impacts on urban traffic, land use, and environment. Thus TOD is expected to create synergy in an integrated transport and urban development, establish new urban spaces, and generate activities in the influence areas of the UMRT. Successful TOD will lead to increased ridership and better satisfaction among UMRT users. At the same time, urban development opportunities at various levels of the UMRT's influence areas are expected to increase.

Box1: Basic Principle and Effects of TOD in the World

Design principles of TOD, stated by Peter Calthorpe, are to: (i) organize growth on a regional level to be compact and transit supportive; (ii) place commercial, housing, jobs, parks, and civic uses within walking distance of transit stops; (iii) create pedestrian friendly street networks that directly connect local destinations; (iv) provide a mix of housing types, densities, and costs; (v) preserve a mix of housing types, densities, and costs; (vi) preserve sensitive habitat, riparian zones, and high quality open space; (vii) make public spaces the focus of building orientation and neighborhood activity; (viii) and encourage infill and redevelopment along transit corridors within existing neighborhoods.



According to the Federal Transit Administration, USA, Positive effects of TOD can farther be listed as follows: (i) more efficient use of land, energy and resources; (ii) less oil and gas consumption; (iii) cleaner air; (iv)minimizes traffic increases; (v) encourages walking; (vi) increases transit ridership at a lower cost than if bus service or parking structures are needed to bring riders to stations; (vii) increases property values, lease revenues and rents; (viii) increases foot traffic for local businesses; (ix) creates opportunities to build mixed income housing; (x) height and density can pay for community benefits and affordability; (xi) reduces transportation expenditures, and (xii) promotes healthier lifestyles.

[1] Transit Oriented Development (TOD) was first used by Peter Calthorpe in his book "*The Next American Metropolis: Ecology, Community, and the American Dream"*, Princeton Architectural Press, 1993.

2.2 TOD Practice in the World (Lessons Learned)

1) Overview

2.4 TOD has long been a care concept got both transportation and urban development in many big cities in Japan. Today, Tokyo is the largest metropolitan area in the world with a total population of over 30 million. Yet, Tokyo is known as one of the competitive, livable and environmental friendly city in the world. Although Tokyo suffers from traffic congestions, people and visitors can travel relatively smoothly in time of various social and business activities. This is largely due to that Tokyo is provided with an extensive urban rail network which has been developed both by public and private sectors for long in the process of rapid urbanization. Therefore, there are many cases and experiences of Tokyo which can be a good reference to development of Hanoi from today toward the future. Some representative examples are shown in the following sections.

2) Smart Growth of Cities Based on TOD

2.5 A key role of TOD is to promote expansion of urban areas and accommodate increasing population in sustainable manner, meaning that the people are provided with affordable housing and improved living environment, while mobility and accessibilities to work place, school place and needed services are concurrently provided through quality public transport. Developments of compact urban areas are encouraged along the rail lines.

2.6 Integrated development of new towns and suburban railway is one of the most characteristic experiences during the time of rapid urban expansion in large-cities in Japan, especially Tokyo and Osaka metropolitan areas. There are many cases of this types if TODs with different scales of development, for different purposes and by different implementing organizations of public and private sectors. Followings are a few representative cases:

(i) Urban Development by the Public Sector in Tama New Town

2.7 Tama New Town is a large residential development, straddling the four municipalities of Tokyo (Hachioji, Tama, Inagi and Machida Cities), with an area of about 28,000 ha. It was designed as a new town in 1965 by the metropolitan government. It is approximately 14 kilometers stretching east-west direction 1-3 km wide and located in an expanse of hills known as the Tama Hills about 20 km west of the center of Tokyo. The railway lines run through the area are, Keio Railway and Odakyu Line, with two lines and more than 10 stations, which connect with the sub-center of Tokyo, Shinjuku. The area's development has been conducted mainly by the public sector with only some small areas in which the residents who wanted to stay applied the land readjustment method. (See Chapter 4 for more details).

(ii) Private sector urban development integrated with railway by Tokyu Corporation

2.8 Tokyu Corporation (Tokyu), has developed the residential areas integrated with railway networks extending to the southwest suburban area of the Tokyo Metropolitan Area. Besides railway and real estate development businesses, Tokyu is involved in various types of businesses such as the commercial and retail business (hotel, tour and resort business, etc.). The "Tama Denen Toshi" (Tama Garden City) along Tokyu's Den-en-toshi Line is one of the success examples of Tokyu's efforts in integrated rail and property development. (See Figure 2.2.1, 2.2.2, 2.2.3, and 2.2.4)

2.9 Tokyu's approach is to integrate (a) trasnport business (railway and bus), (b) real

estate business and commercial/service (housing and office), and (c) commercial/ service business (department store at the station, retail shops, local IT service provision) in synergy. Today, company generate more than 70% of the revenue for non-transport business which is strongly supported by transport sector.

Figure 2.2.1 TOD Concept along UMRT Corridor

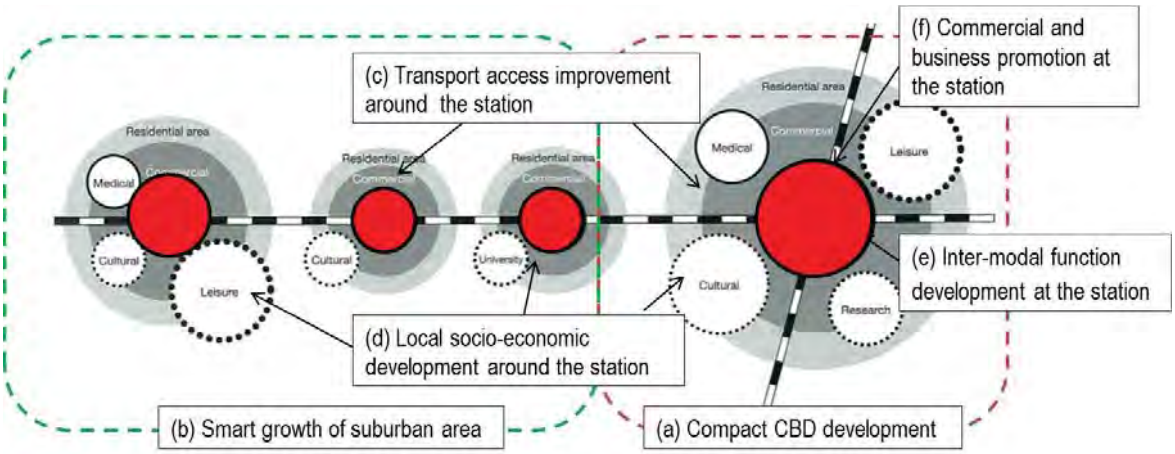


Figure 2.2.2 Smart Growth of Urban Area based on UMRT and TOD

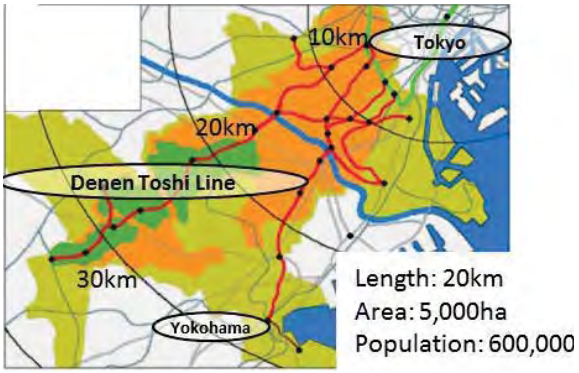
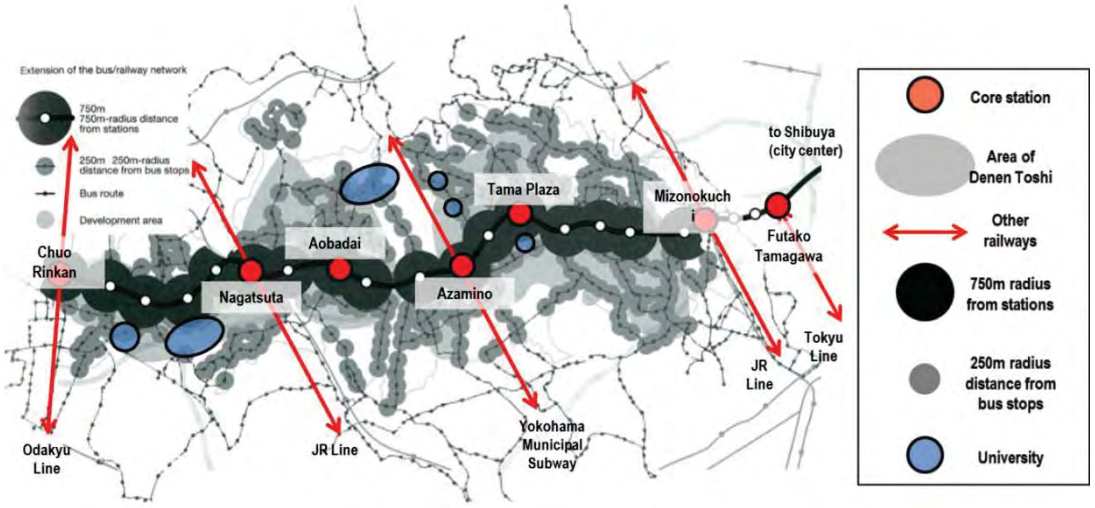


Figure 2.2.3 Tama Plaza Station Area

Figure 2.2.4 Integrated New Town Development and Bus Service Provision along UMRT



(iii) Experience of Singapore

2.10 Singapore shows a good case of UMRT development on extended TOD concept. On a limited scale of lands, a number of new towns have been developed which are connected with CBD and other centres of the city in perfect integration with UMRT network (See Figure 3.2.9).

2.11 New towns are designed in very compact form with high population density with high-rise affordable apartments and provided with rich open space and basic urban amenities. UMRT stations are located mostly in the centre of the new towns which make accessibility to both public transport and urban services convenient.

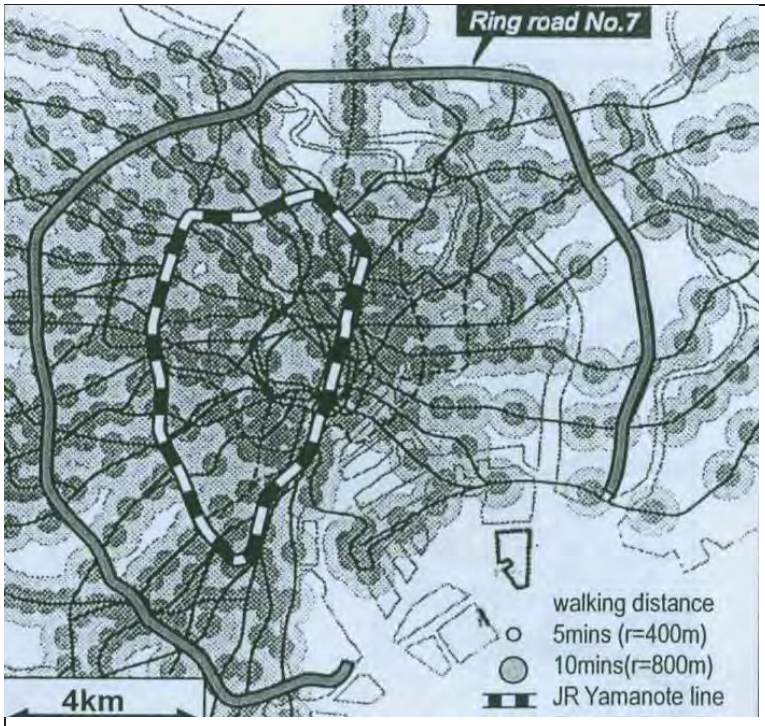
Figure 2.2.5 Basic Urban Structure of Singapore

3) CBD Traffic Management Improvement

2.12 Another important role of UMRT is to contribute to the improvement of traffic situation in CBD when UMRT is developed as an effective network. For example, CBDs in Tokyo are mostly covered within walking distance of UMRT stations (See Figure 3.2.10).

2.13 In busy CBDs, the stations of different lines are even connected with air conditioned extensive underground walkway network which provide UMRT users and pedestrians alternative walking environment depending on walking conditions and environment (See Figure 3.2.11).

Figure 2.2.6 UMRT Network in City Centre of Tokyo



Coverage of Walking distance along with Yamanote Line (Tokyo)

Underground Walkway Network in Marunouchi CBD

Underground Walkway Network in Shinjuku CBD

Source: JICA Project Team

4) TOD in Urban Fringe Area

(a) Ebisu Station Area Redevelopment

2.14 A good study case of station area redevelopment in urban fringe city is Ebisu Station area. Ebisu station is located close to the urban central station such as Shibuya and Shinjuku, and operated by JR East Japan Railway Company (JR East) and the Tokyo Metro Corporation, which is subway operator. Close to Shibuya, Shinjuku central of the Tokyo.

2.15 As one of successful Ebisu station area redevelopment is “Yebisu Garden Place”. It is comprehensive new town composed of commercial, business and residential builldings by utilizing the area Ebisu Beer factory once stood. Ebisu station and Yebisu Garden Place are connected directly by moving sidewalk named “Ebisu Skywalk” which is about 400 m long. Not only the Ebisu Garden Place, but also there is a commercial building above the station and popular for shopping as well.

(b) Totsuka Station Area Redevelopment Project

2.16 Totsuka station, connecting to JR East and Yokohama Metro (subway), is the second busiest station in Yokohama city, with some 290 thousand passengers a day. The station area was not provided with good infrastructure. Particularly in the western area of the station roads were narrow without parking space, and many old wooden houses were crammed, and the location of bus stop was elusive. To improve this situation, a development project was approved as city planning project in 1994 and finished in March 2013. The project adopted both land readjustment project scheme by land readjustment cooperative and urban redevelopment project scheme by Yokohama City.

2.17 Development concepts for the project are comfortable and convenient transportation terminal, pedestrian-friendly walking space and circulation, urban space considering historical and cultural heritage, public facilities and services for citizens, diverse commercial environment, attractive meeting and gathering square. Facilities included in the project are two Station Plazas to de-concentrate the traffic, one plaza for bus and taxi with bus rotary, taxi pool, and taxi berth, and the other for loading and unloading place of ordinary cars and taxi berth. A nine story building is developed to house public facilities such as Totsuka ward government hall, culture center, and underground parking for cars and bicycles. Commercial buildings are also included in the project.

5) Comprehensive Station Area Development in major CBDs

2.18 Tokyo has a number of different sizes where several UMRT Lines intersect. They often started with relatively small scale commercial/business hub located around the stations, then transformed to the areas filled with high-density activities and high-rise buildings. Existing urban areas were redeveloped and publicly owned lands developed on TOD concept. As CBD develops UMRT attracts more passengers which in turn flourish commercial/business activities in the CBD.

(a) Case of Shinjuku CBD

2.19 Shinjuku is one of the biggest CBD in Tokyo which has the biggest number of on and off passengers in all JR stations. An underground walkway connects the JR Shinjuku station and subway stations directly, and various types of buildings along the walkway are connected with it as well. Pedestrian can walk that underground walkway safely and comfortably.

Figure 2.2.7 Development of CBD and UMRT in Shinjuku Station Area

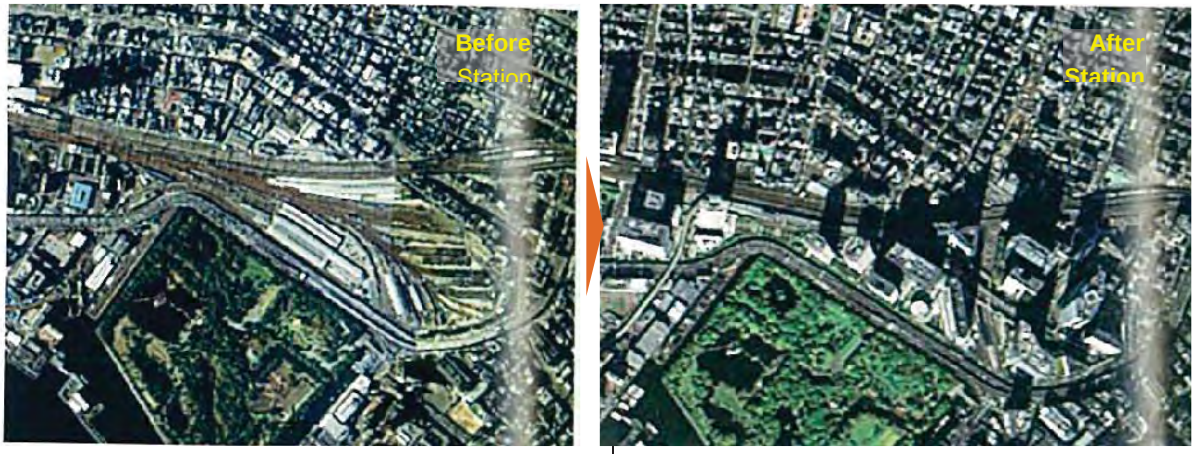
Underground Walkway Network

Underground Walkway connected several buildings, other stations

(b) TOD using Former Train Depot in Tokyo

2.20 Shiodome Station area was developed at the 30.7 ha train depot by the land readjustment project scheme. Approximately 2km elevated walkway is one of the great feature of the area. The elevated walkway connects stations and business, commercial and residential building, therefore pedestrians are provided safe walking environment by separating from vehicles.

Figure 2.2.8 Images of at and around Shiodome Station Area



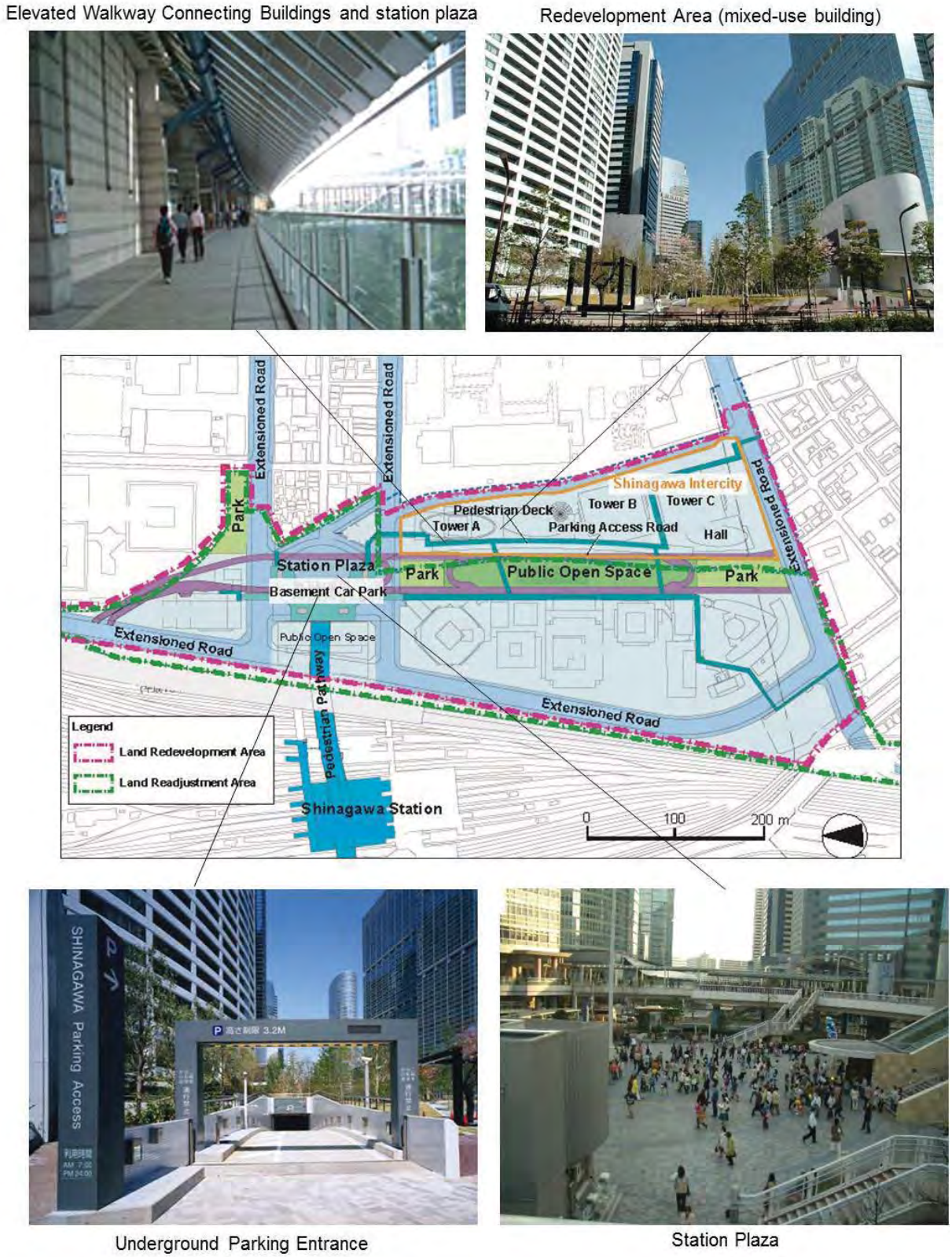
Before the Development **After the Development**

Source: Shiodome SHIO SITE Town Management, https://seidenpriester.wordpress.com/tag/pedestrian-deck/#jp-carousel-4707

(c) Redevelopment in Shinagawa Station Area

2.21 Shinagawa Station is one of the successful integrated urban development area by using the land readjustment scheme and PPP scheme. Through the redevelopment, road extension, provision of park/open space, underground parking and elevated walkway were progressed.

Figure 2.2.9 Shinagawa Station Map



Source: Made by JICA Project Tem based on Shinagawa Intercity Management Co.TokyoLtd. website, Winriver Corporation website

6) Station Building

2.22 A station building is a large scaled railway station house with functions other than the railway station's primary function such as commercial. In many cases, they have tenants such as retailers including department stores, business offices, hotels, etc. The station buildings are major sources to increase revenue of the railway companies, and the station building development induces the suburban people along the railway to shop at the station buildings by using the railway. Station buildings, with enhanced functions of both intermodal transfer and commercial facilities, can play a central role to develop urban centers.

2.23 In Japan, in most cases, finance for the station building development comes from the source other than the railway companies themselves. For instance, station buildings at the former state-run Japan Railway premises were often constructed by private investment. There are cases that the private railway companies built stations themselves, and had retailors like department store as tenants. In development of station buildings, Urban Redevelopment Project Scheme and Air Right Transfer are often adopted to facilitate the project implementation.

2.24 Tokyo Station Building: Tokyo Station is the central terminal in Tokyo as well as historical architecture to be preserved. The preservation project of the station is integrated with urban redevelopment project of Marunouchi District CBD around Tokyo Station. In this project, unused Floor Area Ratio (FAR) above the station, or air right is transferred to redevelopment land around Tokyo Station to construct high-rise buildings around the station and raise fund for restoration of Tokyo Station, which sold the unused air right for 50 billion yen. FAR reaches 1,604% by transferring unutilized floor area allowance above Tokyo Station.

2.25 JR Group Station Building: By leveraging development potential taking advantage of strategic location being just above the station, JR (former National Railway) develops a commercial building targeting young women to change negative image of the station facility. Lumine and Atre are one of popular commercial buildings competing other department stores. Lumine Co.,Ltd. is a company running station-building type of shopping center, which is a consolidated subsidiary of JR East Company with more than 10 such buildings; Atre Co.,Ltd. is also a consolidated subsidiary of JR East, and develops and operates station buildings with JR East. It operates more than 20 stations buildings.

2.26 Nishitetsu Fukuoka Terminal Building: As a mixed-use transport terminal of UMRT and buses and as a shopping base featuring the urban-style department store. It is aimed to address issues such as the need to facilitate the use of longer trains to accommodate increasing railway passengers, to alleviate traffic congestion around the bus terminal and to improve pedestrian circulation routes. Nishitetsu (Nishi Nippon Tetdudou) group has a wide range of companies railway, bus, taxi, freight forwarder, real estate, hotel and leisure, with Nishi-Nippon Railroad Co., Ltd., as core.

7) Intermodal Facilities

(a) Role and Functions of Intermodal Facilities

2.27 One of the most important advantages of the private transport mode is the provision of door-to-door travelling. Therefore, in order to realize the modal shift from the private to public transport mode, it is important to minimize the loss of intermodal transfer as much as

possible. Accordingly, the role of intermodal facilities is to ensure convenience, safety and a pleasant experience for activities of railway users and non-users in the surroundings of the station.

2.28 The users' activities consist of three major activities: (i) transfer between the railway and other modes of transport, (ii) parking of private car, motor cycle and bicycle, and (iii) circulation for walking, meeting and relaxation. These roles are detailed as follows:

(i) **Transfer:** For the urban public transport system development in Hanoi, connecting the UMRT station with other transport modes such as bus, taxi, car, M/C, bicycle, etc. is one of the most important strategies. To successfully realize this, it is necessary to ensure convenience and safety for many daily transit passengers. It is therefore necessary that intermodal facilities such as bus stops and station plazas with bus berths be constructed near the stations. Likewise, transfers from or to private vehicles and taxi should be planned well to avoid congestion and accidents in the surrounding areas. The pick-up and drop-off points and the vehicle pool should be secured near the station. In addition, the access road and pedestrian bridge should provide smooth and safe access to each facility. Thus, intermodal facilities have the significant role to provide appropriate spaces for the modal shift between the railway and other transport modes.

(ii) **Parking**: Using private vehicles to access the railway station will result in a demand for parking spaces around the station. For the reduction of traffic congestion and accidents caused by roadside parking, adequate parking space should be allocated near the station. From the perspective of promoting railway use, convenient parking facilities near the station will promote Park and Ride (P&R)[2] behavior and will contribute in the increase in the number of railway passengers and will decrease the environmental load accordingly.

(iii) **Circulation**: In the station area, railway passengers create circulation activities such as walking, waiting and meeting. Thus, provision of convenience and amenities to these activities is also necessary to promote railway use. In particular, wide passage ways and open spaces are required for the convenience of pedestrians, and green scenery space, installation of a landmark and illumination in the station plaza will create a cityscape as an amenity for station visitors. In addition, retail shops such as supermarkets, kiosks and cafés will also add to the convenience of railway passengers.

2.29 For planning and design of facilities, it is necessary to take following principles into consideration:

(i) **Universal design:** Universal design, often inclusive design, refers to broad-spectrum ideas meant to produce buildings, products and environments that are inherently accessible to older people, people without disabilities, and people with disabilities.

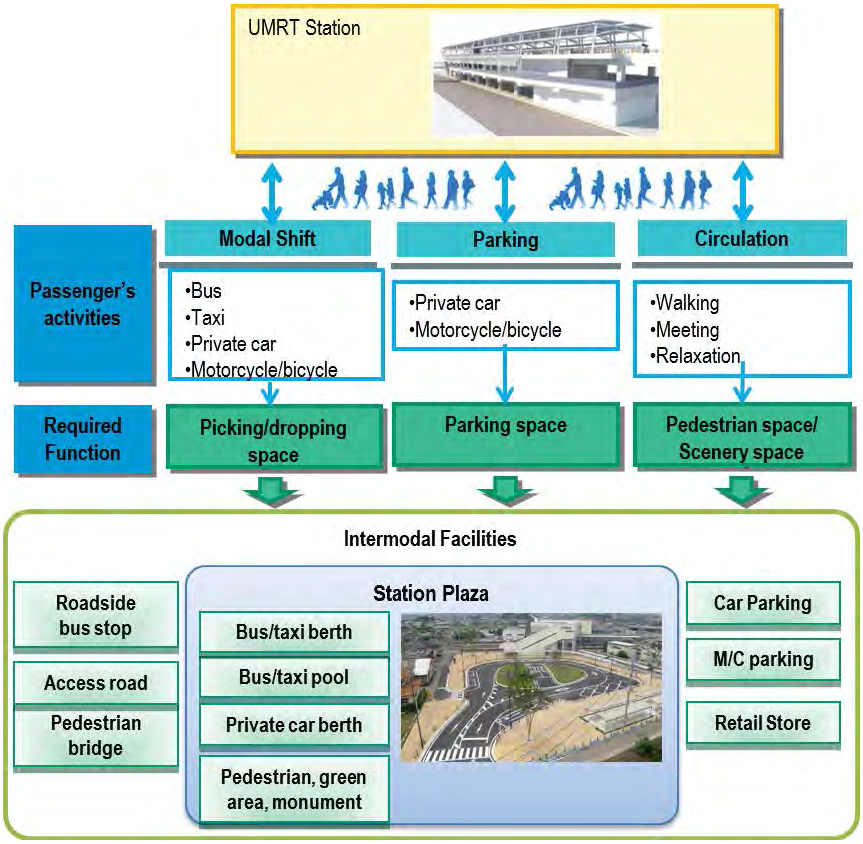
(ii) **Smooth door-to-door movement:** Smooth door-to-door movement of the UMRT users should be facilitated: smooth movement is convenient, comfortable, safe, reliable, affordable one.

[2] Park and ride (P&R) facilities are car parks with connections to public transport that allow commuters and other people headed to city centres to leave their vehicles and transfer to a bus, rail system (rapid transit, light rail, or commuter rail), or carpool for the remainder of the journey. The vehicle is stored in the car park during the day and retrieved when the owner returns. Park-and-rides are generally located in the suburbs of metropolitan areas or on the outer edges of large cities.

(iii) **Walkable public space:** Attractive walking environment, or walkable space is essential to TOD related facilities and buildings. This concept must be always taken into account in planning and deigning.

2.30 Intermodal facilities consist of transport facilities such as station plazas, bus stops, pedestrian bridges, access roads, car parking and motor cycle parking, and other service facilities such as open space, green space and retail shops. Among these, the station plaza is the central facility with multiple functions as both a traffic square and a public open space. The components are (i) carriage way (one-way), (ii) bus berth and bus pool, (iii) taxi berths and taxi pool, (iv) berth for private vehicles, (v) pedestrian bridge, (vi) pedestrians' circulation space, and (vii) open space.

Figure 2.2.10 Role and Function of Intermodal Facilities



(b) Station Plaza

2.31 A station plaza broadly has two spatial functions. One is a transport spatial function to handle traffic of railway users, and the other function is an environmental spatial function for people walking, waiting and meeting, which requires comfortable space for users. In addition, the station plaza is important as "Symbolic Image of City or district" to which gives a first impression of the district, and should be planned as such (see Figure 2.2.11 and Figure 2.2.12).

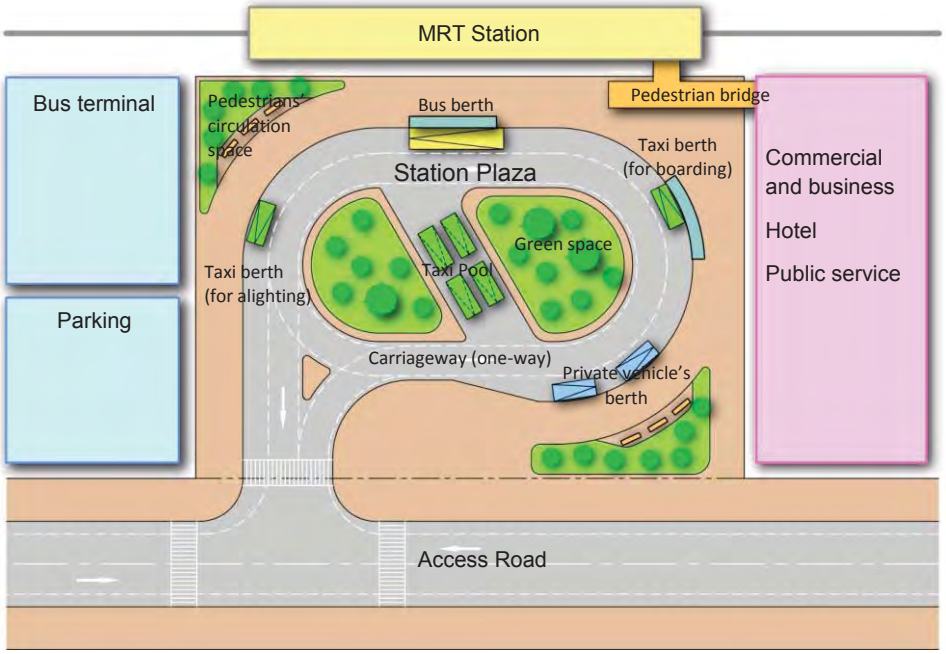
2.32 In the planning of the station plaza, each component should be laid out in consideration of safety, connectivity, accessibility and efficiency. As a traffic square, it is required to secure the users' accessibility between station gate and each transit berth and to reduce traffic congestion and accident. The capacities of traffic components such as the bus berth, taxi berth and taxi pool are estimated based on future railway demand and modal

share.

2.33 As a public open space, it is required to have amenities and convenience for railway passengers and pedestrians through the provision of comfortable area, installation of a landmark and illumination. Finally universal design concept shall be necessarily adopted in designing them.

2.34 Station plazas should be developed and managed by the agreement between the railway operator and the road administrator based on their jurisdiction because the station plaza includes road facility and other facilities. For instance, in Japan, railway companies and the concerned governments agree upon their responsible area of the station plaza in construction cost, operation and maintenance, and other concerns. And the station plaza also is recommended to be officially designated as transport facility with legal basis of urban plan to ensure necessary land and ROW.

Figure 2.2.11 Basic Layout of the Station Plaza



Source: Final Report of "Special Assistance for Project Implementation (SAPI) for Ho Chi Minh City Urban Railway Project (Ben Thanh – Suoi Tien Section (Line 1))", 2014, JICA

Figure 2.2.12 Station Plazas in Japan

Station Plaza of Totsuka Station (bus rotary, taxi pool, pedestrian deck)	Station Plaza of Futako Tamagawa Station (bus rotary, taxl pool, pedestrian plaza with rooftop)
	

Source: JICA Project Team

(c) Bus and Taxi Facilities

2.35 Bus and taxi facilities are usually located in front of the station gate for smooth transfer of passengers. To improve waiting and transfer environment, roofs and shelters, benches, and bus location system (information of bus location and arrival time) are developed. If there are several bus stops in the station plaza, bus bays are located in parallel; accordingly it is necessary to secure a pedestrian crossing or pedestrian bridge for safety.

2.36 In the CBD, the UMRT terminal station is developed integrated with a bus terminal and commercial facilities. For example, Nishitetsu Company, a railway and bus operator, developed a station building, and a department store whose floors are rented out to tenants.

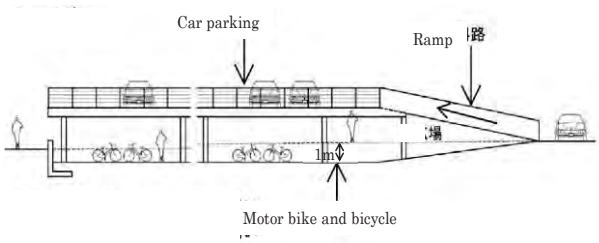
(d) Car Parking

2.37 Car parking should be designed and developed to ensure smooth and comfortable traffic environment, and under the recognition that cars and motorcycles are indispensable transport modes for socio-economic activities. Parking spaces should be planned and developed in consistency with city-wide land use, urban planning, and transportation plan from a long term perspective. Purposes for parking are broadly business, intermodal transfer, shopping, commuting, and park & Ride. In this study, intermodal transfer and Park & Ride are focuses.

2.38 In Japan, car parking is important facility as urban transport facility. Parking necessary for intermodal transfer and park & ride are mostly developed by the public sector, as well as on-street parking and those adjacent to streets within ROW and those which definitely needed in the already urbanized area for maintaining urban function but the private sector cannot develop for financial reason. Parking development and operation and management of parking are stipulated by various laws including City Planning Law to officially designate parking as city planning facility, Road Law to stipulate parking as part of road facility, Parking Law to provide with parking area, on-street parking, and Road Transportation Law to control parking meters of on-street parking. City Planning Law can designate a parking development area which is required to ensure smooth traffic in commercial area, as city planning facility (see Figure 2.2.13).

2.39 In Hanoi, car parking spaces are limited, especially in already urbanized area. Car parking should be planned and developed efficiently and effectively under limited available space, including multi-storied and underground parking facilities as well as surface car parking.

Figure 2.2.13 Example of Car Parking

Multi-story parking building, Hashimoto Station, Tokyo	Semi-underground parking for bicycle, motorcycle and car
	

Source: JICA Project Team based on various sources

(e) M/C and bicycle parking

2.40 Bicycle and motorcycle parking provides space for accommodated bicycles and motorcycles to ensure smooth and comfortable traffic environment for all transport modes. Bicycle parking near stations is indispensable and serves as Park & Ride facility for MRT users. The parking spaces should be planned and developed efficiently and effectively under the available space limitation, in consideration of the following spaces:

2.41 Parking space on sidewalk and under the viaduct: Possible to develop with no additional costs for parking space acquisition and pavement work; however, a careful attention should be paid not to disturb pedestrians when developing on the sidewalk.

2.42 Surface parking space: preferable close to the station, say within 200 meters from the station, utilizing the station premises, or public owned land nearby.

2.43 Underground parking space: Costly, but able to accommodate many units under the available land limitation.

2.44 Bicycle and motorcycle parking are mostly developed by the local government, both pay and free parking. The private business also operates pay parking facilities near stations, most of which are of a couple of stories.

Figure 2.2.14 Examples of Bicycle Parking

Pay bicycle parking on-siewalk, Nishisinjuku, Tokyo	New York	Parking under viaduct of UMRT, Odakyu Line, Tokyo
		

Source: JICA Project Team from various sources

8) Pedestrian Facilities and Walking Environment

(a) Pedestrian--friendly Walking Environment

2.45 It is preferable to secure walking space to separate pedestrians from cars, motorcycles, and bicycles for pedestrians' safety. Even if such space separation cannot be secured, such measures to protect pedestrians from vehicles should be taken, as so-called "shared street" where traffic of cars, motorcycles, bicycles, and pedestrians are all mixed to travel quietly.

2.46 In Vietnam, at least motorcycles should be prohibited to run on the sidewalks for pedestrians' safety. The separation method below can be suggested to Vietnam

(i) **Pedestrian-bicycle-vehicle separation: guardrail between bicycle and car lanes:** This is suitable for the primary road to secure the safety of bicycle and pedestrian, and to keep the smooth traffic flow by separating lanes phisycally.

(ii) **Pedestrian-bicycle-vehicle separation: On-street markers for bicycle lane:** This is

required for the secondary road with middle traffic volume. This separation way secures the traffic flow and access as well. In this case, well manner of vehicle drivers is essential.

(iii) **Pedestrian-Bicycle-Vehicle shared road: On-street markers for pedestrian lane:** This is adapted for tertially road/alley with lightly trafficked. This type of separation way supplies easy access along the road. In this case, keeping traffic manner by drivers of behicle, bicycle and pedestrain is highly required.

(b) Pedestrian Deck

2.47 A pedestrian deck is located at busy station areas or skyscraper blocks to ensure safe and comfortable walking space for people by separating vehicle and pedestrians vertically. In many cases, the pedestrian deck is constructed over the station plaza of big terminal stations, and developed to connect elevated stations and connects with buildings around it. There is also a ring-shaped pedestrian deck over road intersection which enables pedestrians to go every direction of the intersection. This facility plays an important role to form pedestrian friendly walkways.

In Japan, development schemes and legal status of public walkways including pedestrian decks vary and there are no specific rules on their development and management. However, guidelines has been prepared by the government (MLIT) on development cost sharing and responsibility for operation and management between the urban facility administrators and railway operators by type of walkway.

Figure 2.2.15 Examples of Pedestrian Deck

Station plaza elevated above the station, Mizonokuchi Station, Kawasaki City	Connect to commercial facility, Kawasaki Station, Kawasaki City
	
Crossing at an intersection, Shin Yokohama Station, Yokohama City	"Pearl Ring" pedestrian cross an intersection and create openspace, Shanghai City
	

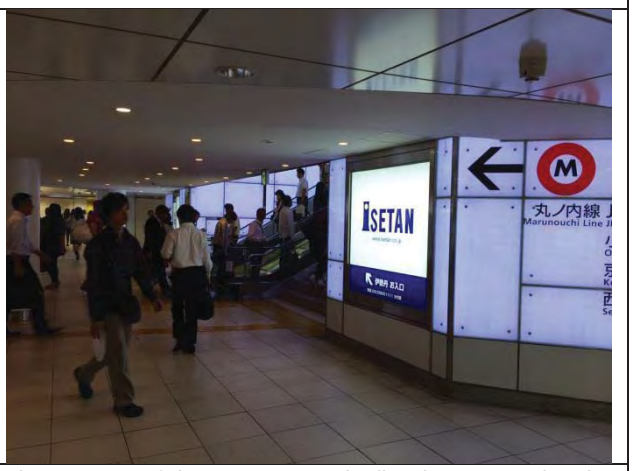
Source: JICA Project Team

9) Use of Underground Space

2.48 Underground walkways are basically developed by UMRT developers to connect to station gateways. In the CBD, the private sector owners of commercial and business facilities along trunk roads often invest to connect the underground entrance of their facilities to the station.

2.49 Because of being located underground, safety measures must be strictly taken to underground walkway. In Japan, the building codes and other related laws and regulations stipulates the safety measures for disaster management against natural and man-caused disaster including fire and flood. Responsibility for development and management of the underground walkway should be decided between the railway operator and the road administrator, referring to the guideline prepared by the MLIT, Japan.

Figure 2.2.16 Examples of Underground Walkway in Tokyo

Underground Metro Promenade connects between Shinjuku Station and Shinjuku Sanchome Station	Underground entrance of a department store
	
Three metros are connected in Shinjuku Sanchome Station, where there are totally 22 entrances most of which connect the underground floor of private buildings along the trunk roads in the staion vicinity.	The entrance of department store is directly connected to the underground walkway of UMRT. An underground walkway network covers about 500m radius from Shinjuku Station, including an underground shopping mall, by connecting commercial and business facilities along the runk roads in the staion vicinity.

Source: JICA Project Team

10) Opportunities for Local Economic Development around UMRT Stations

(a) Local Commercial Street at and around Station

2.50 There are many commercial streets which small and local based shops are clustered on both sides of the street. These streets are used as the main access road from local communities to the nearest station. To create an attractive and comfortable image of the commercial street, various measures are taken such as local economic promotion activities, improvement of walking environment by building arcade, improving and coloring pavements, light and decorated street lamps, benches, restriction of traffic during commuting and shopping time. In Japan, to promote the commercial activities of these commercial streets, most of them organize a cooperative under Law on Local Commercial Street Promotion Cooperatives.

2.51 Motomachi Commercial Street in Yokohama: To create a traditional and modern

image of international city of Yokohama, townscape is unified and shops are setback to provide space for pedestrians. These rules are regulated as the urban design guideline of Motomachi.

2.52 Koenji Commercial Street: This is a typical commercial street in a local residential area. By providing arcade to shelter from rain, sun heat, or wind so that local people can enjoy shoppping on their way to and from the station.

Figure 2.2.17 Examples of Local Commercial Street in front of Station

Motomachi Commercial Street in Yokohama	Koenji commercial street
	

Source: JICA Project Team

(b) Utilization of Under Railway Viaduct

2.53 Spaces under railway viaducts are mostly utilized for car and bicycle parking, storage or park. At the same time, there are potentials to utilize the space in limited urban areas for various purposes.

2.54 In Japan, in CBD, there are small shops and restaurants clustered to enjoy drinking and shopping after business hour for commuters. Recently, railway operators improve space under the viaduct as a shopping mall inviting various types of facilities such as nursery, restaurant, craft shops, library, community centers which support needs of both UMRT users and local communities. The railway companies, or companies entrusted by the railway companies like realtors manage the space, mostly leasing out to tenants.

2.55 Artisan street between Akihabara and Okachimachi Station: Traditionally, there are many craft artisans clustered in this area as a wholesale district. To revitalize its tradition as well as to provide opportunities for young artists to exhibit and sell their works, this street was opened and invited craft shops.

2.56 Ecute Manseibashi: To preserve historical relic of the abandoned brick-made railway bridge, Mansei bridge, the space under the railway and the original statoin platform are used as a shopping mall with restaurants, cafes and shops.

Figure 2.2.18 Examples of Commercial Use under Railway Viaduct

Artisan street between Akihabara and Okachimachi Station	Ecute Manseibashi
	

Source: JICA Project Team

(c) Underground Mall

2.57 Around the UMRT station, many urban facilities such as commercial and business facilities, government offices, and parks are clustered. Underground space has a potential (i) to increase the number of station users and expand catchment areas of the station by developing station entrances to various directions3, (ii) to utilize lands around the station efficiently, and (iii) to formulate exclusive, safe, comfortable pedestrian networks with lighting, air-conditioning, etc.

2.58 In Japan, an underground mall is defined as an integrated underground facility composed of a public underground walkway and shops and offices facing the walkways, which connects to roads or a train station plaza. The underground mall is legally approved by prefectural governor and controlled by City Planning Law to designate public facilities such as public underground walkway and public underground parking, Road Law to approve use of the space within ROW, Building Codes to permit construction and underground walkways, and Fire Service Act to stipulate firefighting equipment and firefighting management.

2.59 The following describes two examples. The one is Tenjin Underground town. It is developed under the trunk road (w=50m), with total length of 590m. B1F is used for a public underground walkway and shops, B2F is a public parking, and B3F is a machine room. The developer is a public-private joint enterprise including Fukuoka City, a power company, a railway company and department stores, etc.

2.60 The other example is Sapporo station-front road underground mall. It is developed by the public sector (a section of 160m-length was subsidized by MLIT, a section of 300m-length by Sapporo City) to connect existing underground shopping malls developed by private sectors to integrate the underground network. While the road management authority of Sapporo City manages the underground mall, the private company participates do the underground open space which is used by local communities (NPO, commercial owners, local groups, etc.).

[3] According to the pedestrian count survey of Tenjin Underground Town, after extension of underground walkway, number of pedestrian underground increased 1.16~2.34 times. Before extension, number of pedestrian at-grade and underground are mostly equal (50%- 50%), but after extension of underground walkway, the share changed to 40%- 60%. (source: the article written by Fukuoka City)

2.3 Approach to TOD in Hanoi

1) Key Role of UMRT in Hanoi

(a) Smart Urban Growth

2.61 UMRT is a key strategic instrument to promote smart growth of large-urban areas such as Hanoi, especially cities in Vietnam have been compactly built with high population density in the city core. In Hanoi, the population density is quite high in Hoan Kiem District (366 persons/ha), Dong Da District (422 persons/ha), Hai Ba Trung District (376 persons/ha), Ba Dinh District (277 persons/ha), on the other hand it is low in fringe areas such as Ba Vi District, Thach That District, Ung Hoa District, My Duc District.

2.62 However, when the population began to increase hand in hand with economic growth and motorization, urban areas have started quickly expand to outer areas and at the same time population density in congested urban centre started slowing down or decreasing. This has been happening during the last decade and being accelerated in Hanoi. Many urban development projects are being implemented in outer areas to meet the demand. De-densification of the city core and promoting population growth in outer areas is a basic urban growth policy of the city which is led by development of roads and active developments of private sector. As a result relatively low density urban areas expand which is rather private transport oriented. It is important to know that UMRT and associated TOD involve tremendous opportunities to guide urban growth in more sustainable manner.

2.63 UMRT can promote developing convenient, livable, and affordable sub urban areas along the route (see Figure 2.3.1). It is convenient because the outer area is connected with CBD with UMRT, it is livable because environment in outer areas is better than the city centre; it is more affordable because the cost of housing and infrastructure is low. There are many successful cases in the world. For example, many large cities in Japan have implemented development of large-scale new towns together with rail development.

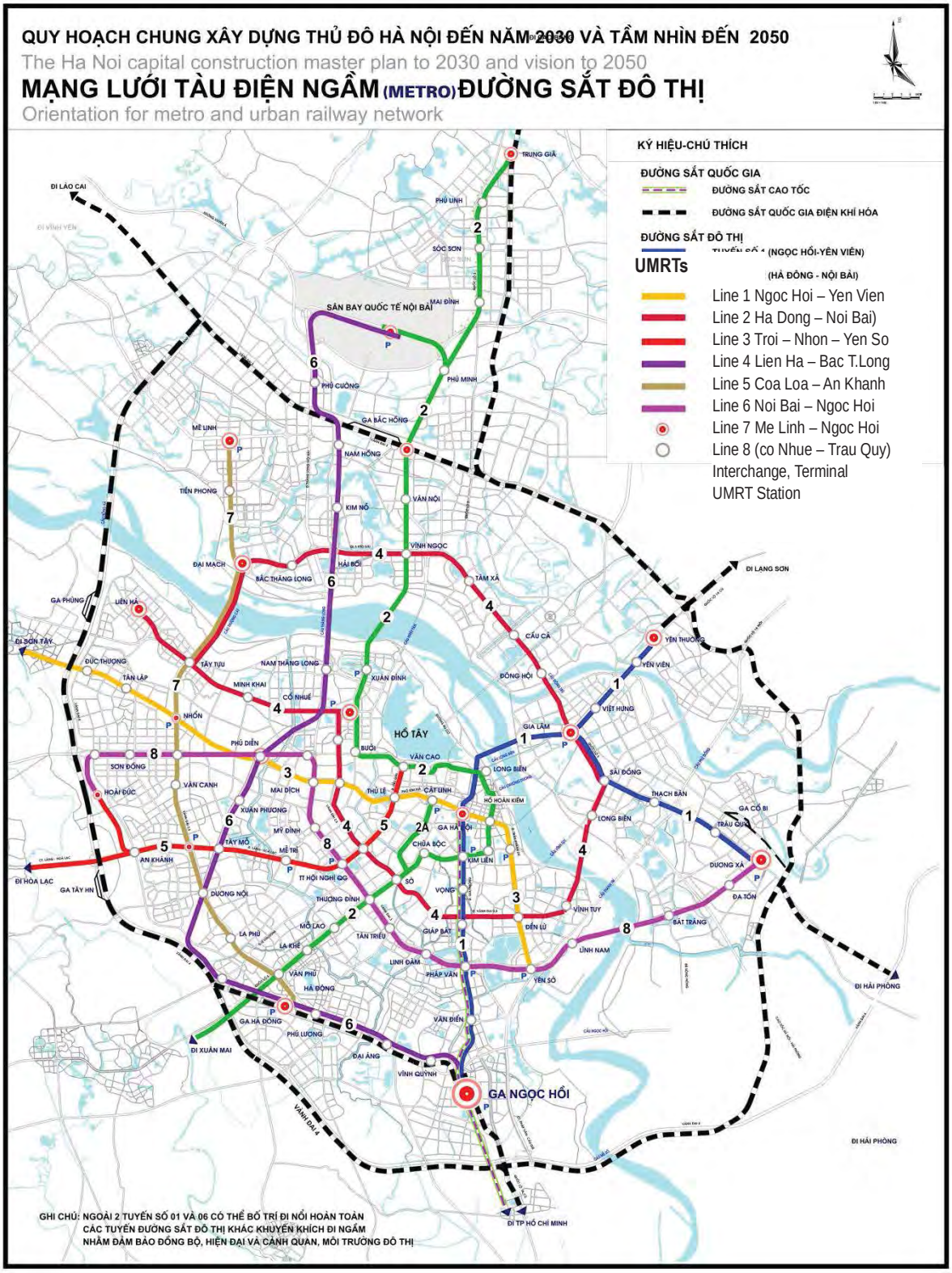
(a) Reorganization/Revitalization of CBD

2.64 UMRT and TOD can contribute to restructuring and improvement of CBD: Improvement role of UMRT in CBD is to reduce traffic congestions or reduce entry of private cars, enhance transport environment (safety, reduction in noise and air pollution) and improve walkability. However, in order to achieve this, UMRT routes should be designed as an integrated network. This means, the people who reside in or visit to the city centre must be provided with UMRT stations within walking distance or convenient feeder transport means.

(b) Enhancement of Urban Development/Redevelopment of Station Areas

2.65 UMRT and TOD can provide ample opportunities for competitive urban development at and around UMRT stations; UMRT stations generate extensive opportunities for urban development (residential, commercial, office/business, recreational, cultural, civic services, etc.) depending on the locational characteristic, and interests of communities, investors and other stakeholders.

Figure 2.3.1 Planned UMRT Network of Hanoi



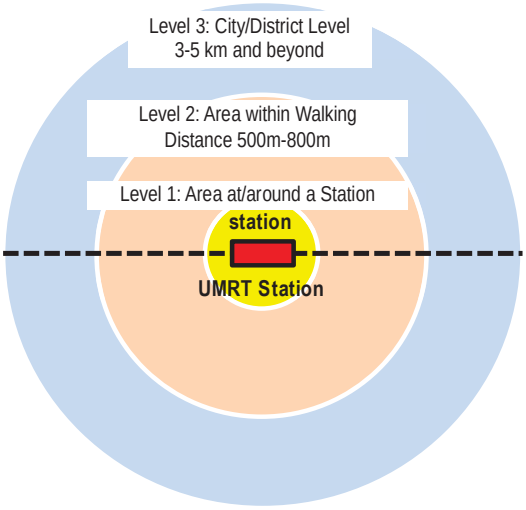
Source: Hanoi City General Plan

2) Importance of Integration

(a) Spatial Integration

2.66 In formulating TOD concept plans for each UMRT station, three levels of influence areas should be considered (see Figure 2.3.2 and Figure 2.3.3).

Figure 2.3.2 UMRT Influence Areas



Source: JICA Project Team

(i) **Urban Cluster:** Urban areas along the UMRT lines are broadly classified to a number of urban clusters which involve more or less homogeneous urban characteristics. In case of the coverage of phase1 section of UMRT Line1 and Line2, five clusters are identified as follows;

- Cluster1: North West Urban Cluster: North-west new urban core of commercial, public administration, residential and extension of transit toward Noi Bai: C1 Nam Thang Long, C2 Ngoai Giao Doan, C3 Tay Ho Tay and C4 Buoi
- Cluster2: South West Lake Urban Center: Existing dense urbanized area with public transport oriented development area: C5 Quan Ngua, C6 Bach Thao, C7 Ho Tay
- Cluster3: Hanoi City Centre: Old downtown, commercial, business district and pedestrian centered urban space: C8 Hang Dau, C9 Hoan Kiem Lake, C10 Tran Hung Dao, V6 Long Bien Nam, V8 Hanoi
- Cluster4: South Urban Cluster: South urbanizing area and expansion area: V9 C.V. Thong Nhat, V10 Bach Mai, V11 Phuong Liet, V12 Giap Bat
- Cluster5: East Urban Cluster: East urbanizing area and expansion area: V4 Gia Lam, V5 Long Bien Bac

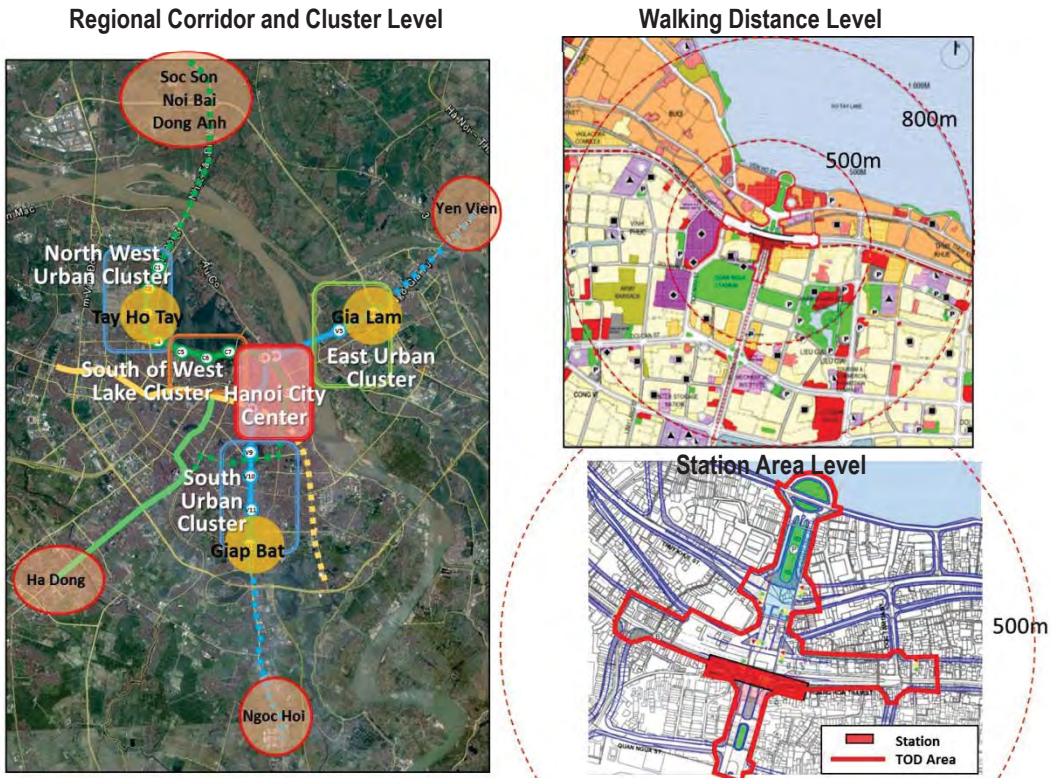
(ii) **Area within Walking Distance:** Though it varies by nature of physical conditions of a city in general and a station specifically, there is a general consensus tolerable distance by walk is 500m to 800m. In case of the coverage of phase1 section of UMRT Line1 and Line2, walking distance is 500 meter radius in general, and 800 meter radius for core stations such as Hanoi, Giap Bat and Gia Lam.

(iii) **Station Area and TOD Area:** The area also varies by station depending on its specific physical condition. It is considered the station area is defined as the necessary area to

ensure provision of basic intermodal facilities of UMRT. This particular area is farther defined for each UMRT station to delineate the boundary specifically. It is proposed that the area is called “TOD Area” and incorporated in Zone Plan (see Chapter 5 for detail).

2.67 The aforementioned three spatial levels are not to be separated but integrated in formulating plans and projects.

Figure 2.3.3 Target Areas for TOD Concept Plan Formulation of UMRT Line1 and Line2



Source: JICA Project Team

(b) Sector Integration

2.68 TOD involves three important scope in planning and development. They are transportation access, integrated urban development and community improvement. Improvement of transportation access should not be limited to UMRT users and isolated from community improvement and integrated urban development. Transportation access improvement should be planned in a way that it will contribute to the improvement of inability and accessibility of the people and facilitation of urban development in the UMRT influence are of related communities.

2.69 Urban development and redevelopment which have been and will be undertaking should also consider the availability of UMRT to promote utilization of public transport. Station area will also provide opportunities for local socio-economic development as well as creating a symbolic public space in the surrounding communities.

(c) Institutional Integration

2.70 In order to implement TOD projects, it is also important to consider institutional aspects as explained below;

(i) Compliance to Zone Plan: Zone Plan is an important tool to control and promote planed

urban development. Proposed TOD plans should be properly reflected or included in the Zone Plan which have been currently finalized.

(ii) Coordination among Related Organizations; TOD plan is composed of various projects which should be implemented by different bodies not only including SOEs, private developers and communities. Without effective coordination, TOD will be no success.

2.71 In formulating TOD concept plans for the stations located in phase1 section of UMRT 1 and 2, planning directions are made clear based on the discussion held comprehensively as explained in previous sections for the 500 meter radius areas of UMRT stations. On this basis of planning directions, a TOD concept plan each UMRT station is prepared as follows;

(i) TOD Area is designated to cover the ROW of UMRT and the area wherein measures to ensure good accessibility to the station must be provided (see Chapter 5 for detail).

(ii) Concept plan is formulated in compliance with current zone plan as well as other approved plans. When it is found necessary to ensure effective use of UMRT, the proposal is shown in the concept plan.

(iii) The concept plan is composed of measures on transport access improvement to and from the station as well as for improvement of existing communities. Access transport improvement plan is worked out for the area within a kilometer radius of the station in general and the TOD Area more specifically.

2.72 TOD plans should be implemented, especially as the UMRT projects are already on-going. When the UMRT is opened, at least UMRT users must be provided with reasonable access and the UMRT should not cause traffic conflicts at and around the station. While those minimum requirements should be met timely, it is also important to establish a base to farther promote TOD and contribute to sustainable development.

3) Key Interventions for Successful TOD

2.73 TOD intends to increate in ridership of UMRT and satisfaction of UMRT users by providing improved access, and promote socio-economic development and environmental sustainability through integrated urban development in synergy in the influence areas of UMRT. When TOD is implemented for all stations of a route, UMRT users will be provided a seamless services and the effects of TOD will be multiplied. It is to be noted that an ultimate objective of TOD is to realize public transport based compact urban area where in lands are effectively used, environment is preserved, high mobility and accessibility are ensured and impacts on climate change is limited.

2.74 Main components of interventions required to implement TOD are as follows (see Figure 2.3.5):

(a) **Access Roads Development:** Stations must be provided with good access roads for pedestrians and vehicles including bicycle, motorbike, car, taxi, bus, etc. to reach and depart to and from the stations.

(b) **Station Plaza:** Stations must be provided with space at the front of stations for easy access to and egress from the stations by walk, bicycle, motorbike, car, taxi, bus and so on. For this, adequate size of parking space and loading/unloading space facilities must be provided. In consideration of local characteristics and needs, station plaza may also have to serve as a symbolic space for community and other activities.

(c) **Pedestrian Access:** Walking is the most important mode of transport in accessing to UMRT stations. Although the access demand by walking varies by station, it normally shares more than half of it. Therefore, the environment for pedestrian access must be improved in the most effective manner especially within walking distance of a station which is more or less 800 meter or 10 minutes' walk. Measures include smooth walkways (at-grade, elevated, underground) without physical barrier and crisscross with vehicles, and with shade, trees and street furniture. Proper arrangements for disabled, children and aged are also necessary.

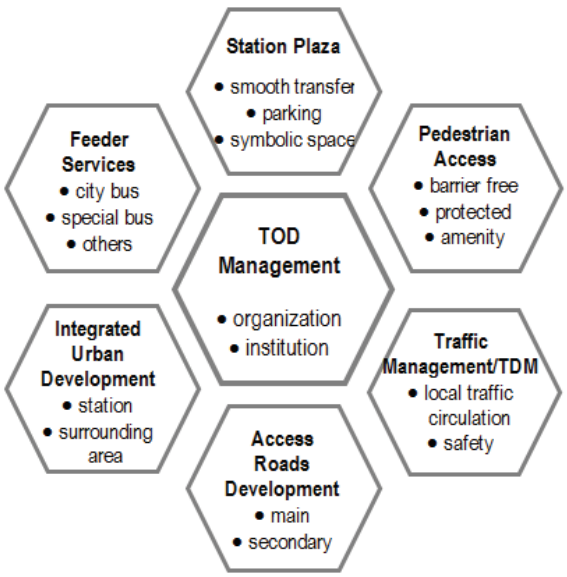
(d) **Traffic Management/TDM:** At and around the stations, different types of traffic concentrate, especially during peak hours. In order to regulate traffic flow at and around the stations, proper traffic management must be provided including, among others, traffic signals both for vehicles and pedestrians, safety facilities. Introduction of UMRT will also provide Hanoi City with an opportunity to introduce more drastic TDM such as care and motorbike restraint in the city center.

(e) **Feeder Services:** Feeder service to UMRT stations is important to expand the catchment areas of UMRT. In addition to connect UMRT with existing city bus services at UMRT stations, there is an opportunity to provide special bus services which are more directly integrated with UMRT through common fare and terminals to extend high-quality bus service beyond the Phase 1 section, which will be operated until next phases of UMRT are completed.

(f) **Integrated Urban Development:** Integrated urban developments at and around UMRT stations is important because it will not only benefit UMRT users but also attract more users. It will also increase opportunities for new commercial development or redevelopment because of improved accessibility for potential customers.

(g) **TOD Management:** In order to handle the above TOD components comprehensively, management is critical. Proper organization and inter-agency coordination mechanism must be established, and necessary regulations and institutional arrangements must be prepared for funding and private sector involvement

Figure 2.3.4 Main Components of TOD



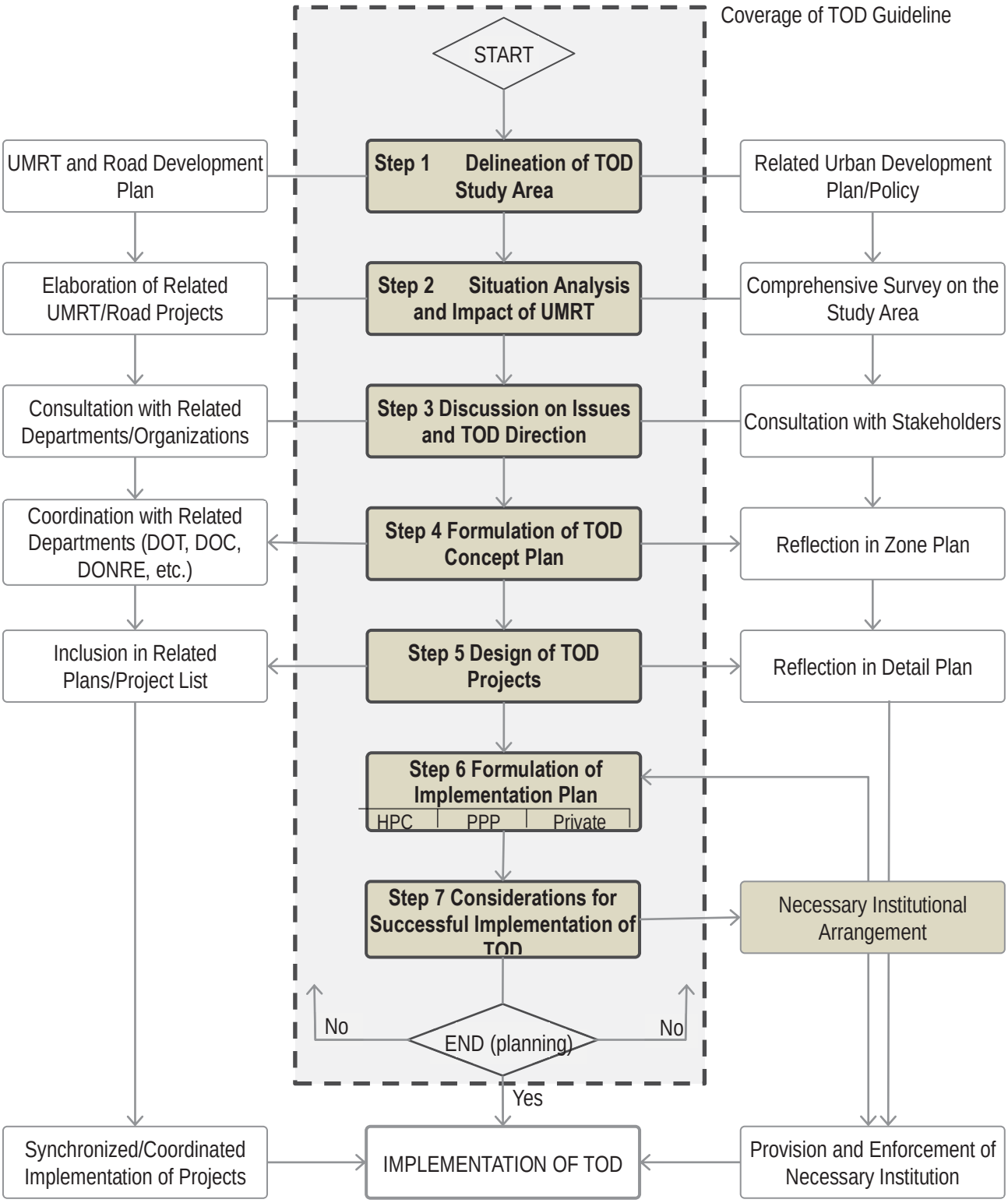
Source: JICA Project Team

3 TOD PLANNING STEPS

3.1 Overall Framework for Plan Formulation

3.1 The overall steps for plan formulation is shown in Figure 3.1.1.

Figure 3.1.1 Flowchart of TOD Planning Methodology



3.2 Step1: Delineation of TOD Study Area

1) Objectives

3.2 To review and analyze present condition of UMRT network, alignment and station areas, TOD study area is selected in hierarchical manner.

2) Tasks

3.3 **Task1 Determine TOD influence areas:** TOD influence areas are categorized into three levels; (i) corridor and cluster level including several stations which involve more or less homogeneous urban characteristics, as well as coverage of feeder services, (ii) station area within walking distance (500 – 800 meter radius), and (iii) station area including ROW of UMRT and the necessary area to ensure provision of basic intermodal facilities of UMRT. TOD study area is defined as the coverage of planning consideration, including TOD influence areas above. The study area is larger than area within walking distance, and is divided by physical barriers such as trunk roads, rivers and/ or administrative boundaries of district or wards/communes.

Figure 3.2.1 Distribution of City Centers with UMRT Network

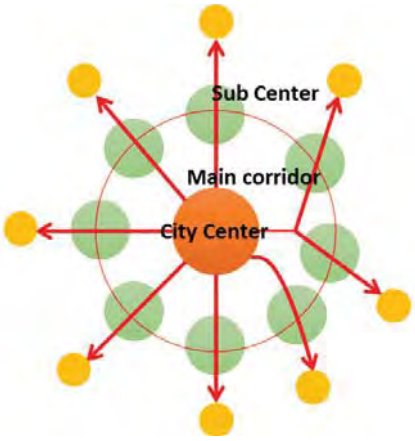


Figure 3.2.2 Corridor along UMRT

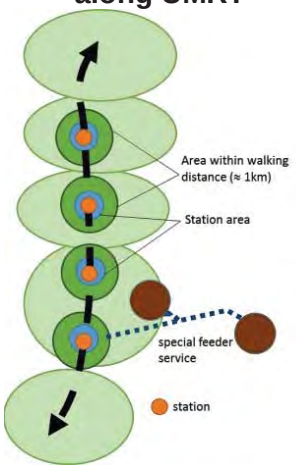
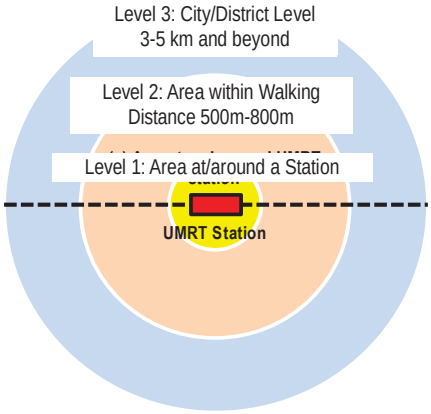


Figure 3.2.3 Three (3) Levels of UMRT Influence Area



Source: JICA Project Team

3.4 **Task2 Review of related plans on transport, urban development, landuse plan:** Relevant plans and projects (City General Plan, Zone Plan, relevant sectorial plans, transport and urban development projects) are reviewed and to clarify overall development orientation, relevant transport (road and public transport) projects, UMRT plans and projects (network, alignments, station locations, implementation schedule, etc.). Necessity of TOD is elaborated taking into consideration of landuse and transport development and socio-economic development of TOD influence areas. Current status of UMRT construction projects and Zone Plan formulation are confirmed.

3.5 **Task3 Prepare Planning Task (TOR) on TOD study:** In compliance with the Urban Planning Law (Article 24, 44, 45, 20, 21 & Decree 37 Article31), the Planning Task (TOR) is prepared including TOR of Strategic Environmental Assessment (SEA).

3) Outputs

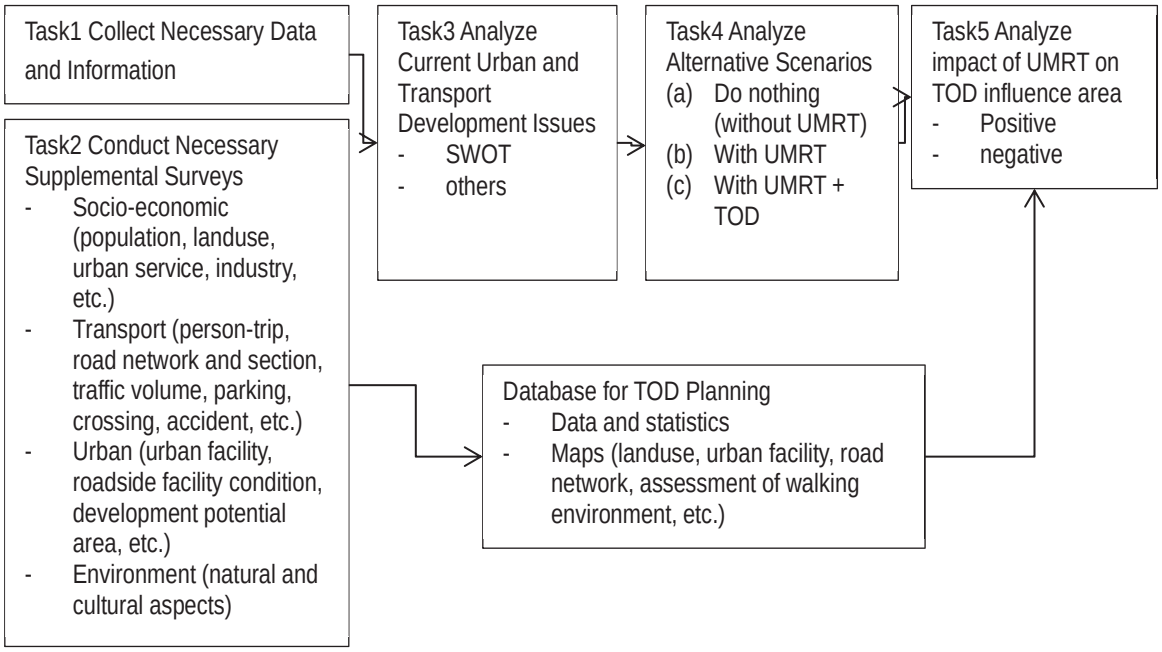
- Proposed TOD Study Area including TOD clusters and station areas

3.3 Step2: Situation Analysis of TOD Study Area

1) Objectives

3.6 This step include four key tasks as follows: (i) data collection, (ii) database building, (iii) situation analysis and (iv) issue identification which are closely related to each other and conducted in coordinated manner to implement the work efficiently and effectively (see Figure 3.3.1). The most important point in this process is to ensure coherence among the five tasks, because what types of data are necessary in transport and urban planning is directly related to how the situation is analyzed and what issues are to be identified in a city and vice versa.

Figure 3.3.1 Workflow for Step2: Situation Analysis of TOD Study Area



2) Tasks

3.7 **Task1 Collect Necessary Data and Information:** Statistics (population, landuse, etc.), base maps, Zone Plan, approved urban and transport project information, etc. are collected to cover following sectors (see Table 3.3.1 for detail).

- Socio economic: population, landuse, urban service, infrastructure, industry, etc.
- Transport: main transport mode, road network, road width, traffic volume, parking condition, pedestrian safety facilities, traffic accident, etc.
- Urban: roadside facility, urban service facility, degraded area, development potential area, etc.
- Environment: cultural property, heritage, water, green, agricultural land to be preserved, street trees, etc.

3.8 The types and scales of base maps are differed from coverage of TOD influence areas. It is recommended to apply for 1/5,000 scale for station area map and 1/2,000 scale for TOD facility map which are correspond to the scale of the Zone Plan.

- Regional/ cluster map: including whole UMRT network and station areas within 1-3km radius (non-scale), using google earth map or topo map
- Station area map: including walking distance with the scale of 1/5,000 (within 500m radius) – 1/10,000 (within 1km radius), using topo map and/ or Zone Plan map
- TOD facility map: including adjoining roads and facilities with the scale of 1/2,000 using topo map

Table 3.3.1 Necessary Information on Transport and Urban Planning

Category	Items	Main Information Source
Administrative Structure	• Role sharing of organizations for urban planning and development • Role sharing of organizations for urban transport planning and management • Profiles of private sectors.	Interview with government and private sector
Statutory Plans	• Statutory plans (Socio-Economic Development Plans, City General Plans, local plans, Urban transport master plans, Land use plans, etc.)	Existing documents
Institutions and Laws	• Institutional mechanisms and legal basis of planning and development approvals. • Construction, transport, land use, resettlement, compensation, development and management of urban facilities. • Environment (SEA, IEE, EIA, etc.) • Examples of operation and application of institutions and laws.	Interviews (i.e. with HAUPA, DOT, DONRE, Land Acquisition Committee, etc.)
Urban Railway	• Drawings and reports of UMRT Line 1 and Line2. • Drawings and reports of UMRT Line 2A and Line3. • Procedures on land acquisition and compensation. • Coordination and procedures for project implementation.	Interviews (i.e. with UMRT construction project team, VNR, MRB, LAC, HAPI, donors, etc.)
Road Transport	• Road networks and facilities (existing condition and plan). • Operation and management condition (traffic management, road maintenance, traffic volume, pedestrian space, etc.) • Administrative procedures for road construction, traffic management and operation.	Interviews (with DOT, Traffic Police, etc.) Field survey
Bus and Public Transport	• Present condition and future plans of bus operations (operation bodies, routes, facilities, number of buses, operational condition, bus information system, fare system, number of passengers, financial condition, etc.) • Present condition of other public transports (taxi, xe-om) • Present condition and future plans for intercity buses.	Interviews (with TRAMOC, bus operators, taxi companies, etc.) Field survey
Urban Development	• Land and building ownership condition around stations, identification of public lands. • Contents of rights of land and buildings around stations. • Transactions on land and building around stations. • Urban development projects (plan, approval, right transaction, implementation, operation, etc.)	Survey on land and building rights (sub-contracted) Interviews (HAPI, HAUPA, DOC, private developers,. Etc.)
Finance	• Law and regulations on funding scheme, revenue and loan payment (cf. Law on public debt management at Decree No.79/2010/ND-CP on July 14th 2010 by Government on public debt management, Decree No.38/2013/ND-CP on April 23rd 2013 by Government on ODA management and utilization, Statement No.218/2013/TT-BTC on December 31st 2013 by MOF regulated on the financial management for ODA programs, projects and priority loan from foreign donors)	Existing document, interviews (DOF, HAPI, MRB, etc.)
FDI for Urban Development Project	• Institutions, laws and operations. • Examples of FDI projects.	Existing documents, interviews (HAPI, foreign capital companies, etc.)
Socio-Economic Data	• Population (number of households, occupations, etc.) • Socio-economic conditions (income, industry, employment, etc.) • Urban services (urban infrastructure, health care, education, social-welfare, etc.)	Statistical data Urban facility survey (sub-contract)

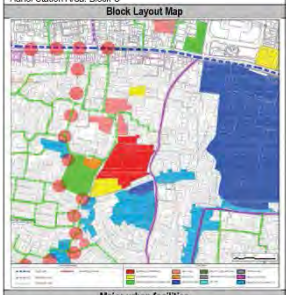
Note) LAC: Land Acquisition Committee
Source: JICA Project Team

3.9 **Task2 Conduct Necessary Supplemental Surveys:** Based on existing information and data as well as surveys, present conditions in the station areas will be analyzed in terms of social, economic, environmental, and transport effects and conditions. Field surveys are included followings:

(a) **Access condition survey:** The surveyors will walk around the station area within 500m-1km radius to identify main access road to the station, structure of local road network including alleys, location of urban facilities, conditions of parking, sidewalk, pavement, lighting, sanitation, etc. Survey results will be summarized into the "Access Condition Profile" (see Figure 3.3.2) which include (i) present condition of major urban facilities (commercial and business facilities, residential facilities, other public facilities, environmental space), (ii) present condition of main transport facilities (road network, major traffic modes, parking condition, sidewalk and walking condition), (iii) general assessment of urban condition, and (iv) general assessment of walking environment.

Figure 3.3.2 Sample Format of Access Condition Profile

Hanoi Station Area: Block C — Administration: BaDinh District

Block Layout Map	Google Earth Map
	

Major urban facilities		Main transport facilities	
Commercial and business facilities	Small scale businesses and shops along Hoang Hoa Tham street and alley 189 are very common	Road network	• The block is characterised by a dense network of community roads, including many narrow alleys and niches, with their width of less than 3m (70%). They connect with each other. They link a distribution road (Alley 189) and a section of trunk road (Hoang Hoa Tham Street) to Van Cao Street.
Residential facilities	• Detached houses are popular with 2-3 stories on community and distribution roads • Detached houses are popular with 3-5 stories on trunk roads.	Major traffic modes	• Trunk road: Car, Motorcycle, Bike, Small Truck, Bus. • Distribution road: Car, Motorcycle, Bike, Small Truck. • Alley and niche/community road: Motorcycle, bike.
Other public facilities	• Public service involves parking space, temple and pagoda, swimming pool, kindergarten and hotel	Parking condition	• There is a large parking space for cars and motorbikes next to Vinh Phuc temple on the community road (Alley 267) • Illegal MC and car parking on trunk road and distribution road.
Environmental space	• There is no potential open space because of high residential density	Sidewalk and walking condition	• Quality of sidewalk surface is quite good. • Along Hoang Hoa Tham trunk road and alley 189 (section A), sidewalks are occupied by shops and illegal parking. Thus, walking is inconvenient and unsafe for pedestrians. • Most of community roads/ alleys do not have sidewalk. People have to walk on the roads/edge/pavement. • Several crossing points are un-safe for pedestrians due to the lack of zebra crossing, signs or signals • Main entrances of major facilities are not safe because there is no zebra

General Assessment of urban condition	General Assessment of Walking Environment
<Present Condition> • High density of residential area • Small-scale commercial activities are popular • More functional facilities: parking space, temple and pagoda, swimming pool, kindergarten and hotel. • No reserved land for the development in the future. <Potentials/Measure after UMRT Development> • Developing some block of flats to gather local residents with the aim of decreasing the number of small dwellings and creating many open spaces.	<Present Condition> • Road network includes many narrow alleys and niches (w=less than 3 m). Most of them do not have sidewalk. • Walking along the trunk road is quite inconvenient because the sidewalks are occupied by parking and business activities. • Several crossing points are un-safety for pedestrian due to the lack of zebra crossing, signs and signals. . < Potentials/Measure after UMRT Development> •
Photos of urban facilities	Photos of typical roads
 Shops along Hoang Hoa Tham Street	 Non-signalised intersection between trunk road (HHT) and distribution road (Alley 189)
 Car Parking on Alley 267.	 A cross section of alley 189
 Main entrance of Khan Quang Do Hotel on Alley 189.	 Access road to alley 267 (Road surface is quite bad)

Source: JICA Project Team

(b) **Household interview survey (HIS):** An interview survey will be conducted covering households who reside within the station influence areas and those along UMRT lines. Contents will include individual and household profiles, trip information, constraints and issues regarding traffic conditions (traffic accident, congestion, safety, etc.), concerns and opinions on station access facilities, stated preferences (i.e., willingness to use UMRT, which traffic mode is preferred in going to the station, willingness to pay parking fees, access route to station, etc.)

(c) **Bus user interview survey:** Interview survey for bus users will be conducted at bus stops located in station influence areas. Contents will include frequency of bus usage, purpose, preferred access mode to bus stops, bus fares, travel time, satisfaction levels, stated preferences (willingness to use UMRT, access made

and route to station, etc.)

(d) **Land and building property survey:** To clarify property conditions both through the legal regimen and actual conditions, a review of land and property certificates will be conducted for properties within a 500m-radious of a selected station. A field survey will also be conducted to check actual land and building utilization practices and type of ownership.

(e) **Company/ urban facility survey:** To identify socio-economic activities in the station influence areas (r=500m), a company and urban facility interview survey will be conducted. Contents will include business and service conditions (e.g., commercial, industrial, retail selling, medical, educational, etc.), ownership (i.e., local, Joint venture, foreign), annual operations, number of employees, number of customers and visitors, capitalization, parking conditions, facilities, the mode of commute for employees and customers, land prices, rental prices, etc.

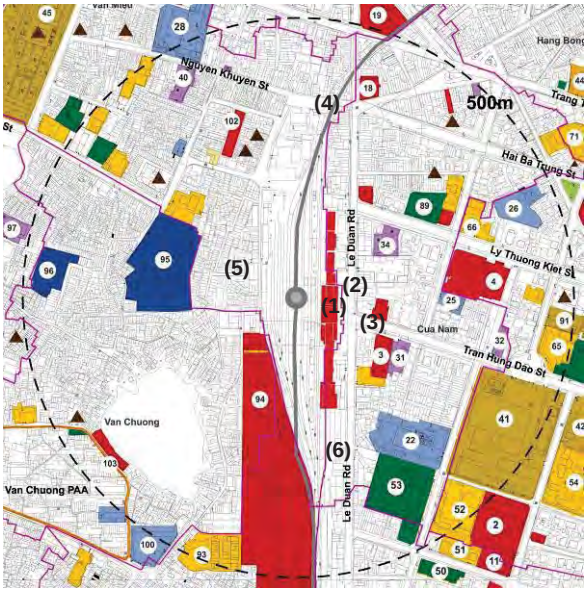
3.10 **Task3 Analyze Current Urban and Transport Development Issues:** Situation analysis must be given an emphasis in urban planning. Without scientific, comprehensive and in-depth analysis of the current situation, it is difficult to conduct subsequent planning steps adequately. While many cities have their own experiences in urban planning and development in different ways, it is assumed that they basically know how the questions are raised. Therefore, it is practical and advisable to set up a set of hypothesis in the situation analysis. When the hypotheses are properly in place, it will make data collection and analysis much more effective. Collected data and information are farther processed in reference to various aspects as explained above, the following ways are recommended:

(i) Develop and use of urban indicators: For each sector or subsector for planning, a set of indicators are prepared based on the collected data. Population of residents, employees and students of the station area of radius 500m – km are reviewed (a) at present, and future population is estimated (b) after UMRT development (without TOD), and (c) after integrated development with UMRT (with TOD). UMRT ridership is also estimated with and without TOD.

(ii) Prepare thematic maps: For aspects of concerns at local (commune) levels within the city, thematic maps are prepared based on the collected data from existing sources and various supplemental surveys.

(iii) Assessment of living conditions by residents: Properly conducted HIS can provide useful information on the assessment of living conditions and infrastructure services at commune level. When the situation and problems are identified comprehensively at commune levels, they can provide very useful basis for planning (see Figure 3.3.3 Station Area Profile).

Figure 3.3.3 Sample Format of Station Area Profile



Socio-Economic Condition of Station Area		within 500m	500m -1km	Total
Population		31,561	93,305	124,866
Net Population Density (no./ha)		445	394	406
No. of Employment (workplace)		26,360	67,723	94,083
No. of Student (at school)		9,298	22,002	31,299
Socio-Economic Condition of Major Communes	District	Dong Da	Hoan Kiem	Dong Da
	Commune	Van Chuong	Cua Nam	Van Mieu
Average Household Size (persons)		4.1	4.0	4.1
Ave. Monthly HH Income (000VND)		2,790	3,042	2,771
HH with Self-owned Housing (%)		89.4	60.0	75.7
HH with Car/ Motorcycles (%)		81.0	89.0	80.3
Industry Structure (%)	Primary	0.0	1.6	0.8
	Secondary	12.3	12.7	8.8
	Tertiary	87.7	85.7	90.4
Bus facilities and network[1)]	No. of Bus Stops	5 (within 500m)		
	Bus Route Number	1, 3, 11, 32, 34, 38, 40, 43, 45, 49, 52		

Related Plans and Projects
1) UMRT Line3 Development

(1) Hanoi Station and VNR related facility area

(2) Le Duan Street in front of Hanoi Station

(3) Tran Hung Dao Street and high rise buildings

(4) Intersection of Nguyen Khuyen Street and Le Duan Street

(5) High-dense residential area of Van Chuong Commune

(6) Shops along Le Duan Street

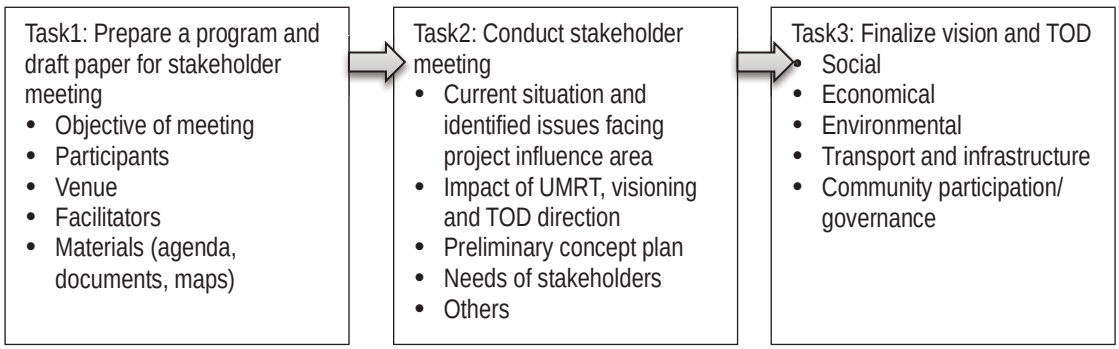
Source: JICA Project Team

3.4 Step3: Discussion on Issues and TOD Direction

1) Objectives

3.11 Alternative urban growth scenarios as well as overall process of urban structure formulation are explained with results of assessment to stakeholders.

Figure 3.4.1 Discussion on Issues and TOD Direction



Source: JICA Project Team

2) Tasks

3.12 **Task1: Prepare a program and draft paper for stakeholder meeting:** The stakeholder's meeting aims to explain the significance and progress of Urban Mass Rail Transit (UMRT) project and TOD approach. In this meeting, participants will discuss on problems and opportunities of UMRT development. The inputs from the representatives will be used to further elaborate how those issues and needs could be incorporated in the TOD approach. Specific purposes of the meeting are as follows:

- to promote and share the understanding on the overall role and function of UMRT
- to facilitate the understanding of the impacts of UMRT development of the influence area
- to discuss on the approach of TOD and alternative concept plans with stakeholders
- to discuss issues and needs of selected communes and the districts, identified by stakeholders.

3.13 At the end of the meeting, following outputs are expected:

- Stakeholders clearly and tangibly understand the UMRT project and the approach to and the concept plans of TOD.
- Stakeholders raise their opinions and suggestions to Hanoi City Authority for more effective use of UMRT and integrated urban development concept of respective stations.
- Other matters regarding socio-economic and environmental condition improvement around the stations' area.
- Identification of specific concerns and/or issues raised by the stakeholders in relation to the above matters.

3.14 Main issues are differed from level of spatial hierarchy and levels of stakeholders including central government, city government, local governments of district and ward, local community and private sectors (see Table 3.4.1).

Table 3.4.1 Main Scopes of Stakeholder Meeting

Spatial Level of TOD Influence Area	Main Scopes	Main Stakeholders
TOD at regional level	• Smart growth of urban area • Enhancement of city-wide mobility of public transport • New town development with good accessibility to CBD	Central Government (MOT, MOC, MONRE, MOT-PMU, etc.) City Government (HAUPA, HUPI, DOT, DOC, DONRE, DOF, MRB, etc.)
TOD at corridor and cluster level	• Improvement of traffic circulation • Increase in mobility and accessibility to urban service • Increase in urban development opportunities integrated with high quality public transport (UMRT)	City Government (same as above) District PCs (Division of Urban Management, Division of Finance and Planning, Division of Natural Resources and Environment, Fatherland Front) Private sectors
TOD at 500 – 800 meter radius area level	• Improvement of local traffic conditions and environment for walking, bicycle and M/C users • Enhancement of local socio-economic activities • Promotion of effective landuse around UMRT station	District PCs (same as above) Ward PCs Representatives of local community Private sectors
TOD at station area level	• Provision of facilities and services for smooth and safe intermodal transfer • Creation of attractive space for socio-economic and cultural activities in the community • Integrated urban development with efficient and high-dense landuse	Ward PCs Representatives of local community Private sectors

Source: JICA Project Team

3.15 **Task2: Conduct Stakeholder Meetings:** Main topics and typical questions to stakeholders are as follows:

(a) Current situation and identified issues facing project influence area

- *How are the trends of population distribution, economic situation, landuse change, transport condition, environmental issues, etc.?*
- *What will be issues in future without any transport and urban development projects? ("do nothing" case)*

(b) Impact of UMRT: Positive/ expected impacts and negative/ anticipated impacts of UMRT development will be discussed.

- *Will UMRT development change transport condition (transport modes, behaviors, traffic volume of roads, etc.)?*
- *Will UMRT development promote urban development/ redevelopment around the station? Will it contribute to job creation and socio-economic promotion?*
- *Will UMRT development affect to local environment negatively? (cf. change of lifestyle and communities, traffic congestion around the station, inflow of new communities)*
- *What are expectations of UMRT development to the station area?*

(c) Visioning and TOD direction: Image of ideal station area integrated with UMRT is summarized as vision and TOD direction. The image and expected functions of UMRT station will be identified, and the station area will be developed to strengthen capacity of the station. The typical types of UMRT stations are summarized as follows:

- To be a multifunctional regional center: the station area will be developed/ redeveloped with high-dense, high-rise and multi-purpose facilities with appropriate road network to formulate CBD or regional center (cf. Hanoi of Line1, Giap Bat of Line1, Tay Ho Tay of Line2).
- To be a transport hub center: the station area will provide convenient and efficient feeder transport services and intermodal facilities such as station plaza, bus terminal, and parking facilities (cf. Giap Bat of Line1, Gia Lam of Line1, Tay Ho Tay of Line2).
- To be a historical and tourism center: the station will be a core of station area which requires multi-services not only UMRT users but also local communities and tourists (cf. Long Bien Nam of Line1, Hoan Kiem Lake of Line2).
- To be a local community center: the station will provide daily urban services for UMRT users and local communities which present urban facilities are limited, and will promote urban improvement and redevelopment activities (cf. Phuong Liet of Line1, Bach Thao of Line2).

(d) Preliminary concept plan: Based on TOD direction, concept plan will be preliminarily discussed in terms of transport improvement, urban development and community improvement.

3.16 **Task3: Finalize vision and direction on TOD:** It includes issues and development potentials, roles and impacts of UMRT development, and TOD orientations (coverage, beneficiaries, impacts on transport improvement, urban development, socio-economic development, environmental improvement) and implementation management (necessary institutional arrangement, role sharing among stakeholders). In case of implementation and management, following topics will be discussed.

- Legal and institutional framework and mechanisms.
- Implementation of organizational and role sharing.
- Project cost, finance, and subsidy.
- Rationale of urban plans, coordination with other plans and projects.
- Public participation mechanisms.

3) Outputs

- Summary of issues in TOD influence area
- Proposed vision and TOD direction
- Report on Stakeholder Meeting

3.5 Step4: Formulation of TOD Concept Plan

1) Objectives

3.17 Based on agreed vision and TOD direction, TOD concept plan is formulated to indicate overall TOD approach and concepts at district/ cluster level and station area level.

3.18 The concept plans are included: (a) access transport development/ improvement plan in the influence area, (b) intermodal/ transfer facility plan at station area, (c) integrated urban development concept plan, and (d) TOD management plan.

3.19 Based on TOD concept plan, necessary items are reflected to the Zone Plan for institutionalization and are included to projects of related department for prioritized implementation.

2) Tasks

3.20 **Task1 Prepare base maps and data:** It includes following items.

- Base maps
- Approved plans and projects in the influence area
- Drawings (Basic Design) of UMRT Construction Projects (including ROW of UMRT, planned facilities)
- Present thematic maps (road network, urban facilities, walking environment assessment, etc.)
- Socio-economic data (population, employment, industry, etc.)
- Transport data (road inventory, parking, accident, etc.)
- Traffic demand (UMRT ridership, modal share, etc.)

3.21 **Task2 Cluster Approach:** It includes following items.

- **Area characteristics:** Socio-economic characteristics including population, density are summarized, and trend of urbanization and landuse change are elaborated. Transport condition is summarized including present traffic condition, road network and ongoing and planned projects, including UMRT routes and stations. The location map of cluster level is developed including UMRT routes and stations, road network and major urban facilities based on the google earth map or topo map (see Figure 3.5.1). Population growth trend is analyzed based on population and density of all wards within 1km radius of stations and the growth in recent 5 years (see Table 3.5.1).
- **Impact of UMRT:** Anticipated positive and negative impacts of UMRT development to the cluster are elaborated, in terms of mobility and accessibility, landuse change, socio-economic development, environment, etc.
- **TOD planning direction:** In order to maximize the positive impacts of UMRT through TOD, it is necessary to address the issues from the viewpoints of transportation, urban development and community improvement. This is the basis to formulate the TOD Concept Plan of each station area, which will be in line with the direction of cluster level.

Figure 3.5.1 Location Map of Cluster Level (Sample of South of West lake Cluster)

Source: JICA Project Team

Table 3.5.1 Format of Population Growth Trend in Cluster

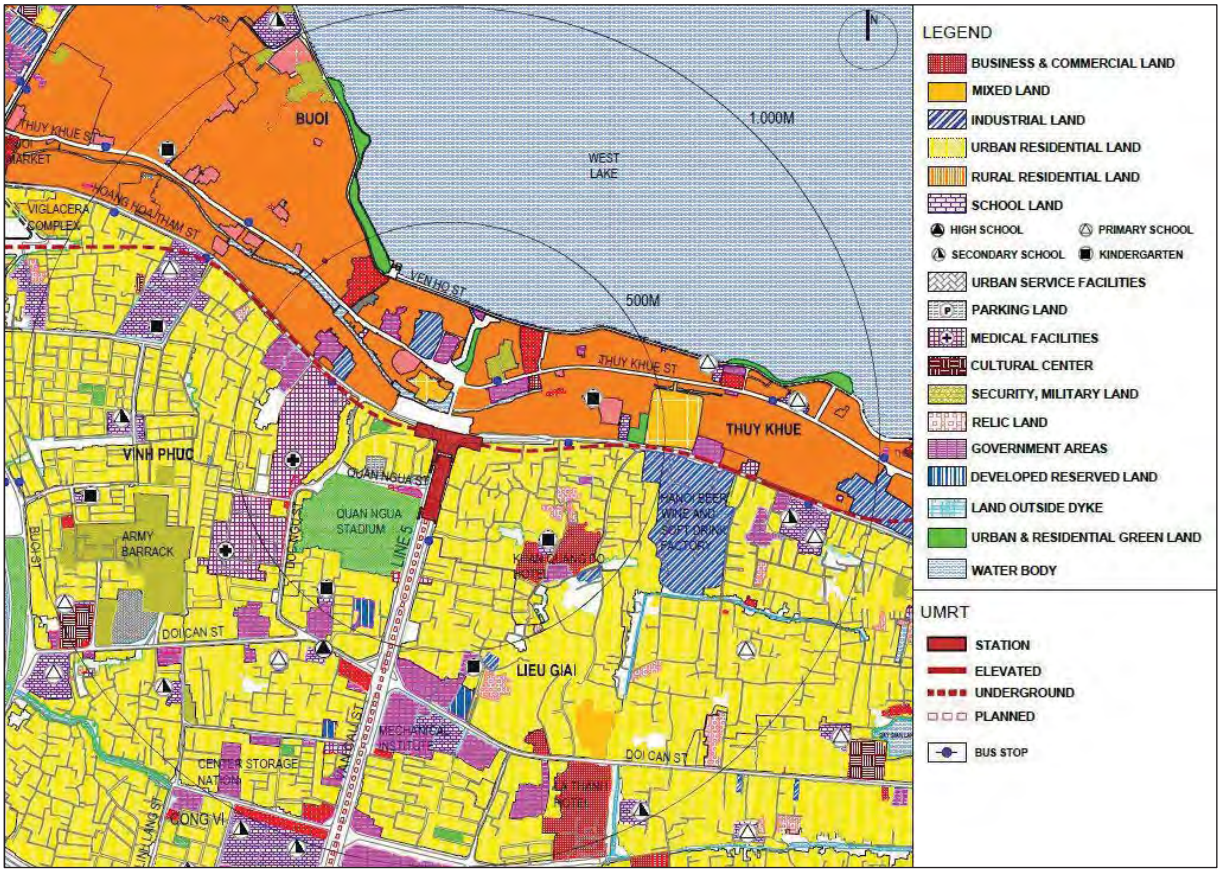
Ward	District	UMRT Station	Coverage (%)[1)]	Population		AGR (%/yr)	Population Density (no/ha)
				2010	2015	10 - 15	
	.	.					
.							
Total							

Source: JICA Project Team
1) Coverage refers to % of ward area included within 1km radius of UMRT station

3.22 **Task3 Prepare concept plans:** It includes following items.

- **Locational characteristics:** The characteristics of the station location such as connectivity of transport network and services, landuse of surrounding areas, major urban facilities, walking environment is summarized, which will be related to issues and concept plans. Location map of station (500m-1km radius from the station) is prepared based on present landuse and transport network, including locations of urban facilities such as educational, medical and cultural. The present map of station area is prepared to indicate planned UMRT routes and station location on the present landuse map (see Figure 3.5.2). From this map, anticipated positive and negative impacts of UMRT development will be elaborated, especially without TOD approach (baseline scenario).

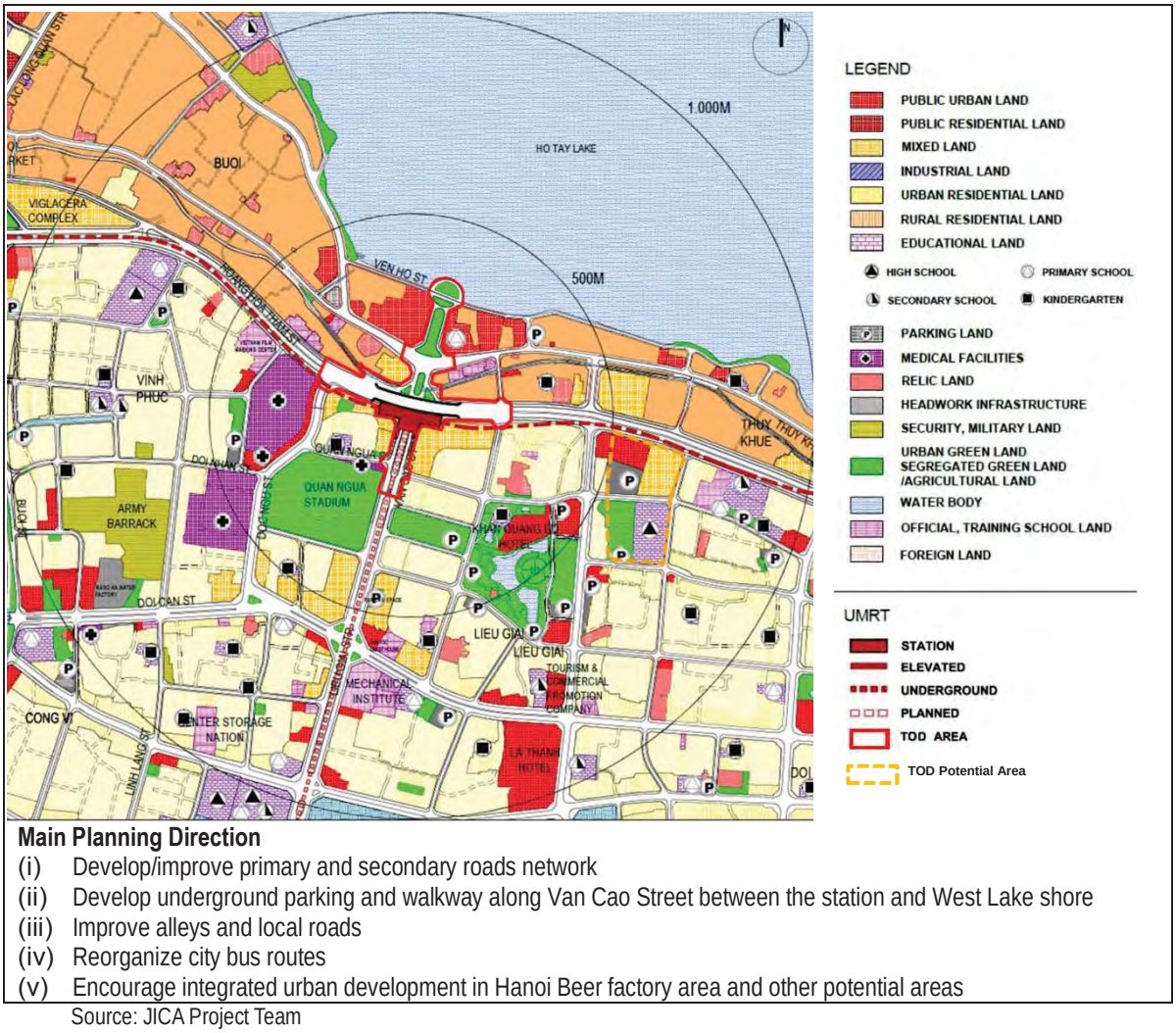
Figure 3.5.2 Present Location Map of Station Area (Sample of Quan Ngua Station)



Source: JICA Project Team

- **Main planning consideration and direction:** In order to maximize the benefits of UMRT through TOD, key points are summarized in terms of (i) transportation access improvement, (ii) integrated urban development and (iii) community improvement. Location map of station in Zone Plan is prepared based on future landuse and transport network to ensure future connectivity and conformity with road network, as well as conformity with landuse of surrounding area of the station (see Figure 3.5.3). Based on two types of maps (present and future landuse), it is necessary to consider (i) improvement of road network, (ii) landuse change, (iii) planned project area, which will be coordinated with TOD Concept Plan. It is also necessary to identify necessary revision of the Zone Plan to harmonize with UMRT development and TOD. In conclusion, main planning direction is summarized.

Figure 3.5.3 Location Map of Station in Zone Plan (Example of Quan Ngua Station)



Main Planning Direction

(i) Develop/improve primary and secondary roads network
(ii) Develop underground parking and walkway along Van Cao Street between the station and West Lake shore
(iii) Improve alleys and local roads
(iv) Reorganize city bus routes
(v) Encourage integrated urban development in Hanoi Beer factory area and other potential areas

Source: JICA Project Team

- **TOD concept plan:** On the basis of planning directions, a TOD concept plan of each UMRT station is prepared as follows:

  (i) The concept plan is formulated in compliance with current zone plan as well as other approved plans. When it is found necessary to ensure effective use of UMRT, the proposal is shown in the concept plan.

  (ii) The concept plan is composed of measures on transport access improvement to and from the station as well as for improvement of existing communities. Access transport improvement plan is worked out for the area within a 500m – 1km radius of the station in general and the TOD Area more specifically.

  - Transport access improvement plan to issue necessary accessibility improvement from station area, and identify intermodal facilities and traffic management at and around the station
  - Integrated urban development plan to identify TOD potential areas
  - Community improvement plan to issue benefits and participation opportunities of local communities

  (iii) **Transport access improvement plan:** Required functions and facilities for access improvement are diversified and differed by local characteristics and

station types. It is necessary to formulate accessibility improvement plan not only by each station but also by UMRT corridors and network with urban structure. The local characteristics of station area are mainly categorized into 4 types: (i) CBD in urban area (Ancient Quarter and French Quarter of Line1, 2, 3), (ii) high-dense built-up area in urban area, (iii) sub center in suburban area (Giap Bat and Gia Lam of Line1), and (iv) new development area in suburban area (Tay Ho Tay new development area of Line2, extension areas of Line1 and 2). Based on regional characteristics and required functions of the station, prioritized measures for access improvement are summarized in Table 3.5.2.

Table 3.5.2 Required Functions and Facilities by Local Characteristics and Station Types

Area Type	Local Characteristics and Requirements		Prioritized Measures for Access Improvement	
	Accessibility	Land availability	Intermodal facility development	Other measures
CBD in urban area	• Pedestrian is prioritized, and private car entry should be regulated and restricted.	• Land and space for development are limited in CBD and new development is restricted. • Public lands and facilities, elevated and underground space are potential areas.	• Fringe parking • Elevated walkway under viaduct • Underground walkway and parking • Drop off& pick up space along sidewalk, space under viaduct	• Traffic management (restriction of private car entry, designation of pedestrian street, etc.) • Area circulation bus services connecting station and urban facilities
High-dense built-up area in urban area	• Main transport modes are by walking, bicycle or motorbike. • Road widening and development are required in mid and long-term. • Traffic safety is prioritized to access from local roads to the station in short-term.	• Land and space for development are limited in built-up area. • Integrated urban redevelopment is promoted to improve accessibility and promote economic activities.	• Motorbike parking using space under viaduct, sidewalk, public lands, etc. • Drop off& pick up space along sidewalk, space under viaduct	• Access road improvement (colored pavement for pedestrian, guard rail, etc.) • Parking management around station to ensure pedestrian space
Sub center in suburban area	• Main transport modes are by feeder bus, walking, bicycle or motorbike. • Feeder bus network is promoted to formulate transport hub and extend public transport service coverage.	• To formulate the sub center at the station, integrated development is promoted utilizing railway land, public land (bus terminal, etc.) as well as built-up area.	• Station plaza for various transport modes and pedestrian • Bus terminal for feeder bus • Parking space	• Feeder bus service along extension section of UMRT and neighboring towns • Integrated development to develop intermodal facilities and other services
New development area in suburban area	• Road development is prioritized to ensure access road to station. • Designated lanes for bus, motorbike and bicycle in carriageway and pedestrian streets are promoted.	• Lands for intermodal facility development are ensured by extending ROW of UMRT or designating transport facility lands in new development area.	• Station plaza to provide feeder bus service and pedestrian space • Parking space for P&R	• Area circulation bus services connecting station and new development areas • Environmental friendly transport (E-bus, bicycle, etc.)

Source: JICA Project Team

(iv) **Integrated urban development plan:** To enhance development opportunities at and around the station in addition to improve accessibility, integrated urban development activities will be promoted. The TOD potential areas are both within

ROW of UMRT and out of ROW. The elevated and underground station development encourages to maximize to utilized limited urban land in multi-level within the scope of UMRT construction project boundary.

(v) Based on concept plans above, the facility concept plan is prepared to identify location and concept of road and intermodal facility development with the scale of 1/5,000 (see Figure 3.5.4).

- **The topo map with Zone Plan** road is used as the base map to identify present and future road network.
- **UMRT construction projects** including route and station structure, entrance, ROW of UMRT are clearly indicated to identify the coverage of the UMRT Construction Project.
- **Transport access facilities** are indicated such as station plaza, elevated/ underground walkway, parking, traffic signal, etc.
- **TOD potential area** is indicated which will be applied for TOD projects (station building, parking, integrated development, etc.) to manage its land and facilities to ensure future connectivity to station and integrated urban development.
- **TOD Area boundary** is designated to cover the UMRT ROW and the area wherein measures to ensure good accessibility to the station must be provided (see Figure 3.5.4).

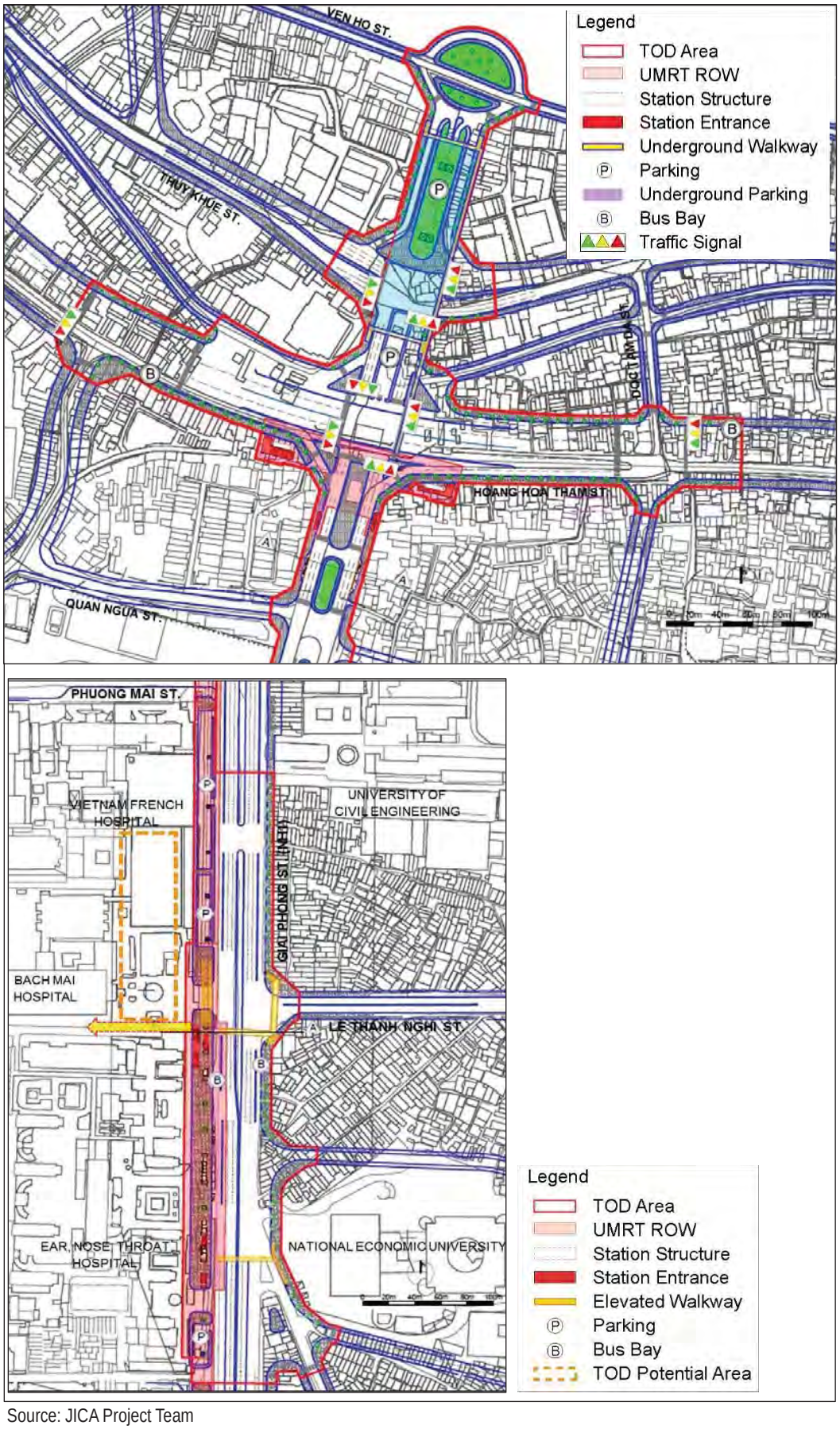
3.23 **Task3: Consult/ coordinate with related departments/ stakeholders:** Proposed TOD concept plans including facility plans are discussed among related departments such as HAPI, HAUPA, DOT, HUPI, DOC, railway developers, and district PCs if necessary.

3.24 **Task4: Coordination with Zone Plan and related plans and projects:** Based on proposed concept plans, it is required to coordinate with Zone Plan and related plans and projects in terms of effective landuse, appropriate transport network, attractive urban design of station area, etc.

3) Outputs

- TOD concept plan at corridor/ cluster level
- TOD concept plan at station area level
- Location map of station on Zone Plan (within 1km radius from the station, scale of 1/10,000)
- Facility concept plan at TOD area (scale of 1/5,000)
- Proposal on TOD area boundary (scale of 1/5,000)

Figure 3.5.4 Facility Concept Plans (Example of Quan Ngua Station and Bach Mai Station)



Source: JICA Project Team

3.6 Step5: Design of TOD Projects

1) Objectives

3.25 Based on TOD concept plan, set of projects are selected which should be implemented with financial and institutional priorities. Transport access to UMRT station is the most critical for effective operation of UMRT. For this, it is necessary to conduct pre F/S for priority projects to identify project scope and cost estimation (in case if the implementation body is selected, F/S should be implemented).

3.26 Basic objectives of traffic access improvement projects are as follows:

- To improve facilities, services and environment for access transport within 500 – 800 meter radius area
- To provide adequate facilities for smooth connection with UMRT at the station area
- To contribute to the improvement of overall walking and traffic conditions in the local communities

3.27 TOD projects are evaluated in terms of socio-economic, transport, urban development, and environment viewpoints.

2) Tasks

3.28 **Task1 Identify TOD projects:** Main TOD projects are categorized (a) projects within walking distance, and (b) projects within TOD area, and (c) integrated urban development projects. Among projects within walking distance, projects within TOD area are farther elaborated to ensure necessary facility development in time for UMRT development as well as to define and secure ROW of facilities and roads which must be developed in future. It is important to propose options and alternatives if any. Main TOD projects are summarized in Table 3.6.1.

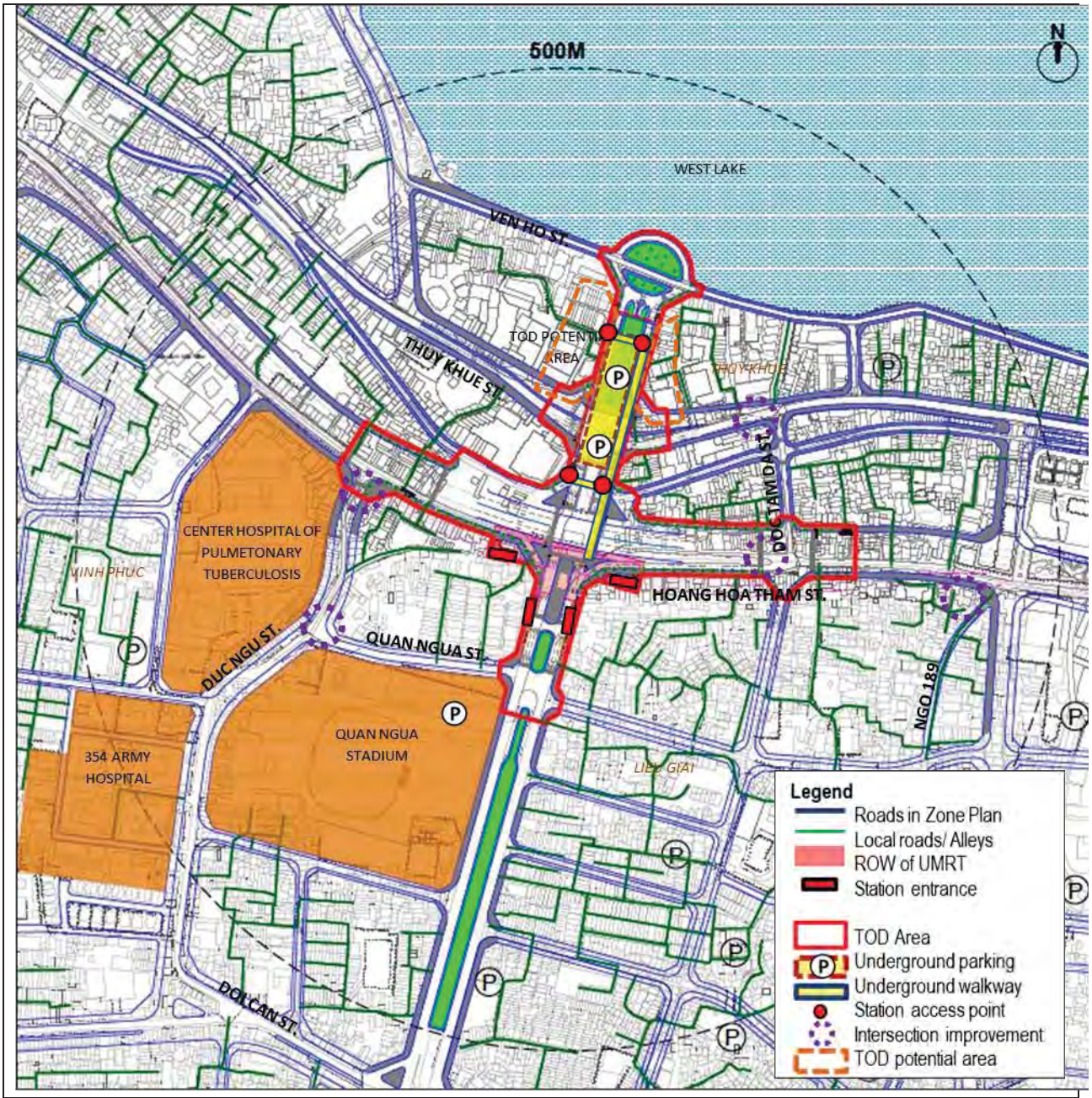
Table 3.6.1 List of TOD Projects

Category	Coverage	Project	Contents
Transport improvement	Area within walking distance (500m- 800m radius)	Road improvement	to improve carriageway and sidewalk condition of main trunk roads and distribution roads to ensure accessibility to the station
		Road development and widening	to develop new roads and/or widen existing roads in compliance with the Zone Plan to formulate road network around the station
		Access alley improvement	to improve condition of alleys (re-pavement, drainage, street light, road marking, etc.) to ensure accessibility from built-up areas to the station
		Intersection improvement	to improve intersection (signal, pedestrian crossing, road marking, etc.) to ensure pedestrian's safety for crossing and to manage traffic flow
	TOD Area	Priority road within TOD area	to develop roads at the station which are indispensable to access to the station
		Station plaza	to develop intermodal facilities and environmental space (pedestrian plaza, open space, etc.) in an integrated manner at the intermodal stations
		Bus terminal	to operate feeder buses including UMRT relay bus and

			circulating bus at the terminal stations and/ or intermodal stations
		Pedestrian crossing	to ensure safety, time-saving of pedestrian crossing of intersections
		Underground walkway	to ensure safety, time-saving of pedestrian crossing of intersections and transferring to other stations
		Underground parking facility	to develop underground parking facility where is difficult to secure at-ground space for parking in built-up areas
		Parking space	to ensure parking space for motorbikes and bicycles at the station plaza, space under the UMRT viaduct, public spaces such as roads, sidewalk space and parks
		Bus stop	to ensure smooth accessibility between UMRT station and buses near the station
		Traffic management	to install signals, pedestrian facilities, road marking, traffic signs, tactile for visually impaired person, designated lanes for motorbike, bus priority lane, etc.
Integrated urban development	Station and transport related facility	Development of space inside the station	To develop commercial and service facilities such as kiosk, café, bookstore, convenience store, etc. inside platform and concourse space mainly for UMRT users
		Development of space under the viaduct	To develop commercial and service facilities such as convenience store, supermarket, retail shops, nursery, parking, etc. under the viaduct of elevated railway mainly for UMRT users and local communities
		Development of station building	To develop the station building at and above the UMRT station to formulate a landmark of the station with distinguished urban facilities such as hotel, office, clinic, apartment, as well as public service facilities
		Development of underground facilities	To develop underground mall and parking space to promote subway use and to alleviate congestion around the station and to promote integrated development with neighboring facilities by connecting underground walkways
		Redevelopment of railway related lands	To develop VNR owned lands including depots and factories to promote integrated development to formulate a new CBD and regional center
		Redevelopment of bus terminal	To redevelop bus terminal land to improve connectivity between UMRT station and provide convenient services such as department store, hotel, etc.
	Area around the station	Redevelopment of public facilities and factories	To promote redevelopment of public facilities and factories which will be relocated to develop multi-purpose complex including apartments for resettlement and public facilities
		Redevelopment of high-dense residential areas, old apartment areas	To promote improvement and redevelopment of existing residential areas and apartments by providing new apartment flats inside the project area
		Development of new towns along UMRT railway	To develop new towns with urban facilities along railway in suburban areas, with business revenues generating a capital gain that covers the cost of construction of railway and new towns and promoting UMRT ridership

Source: JICA Project Team

Figure 3.6.1 Sample of Identified Project Location Map (Quan Ngua Station Area)



Projects within 500m radius Area	Projects in TOD Area
(1) Widening of Hoang Hoa Tham St. and Thuy Khue St. (2) Improvement of Duc Ngu, Ngo 189 and Doc Tam Da streets (3) Improvement of alleys in Thuy Khue, Lieu Giai Ward and Vinh Phuc Ward (4) Utilization of roads inside Vietnam Institute of Science and Technology at north and military areas at south (5) Improvement of intersections	(1) Priority development of Hoang Hoa Tham St. and Thuy Khue St. in TOD Area (2) Development of integrated underground walkway and parking (3) Provision of bus bays and intermodal facilities along Hoang Hoa Tham St. and Van Cao St . (4) Improvement of traffic management

Source: JICA Project Team

3.29 **Task2 Assessment of projects:** TOD projects are elaborated from the viewpoints of accessibility improvement, development effects, urgency and durability. A key factor is that land acquisition and consensus building among stakeholders will not be complicated. Criteria are proposed as follows:

(a) Contribution to the increase of UMRT users through improved convenience and safety, as a result of station area development and an improved feeder bus service

(b) Contribution to the improvement of traffic conditions (pedestrians and vehicles) in the influenced area (cf. the Ancient Quarter)

(c) Positive impacts on urban development through the promotion of urban environmental improvement and the creation of new development opportunities, in compliance with future development orientation in Zone Plans.

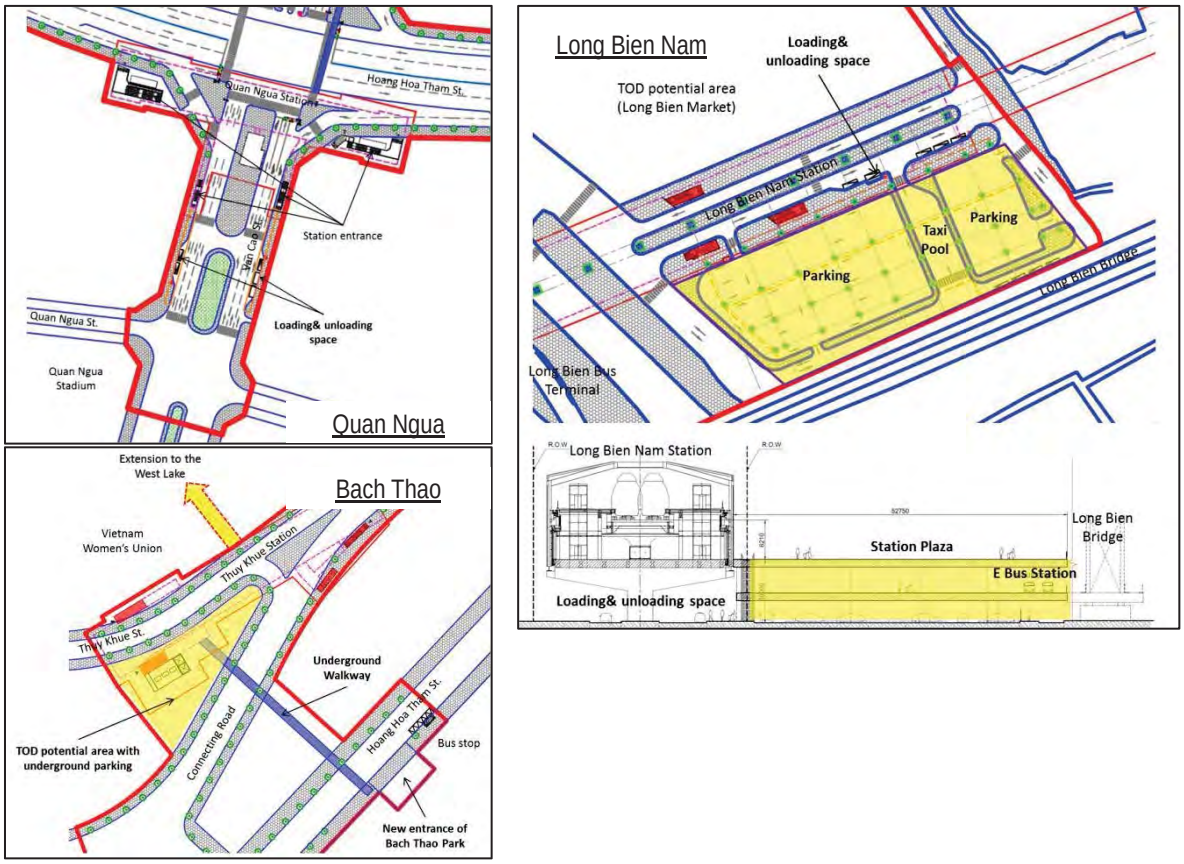
(d) Feasibility of project implementation in terms of land acquisition issue (or constraints), coordination with existing facilities, easiness of consensus building, and the trigger of related project implementation.

(e) Ample opportunities for private sector and community participation

(f) Replication of the project where experiences can be utilize in other stations and areas

3.30 **Task3: Conduct pre-FS/ basic design:** The facility drawings are prepared with scale of 1/500 (detail design level) – 1/2,000 (zone plan level), including TOD Area boundary. In the Pre F/S report, facility layout plan is farther explained to indicate main concepts, based on the drawings with the scale of 1/500 – 1/2,000 (see Figure 3.6.2). As for station plaza planning and design, see the Box: Design Guideline of Station Plaza for reference.

Figure 3.6.2 Sample of Facility Layout Plan



Source: JICA Project Team

Box 1: Typology of Station Plaza

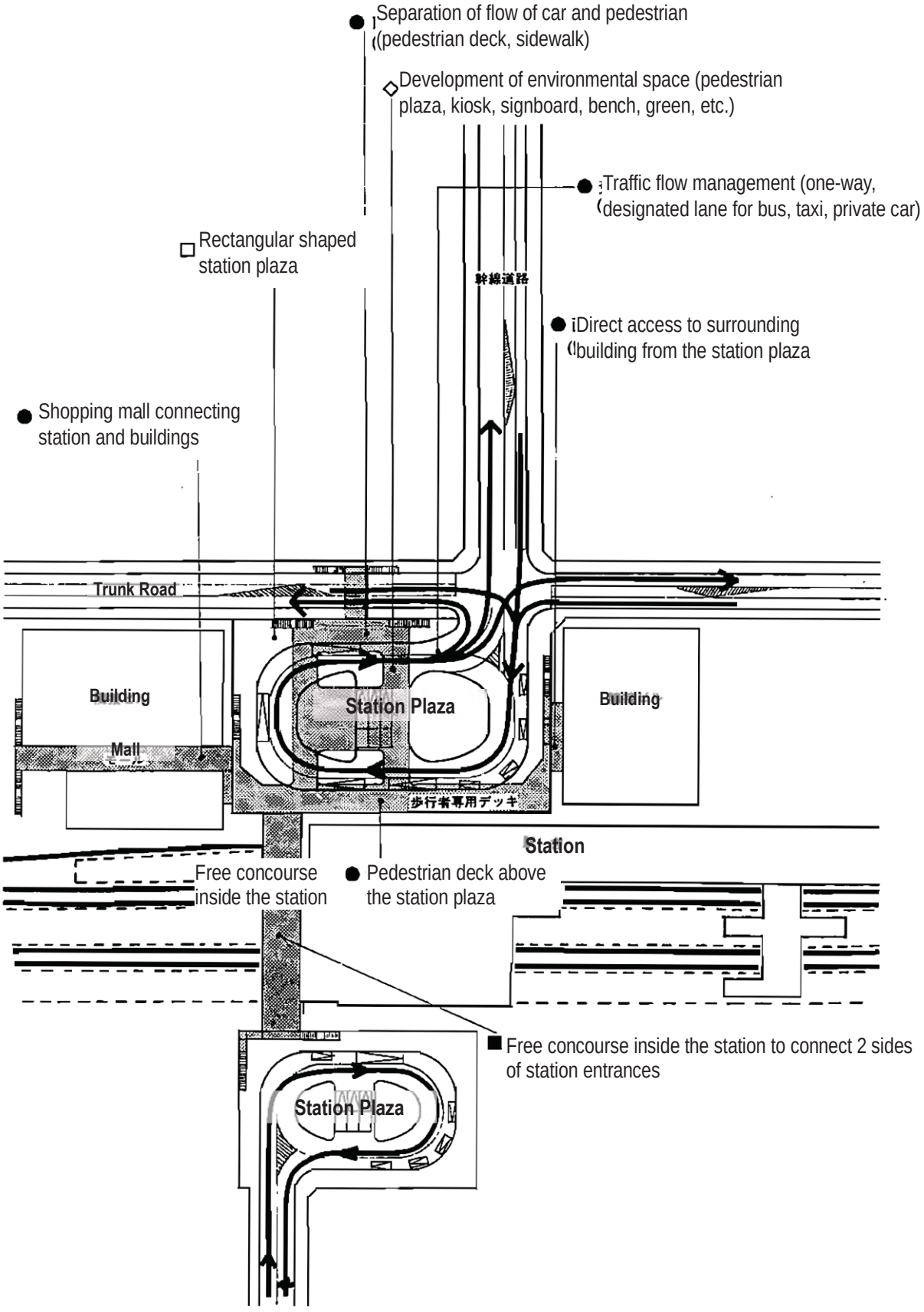
- The station plaza includes following facilities and spaces: (i) loading and unloading space for public transport (bus, taxi), (ii) taxi pool, (iii) loading and unloading space for private vehicle, (iv) parking for disabled (at the nearest space to the station entrance), (v) pedestrian plaza / space. In case of the elevated station, pedestrian deck is developed to separate pedestrian space and to cross trunk road in front of the station.
- It is difficult to develop station plazas based on results of traffic demand analysis, since many stations are developed in built-up area where development land is limited. Furthermore, it is not popular to develop station plazas for underground station in the city center, where many stations are located within walking distance.
- In Japan, station plazas are developed mainly in core stations in CBD and suburban area. In case of CBD, the station plazas are the landmarks surrounded by various commercial and business facilities, so it is convenient not only for station users but also these facility users for commuting and shopping. In case of suburban area, the station plazas include bus rotary to provide feeder bus services and large-scale parking facility to promote Park and Ride.
- For this, necessity of station plaza can be decided not only based on traffic demand analysis and estimated number of passengers, but also based on local characteristics and type of station. Requirement of local governments and communities is one of criteria to develop station plaza, since it is a landmark and public space for local society.
- While the size and facilities of station plaza are differed, it is necessary to ensure individual spaces by different transport modes (bus, taxi, private vehicle) not to mix different traffic flow (see Table 1 and Figure 1). In case of Hanoi, it is necessary to consider how to manage xe-om (bike taxi) properly. It is recommended to ensure waiting space for motorbike including xe-om to facilitate traffic flow at the station. In case of Type4 where station plaza cannot be developed in small scale station, it is required to develop drop off& pick up space for bus, taxi and car along sidewalk or under the viaduct to ensure designated space for station access.

Table 1 Typology of Station Plaza

Type of Station		Average Size of Station Plaza	Intermodal Facilities inside Station Plaza					
			Bus rotary	Taxi bay	Drop off& pick up	Parking facility	Pedestrian plaza (openspace)	Pedestrian facility
Type1	A core station (50,000 passengers/ day or more) to be a regional landmark of station area providing various intermodal facilities	2 - 3ha	●	●	●	●	●	●
Type2	A sub center station (20,000 – 50,000 passengers/ day) to be a local symbol of station area providing intermodal facilities	1 – 2 ha	●	●	●	●	○	●
Type3	A general station (10,000 – 20,000 passengers/ day) to provide minimal intermodal facilities	0.5 - 1 ha	○	○	●	●		●
Type4	A small-scale station (10,000 passengers/ day or less)	Not absolutely necessary			○	○		●

Note: ●Indispensable, ○Required

Figure 1 Image of Access Improvement Facility Layout Plan with Main Planning Items



3.31 **Task4: Land availability:** To implement proposed transport access projects, availability of land is one of the critical issues. It is recommended to utilize ROW of UMRT, road, park, other public lands and private development lands which are not required land acquisition of residential lands. To identify land availability in detail, two types of maps are developed;

(a) TOD Area map to indicate types and size of land and facility affected (ROW of UMRT, road, sidewalk, park, public facility, private land, etc.), necessity of land acquisition to develop roads and intermodal facilities inside TOD Area

(b) Intermodal facility location map to indicate affected roadside facilities such as trees, plants, electricity poles which technical arrangement and environmental consideration are required

Figure 3.6.3 TOD Area Map (Sample of Quan Ngua Station)

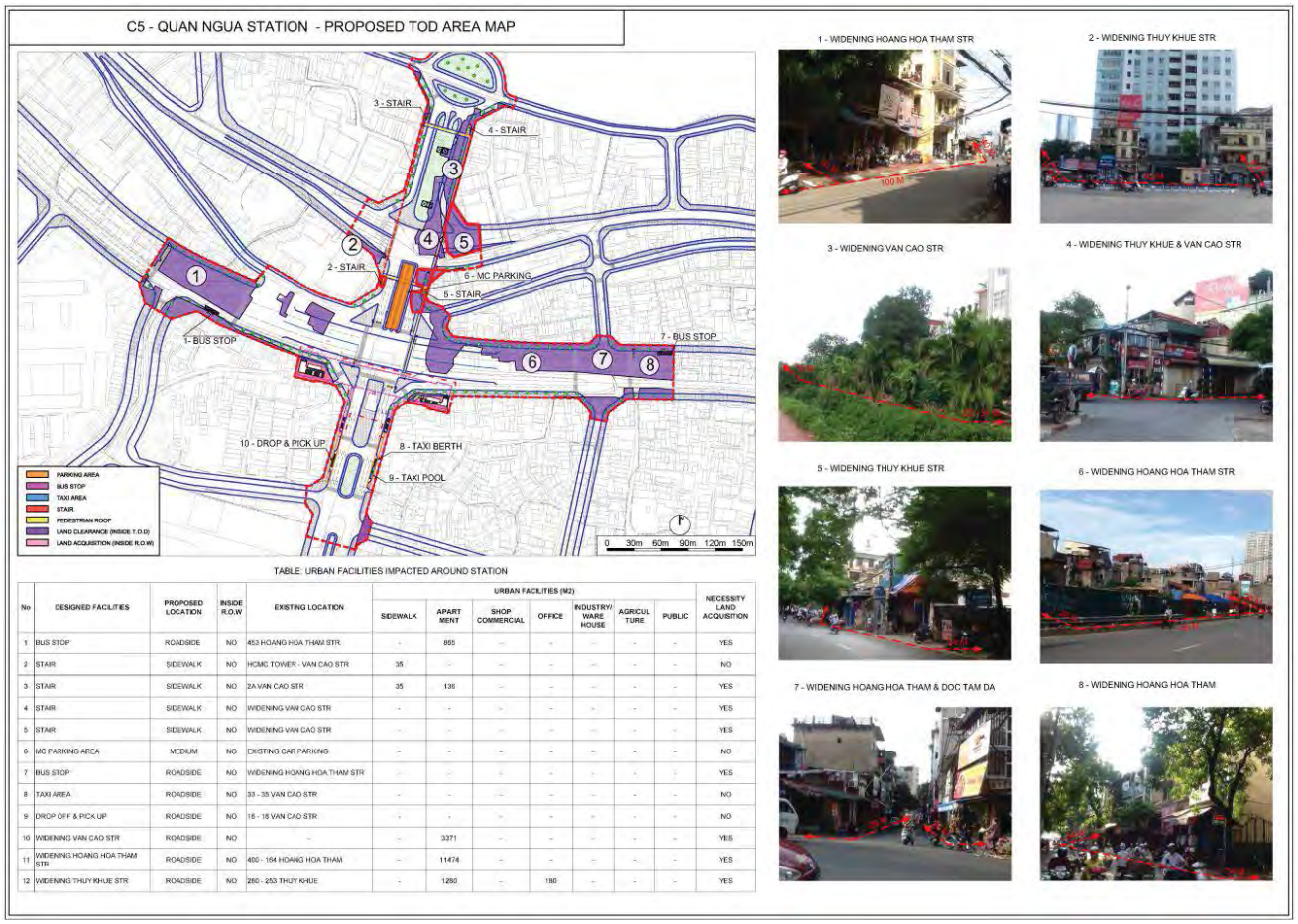


TABLE: URBAN FACILITIES IMPACTED AROUND STATION

No	DESIGNED FACILITIES	PROPOSED LOCATION	INSIDE R.O.W	EXISTING LOCATION	URBAN FACILITIES (M2)							NECESSITY LAND ACQUISITION
					SIDEWALK	APART MENT	SHOP COMMERCIAL	OFFICE	INDUSTRY/ WARE HOUSE	AGRICUL TURE	PUBLIC	
1	BUS STOP	ROADSIDE	NO	453 HOANG HOA THAM STR.	-	855	-	-	-	-	-	YES
2	STAIR	SIDEWALK	NO	HCMC TOWER - VAN CAO STR	35	-	-	-	-	-	-	NO
3	STAIR	SIDEWALK	NO	2A VAN CAO STR	35	136	-	-	-	-	-	YES
4	STAIR	SIDEWALK	NO	WIDENING VAN CAO STR	-	-	-	-	-	-	-	YES
5	STAIR	SIDEWALK	NO	WIDENING VAN CAO STR	-	-	-	-	-	-	-	YES
6	MC PARKING AREA	MEDIUM	NO	EXISTING CAR PARKING	-	-	-	-	-	-	-	NO
7	BUS STOP	ROADSIDE	NO	WIDENING HOANG HOA THAM STR	-	-	-	-	-	-	-	YES
8	TAXI AREA	ROADSIDE	NO	33 - 35 VAN CAO STR	-	-	-	-	-	-	-	NO
9	DROP OFF & PICK UP	ROADSIDE	NO	16 - 18 VAN CAO STR	-	-	-	-	-	-	-	NO
10	WIDENING VAN CAO STR	ROADSIDE	NO	-	-	3371	-	-	-	-	-	YES
11	WIDENING HOANG HOA THAM STR	ROADSIDE	NO	400 - 164 HOANG HOA THAM	-	11474	-	-	-	-	-	YES
12	WIDENING THUY KHUE STR	ROADSIDE	NO	260 - 253 THUY KHUE	-	1260	-	180	-	-	-	YES

Source: JICA Project Team

Figure 3.6.4 Intermodal Facility Location Map (Sample of Quan Ngua Station)

TABLE: URBAN FACILITIES IMPACTED AROUND STATION

No	DESIGNED FACILITIES	PROPOSED LOCATION	INSIDE R.O.W	EXISTING LOCATION	URBAN FACILITIES							NECESSITY LAND ACQUISITION
					TREES			PLANT		NO. POLE		
					KINDS OF TREE	DIMENSION	QUANTITY	KINDS OF PLANT	QUANTITY	LIGHTING	SIGN	
1	BUS STOP	ROADSIDE	NO	453 HOANG HOA THAM STR	-	-	-	-	-	1	-	YES
2	STAIR	SIDEWALK	NO	HCMC TOWER - VAN CAO STR	-	-	-	-	-	1	1	NO
3	STAIR	SIDEWALK	NO	2A VAN CAO STR	-	-	-	-	-	-	-	YES
4	STAIR	SIDEWALK	NO	SIDEWALK - WIDENING VAN CAO STR	-	-	-	-	-	-	-	YES
5	STAIR	SIDEWALK	NO	SIDEWALK - WIDENING VAN CAO STR	-	-	-	-	-	-	-	YES
6	MC PARKING AREA	MEDIUM	NO	EXISTING CAR PARKING	-	-	-	-	-	-	-	NO
7	BUS STOP	ROADSIDE	NO	ROADSIDE - WIDENING HOANG HOA THAM STR	-	-	-	-	-	-	-	YES
8	TAXI AREA	ROADSIDE	NO	33 - 35 VAN CAO STR	BÀNG LĂNG	15 - 20 CM	4	-	-	1	2	NO
9	DROP OFF & PICK UP	ROADSIDE	NO	16 - 18 VAN CAO STR	BÀNG LĂNG	20 CM	3	-	-	2	1	NO
					DÂU DA	30 CM	1					
10	WIDENING VAN CAO STR	ROADSIDE	NO		-	3371	-	GARDEN	1534 M2	-	-	YES
11	WIDENING HOANG HOA THAM STR	INSIDE TOD	NO	460 - 164 HOANG HOA THAM	XÀ CỪ	40 CM	3	-	-	4	3	YES
					XÀ CỪ	70 - 80 CM	3					
					DÂU DA	20 CM	1					
12	WIDENING THUY KHUE STR	INSIDE TOD	NO	260 - 253 THUY KHUE	PHƯỢNG	40 CM	2	-	-	-	-	YES
					BÀNG LĂNG	20 CM	1					

Source: JICA Project Team

3.32 **Task5: TOD project list with cost estimation:** TOD project list is formulated with project ID, project name, quantity (size), estimated cost and implementation phase. TOD projects are divided into 2 categories; (a) area within 500 – 800 meter radius, and (b) within TOD Area.

- Road development project within 500 – 800 meter radius should be in compliance with the Zone Plan, or it is newly proposed to adjust the Zone Plan. For this, the cost of road development projects within 500 – 800 meter is excluded from the TOD project which is already designated in the Zone Plan.
- The implementation phases are divided by implementation phase (short-term, minimum, basic), shown in Task6 in detail.
- The estimated cost is summarized by phase to identify total amount of cost of minimum, short-term and basic projects.
- Required resettlement area for priority road development in TOD area is indicated.

Table 3.6.2 Sample Format of Project List with Cost Estimation for Access Improvement Project

Category	ID	Project Name		Quantity	Estimated Cost (mil VND)	Implementation Category
Area within 500m Radius	a1	Widening of Hoang Hoa Tham St. and Thuy Khue Streets	1. Improvement	13,000m^2	25,000	Short (Minimum)
			2. Widening	*28,000 m^2*	*50,000*	*Others[1)]*
	a2	Improvement of Doc Ngu, Ngo 189, Doc Tam Da Streets	1. Improvement	7,600 m^2	14,000	Short (Minimum)
			2.Widening	*11,000m^2*	*19,000*	*Others[1)]*
	a3	Improvement of Access Alleys in Thuy Khue, Ngoc Ha and Vinh Phuc Wards		36,000 m^2 (W=3m, L=12,000m)	77,000	Short (Minimum)
	a4	Improvement of Intersections		6 locations	1,000	Short (Minimum)
	Sub Total (excluding others)				117,000	
TOD Area	b1	Priority Development of Roads in TOD Area[2)]		19,000m^2	34,000	Short
	b2	Development of Integrated Underground Walkway and Parking	1. Underground Walkways	1,000m^2	133,000	Basic
			2. Underground Parking	8,000m^3	652,000	Basic
	b3	Provision of bus bays and intermodal facilities along Hoang Hoa Tham St. and Van Cao St		Lump sum	800	Short (Minimum)
	b4	Improvement of traffic management		Lump sum	3,800	Short (Minimum)
	Sub Total				823,600	
Total					940,600	

Source: JICA Project Team

1) Road development project in the area within 500m radius is excluded from TOD project.

2) Quantity and coverage of road projects within 500m radius and projects in TOD area are not overlapped.

Table 3.6.3 Summary of Estimated Cost and by Phase for Access Improvement

Project Type		Included Project ID	Estimated Cost (million VND)
Short	Minimum	a1-1, a2-1, a3, a4, b3, b4	121,600
	Short	b1	34,000
Basic		b2-1, b2-2	785,000
Total of TOD Project			**940,600**
Others (road development project in area within 500m radius)		a1-2, a2-2	69,000
Grand total			1,009,600

Source: JICA Project Team

3.33 **Task6: Project packaging:** As Identified projects for each UMRT station extend to a wide range and scope, they need to be packaged for implementation by different organization and funding source. It is considered practical to categorize the projects as follows;

(i) Short-term Projects: The projects in this category should have been implemented before the opening of UMRT operation. Of the short-term projects, “minimum” projects can be implemented in ROW of UMRT, public lands, etc. which do not require land acquisition of residential lands are identified.

(ii) Basic projects: The projects in this category are considered desirable for implementation to farther enhance the function of UMRT stations such as station plaza, underground parking, etc.

Table 3.6.4 Summary of Transport Access Improvement Projects by Station

Cluster	Station	500m Area				TOD Area								
		Road			Inter-section	Road (priority)	Station plaza	Bus terminal	Pede-strian bridge	UG walk-way	UG park-ing	Parking	Bus stop	Traffic mana-gement
		Impro-vement	New/ widen-ing	Alley										
North West	C1	A	B*	A	A	B*	C	-	A	-	-	A	A	A
	C2	A	B*	A	A	-	A	-	-	-	-	A	A	A
	C3	A	B*	A	A	-	C	A	A	-	-	A	A	A
	C4	A	B*	A	A	A	-	-	-	C	C	A	A	A
South of West Lake	C5	A	B*	A	A	B*	-	-	-	C	C	A	A	A
	C6	A	B*	A	A	B*	-	-	-	C	C	C	A	A
	C7	A	B*	A	A	B	-	-	-	C	C	C	A	A
City Center	V6	A	-	A	A	-	A	-	A	-	-	A	A	A
	C8	A	-	A	A	-	-	-	-	-	-	C	A	A
	C9	A	-	A	A	-	C	-	-	C	C	C	A	A
	C10	A	-	A	A	-	C	-	-	B	A**	A**	A	A
	V8	A	B*	A	A	B*	A** -C*	-	B*	B	-	A**	A	A
South	V9	A	B*	A	A	B*	C*	-	A	C	-	A**	A	A
	V10	A	B*	A	A	B*	C*	-	B*	-	-	A**	A	A
	V11	A	B*	A	A	B*		-	B*	-	-	A**	A	A
	V12	A	B*	A	A	B*	A** -C*	A	B*	-	-	A**	A	A
East	V5	A	B*	A	A	B*	C*	-	-	-	-	A**	A	A
	V4	A	B*	A	A	B*	C -C*	B	-	-	-	A**	A	A

Source: JICA Project Team
A: short-term (minimum) project, B: short-term project, C: basic project
* needs land acquisition of residential land
** within ROW of UMRT project

3.34 The total costs of all stations of the same line are farther elaborated by facility type (road, walkway, bus, parking and intermodal facility) and allocated by potential implementation bodies/ investors.

Table 3.6.5 Summary of Estimated Cost and by Phase and Facility Type

	by Facility Type (billion VND)				
	Road	Walkway	Bus	Parking	Intermodal facility
Short-term (minimum)					
Basic					
Sub Total					

Source: JICA Project Team

Table 3.6.6 Proposed Allocation of Investment Costs

	by Phase (billion VND)			Total	
	Short-term		Basic	billion VND	%
		(of which minimum)			
DOT					
UMRT developer					
District					
Private					
Total					
%					

Source: JICA Project Team

3.35 **Task7: Environmental and social considerations:** Basically, integrated development projects with UMRT may have adverse impacts on the environment (air, water, soil, ecosystem, flora and fauna) or the society (involuntary resettlement, impacts on vulnerable people, community safety, and social structures), but these impacts are less significant or are site-specific, and in most cases, they can be mitigated if appropriate mitigation measures are adopted. Initial Environment Examination (IEE) is carried out for all planned stations to evaluate the impacts as required by the ESC Guidelines. The environmental criteria included in the scoping checklist were classified into 5 categories:

(i) Pollution: Air quality, Water quality, Noise and Vibration, Soil Pollution, Solid Waste, Odors;

(ii) Natural Environment: Protected areas, Ecosystem (Flora, Fauna and Biodiversity) and Hydrology

(iii) Socioeconomic environment: Involuntary resettlement, Living conditions and livelihood, Heritage and cultural value, Landscape, cultural and historical landscape, Ethnic minorities and indigenous people;

(iv) TOD specific criteria: Accessibility, Traffic and accident, Walking environment, Safety and Security, Universal design;

(v) Others: Operation and monitoring stages

(a) **Task6: Economic and financial evaluation of TOD projects:** The access improvement projects are expected to generate many positive impacts on local communities as well as UMRT users. However, the projects require large amount of investment including private sector involvement and economic rationality is necessary to determine the implementation. From the standpoint of an operator, financial viability is also indispensable. In addition, the implementation of the projects may possibly affect living environment of local people such as noise and vibration by construction works. So, the proposed projects need to be evaluated from the various viewpoints, social, economic, financial, environmental etc. The results of project evaluation are summarized as follows:

(i) Economic analysis: Saved time is assumed to be 3 minutes per beneficiary for all stations by the access improvement projects (except for underground parking) since every project in each station has the time saving effect and integrated development of those projects is expected to further increase the effect. If the result of analysis show that EIRR is more than 12.0%, the proposed access improvement project is considered economically feasible.

(ii) Financial analysis: Transport access improvement projects are non-revenue projects except for parking fees, so these are not viable financially. In case of ground parking, it must be feasible to construct and operate them with using parking fees.

(iii) Social and environmental impacts: Transport accessibility improvement will contribute social and environmental aspects significantly. In addition to time saving of access, traffic safety will contribute to reduce traffic accident, improvement of walking environment will contribute to promote socio-economic development of local communities.

Table 3.6.7 Benefits of TOD by Beneficiary

Category	Benefits	UMRT users	Local people	Transport operator	Government
Transport Access Improvement	Travel time saving	○	○	○	
	Reduced Household cost on transportation		○		
	Improved driving comfort by increased traffic capacity	○	○	○	
	Improved a feeling of comfort and security in walking	○	○		
	Improved Connectivity and Accessibility	○	○		
	Increased UMRT station users			○	
	Reduction in pedestrian/bicycle/vehicle accidents	○	○	○	○
	Reduction in Carbon Dioxide emission	○	○		○
Integrated Urban Development	Increased commercial revenue		○	○	
	Increased tax revenue				○
	Increased land value		○		○
	Job creation		○		○
	Improved accessibility to commercial buildings and public facilities.	○	○	○	

Source: JICA Project Team

3) Outputs

- TOD project list with identified TOD project location map (scale of 1/5,000)
- Project packages with cost estimation
- Drawings of Basic Design (scale of 1/1,000 – 1/2000) or Detailed Design (scale of 1/100 – 1/500)
- TOD Area Map and Intermodal Facility Location Map (scale of 1/1,000 – 1/2,000)

3.7 Step6: Formulation of Implementation Plan

1) Objectives

(b) Since implementation bodies and stakeholders are various for TOD projects, it is necessary to formulate TOD implementation plan including role sharing between HPC and private sector for investment, operation and management.

(c) To promote private sector's involvement, institutional support for TOD-PPP is significant including incentives and responsibilities of private sectors.

2) Tasks

(d) **Task1 Determine implementation methods:** Implementation plan includes financing, timing for implementation and project implementation bodies.

(a) Possible Funding Source: Possible funding sources include such organizations as DOT, VNR, MRB, District and private sector, or combination thereof.

- Although farther study is necessary, possibilities for private sector participation are high
- HDOT is a main funding source, especially for development of access roads including Zone Plan roads
- District is to fund improvement of alleys and related traffic management
- MRB and VNR are to be responsible for the facilities which are directly related to on-going UMRT construction projects

(b) Timing for Implementation: Timing and consideration on implementation of the projects by category are as follows;

- Minimum Projects: Improvement of roads, traffic management walking environment within the station influence area (500 – 800 meter radius) can be commenced immediately because no additional land acquisition is necessary. At the same time, budgeting and implementation for Zone Plan roads within TOD Area should be prepared soonest.
- Short-term Projects: Although the projects require partial land acquisition, they also should be attended as early as possible.
- Basic Projects: The projects include such intermodal facilities as station plaza, underground parking, among others, requiring land acquisition and coordination among stakeholders including private sector. As they can be developed in integration with revenue generating urban development, possibilities for private sector participation are high. When underground parking and walkway are constructed together with UMRT, their construction costs will be significantly reduced.

(c) Project Implementation Bodies: Implementation of the projects is considered as follows;

- HPC should primarily be responsible transportation access improvement projects because they intend to ensure public interests and safety, and benefit not only UMRT users but also communities in influence area.
- With regard to bus service improvement, UMRT will implement UMRT relay bus while TRAMOC is responsible for other feeder bus services.

- Intermodal facilities at and around the UMRT stations should be implemented in close coordination with UMRT project. Once the projects have been constructed, they should be transferred to HPC for subsequent management of the facility by HDOT. They are more specifically as follows;
  - Station Plaza: the station plaza within ROW of UMRT should be developed as a component of UMRT constriction project by MOT-VNR and MRB.
  - Elevated Walkway under the UMRT Viaduct and Loading/unloading Facilities in ROW of UMRT: They should be developed as a component of UMRT construction project
  - Elevated walkway outside ROW of UMRT: As they are to be connected directly with UMRT stations, they should be developed as a component of UMRT construction project
  - At-grade Space under the Line1 Viaduct: They should be developed as a component of UMRT construction project
- Traffic Management and Safety Projects: They should be primarily implemented by HDOT and Traffic Police, though measures at community levels should be implemented in participation of local authorities and people.
- Parking Projects: They should be basically implemented by HDOT though operation and management should involve local authorities and communities. For large-scale parking facilities participation of private sector should be considered.

(d) **Task2 Prepare necessary documents for investment/ bidding:** Based on TOD concept plan and list of TOD projects, HPC allocate public budget for infrastructure project with prioritization of TOD projects within TOD area, or calls for investment from private sectors, such as parking development, integrated urban development projects which will be profitable to recover project costs and get revenues.

(e) **Task3 Set up necessary organizational, institutional and financial arrangements:** As explained in Step5, there are various types of TOD projects, which are non-profitable projects such as intermodal facilities except for parking, and profitable projects such as integrated development projects such as station building, comprehensive integrated development project of the station area. By consolidating and packaging several TOD projects (TOD-PPP), there are opportunities that private sector will participate in the projects including non-profitable transport facility development projects. Role and risk sharing between public and private sectors should be clarified.

3) Outputs

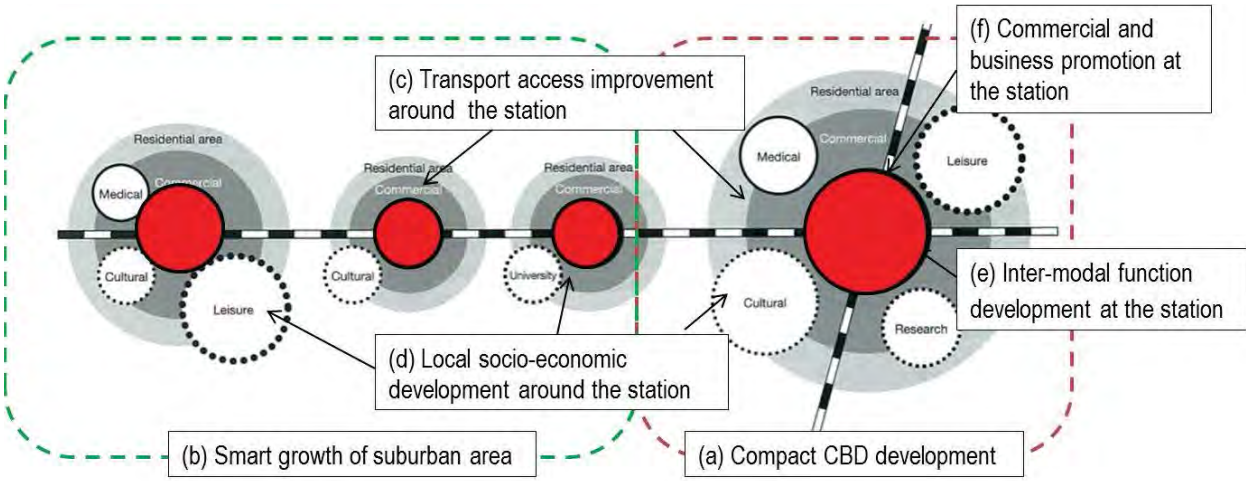
- TOD Implementation program
- Project implementation plan for approval by HPC/ HAPI

4 USEFUL REFERENCE IN TOD CONCEPT PLANNING

1) TOD potentials along UMRT network

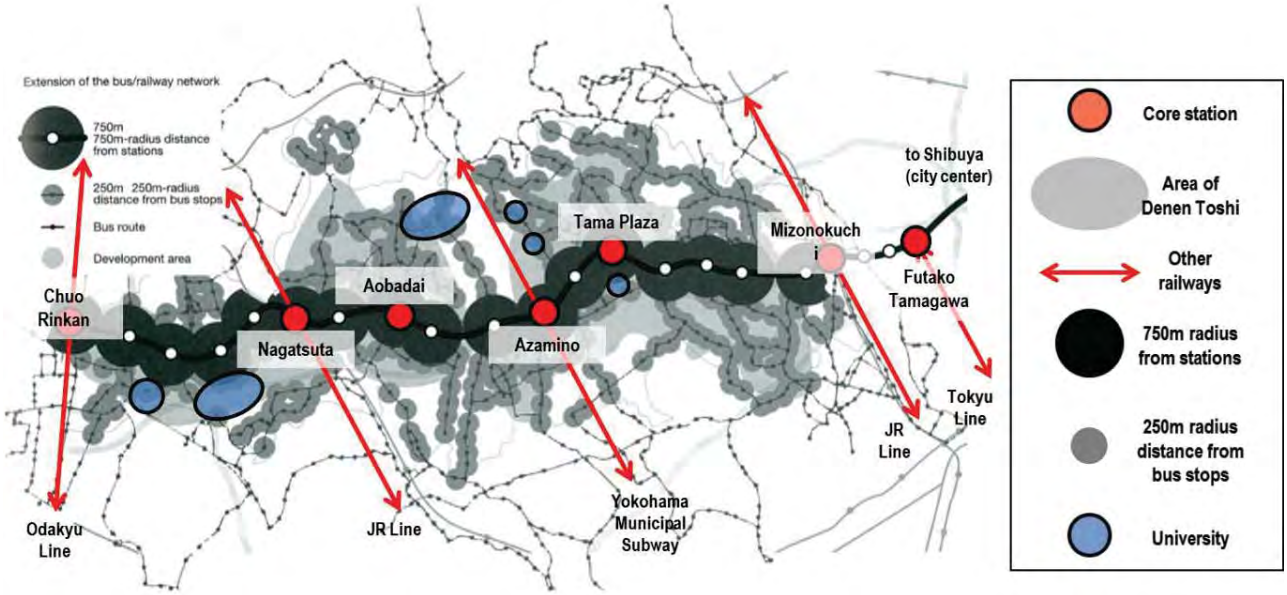
4.1 Successful TOD will lead to increased ridership and better satisfaction among UMRT users. At the same time, urban development opportunities at various levels of the UMRT's influence areas are expected to increase. If TOD concepts are applied to all of various types stations in hierarchical manner (see Figure 4.1), TOD potentials and impacts will be increased in synergy and overall image of UMRT and surrounding areas will be improved to increase UMRT ridership and property values. In Japan, many UMRT lines connecting between the city center and suburban area apply this TOD model along UMRT line to develop new towns and universities (see Figure 4.2).

Figure 4.1 TOD Potentials along UMRT



Source: JICA Project Team based on material of Tokyu Corporation

Figure 4.2 Integrated New Town Development along UMRT in Suburban Area



Source: JICA Project Team based on material of Tokyu Corporation

2) Coordination with land use and transport plan

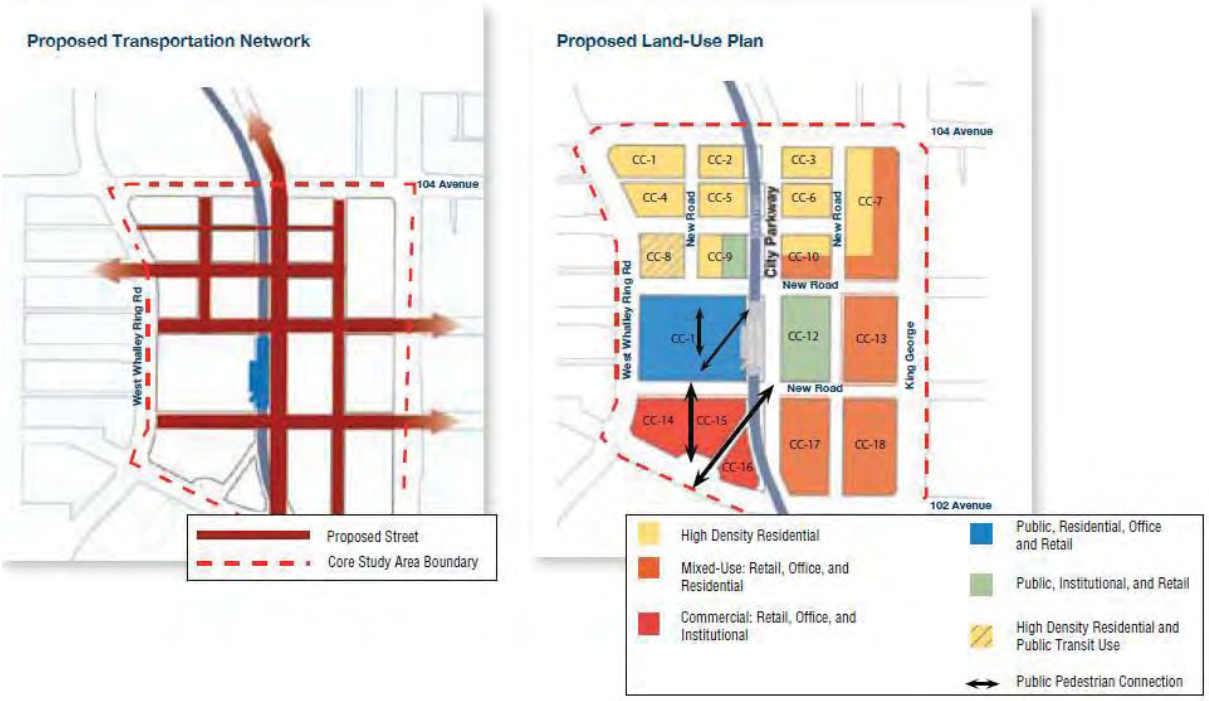
4.2 When land use and transportation are well-coordinated, transit can provide fast, direct, and cost-effective access to more destinations for more people. Transit-oriented communities coordinate land use and transportation in two important ways:

(i) at the regional scale, they locate the highest densities of development and the most important destinations at nodes where several frequent transit services meet; and

(ii) at the neighborhood scale, they locate most new development along reasonably direct corridors so that most destinations are conveniently connected to other destinations.

4.3 So it is necessary to ensure that major destinations lined up along a reasonably direct corridor so they can be served by frequent transit. The highest intensity of development in urban centers and at frequent transit nodes are encouraged. Furthermore, smart growth toward suburban areas by extension of UMRT and transit corridors is considered to enhance development capacity of UMRT and to control urban growth in a sustainable manner (see Figure 4.3).

Figure 4.3 Coordinated Transport and Land Use Plan around Station



Source: Transit- Oriented Communities Design Guideline, Vancouver City, Canada

3) Promotion of Mixed-Use Development

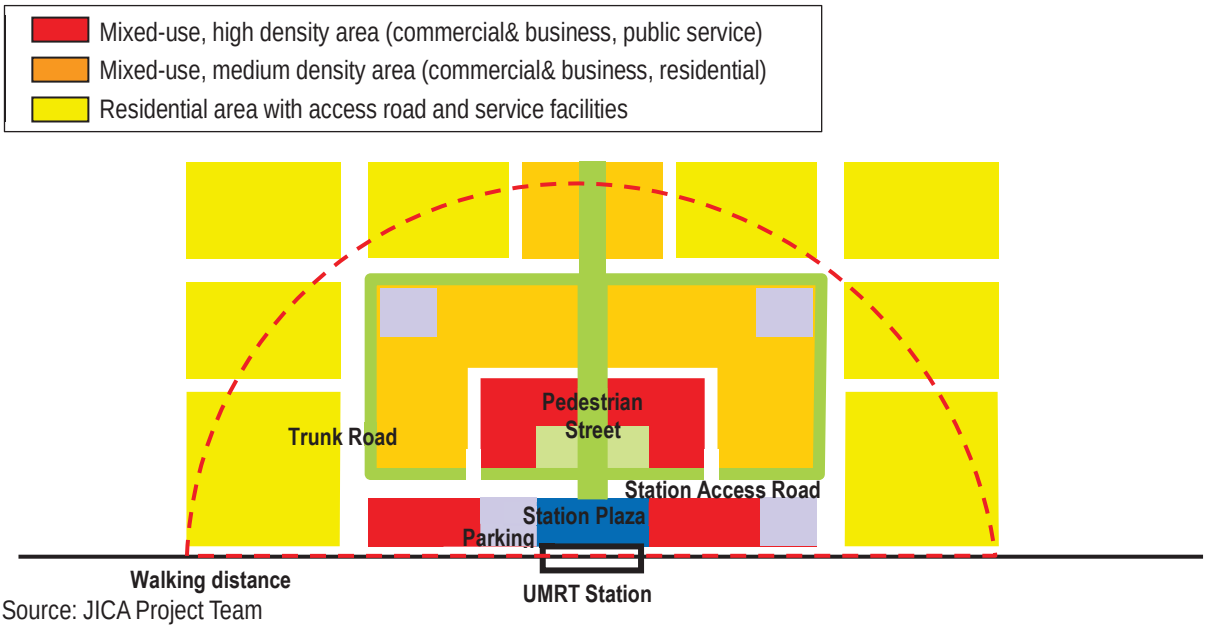
4.4 Mix of landuse including active uses such as commercial, business, public service, residential is promoted at transit nodes to reduce walking distances between destinations and to promote pedestrian activities (see Figure 4.4). Mixed-use development also contributes to control population density in a sustainable manner.

4.5 To encourage circulation at mixed-use station area, transport network must be established taking into consideration of traffic flow and traffic modes to access to the station, including bicycle, motorbike, taxi, car and bus. Especially access roads at the station must be ensured in time for UMRT operation.

4.6 Urbanization with efficient land use and accessibilities around UMRT would promote compact and environmental friendly development. TOD concept plan is needed to formulate appropriate principles as shown in below for station area development (see Figure 4.4).

- To have a compact, higher density land use
- To contain a diversity and mix of uses in combination with residential and commercial - business, with daily conveniences and transit as the center
- To promote satellite working place in sub center of suburban stations instead of congested city center
- To have a pedestrian-friendly physical design that encourages walking with limited automobile access to station area
- To formulate integrated transportation system including feeder bus service, transport sharing system (cf. community bicycle, car sharing), Park& Ride area development in conjunction with pedestrian network, access control and regulatory of private vehicles in combination with pedestrian network, fringe parking area development, etc.

Figure 4.4 Landuse and Transport Network Diagram based on TOD Concept



Source: JICA Project Team

4) Creation of a Well-Connect Street Network

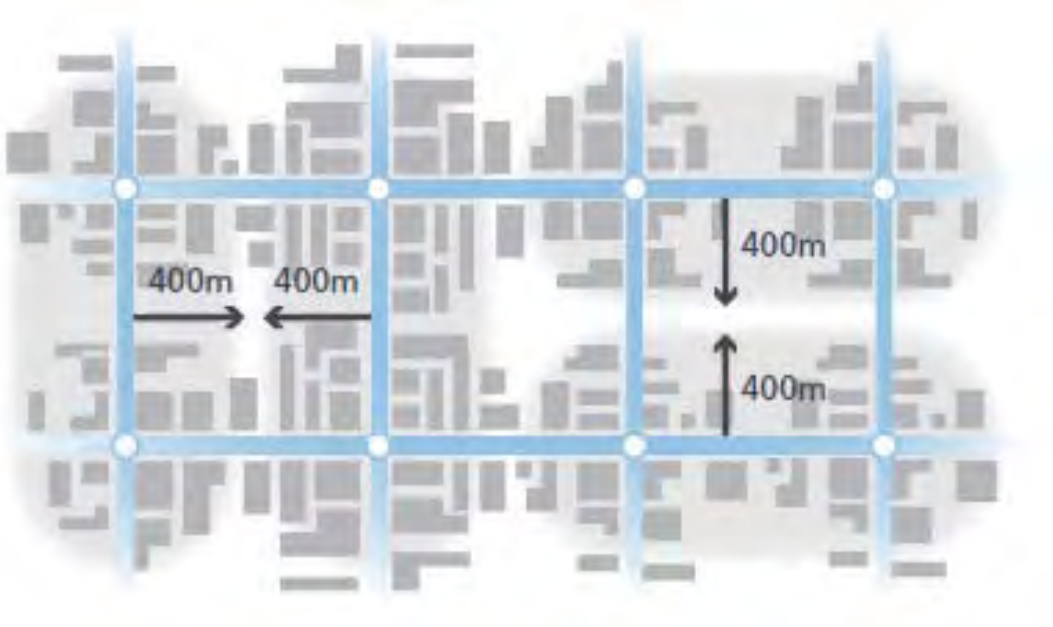
4.7 A well-connected street network provides shorter travel distances and makes it possible for people to walk or cycle to transit services quickly and conveniently from the places they live, work, shop, and play, while also supporting walking and cycling as everyday transportation options on their own.

4.8 Just as a well-connected street network shortens distances to transit, it also shortens distances for all other trips, supporting walking and cycling as attractive modes of transportation in their own right. In combination with a vibrant mix of land uses, a well-connected street network helps to create communities where many of the needs of daily life can be met within walking or cycling distance.

4.9 Especially in neighboring area, hierarchical street network surrounded by arterial roads should be established to ensure main corridors to access to the station at shortest, as well as to enjoy walking and passing with local socio-economic activities such as street market.

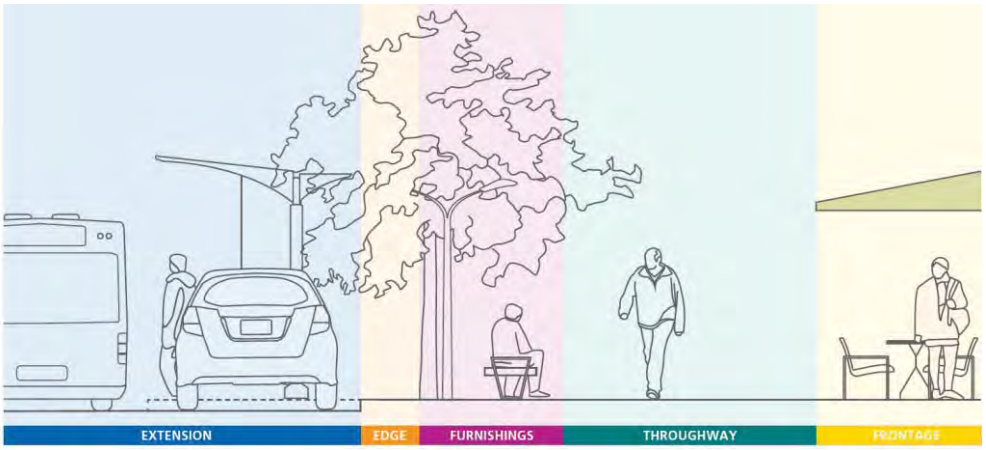
4.10 Arterial streets are designed primarily for through-movement, local streets are used primarily for local access to property, and collectors are used to connect them. Among them, “shared space” or “multi-modal street” will be identified where the space is provided for all road users including pedestrian, bicycles, motorbikes and other vehicles.

Figure 4.5 Hierarchical Road Network and Concept of “Shared Road Space”



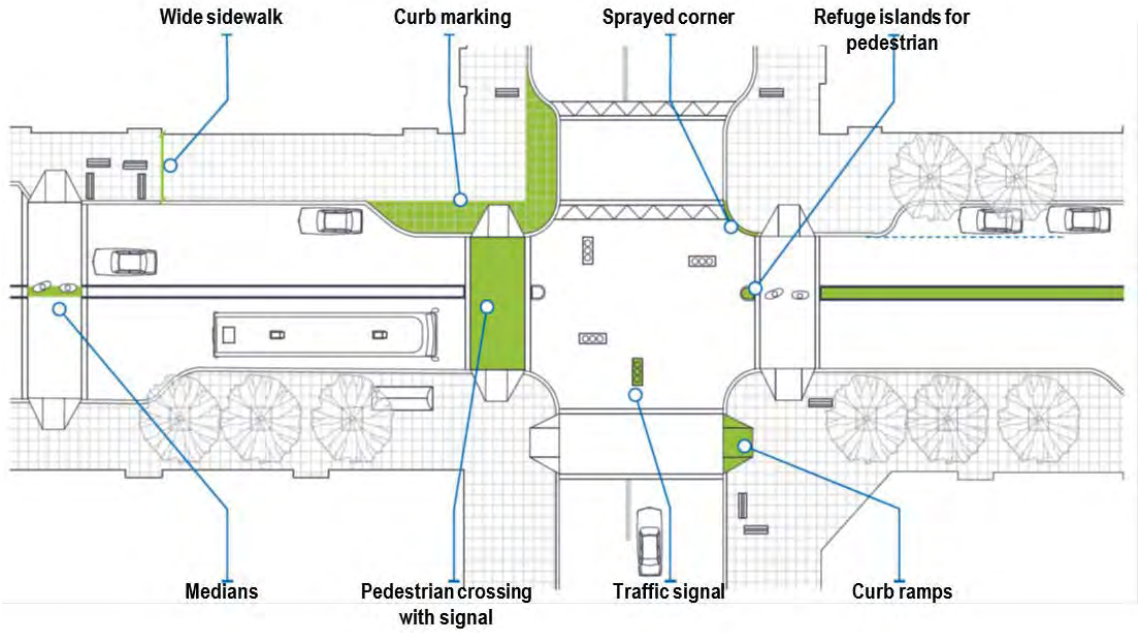
Source: Transit- Oriented Communities Design Guideline, Vancouver City, Canada

Figure 4.6 Shared Road Space



Source: Transit- Oriented Communities Design Guideline, Vancouver City, Canada

Figure 4.7 Measures and Facilities around Intersection

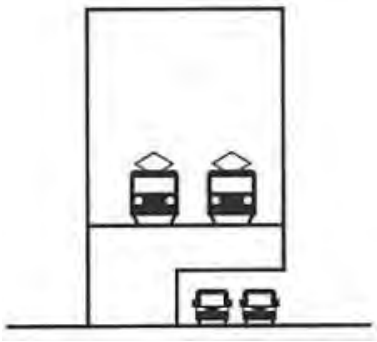
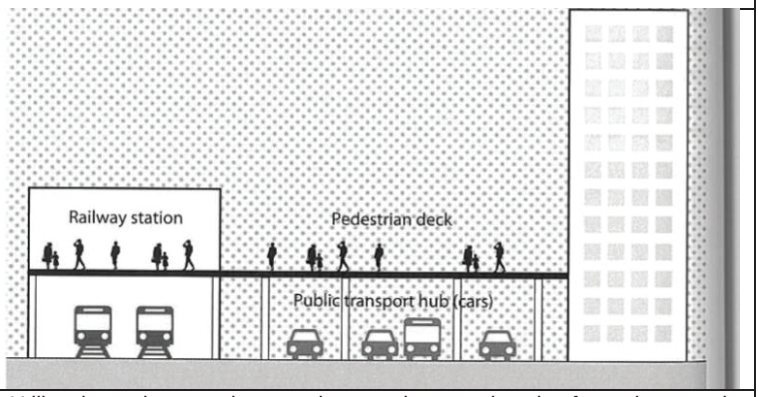
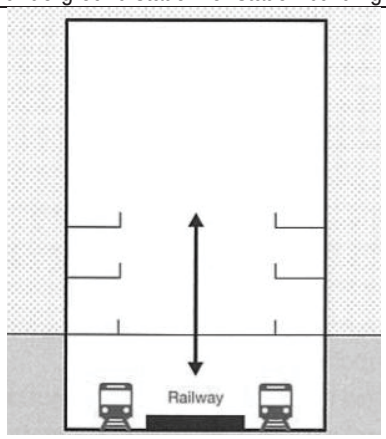
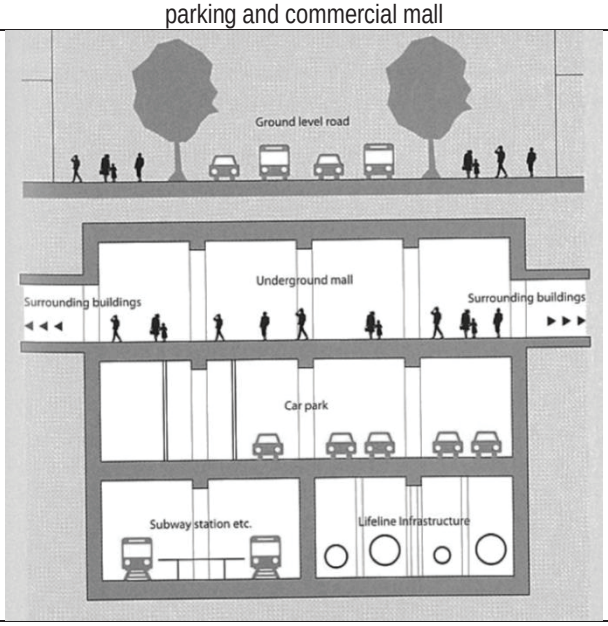


Source: Transit- Oriented Communities Design Guideline, Vancouver City, Canada

5) Multi-level Development at and around the Station

4.11 The elevated and underground station development encourages to maximize to utilized limited urban land in multi-level.

Figure 4.8 Multi-level development and at and around the station

<table>
<tr><td>Utilize the space under elevated station for intermodal facilities (station plaza and loading and unloading space)</td><td>Utilize the space above the station and road to connect surrounding buildings (pedestrian bridge, pedestrian deck)</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Utilize the space above the underground station for station building</td><td>Utilize the underground space above underground station for underground parking and commercial mall</td></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>

Source: “Integrated Station-City Development – the Next Advances of TOD, a+u”, October 2013

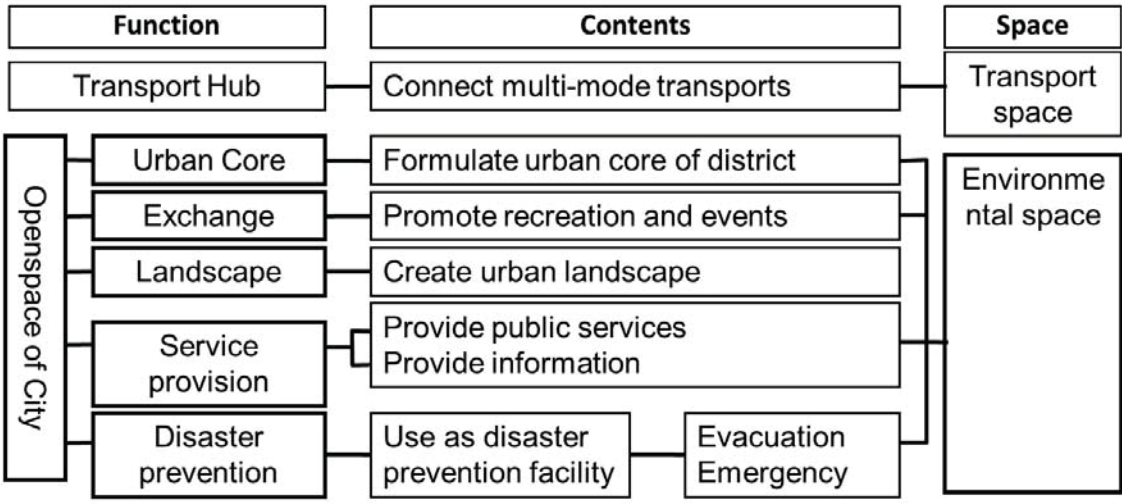
6) Station Plaza Development

(a) Functions of Station Plaza

4.12 A station plaza is the place where railway users transfer to different modes of transport, serving a role as a transport node. It is an important facility for smoothly facilitating a large amount of traffic flow at the station for convenient transfer between other UMRT lines and other transport modes (bicycle, motorbike, bus, taxi, car) and for safety for pedestrian.

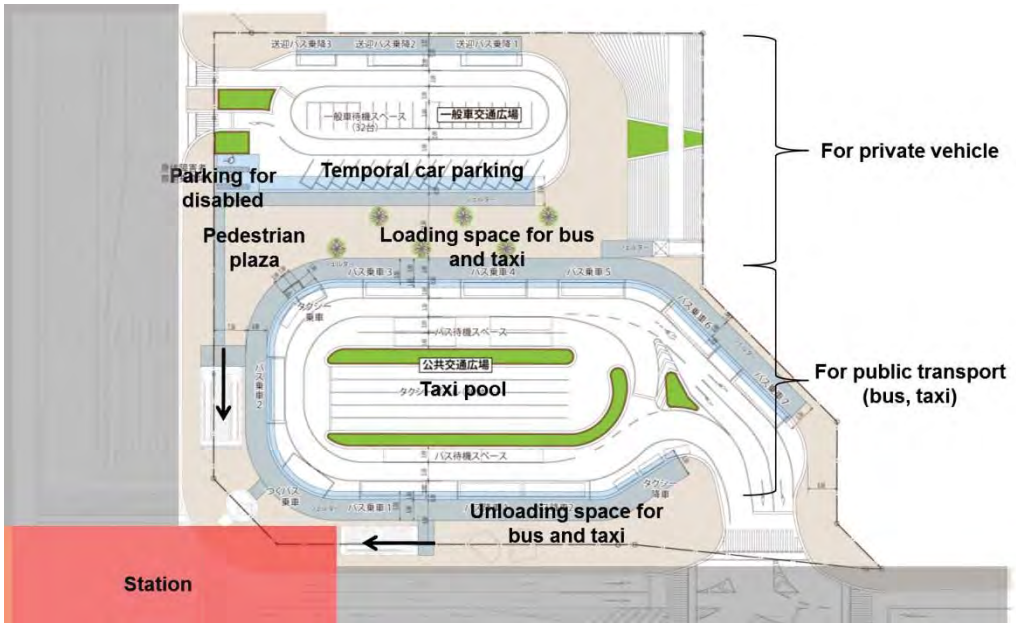
4.13 Furthermore, the station plazas contribute to serve functions of exchange and circulate at and around the station for both station users and local communities once there is a pedestrian plaza or an openspace for public. This spaces can be utilized to provide information of transport and local activities, space for events, and disaster management. Intermodal facilities are developed to provide transport functions for smooth transfer and access and environmental functions for amenity improvement and public safety (see Figure 4.8 and Figure 4.9).

Figure 4.9 Functions of Station Plaza



Source: JICA Project Team

Figure 4.10 Example of Facility Layout Plan of Station Plaza



Source: JICA Project Team

(b) Typology of the Station Plaza

4.14 The station plaza includes following facilities and spaces: (i) loading and unloading space for public transport (bus, taxi), (ii) taxi pool, (iii) loading and unloading space for private vehicle, (iv) parking for disabled (at the nearest space to the station entrance), (v) pedestrian plaza / space. In case of the elevated station, pedestrian deck is developed to separate pedestrian space and to cross trunk road in front of the station.

4.15 It is difficult to develop station plazas based on results of traffic demand analysis, since many stations are developed in built-up area where development land is limited. Furthermore, it is not popular to develop station plazas for underground station in the city center, while stations are located within walking distance.

4.16 In Japan, station plazas are developed mainly in core stations in CBD and suburban area. In case of CBD, the station plazas are the landmarks surrounded by various commercial and business facilities, so it is convenient not only for station users but also these facility users for commuting and shopping. In case of suburban area, the station plazas include bus rotary to provide feeder bus services and large-scale parking facility to promote Park and Ride.

4.17 For this, necessity of station plaza cannot be decided only by traffic demand analysis and estimated number of passengers, but also by local characteristics and type of station. Requirement of local governments and communities is one of criteria to develop station plaza, since it is a landmark and public space for local society.

4.18 While the size and facilities of station plaza are differed, it is necessary to ensure individual spaces by different transport modes (bus, taxi, private vehicle) not to mix different traffic flow (see Table 4.1 and Figure 4.11). In case of Hanoi, it is necessary to consider how to manage xe-om (bike taxi) properly. It is recommended to ensure waiting space for motorbike including xe-om to facilitate traffic flow at the station.

4.19 In case of Type 4 where station plaza cannot be developed in small scale station, it is required to develop drop off& pick up space for bus, taxi and car along sidewalk or under the viaduct to ensure designated space for station access.

Table 4.1 Typology of Station Plaza

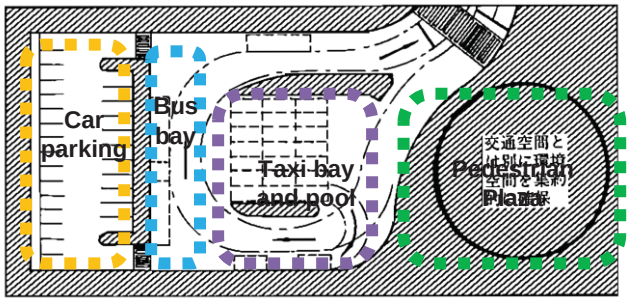
Type of Station		Average Size of Station Plaza	Intermodal Facilities inside Station Plaza					
			Bus rotary	Taxi bay	Drop off& pick up	Parking facility	Pedestrian plaza (openspace)	Pedestrian facility
Type1	A core station (50,000 passengers/ day or more) to be a regional landmark of station area providing various intermodal facilities	2 - 3ha	●	●	●	●	●	●
Type2	A sub center station (20,000 – 50,000 passengers/ day) to be a local symbol of station area providing intermodal facilities	1 – 2 ha	●	●	●	●	○	●
Type3	A general station (10,000 – 20,000 passengers/ day) to provide minimal intermodal facilities	0.5 - 1 ha	○	○	●	●		●
Type4	A small-scale station (10,000 passengers/ day or less)	Not absolutely necessary			○	○		●

Source: JICA Project Team

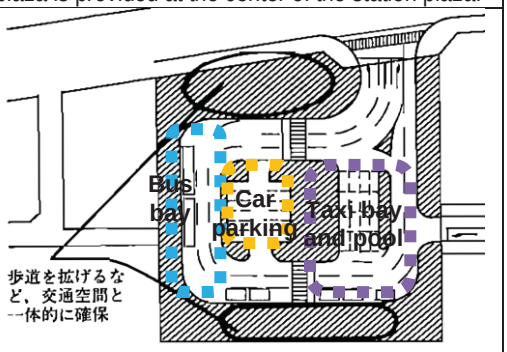
Note: ●Indispensable, ○Required

Figure 4.11 Typical Layout Plan of Station Plazas by Type

Type 1: Facilities for bus, taxi, private cars are independently provided. Pedestrian plaza is provided at the center of the station plaza.



Type2: Rotary for bus, taxi and private cars are combined. Parking space for temporal use and pedestrian plaza area provided.



Type3: All facilities are combined inside the rotary.

Source: JICA Project Team

(c) Required Function and Layout

4.20 Basic function for effective traffic flow: Several transit modes and other traffic by private car and others might be congested when those mode get together in one place of ITF. Effective demarcation and suitable flow of each mode is required inevitably in ITF. Especially, the followings are considerable measures to manage each transportation mode.

- Small transportation (paratransit mode, bike-taxi) and bigger one (bus or mini-bus) should avoid mixed distribution of facilities and its traffic flow from congested condition within ITF
- ITF should minimize private car traffic by adequate access control or separation of facilities
- Safe and efficient flow for walkers in ITF is required to consider by minimum encounter with vehicle flow.
- Clear and understandable guide on lane or road alignment for access and egress traffic route should be formulated.
- Flexible surplus space for traffic management of each mode is required

4.21 Supplemental function to meet various needs based on station character: Mass transit system requires new type of traffic management to maximize the advantage of punctual, low cost and environmental friendly transit such as park & ride system or kiss & ride. Supplemental function should meet those demand and needs by providing adequate facilities as follows.

- “Park & Ride” is one of the key function for ITF unless feeder transit would be provided, however it is necessary to consider that space availability is limited due to large demand of mode which commuters use own private car. ITF should promote park & ride system having a part of total demand as initiatory role.
- ITF should consider private car access to ITF as “kiss & ride” traffic by adequate access

control or separation of facilities

- ITF can cover more function for private transit system such as shuttle bus for factories or tourist bus access.
- Environmental friendly mode such as bicycle, E-bus and other modes are also needed to consider introduction of supporting facilities such as bicycle parking.

4.22 Pedestrian network to enhance efficient transfer by modes: It is key role for ITF in preparing effective and smooth transfer from mass transit (railway station) to feeder transit or other individual transportation modes. Pedestrian network of ITF would play a pivotal role in accommodating this requirement. The followings are considerable measures when pedestrian network is planned and designed.

- Shortest pass by pedestrian network to each transit mode or other transportation modes is inevitable to secure comfortable accessibility. It is necessary for location of transit mode to give the priority to set formation of facilities.
- Disable user with wheelchair or others requires seamless walkway surface and accessibility from station to other mode. Elevator and deck or other facilities to support disable users to connect with station directly should be introduced into ITF.
- In order to promote walkers access to station, comfortable pedestrian network is required to connect with all other walkways from ITF.

4.23 Provision of environmental function: Although plaza amenity covers supplemental function of ITF enabling users or passengers to prepare more convenient environment, this function would play an important role in formulating urban character to attract users. The following function and facilities is important element not only to support ITF but also to show up station area attractively. The station plaza works as a public space for emergency in case of flooding, fire, etc.

- Rest and waiting space and facilities (bench for rest and shelter providing shade and avoiding from rain, open space to enable people to meet, gather and wait, comfortable environmental treatment by greenery, and lighting system in night time.)
- Public and commercial services (User information facilities such as timetable and route map of UMRT and bus, information kiosk, signage, traffic police booth, etc, daily convenient kiosk or booth, public facilities such as public toilet, postal office, etc.
- Landmark and symbol: sculpture, trees, street furniture to provide symbolic space
- Disaster prevention facilities: storage of food supply and clothes, medical service, toilet for emergency, disaster information

(d) Determination of Required Capacity of Station Plaza (For Reference)

4.24 In case of Japan, capacity of station plazas and bus stops are estimated based on the manual ("the Station Plaza Estimation 1998 in Japan"), since UMRTs have been operated and future modal share can be estimated based on actual data based on field surveys.

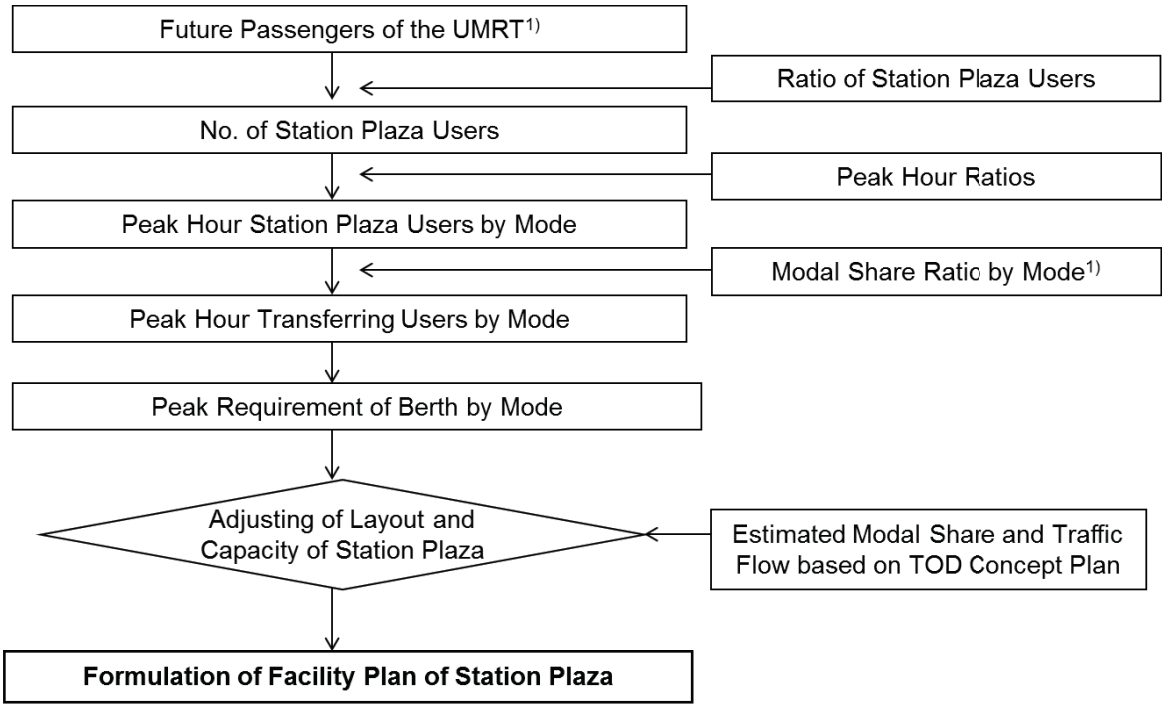
4.25 In case of Hanoi, it is recommended not only to rely on quantative indicators based on traffic demand analysis, but it is necessary to take into consideration of land availability, road connectivity, transit condition of other transport modes, necessity of station plaza for local socio-economic development, etc. For this, method of estimation of capacity of station plaza is introduced for reference in this section.

4.26 The station plaza is composed of transport facilities including (i) bus berth, (ii) taxi berth and pool, (iii) drop off and pick up space for private vehicle, and (iv) motorbike parking. In case of car parking, it requires wide space, and some of users are non-UMRT users which occupy parking space whole day. For effective use of space in the station plaza, it is recommended to develop car parking space out of the station plaza (cf. space under the viaduct, underground

space, inside commercial building, etc.).

4.27 The proposed methods aims to determine standard area of station plaza development based on bus service as one of the most efficient transits for intermodal transfer from/ to UMRT station. The standard area of station plaza includes flexible area to handle each transport taking account of daily charge of use such as peak hour and off-peak hour. Based on the number of future passengers of station, facilities and area requirement are calculated for each transport mode (see Figure 4.12).

Figure 4.12 Basic Flowchart to Estimate Capacity of Station Plaza



1) UMRT passengers and modal share ratio are estimated based on traffic demand analysis of UMRT stations.

Source: JICA Project Team

4.28 The steps for capacity estimation are as follows (see Figure 4.13):

(i) Number of users of each mode is estimated based on results of traffic demand analysis (number of daily passengers and modal share of each station). Modal share is reviewed and readjusted taking into consideration of local characteristics and transport condition in future (cf. feeder bus service is promoted while private vehicle is restricted).

(ii) Numbers of users at peak hour is calculated. Peak hour ratio of “21%” as referential number is applied based on results of person trip survey in Hanoi.

(iii) Number of peak hour bus berth is calculated to accommodate passengers of each mode who transit to UMRT station. In case of bus, 40 persons is accommodated in one bus, and 3 minutes (0.05 hour) is necessary for riding and getting off bus. As a result, required number of bus berth is calculated. In case of taxi and car, 1.4 persons is accommodated at average, and 30 seconds (0.008 hour) is required for riding and getting off. These coefficients can be modified based on results of traffic survey.

(iv) The total size of berth for each mode is calculated based on required number of berth. Required size of one vehicle for parking are 70m^2 for bus, 20m^2 for taxi and car, and 2m^2 for

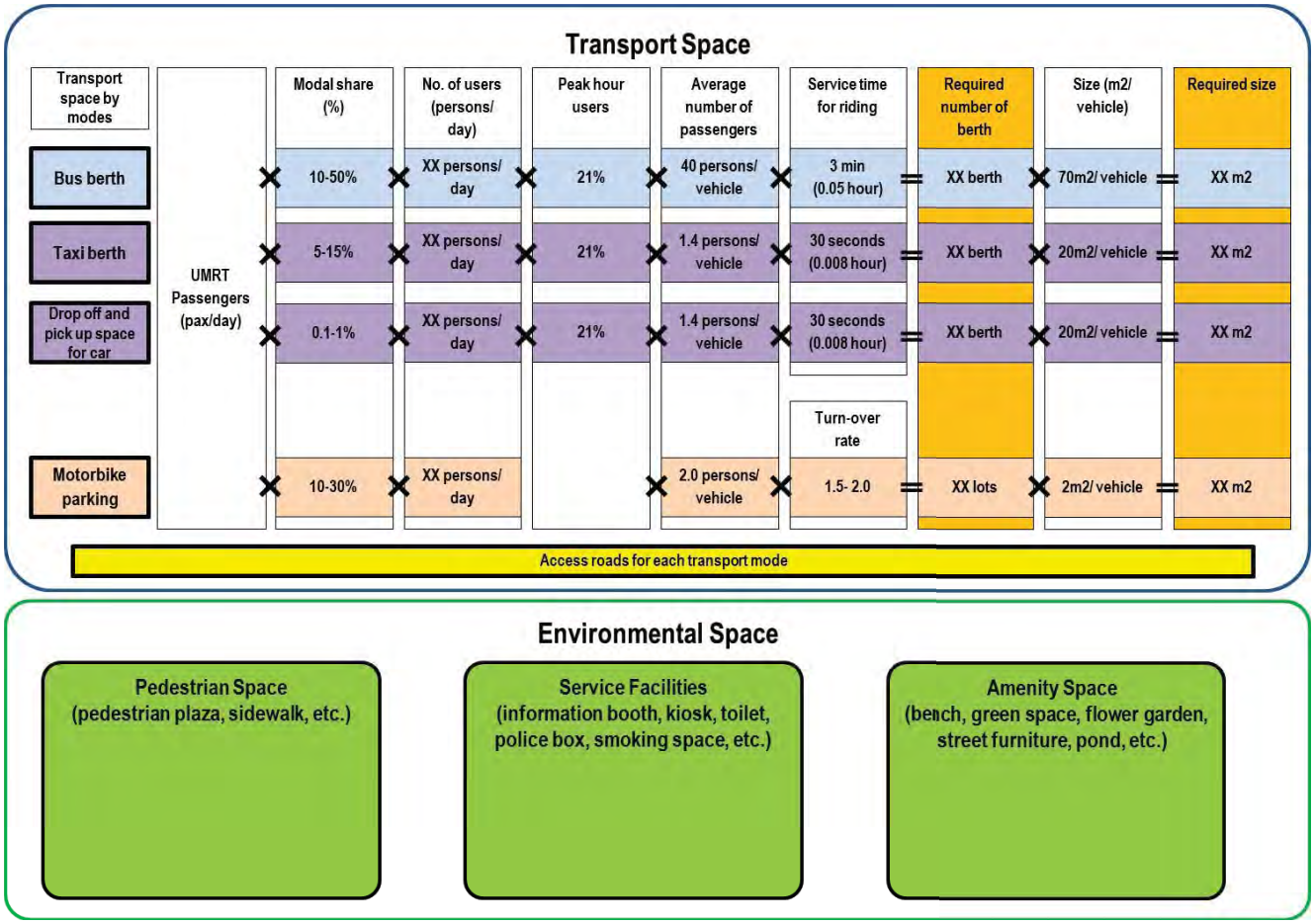
motorbike, including buffer space.

(v) In case of motorbike parking, turn-over rate (usage rate per day) is applied in place to peak hour ratio. In case of station in residential area, the coefficient is 1.5, and the station in commercial and business area, the coefficient is 2.0.

(vi) Access roads are required which are separately provided for each mode, in addition to transport space. The total of these spaces and roads are the whole transport space of the station plaza.

(vii) The environmental space is provided to ensure pedestrian space, open space and service facilities. It is recommended the total size of environmental space is the same as the transport space to develop a convenient and comfortable station plaza for station users and local communities.

Figure 4.13 Elements of Station Plaza with Capacity Estimation Process



Source: JICA Project Team

7) Actions to Promote Desirable TOD

4.29 To realize TOD concept plan by implementing TOD projects, actions should be taken in collaboration with public and private sectors as well as local communities. Seven key actions are proposed as follows:

(i) **Improvement and Development of Main Roads included in Zone Plan:** Main roads included in Zone Plan which connect UMRT stations should be given priority in improvement and development, especially in the areas at and around the stations in integration with UMRT development. This will not only facilitate efficient implementation of both projects but also provide more effective opportunities in resettlement of affected households and land acquisition. Key actions are summarized as follows:

- To adjust Zone Plan roads for improved access to UMRT station
- To prioritize budget allocation on UMRT station access roads
- To complete access roads in time of UMRT operation
- To implement roads covered in designated TOD Area together with UMRT construction

(ii) **Improvement of Local Roads and Alleys:** Main mode of access to UMRT is walking as is experienced in many other transit cities in the world. The improvement of walking conditions and environment is so important that level of improvement affects the spatial coverage of UMRT influence area. In Hanoi, access to UMRT station by bicycle and motorcycle should also be duly considered. The improvement of local roads and alleys including pavement, drainage, traffic signage and control, street lighting, tree planting, safety facilities, among others, should not only focus on the improvement of access to UMRT but also the overall improvement of mobility and living environment of local communities. Key actions are summarized as follows:

- To provide financial and technical support by HPC for improvement of local roads with initiative of local governments (District and Ward)
- To promote road development and traffic management projects in 500m – 800m radius area
- To promote community participation for improvement of local roads and traffic management

(iii) **Enhanced Traffic Management of Hanoi City Centre:** Development of UMRT Line 1, Line 2 and Line 3 will provide a significant opportunity for Hanoi City to improve traffic situation in the city centre. The city centre will be provided with UMRT stations including Hang Dau, Long Bien Nam, Hoan Kiem Lake, Tran Hung Dao and Hanoi Stations (Phung Hung Station could be added due to decision on 75 meter option alignment) (see Figure 4.14). Almost entire areas in AQ and FQ are covered within the walking distance of UMRT. Together with provision of parking facilities at the periphery (see Figure 4.15), special circulation bus and restrain measures against the entry of car, there is a high possibility of improving traffic situation in the city centre dramatically.

Figure 4.14 Area Coverage within Walking Distance of UMRT

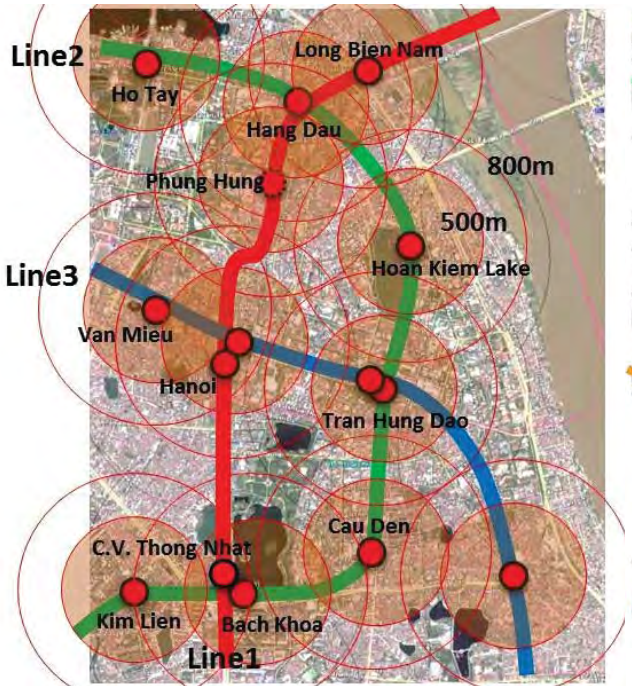
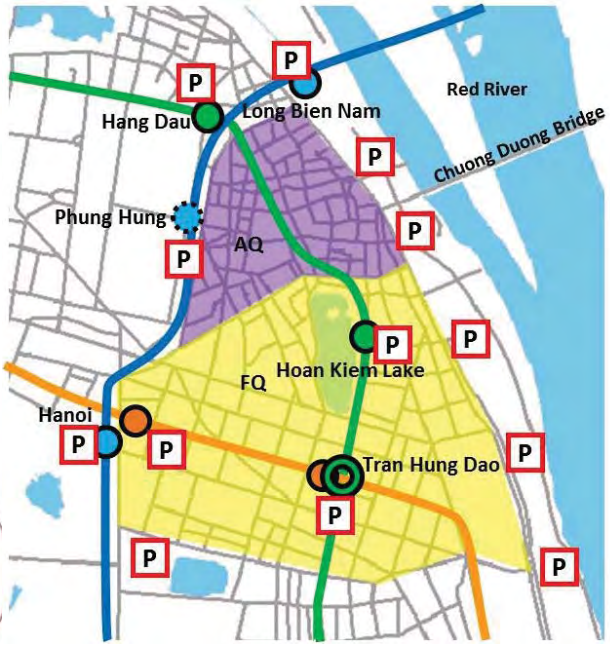


Figure 4.15 Location of Potential Fringe Parking at the City Center



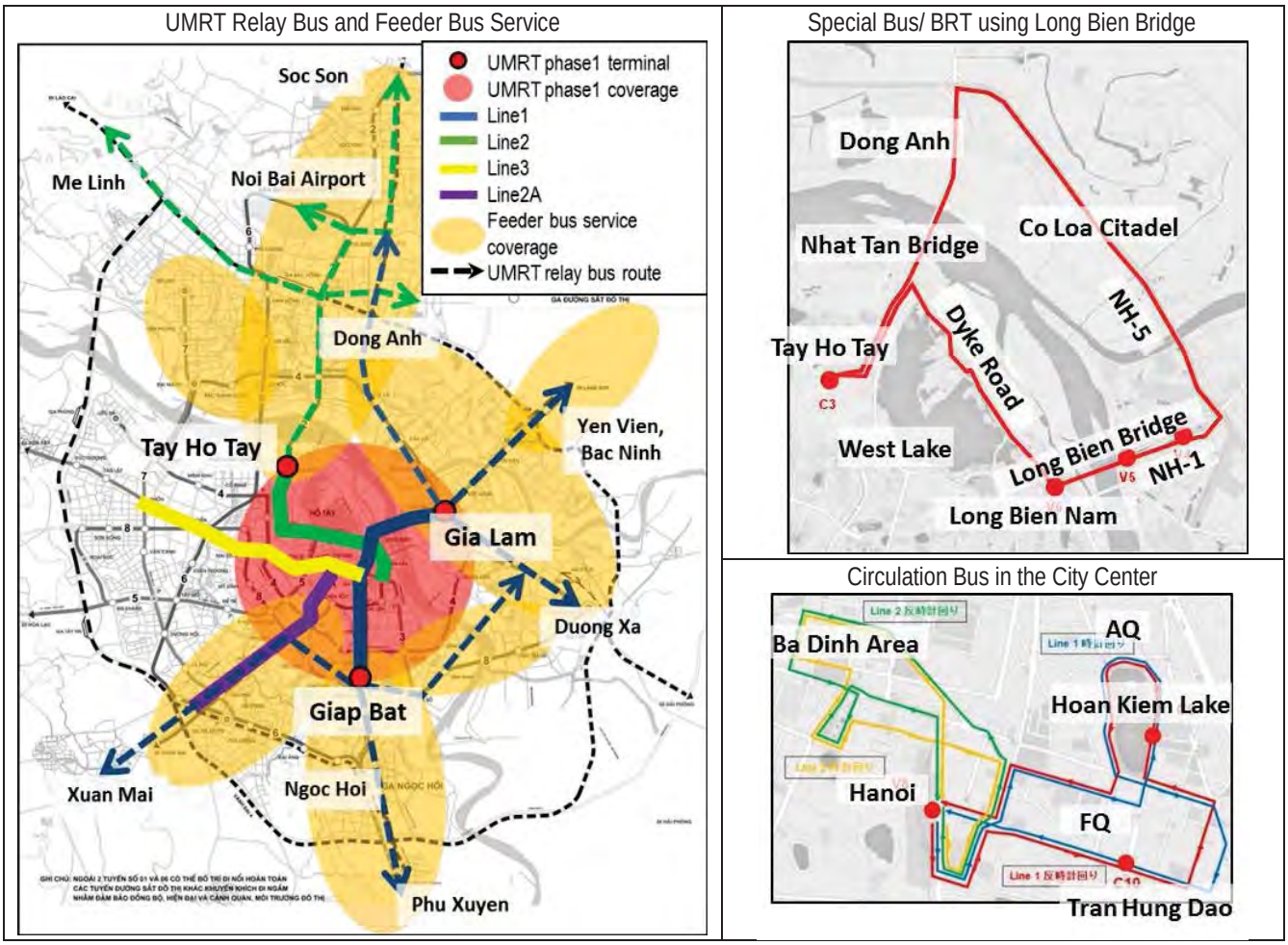
Source: JICA Project Team

(iv) **Promotion of UMRT Integrated Parking Facilities:** Although UMRT station must be provided with adequate parking facilities to strengthen intermodal connectivity, there are many stations which lack proper space for provision of parking facilities especially in the city centre. Therefore considerations must be given on the use of space under the viaduct and integrated development of underground space which will be made available during the construction of UMRT. Key actions are summarized as follows:

- To Promote development of parking space and facilities at and around UMRT stations including station plaza, under viaduct, public land, underground parking and integrated parking in TOD potential area
- To integrate parking development projects with UMRT construction projects
- To promote private sector participation with adequate financial and institutional support

(v) **Provision of New Bus Services:** In addition to reorganization of existing city bus services (rerouting and adjustment of bus frequencies) it is advisable to add new bus services in integration with UMRT services (see Figure 4.16). One is UMRT relay bus which provide high quality services along planned extension route of UMRT. The relay bus is directly connected at the end or near end stations of phase 1 section such as Tay Ho Tay of Line 2 and Giap Bat and Gia Lam of Line 1 based on common fare. This will complement relatively short phase 1 section of UMRT with seamless services to attract passenger of outer area. Circulation services using smaller capacity buses in the city centre and specific areas will also be feasible.

Figure 4.16 New Integrated Bus Services



Source: JICA Project Team

(vi) **Creation of Integrated Urban Development Opportunities:** UMRT can create ample opportunities for integrated urban development/redevelopment which will be benefited through improved accessibility. They include, but not limited to, (i) public facilities such as hospitals, universities, factories, government facilities, etc., (ii) old public apartment areas, (iii) VNR lands, (iv) underutilized bus terminal areas, (vi) planned new town areas, and (vii) underground space. Key actions are summarized as follows:

- Promotion of urban redevelopment projects in combination with UMRT development
- Promotion of relocation of public facilities from the city centre to utilize vacant land for more productive integrated development
- Conduct of feasibility study on underground space development with legal and institutional framework

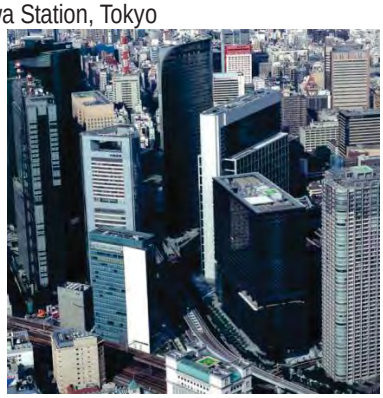
(vii) **Comprehensive TOD at Main UMRT Stations:** Among the stations, there are a number of potential stations which can serve as key inter-modal nodes and, at the same time, as a new urban core. They include Hanoi station, Giap Bat station and Gia Lam station of UMRT Line1, and are provided with ample underutilized land and space owned by VNR. With implementation of comprehensive TOD, concentrated CBD function in the city centre can more adequately be dispersed to outer areas (see Figure 4.17). Promotion of development of new sub CBD in outer areas in integration with UMRT will not only improve traffic

situation but also contribute to urban growth management and effective landuse of the city. Key actions are summarized as follows:

- To provide guidance for more effective use of underutilized lands and space (VNR owned land, bus terminal, factories, etc.)
- To establish adequate institutional arrangement for coordinated development involving private sector
- To provide resettlement sites and facilities for those who are to be relocated from overcrowded city center with good UMRT connectivity

Figure 4.17 Comprehensive TOD Project of Railway Yard Land at Main Station in Japan

Land Readjustment Project of Railway Yard of Shinagawa Station, Tokyo



Urban Redevelopment Project of Railway Yard of Shiodome Station, Tokyo

Source: website of Shinagawa Intercity (Shinagawa Station), materials of Japan Railway (Shiodome Station)

5 Institutional Arrangement for TOD Promotion

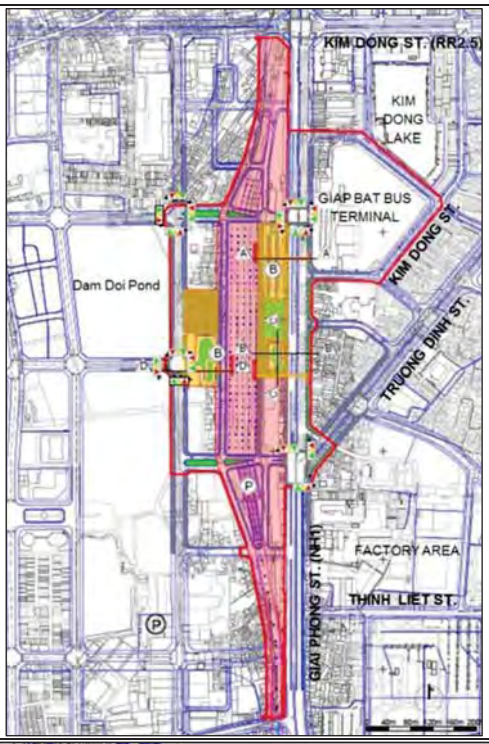
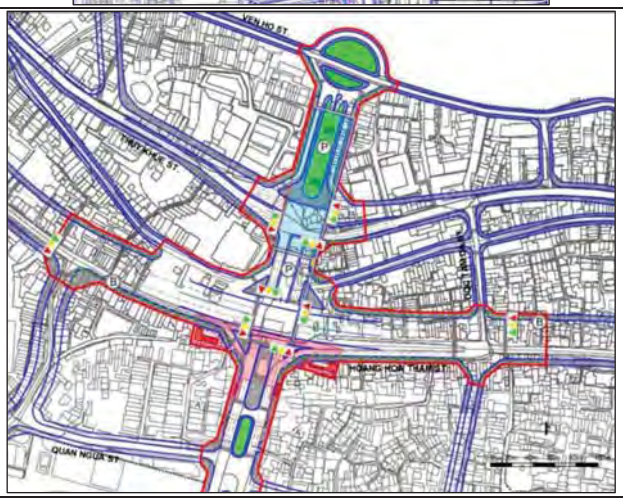
1) Designation of TOD area

5.1 It is proposed to introduce the concept of "TOD Area" to ensure provision of basic infrastructure and intermodal facilities at UMRT station area for smooth access of UMRT users and efficient operation and manage of UMRT (see Figure 5.1). TOD Area is basically defined as the area including the ROW of UMRT, section of Zone Plan roads at the station area and other critical areas for development of necessary intermodal facilities.

5.2 The coverage and size of TOD area depend on characteristics of stations and necessity of projects which must be implemented in time for UMRT operation.

5.3 The identified TOD Area should be reflected in Zone Plan and other related plans for timely implementation.

Figure 5.1 Examples of TOD Area of UMRT Line1 and Line2 Stations

	**TOD Area of Giap Bat Station** • To ensure accessibility from trunk roads (NH-1 and Ring Road 2.5) • To implement west access road in compliance with the Zone Plan timely • To develop comprehensive station plazas • To promote redevelopment of Giap Bat Bus Terminal • To improve intersections at the station
	**TOD Area of Quan Ngua Station** • To ensure intermodal facilities and sidewalks around the station • To implement road development/ widening project in compliance with the Zone Plan timely • To ensure ROW of proposed underground parking and walkway

Source: JICA Project Team

2) Equal Sharing of Costs and Profits among Stakeholders

5.4 At present, BT methods are often applied to develop both profitable facilities (commercial, residential, etc.) and public infrastructure by private developers, based on negotiation between the government and developers. In return to develop public infrastructure in the urban development project, the developer is provided landuse rights of another location (in suburban areas). Since the urban development project in urban areas is difficult to implement because of consensus building among stakeholders and land acquisition, the developers encounter difficulties for smooth implementation rather than in suburban areas. Furthermore, local communities are difficult to participate in the project implementation process and to get profits from the project.

5.5 The proposed integrated development project is aimed to share costs and profits of the project equitably among stakeholders including existing property owners, new investors and governments, based on the principle of “Capital Gain” (see Figure 5.2). The capital gain of a project can be used to recover the investment costs including for public facilities through an increased asset value. By using this increased value, all stakeholders including the government, private developers, and right holders, will benefit from the projects, as follows:

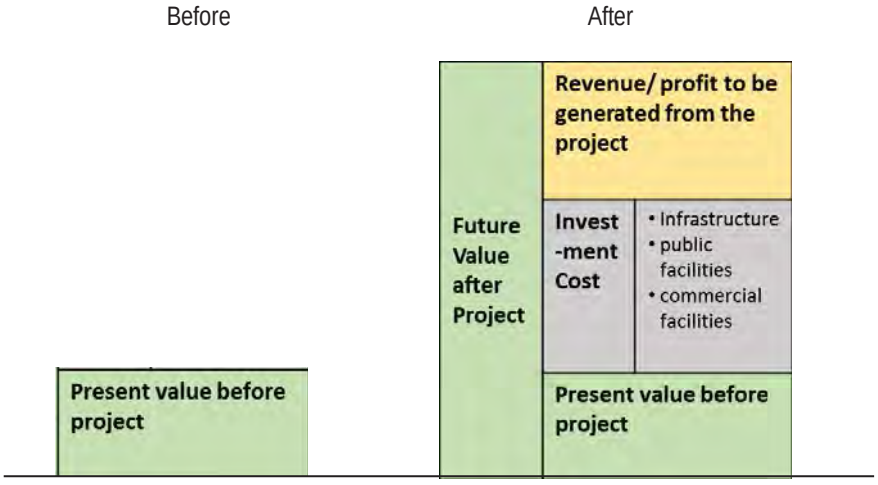
(i) The government can develop public infrastructure and facilities as part of an integrated project, and thereby raise profits through increased property tax;

(ii) The developer can recover the investment costs by selling reserved land (or reserved floor);

(iii) The right holders can participate in the project with their property asset and be provided with new properties (apartments) ;

(iv) Existing local communities benefit from improved transport and infrastructure and attractive urban facilities, and increased asset value as external economy.

Figure 5.2 Capital Gain Concept of Integrated Development



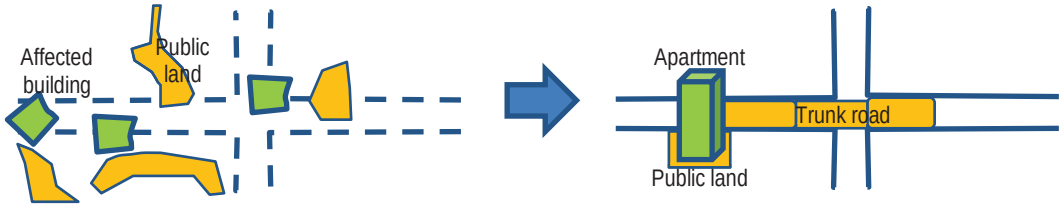
Source: JICA Project Team

3) Land replotting and consolidation for public land for road and infrastructure

5.6 Based on this right conversion principle, land conversion-based swapping of land in the vicinity of the station and developable land a little away from the station such as factories or public land could consolidate developable lands near the station, which is called as “consolidated land replotting”, and facilitate urban complex development at and around the station area. The mechanism of right conversion and land replotting should be accepted by Hanoi citizens.

5.7 For example, the existing facilities inside lands for planned roads must be relocated to vacate the land. To provide land and facility for resettlement of affected households, the government will readjust public lands and unused lands to ensure lands for road and resettlement apartments as shown in Figure 5.3. After consolidation of public lands and development of roads, the government will sell remained public lands, or construct public apartments for resettlement of the relocated households and low-income groups as well as for sale to recover project costs.

Figure 5.3 Replotting and Consolidating of Public Land for Public Infrastructure Development



Source: JICA Project Team

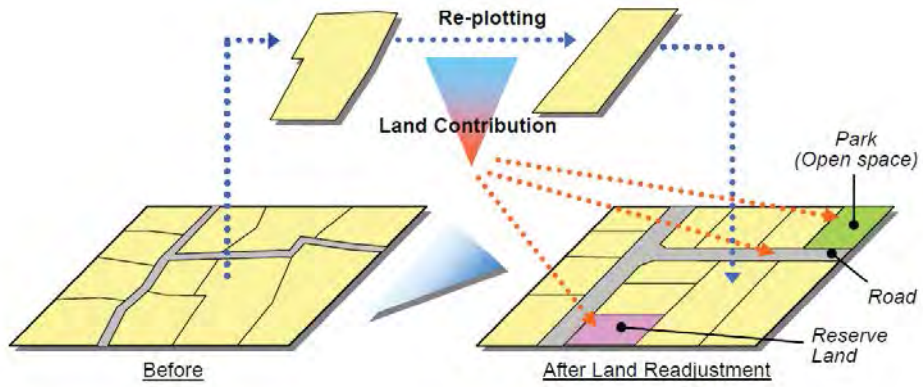
4) Mechanism of an Integrated Urban Development

5.8 Land Readjustment scheme and urban redevelopment scheme are applied to acquire land for road and intermodal facility development, and to readjust land plots to fit appropriate road network.

5.9 Land Readjustment (LR) is an integrated urban development measure including land re-plotting and infrastructure construction (see Figure 5.4). 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 (see Figure 5.5). 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.

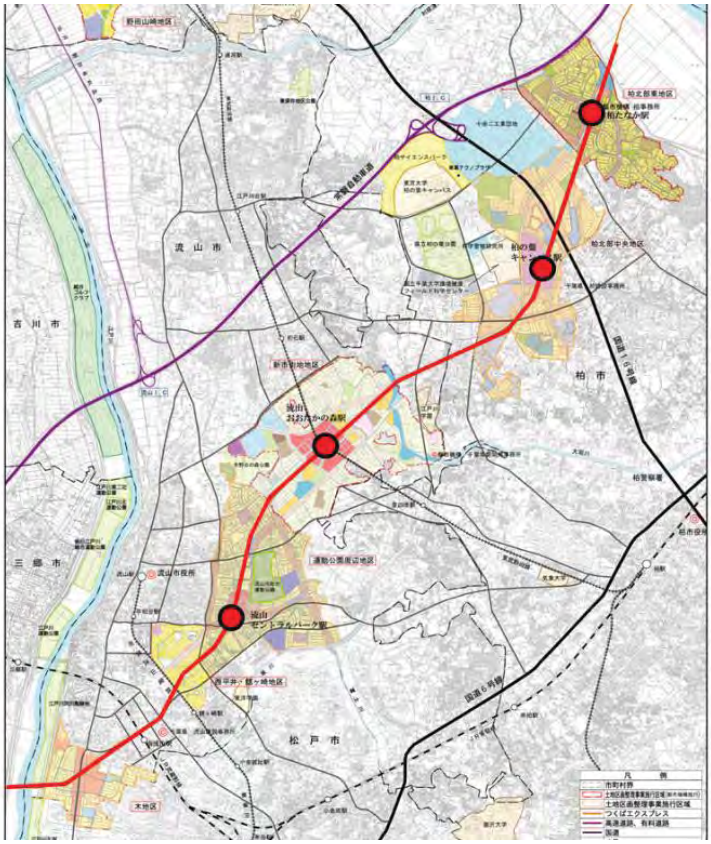
5.10 There is the “Land Contribution System” to secure lands for infrastructure, public open space and/ or reserved land for urban development (see Figure 5.4). The project implementation body can secure reserved lands to sell for project cost as a self-financial system.

Figure 5.4 Land Readjustment Scheme

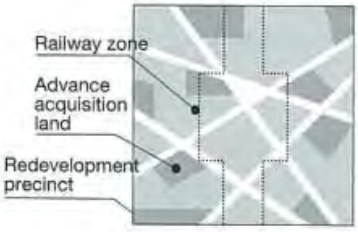


Source: JICA Project Team

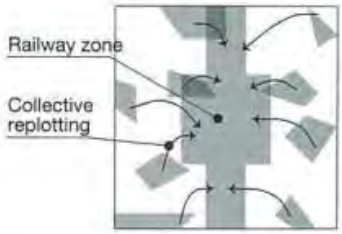
Figure 5.5 Suburban development by land readjustment project along UMRT



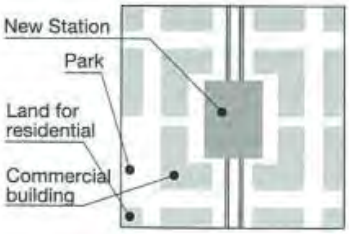
(i) Advance land acquisition in the station area



(ii) Collective replotting



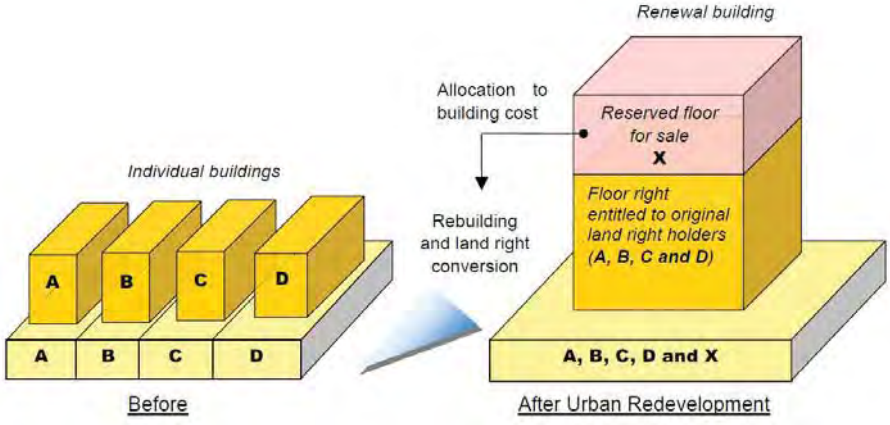
(iii) Development of station and intermodal facilities



Source: JICA Project Team based on materials of Urban Renaissance

5.11 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 5.6). 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 5.6 Urban Redevelopment Scheme



Source: JICA Project Team

5) Designation of TOD Planning Area for Integrated Urban Development with Station Development

5.12 TOD Planning Area can be designated to be overlaid onto Zone Plan for an integrated TOD development adjacent to or in the vicinity of the UMRT stations, where a TOD project will be implemented on the basis of public-private partnership.

5.13 TOD Planning Area includes less efficiently used land and those lands which needs improvement of living environment, and whose development issues can be addressed by an integrated development with the UMRT station in economic, social, and environment terms.

5.14 And it can be not only planned by the public sector alone, but proposed to HPC by the private sector while the TOD Planning Area is stipulated and decided only by the public sector and designated in the Zone Plan as rigorously authorized plan.

5.15 The TOD Planning Area proposed by the private sector is to be deliberated by the evaluation council composed of the representatives of the relevant governmental agencies, and academic experts and experienced persons.

(i) Rather less efficiently used land, particularly, public land and factories

(ii) In need to improve living environment of congested built-up area

(iii) As incentives, for TOD Planning Area can propose change in land use designated in the Zone Plan; Relax of BCR and building height

(iv) As obligation, the private sector should provide some infrastructure required in Zone Plan.

6) Coordination and Consistency among Urban, Transportation and TOD Project

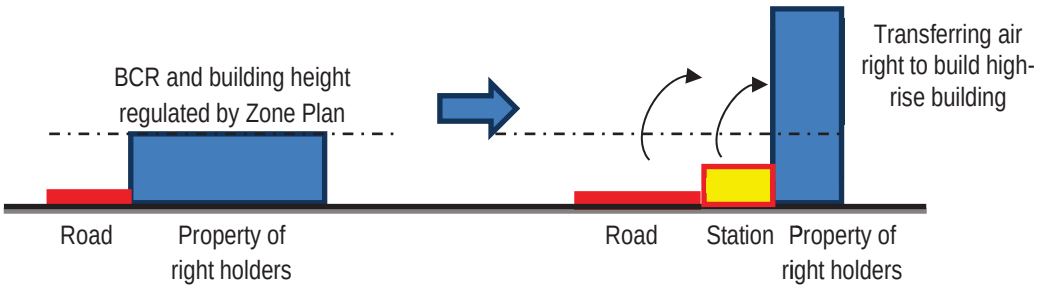
5.16 Road network, land use and development framework of TOD project are complied with the Zone Plan.

5.17 "TOD area" is proposed to be overlaid on Zone Plan to ensure accessibility at the station. Inside TOD area, following measures should be taken: (i) to control on construction activities and land transaction; (ii) to designate red lines of access road and intermodal facilities; (iii) to permit for pre-emptive acquisition of land prior to the project approval; and (iv) to prioritize access road development with budget allocation.

7) Incentives of Air Right Transfer to Maximize Development Impacts

5.18 For an integrated development covering a broad area, road network and public infrastructure must be ensured to comply with the Zone Plan, Building Code and other legal bases. As an incentive for developers, providing supplemental air rights to recover infrastructure cost will be preferable to develop consolidated TOD area with public facilities so as to utilize the space in the project area more intensively (see Figure 5.7).

Figure 5.7 Concept of Air Right Transfer



Source: JICA Project Team

5.21 The PMU conducts the competition to select a private developer (or JV consortium) which formulates the whole TOD plan, facilitates and invests projects. The developer formulates the project implementation plan including physical plan, financial plan and right conversion plan, by discussing with PMU or Steering Committee and public consultation with local communities.

5.22 The role of HPC is to monitor the project and provide technical and financial supports if required. The PMU must protect rights of right holders during the project implementation process. At the end of the project, increased property value will be shared equitably among stakeholders.

(c) Guidance for and Control on the Private Sector

5.23 A Major purpose of TOD, as an integrated development concept, is to develop infrastructure. For this purpose, HPC should take the initiative to involve the private sector in its implementation.

5.24 The Build-Transfer (BT) method is commonly used in Vietnam. With this method, developers are given permission to develop other areas whose value is equivalent to the cost of public infrastructure that they are obliged to develop within the project area. With this method, however, sometimes the developer does not develop infrastructure as agreed, but only invests in the permitted other development areas. There are no written standards for BTs about role and responsibility sharing between the public and the private sector, and the terms and conditions depend on the negotiation and agreement between the government and the developer, based on the content of the project.

5.25 Some guidelines should be established to provide guidance on TOD to ensure a certain level of service. They should apply to all the station areas.

(d) Participation of Right Holders

5.26 As mentioned above, original right holders can choose between two options: (i) participate in the project and settle in new apartments within the project area, and (ii) move out from the project area, with compensation.

5.27 Social housings are developed in TOD project area for resettlement of original property owners, and employment opportunities are ensured to sustain livelihoods and improve socio-economic activities for local communities.

5.28 Right holders who participate in the project can raise opinions for project contents not only housing issues but also overall project concept how to improve station area for new and original communities, since original residents know well issues of area and necessity for living environment improvement.

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