



12th International Conference  
Sustainable Urban Development

**"Housing for All: Affordability, Inclusivity, and Sustainability"**

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# HOUSING DEVELOPMENT ORIENTATION INTEGRATED WITH URBAN RAIL TRANSIT SYSTEM IN NHA BE COMMUNE, HCMC

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# PRESENTATION OVERVIEW

- 1.Introduction
- 2.Research Objectives
- 3.Methodology
- 4.Literature Review
- 5.Results
- 6.Conclusion
- 7.Q&A



An aerial rendering of a modern urban development. It features a large, curved, white-roofed structure with 'GA KHO B' written on its side, surrounded by greenery, a river, and a bridge. The scene is set against a backdrop of tall city buildings.

# 1 INTRODUCTION

# 1. INTRODUCTION



## 1.1. CURRENT POPULATION AND HOUSING CONDITIONS IN NHA BE COMMUNE

### SUSTAINABLE DEVELOPMENT GOALS



Make cities and human settlements inclusive, safe, resilient, and sustainable. **Housing is identified as a key target**, with the aim of ensuring access for all to adequate, safe, and affordable housing and basic services.

### IN THE HCMC CONTEXT

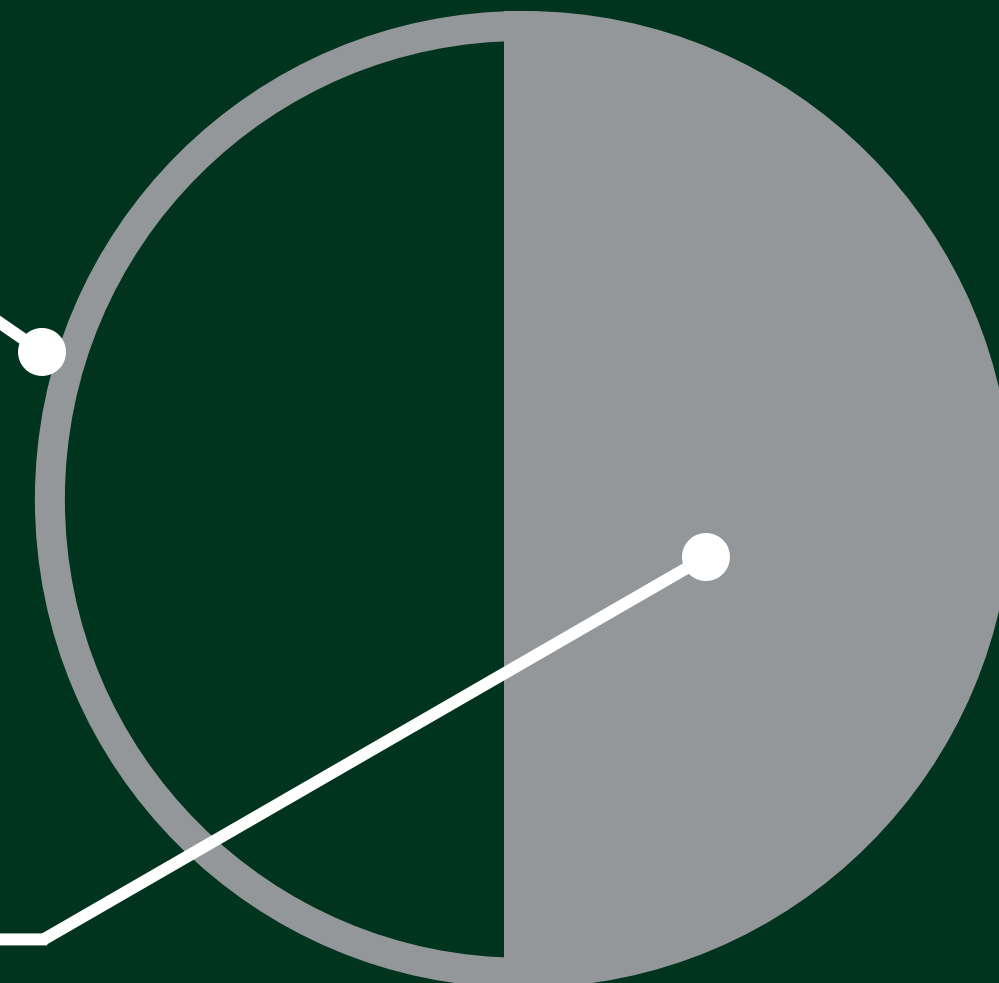
According to the Ho Chi Minh City Federation of Labour

70%

Migrant enterprise workforce

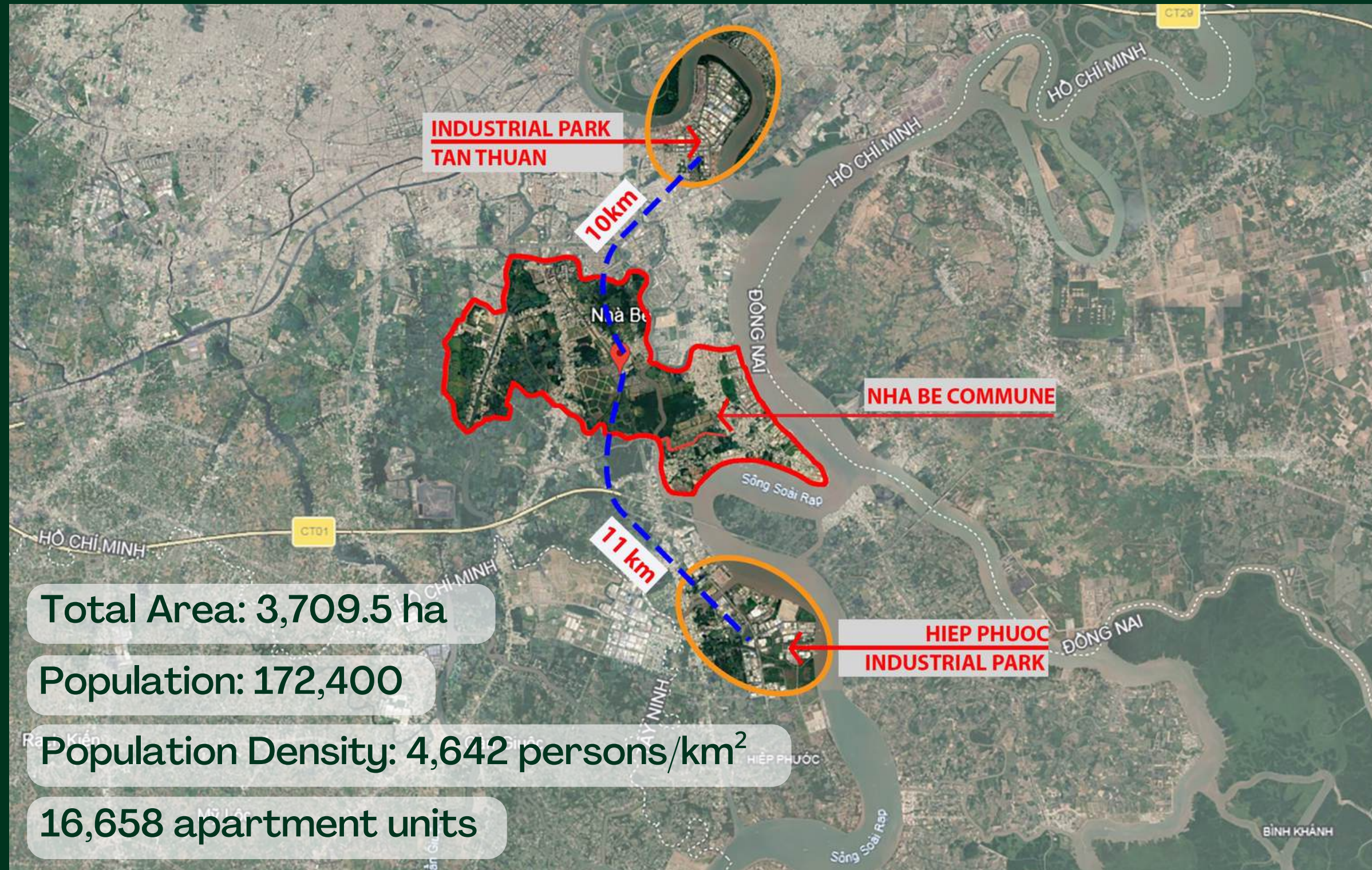
1.3M

People have an urgent need for stable housing



# 1. INTRODUCTION

## CONTEXT OF METRO SYSTEM DEVELOPMENT IN NHA BE COMMUNE



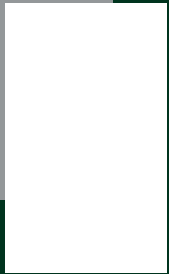
Location of Nha Be Commune in Southern Ho Chi Minh City



Urbanization along Chanh Hung Street



Urbanization along Nguyen Huu Tho Street



# 1. INTRODUCTION



## CONTEXT OF METRO SYSTEM DEVELOPMENT IN NHA BE COMMUNE

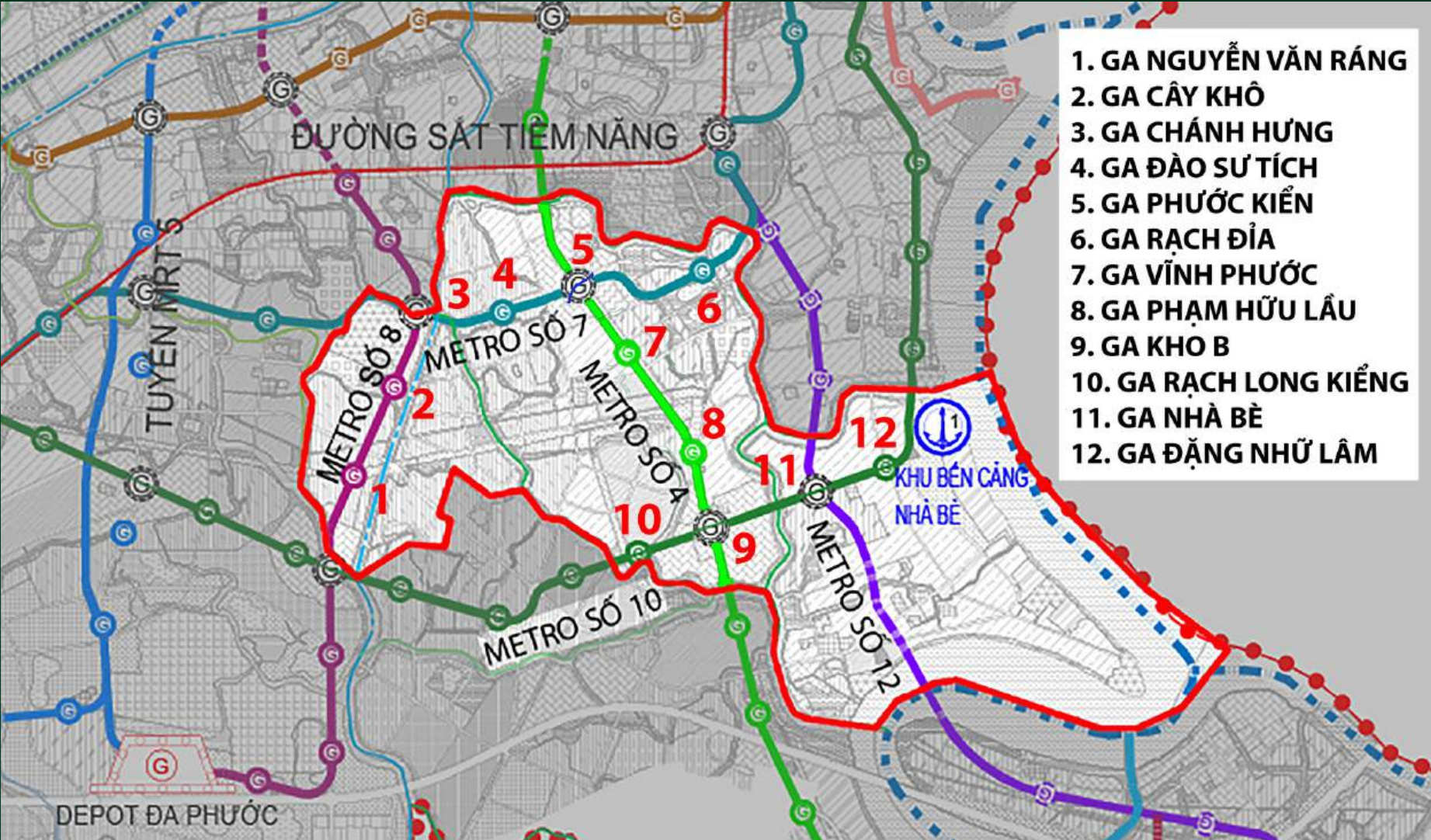


Table 1. Roles of Metro Lines in Housing Development

| Metro Line    | Role                            | Key Stations                                | Expected Impacts on Housing Development      |
|---------------|---------------------------------|---------------------------------------------|----------------------------------------------|
| Metro Line 4  | North–South urban rail corridor | Phuoc Kien, Vinh Phuoc, Pham Huu Lau, Kho B | Primary housing development corridor         |
| Metro Line 7  | East–West urban rail corridor   | Phuoc Kien, Chanh Hung                      | Strengthened housing–employment connectivity |
| Metro Line 8  | Regional connectivity corridor  | Nha Be                                      | Enhanced role as a transit interchange       |
| Metro Line 10 | Orbital metro line              | Kho B, Nha Be                               | Formation of new urban centers               |
| Metro Line 12 | Coastal development corridor    | Nha Be                                      | Formation of new urban centers               |

● **12 LINES** ● **582 KM** ● **5 LINES** ● **12 STATIONS** ●

Line 4: Connect Dong Thanh (Hoc Mon) with Hiep Phuoc Port along the Nguyen Huu Tho corridor

Line 12 : Connect Ben Thanh with the Can Gio coastal reclamation urban area

Line 7, 8, 10 : inter-regional metro lines

An aerial view of a modern urban development. In the center is a large, modern train station with a curved, white, wave-like roof. The station is surrounded by green spaces, including a large circular park with a fountain. To the left, a train is visible on an elevated track. In the background, there are several tall, modern high-rise buildings. The overall scene depicts a sustainable and modern urban environment.

# 2 RESEARCH OBJECTIVES



## 2. OBJECTIVES



Based on the above research gaps, this study pursues the following objectives

### TOD-Oriented Housing in Nha Be Commune

Integrating housing spatial organization with metro accessibility.



### Green-Blue Infrastructure Integration

Connecting green spaces and waterways to enhance ecological resilience.



### Flood-Resilient Housing Adaptation

Adapting housing models to low-lying terrain and flood risks.



**1** To establish orientations for developing a TOD-based housing system around metro stations in Nha Be Commune

**2** To integrate residential areas with mixed-use urban spaces serving residents in the southern part of Ho Chi Minh City

**3** To organize residential space in coordination with green-infrastructure solutions that respond to Nha Be's riverine characteristics and contribute to SD

An aerial view of a modern urban development. In the foreground, there's a large, curved, white-roofed train station with the text "GA KHO B" on its side. A train is visible on the tracks. To the right of the station, there's a large green area with many trees and a winding path. A river flows along the right side of the image. In the background, there are several tall, modern apartment buildings. The overall scene is a mix of urban infrastructure and green spaces.

# 3 METHODOLOGY

# 3 . RESEARCH METHODOLOGY



1

**Existing-condition and  
contextual analysis**

Planning documents and data on land use, population, and flooding in Nha Be Commune were collected and synthesized, together with field surveys along the planned metro corridors. This analysis identifies urban morphological characteristics, developable land resources, and the relationship between the metro system and the riverine landscape, thereby providing a basis for proposing housing models along the metro lines.



2

**Synthesis and statistical  
analysis**

Data on flooding, population, and planned metro lines were compiled to support housing-development orientations for the working population of Nha Be Commune in the context of metro-network expansion.



3

**Case-study analysis  
Literature Review**

Integrated housing models in TOD areas in Punggol, Singapore, and Tama Den-en-toshi, Japan, were examined to derive principles for combining housing development with green-blue infrastructure, conserving canal systems, and increasing water-storage capacity to mitigate flooding and support sustainable development in Nha Be.



4

**Delopment of a housing  
spatial-organization  
model**

Based on the analytical results, the study develops a housing model along the metro corridors, integrates an adaptive landscape model reflecting Nha Be's riverine identity, and proposes a representative station-area model to illustrate the potential for housing development around a metro station.



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# 4 LITERATURE REVIEW

INTERNATIONAL CASE STUDIES OF METRO-INTEGRATED  
HOUSING DEVELOPMENT



# 4. LITERATURE REVIEW

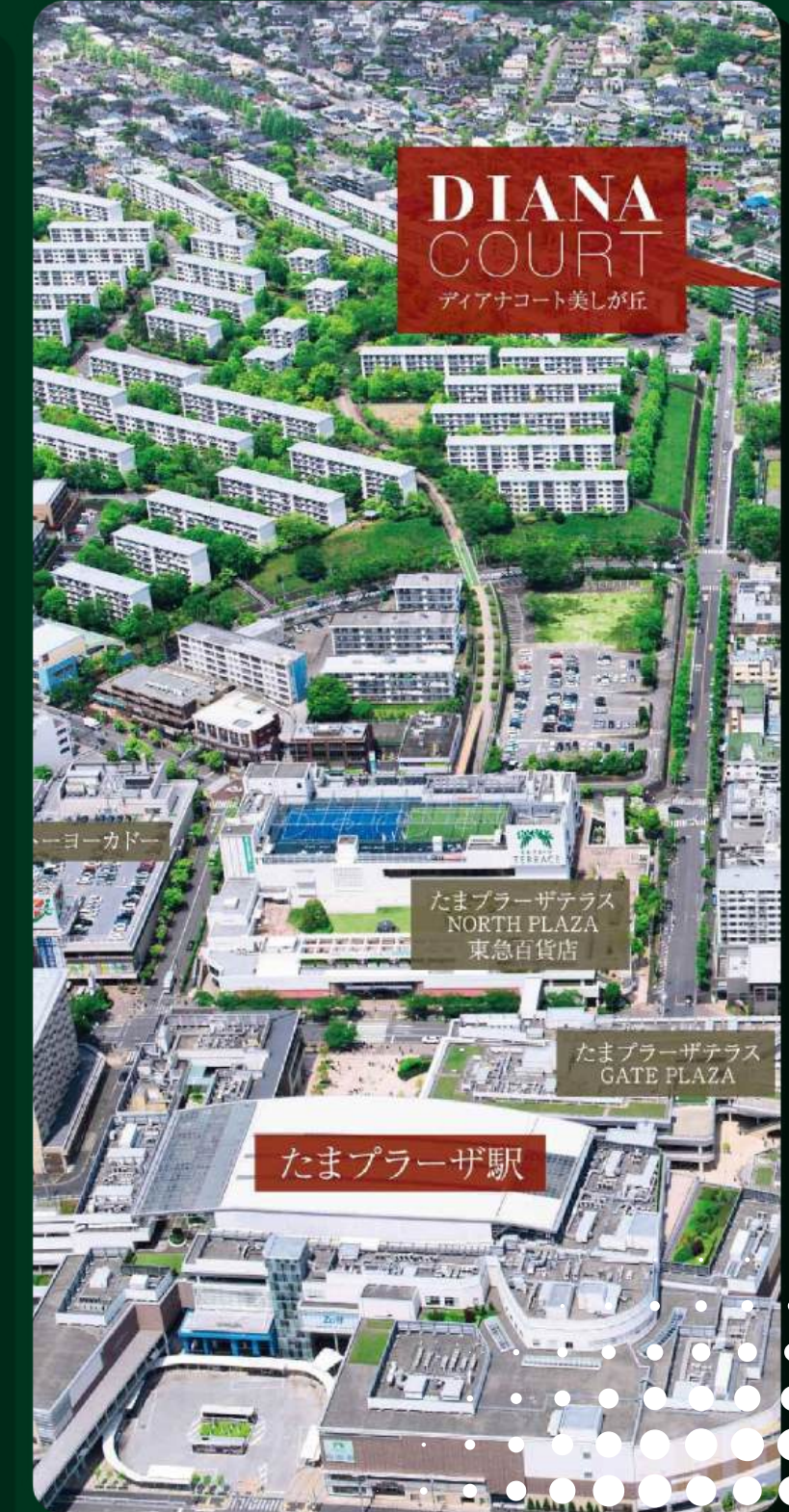
## INTERNATIONAL CASE STUDIES OF METRO -INTEGRATED HOUSING DEVELOPMENT



**1** Housing Development Model  
in Punggol, Singapore

**2** Housing Development Model  
in Tama Den-en-toshi, Japan

**3** Synthesis of Lessons for  
Metro-Integrated Housing  
Development in Nha Be



# 4. LITERATURE REVIEW



## HOUSING DEVELOPMENT MODEL IN PUNGGOL, SINGAPORE

### The Punggol Town Design Guide

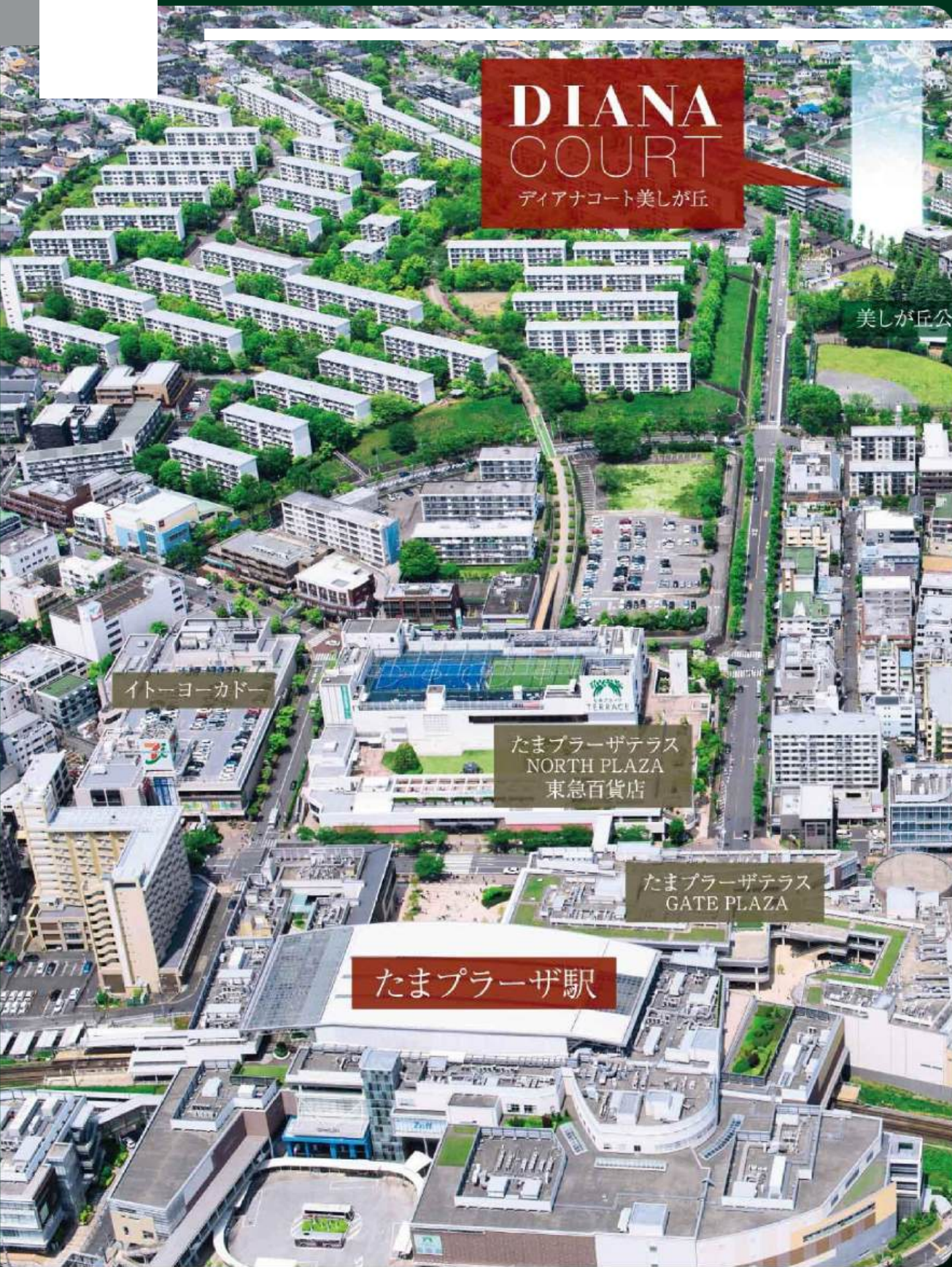
- ▶ WALKABLE NEIGHBORHOODS
- ▶ CONNECTIVITY TO GREEN-BLUE NETWORKS
- ▶ CYCLING INFRASTRUCTURE

Housing developments such as Waterway Terraces and Waterway Ridges are arranged along Punggol Waterway, creating a direct spatial relationship among housing, transit, and the waterfront landscape. This configuration is consistent with TOD principles of density, diversity, and public-transport accessibility

### For Nha Be Commune

Organizing high-density residential development around stations according to the principle of ***“compact development around stations, gradually decreasing toward waterways”***.

# 4. LITERATURE REVIEW



## HOUSING DEVELOPMENT MODEL IN TAMA DEN-EN-TOSHI, JAPAN

### Tama Den-en-toshi Design Guide

- ▶ • INTEGRATED DEVELOPMENT OF RESIDENTIAL AREAS AND URBAN RAIL TRANSIT INFRASTRUCTURE
- ▶ • METRO STATIONS AS NUCLEI FOR RESIDENTIAL DEVELOPMENT
- ▶ • CORRIDOR-BASED DISTRIBUTION OF RESIDENTIAL CLUSTERS ALONG RAILWAY LINES
- ▶ • INTEGRATION OF MIXED-USE FUNCTIONS

Its railway-oriented urban structure features stations as nuclei for residential clusters integrated with commercial-service functions, schools, public spaces, and pedestrian networks. Residential density is distributed according to station accessibility, forming a transit-oriented development (TOD) corridor that integrates transport, housing, and urban services

### For Nha Be Commune

Residential areas should be developed in an integrated manner around metro stations, incorporating commercial-service functions and public amenities. Housing density should be concentrated around stations and gradually decrease toward rivers and canals to adapt to the distinctive riverine urban landscape of Nha Be.

Tama Den-en-toshi was planned in 1953 as a satellite urban area southwest of Tokyo, covering approximately 5,000 ha, with 3,200 ha developed to accommodate around 400,000 residents



# 4 . LITERATURE REVIEW



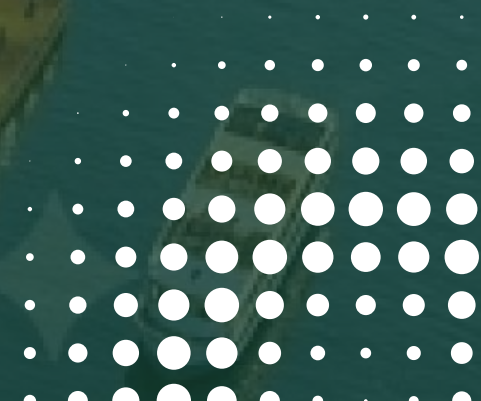
## SYNTHESIS OF LESSONS FOR METRO-INTEGRATED HOUSING DEVELOPMENT IN NHA BE

| Table 2. Synthesis of Lessons for Metro-Integrated Housing Development in Nha Be |                                                     |                                                 |                                                                             |
|----------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|
| Aspect                                                                           | Punggol – Singapore                                 | Tama Den-en-toshi – Japan                       | Planning Implications for Nha Be                                            |
| Development Model                                                                | Public housing integrated with MRT/LRT              | Railway-led TOD                                 | Housing–metro integrated TOD                                                |
| Development Scale                                                                | New town                                            | Railway corridor                                | Integrated station-area and corridor development                            |
| Housing                                                                          | HDB housing organized into residential precincts    | Large-scale residential communities             | Diverse housing typologies with graduated densities                         |
| Transportation                                                                   | MRT + LRT + walking/cycling                         | Den-en-toshi Line                               | Metro Line 4 integrated with the future metro network                       |
| Integrated Functions                                                             | Housing + schools + commercial uses                 | Housing + commercial uses + schools + services  | Housing + employment + social services                                      |
| Green Space                                                                      | Highly significant                                  | Parks and open spaces                           | Green–blue infrastructure                                                   |
| Water System                                                                     | Punggol Waterway as the primary spatial structure   | Not a primary structuring element               | Rivers and canals as key elements of the urban spatial structure            |
| Density                                                                          | Medium to high                                      | Medium, with spatially differentiated densities | High density around stations, gradually decreasing toward rivers and canals |
| Key Lesson                                                                       | Integration of housing + public transport + ecology | Railway corridor-based urban development        | Integration of metro + housing + services + riverine ecology                |



# 5 RESULTS

PROPOSED HOUSING DEVELOPMENT MODEL INTEGRATED  
WITH THE URBAN RAIL TRANSIT SYSTEM FOR NHA BE  
COMMUNE



# 5. RESULTS

## PRINCIPLES FOR HOUSING DEVELOPMENT INTEGRATED WITH THE METRO NETWORK IN NHA BE COMMUNE



### 5 PRINCIPLES FOR HOUSING DEVELOPMENT IN NHÀ BÈ COMMUNE

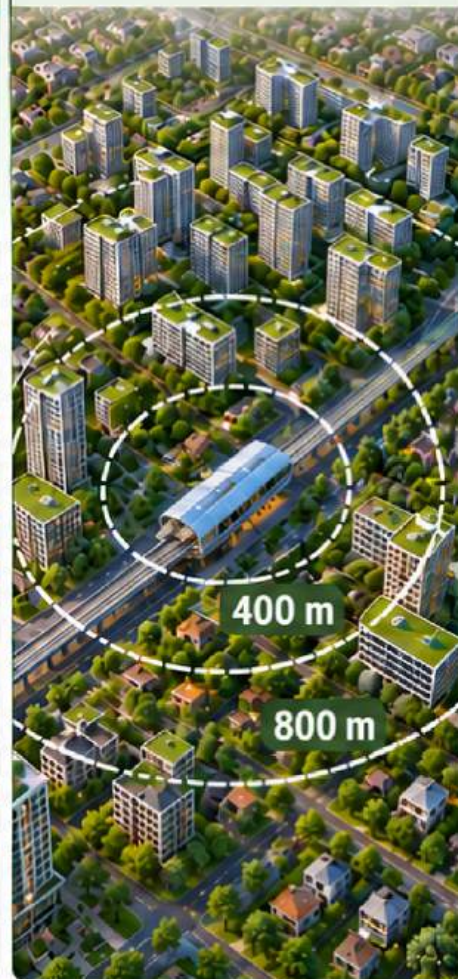
1

HOUSING AS  
A KEY INFRASTRUCTURE  
IN THE TOD SYSTEM



2

ORGANIZE HOUSING  
TO ENSURE WALKING DISTANCE  
TO THE METRO SYSTEM



3

CONCENTRATE HOUSING  
AROUND STATIONS  
AND GRADUALLY DECREASE  
TOWARDS RIVERS AND CANALS



4

CREATE MULTI-FUNCTIONAL  
RESIDENTIAL AREAS



5

DEVELOP HOUSING  
THAT ENSURES PRESERVATION  
OF THE RIVER AND CANAL  
STRUCTURE



**(1) Develop housing as urban infrastructure within the TOD system:** Housing should be regarded as a component of urban infrastructure and developed in coordination with public transport, services, and essential infrastructure.

**(2) Ensure convenient residential access to the metro system:** Residential areas should be organized within convenient station catchments, preferably within approximately 400–800 m, and connected through pedestrian and cycling networks.

**(3) Concentrate housing density around stations and gradually reduce it toward waterways:** High-density development should be concentrated in station-area cores to locate residents and urban activities where metro accessibility is greatest, thereby improving land-use efficiency and generating ridership for the metro system.

**(4) Create mixed-use residential areas:** Integrating housing with commercial-service uses and public spaces can shorten distances between homes, workplaces, and public services.

**(5) Conserve the riverine spatial structure in housing development:** Urban development should protect water bodies and maintain green-blue corridors to support water regulation.

# 5. RESULTS



## OVERALL HOUSING DEVELOPMENT MODEL FOR TOD AREAS IN NHA BE COMMUNE

The resulting model establishes a “**Compact TOD Core – Porous Transition Zone – River–Canal Ecological Corridor**” structure.

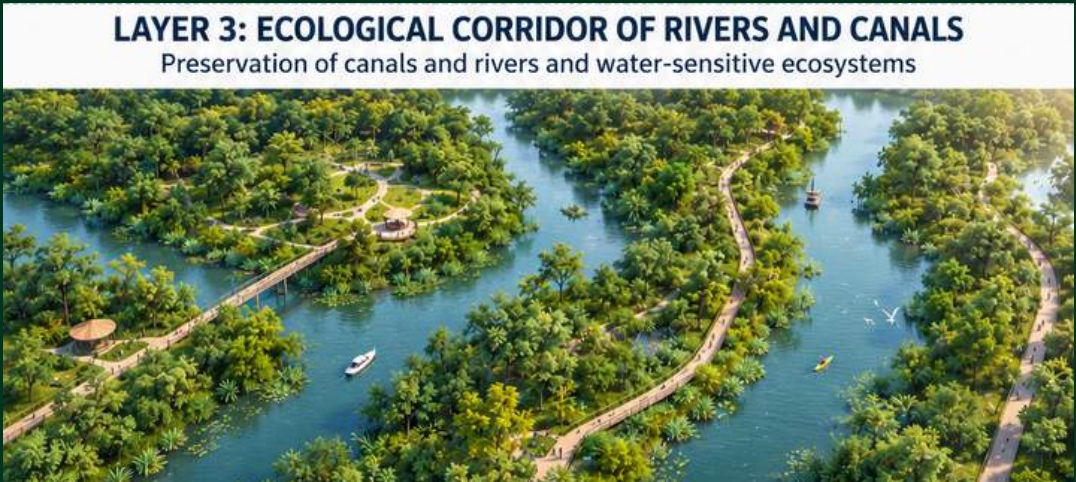
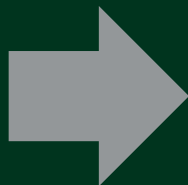
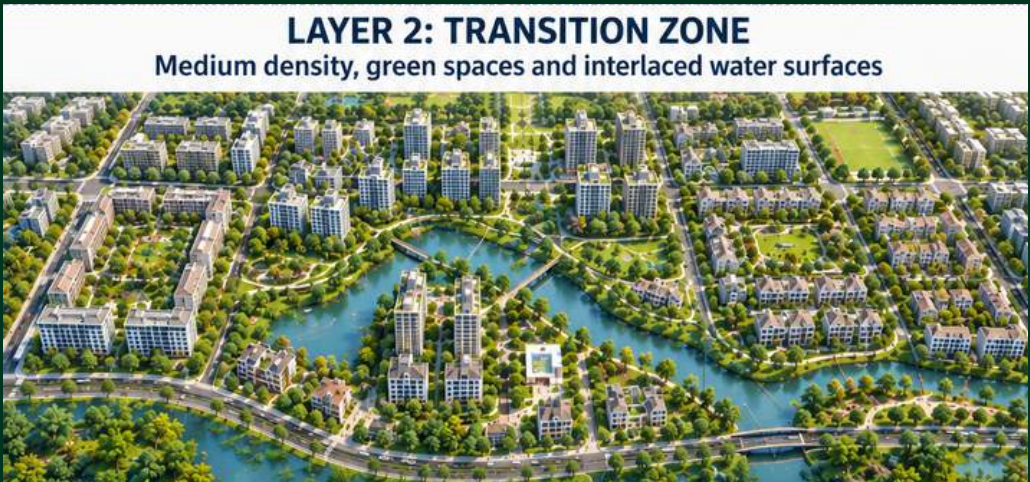
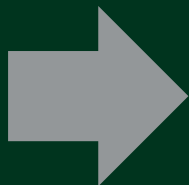


Table 3. Characteristics of the Three Spatial Layers of Housing Development

| Layer                      | Radius / Distance                                 | Building Height      | Development Density  | Primary Functions                                          |
|----------------------------|---------------------------------------------------|----------------------|----------------------|------------------------------------------------------------|
| Layer 1<br>TOD Core        | 0–400 m                                           | High                 | High                 | Housing + Commercial Uses + Employment                     |
| Layer 2<br>Transition Zone | 400–800 m                                         | Medium               | Medium               | Housing + Parks + Water Retention                          |
| Layer 3<br>River Corridor  | Within the designated protection corridor         | Low                  | Low                  | Ecological Functions + Public Space                        |
| Overall Spatial Structure  | Transition from stations toward rivers and canals | Gradually decreasing | Gradually decreasing | TOD Housing + Green–Blue Infrastructure + Riverine Ecology |



# 5. RESULTS

## REPRESENTATIVE HOUSING DEVELOPMENT MODEL ALONG METRO LINE 4 IN NHA BE COMMUNE



CENTRAL STATION

HIGH LEVEL

HIGH-RISE

HIGH-DENSITY

commercial-service uses,  
offices, employment, and  
public amenities

RESIDENTIAL FUNCTION

SOCIAL INFRASTRUCTURE

residential areas, educational  
facilities, healthcare services,  
public spaces,...



RESIDENTIAL STATIONS

INTEGRATED HOUSING

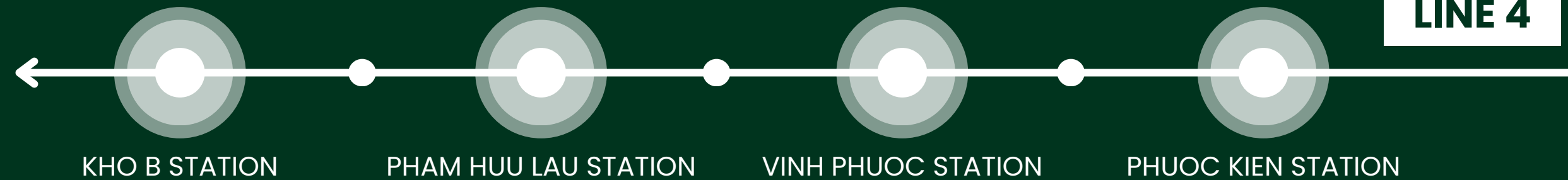
ECOLOGICAL FUNCTIONS

SPONGE CITY

Housing is developed in  
integration with commercial-  
service uses, public spaces



MIX - USE STATION



# 5. RESULTS

## HOUSING DEVELOPMENT MODEL AROUND KHO B STATION



KHO B STATION

LINE 10

LINE 4

MIXED-USE

HIGH-RISE

HIGH-DENSITY

HIGH LEVEL OF REGIONAL  
CONNECTIVITY

SUBSTANTIAL GREENERY

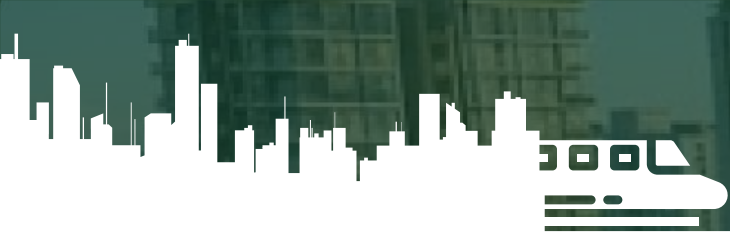
NETWORK OF CANALS

RIVERFRONT  
ECOLOGICAL FUNCTIONS



The mixed-use character of Kho B Station is developed with housing as the principal function. Plazas, sponge parks, urban-agriculture areas, and waterfront spaces are interwoven with commercial-service, recreational, tourism, experiential, and educational activities. These functions simultaneously create a transition from high-density station-area housing to the river-canal ecological corridor





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# 6 CONCLUSION



# CONCLUSION

- This study contributes to establishing orientations for a housing system integrated with urban rail transit in Nha Be Commune by leveraging metro accessibility while responding to the area's low-lying terrain and dense river–canal network.
- The study establishes five principles for metro-integrated housing organization and proposes a model at three spatial scales. At the commune scale, housing is organized according to a three-layer structure: “Compact Station–Area Core – Porous Transition Zone – Natural River–Canal Ecological Corridor.” At the metro–corridor scale, Metro Line 4 is selected as the representative case, with stations classified as central, residential, or mixed-use stations to guide appropriate housing–development forms. At the station–area scale, Kho B, a mixed-use station, is selected as the representative TOD area for a housing model that combines multiple functions while ensuring connections among housing, the metro system, public spaces, and ecological–experiential activities.
- Overall, the study proposes a housing–development structure that concentrates mixed-use development around metro stations and progressively reduces development intensity toward rivers and canals. This approach contributes to more efficient land use, improved public–transport accessibility, and sustainable urban development in Nha Be Commune.

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**THANK YOU  
FOR YOUR  
ATTENTION**

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