



# MASTER PLAN FOR THE SHARED ELECTRIC TWO-WHEELER STATIONS: PROPOSAL FOR 10 CENTRAL DISTRICTS IN HANOI CITY





## PROJECT PARTNERS



### ABOUT

This brochure has been prepared for the project SOLUTIONSplus. The project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement no. 875041

### TITLE

Master plan for the shared electric two-wheeler stations: Proposal for 10 central districts in Hanoi City

### AUTHORS

Assoc. Prof. Vu Ngoc Khiem, PhD., Hanoi UTT  
 Nguyen Thi Loan, PhD., Hanoi UTT  
 Nguyen Thi Thu Hien, Hanoi UTT  
 Bui Duc Hung, Hanoi UTT

### REVIEWERS

Shritu Shrestha, Wuppertal Institute

### DISCLAIMER

The views expressed in this publication are the sole responsibility of the authors named and do not necessarily reflect the views of the European Commission.

### LAYOUT

Yasin Imran Rony, WI

### PICTURES

All the pictures are provided by the SOL+ partners

June, 2024





# Master plan for the shared electric two-wheeler stations: Proposal for 10 central districts in Hanoi City

## Authors:

- Assoc. Prof. Vu Ngoc Khiem, PhD., Hanoi UTT
- Nguyen Thi Loan, PhD., Hanoi UTT
- Nguyen Thi Thu Hien, Hanoi UTT
- Bui Duc Hung, Hanoi UTT
- .....

## Reviewers:

- Shritu Shrestha, Wuppertal Institute
- .....

## Disclaimer:

This master plan for the shared two-wheeler stations in 10 central districts of Hanoi City is a product of EU-funded SOLUTIONSplus project. The findings, suggestions, recommendations, and conclusions expressed in this document are based on information gathered by SOLUTIONSplus Hanoi partner (University of Transport Technology) and contributors. We do not, however, guarantee the accuracy or completeness of information in this document and can not be held responsible for any errors, omissions or losses which result from its use.

## TABLE OF CONTENTS

1. An overview of the current status and assessment of shared two-wheelers in 10 central districts of Hanoi City.....	6
<b>1.1. Pilot of public bicycle service .....</b>	<b>6</b>
1.2. MBI Sharing electric vehicle sharing service in internal areas .....	7
1.3. Pilot application of TNGo shared two-wheelers vehicle service in public areas .....	7
2. Review and assessment of stops and terminals among different means of public transport in 10 central districts of Hanoi .....	8
3. Proposed criteria for setting up stations for shared two-wheelers in 10 central districts .....	10
3.1. Survey of passengers and Stakeholder Workshop .....	10
3.2. Determining Goals and Criteria for setting up stations .....	12
3.3. Principle and methodology to plan stations .....	13
4. Mapping shared two-wheeler stations in 10 central districts of Hanoi City .....	15
4.1. Planning Station Locations in Tay Ho district .....	15
4.1.1. Local Context Analysis.....	15
4.1.2. Station locations and service area.....	18
4.2. Planning Station Locations in Hai Ba Trung district.....	21
4.2.1. Local Context Analysis.....	21
4.2.2. Station locations .....	23
4.3. Planning Station Location in Nam Tu Liem district .....	26
4.3.1. Local Context Analysis.....	26
4.3.2. Station locations .....	28
4.4.1. Local Context Analysis.....	31
4.4.2. Station locations .....	34
4.5. Planning Station Location in Ha Dong district .....	37
4.5.1. Local Context Analysis.....	37
4.5.2. Station locations .....	40
4.6. Planning Station Location in Cau Giay district.....	43
4.6.1. Local Context Analysis.....	43
4.6.2. Station locations .....	47
4.7. Planning Station Location in Thanh Xuan district.....	50



4.7.1. Local Context Analysis.....	50
4.7.2. Station locations .....	53
4.8. Planning Station Location in Dong Da district .....	57
4.8.1. Local Context Analysis.....	57
4.8.2. Station locations .....	59
4.9. Planning Station Location in Hoan Kiem district .....	63
4.9.1. Local Context Analysis.....	63
4.9.2. Station locations .....	66
4.10. Planning Station Location in Ba Dinh district .....	69
4.10.1. Local Context Analysis.....	69
4.10.2. Station locations .....	72
5. Site surveying and adjusting the map according to the actual conditions in a sample area of Hanoi City .....	75
6. Recommendations .....	78
References .....	81

## TABLE OF FIGURES

<b>Figure 1:</b> Public bicycle service in Ha Noi in 2014.....	6
<b>Figure 2:</b> MBI Sharing service in Ha Noi .....	7
<b>Figure 3:</b> TNGo service pilot in Ha Noi.....	8
<b>Figure 4:</b> Bus stops and terminal in Ha Noi and 10 central districts .....	10
<b>Figure 5:</b> Stakeholders workshop and passenger surveying .....	12
<b>Figure 6:</b> Population density by commune and ward area of Tay Ho district .....	16
<b>Figure 7:</b> Distribution of bus stop in Tay Ho district .....	16
<b>Figure 8:</b> Distribution of Demand Points in Tay Ho district .....	17
Figure 9: Shared two-wheeler station along the bus route in Tay Ho district .....	18
<b>Figure 10:</b> Shared two wheeler station at demand points in Tay Ho district .....	19
<b>Figure 11:</b> Shared two-wheeler service area in Tay Ho district .....	20
<b>Figure 12:</b> Ward administrative boundaries and population density of Hai Ba Trung district .....	21
<b>Figure 13:</b> Distribution of bus stop in Hai Ba Trung district .....	22
<b>Figure 14:</b> Distribution of Demand Points in Hai Ba Trung district .....	23
Figure 15: Shared two-wheeler station along the bus route in Hai Ba Trung district.....	24
<b>Figure 16:</b> Shared two-wheeler station at demand points in Hai Ba Trung district .....	24
<b>Figure 17:</b> Shared two wheeler service area in Hai Ba Trung district .....	25
<b>Figure 18:</b> Ward administrative boundaries and population density of Nam Tu Liem district .....	26
<b>Figure 19:</b> Distribution of Demand Points in Nam Tu Liem district .....	28
Figure 20: Shared two wheeler station along the bus route in Nam Tu Liem district .....	29
<b>Figure 21:</b> Shared two-wheeler station at demand points in Nam Tu Liem district.....	29
<b>Figure 22:</b> Shared two wheeler service area in Nam Tu Liem district .....	30
<b>Figure 23:</b> Ward administrative boundaries and population density of Hoang Mai district .	32
<b>Figure 24:</b> Distribution of bus stop in Hoang Mai Trung district .....	33
<b>Figure 25:</b> Distribution of Demand Points in Hoang Mai district .....	34
Figure 26: Shared two wheeler station along the bus route in Hoang Mai district .....	35
<b>Figure 27:</b> Shared two wheeler station at demand points in Hoang Mai district.....	35
<b>Figure 28:</b> Shared two wheeler service area in Hoang Mai district .....	36
<b>Figure 29:</b> Ward administrative boundaries and population density of Ha Dong district .....	38
<b>Figure 30:</b> Distribution of bus stop in Ha Dong district .....	39
<b>Figure 31:</b> Distribution of Demand Points in Ha Dong district .....	40
Figure 32: Shared two wheeler station along the bus route in Ha Dong district.....	41



<b>Figure 33:</b> Shared two wheeler station at demand points in Ha Dong district .....	42
<b>Figure 34:</b> Shared two wheeler service area in Ha Dong district .....	42
<b>Figure 35:</b> Ward administrative boundaries and population density of Cau Giay district .....	45
<b>Figure 36:</b> Distribution of bus stop in Cau Giay district .....	46
<b>Figure 37:</b> Distribution of Demand Points in Cau Giay district .....	47
Figure 38: Shared two wheeler station along the bus route in Cau Giay district .....	48
<b>Figure 39:</b> Shared two wheeler station at demand points in Cau Giay district.....	49
<b>Figure 40:</b> Shared two wheeler service area in Cau Giay district .....	49
<b>Figure 41:</b> Ward administrative boundaries and population density of Thanh Xuan district	51
<b>Figure 42:</b> Distribution of bus stop in Thanh Xuan district .....	52
<b>Figure 43:</b> Distribution of Demand Points in Thanh Xuan district .....	53
Figure 44: Shared two wheeler station along the bus route in Thanh Xuan district .....	54
<b>Figure 45:</b> Shared two wheeler station at demand points in Thanh Xuan district .....	54
<b>Figure 46:</b> Shared two wheeler service area in Thanh Xuan district .....	55
<b>Figure 47:</b> Ward administrative boundaries and population density of Dong Da district .....	58
<b>Figure 48:</b> Distribution of bus stop in Dong Da Trung district .....	58
<b>Figure 49:</b> Distribution of Demand Points in Dong Da district .....	59
Figure 50: Shared two wheeler station along the bus route in Dong Da district.....	60
<b>Figure 51:</b> Shared two wheeler station at demand points in Dong Da district.....	61
<b>Figure 52:</b> Shared two wheeler service area in Dong Da district .....	62
<b>Figure 53:</b> Ward administrative boundaries and population density of Hoan Kiem district..	64
<b>Figure 54:</b> Distribution of bus stop in Hoan Kiem district .....	65
<b>Figure 55:</b> Distribution of Demand Points in Hoan Kiem district.....	66
Figure 56: Shared two wheeler station along the bus route in Hoan Kiem district.....	67
<b>Figure 57:</b> Shared two wheeler station at demand points in Hoan Kiem district .....	68
<b>Figure 58:</b> Shared two wheeler service area in Hoan Kiem district.....	68
<b>Figure 59:</b> Ward administrative boundaries and population density of Dong Da district .....	70
<b>Figure 60:</b> Distribution of bus stop in Ba Dinh district.....	71
<b>Figure 61:</b> Distribution of Demand Points in Hoan Kiem district.....	72
Figure 62: Shared two wheeler station along the bus route in Ba Dinh district .....	73
<b>Figure 63:</b> Shared two wheeler station at demand points in Ba Dinh district .....	74
<b>Figure 64:</b> Shared two wheeler service area in Ba Dinh district.....	74

## 1. An overview of the current status and assessment of shared two-wheelers in 10 central districts of Hanoi City

In Vietnam, Hanoi is the pioneering city piloting shared two-wheeler services with the goal of reducing traffic congestion, environmental pollution, and fossil fuel consumption while promoting a green, clean, and livable capital. However, despite these goals, Hanoi lacks specific policies and regulations to support the widespread implementation of shared two-wheeler services. As a result, these services are currently only available on a pilot basis or within specific urban zones. Some of those pilot projects are summarized below:

### 1.1. Pilot of public bicycle service

In 2014, the People's Committee of Hanoi approved a pilot public bicycle project to address increasing urban traffic pressure. The project, spearheaded by the Urban Green Environment Joint Stock Company (VPT), was implemented with guidance from the Department of Transport.

The pilot project provided public bicycle services at four university locations: Hanoi University of Industry, Electric Power University, University of Commerce, and Central College of Pedagogy. Unfortunately, the service was short-lived, ceasing operations due to a lack of users and insufficient resources for maintenance.

Limitations of the VPT public bicycle service:

- Manual management and operation system;
- Service was limited to only four borrowing and returning points spread over a wide area, which did not cater to short distance travellers;
- Unable to connect with the bus system;
- High-traffic pilot routes without dedicated bicycle lanes.



**Figure 1:** Public bicycle service in Ha Noi in 2014



## 1.2. MBI Sharing electric vehicle sharing service in internal areas

MBI Sharing, an electric vehicle sharing service, is an initiative by MBI Motor Group from South Korea. It has been launched at several locations, including Ecopark in Hung Yen province (2020), Phu Quoc United Center in Kien Giang province (2021), Sun World Ha Long in Quang Ninh province (2022), Vinhomes Ocean Park 1 (2022), and Vinhomes Smartcity (2023) in Hanoi City.

Each MBI Sharing project is equipped with an integrated system. This includes electric vehicles (electric two-wheelers) specially designed for public use, a Content Management System (CMS), IoT devices on the vehicles, and mobile applications. The automated service has attracted local residents to use it.

However, due to a lack of policies and regulations on the shared two-wheelers service model, the MBI Sharing service has been limited to operating only within the designated areas of private urban zones.

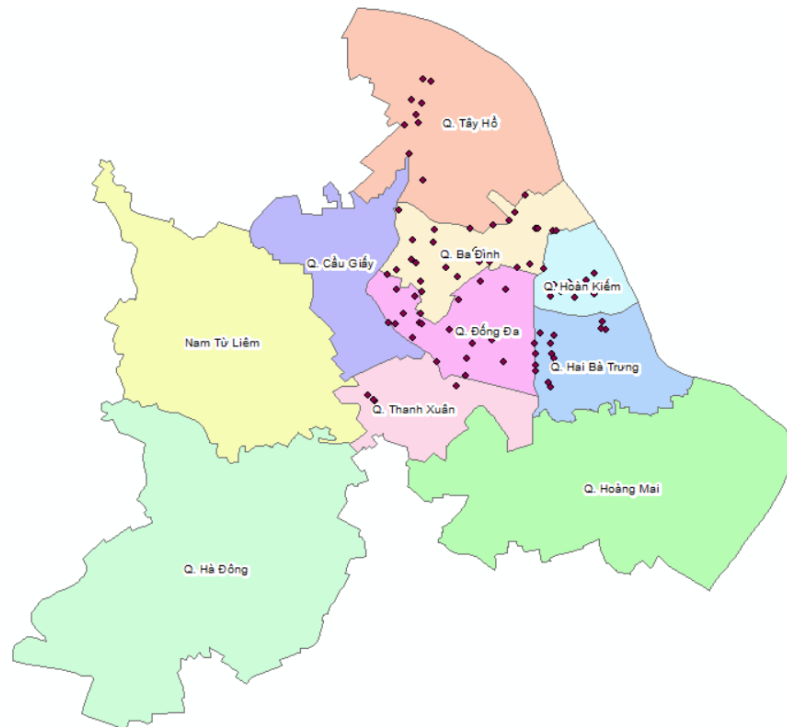


*Figure 2: MBI Sharing service in Ha Noi*

## 1.3. Pilot application of TNGo shared two-wheelers vehicle service in public areas

In 2023, the TNGo shared two-wheeler service, invested and operated by Tri Nam Group, was launched on a pilot basis in six central districts of Ha Noi: Tay Ho, Hoan Kiem, Ba Dinh, Dong Da, Hai Ba Trung and Thanh Xuan. The initial phase included 79 borrowing and returning stations, offering 500 bicycles and 50 electric-assisted bicycles. According to the operating unit's statistics, from 24th August to 5th December 2023, TNGo facilitated nearly 180,000 trips. The system has since expanded, adding six more stations, bringing the total to 86. These stations are primarily located mainly at tourist attractions, schools and bus stations (Appendix 1). The service is managed and operated through an

integrated manner. This includes vehicles designed and produced for public use, along with automated software systems and applications.



**Figure 3:** TNGo service pilot in Ha Noi

This is a fee-based pilot activity. To date, the cities and agencies operating this pilot service have not yet proposed policies for managing shared two-wheel vehicle services based on the results of the pilot implementation.

## **2. Review and assessment of stops and terminals among different means of public transport in 10 central districts of Hanoi**

Hanoi, the bustling capital of Vietnam, relies on a diverse public transport system to meet the mobility needs of its residents and visitors. This review and assessment cover the stops and terminals of various public transport modes in 10 central districts: Ba Đình,



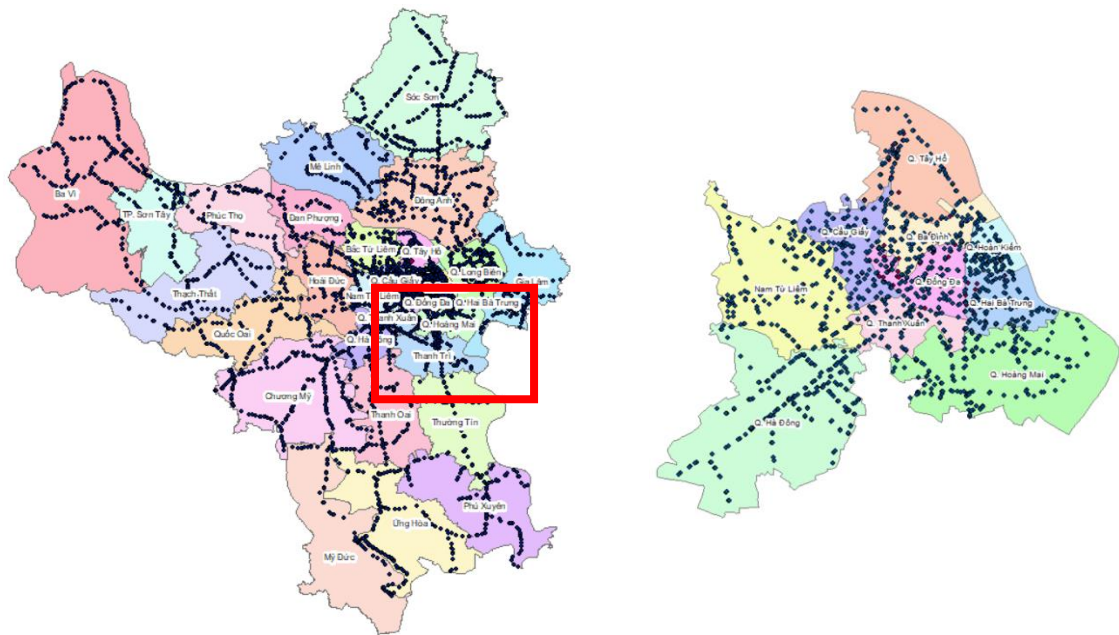
Hoàn Kiếm, Hai Bà Trưng, Đống Đa, Tây Hồ, Cầu Giấy, Thanh Xuân, Hoàng Mai, Nam Từ Liêm, and Hà Đông

Main modes of public transport in these districts include the **Bus System, Bus Rapid Transit (BRT), and Urban Rail (Metro)**.

- **Bus System:** The bus system is the backbone of Hanoi's public transport, with a network of stops distributed across all districts. The city's bus network includes 153 routes with a total of 4492 stops, of which 1553 stops are located within the 10 districts. Major bus terminals, such as Giáp Bát, Mỹ Đình, and Gia Lâm, serve as hubs for multiple routes, providing amenities like waiting areas, ticket counters, and restrooms.

- **BRT (Bus Rapid Transit):** Hanoi's Bus Rapid Transit is a type of public transportation operated by the Hanoi Bus Rapid Transit Enterprise. According to the plan approved by the Prime Minister of the Socialist Republic of Vietnam in 2016, Hanoi was to have eight rapid bus routes and three transit routes. The first bus rapid transit route was put into operation on December 31, 2016, with 21 stops and 2 terminals. As of 2024, no additional rapid bus routes have been launched.

- **Urban Rail (Metro):** The first two railway lines under construction are Line 2A (Cát Linh - Hà Đông section) and Line 3 (Nhon - Hanoi Station section). Line 2A officially began commercial operation on November 6, 2021. Line 3, Nhon - Hanoi Station section, is expected to start commercial operation of the elevated section in July 2024. Major terminals, such as Cát Linh and Hà Đông, are designed to handle high passenger volumes and provide seamless integration with buses and BRT.



The whole Ha Noi City

10 central districts

**Figure 4:** Bus stops and terminal in Ha Noi and 10 central districts

### 3. Proposed criteria for setting up stations for shared two-wheelers in 10 central districts

Setting up stations for shared two-wheelers in central districts requires careful consideration of various criteria to ensure a useful, convenient, reliable and safe two-wheeler share system.

To determine these criteria, a series of activities were conducted, including passenger surveys and organizing workshops to gather expert opinions. Additionally, government documents and ITDP’s guidelines were reviewed. This comprehensive approach helped to plan the identification and establishment of shared two-wheeler stations in the 10 central districts

#### 3.1. Survey of passengers and Stakeholder Workshop

A Survey was conducted among of 2,656 people using public transportation, through both Google Form and direct interviews. The participants, aged between 18 and 65, were from targeted 10 districts.

Survey results:

- 31.8% of respondents believe that the distance to the shared vehicle station should be less than 300 meters.
- 37.7% of respondents believe that the range could be 300 to 500 meters.

- Additionally, 60.8% of respondents indicated that they would use shared two-wheelers to connect to public passenger transport.

A workshop titled "Developing a Master Plan for Shared Electronic Two-Wheeler Stations in Hanoi" was held at the University of Transport Technology. The workshop focused on the necessity, methodology, and results of identifying suitable locations for borrow-and-return stations in 10 central districts of Hanoi. It was attended by traffic experts, representatives from two-wheeled electric vehicle manufacturing businesses, and officials from the city's traffic management agencies

All participants unanimously affirmed the importance and necessity of comprehensive planning for rental station locations. This planning provides a scientific and reliable foundation for city authorities and traffic management agencies in formulating policies and implementing the system.

Experts also agreed that the method used to determine station locations in the project was both scientific and appropriate. However, they emphasized the need to update related plans, such as land use planning, public transport network planning, and electrical grid planning, during the implementation phase. Additionally, it is crucial to ensure compliance with current regulations

Representatives of the Hanoi Department of Transport, the unit managing the city's traffic network, highly appreciated the project and expressed a desire to continue cooperating with the University of Transport Technology to develop this project in the next phase.

For the detailed results from the passenger surveys and the workshop, refer to Appendix 1.1.





*Figure 5: Stakeholders workshop and passenger surveying*

### **3.2. Determining Goals and Criteria for setting up stations**

The following goals for two-wheeler sharing system stations in Hanoi has been identified based on Plan 201/KH-UBND, dated October 16, 2020 from the Hanoi People's Committee on "Development of public passenger transport in Hanoi city (2021 - 2030)," , as well as survey results from public and experts, and ITDP's Guidelines:

#### **1. Transport Connectivity:**

- a. Prioritize locations near public transport hubs (bus stops, metro stations) to facilitate seamless multimodal transportation.
- b. Improve last mile access to public transit network, especially in underserved areas or those lacking transit services.
- c. Enhance access to high demand locations, such as employment centers, campuses, parks, event venues, urban growth centers, tourist attractions, shopping centers, hospitals, schools, and densely populated density areas.

**2. Maximize Coverage:**

- a. Ensure the service covers a wide range of residential areas, providing fair opportunities for all to use the service

**3. Uniform Station distribution:**

- a. Aim for even distribution of stations to ensure users can easily access, conveniently borrow, and return vehicles, thereby making the service more reliable.

**3.3. Principle and methodology to plan stations**

**Station Location characteristic:**

Proper station placement is important for ensuring efficient utilization and high revenue potential. For the central districts of Hanoi, the following criteria should be considered when choosing a station location:

- At least 2 meters of clear walking space
- Close to intersections
- Close to public transit stations
- Close to demand points
- High-visibility area with adequate street lighting
- Easy access for users, as well as maintenance and rebalancing vehicles
- Areas with low volume of cars and low speed limits

**Data for location planning**

Station locations are planned according to each district administrative unit. Data for location planning includes:

- Administrative boundaries of the district and its communes and wards

- Population, area and population density of each district or commune
- Location of bus stops/train stations
- Location of demand points
- The current traffic network

### Establishing station density ratio

Based on survey with users, regarding the preferred walking distance to a vehicle rental station and insights from deploying shared two-wheeler vehicle systems in a various cities, following ITDP guideline, one station every 300 meters on average is considered. However, station density may vary depending on the density and distribution of bus stations and demand points.

### Methods and rules for determining station locations

Station locations are determined remotely using GIS software with a Google Maps basemap, which updates the locations of cadastral boundaries, bus stations, train stations, attraction locations, and more.

A 300x300 meter square grid is created to facilitate station location determination, ensuring appropriate distribution and compliance with the standards mentioned in section 3.2

These are the principles to select station locations near to bus stations:

- At locations with double roads that have bus stops on both sides and no crosswalk, place stations on both sides of the road.





- If bus stations are close to each other on the same side of the road, choose a location in the middle of the two stations.



#### 4. Mapping shared two-wheeler stations in 10 central districts of Hanoi City

Station locations are determined using GIS software with a with thematic map layers:

- Ward and commune administrative boundary layer;
- Bus stop and train station class;
- Demand point location layer;
- Google base map layer.

The borrow-and-return stations were identified as adhering to the standards specified in section 3.3. The planning location results are posted on Google map to facilitate searching, reviewing, and correcting the location when implementing the shared electric two – wheeler system in the next stages.

The contents of items 4.1 to 4.10, as detailed below, represent the results of the station location planning for the 10 central districts of Hanoi:

##### 4.1. Planning Station Locations in Tay Ho district

###### 4.1.1. Local Context Analysis

###### a. Geographical location and Population

Tay Ho District is an inner-city district located in the northwest of Hanoi, bordered by Long Bien district to the east and Bac Tu Liem district to the West borders. Covering area of 24,38 km<sup>2</sup>, it comprises eight wards: Buoi, Yen Phu, Thuy Khue, Tu Lien, Quang An, Nhat Tan, Xuan La, Phu Thuong.

The district's total population in 2022 was 167851, with approximately 114,390 residents aged 15 to 64. Roughly 44% of the total area, or about 10.8 square kilometers, is inhabited. Population density varies between communes (Figure 1)

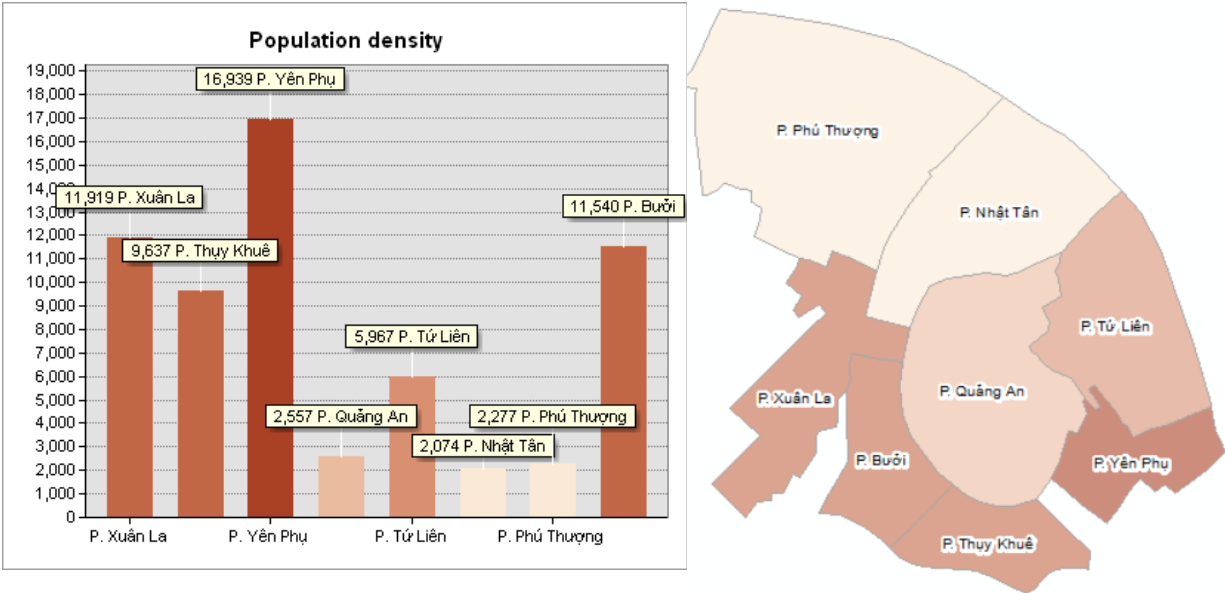


Figure 6: Population density by commune and ward area of Tay Ho district

**b. Transit**

Tay Ho District is served by 30 bus routes operating on 6 main streets with total of 97 stops (Appendix 2.1). However, many areas, especially residential neighbourhood and tourist attractions, are located more than one kilometer from the nearest bus stop.

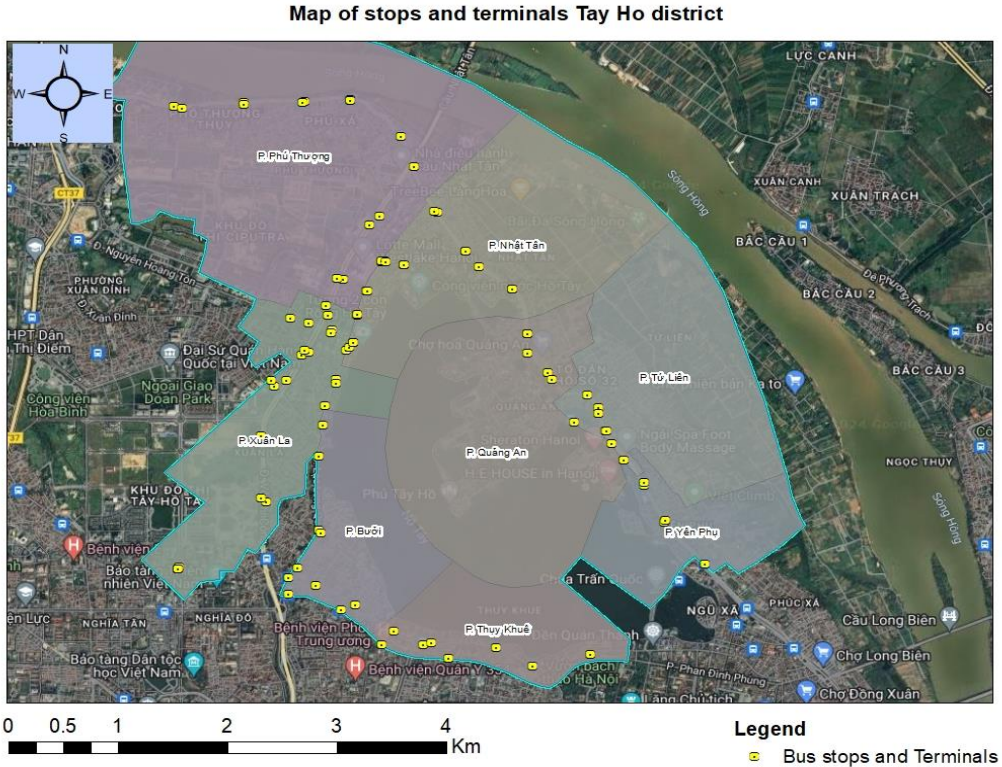


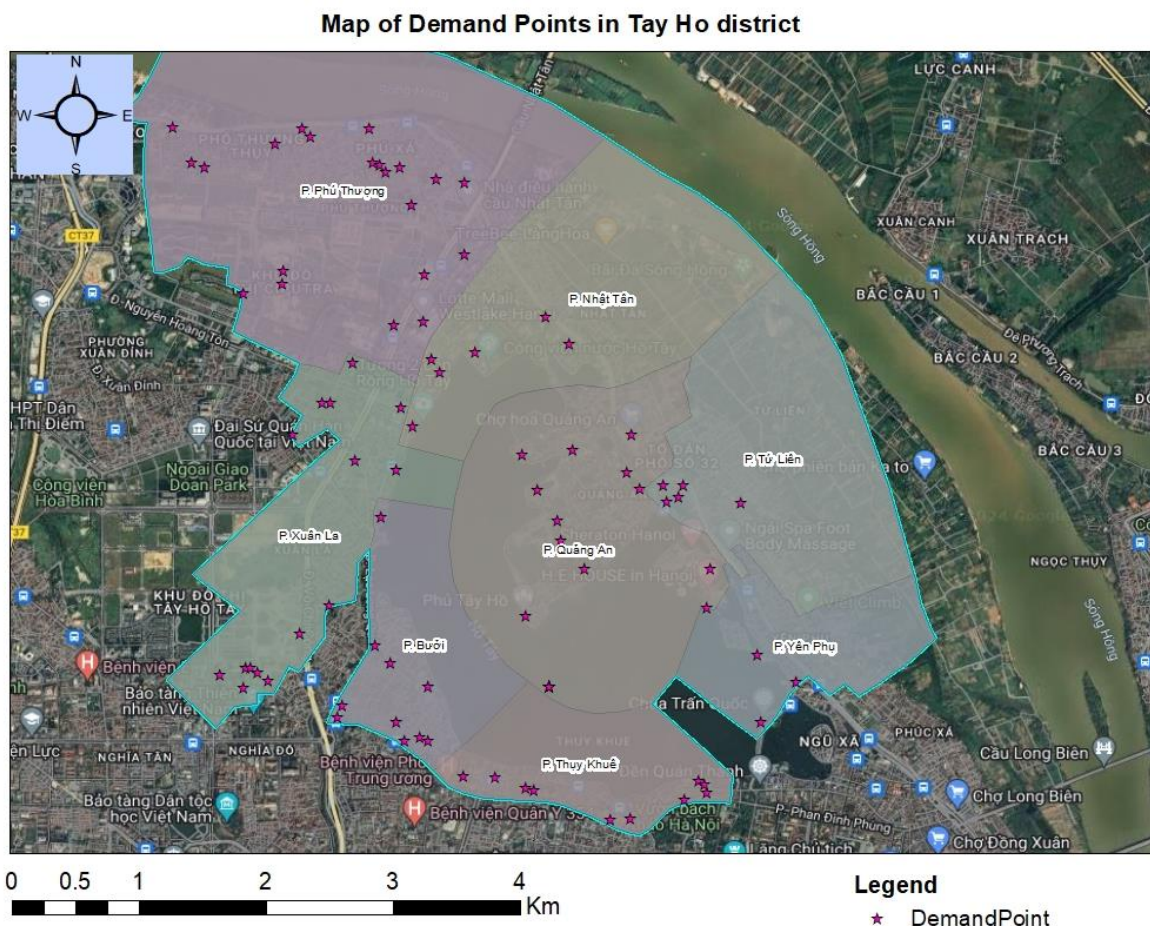
Figure 7: Distribution of bus stop in Tay Ho district

### c. Demand points

Tay Ho is a major tourist destination in Hanoi, with 71 historical and cultural relics, including 42 renowned sites such as Tay Ho Phu, Tran Quoc Pagoda, Dong Co Temple. The district is also known for its traditional crafts such as Phu Thuong Sticky Rice, Dao Nhat Tan, Tu Lien Kumquat, Quang An Lotus Tea, and entertainment venues such as West Lake Water Park, Tay Ho Creative Cultural Space. These attractions draw both local and tourists.

At the beginning of the new year alone, Tay Ho Palace welcomes over 20,000 visitors, Van Nien Pagoda over 8,000 visitors, and Tran Quoc Pagoda an average of 2,000 - 3,000 visitors per day, with 32% of the visitors being foreign tourists.

In addition to tourist attractions, other locations such as apartments, hospitals, shopping centers, schools, and residential areas are also needed to be considered for two-wheeler sharing stations. There are 89 such demand points in the districts (Appendix 2.1)



**Figure 8:** Distribution of Demand Points in Tay Ho district



#### 4.1.2. Station locations and service area.

##### a. Station Location along the bus route

Stations on strategically located near bus stops, with a total of 45 stations identified along these routes (Appendix 2.1)

Map of shared two wheeler along the bus route

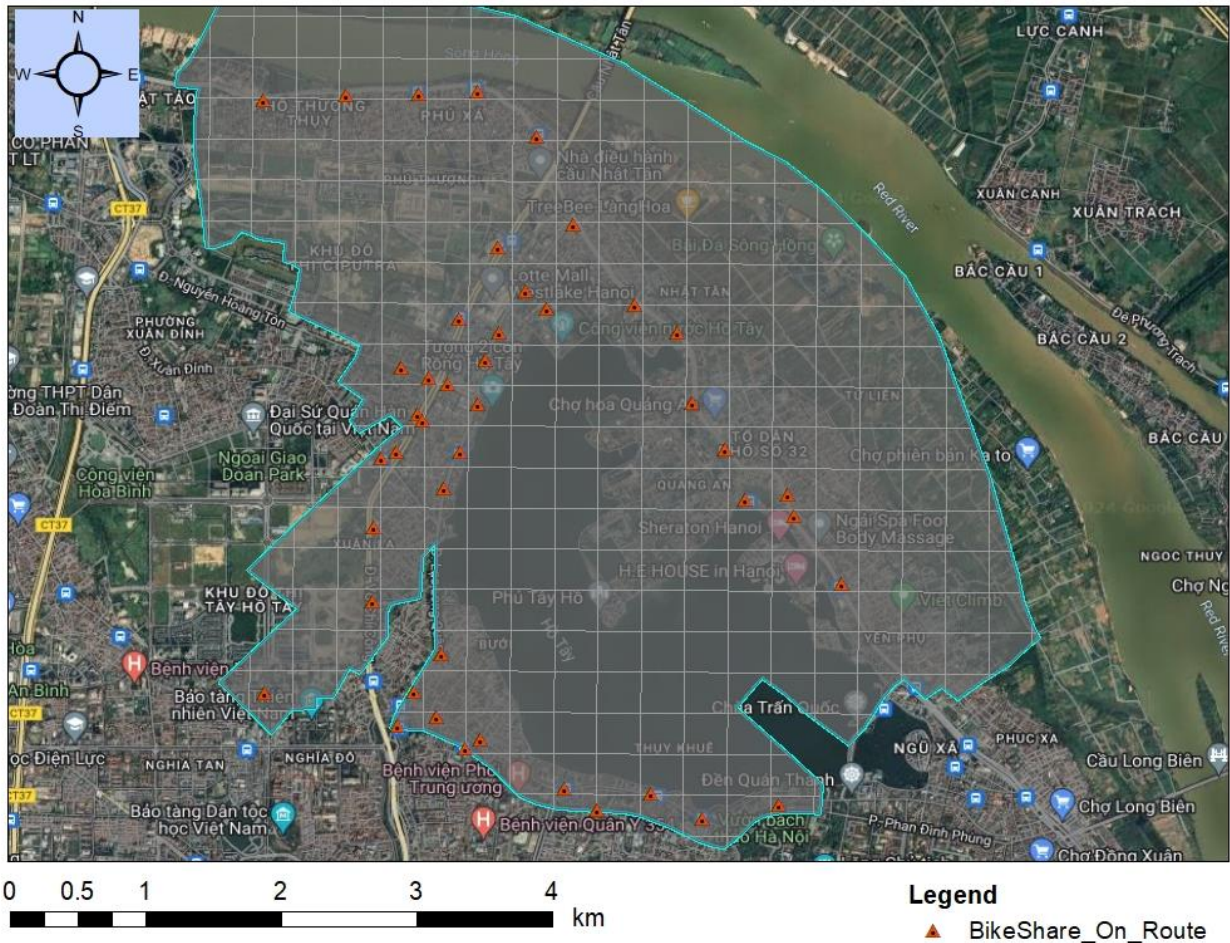


Figure 9: Shared two-wheeler station along the bus route in Tay Ho district

##### b. Station Location at demand points

A total of 72 stations have been identified near demand points, such tourist attractions, residential areas, and other high-traffic locations (Appendix 2.1)

Map of shared two wheeler at the demand points

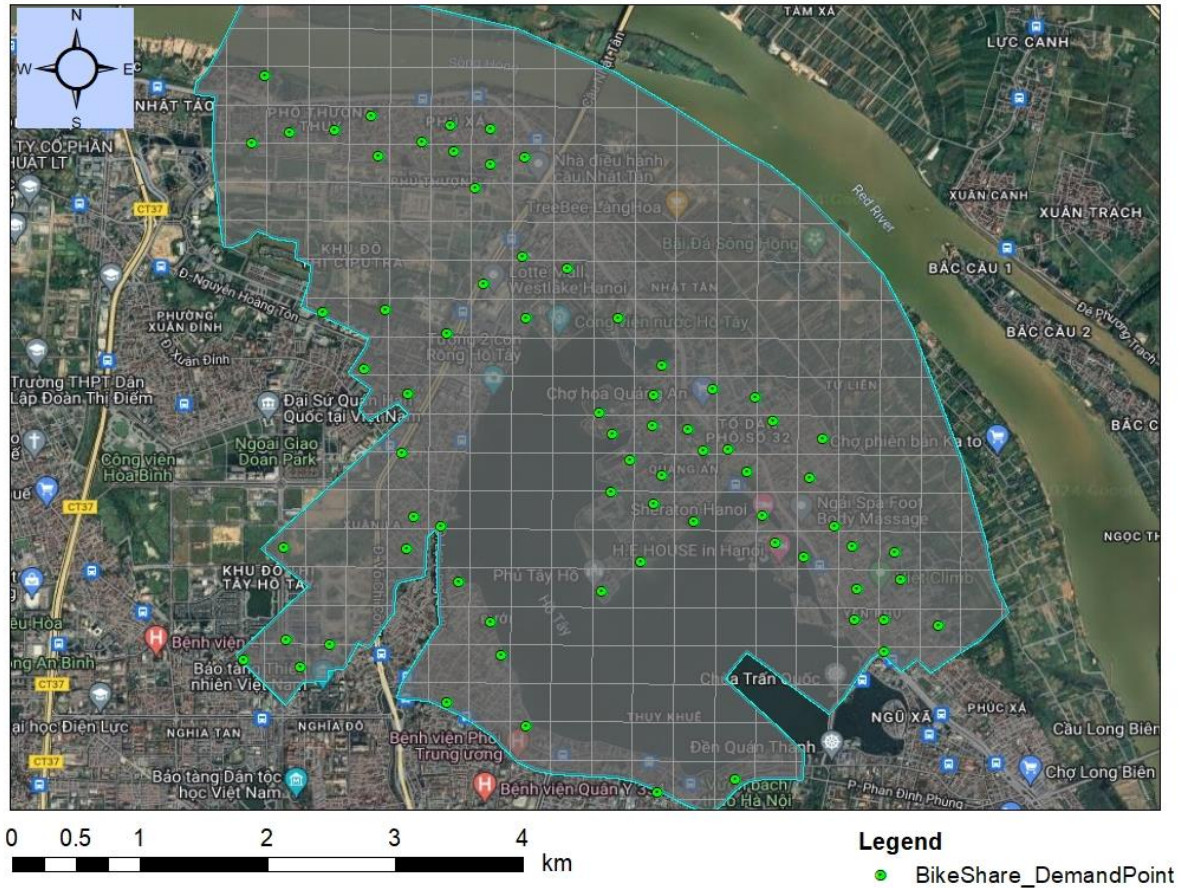


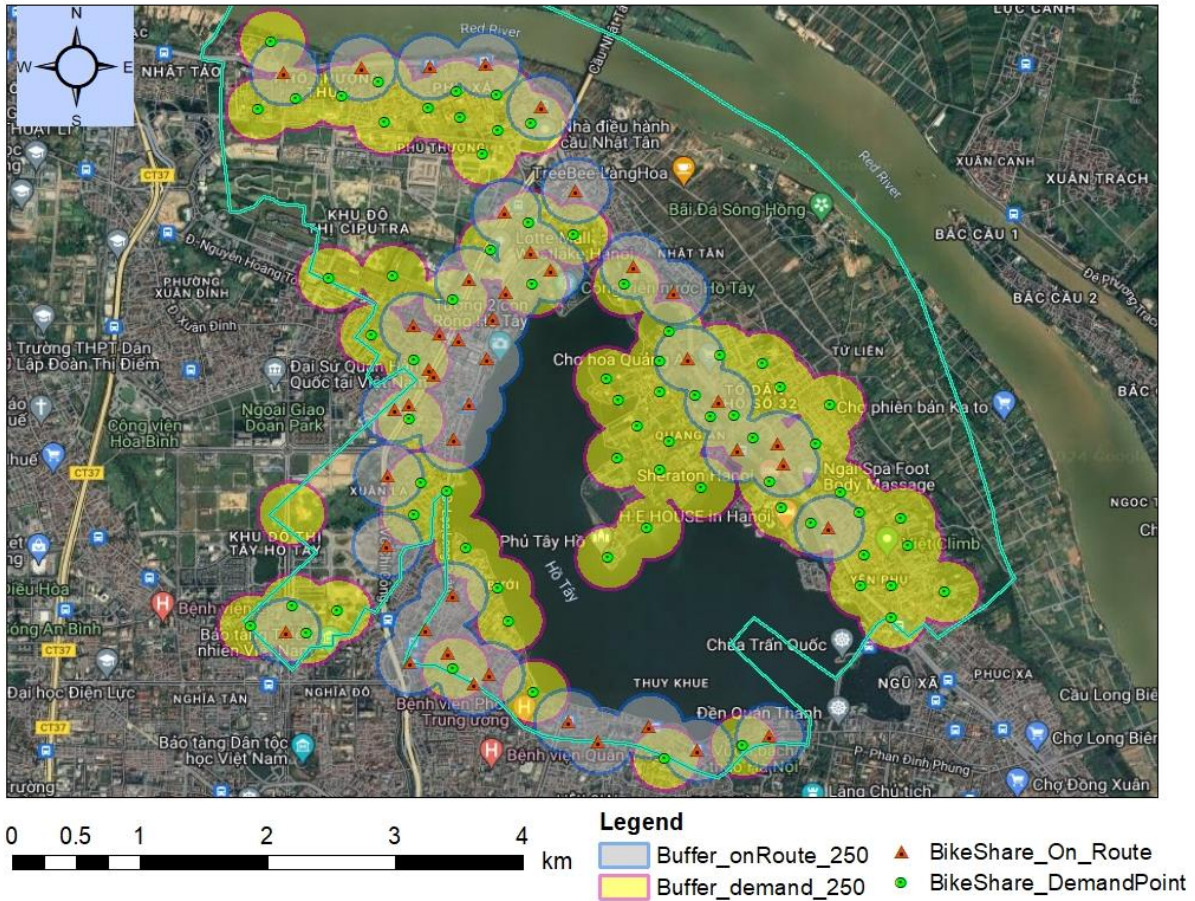
Figure 10: Shared two wheeler station at demand points in Tay Ho district

**c. Service area**

In total number, there are 117 stations throughout the district. Using 250-meter buffers around each station, service area for shared two-wheeler in Tay Ho district covers more than 95% of the district's population and about 40 % the entire district's area.

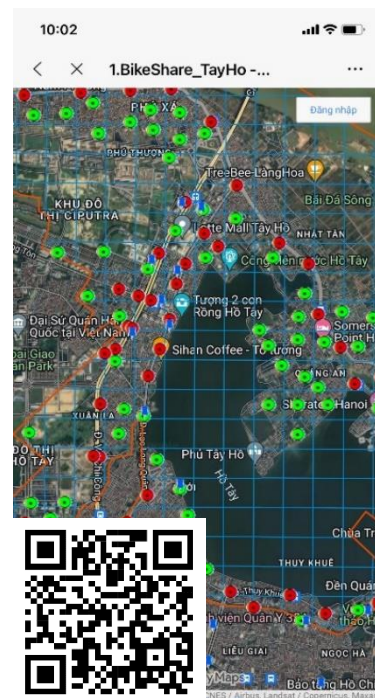


Map of service area



**Figure 11:** Shared two-wheeler service area in Tay Ho district

The locations of the planned stations are posted on Google mymap and can be accessed by scanning a QR code:

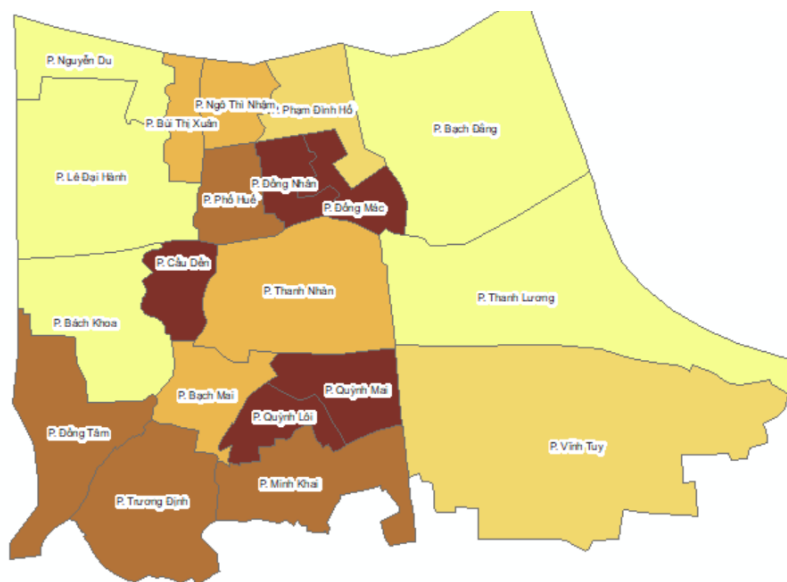
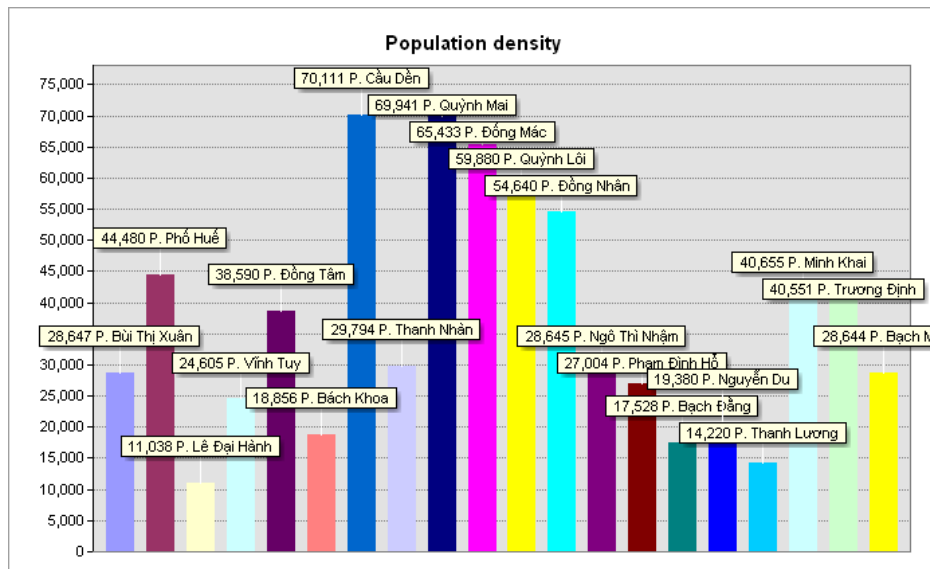


## 4.2. Planning Station Locations in Hai Ba Trung district

### 4.2.1. Local Context Analysis

#### a. Geographical location and Population

Hai Bà Trưng District is situated in the southeastern part of Hanoi. As of the 2022, the district has a population of 304,101, making it one of the more densely populated districts in Hanoi. Covering approximately 10.26 square kilometers, Hai Bà Trưng District has a high population density. As of the end of 2019, district comprises 20 wards: Bach Dang, Bach Khoa, Bach Mai, Bui Thi Xuan, Cau Den, Dong Mac, Dong Nhan, Dong Tam, Le Dai Hanh, Minh Khai, Ngo Thi Nham, Nguyen Du, Pham Dinh Ho, Pho Hue, Quynh Loi, Quynh Mai, Thanh Luong, Thanh Nhan, Truong Dinh, Vinh Tuy.



**Figure 12:** Ward administrative boundaries and population density of Hai Ba Trưng district



## b. Transit

The district is served by 61 bus routes with a total of 145 stops and terminals (Appendix 2.2). These bus stops are relatively evenly distributed across district, with an average density of about 14 stations per 1 square kilometer.

Map of stops and terminals Hai Ba Trung district

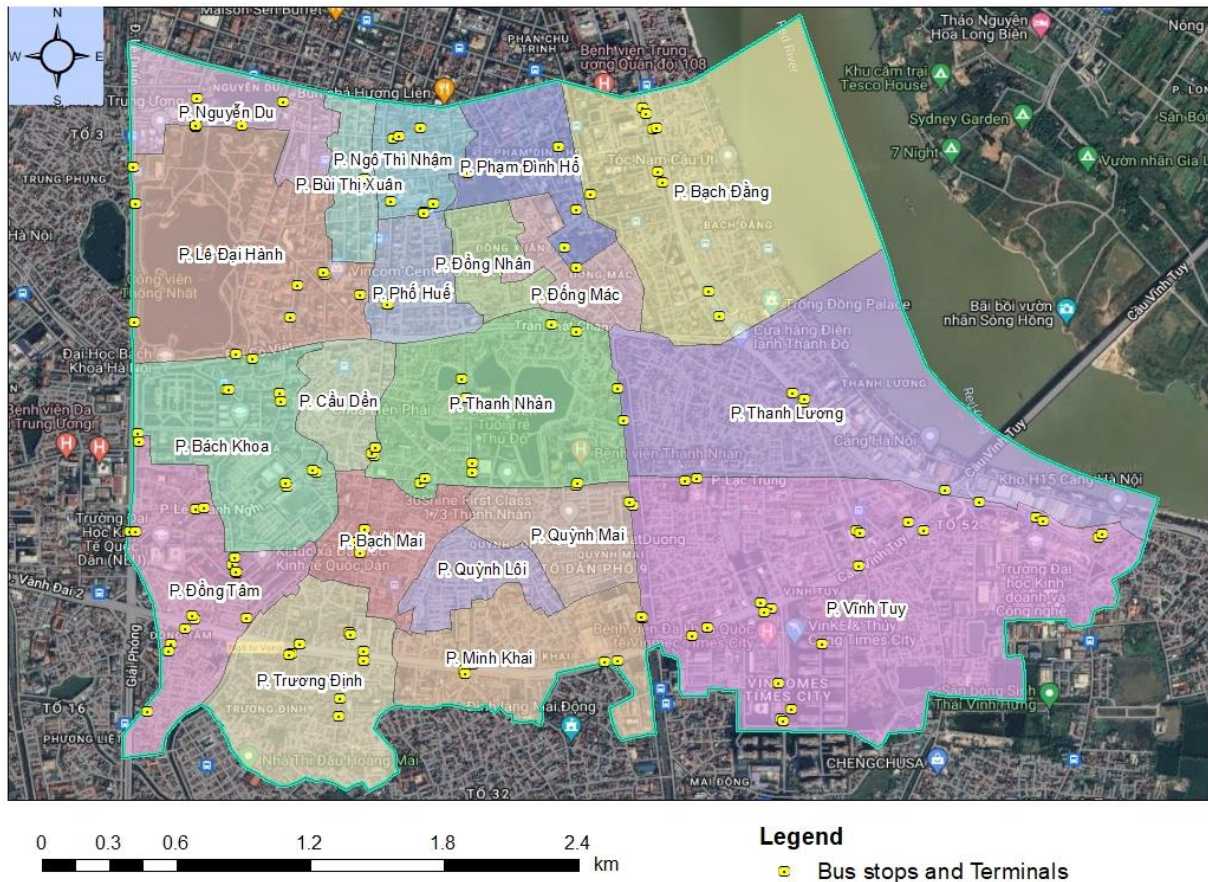


Figure 13: Distribution of bus stop in Hai Ba Trung district

## c. Demand points

Although Ha Ba Trung District does not have many tourist attractions, it has a high population density and is home to many universities, high schools, and large and modern new urban areas. There are approximately 125 demand points in this district (Appendix 2.2)

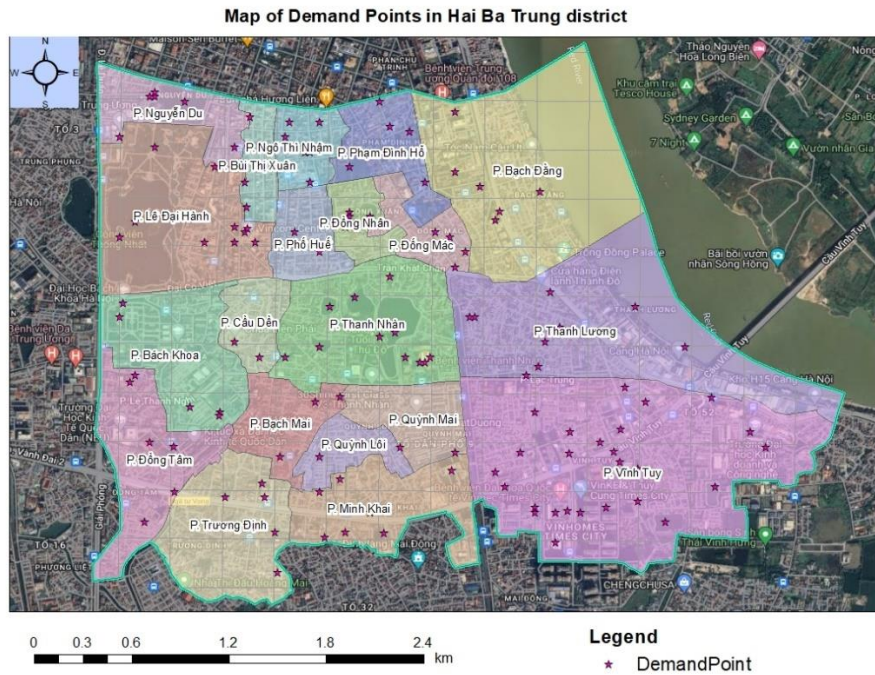
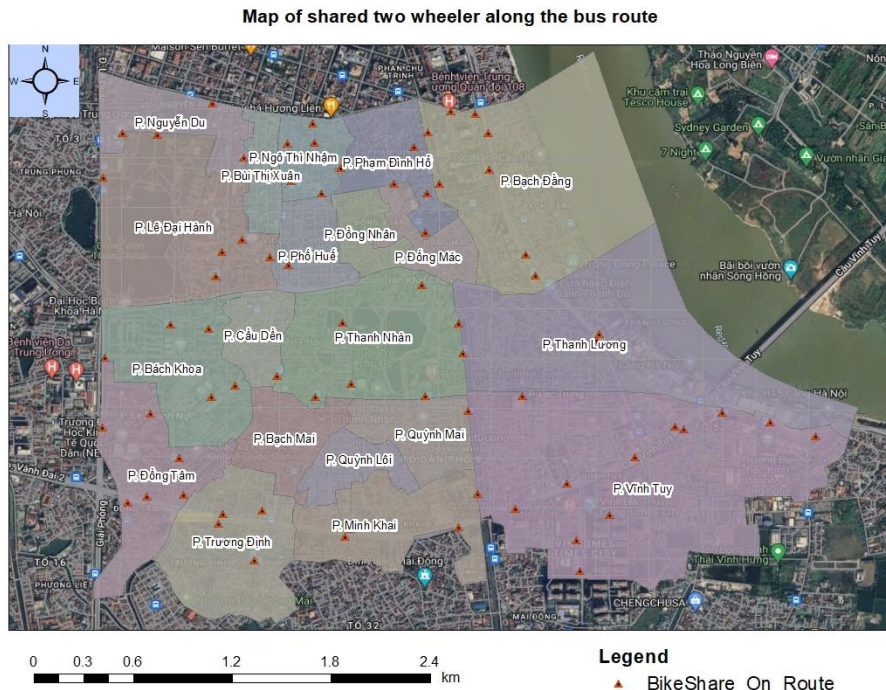


Figure 14: Distribution of Demand Points in Hai Ba Trung district

#### 4.2.2. Station locations

##### a. Station Locations along the bus route

A total of 72 stations have been identified and distributed along bus routes throughout the district (Appendix 2.2)

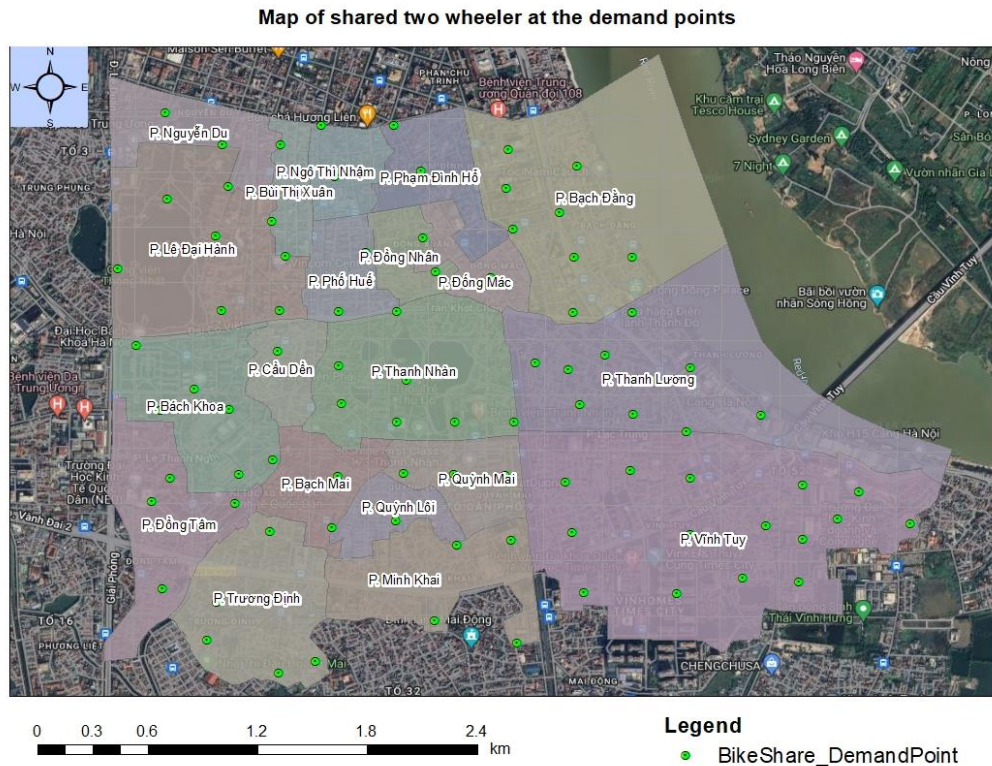




**Figure 15:** Shared two-wheeler station along the bus route in Hai Ba Trung district

**b. Station Locations at demand points**

A total of 85 stations have been identified near key demand points (Appendix 3.2)

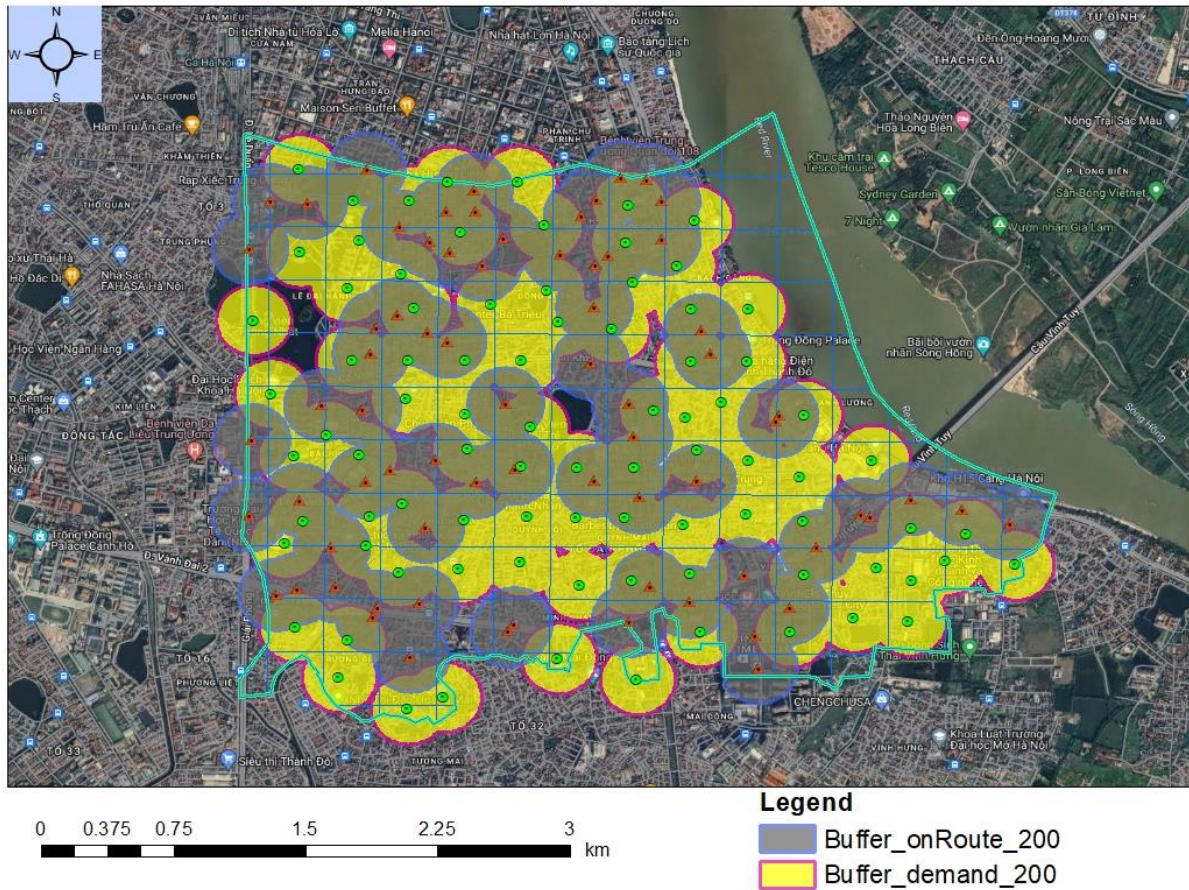


**Figure 16:** Shared two-wheeler station at demand points in Hai Ba Trung district

**c. Service area**

In total, there are 157 stations across the district, resulting in a density of 15 stations per square kilometer. Using 250-meter buffers around each station, the service area for shared two-wheeler in the district covers more than 95% of the district's population and residential areas.

### Map of service area



**Figure 17:** Shared two wheeler service area in Hai Ba Trung district

The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:



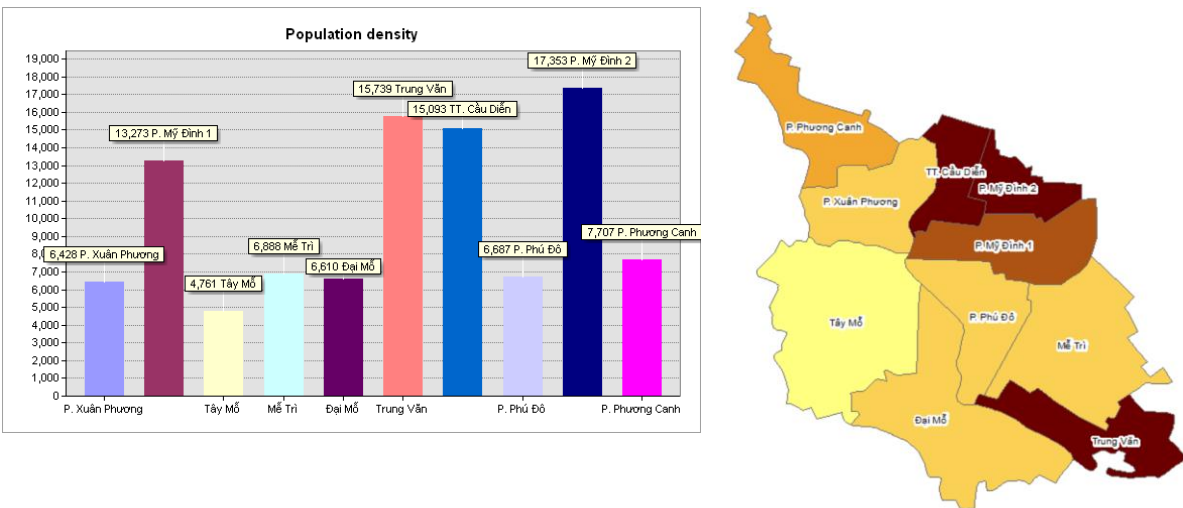


### 4.3. Planning Station Location in Nam Tu Liem district

#### 4.3.1. Local Context Analysis

##### a. Geographical location and Population

Nam Tu Liem District is located 10 kilometers west of Hanoi city center. The district covers an area of 32.17 km<sup>2</sup> and had a population 269,076 people in 2020, resulting in a population density of 8,364 people per km<sup>2</sup>. The district has 10 commune-level administrative units, including 10 wards: Cau Dien, My Dinh 1, My Dinh 2, Phu Do, Me Tri, Trung Van, Dai Mo, Tay Mo, Phuong Canh, Xuan Direction. However, there is a significant variation in population density across the wards (figure 12)

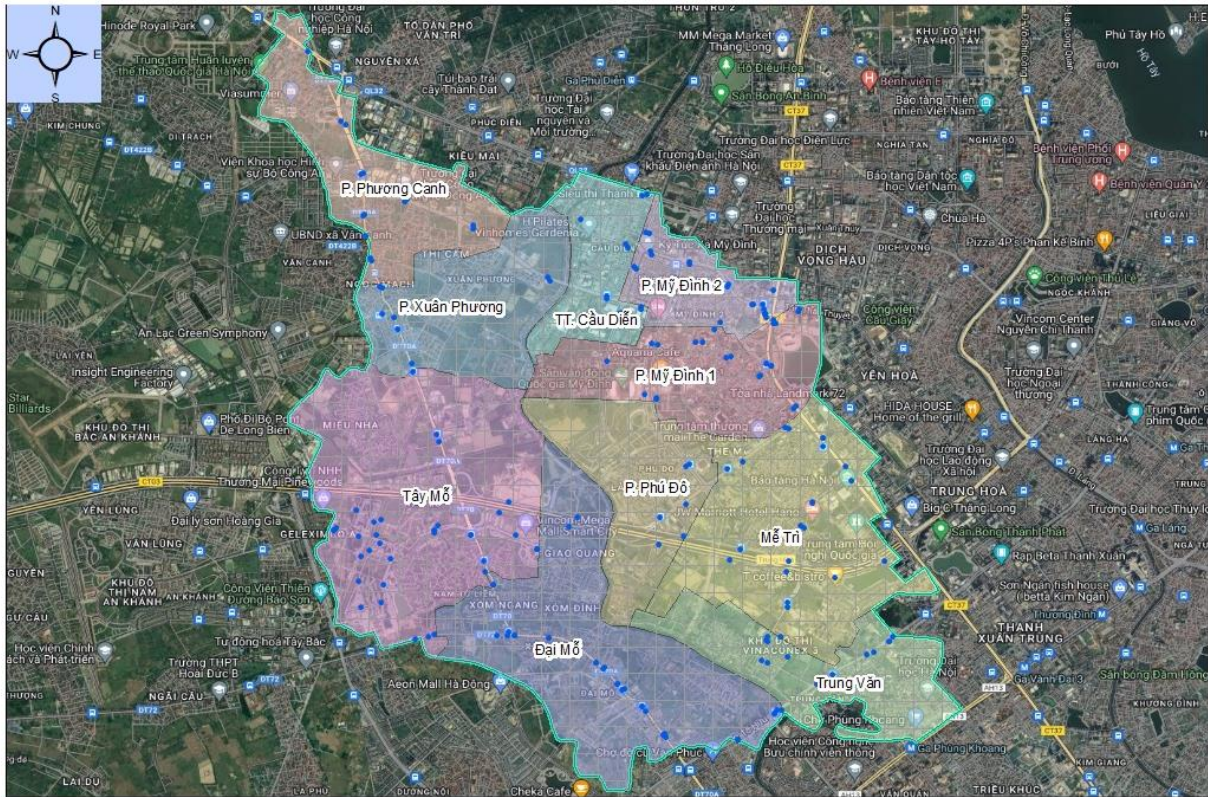


**Figure 18:** Ward administrative boundaries and population density of Nam Tu Liem district

##### b. Transit

The district is served by 61 bus routes with a total of 212 stops and terminals (Appendix 2.3). Bus stops locations are evenly distributed throughout the district, with an average density of approximately 13 stations per square kilometer.

Map of stops and terminals Nam Tu Liem district



**Legend**

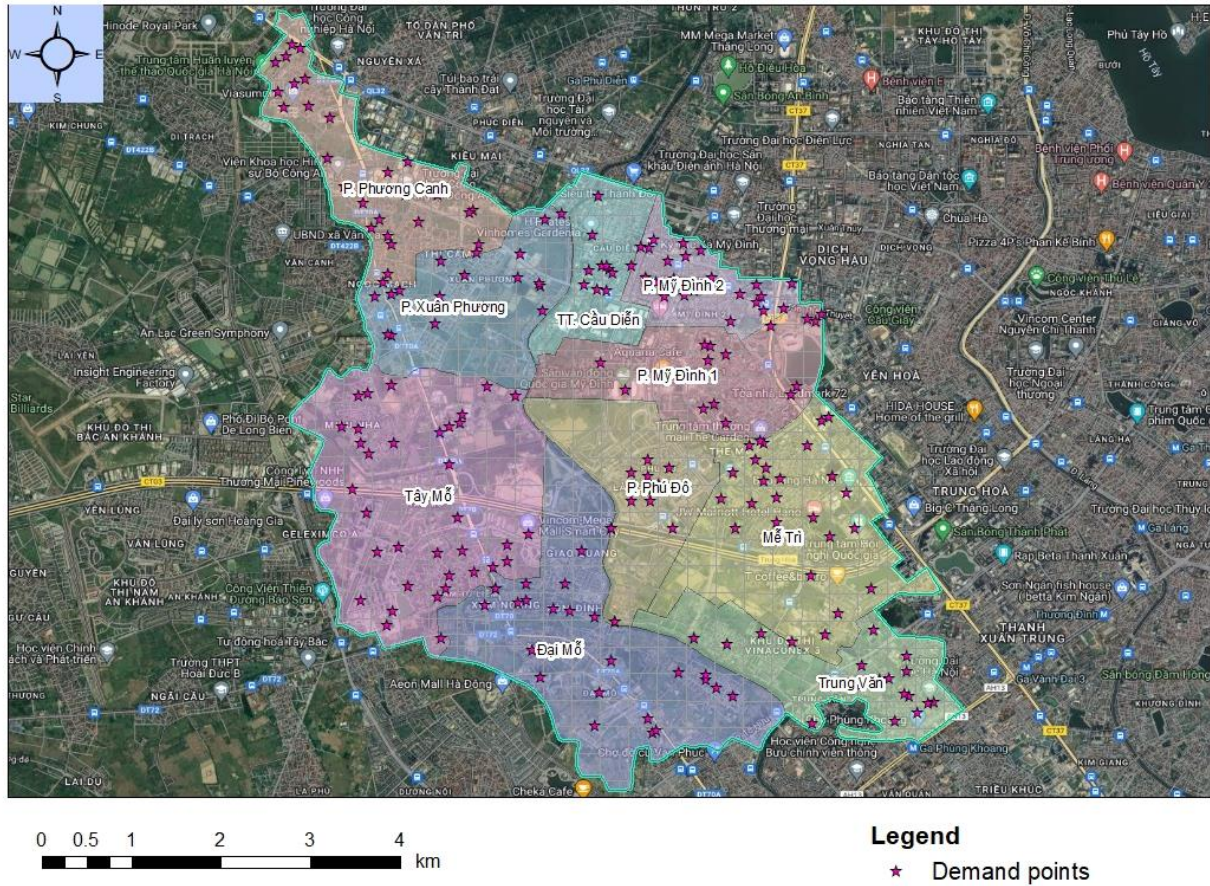
- Bus stops and terminals

**c. Demand points**

While Nam Tu Liem does not have many tourist attractions, it has a high population density, many universities and high schools, as well as large and modern new urban areas. There are approximately 115 demand points within the district (Appendix 2.3)



**Map of Demand Points in Nam Tu Liem district**

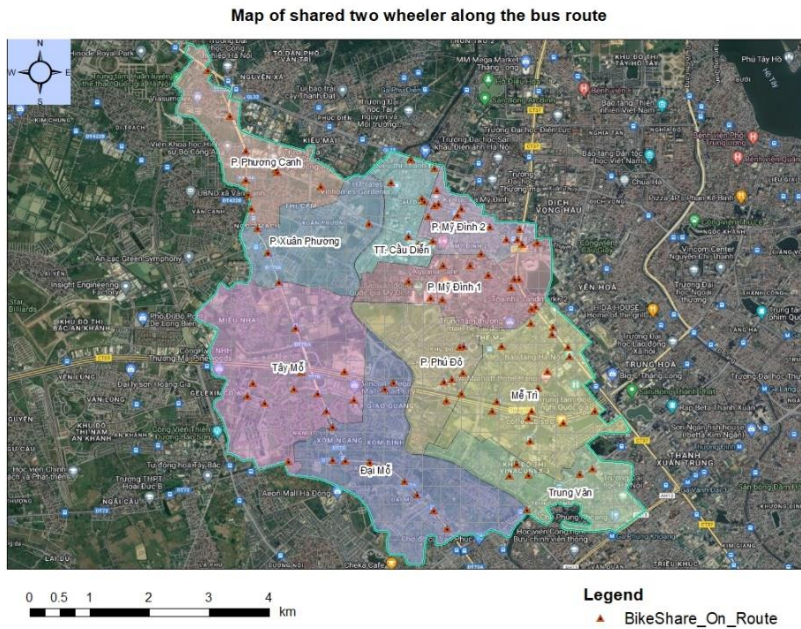


**Figure 19: Distribution of Demand Points in Nam Tu Liem district**

**4.3.2. Station Locations**

**a. Station Locations along the bus route**

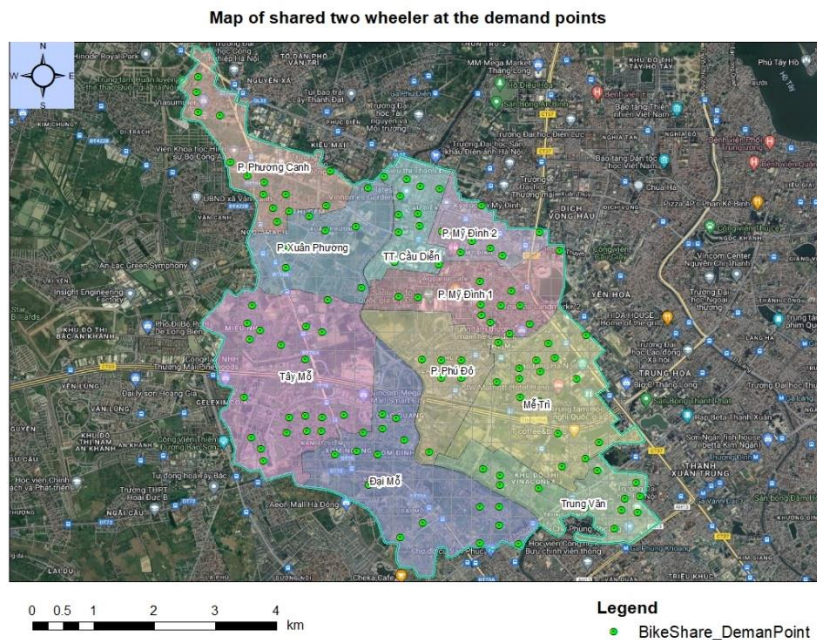
A total 100 stations have been identified and placed along the bus routes throughout the district (Appendix 2.3)



**Figure 20:** Shared two wheeler station along the bus route in Nam Tu Liem district

**b. Station Locations at demand points**

The total number of determined stations is 85 that is close to demand points (Appendix 3.3)



**Figure 21:** Shared two-wheeler station at demand points in Nam Tu Liem district



### c. Service area

In total, there are 185 stations across the district, resulting in a density of 12 stations per square kilometer. Using 250 meter buffers around each station, the service area for shared two-wheeler covers more than 95% of the district's population and residential areas.

Map of service area

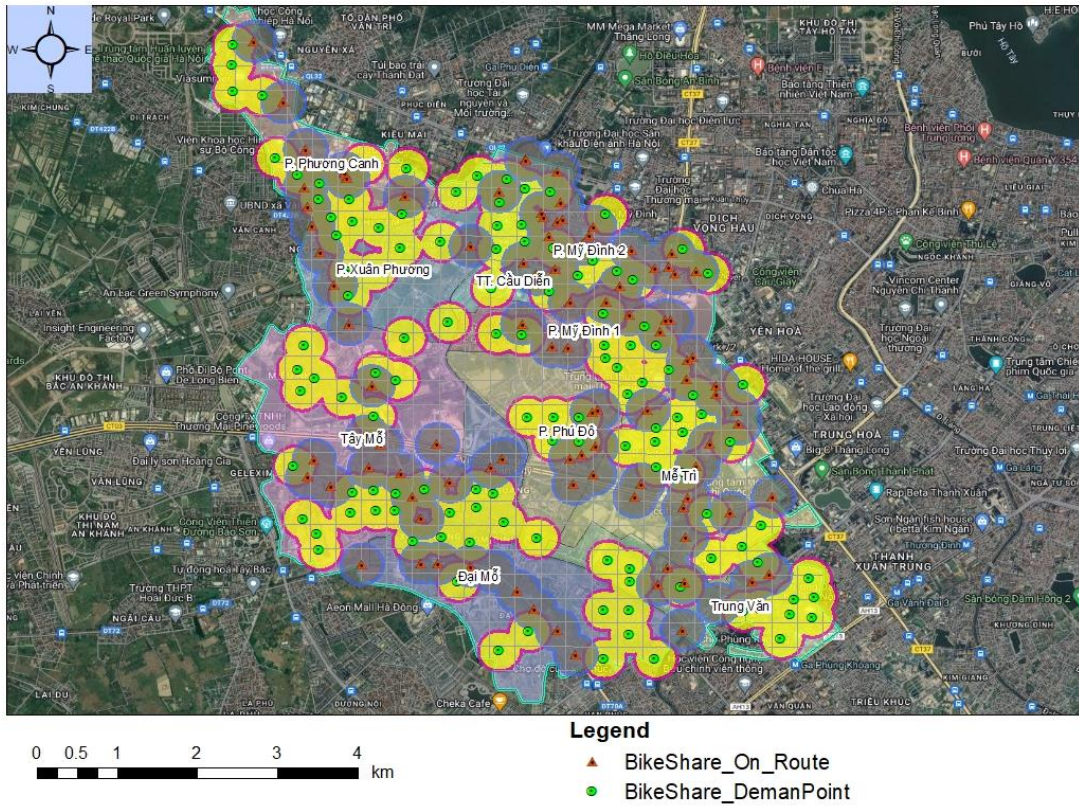
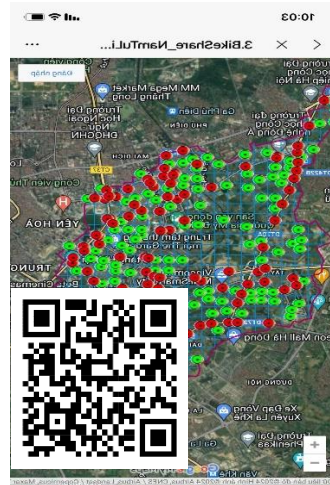


Figure 22: Shared two wheeler service area in Nam Tu Liem district

The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:

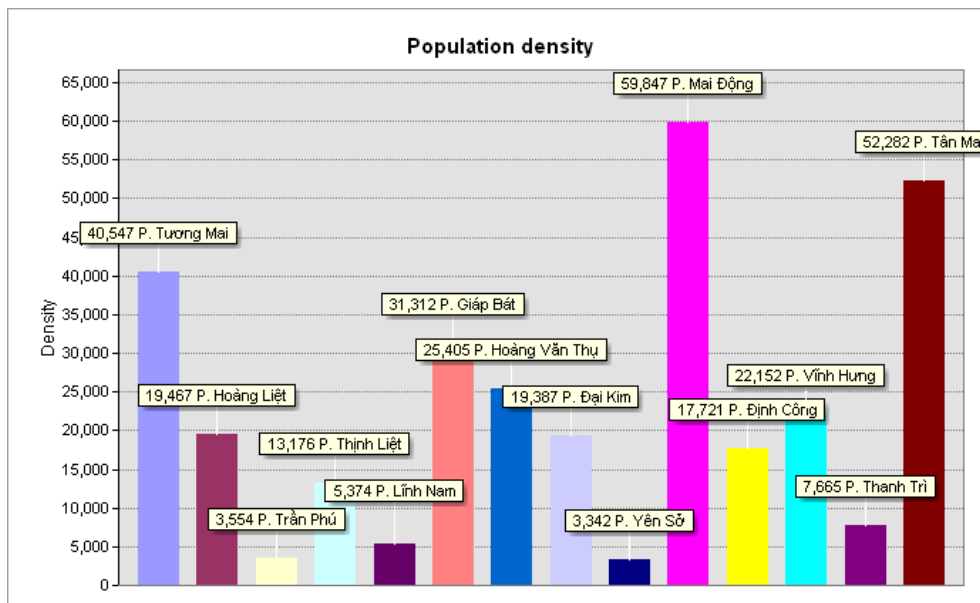


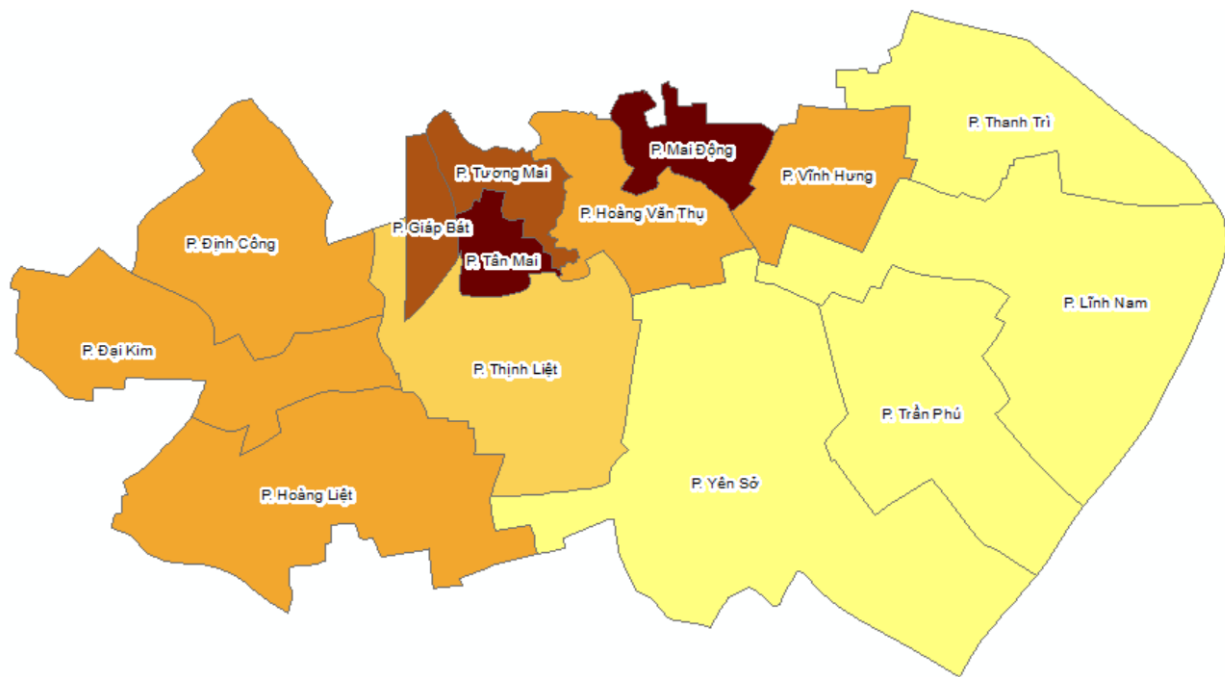
#### 4.4. Planning Station Location in Hoang Mai district

##### 4.4.1. Local Context Analysis

###### a. Geographical location and Population

Hoang Mai is the largest district in Hanoi by population and ranks fourth in terms of area. Covering of 40.19 km<sup>2</sup>, the district had a population of 540,732 people in 2022. There is a significant variation in population density across different areas of the district (figure 14)





**Figure 23:** Ward administrative boundaries and population density of Hoang Mai district

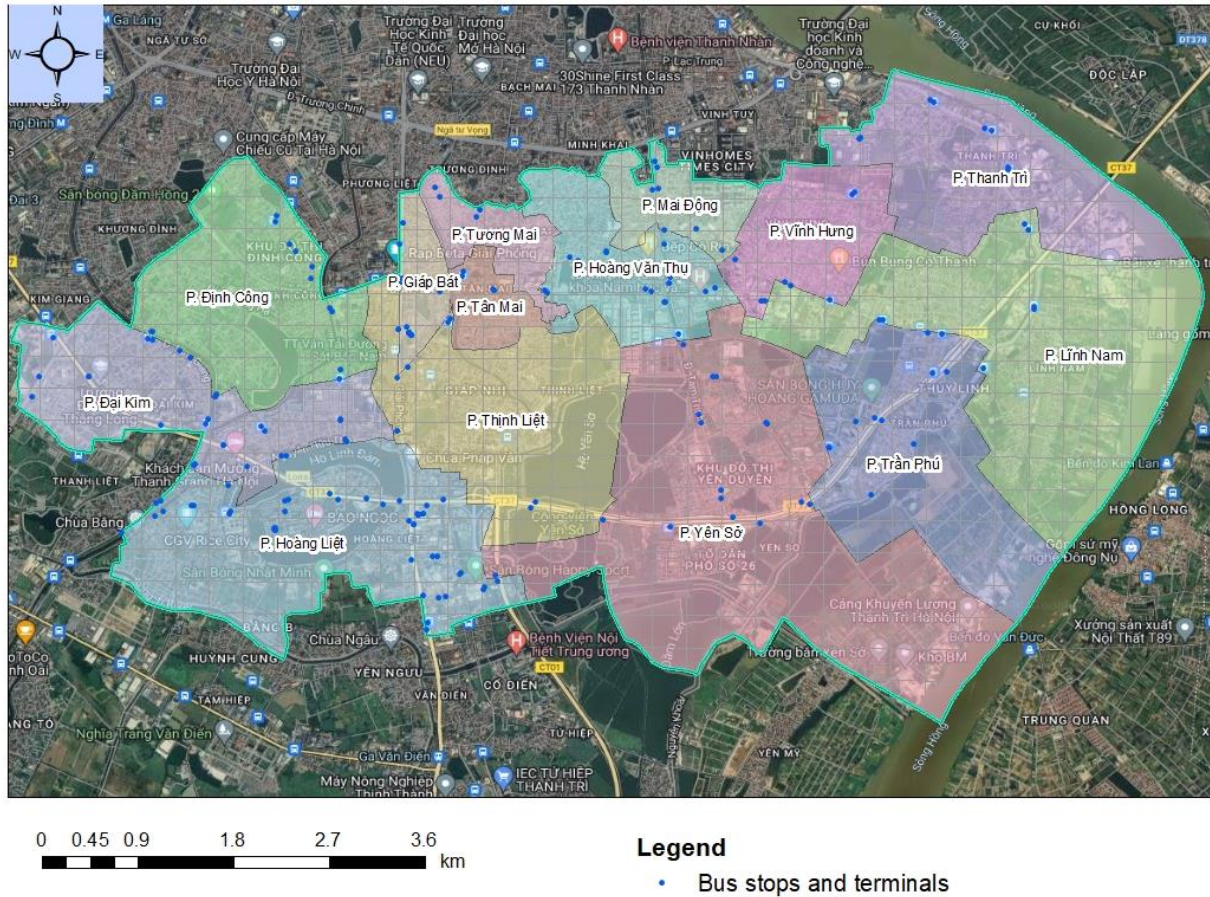
### **b. Transit**

Hoang Mai district is served by 47 bus routes, with a total of 210 stops and terminals (Appendix 2.4). Bus stops are distributed throughout the district, with an average density of approximately 12 stations per km<sup>2</sup>.

Additionally, several railway projects intersect the district: Line 1 (Ngoc Hoi - Yen Vien), line 3 (Troj - Nhon - Hoang Mai), line 4 (Lien Ha - Bac Thang Long), line 8 (An Khanh - Duong Xa); of which line number 3, Hanoi Station section - Hoang Mai (part of the Troi - Nhon - Hoang Mai line) and line number 1 are currently under construction.



**Map of stops and terminals Hoang Mai district**



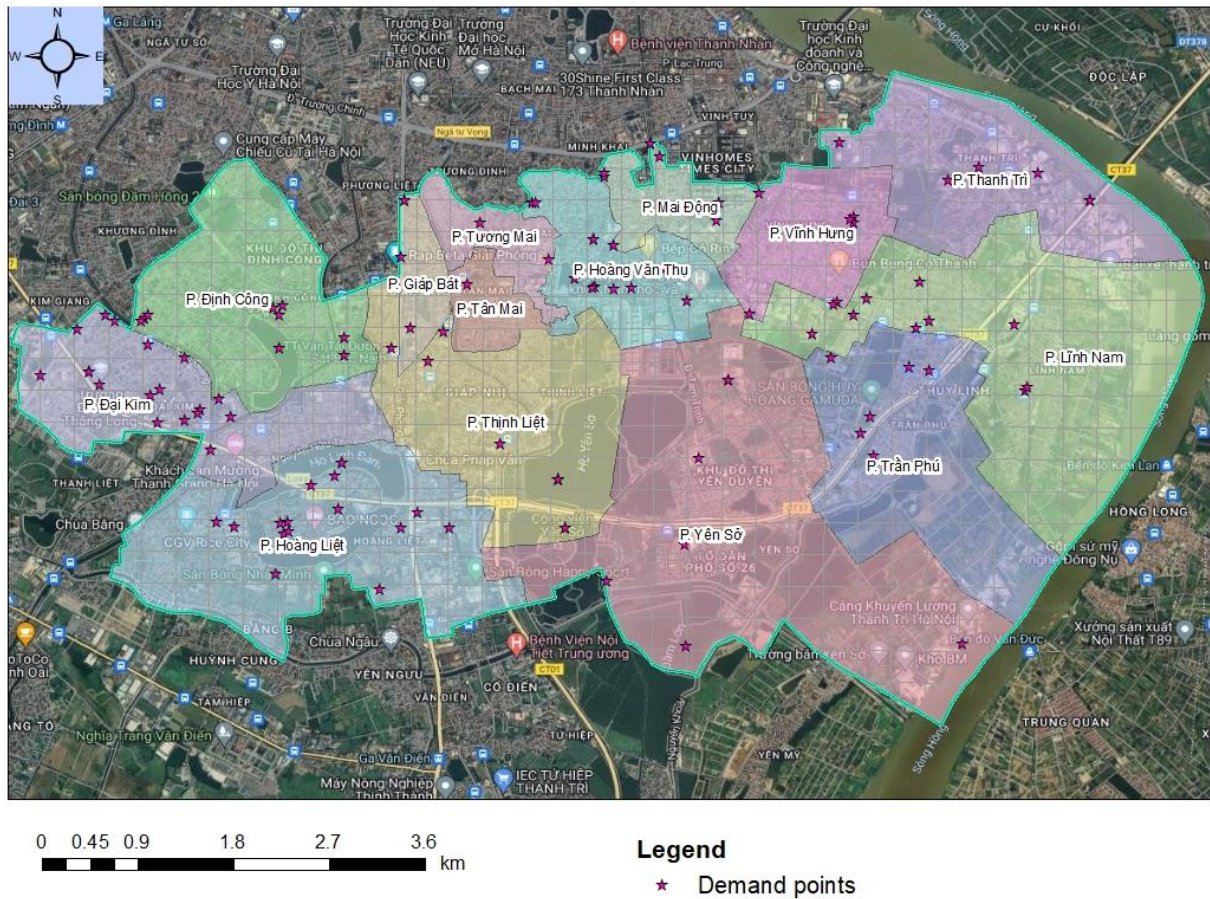
**Figure 24: Distribution of bus stop in Hoang Mai Trung district**

**c. Demand points**

Hoang Mai District is characterized by high urbanization and ongoing infrastructure development. The district is home to many new urban areas with dense population and headquarters of agencies and schools. Approximately 115 demand points are identified in this district (Appendix 2.4)



**Map of Demand Points in Hoang Mai district**



**Figure 25: Distribution of Demand Points in Hoang Mai district**

#### **4.4.2. Station locations**

##### **a. Station Location along the bus route**

The total number of determined stations is 115, distributed along the bus routes throughout the entire district (Appendix 2.3)



Map of shared two wheeler along the bus route

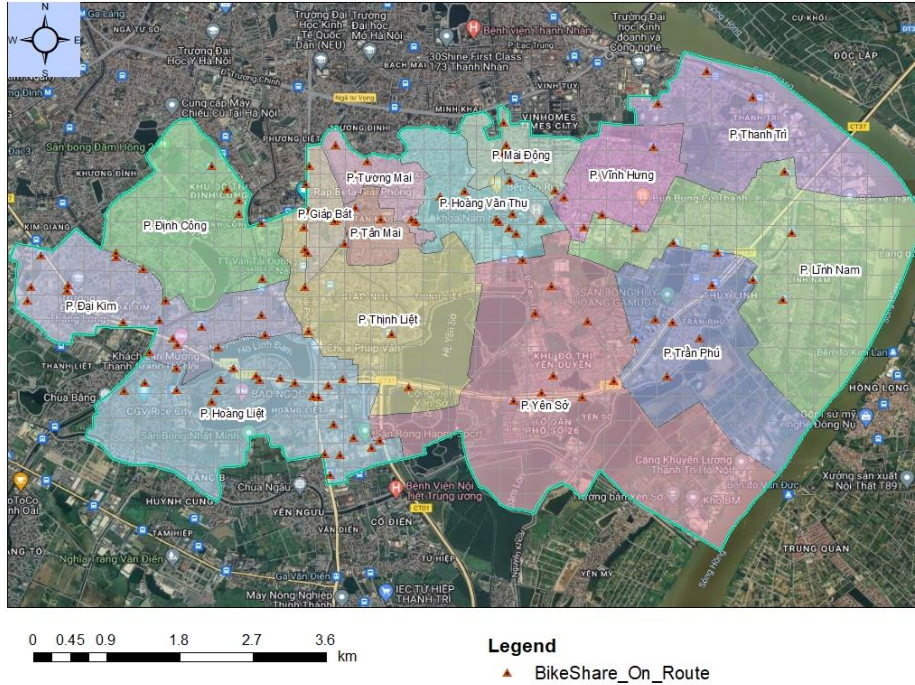


Figure 26: Shared two wheeler station along the bus route in Hoang Mai district

**b. Station Location at demand points**

The total number of determined stations is 204 that is close to demand point (Appendix 3.4)

Map of shared two wheeler at the demand points

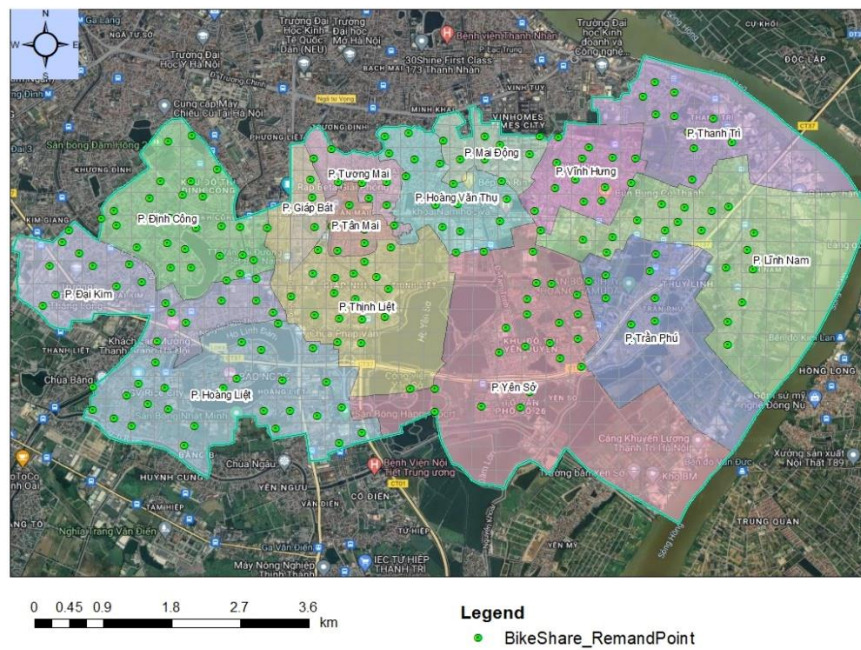
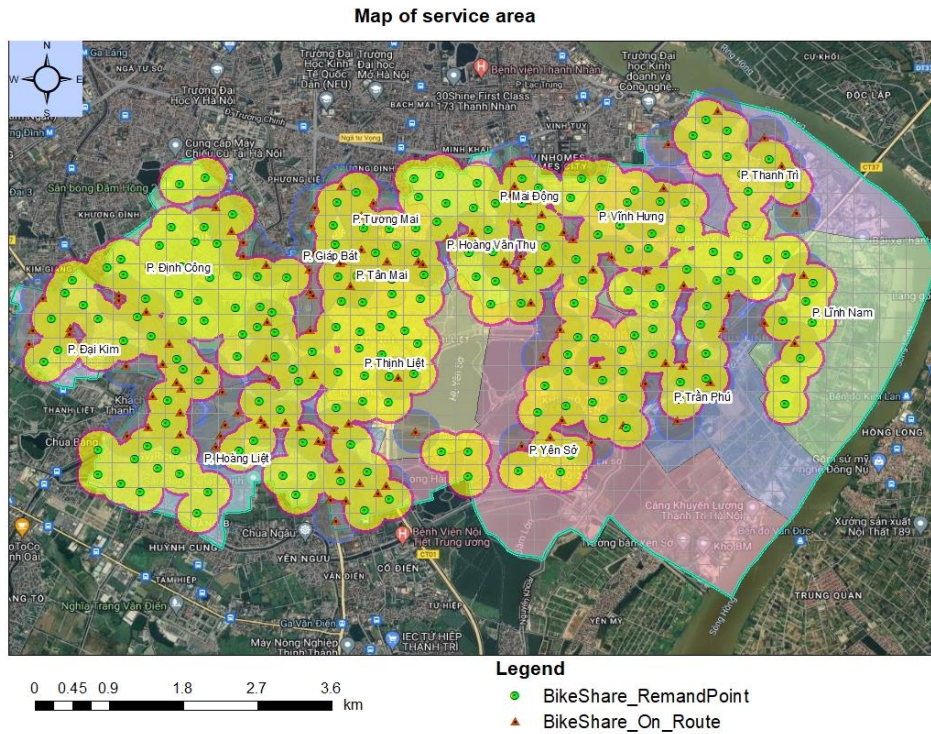


Figure 27: Shared two wheeler station at demand points in Hoang Mai district

### c. Service area

The total number of stations in the entire district is 319 stations that giving density of about 15 stations per square kilometer. Using 250-meter buffers around each station, the service area for shared two wheeler in the district covers more than 90% of the district's population and city area where residents living.



**Figure 28:** Shared two wheeler service area in Hoang Mai district



The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:



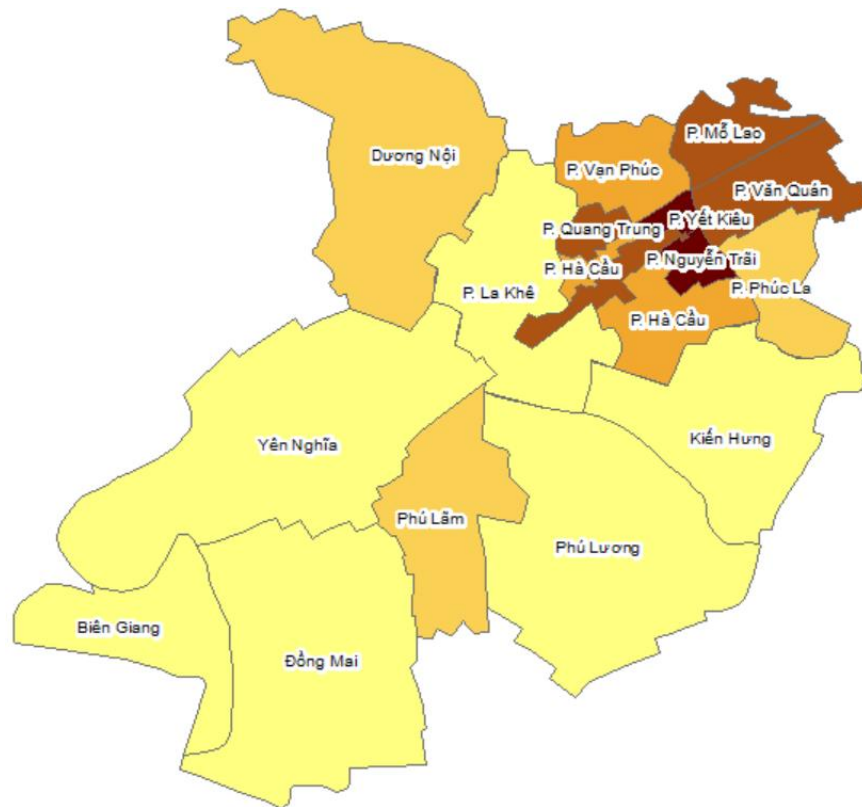
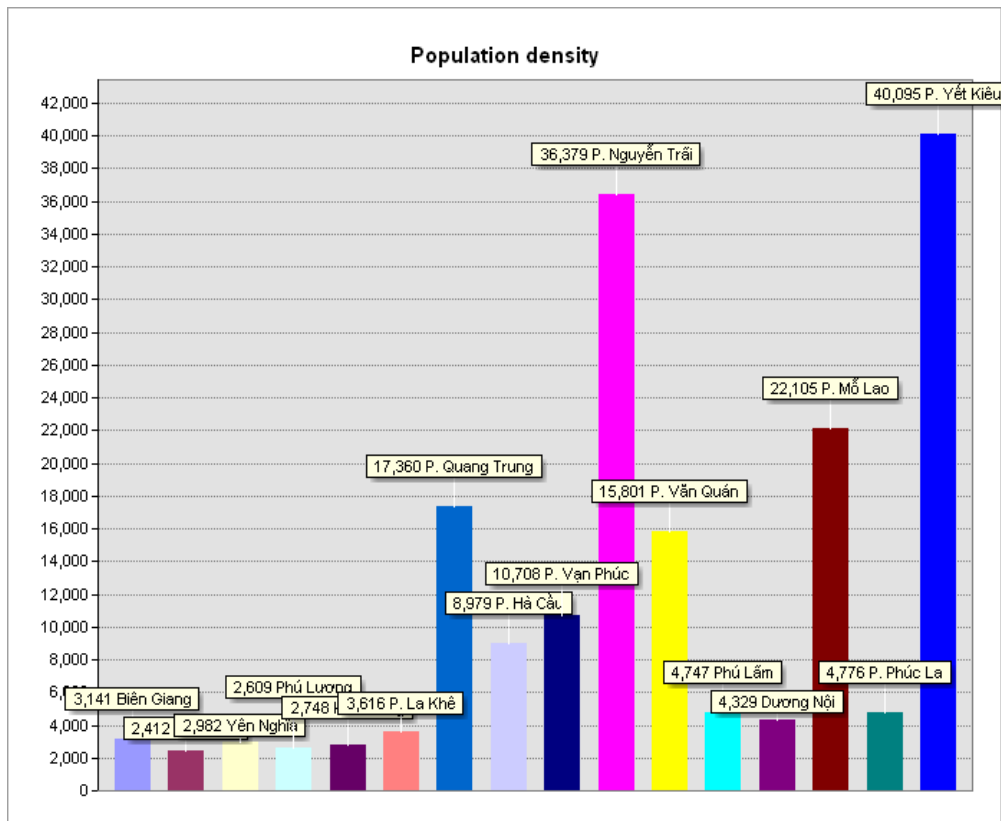
## 4.5. Planning Station Location in Ha Dong district

### 4.5.1. Local Context Analysis

#### a. Geographical location and Population

Ha Dong District is located in the southwest of Hanoi's inner city, approximately 12 km from the city center. It is home to several city-level administrative agencies and is known for its rich historical and cultural heritage. The district is one of the fastest-growing areas in Hanoi.

The district is divided into 17 wards: Bien Giang, Dong Mai, Yen Nghia, Duong Noi, Ha Cau, La Khe, Mo Lao, Nguyen Trai, Phu La, Phu Lam, Phu Luong, Kien Hung, Phuc La, Quang Trung, Van Phuc, Van Quan, and Yet Kieu. Covering an area of 49.64 km<sup>2</sup>, Ha Dong had a population of 382,637 in 2022. The population density varies significantly among the different wards (figure 29).



**Figure 29:** Ward administrative boundaries and population density of Ha Dong district







Map of shared two wheeler along the bus route

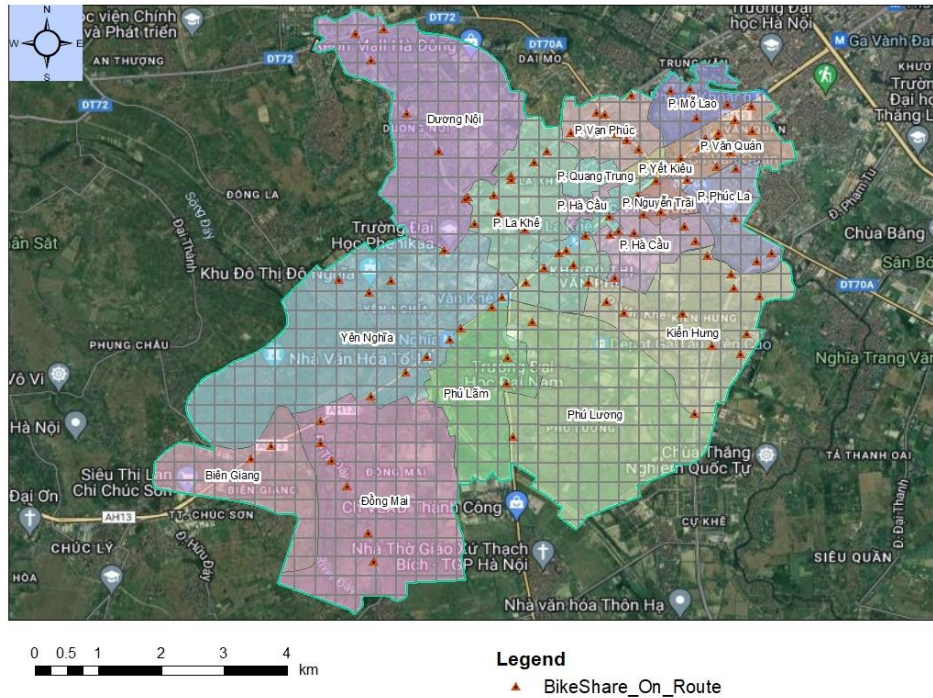
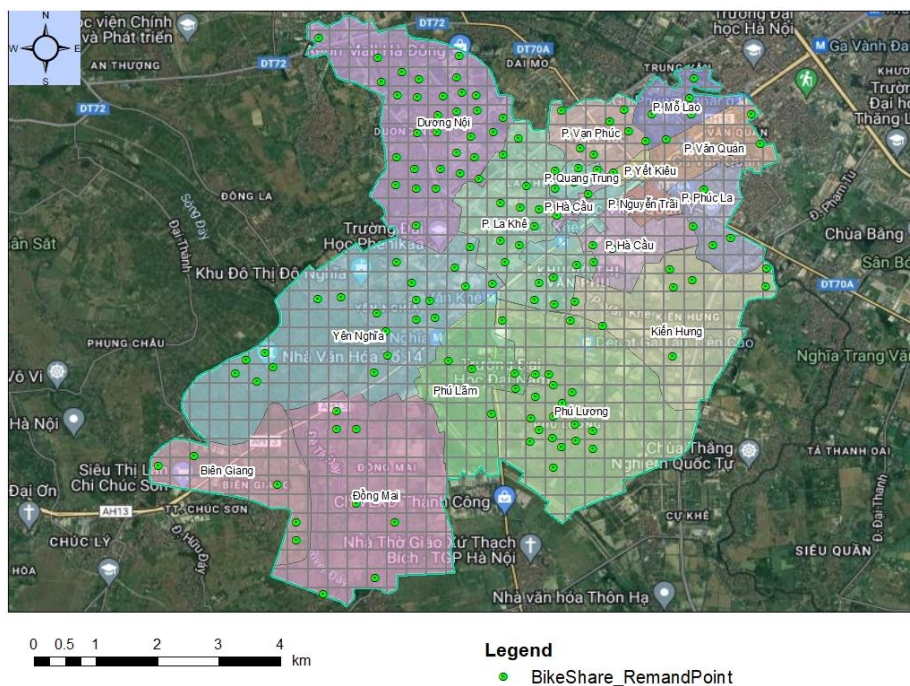


Figure 32: Shared two wheeler station along the bus route in Ha Dong district

**b. Station Location at demand points**

The total number of designated stations is 216, which is close to the number of demand points (Appendix 3.5).

Map of shared two wheeler at the demand points

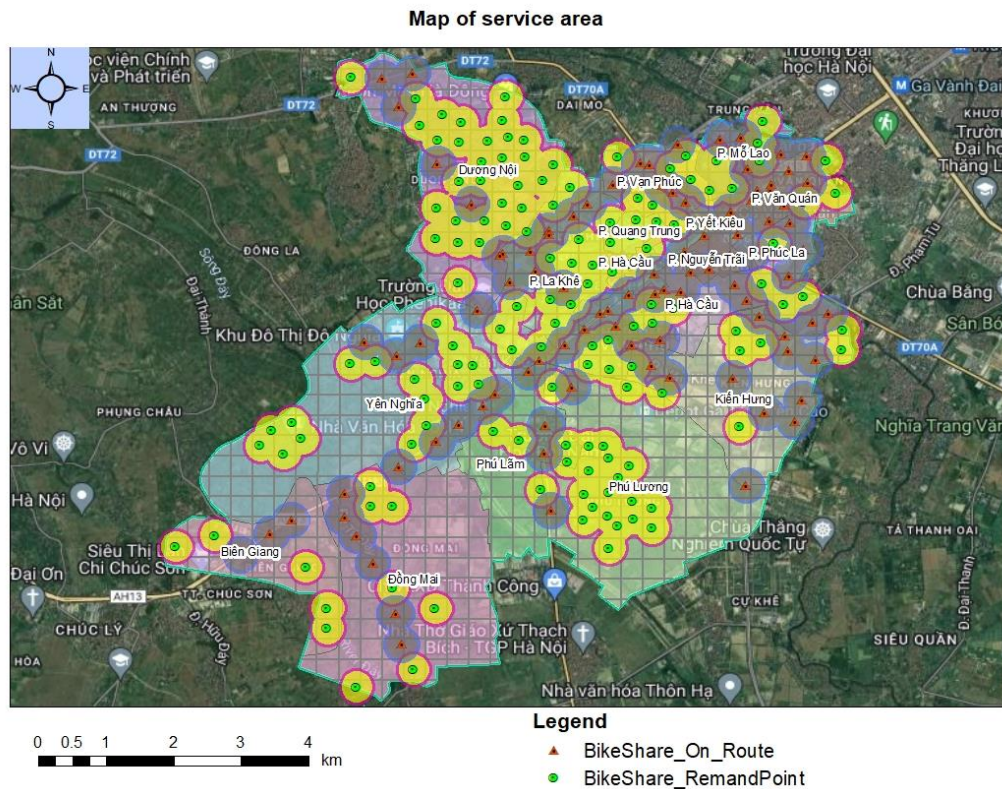




**Figure 33:** Shared two wheeler station at demand points in Ha Dong district

**c. Service area**

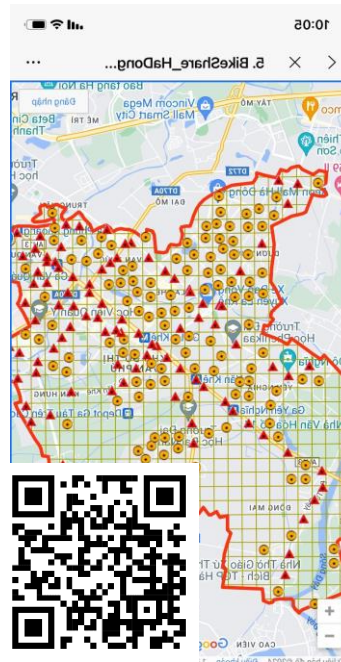
In total, the district has a 327 stations, resulting in a density of 13 stations per square kilometer. With a 250-meter buffer zone around each station, the shared two-wheeler service area covers more than 95% of the district's population and residential areas.



**Figure 34:** Shared two wheeler service area in Ha Dong district



The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:



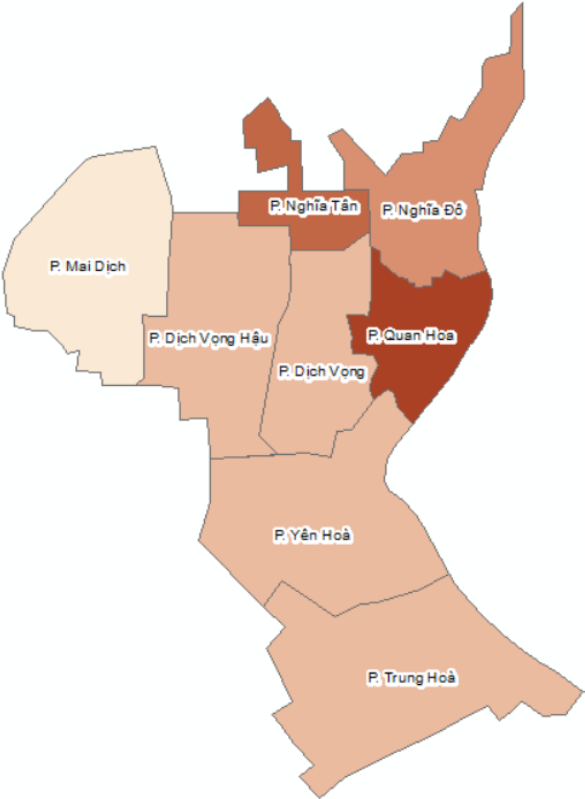
## 4.6. Planning Station Location in Cau Giay district

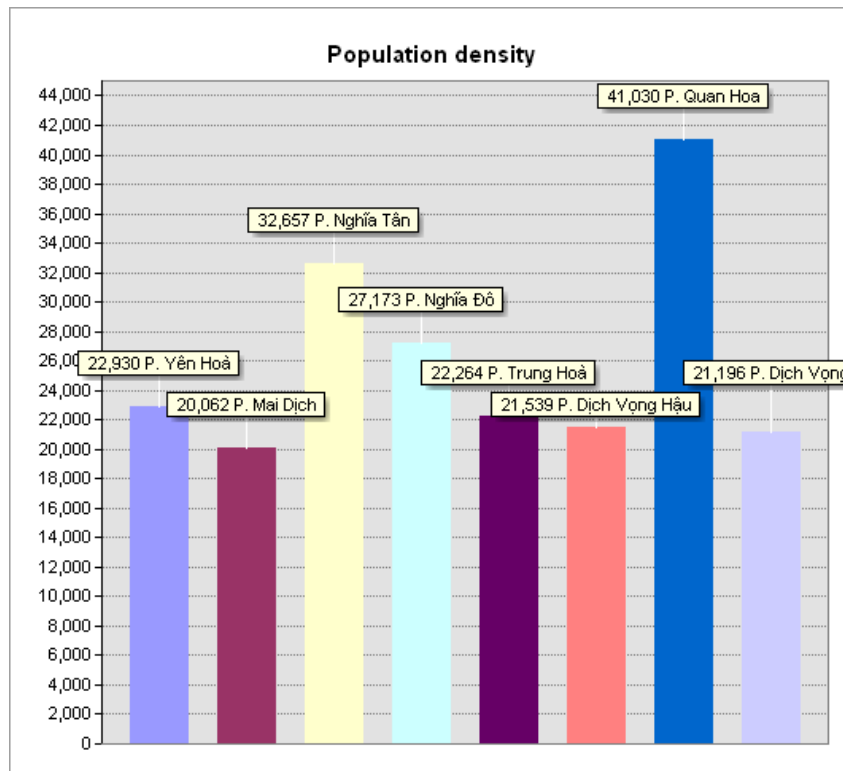
### 4.6.1. Local Context Analysis

#### a. Geographical location and Population

Cau Giay District covers an area of 12.44 km<sup>2</sup> and had a population of 292,536 in 2020, resulting in a population density of 23,516 people per square kilometer. The district is

divided into 8 commune-level administrative units, which are the following wards: Dich Vong, Dich Vong Hau, Mai Dich, Nghia Do, Nghia Tan, Quan Hoa, Trung Hoa, and Yen Hoa.





**Figure 35:** Ward administrative boundaries and population density of Cau Giay district

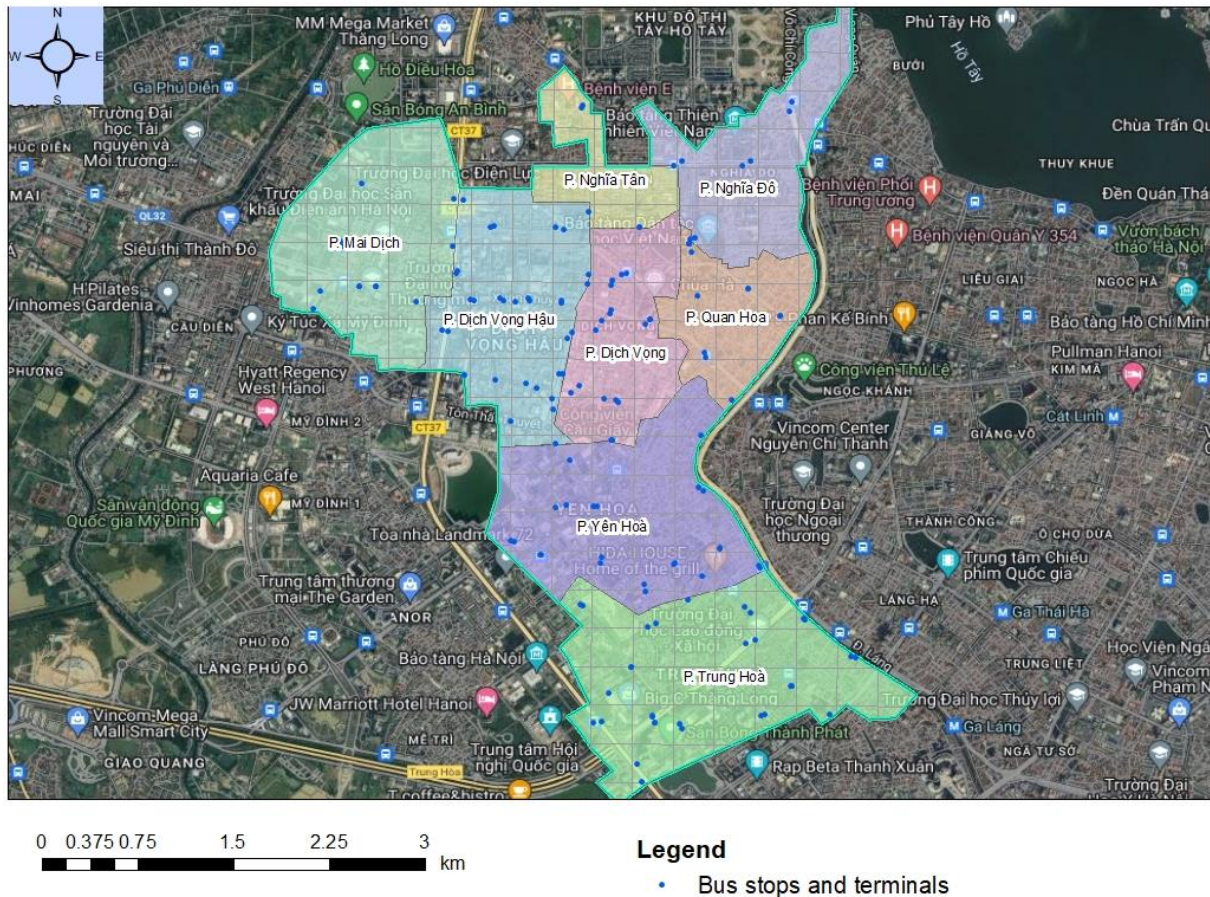
### b. Transit

The district has 68 bus routes with 147 stops and terminals (Appendix 2.6), providing an average density of approximately 12 bus stations per square kilometer.

In addition, several urban railway projects are planned for the district, including Line 3 (Son Tay - Nhon - Yen So), Line 4 (Lien Ha - Bac Thang Long), Line 5 (West Lake - An Khanh), and Line 8 (An Khanh - Duong Xa). Currently, construction is underway for Line 3 (Nhon - Hanoi Station), which is a segment of the Son Tay - Nhon - Yen So line, and for Line 5.



**Map of stops and terminals Cau Giay district**

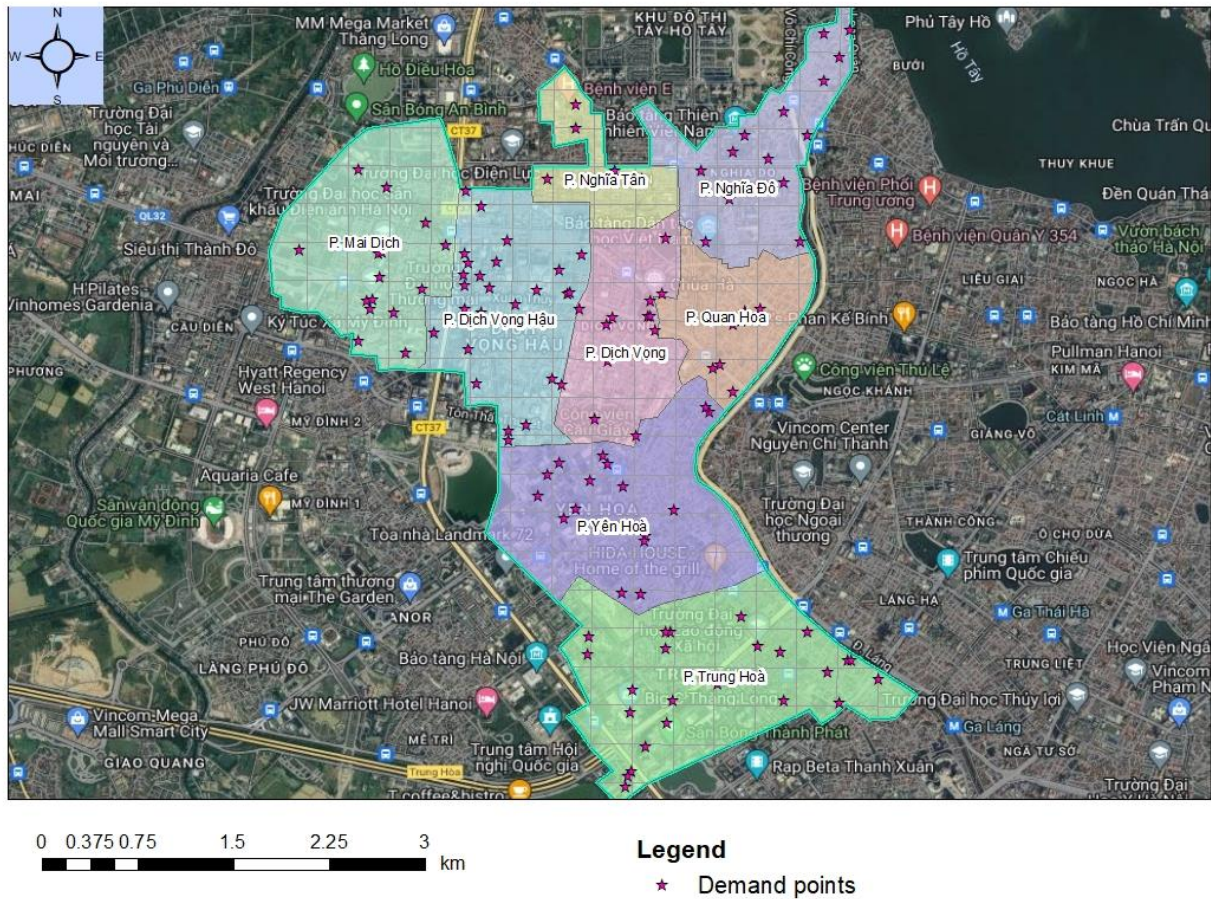


**Figure 36: Distribution of bus stop in Cau Giay district**

**c. Demand points**

In Cau Giay District, there are over 80 scientific research and training facilities at the state and ministerial levels, as well as numerous state agencies, urban areas, and apartment buildings. The district has approximately 127 demand points spread across various locations (Appendix 2.6).

**Map of Demand Points in Cau Giay district**



**Figure 37: Distribution of Demand Points in Cau Giay district**

**4.6.2. Station locations**

**a. Station Location along the bus route**

The total number of determined stations is 107, distributed along the bus routes throughout the entire district (Appendix 2.6)



Map of shared two wheeler along the bus route

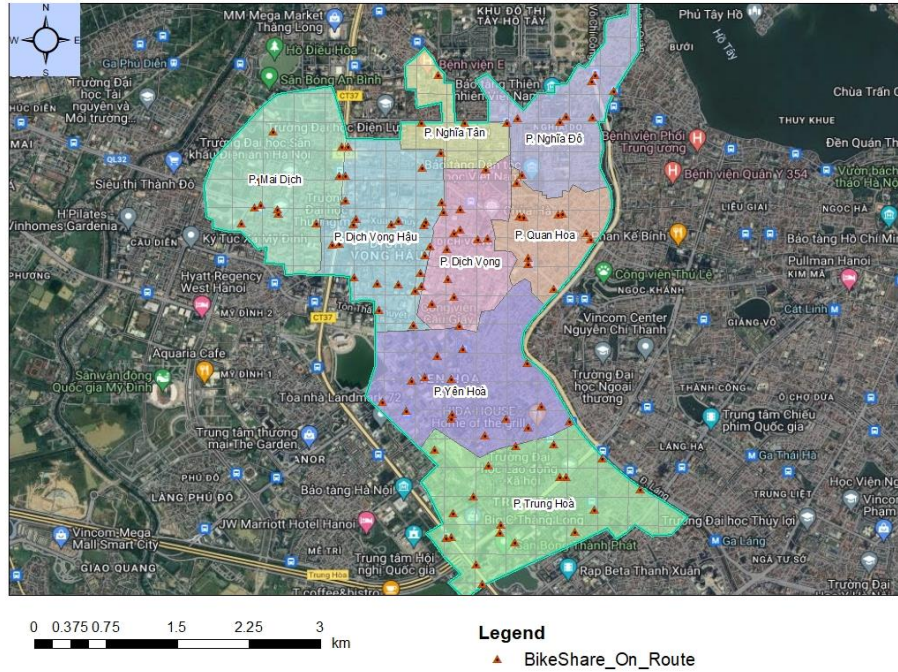
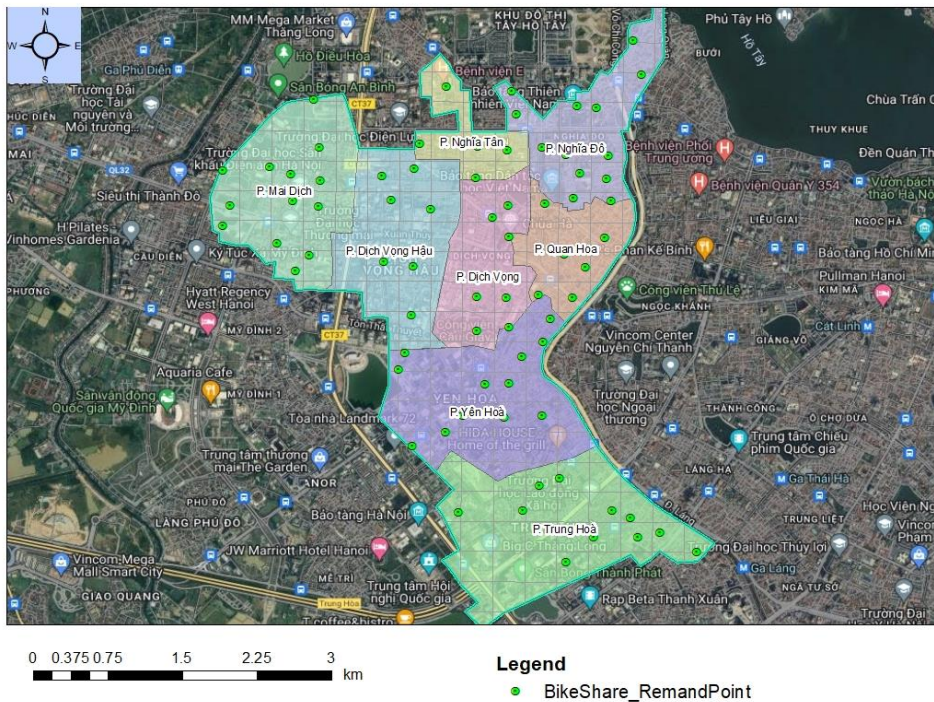


Figure 38: Shared two wheeler station along the bus route in Cau Giay district

**b. Station Location at demand points**

The total number of determined stations is 76 that is close to demand point (Appendix 3.6)

Map of shared two wheeler at the demand points

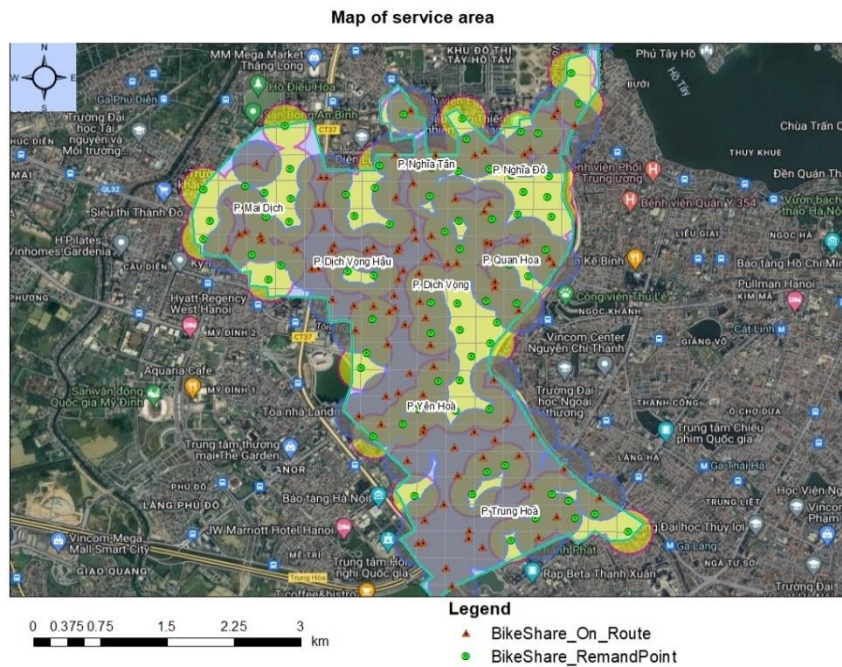




**Figure 39:** Shared two wheeler station at demand points in Cau Giay district

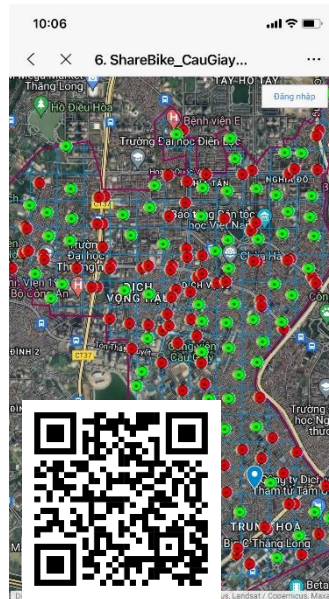
**c. Service area**

The total number of stations in the entire district is 183 stations that giving density of about 15 stations per square kilometer. Using 250 meter buffers around each station, the service area for shared two wheeler in the district covers more than 95% of the district's population and the whole district area.



**Figure 40:** Shared two wheeler service area in Cau Giay district

The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:

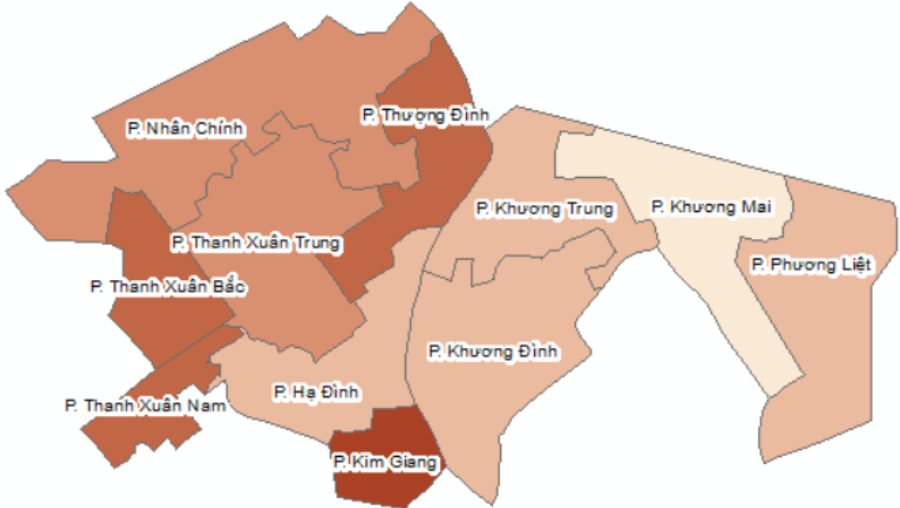
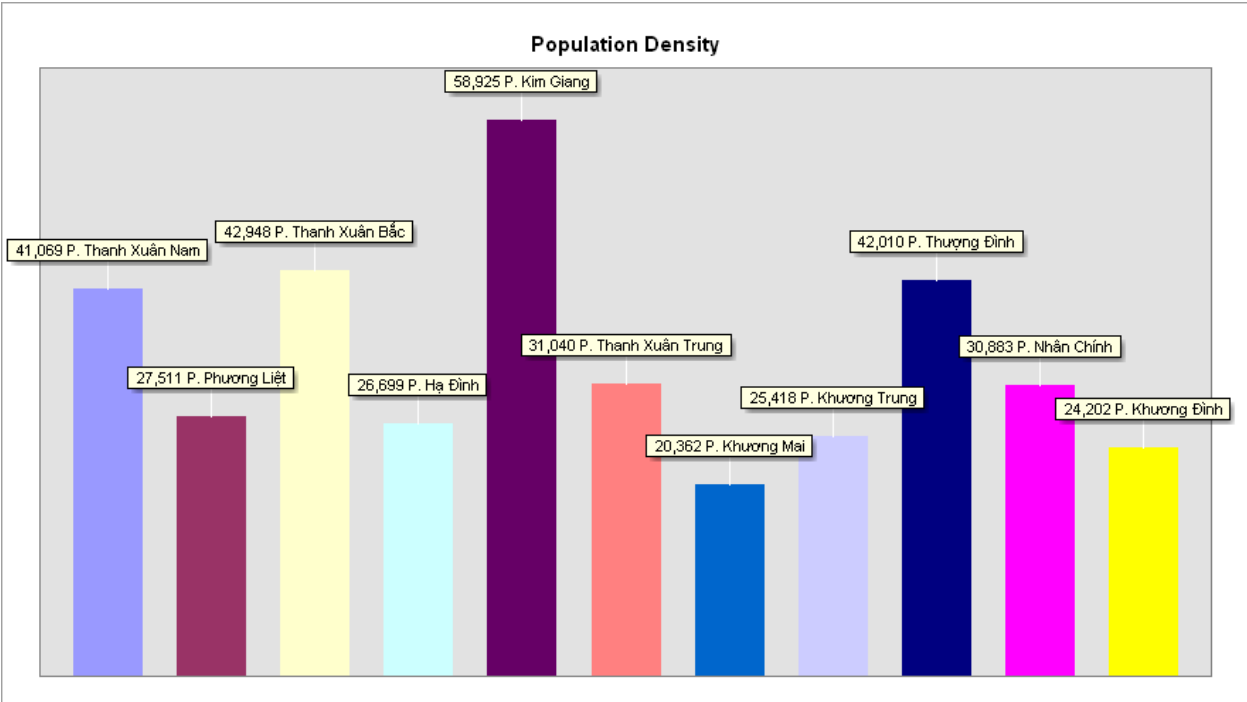


## 4.7. Planning Station Location in Thanh Xuan district

### 4.7.1. Local Context Analysis

#### a. Geographical location and Population

Thanh Xuan District covers an area of 9.17 km<sup>2</sup> and had a population of 293,292 in 2022, resulting in an average population density of 31,971 people per square kilometer. The district is divided into 11 wards: Ha Dinh, Khuong Dinh, Khuong Mai, Khuong Trung, Kim Giang, Nhan Chinh, Phuong Liet, Thanh Xuan Bac, Thanh Xuan Nam, Thanh Xuan Trung, and Thuong Dinh. The population density is relatively uniform across these wards (Figure 26).



**Figure 41:** Ward administrative boundaries and population density of Thanh Xuan district

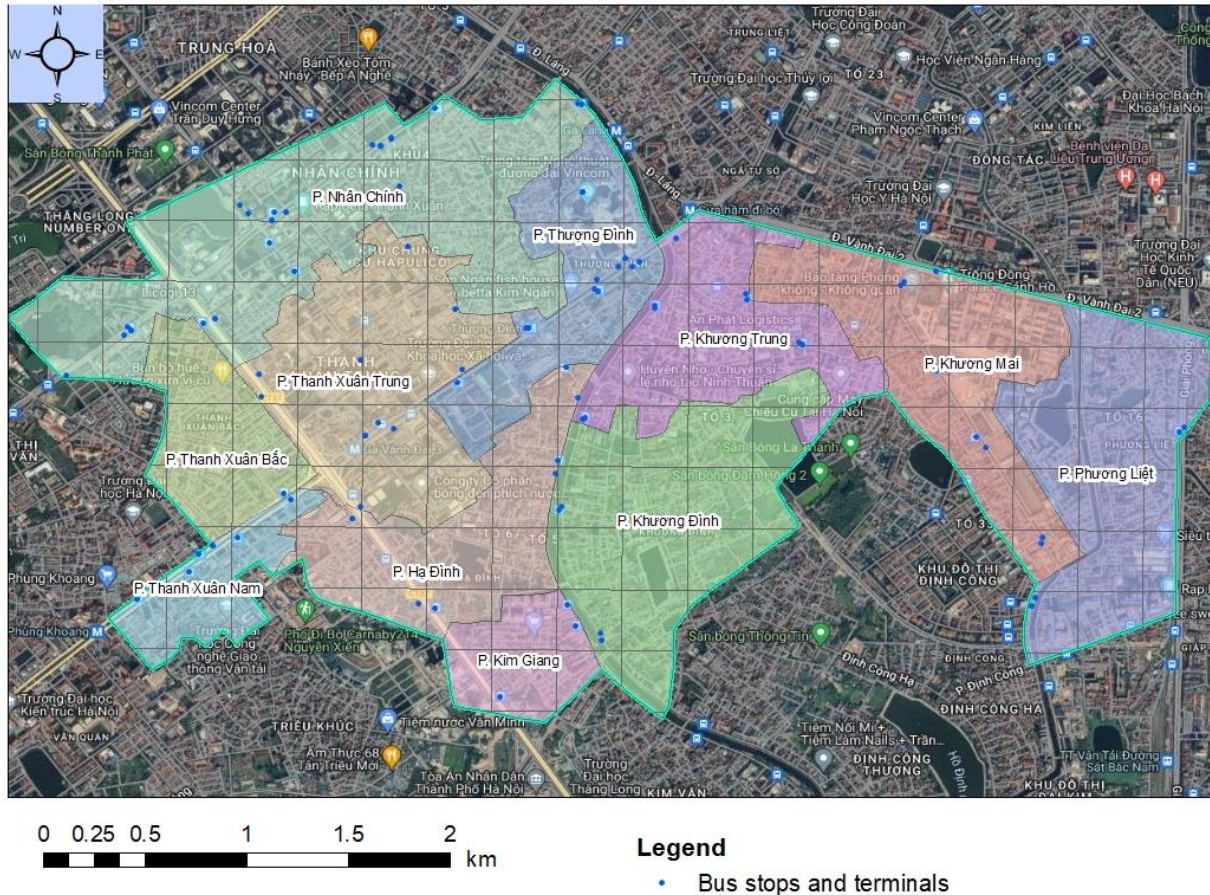
**b. Transit**

The district has 36 bus routes with 98 stops and terminals (Appendix 2.7), resulting in an average density of about 11 bus stations per square kilometer.

Several urban railway projects are planned for the district, including Line 1 (Ngoc Hoi - Yen Vien), Line 2 (Noi Bai - Thuong Dinh), Line 2A (Cat Linh - Ha Dong), Line 4 (Lien Ha - Bac Thang Long), and Line 8 (An Khanh - Duong Xa). Line 2A began operation in the fourth quarter of 2021, while Line 1 is currently under construction.



**Map of stops and terminals Thanh Xuan district**



**Figure 42: Distribution of bus stop in Thanh Xuan district**

**c. Demand points**

This district is also known as an area with rapid and stable economic growth of the city. This place also preserves many historical and cultural values and many bustling new urban areas in the ward. Notably, Trung Hoa Nhan Chinh urban area is considered the new center of Hanoi city. Currently, there are about 97 demand points scattered throughout the district (Appendix 2.7)



Map of Demand Points in Thanh Xuan district

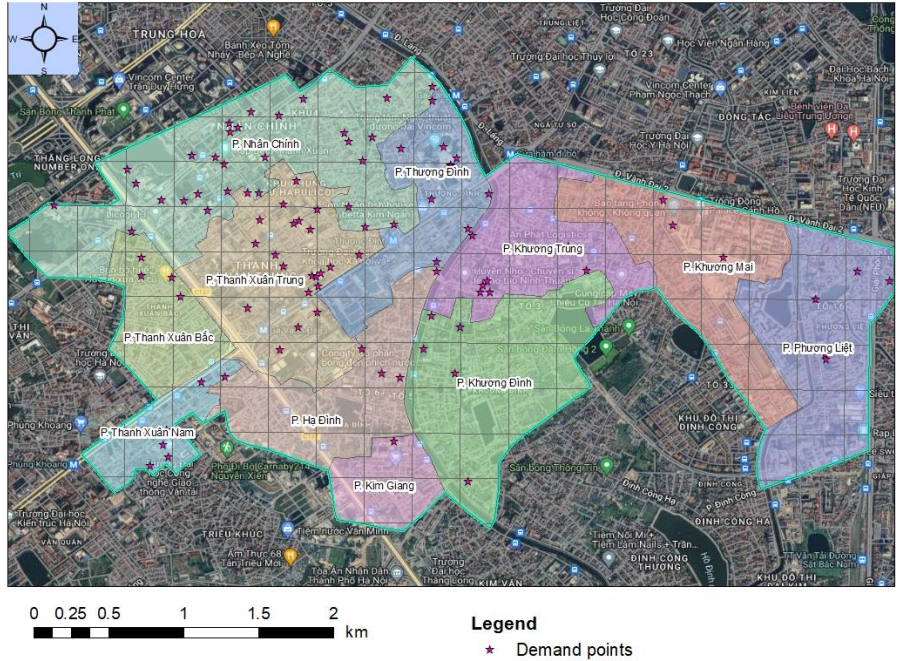


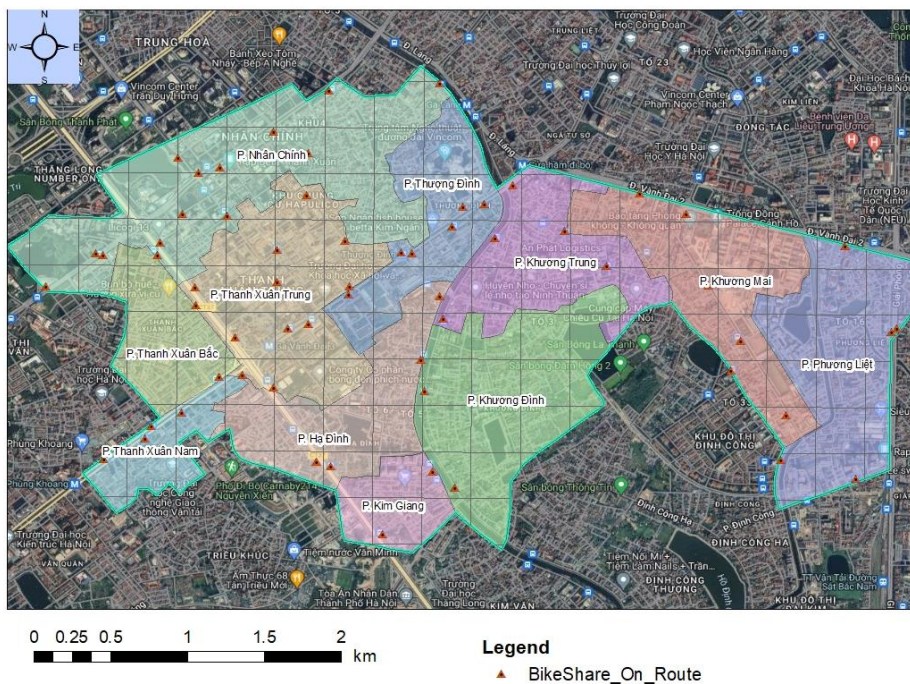
Figure 43: Distribution of Demand Points in Thanh Xuan district

#### 4.7.2. Station locations

##### a. Station Location along the bus route

The total number of determined stations is 61, distributed along the bus routes throughout the entire district (Appendix 2.7)

Map of shared two wheeler along the bus route



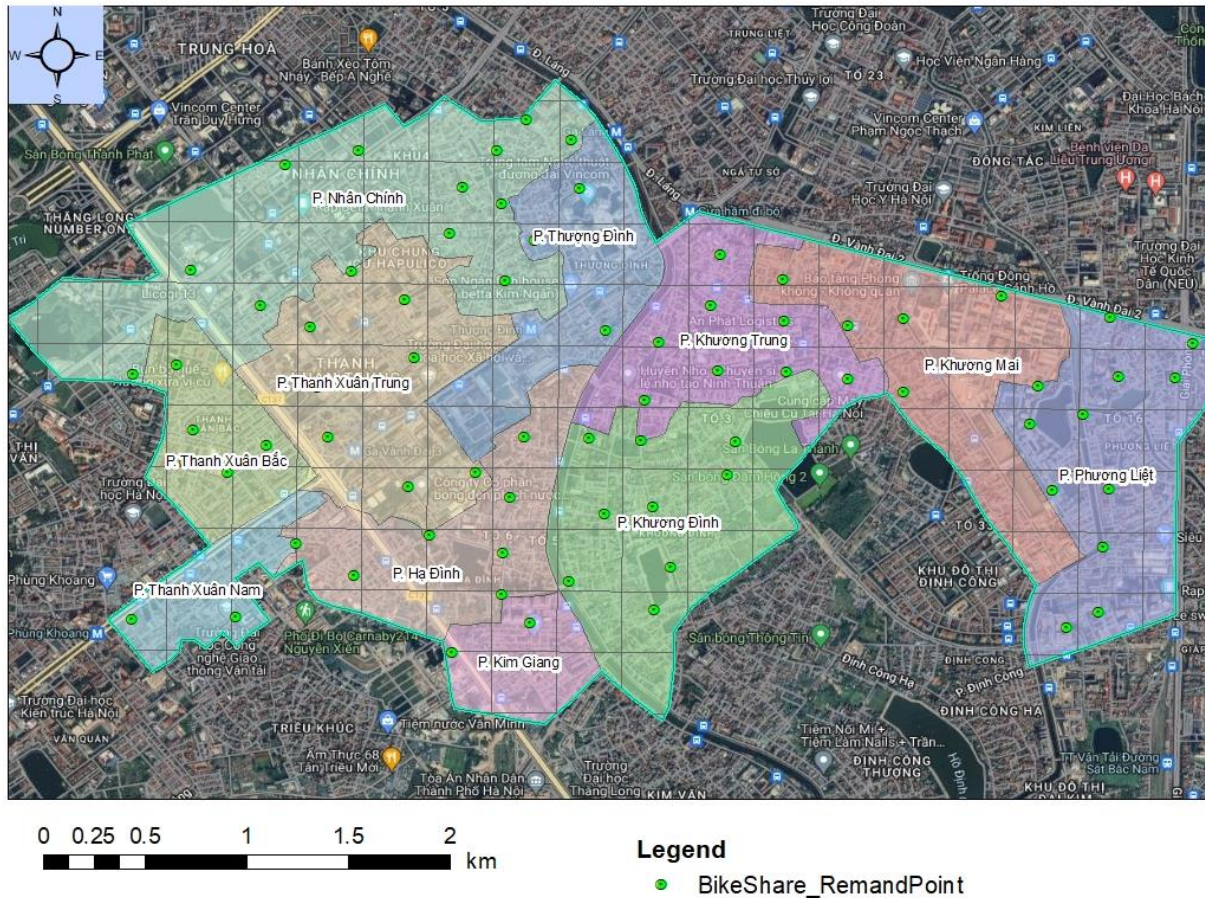


**Figure 44:** Shared two wheeler station along the bus route in Thanh Xuan district

**b. Station Location at demand points**

The total number of determined stations is 74 that is close to demand point (Appendix 3.6)

**Map of shared two wheeler at the demand points**



**Figure 45:** Shared two wheeler station at demand points in Thanh Xuan district

**c. Service area**

The total number of stations in the entire district is 135 stations that giving density of about 15 stations per square kilometer. With a 250-meter buffer zone around each station, the shared two-wheeler service covers more than 95% of the district’s population and the entire district area.



Map of service area

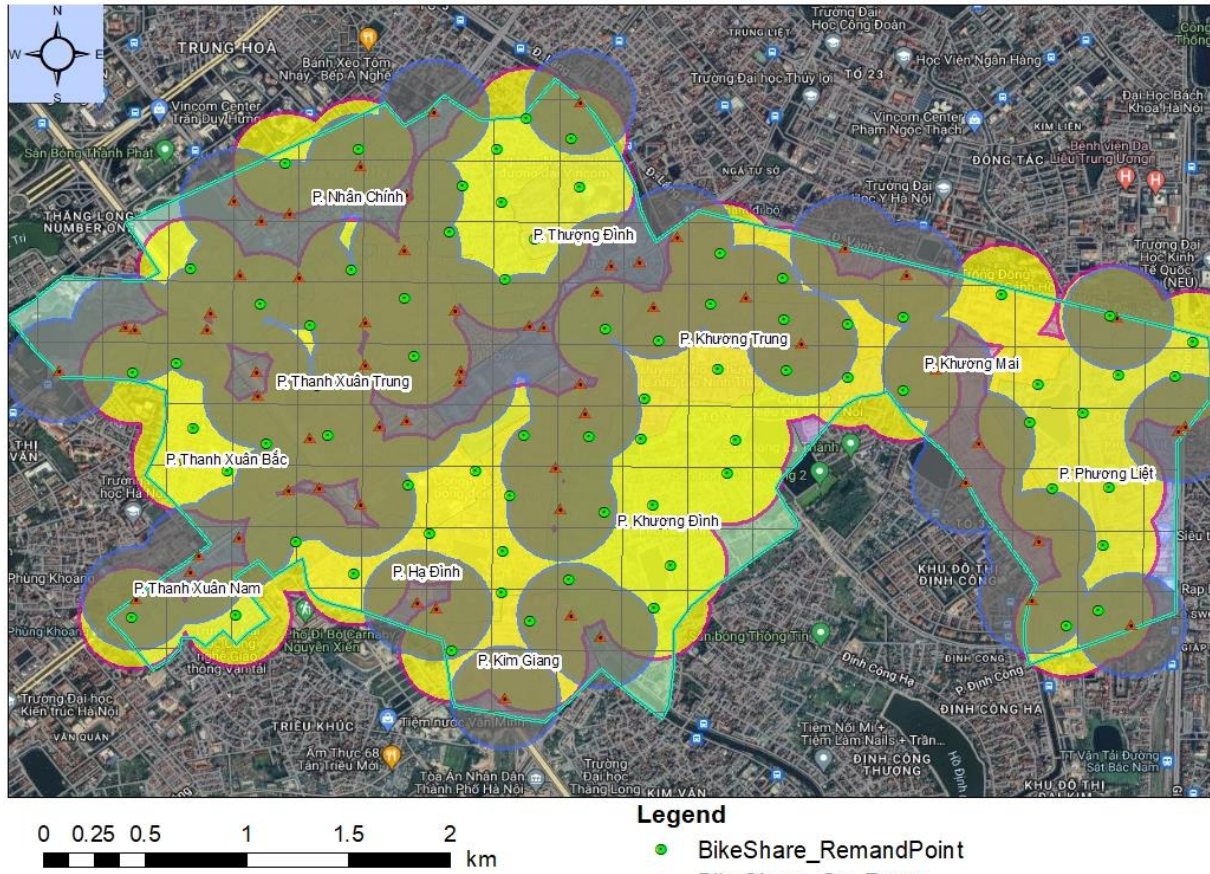


Figure 46: Shared two wheeler service area in Thanh Xuan district

The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:



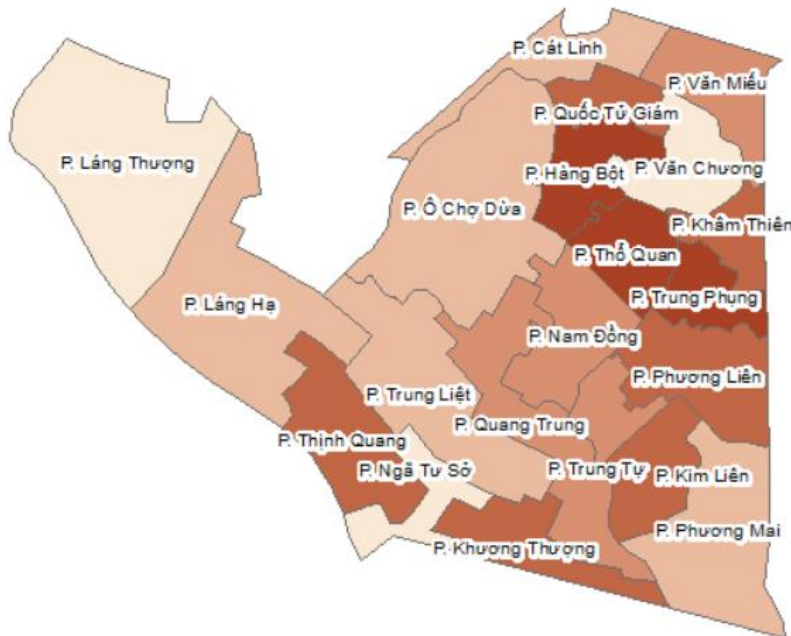
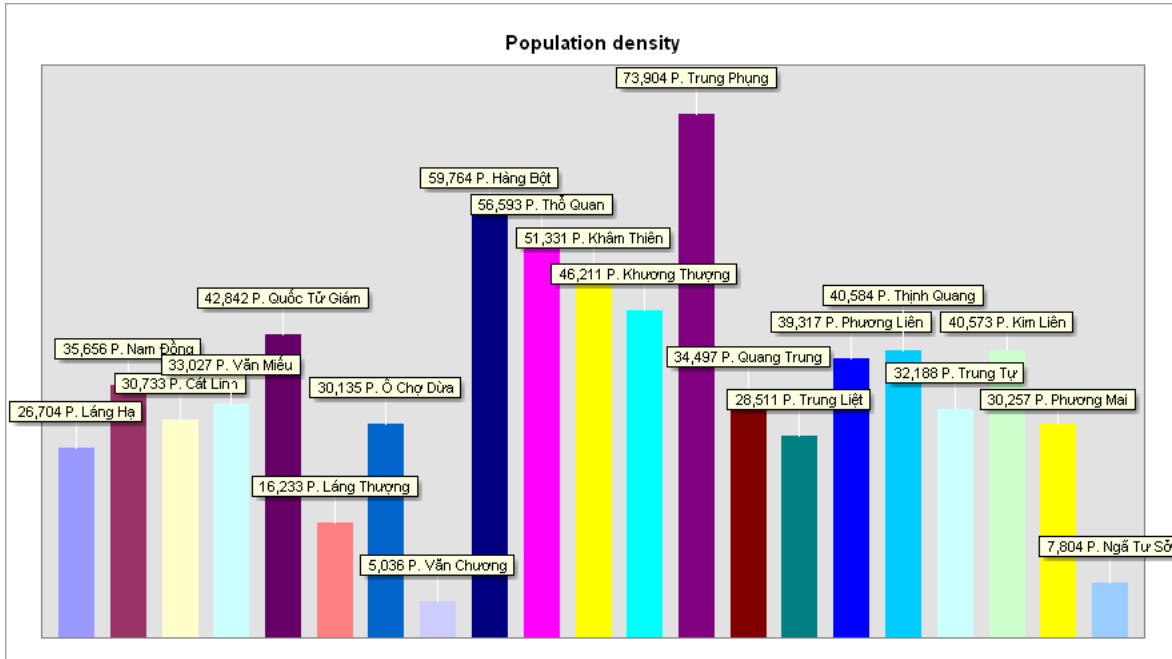


## 4.8. Planning Station Location in Dong Da district

### 4.8.1. Local Context Analysis

#### a. Geographical location and Population

Dong Da is a central district of Hanoi, Vietnam, and one of the four core districts in the city center. It consists of 21 wards and covers a total area of 9.95 km<sup>2</sup>. As of 2022, the district's population is 376,709, resulting in an average population density of 37,860 people per square kilometer—15 times higher than the overall population density of the city. The district's 21 wards are characterized by their dense population (Figure 29).



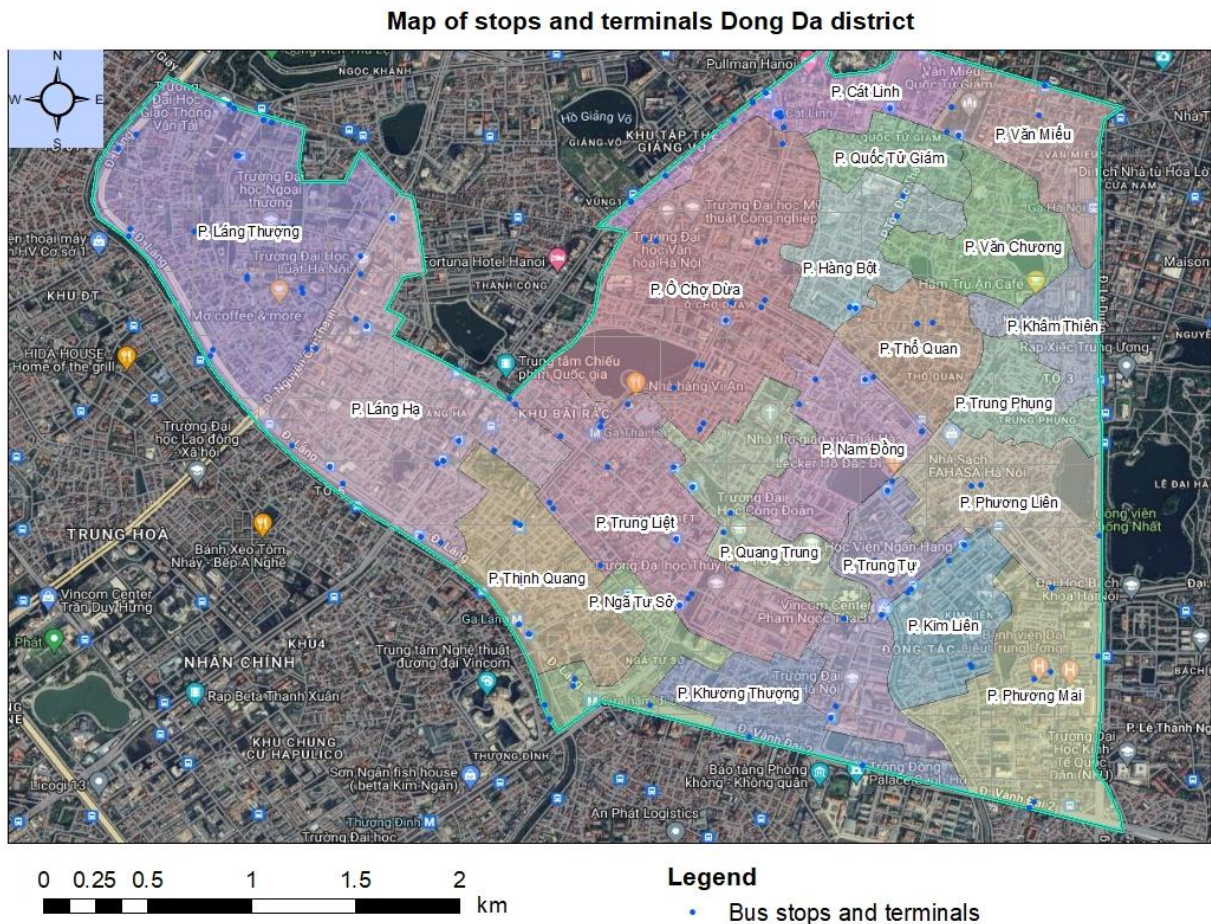


**Figure 47:** Ward administrative boundaries and population density of Dong Da district

**b. Transit**

The district has 55 bus routes with 152 stops and terminals (Appendix 2.4). Urban railway projects planned for the district include Line 1 (Ngoc Hoi - Yen Vien), Line 2 (Noi Bai - Thuong Dinh), Line 2A (Cat Linh - Ha Dong), Line 3 (Troai - Nhon - Yen So), and Line 5 (West Lake - An Khanh). Currently, Line 3 (Nhon - Hanoi Station), a section of the Troi - Nhon - Yen So line, and Line 5 are under construction. Line 2A began operation in the fourth quarter of 2021, while Line 1 is also under construction.

Bus stations are well distributed throughout the district, which has the second highest bus station density in the city, approximately 15 stations per square kilometer.



**Figure 48:** Distribution of bus stop in Dong Da Trung district











Map of shared two wheeler at the demand points

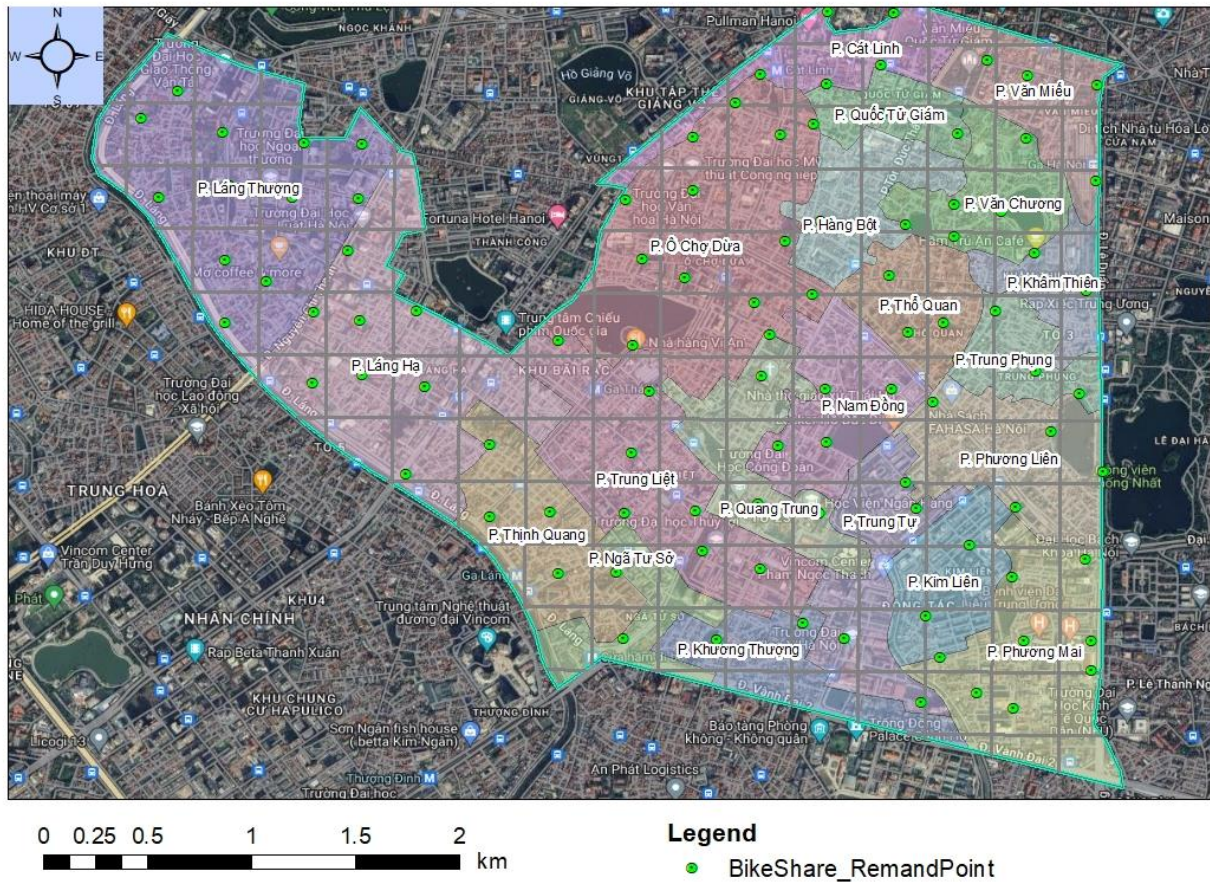


Figure 51: Shared two wheeler station at demand points in Dong Da district

**c. Service area**

The total number of stations in the entire district is 198 stations that giving density of about 20 stations per square kilometer. Using 250 meter buffers around each station, the service area for shared two wheeler in the district covers more than 90% of the district’s population and city area where residents living.



Map of service area

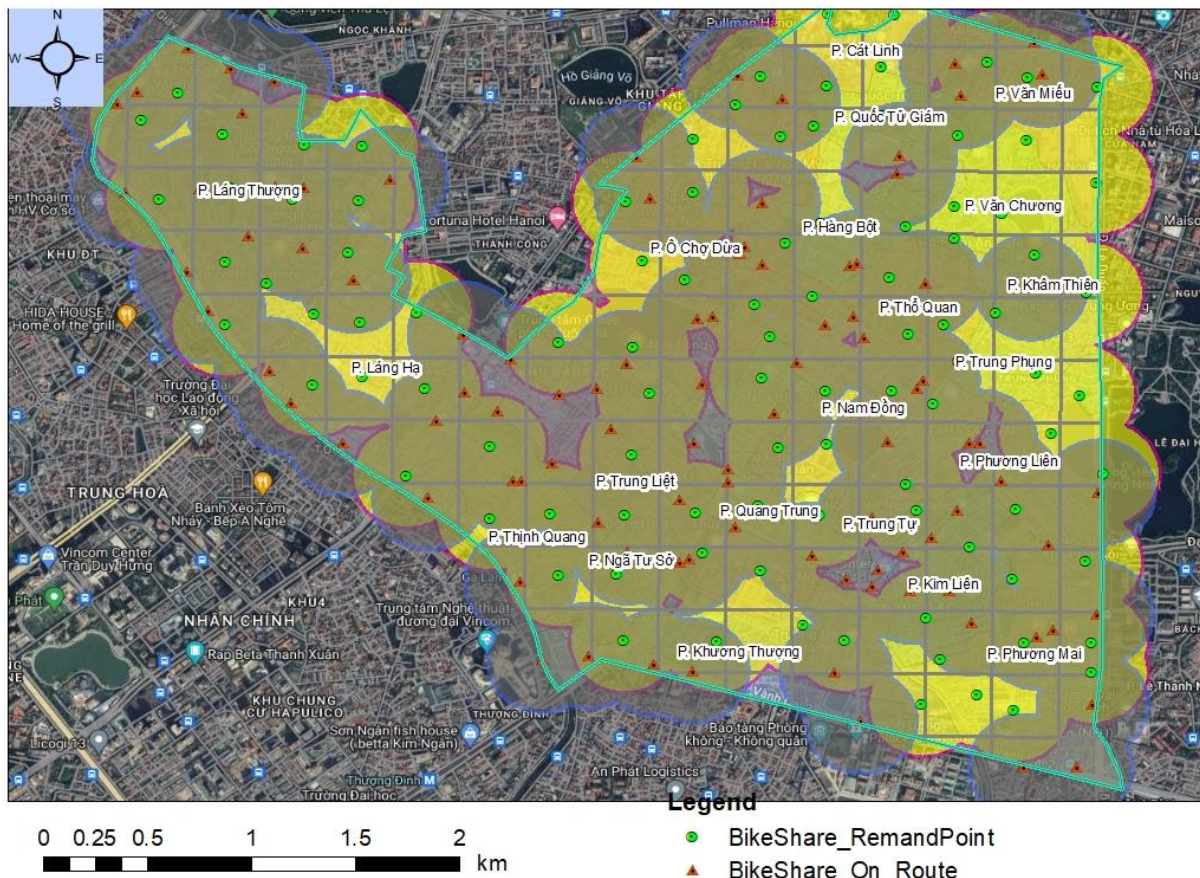


Figure 52: Shared two wheeler service area in Dong Da district

The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:



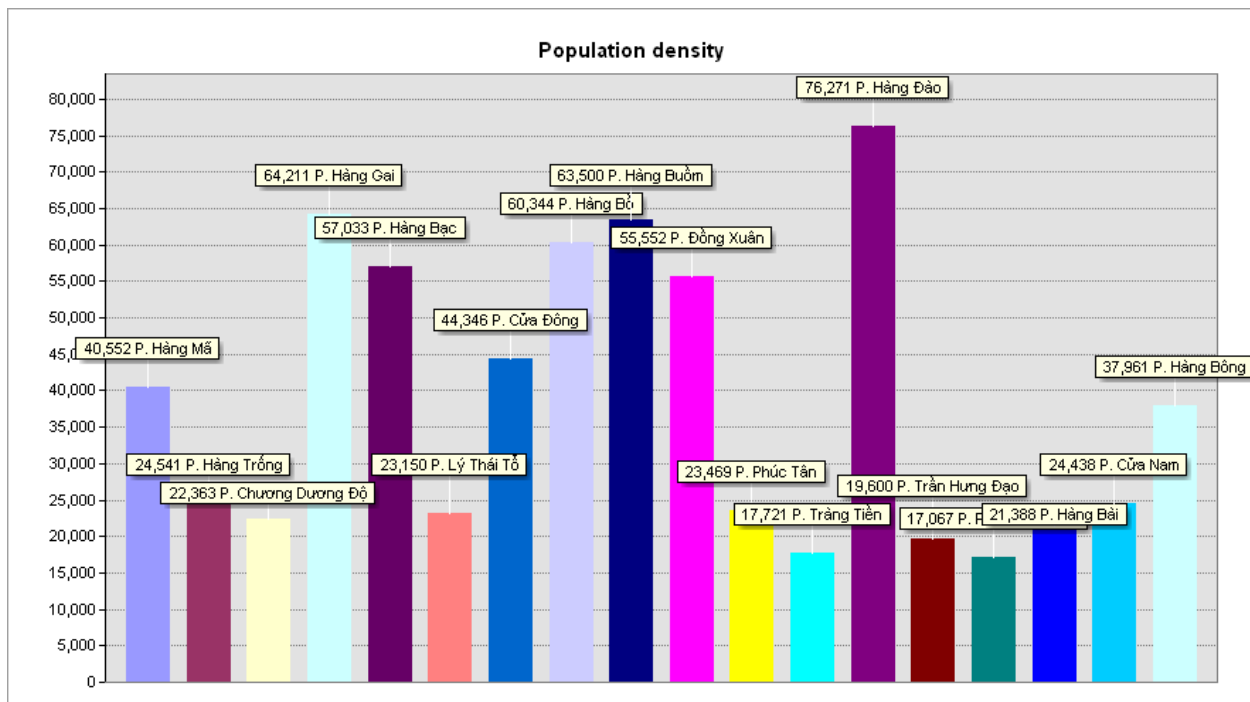
## 4.9. Planning Station Location in Hoan Kiem district

### 4.9.1. Local Context Analysis

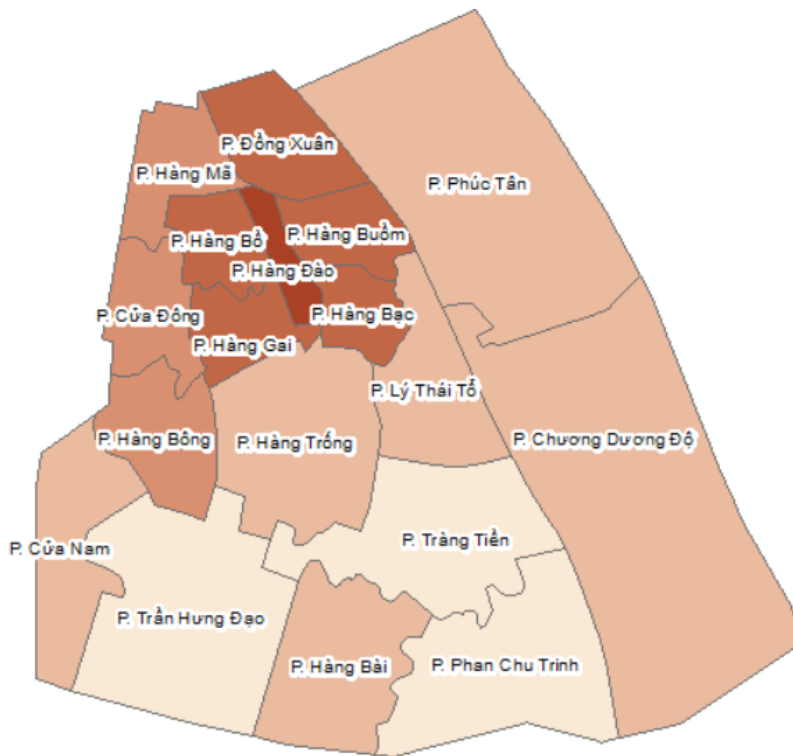
#### a. Geographical location and Population

As a central district of Hanoi, Hoan Kiem is closely tied to the city's thousand-year history of development and preservation. Covering an area of 5.35 km<sup>2</sup>, it is the smallest district in Hanoi. In 2022, the district's population was 141,687, resulting in a population density of 26,484 people per square kilometer.

Hoan Kiem District comprises 18 wards: Chuong Duong, Cua Dong, Cua Nam, Dong Xuan, Hang Bac, Hang Bai, Hang Bo, Hang Bong, Hang Buom, Hang Dao, Hang Gai, Hang Ma, Hang Trong, Ly Thai To, Phan Chu Trinh, Phuc Tan, Tran Hung Dao, and Trang Tien. The population density varies across these wards, as illustrated in the accompanying figures.







**Figure 53:** Ward administrative boundaries and population density of Hoan Kiem district

### **b. Transit**

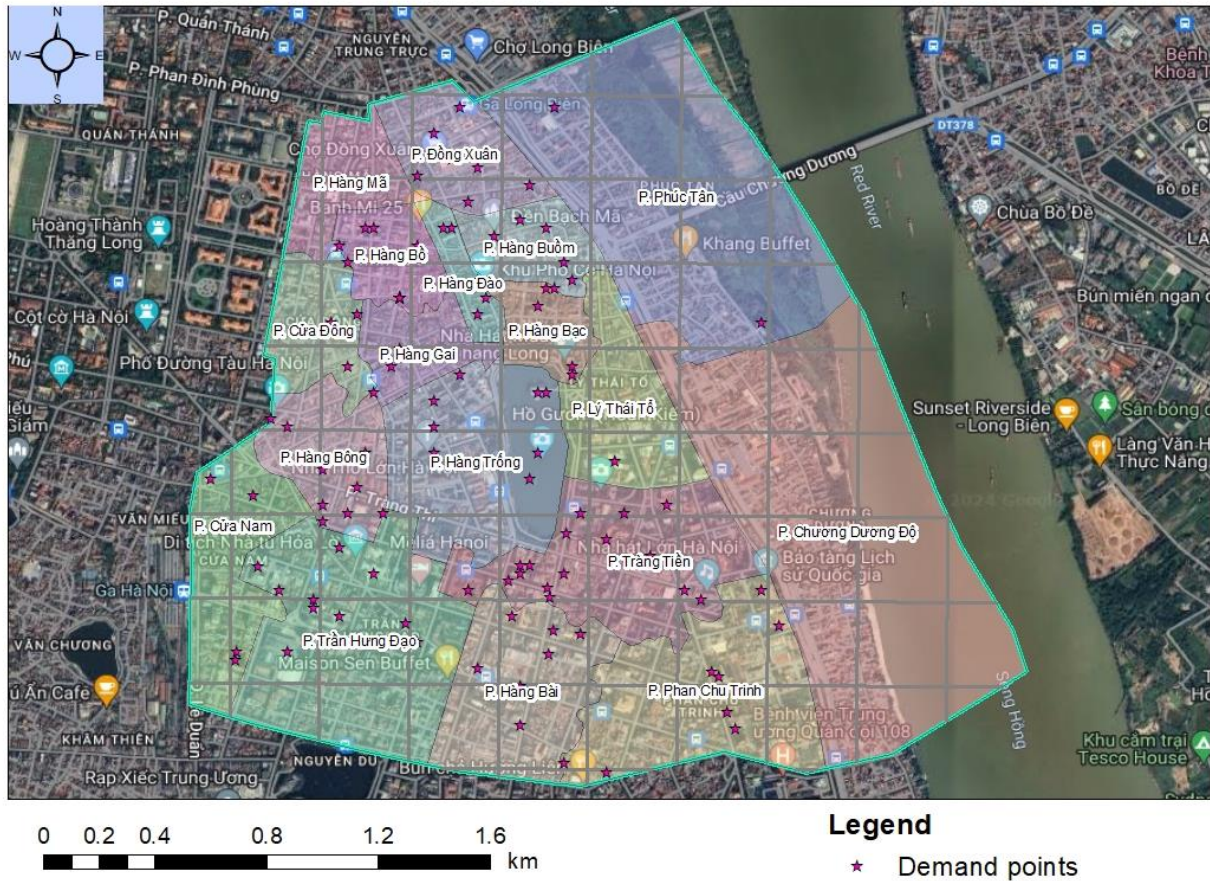
The district features 56 bus routes with 98 stops and terminals. It also has several railway projects planned, including Line 1 (Ngoc Hoi - Yen Vien), Line 2 (Noi Bai - Thuong Dinh), and Line 3 (Trois - Nhon - Hoang Mai). Currently, construction is underway for Line 2, specifically the section from Nam Thang Long to Tran Hung Dao (part of the Noi Bai - Thuong Dinh route), and Line 3, specifically the section from Nhon to Hanoi Station (part of the Trois - Nhon - Hoang Mai route). Additionally, Line 3 (Hanoi Station - Hoang Mai) and Line 1 are also under construction.

Bus stations are well distributed throughout the district, which has the highest bus station density in the city, approximately 18 stations per square kilometer (Appendix 2.9).



These attractions draw a significant number of domestic and international visitors.

**Map of Demand Points in Hoan Kiem district**



**Figure 55: Distribution of Demand Points in Hoan Kiem district**

#### **4.9.2. Station locations**

##### **a. Station Location along the bus route**

The total number of determined stations is 70, distributed along the bus routes throughout the entire district (Appendix 2.9)



Map of shared two wheeler along the bus route

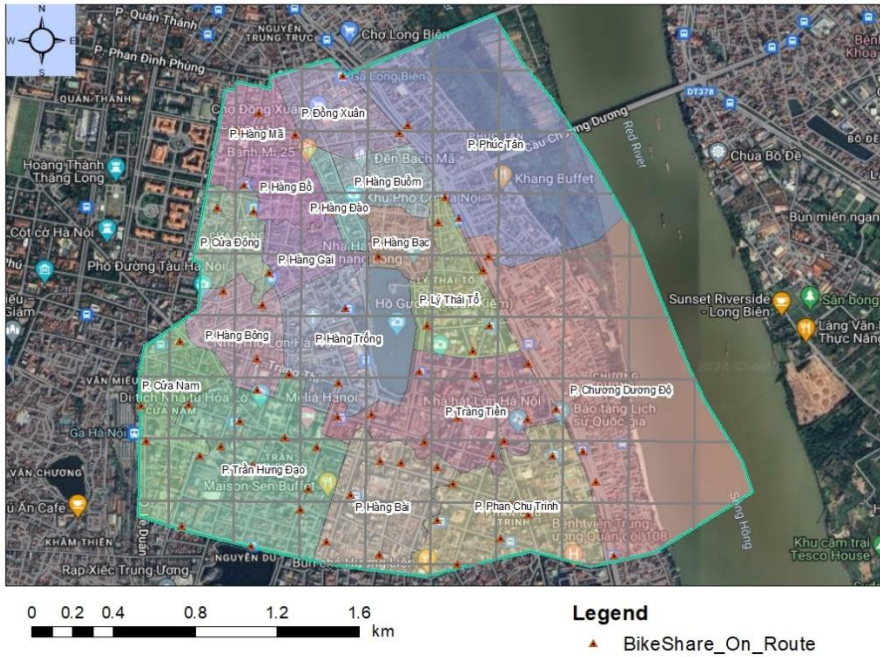
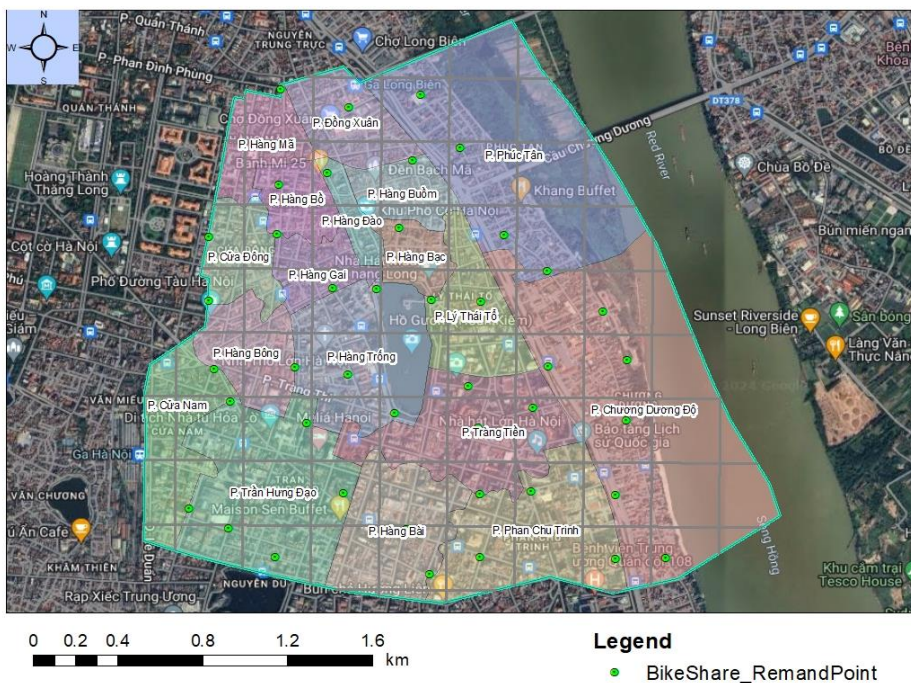


Figure 56: Shared two wheeler station along the bus route in Hoan Kiem district

**b. Station Location at demand points**

The total number of determined stations is 44 that is close to demand point (Appendix 3.8)

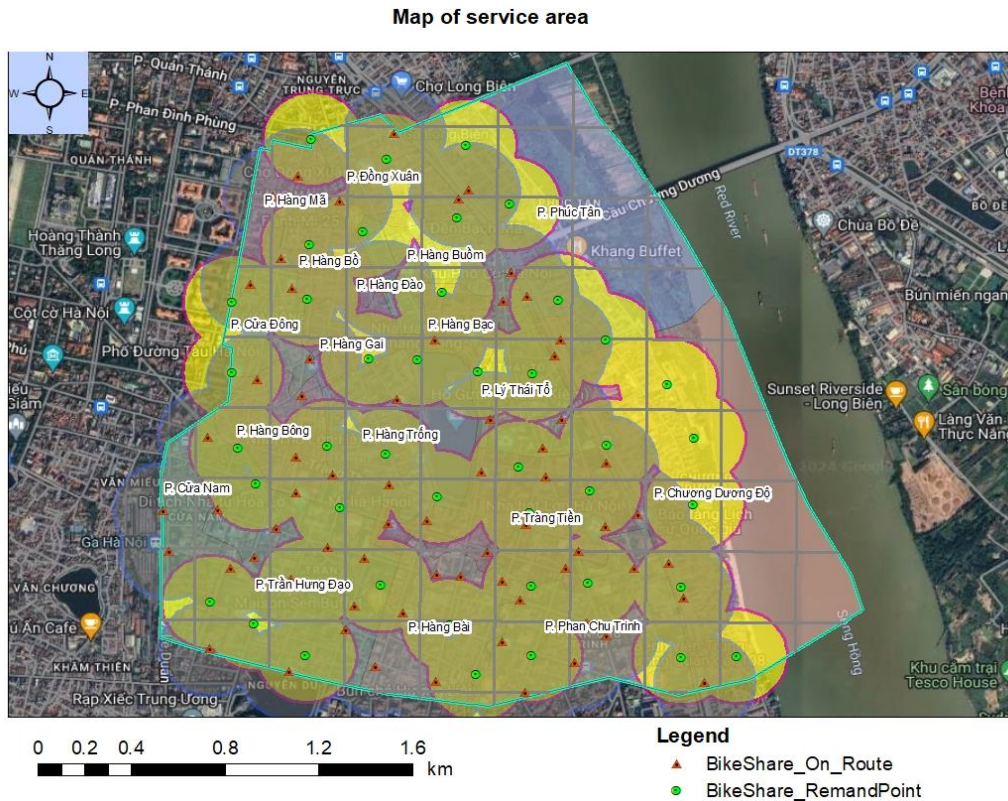
Map of shared two wheeler at the demand points



**Figure 57:** Shared two wheeler station at demand points in Hoan Kiem district

**c. Service area**

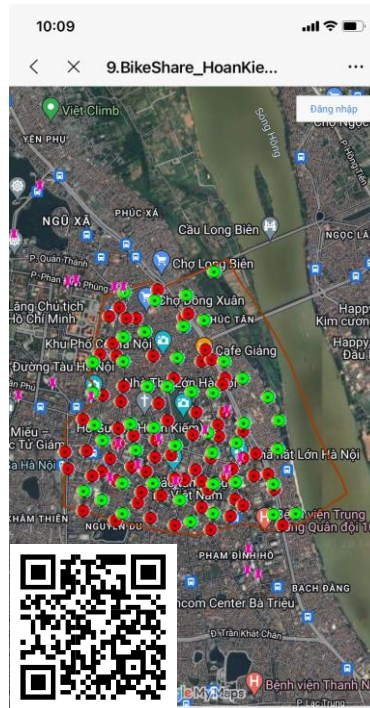
The district has a total of 114 stations, resulting in a density of about 21 stations per square kilometer. With a 250-meter buffer around each station, the shared two-wheeler service covers more than 95% of the district’s population and residential areas.



**Figure 58:** Shared two wheeler service area in Hoan Kiem district



The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:



#### 4.10. Planning Station Location in Ba Dinh district

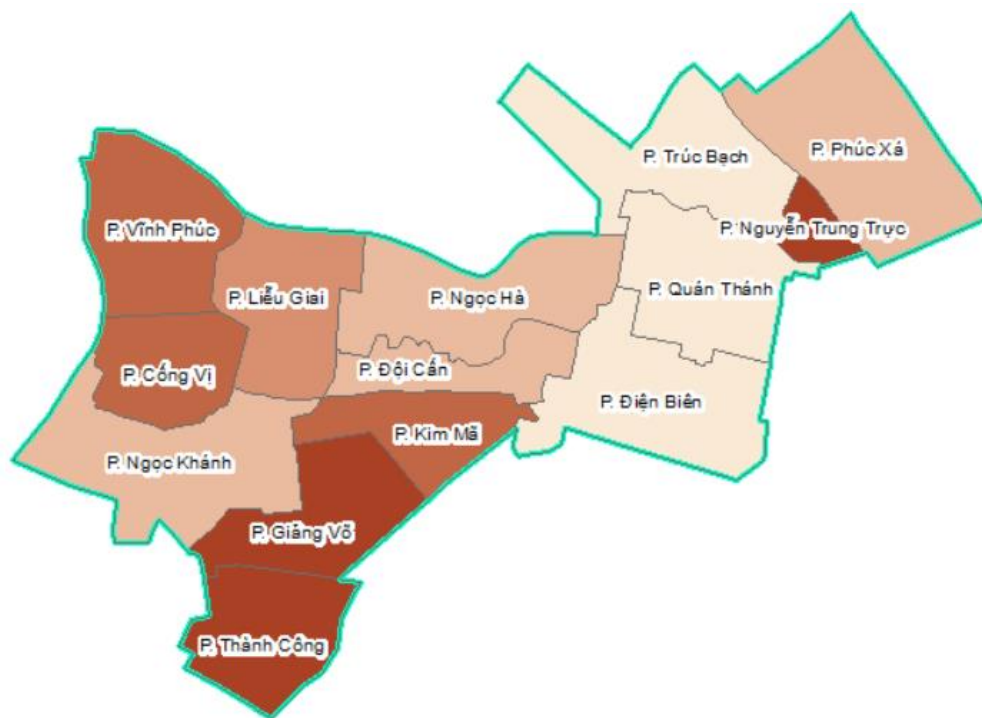
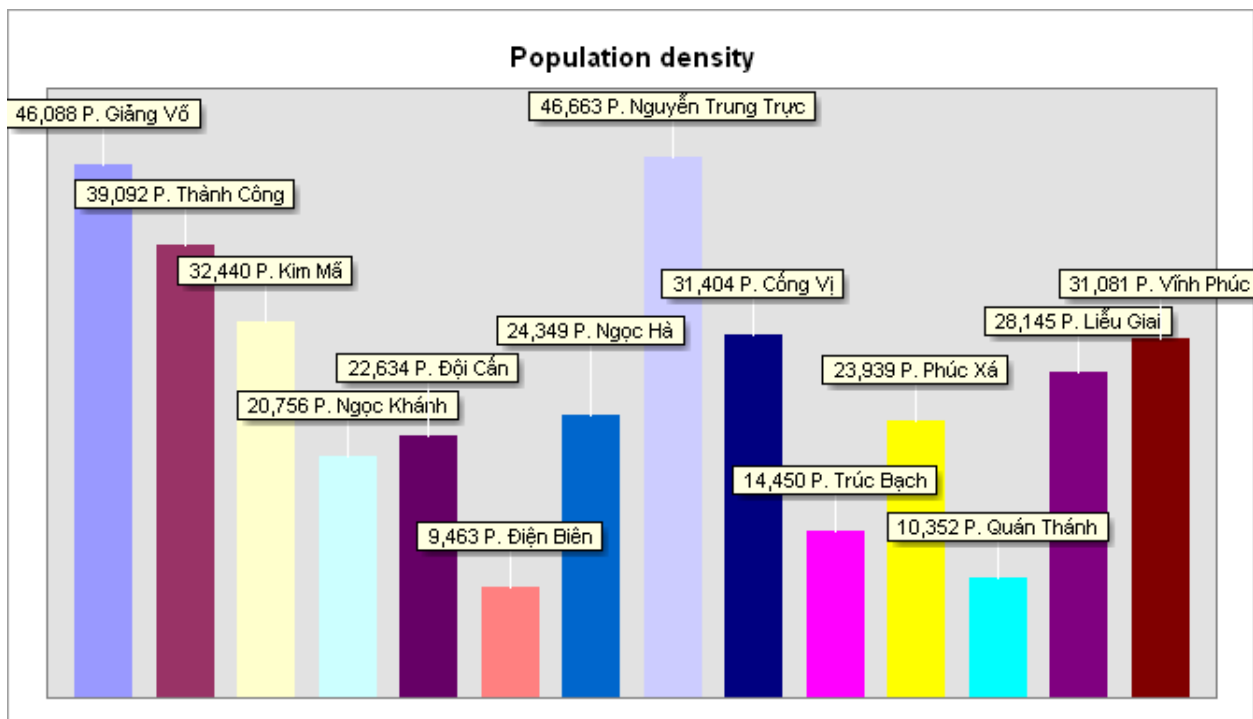
##### 4.10.1. Local Context Analysis

###### a. Geographical location and Population

Ba Dinh is one of the four central districts of Hanoi and hosts many key agencies for both Vietnam and Hanoi. The district covers an area of 9.21 km<sup>2</sup>, making it one of the smallest districts in Hanoi. In 2022, Ba Dinh had a population of 226,315, resulting in a population density of 24,572 people per square kilometer.

The district is divided into 14 wards: Cong Vi, Dien Bien, Doi Can, Giang Vo, Kim Ma, Lieu Giai, Ngoc Ha, Ngoc Khanh, Nguyen Trung Truc, Phuc Xa, Quan Thanh, Thanh Cong, Truc Bach, and Vinh Phuc. Population densities vary among these wards, as illustrated in the accompanying figure.





**Figure 59:** Ward administrative boundaries and population density of Dong Da district

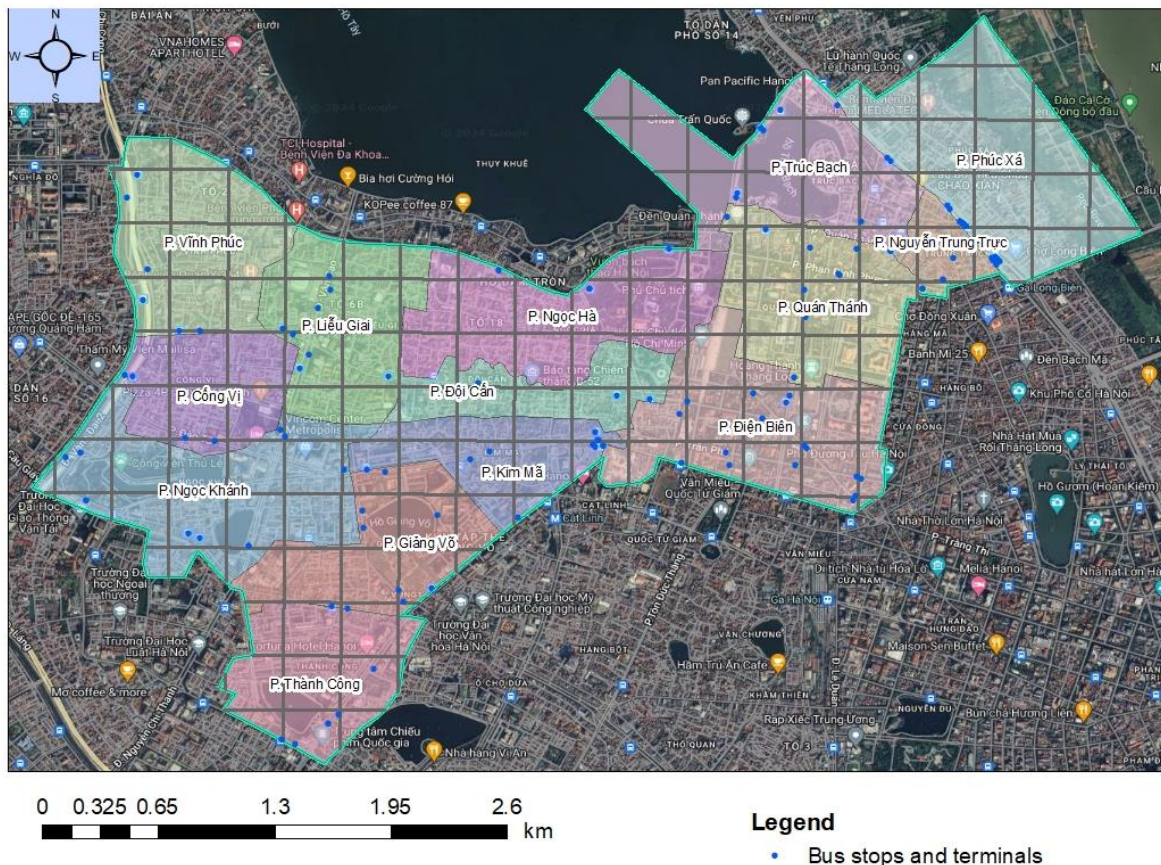
**b. Transit**

The district has 50 bus routes with 139 stops and terminals, making it the second densest in terms of bus stations in the city, with 15 stations per square kilometer. Several railway

projects are currently passing through the district, including: Line 1 (Ngoc Hoi - Yen Vien); Line 2 (Noi Bai - Thuong Dinh) and Line 3 (Troj - Nhon - Yen So) as well as Line 5 (West Lake - Hoa Lac)

Among these, Line 3 (Nhon - Hanoi Station section) is under construction. Additionally, Line 1, Line 2 (Nam Thang Long - Tran Hung Dao section), and Line 5 are also under construction.

**Map of stops and terminals Ba Dinh district**



**Figure 60: Distribution of bus stop in Ba Dinh district**

### c. Demand points

Ba Dinh District is home to many famous tourist attractions of Hanoi city and is also home to government headquarters. The district also has many of the most modern shopping and entertainment facilities in the capital such as Lotte Center, Long Bien Market, Ba Dinh Square, Vincom Center Metropolis Lieu Giai, National Cinema, CGV Cinema... , besides the densely populated areas with many of Hanoi's earliest apartment buildings, many new modern urban areas are also being built here (Appendix 2.10)







Map of shared two wheeler along the bus route

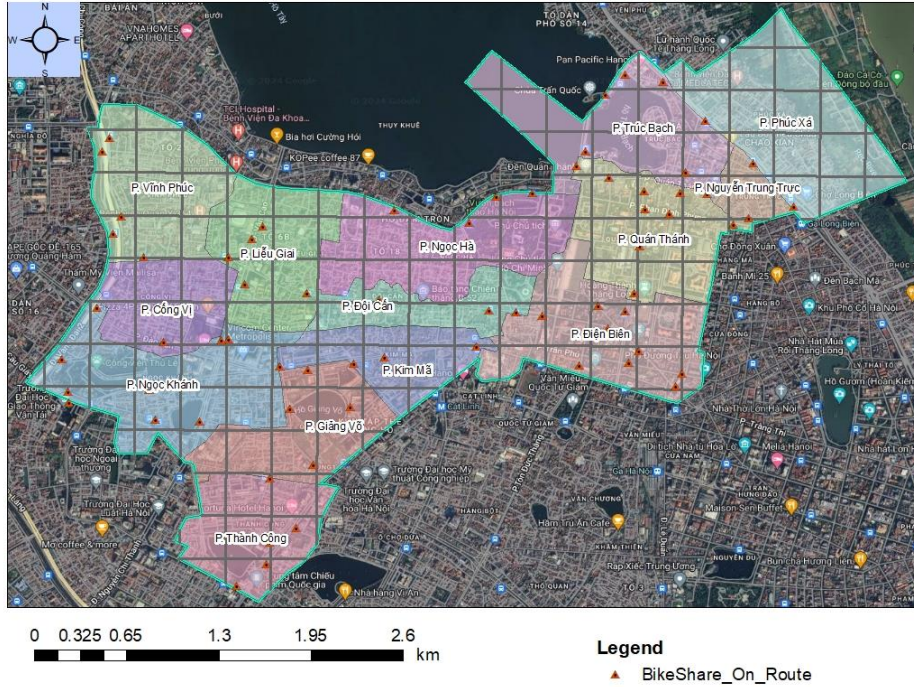
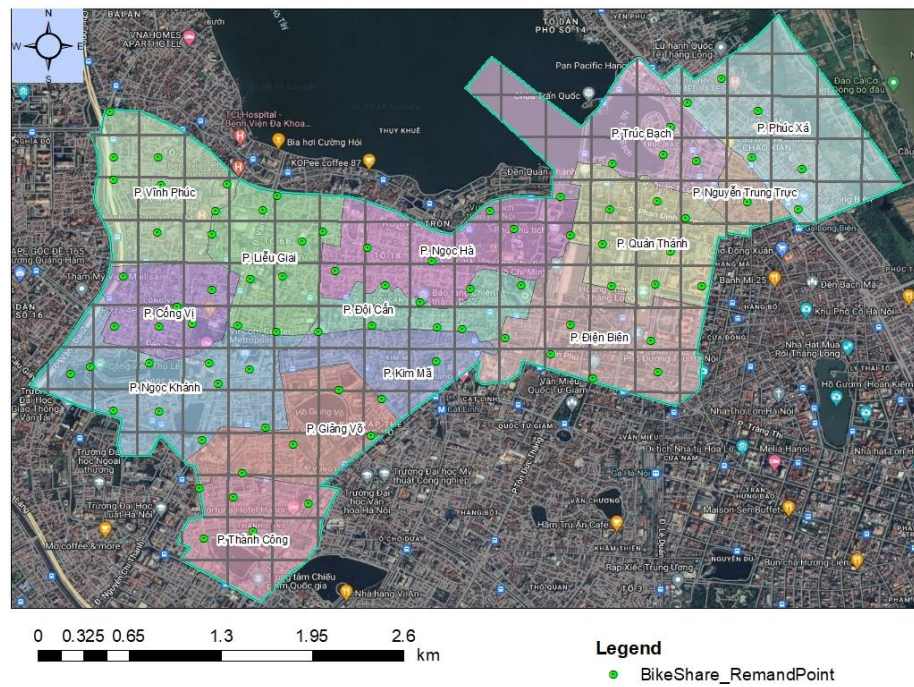


Figure 62: Shared two wheeler station along the bus route in Ba Dinh district

**b. Station Location at demand points**

The total number of determined stations is 85 that is close to demand points (Appendix 3.8)

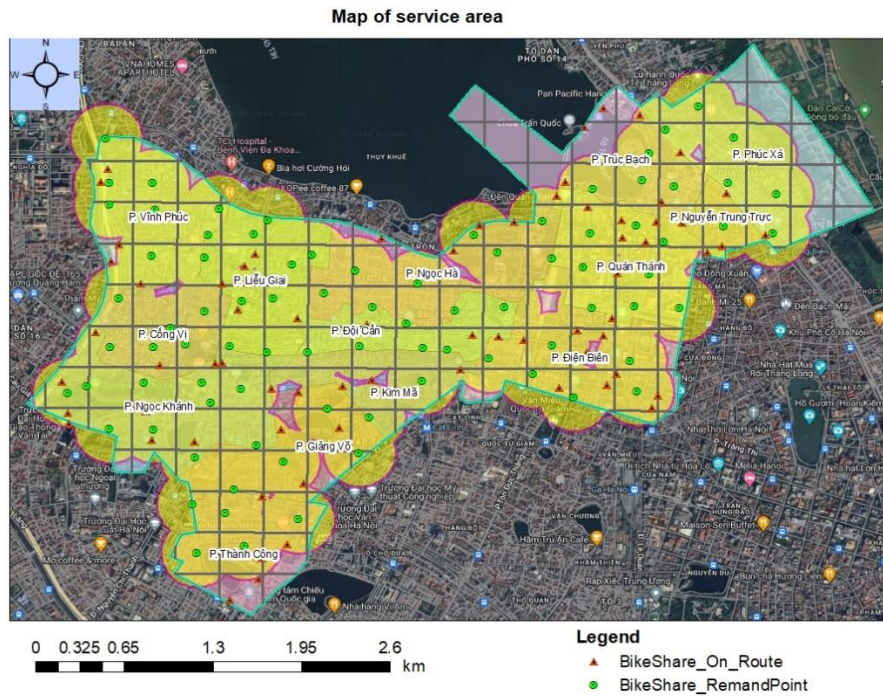
Map of shared two wheeler at the demand points



**Figure 63:** Shared two wheeler station at demand points in Ba Dinh district

**c. Service area**

The total number of stations in Ba Dinh District is 155, resulting in a density of approximately 17 stations per square kilometer. Using 250-meter buffers around each station, the service area for shared two-wheelers covers more than 90% of the district's population and residential areas.



**Figure 64:** Shared two wheeler service area in Ba Dinh district




The locations of the planned stations are posted on Google map and can be accessed by scanning a QR code:




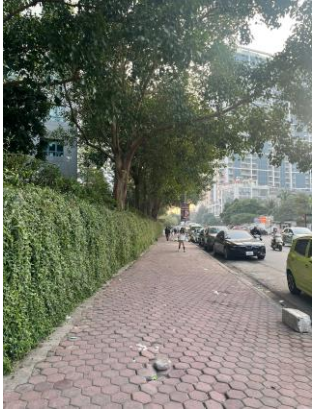




### 5. Site surveying and adjusting the map according to the actual conditions in a sample area of Hanoi City

The initial locations of shared two-wheeler stations are determined remotely, with coordinates identified on the map. However, these preliminary locations may not always meet the set criteria, necessitating a field survey for adjustments. The planning map is made available on Google Maps, and during field surveys, navigation tools can be used to locate each proposed station. If a station location proves unsuitable, the location needs to be adjusted, and new coordinates recorded to update the planning map accordingly. Below are some examples illustrating the process of surveying and adjusting planning points in the field.

No	Preliminary position	Location characteristics	Adjusted coordinates	Remark
1	20.98411, 105.79317	In front of residential houses, the sidewalk does not meet the required area	20.983799, 105.79276	



No	Preliminary position	Location characteristics	Adjusted coordinates	Remark
2	20.97812, 105.79577	In front of residential houses, the sidewalk does not meet the required area, and the area has few passersby	20.97814, 105.7970080	
3	20.97698, 105.79141	The sidewalk is not wide enough for pedestrians and people exercising	20.976449, 105.79014	
4	20.98107, 105.78942	The sidewalk in the area is adequate, and the coordinates are accurately adjusted	20.981105, 105.789368	
5	20.9877, 105.78602	The sidewalk does not meet the required area, and the road is a dead end	20.987508, 105.784649	

No	Preliminary position	Location characteristics	Adjusted coordinates	Remark
6	20.98463, 105.77467	Adjust the coordinates	20.98482965, 105.77465097	
7	20.98213, 105.76966	Adjust the coordinates	20.981657, 105.769095	

## 6. Recommendations

"The master plan for the shared two-wheeler stations in 10 central districts of Hanoi City" is an important research outcome conducted by the University of Transport Technology under the EU funded SolutionPlus project. The study aims to assist Hanoi in deploying and developing effective shared electric two-wheeler services, which will connect people to public transportation, improve the efficiency of public passenger vehicles, reduce the number of personal vehicles, and lower greenhouse gas emissions and pollutants from internal combustion engine vehicles.

To effectively implement this master plan, the research team recommends the following:

### For SolutionPlus:

- Expedite the release of the two products developed by the University of Transport Technology: (1) The master plan for the shared two-wheeler stations in 10 central districts of Hanoi City, and (2) The policy advice paper for shared electric two-wheeler services in Hanoi.
- Submit a document to Hanoi City containing these two products, recommending that the city study and consider applying them.

### For the Hanoi City:

1. The Hanoi People's Committee has issued a directive assigning the Hanoi Department of Transport to take the lead and coordinate with relevant departments and branches to study the contents of the two aforementioned products. Their task is to propose a policy or plan for developing shared electric two-wheeler services in Hanoi. This proposed draft policy or plan should encompass the following main aspects:
  - (1) Definitions and concepts related to the shared electric two-wheeler system;
  - (2) Roles, positions, and functions of the parties involved in the shared electric two-wheeler system in Hanoi;
  - (3) A development plan for shared electric two-wheeler systems in each district, including a design proposal for the locations of borrowing/returning stations in each district;
  - (4) Infrastructure regulations, including coverage areas, station density, fleet size, charging station requirements, and station design specifications;



(5) Specifications for the electric two-wheelers used in the city's shared system, including shape, size, color, safety features, vehicle accessories, helmets, etc., as well as guidelines for vehicle repair and redistribution between stations;

(6) Technology requirements for system operation management, such as information platforms, GPS tracking, mobile apps, QR code scanning, etc.;

(7) Guidelines for the management and operational model of the shared electric two-wheeler system in Hanoi, along with supporting financial policies;

(8) Procedures for bidding on investment and operational rights for the shared electric two-wheeler system;

(9) Communication strategies, capacity-building training, advertising guidelines, and regulations for scientific research and international cooperation in the development of shared electric two-wheelers.

2. Once the proposed Draft Policy or Plan for the shared electric two-wheeler services in Hanoi is finalized, the city will select a pilot operator to conduct a trial in one district, as outlined in the Draft Policy. This pilot operator will use the design for the borrowing/returning stations to establish a project for deploying a shared electric two-wheeler system in the designated district. During the project development process, the pilot operator must organize meetings with relevant stakeholders to reassess the station locations and ensure that all conditions meet the requirements outlined in the Draft Policy.
3. The Department of Transport will oversee the assessment of the pilot operator's compliance with the necessary conditions. If the requirements are met, the Department will submit a proposal to the Hanoi People's Committee for permission to conduct a pilot program lasting approximately 6 months to 1 year. This pilot period will allow for a re-evaluation of all aspects related to shared electric two-wheelers and provide a basis for establishing technical and economic standards, as well as unit prices, to facilitate the bidding process in accordance with the law.

This will be a toll-based pilot program, and Hanoi may offer certain incentives, such as exemptions and reductions in land use fees and certain taxes, based on the pilot operator's proposals and in compliance with current laws.

4. The results of the pilot program will serve as the foundation for Hanoi to finalize the policy or plan for developing "shared electric two-wheelers in Hanoi."

5. Upon finalizing the policy or plan, the city will issue it and conduct open bidding to select qualified contractors to implement shared electric two-wheeler services in each district of Hanoi.

**For the University of Transport Technology:**

- Upon receiving the document from SolutionPlus, the University will submit two products to the Hanoi People's Committee through the Hanoi Department of Transport: (1) The master plan for the shared two-wheeler stations in 10 central districts of Hanoi City, and (2) The policy advice paper for shared electric two-wheeler services in Hanoi.
- The University will continue to provide consultation to Hanoi City within the scope of authority and responsibility granted by SolutionPlus.

## References

1. Plan 201/KH-UBND dated October 16, 2020 "Development of public passenger transport in the city, period from 2021 to 2030
2. Notice No. 64/TB-UBND of Hanoi People's Committee in 2022 (population)
3. Circular 10/2022/TT-BTNMT, Promulgating the List of residential, landscape, hydrological, economic and social place names to serve the work of creating a map of Hanoi city,
4. Bus station statistical data of Hanoi Department of Transport, 2024
5. ITDP, Bikeshare Planning Guide, 2018



