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Development of Urban Railway in Vietnam: Current Status and Development Prospects

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Abstract

Economic development and transportation are also necessary to develop, in which, the railway is one of the critical transport infrastructures contributing to the country's socio-economic development. In the context that the national railway system is still backward, traffic congestion in big cities is increasingly severe, investment in renovating and upgrading existing railways and developing new

railways, and urban railways to meet the transportation needs and serve the country's socio-economic development is very necessary. On the basis of analyzing the current situation of urban railways in Vietnam in the recent period, this study outlines the prospects for urban railway development and recommends policies to continue developing urban railways in the future.

Keywords: Development, urban railway, Hanoi, Ho Chi Minh City, Vietnam

1. Introduction

Urban Railway or Metropolitan is the inner-city railway system including Metro line, Tramway on the ground, and Tramway overhead (viaduct). The urban railway is considered the backbone of the transport infrastructure system for any developed city in the world; Hanoi and Ho Chi Minh City are no exception. Because these are the two largest cities in Vietnam, the need to use public transport including urban railway is inevitable.

Moreover, the need to build an urban railway network is becoming more urgent than ever when the pressure of traffic congestion and environmental pollution increasingly weighs on the narrow infrastructure fund of Hanoi and the city. Ho Chi Minh. Putting into operation the urban railway network is expected to change the urban appearance of Hanoi and Ho Chi Minh City, solve congestion and accidents, and change usage habits. public transport and transport culture of the people in the future. For many major cities in the world, urban railways have affirmed their position and role in the development of urban areas thanks to the following preeminent features: Reducing traffic congestion, and transportation bulk load; Helping save energy and reduce air pollution; Fast movement speed saves time; Convenient and smart: when the Metro system connects to other vehicles such as buses, bicycles, motorbikes; Good service quality. These are also experts' assessments if the railway is put into operation in Vietnam.

Therefore, according to the general planning on construction of the capital until 2030 and a vision to 2050 approved by the Prime Minister under Decision 519/QĐ-TTĐ dated March 31, 2016, the urban railway network in Hanoi interior includes 8 routes, a total length of 318 km. In the past 10 years, two railway lines are under construction including Line 2 (section 2A, Cat Linh - Ha Dong) and Line 3 (Non-section - Hanoi station). Below is a detailed planning map of urban railway lines in Hanoi.

For Ho Chi Minh City, in order to fundamentally solve the traffic congestion problem, the Prime Minister issued Decision No. 568/QĐ-TTĐ dated April 8, 2013, approving the adjustment of the Traffic Development Planning. Transport in Ho Chi Minh City to 2020 and a vision after 2020, according to which, Ho Chi Minh City will build 08 radial and ring routes connecting the main centers of the city, mainly going underground in the inner city.

2. Literature review

The Hanoi General Plan (2030) and Ho Chi Minh City General Plan (2030) list a series of general requirements for urban railway construction and development - but have not paid much attention to the feasibility of the requirements or proposed coordination measures for implementation. The urban railway is assumed to be an infrastructure that can be implemented and implemented independently through specialized transport projects of HAIDEP, TEDI, and other units, while the coverage and quality of these projects really matter. Rather, to effectively promote the urban railway system, it is necessary to combine the

station system planning with the renovation and urban planning - including land fund preparation and space system development planning. public and walking routes, crowded areas such as markets, supermarket centers, service centers, offices, hospitals, schools, etc. Doing so will enhance the attractiveness, comfort, and reasonable of walking spaces, making Hanoi really suitable for walking lifestyle and public transport, in line with the current trend of green, sustainable, and energy-saving development of the world.

However, this is not a simple task and depends much on the city's economic potential. To develop appropriate control solutions, what should be done in the immediate future is to identify outstanding factors that are likely to have a fundamental effect on task performance.

Currently, the main public transport system of the city is the bus and fast bus (BRT) with a total of 112 routes, the coverage reaches 68.5% and only meets 10% of travel needs people's back. When the population and the planned target of public transport use increases, public transport needs to be further developed^[3, 4, 5]. Otherwise, Hanoi will easily fall into the situation of "no way to go".

3. Research content

Urban railway planning in Ho Chi Minh City

In order to fundamentally solve the problem of traffic congestion, the Prime Minister issued Decision No. 568/QĐ-TTĐ dated April 8, 2013, approving the adjustment of the Transport Development Planning of Ho Chi Minh City. to 2020 and a vision after 2020^[1]. Specifically, as follows:

Urban rail:

To build 08 radial and ring routes connecting the main centers of the city, mainly going underground in the inner city, including:

Route 1: Ben Thanh - Suoi Tien, about 19.7 km in length; The study extends to Bien Hoa city - Dong Nai province and Binh Duong province as follows:

+ Extending to Bien Hoa city - Dong Nai province: From Suoi Tien station, go along National Highway 1 to Cho Sat junction, Bien Hoa city;

+ Extend to Binh Duong: From Suoi Tien - My Phuoc - Tan Van station - XT1 road - central station (Binh Duong Industrial - Urban - Service Complex).

Route 2: Northwest urban area (Cu Chi district) - National highway 22 - Tay Ninh bus station - Truong Chinh - (branch to Tham Luong Depot) - Cach Mang Thang Tam - Pham Hong Thai - Le Lai - Ben Thanh - Thu Thiem, about 48.0 km in length.

Route 3a: Ben Thanh - Pham Ngu Lao - Cong Hoa intersection - Hung Vuong - Hong Bang - Kinh Duong Vuong - Tan Kien Depot - Tan Kien station, about 19.8 km in length. Studying to extend line 3a connecting Tan An city (Long An province) from Hung Nhon station along National Highway 1.

Route 3b: Cong Hoa intersection - Nguyen Thi Minh Khai - Xo Viet Nghe Tinh - National highway 13 - Hiep Binh Phuoc, about 12.1 km in length. Research to connect with Thu Dau Mot town (Binh Duong province) from Hiep Binh station and go along National Highway 13, connecting with urban railway No. 1 of Binh Duong province;

Route 4: Thanh Xuan - Ha Huy Giap - Nguyen Oanh - Nguyen Kiem - Phan Dinh Phung - Hai Ba Trung - Ben

Thanh - Nguyen Thai Hoc - Ton Dan - Nguyen Huu Tho - Hiep Phuoc urban area, the length is about 36,2 km.

Route 4b: Gia Dinh Park Station (line 4) - Nguyen Thai Son - Hong Ha - Tan Son Nhat International Airport - Truong Son - Hoang Van Thu Park - Cha Ca Lang Station (line 5), about 5.2 km in length;

Route 5: New Can Giuoc bus station - Highway 50 - Tung Thien Vuong - Phu Dong Thien Vuong - Ly Thuong Kiet - Hoang Van Thu - Phan Dang Luu - Bach Dang - Dien Bien Phu - Saigon bridge, length approx. 26.0 km.

Route 6: Ba Queo - Au Co - Luy Ban Bich - Tan Hoa Dong - Phu Lam roundabout, about 5.6 km in length.

The construction planning of 07 Depots is as follows: Suoi Tien - an area of about 27.7 hectares (Route No 1), Tham Luong - an area of about 25 hectares (Route No 2), Tan Kien - an area of about 26.5 hectares (Route No 2, route number No. 3a), Hiep Binh Phuoc - an area of about 20.0 ha (Route No. 3b), Thanh Xuan - an area of about 27.0 ha, Nha Be - an area of about 20.0 ha (Route No. 4), Da Phuoc - area of about 32.0 hectares (Route No 5), a total area of Depots about 158.2 hectares and urban railway stations: Central Station (Ben Thanh Station), Rail Link Station and Interconnection Station routes (Ba Queo station, Cong Hoa intersection station; Lang Cha Ca station, etc.), Intermediate stations: From 700 m to 2,000 m on average, 01 stations will be arranged.

Other urban railways:

Construction of 03 tram lines or monorail (Tramway or Monorail), including:

Ground tram line No. 1: Ba Son - Ton Duc Thang - Me Linh Square - Vo Van Kiet - Ly Chieu Hoang - Existing Mien Tay Bus Station, about 12.8 km in length. Orientation extends from Ba Son to Binh Quoi urban area (Thanh Da - Binh Thanh)

Monorail line No. 2: National Highway 50 (District 8) - Nguyen Van Linh - Tran Nao - Xuan Thuy (District 2) - Binh Quoi Urban Area (Thanh Da - Binh Thanh); Orientation to connect urban railway line No. 3a, about 27.2 km in length;

Monorail route number 3: Crossroads (Phan Van Tri - Nguyen Oanh) - Phan Van Tri - Quang Trung - Quang Trung Software Park - To Ky - Tan Chanh Hiep station, about 16.5 km in length.

Building 03 Depots for tram lines or Monorail as follows: Mien Tay Bus Station, area of about 2.1 ha (tramway line No. 1); Nguyen Van Linh Street, area about 5.9 ha (Monorail line No. 2); Tan Chanh Hiep street, area about 5.90 ha (Monorail line 3). The total area of the Depots is about 13.9 hectares.

Hanoi urban railway planning

According to the general construction planning of Hanoi capital up to 2030 and vision to 2050 approved in Decision No. 1259/QĐ-TTĐ dated July 26, 2011, the urban railway network consists of 8 routes with a total length of 2. about 318 km long^[2], specifically:

Route 1: Ngoc Hoi - Yen Vien - Nhu Quynh, about 38.7 Km in length;

Route 2: Noi Bai - City Center - Thuong Dinh, about 35.2 Km in length, is the backbone for the current and future urban area, connecting with Line 2A;

Line 3: Nhon - Hanoi Railway Station - Hoang Mai is about

21 km long, after 2020 will develop line 3 to Son Tay, the total length is expected to be 48 km;

Route 4: Dong Anh - Sai Dong - Vinh Tuy/Hoang Mai - Thanh Xuan - Tu Liem - Thuong Cat - Me Linh. The route has a length of about 53.1 km, and has a circular shape, connecting with lines No. 1, No. 2, No. 3, and No. 5.

Route 5: South West Lake – Ngoc Khanh – Lang – Hoa Lac. The length is about 34.5 km.

Route 6: Noi Bai – New urban area west of Ngoc Hoi, connecting with Line 4 in Co Nhue and Line 7 in Duong Noi. The length is about 43 km.

Route 7: Me Linh – New Urban Area West Nhon – Van Canh – Duong Noi, connecting with Line 4 at Dai Mai and Tay Tuu sections, with Line 6 at Duong Noi section. The length is about 35 km.

Route 8: Co Nhue – Ring Road 3 – Linh Nam – Bat Trang – Duong Xa. The length is about 28 km.

It is expected that when the urban railway network in Hanoi is completed, the proportion of people using public passenger vehicles will increase to 35-45%, reducing the market share of private vehicle users participating in traffic. throughput down 30%; contribute to the economic development of the region and improve the urban environment by reducing traffic congestion and pollution.

Along with the urban railway system planning, Hanoi will also plan 78 underground public parking lots with a total floor area of more than 104 hectares, mainly located in the area of 4 old inner-city districts. building from 3 to 4 basements (maximum to 5 basements and arranged in combination with commercial and service functions.

Regarding underground public space, the city identifies major public transport hubs (urban railway stations, national railway stations) as the nucleus.

Specifically, identified 39 underground public space development areas in the inner city (historic and expanded) with a total area of about 954 hectares. Orientation to arrange the functions of services, commerce, entertainment, and underground garages associated with urban railways and stations on the route.

In addition, 65 locations are proposed to encourage the formation of underground space in new development areas north of the Red River and South of the Red River with a total area of about 2,171 ha.

The planning of 3 horizontal zones, including the inner-city area has the historical inner city, from ring 2 to the center, it will promote the development of underground space because basically all the space on the ground has been exploited. high urban density. In the expanded inner-city area, from Ring 2 to Green Belt Nhue River will strengthen the connection of local underground spaces at the constructions that have been and are being formed, forming a continuous system.

In the new development area, from the East Ring 4 urban area and the new development area north of the Red River, the land fund will be reserved for synchronous development between underground space and synchronous and modern floating space.

Finally, the corridor area on both sides of the Red and Duong rivers will limit the development of underground space, only developing underground infrastructure works.

In satellite towns, the planning is to orient the development of underground public spaces around suburban railway lines connecting with the central urban area.

Factors affecting the urban railway of Hanoi and Ho Chi Minh City

Hanoi and Ho Chi Minh City is often considered the most important factor in the construction of urban infrastructure, especially the urban railway system. In fact, the rate of return on capital is important ^[5]. The key issue is the guidelines and mechanisms that allow the exploitation of the benefits that can be generated from urban railway projects. This is something many experts have mentioned. Of these, the approved urban railway network plays a decisive role in the future, because once the planned roads are built, there are not many opportunities to change or adjust.

With the option of arranging major urban railways in parallel with the main roads, these urban roads basically do not open more opportunities for land fund development and urban improvement but only enhance accessibility to developed buildings, and have good access along the big road - which is not a major concern for the owners ^[5, 6]. Therefore, it is difficult for urban railway projects to exploit capital from the added value of the land lots that urban railways go through.

Technology and management: In official statements, the role of technology and management of urban railways are often overemphasized, considering these as the most important factors. These should only be considered as project-specific issues.

For urban and urban futures, it is important to be consistent with the level of operation, efficiency, and impact of the urban railway system. Thus, a system of requirements is the basis for management and development; specific mechanisms to encourage development; and specific concrete support commitments - which are really necessary to ensure the competitiveness, relevance, and future of railway development.

The prominent impact of the urban railway on transport

Station and the link between urban railway and urban areas: This is a matter that many experts consider to be the most important to promote the efficiency of the urban railway system but little is mentioned in practice - mostly due to the lack of Prepared in advance, the limited purpose of urban railway projects, as well as the complexity of the problem. In the long run, the efficiency and revenue of the urban railway system depend largely on the comfort and suitability of the connections between the urban railway station and the urban area, namely: walking routes, crowded operating centers, parking lots, and transit systems ^[5]. Although it may not be done, right now we have to consider the development of the area around the station for the next 20 years to take appropriate control measures.

Leaving private vehicles and using public transport: Most studies on this issue agree that the main reason people use motor vehicles (especially motorbikes) is due to their flexibility, convenient, suitable for the travel purpose of the majority of people. Therefore, besides the "negative" measures to make it difficult for individual vehicles to become more inconvenient - the main problem is to build a public transport system that is flexible, convenient, and more suitable for the Daily travel destination of different objects ^[3]. When the quality of transport means and directions of the public transport (except urban railways) can be adjusted without much difficulty - the quality of public transport walking and parking spaces is actually a

more decisive factor the tendency to abandon personal means in the long run.

Spacewalk: Supporting the development of pedestrian spaces is the policy of Hanoi and Ho Chi Minh City, Government, and planning with the recent result of the establishment of more walking streets in the center of Hanoi. However, for people to really walk every day, walking spaces must exist everywhere, must meet the daily travel needs of many people, connect well with public transportation, and are comfortable and convenient that people find walking really more appealing.

In addition, many design principles of walking space organizations can be easily found in specialized documents. Particular attention should be paid to the development of walking space in Hanoi in particular and Vietnam in general as the negative effects of a hot and humid climate. Without a solution to make the walk spaces dry, cool, shady, every other effort would not make much sense - because walking in the sun, in hot and humid climates, is a pain for everyone^[5]. This explains why most people often walk, practice running in the early morning or late afternoon; or just like to stroll around the large lake with many trees.

Certainly, Hanoi will need a lot of time and effort to build a quality walking space system for people to switch to walking^[6,7]. For the future, from now on, Hanoi needs to set up a plan of the pedestrian space network in combination with the organization of public transport system, tourism, social infrastructure, and trade in services - with important goals being standard the land fund, orientation for renovation and new construction. Regulations need to be built on the construction of pavement roofs or independent walkways to provide a consistent basis for urban management.

4. Discussion

Development context

Urban transport plays an important role in developing the surrounding urban connection. Hanoi and Ho Chi Minh City only rely on buses and taxis, it cannot solve the traffic congestion in the inner city. Therefore, it is necessary to think of other, larger vehicles to meet the increasing travel demand. Therefore, the solution is to build a metro and urban railway. The Government also assigned the Ministry of Transport and the two cities to invest in building and completing urban railways.

Hanoi and Ho Chi Minh City is now a combination of planned areas (old town, old street, and new urban areas) interspersed with spontaneous development zones and large constructions or clusters built on blocks of old land^[7]. With a large area, narrow roads following the fishbone network structure, and a very high density of construction, spontaneous development zones act as "solid areas" in urban areas, which are nearly impossible for vehicles to travel through.

As a result, vehicles are often forced to use main roads, causing them to overload, causing congestion. Most of the large-scale constructions on old plots only contribute to increasing traffic pressure. Building multiple roads through spontaneous development zones is a basic solution to complete the Hanoi Road network. However, due to the high cost of compensation, Hanoi is probably only able to clear the ground to open a number of main roads, and spontaneous development zones will remain long-term. These areas will continue to hinder Hanoi's traffic and Ho

Chi Minh City- regardless of how the new urban area is built - if we don't know how to look it the other way.

Opportunities from the defects

The nature of the development of spontaneous zones is to cling to the outer rim traffic, constantly encroaching in the open alleyways until they occupied all the vacant land. From outside to inside, the economic value of land plots decreases; the level of solidification of works also tends to decrease. For most spontaneous development plots, the core is the cheapest and easiest place to buy land to create a large plot of land^[5]. The only thing that prevents these plots from being purchased and developed into apartments, or commercial centers, is that there is no convenient transportation.

If both creating convenient transportation and arranging more quality services, this core will become the ideal new residential areas because they are located between the new urban areas and the old center of Hanoi and Ho Chi Minh City.

Renovate the core of spontaneous development areas

In a nutshell, the idea of improving the core of spontaneous development zones is as follows:

Acquire, merge valuable land plots in the core to create a large plot of land with all alleys connecting to the main road;

On the newly created large lot, construction of underground car parks, a system of quality walking spaces (indoors and outdoors) with quality, urban railway station, play and entertainment spaces, service works, high-rise apartment buildings (serving both the needs of resettlement on the spot);

Improve alleys to create quality walking spaces, connecting with other walking spaces;

If possible, the urban railway station is located as close to the main road as possible to limit changes to urban railway lines, while still being well connected to the walk space system in the core;

In areas with very high construction density, especially the outer rim, the urban railway stations can be connected by monorail with small capacity going high and connected to the urban railway station.

Theoretically, this solution can significantly increase accessibility and core value. Due to the ability to gather large land funds at the core, it is possible to form a quality and safe walking space system for the area, which will not only be conveniently connected to the urban railway stations but also to the translation works^[6,7]. Service and parking are further developed at the core. Doing it this way can not only create urban areas that really adapt to walking and public transport but can also help improve the quality of life, and create more jobs, vitality, and attractiveness for the spontaneous development of urban areas. The core of spontaneous development zones is likely to become a chain of new centers, becoming a place to attract users from the old Hanoi center and from new urban areas, mainly through the walk and the urban railway system.

5. Conclusion

According to Ms. Fanny Quertamp, Co-Director of PADDI, Center for Urban Forecasting and Research, Vietnam is currently facing challenges in urban transport, especially in Hanoi and Ho Chi Minh City. Ho Chi Minh. In, the big

problem that needs to be solved is capital, in addition to technical problems, different funding sources are also needed. In order to reduce traffic congestion in Hanoi, besides the harmonious development of the subway system with the bus system, it is necessary to change people's habits of limiting personal vehicles, increasing strengthen public transport.

Thus, developing the railway transport system is a matter of concern and focus in the coming time in the Hanoi capital. In particular, it is necessary to attract investment capital from many sources and train technical human resources. On the other hand, to reduce traffic congestion in Hanoi capital, it is not only necessary to implement one solution, but also to implement a package of solutions.

According to a representative of the UBIFRANCE Commercial Office, with GDP growth of more than 7% per year, an annual population increase of more than 1 million people, and rapid urbanization, Vietnam must develop a rail transport system. urban. The target set by 2020 is for the railway industry to account for 13% of passenger and 14% of freight transport. The project to build a North-South high-speed railway is also being considered in the immediate future.

The transport master plan of Hanoi city has set out a plan to build eight urban railway lines. And Ho Chi Minh City plans to build 7 metro lines and 3 tram lines with a total length of 160 km. France participates in financial investment for Hanoi's pilot metro line (line 3). It is expected that the pilot metro line will come into operation around 2016, followed by line 2 (Nam Thang Long - Tran Hung Dao, in the direction of connecting to Noi Bai international airport).

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