

*Prosperity Fund*

GLOBAL FUTURE CITIES PROGRAMME

# HO CHI MINH CITY

CITY CONTEXT REPORT



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Global Future Cities Programme  
HO CHI MINH CITY  
City Context Report

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# CONTENTS

<b>GLOBAL FUTURE CITIES PROGRAMME</b>	<b>4</b>
<b>Introduction</b>	<b>4</b>
About The Global Future Cities Programme	
Intervention Development and Validation	
The City Context Report	
<b>Ho Chi Minh City</b>	<b>9</b>
General Context	
Problem Statement	
Introduction to the Interventions	
<b>URBAN ANALYSIS</b>	<b>12</b>
<b>Spatial Analysis</b>	<b>12</b>
Rapid Expansion of Ho Chi Minh City	
Existing Condition of the Mobility System	
Public Transportation Challenges	
Existing Condition of Hydrological Systems	
<b>Financial Analysis</b>	<b>22</b>
Local Fiscal Capacity	
Restrictions on Capital Investment	
Smart Ticketing System of Transport Network	
Development of GIS System for Underground Drainage	
<b>Legal Analysis</b>	<b>26</b>
Transport Governance Structure	
Flooding Resilience Governance Structure	
Interventions' Alignment to Existing Plans and Policies	
Legal Framework for Public-Private Partnerships	
<b>INTERNATIONAL ALIGNMENT AND TECHNICAL RECOMMENDATIONS</b>	<b>28</b>
<b>Potential Impact of the Interventions</b>	<b>28</b>
Short-term Outcome	
Medium-Term Outcome	
Long-term Potential Impact	
<b>Contribution to Sustainable Urban Development</b>	<b>30</b>
2030 Sustainable Development Goals	
New Urban Agenda Alignment	
Alignment with Cross-Cutting Issues and the Prosperity Fund	
<b>Success Factors</b>	<b>33</b>
Spatial Considerations	
Financial Considerations	
Legal Considerations	
<b>ENDNOTES</b>	<b>36</b>

# GLOBAL FUTURE CITIES PROGRAMME

## Introduction

### ABOUT THE GLOBAL FUTURE CITIES PROGRAMME

In 2015, the UK government created a new Cross-Government Prosperity Fund worth £1.3 billion from 2016-2021, in order to help promote economic growth in emerging economies. Its broad priorities include improving the business climate, competitiveness and operation of markets, energy and financial sector reform, and increasing the ability of governments to tackle corruption.

Emerging Economies still face considerable challenges such as uncontrolled urbanisation, climate change and high and persistent inequality which can lower long-term growth prospects. The Prosperity Fund supports the broad-based and inclusive growth needed to build prosperity and reduce poverty, but also make development overall more sustainable through the strengthening of Institutions and Improvement of the global business environment.

The Global Future Cities Programme (GFCP) is a specific component of the Prosperity Fund which aims to carry out targeted interventions to encourage sustainable urban development and increase prosperity whilst alleviating high levels of urban poverty. The programme will also create significant short and long-term business opportunities in growing markets, forecast to be regional growth hubs, including for UK exporters who are world recognised leaders in urban innovation.

The overall strategy of the Global Future Cities Programme is to deliver the Programme in two phases; a strategic development phase (2018), followed by an implementation phase (2019-2021). UN-Habitat, in collaboration with the International Growth Centre (IGC) and the UK Built Environment Advisory Group (UKBEAG), has been mandated by the UK Foreign and Commonwealth Office (UK FCO) to develop and undertake the strategic development phase. This in turn, will inform and shape the implementation phase,

and collectively provide further evidence for the overall programme.

The Programme builds upon a coherent series of targeted interventions in 19 cities across 10 countries, to support and encourage the adoption of a more sustainable approach to urban development. In general, the proposed interventions aim to challenge urban sprawl and slum developments, thereby promoting more dense, connected and inclusive cities that in combination contribute to prosperity, achieving the Sustainable Development Goals (SDGs) and implementing the New Urban Agenda (NUA).

The Global Future Cities Programme builds upon three integrated pillars, that will address key barriers to prosperity, in selected cities:

- **Urban planning** – technical assistance for spatial restructuring (Public space, Heritage and urban renewal, Urban strategies and plans, Data systems for integrated urban planning);
- **Transportation** – technical assistance to support cities to develop integrated transport systems (Multi-modal mobility strategies and plans, Data systems for multi-modal mobility);
- **Resilience** – technical assistance to develop strategies to address the impact of climate change and ensure development is sustainable (Flood management plans and systems).

In order to capitalize on the proposed interventions and to ensure sustainability and impact in a longer-term perspective, the programme has a strong focus on technical support and institutional capacity development.

In many of the interventions, there is a particular focus on the potential of embedding smart/digital technology and data analysis platforms in urban governance and management processes. Integrating smart technologies is recognized as an instrumental area that significantly can improve the efficiency in the provision of key infrastructure services, enhance urban resilience, support evidence-based plans and strategies and promote integrated planning approaches across sectors.

### INTERVENTION DEVELOPMENT AND VALIDATION

Based on initial scoping studies and government-to-government engagement carried out by UK FCO, the UN-Habitat team worked with partner local authorities and wider stakeholders to corroborate their city development strategies, and to confirm, enhance and develop the intervention proposals.

In each city, a Local City Specialist, supported by the national and regional country offices of UN-Habitat



and in liaison with the FCO local posts, took the lead in identifying stakeholders in a series of bilateral meetings, interviews and focal group discussions. This has collectively gathered information and provided more detailed knowledge and information on the City's visions and goals.

Based on this initial phase, a Charrette (planning workshop) involved high-level decision-makers from the public and private sectors together with civil society representatives. This facilitated discussion on the proposed and possible alternative interventions, related individual interests, technical opportunities and constraints, as well as political objectives. The outcome of the Charrette provided clarity on where stakeholders stand in relation to the strategic potential of the discussed projects and it allowed for the mobilisation of support.

At the same time, the Charrette allowed for the technical teams to proceed with the development of a Terms of Reference, outlining the specific scope and activities of each intervention. A final Validation Workshop assured consensus on the proposed projects and document's endorsement by the authorities.

Parallel to preparing the Terms of Reference, an evaluation of the interventions was initiated, aiming to address its feasibility within the local strategic context, identify potential impact on prosperity barriers and to explore the optimal delivery models. This process resulted

in a set of City Context Reports as well as an analysis of the technical viability of the interventions. The analysis aimed at both informing the development of the Terms of Reference and the future implementation phase of the Programme.

## THE CITY CONTEXT REPORT

### Objectives

A City Context Report is provided for each city of the Global Future Cities Programme. It serves as a tool to frame the proposed Programme interventions within the characteristics and pre-conditions of each city.

The Report targets a variety of stakeholders in the Programme: administrators, city managers, policy makers, legislators, private sector actors, donors, and local as well as international researchers and knowledge generators. The Reports also provide UKFCO the contextual setting of each proposed intervention, and can in addition, be used by the Service Providers as an entry point for the implementation phase.

By addressing the specific challenges facing each city, the Report illustrates how the interventions can work towards inclusive prosperity and sustainable urban development. The benefits of each intervention, however, cannot be achieved without certain enabling conditions to ensure its success. Therefore, critical aspects for the delivery of the proposed interventions and its success from a long-term perspective are outlined. Using thematic

best practices and evidence from global learnings and research, contextualised recommendations are provided on the conditions necessary for the intervention to be viable and to reach a maximum impact.

Essentially, the City Context Report serves to ensure that all actors within the Global Futures Cities Programme are aware of the specific conditions to be considered in the delivery of the proposed interventions, on a case-by-case basis.

### Set-up and Scope

The first part of the City Context Report (General Overview) provides an overview of the Global Future Cities Programme and introduces the city from the perspective of the urban challenge which the proposed intervention intends to address.

The second part of the Report (Urban Analysis) more critically and technically analyses a selection of factors which need to be considered or to be in place for the intervention to succeed, addressing its feasibility, potential impact on prosperity barriers from a long-term perspective.

The third part of the Report (International Alignment and Technical Recommendations) presents short- and mid-term expected outcomes as well as long-term potential impacts. It further elaborates the contribution of the intervention to the achievement of the SDGs and the implementation of the New Urban Agenda as well as the programme objectives of the Prosperity Fund.

As the City Context Report is tailored directly to the Programme interventions, the analysis does not aim to comprehensively present all aspects of urban development. It does not elaborate on long term planning and transformation strategies, the effectiveness of policy or urban legislation, nor the entire municipal financial system. As such, it also excludes urban policy recommendations.

However, the Report has the scope to illustrate the general capacity of the city for project delivery, and in this regard, make recommendations to support implementation of the interventions and reaching set goals. The City Context Reports will be part of knowledge management for the Programme to generate local information and data on the cities as well as identify gaps in knowledge, systems or governance.

### Methodology

#### Urban Analysis

The City Context Report provides a general analysis of the spatial, financial and legal conditions in the city that

can either facilitate or hinder the implementation and the long-term sustainability of the proposed interventions in transport, resilience and urban planning.

This framework follows UN-Habitat's three-pronged approach, recognising the three essential components for a successful and sustainable urbanisation: 1. urban planning and design; 2. urban economy and municipal finance; 3. urban legislation, rules and regulations.

Firstly, the spatial analysis describes the existing urban context specific to the intervention. Urban mobility systems, vulnerability of the built environment, spatial form and trends are considered as possible challenges in urban management that the intervention can address.

Secondly, the financial analysis aims to identify the mechanisms in place by which the intervention could be sustainably financed in the long-run. This section outlines the city's municipal capacity, existing regional, national and international financial ecosystem and existing financing mechanisms at the municipal level.

Thirdly, from a legal perspective, the Report critically analyses how the intervention could be facilitated or challenged by the vision of the city and its governance hierarchy. Enablers and obstacles resulting from any relevant legislation, as well as sectoral frameworks (e.g. strategies, policies, planning frameworks and development plans, detailed plans of relevance) are also described.

This approach aims to offer implementing partners, stakeholders and donors a general context of the city and, with it, demonstrate the appropriateness of the intervention from a spatial, financial and legal point of view, while at the same time informing about potential barriers and enablers for its implementation.

#### Potential Impact to the Program Objectives and the SDGs

The Report also outlines the potential impact of the interventions, based on the specific activities and outputs proposed. Impact can arise from a complex interaction of context-specific factors, rather than as result of a single action, which makes it difficult to empirically quantify longer-run effects that go beyond the identification of program outputs. An empirical, comprehensive impact assessment is therefore not part of the scope of this report.

Nevertheless, the report outlines potential benefits that are only achievable under certain preconditions and activities. Thereby, short-, medium- and long-term outcomes are defined with reference to a project-cycle approach, which considers all the project phases from



*Planning and Design through Building, to Operating and Maintaining.*

Short-term outcomes are directly achieved through the implementation of the technical assistance support, within the 2-3 years scope of the Global Future Cities Program.

Mid-term outcomes are only realised once the intervention is executed through either capital investment, implementation of pilot projects or the actual enactment of legal documents, plans or masterplans, within a possible timeframe of 3 to 7 years.

The broader long-term impact of the interventions is linked to the sustainability of the interventions in a 7-15 years timeframe and relates to the operation and maintenance phase of the project cycle.

The City Context Reports further connect potential impacts to the Programme's objectives, taking into account also the Cross-cutting issues at the core of UN-Habitat's mandate from the UN General Assembly. Consequently, the Programme's objectives are summarized into five principles:

- Climate Change;
- Gender Equality;
- Human Rights;
- Youth;
- Sustainable and Inclusive Economic Growth.

Cross-cutting issues are addressed with explicit reference to the 2030 Sustainable Development Goals (SDGs) and the New Urban Agenda, in an attempt to ensure that the proposed interventions are in line with the design, implementation, review and success of the 2030 Agenda for Sustainable Development. Consistent with UN-Habitat's mandate, the SDG 11 Sustainable Cities and Communities is linked with the urban dimension of the other 16 goals as an essential part of the localisation of the SDGs. In this way, interventions can support localisation processes, to support local ownership and ensure SDG integration in sub-national strategies and plans.

#### Technical Recommendations and International Best Practices

The interventions proposed in the various cities of the Global Future Cities Programme were grouped into clusters according to their thematic entry-point, as an elaboration of the thematic pillars of Urban Planning, Transport and Resilience.

These clusters are:

- Public space
- Heritage and urban renewal
- Urban strategies and plans
- Data systems for integrated urban planning
- Multi-modal mobility strategies and plans
- Data systems for multi-modal mobility
- Flood management plans and systems

Combining the international experience in urban policy and project implementation of UN-Habitat and the leading academic research of IGC, each cluster was analysed to offer evidence-based recommendations for a successful Implementation and a maximised impact of the intervention. Specific reference was given to implemented plans and international best practices.

The recommendations inform the Planning and Design phase which coincides with the timeframe of the Global Future Cities Programme, and always aim for long-term sustainability of the interventions.



Fig. 1. Ho Chi Minh City view from Bitexco Financial Tower (Source: N Roger, Flickr)

# Ho Chi Minh City

## GENERAL CONTEXT

Ho Chi Minh City is the largest city in Vietnam with a population of 8.4 million, exceeding Hanoi, Vietnam's capital (Fig. 2).<sup>1</sup> It is located in the south of Vietnam and is at the core centre of Ho Chi Minh City Metropolitan Area, which has a population that exceeds 20 million, 16 million of whom live in urban areas. The Metropolitan Area consists of Ho Chi Minh City and seven nearby provinces, covering an area of 30,000 km<sup>2</sup> (Fig. 3).<sup>2</sup>

The city is currently undergoing a period of strong economic and population growth; as it is the economic and financial hub of Vietnam, it continues to attract migrants from other provinces. The shift from a Socialist to an open market economy has also encouraged the growth of private enterprises in Ho Chi Minh City (HCMC); it currently accounts for 23 per cent of Vietnam's gross domestic product (GDP) and 20 per cent of foreign direct investment.<sup>3</sup>

Ho Chi Minh City is in an intra-tropical zone and has a relatively low elevation that makes it vulnerable to many of the adverse impacts of climate change. The location of HCMC has also further aggravated the impacts of flooding; being situated along the coast makes the city susceptible to storm surges. Due to the rapid population and spatial growth of the city, future risks are likely to be further exacerbated.

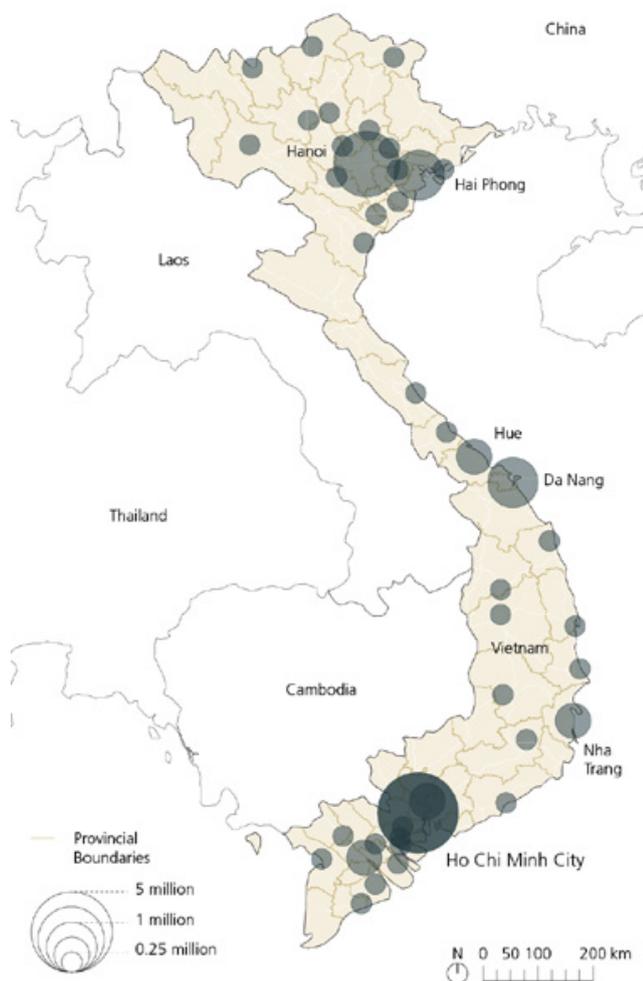


Fig. 2. Ho Chi Minh City, the most populous city in Vietnam

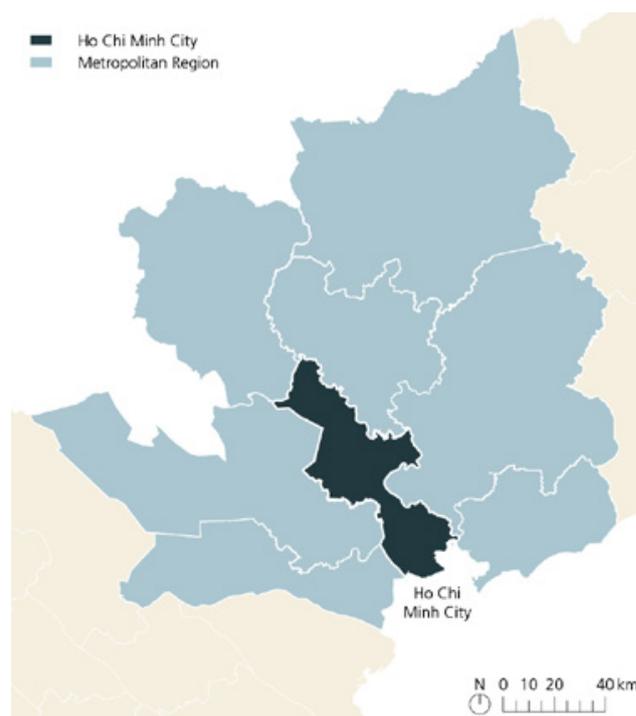


Fig. 3. HCMC's location within the Metropolitan Region



Fig. 4. Ho Chi Minh City Aerial View (Source: Flickr)

## PROBLEM STATEMENT

Ho Chi Minh City (HCMC) currently faces many issues caused by rapid population growth and subsequent land-use change; the most notable being insufficient mobility and flooding. By utilising a participatory process to engage stakeholders and citizens, these two issues were identified due to their adverse impact on the city's prosperity and economic growth.

The city's residents are heavily reliant on motorbikes for transport as they are considered the most convenient by offering door-to-door service and the ability to park anywhere within HCMC. Currently, there is a low use of public transport in the city; only 4 per cent of residents use buses.<sup>4</sup> Apart from the dominance of private vehicles, many residents are dissatisfied by the current coverage of the bus network. The ticketing system also limits public transport use; the current fares are not affordable and do not promote buses.

Ho Chi Minh City (HCMC) ranks among the ten cities most affected by climate change as 45 per cent of land in HCMC is less than 1 metre above sea level.<sup>5</sup> Large parts of the city are exposed to floods on a regular basis, causing economic damage to key infrastructure. Canals and drains have been set up to help mitigate flooding and allow water drainage built during the French era to meet the demand of a population of what was then 2 million.<sup>6</sup> The system has since been expanded but it still does not meet the demand of the growing population.

The current database of drains and canals is facing several issues concerning data management and reliability; it has not been updated regularly to match the current status of the drains and many documents have also been lost or damaged due to the war, resulting in critical gaps. This is crucial as the current system is at the edge of its capacity and, without a database, the city will not be able to expand the canals and drain network.

## INTRODUCTION TO THE INTERVENTIONS

The programme proposes two interventions in the fields of transportation and resilience in order to harness the opportunities provided by rapid urbanisation to support sustainable development and inclusive urban prosperity.

### **Intervention 1: Development of a Smart Ticketing System for Public Transportation Network in HCMC**

The utilisation of public transport in Ho Chi Minh City is very limited, with only 4 per cent of the population relying on buses. There has been interest by Ho Chi Minh City's People's Committee (HCMC-PC) to increase public transport ridership by 2025 to reach 20-25 per cent of the city's transport demand. To achieve that, HCMC-PC adopted a Master Plan for Transport Development to encourage the shift to public transport and has since approved new modes. In order to encourage the use of public transport, the city is expected to have eight new Mass Rapid Transit (MRT) routes, six Bus Rapid Transit (BRT) routes and three monorail routes. However, the lines are currently facing delays due to budget overruns.

With this in mind, the current management centre requires capacity building and support in anticipation for the new routes. There is perceived interest in introducing a smart ticketing system for the current public transport routes; the ticketing system will integrate the bus operators into a single ticketing system and will allow the integration of the upcoming routes (MRT, BRT and monorails).

The smart ticketing system will aim to optimise public transport routes by enhancing collaboration amongst bus operators, while enhancing the reliability of public transport to increase ridership. It will also directly impact the Management Centre of Public Transport (MCPT), the main stakeholder engaged, by building capacity and providing technical assistance through multiple workshops and trainings. It also includes a participatory process by including a public engagement strategy that aims to understand passengers' needs and behavioural changes in response to the new system.

The intervention aims to review and assess fare policies and ticket technologies of the current public transport system and develop a short- to medium-term proposal. It also includes the development of technical documents and a capacity-building plan to facilitate the implementation of the smart ticketing system.

### **Intervention 2: Development of Geographical Information System for the Drainage System in HCMC**

The current drainage system is an integral mechanism for flood mitigation. However, its management has been strained due to issues of data management and reliability. Many documents have been lost or damaged, while others have not been updated to reflect ground conditions. The intervention proposes to digitalise the drainage system's inventory within Ho Chi Minh City.

While the city is currently implementing a first pilot project to develop a digitalised inventory of a specific area, it only covers 8 per cent of the total network. The city currently heavily relies on funding from its budget and international donor agencies (DANIDA, JICA, and World Bank to name a few) for providing data on the drainage system, and a central digitalised inventory that compiles and collects this data is not present. The intervention hence proposes to develop an inventory that compiles the information on the canals and drains network, which is updated regularly. It will provide a framework for the city to expand its network of canals and drains in the future, while also providing technical assistance and mechanisms on data management and sharing between multiple agencies.

The intervention aims to review and assess the current drainage network in order to carry out geologic, hydrologic and topographic surveys of the drainage network. This will then lead to the development of a comprehensive GIS database, which can be used to develop flooding models such as catchment, city and neighbourhood scale. Long-term development strategy is also considered for integrating the data with the city, along with proposing future flood mitigation strategies.

#### **DEVELOPMENT OF A SMART TICKETING SYSTEM FOR PUBLIC TRANSPORTATION NETWORK IN HCMC**

##### **Main Stakeholder**

Department of Transport (DOT)

##### **Possible Project Partners**

- Management Authority for Urban Railways
- Urban-Civil Works Construction Investment Management Authority
- Current Bus Operators (40 in total)
- Upcoming Operators

##### **Thematic Cluster**

Data Systems for Transport Planning

##### **Keywords**

Public Transport, Smart Ticketing System, Urban mobility

#### **DEVELOPMENT OF GEOGRAPHICAL INFORMATION SYSTEM FOR THE DRAINAGE SYSTEM IN HCMC**

##### **Main Stakeholder**

Steering Centre for Flood Control (SCFC)

##### **Possible Project Partners**

DOC, DOT, DARD, DONRE, Committee for Flood & Storm Control

##### **Thematic Cluster**

Flood and Crisis Management Systems

##### **Keywords**

Flooding, Resilience, Data Management, Climate Change

# URBAN ANALYSIS

## Spatial Analysis

### RAPID EXPANSION OF HO CHI MINH CITY

The city has subsequently expanded to accommodate the growing population. The population of Ho Chi Minh City in 1989 was 2.5 million, increasing at a rate of 4 per cent until 1999 and reaching a population of 3.9 million in 1999.<sup>7</sup> The average annual change rate increased to 6.3 per cent, and Ho Chi Minh City's population reached 8.4 million in 2017.<sup>8</sup> Most of the area the city expanded on is agricultural land because of industrialisation policies and, in Vietnam's context, the Doi Moi Policy<sup>9</sup> has compelled many rural landowners to sell high-yield cropland to developers.<sup>10</sup>

This rapid growth has led to an unsustainable urban expansion of HCMC, whereby the city grew from 8,430 hectares in 1989 to 99,391 hectares in 2015. The growth can be witnessed specifically in rural and peri-urban areas (Fig. 5).<sup>11</sup> It can also be observed that the development is concentrated mostly to the northeast of the centre and it has leapfrogged into rural areas, creating new peri-urban areas on the outskirts of the city.

### Masterplan 2025 and Future Growth

In March 2010, the People's Committee of Ho Chi Minh City approved a revised Master Plan to guide the city's development to the year 2025. It designates specific directions for future growth and indicates new transport routes that should be implemented. The Master Plan seeks to accommodate the growing population without building on flood-prone land or encroaching the historical neighbourhoods.<sup>12</sup>

The 2025 Master Plan proposes that future development should take place outside HCMC's urban core, in satellite cities. The location of these satellite cities reflect a consideration of topography and flood-risk; most of these satellite cities are located in areas of higher

topography that responds to future flood risks that face HCMC. However, the Master Plan also reveals the importance of having a reliable public transport system that allows residents to commute between the multiple nodes within the metro area.

There has been a clear shift in the direction of development as reflected in the history of Master Plans approved. The Master Plan for the year 1993 indicated that development should be directed towards the north east. Development direction was later dictated towards the east and the south, as per the Master Plan for the year 2010.<sup>13</sup> The Master Plan for the year 2025 (Fig. 7) suggests a polycentric model, whereby development is encouraged outside HCMC's urban centre to alleviate the pressure on the urban core.<sup>14</sup> This continuous change in direction for future development clearly reflects a lack of synthesis of alternative land use and policies in regards to transportation and housing, discouraging sustainable development.<sup>15</sup>

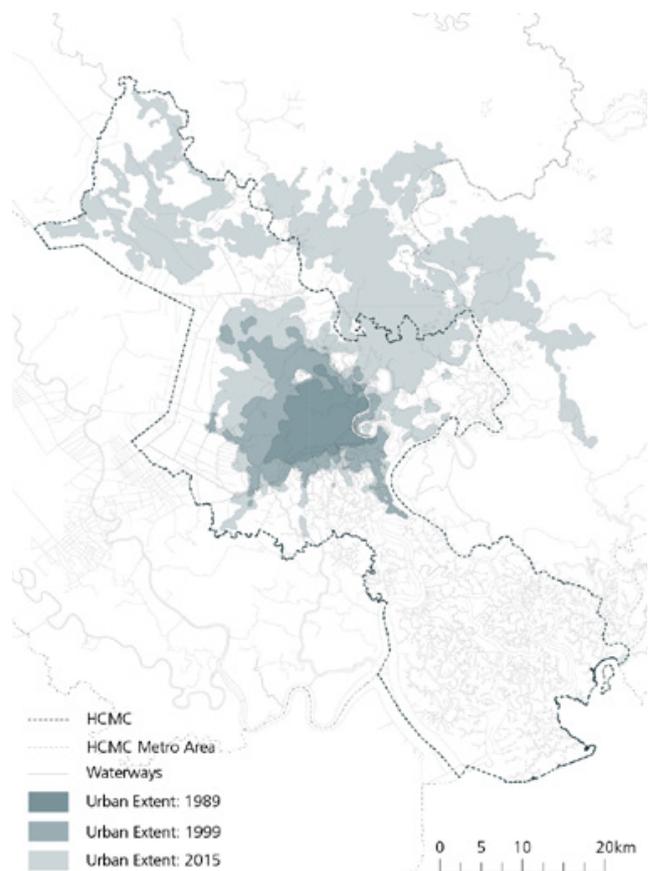


Fig. 5. HCMC's spatial growth has expanded beyond the administrative boundaries

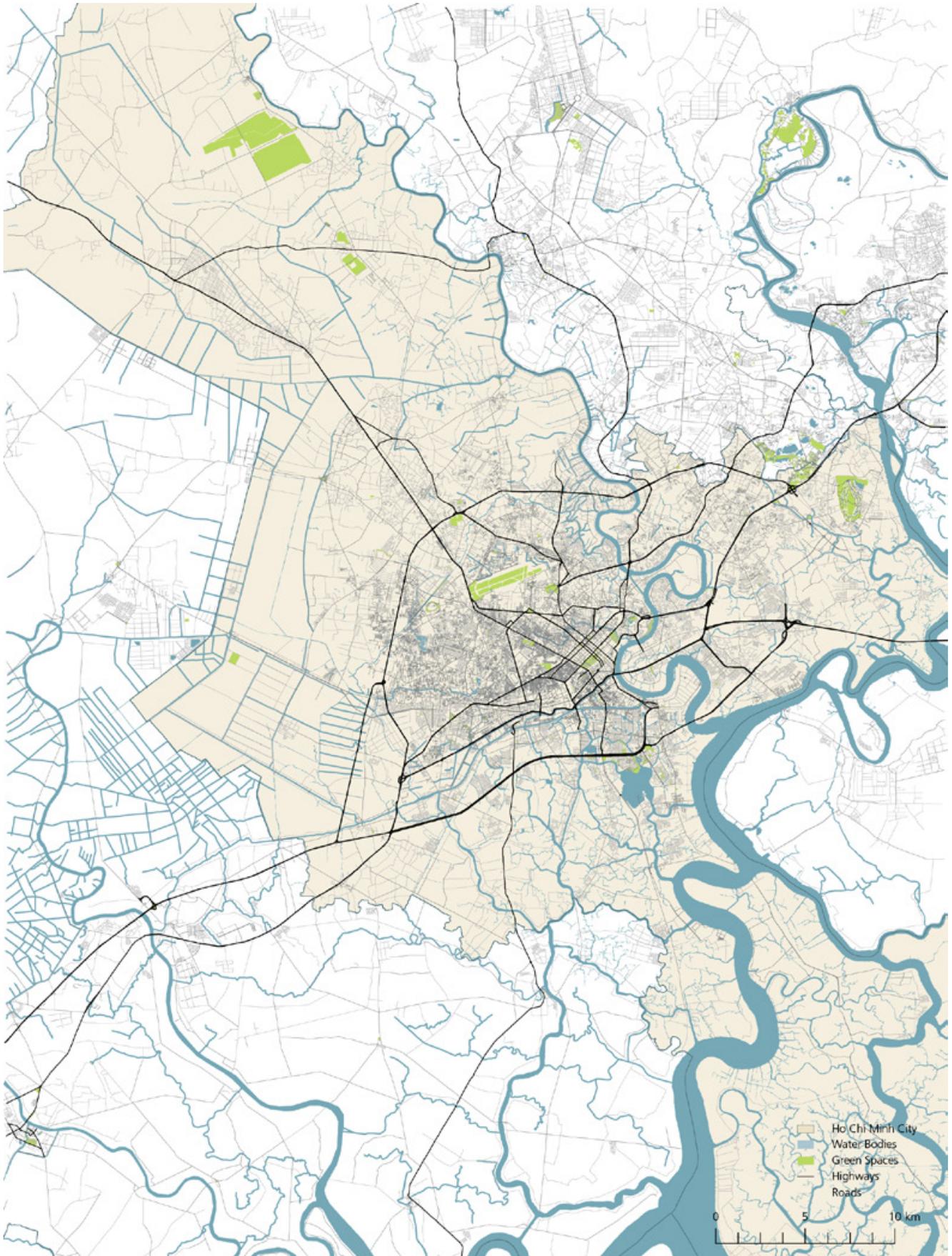


Fig. 6. HCMC's main roads, waterbodies and green spaces

**EXISTING CONDITION OF THE MOBILITY SYSTEM**

Ho Chi Minh City is challenged by its limited supply of public transport services. The current ridership (Fig. 8) indicates that only 4 per cent of the current population relies on buses as the main mode of transport, while the majority of the population (74 per cent) is reliant on motorbikes.<sup>16</sup>

In 2015, there were more than 6.8 million motorcycles and 0.5 million cars.<sup>17</sup> Motorcycles have been considered to be the most dominant mode of transport due to their convenience; they offer door-to-door service with the flexibility of parking anywhere. The climate of Vietnam allows the use of motorcycles throughout the year. Car usage and ownership has also been on the rise; private car ownership had been discouraged recently through heavy import duty fees and registration fees but Vietnam’s economic growth and rise of income has still increased ownership.<sup>18</sup>

The only public transport mode currently available in HCMC is bus; there is 2,603 buses currently running in the city on 141 routes.<sup>19</sup> While bus routes seem to overlap and offer residents with the opportunity to interchange, they only cover central districts of HCMC. (Fig. 10)

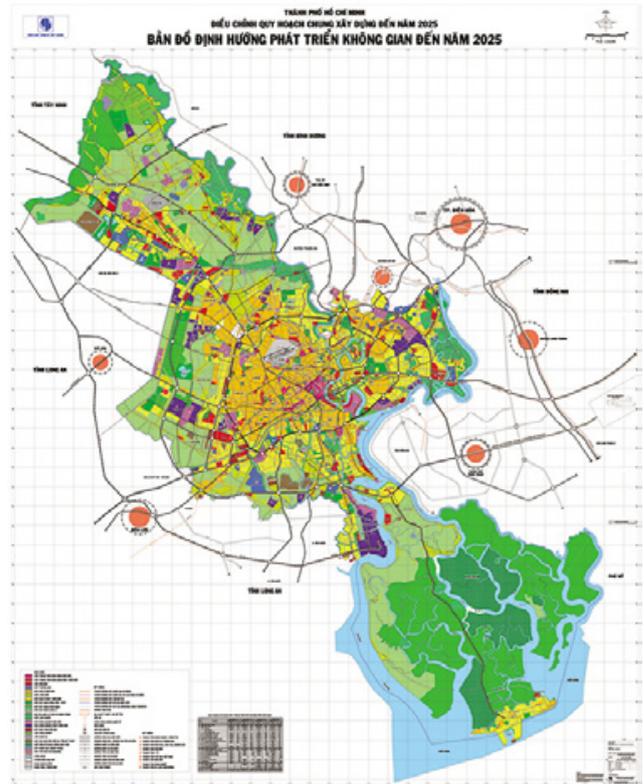


Fig. 7. The Masterplan for 2025 proposes a satellite city strategy to encourage development outside the urban core (Source: HCMC People Committee)

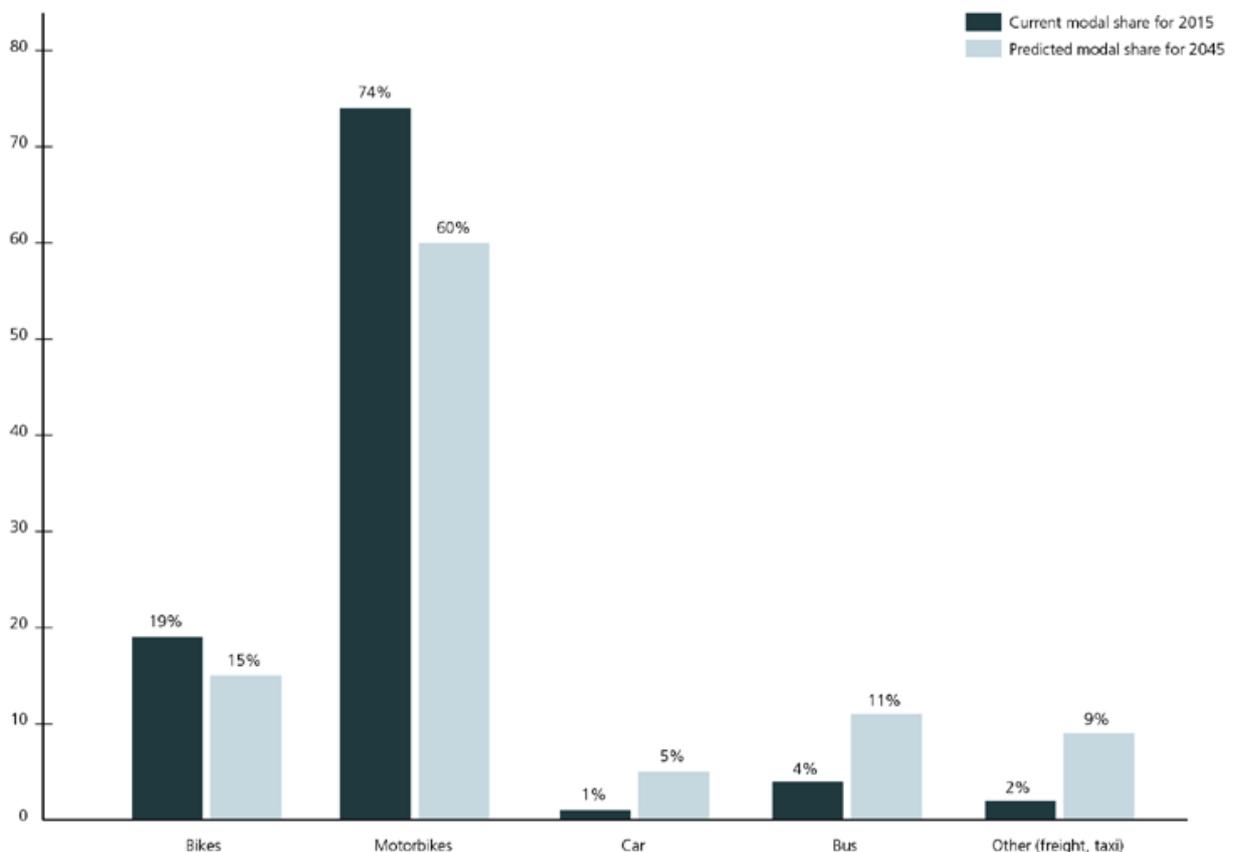


Fig. 8. The current and future modal share indicates a heavy reliance on motorbikes (Source: Arup and Siemens)

According to the Management Centre for Public Transport, there are 1.2 million passengers using bus service every day; 30 per cent are students.<sup>20</sup> In 2017, bus ridership was 306.6 million rides as compared to 2013 (Fig. 11), when bus ridership peaked at 414.3 million rides due to a change in policies and regulations. The current bus system is led by multiple operators, some which have been subsidised by the government. Currently, 103 out of 141 routes have been subsidised due to their operation structure.

Service Components	Dissatisfaction Rate
Waiting time at bus station	62.2%
Information on transport routes and timetables	66.1%
Frequency of service	66.1%
Return the balanced money to customer	71.3%

**PUBLIC TRANSPORTATION CHALLENGES**

As observed, Ho Chi Minh City has grown rapidly spatially in the past 20 years, increasing the distance a citizen would cross on a daily basis and subsequently increasing time spent travelling within the city. Dispersed urban areas in HCMC have inhibited growth factors and, with a lack in a reliable public transport system, residents must rely heavily on private vehicles. Population growth has outpaced infrastructure growth; between the years 2011 and 2017, road space increased by 4.8 per cent, while public transport ridership decreased, and personal vehicle ownership increased at an average of 9.3 per cent.<sup>21</sup>

Fig. 9. HCMC bus users are mainly dissatisfied with the return of the remaining balance



Fig. 10. While the bus routes seem to overlap and allow the opportunities for interchange, they only cover the urban core (Source: Mappery)

## Declining Ridership

Since 2013, bus ridership has been on the decline. (Fig. 11) The declining ridership has been linked to multiple factors, especially service quality deterioration, and has encouraged more residents to rely on private vehicles for transportation. A study found widespread dissatisfaction with the bus system in the city; around 71.3 per cent of bus users were dissatisfied with returning balanced money to customers, while 66.1 per cent were dissatisfied with the frequency of service (Fig.9).<sup>22</sup>

## Spatial Conditions

A spatial condition that has inhibited bus coverage around the city is that 44 per cent of all roads are less than 7m wide, preventing buses from entering them. Often, when bus routes are along these narrow roads they cause congestion within the area and impact upon the punctuality. Bus routes have also been planned in a manner that follows a point-to-point structure, whereby the current public transport system lacks any interchanges. Half of the termination points are currently along main roads, increasing traffic congestion.<sup>23</sup>

Regarding accessibility and visibility, around 30 per cent of the bus stops do not have any stop signs, poles or rest areas.<sup>24</sup> This raises safety concerns to many customers, whereby the customers do not have a place to rest. The lack of shelter also is a concern considering HCMC's wet climate; customers need a shelter to cover themselves from the rain as they are waiting for the next bus. Women view it with particular concern as they will not feel safe, especially during later hours. This also makes it difficult for new riders to navigate their way along the public transport system. Bus users are also concerned about accessing bus stops or stations due to encroachment on pavements by local vendors and parking of motorcycles, reducing space and walkability and forcing residents to walk on roads.<sup>25</sup> The spatial conditions makes it inaccessible for people with disabilities, making the public transport system less inclusive.

## Ticketing System

The current ticketing system is facing many challenges due to the lack of coordination amongst these operators; customers are required to buy a ticket pack for a certain operator, increasing the cost to the customer and forcing him/her to carry multiple packs for multiple routes. The

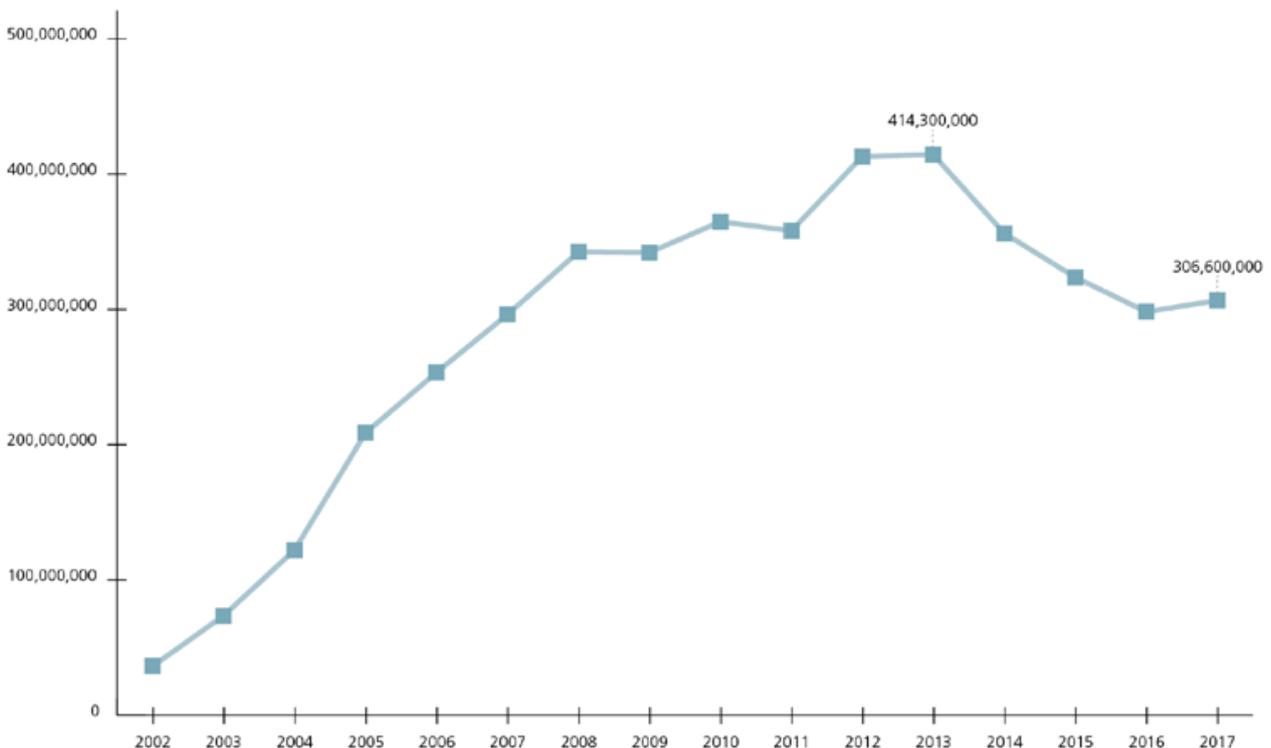


Fig. 11. Bus ridership was encouraged due to policy reforms in 2000s, but was no longer found convenient by residents after 2013

current bus system also operates in a point-to-point structure, where there are no interchange stations that allow customers to switch bus routes. This increases the time and cost of a single journey as customers are forced to buy a new ticket for the next bus.

### Future Plans

In recent years, Ho Chi Minh City has been investing in transportation infrastructure to gradually meet the rising demands of the population. As per the city's 2025 Master Plan, new public transportation routes are being planned to increase public transportation ridership to 20-26 per cent of total ridership.<sup>26</sup> This includes the construction of eight Mass Rapid Transit Lines (MRT), three Tramway/Light Rail Lines (LRT), and a Bus Rapid Transit System (BRT) (Fig.13). The city also aims to limit and terminate the operation of motorbikes and scooters by 2025-2030 within selected areas of the city, along with constructing new ring roads around the urban core.

However, the goals of the Master Plan are ambitious, as with current progress it does not seem possible that the city will achieve all these goals by 2025. Until now, only one MRT line is under construction, with the completion

date already delayed. Line 1 began construction in 2012. However, due to miscalculations in the budget, the line will not be fully operational by 2021.<sup>27</sup> Due to these delays, residents are still using motorcycles as their primary mode of transport, losing their trust in a public transport system that can be reliable.

As mentioned, the spatial Master Plan proposes new satellite cities around Ho Chi Minh City to relieve the pressure on the urban core, and the proposal includes new ring roads around the urban centre of HCMC. This could result in an increased dependence on private vehicles if no efficient public transport system is in place by the set date, and if the satellite cities are well planned as autonomous centres. This could further exacerbate the city's traffic and air pollution issues relating to the use of private vehicles.



Fig. 12. HCMC's roads have become increasingly congested due to increased personal vehicle use (Source: Thanh Nien News)

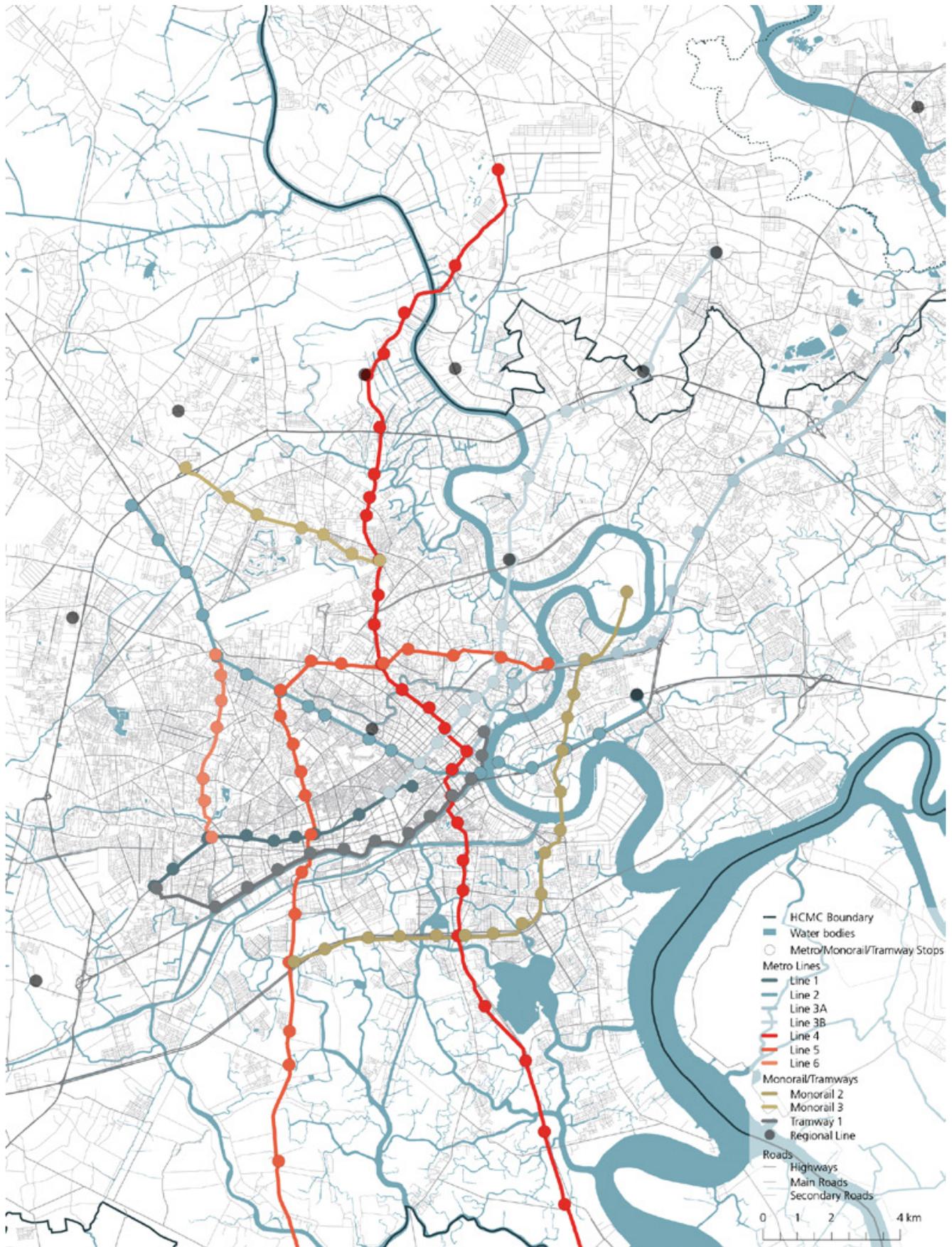


Fig. 13. Future public transport lines in HCMC

**EXISTING CONDITION OF HYDROLOGICAL SYSTEMS**

Ho Chi Minh City experiences flooding regularly. Currently, USD 28.86 billion worth of assets in the city are exposed to flooding.<sup>28</sup> The flooding is caused by multiple factors (Fig. 14), mainly periods of intense rainfall that regularly inundate the city, especially during the rainy season which spans from June to November. In total, about 160 rain events occur throughout the year with an average accumulated rainfall of 2000mm.<sup>29</sup> The wet months bring an average of 250-330mm of rainfall monthly, with a maximum of 683mm.<sup>30</sup>

The city also is subject to flooding from the Saigon River and waterways from the neighbouring Mekong Delta, along with discharge from upstream waterbodies and dams. As HCMC is a coastal city that is subject to semi-diurnal tidal waves from the South China Sea, with amplitude reaching a maximum of 1.5 m.<sup>31</sup> This means that flooding will be further exacerbated by climate change effects; the rising sea level along with tidal pressures can inundate the majority of the city.

HCMC is vulnerable to flooding due to its geographical location; around 40-45 per cent of the land lies less than 1 metre above sea level, while 15-20 per cent is within 1 to 2 metres above sea level. In total, around 54 per cent of HCMC’s area is exposed to regular flooding.<sup>32</sup> The city is also facing subsidence<sup>33</sup> due to groundwater extraction. Figure 15 indicates areas that are regularly flooded.

Land-use planning has also impacted upon the areas currently flooding; weak land-use planning has not prevented any development in low-lying areas. In the absence of any adaption strategies, planned urban development could increase HCMC’s exposure to sea-level by 17 per cent.<sup>34</sup> Figure 16 indicates areas that are at risk of flooding by 2050 without any adaptation strategies or mechanisms in place.

**Impact of Urban Expansion**

The urban expansion of HCMC has caused the loss and degradation of valuable multifunctional natural areas in the urban periphery that are around waterways, channelling the water and retaining it in flooding

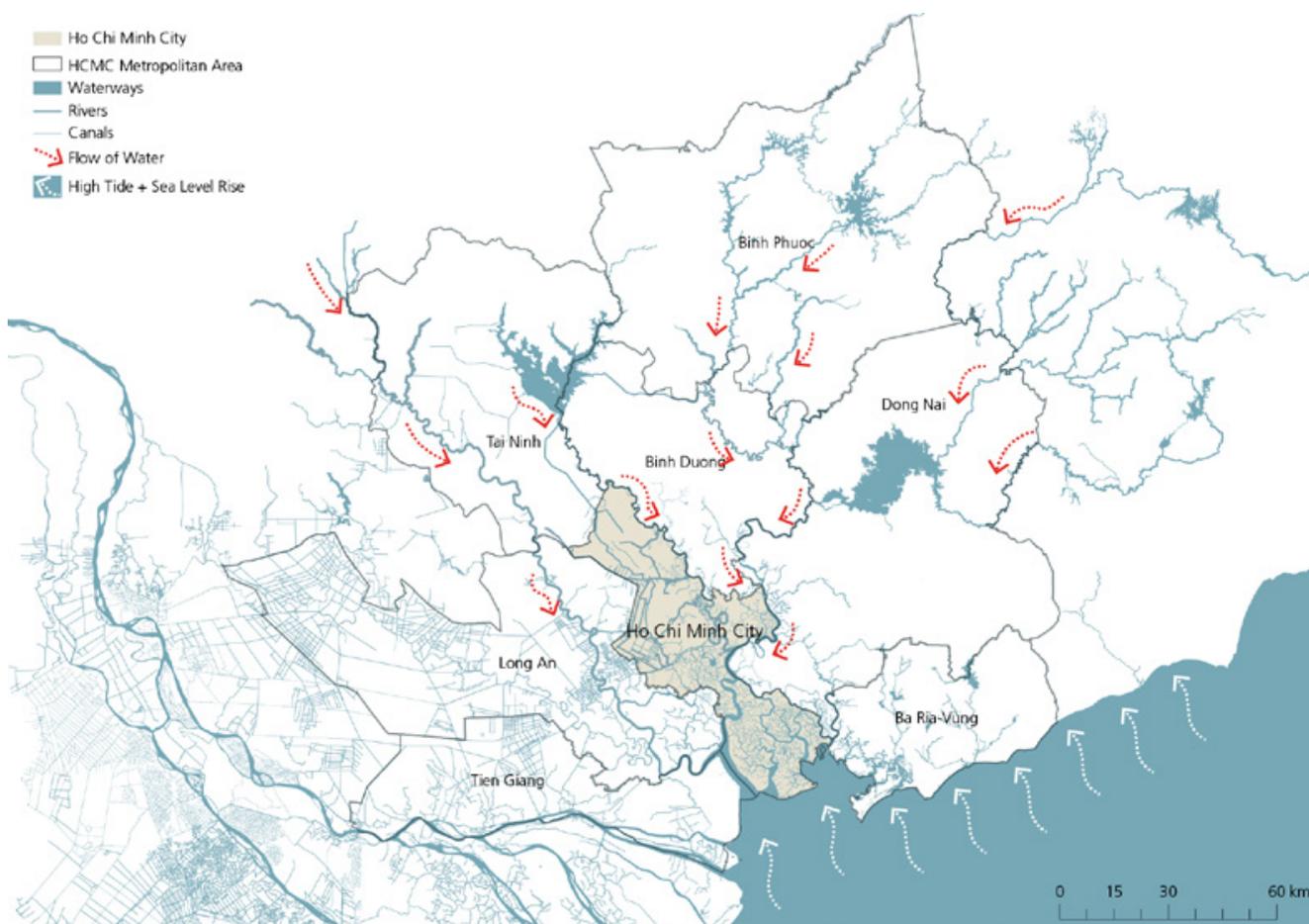


Fig. 14. A regional analysis of HCMC indicates that its geographical location has further exacerbated flooding

scenarios. It has led to the creation of more hardscape features that do not permeate water to replenish groundwater, increasing the rate of runoff water.

Between the years 2000 and 2010, agricultural land decreased by 7 per cent or 12,000 hectares, while rivers and lakes lost 4,000 hectares through a 13 per cent decrease due to encroachment. On the other hand, built-up areas have increased by 43 per cent or 11,500 hectares.<sup>35</sup>

As the city expands, informal settlements have emerged throughout the city, specifically on floodplains or near canals and rivers. These impact the canals and their capacity.<sup>36</sup> Settlers have also used these canals for dumping their waste, obstructing the flow of water and impacting its quality.

### Current State of the Drainage System

The city has a dense network of rivers and canals; there are 2,953 canals with a total length of 4,369 km.<sup>37</sup> These canals were established prior to the reunification of North and South Vietnam in 1975, for a population

of 2 million people. As the current population greatly exceeds that number, there is further pressure on the current system. However, based on an assessment by the Steering Centre for Urban Flood Control (SCFC) indicates that the total capacity of the drainage and sewerage system only covers 30 per cent of the total required for the city.<sup>38</sup>

Many of these canals are currently facing issues relating to their capacity and quality. As the pressure on land increases in HCMC, encroachment has taken place around canals. Built up areas around the canals also have a poor drainage system in place, forcing residents to use the canals for dumping untreated water. Many of the canals have also been used for dumping solid waste by the residents, which has limited their capacity.

There have been multiple projects by international agencies that attempt to increase the capacity of the city's drainage system, including a plan developed by the Japan International Cooperation Agency (JICA) to build 6000km of canals and pipes.<sup>39</sup> The infrastructure capacity was based on projects made on the time of the study, however, over the past decade, the impact of

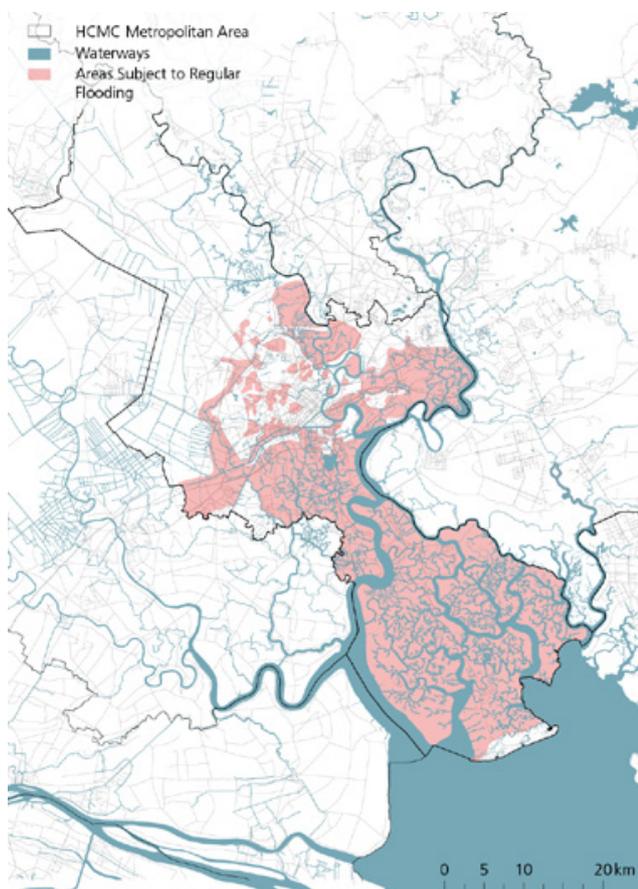


Fig. 15. Areas that are subject to regular flooding

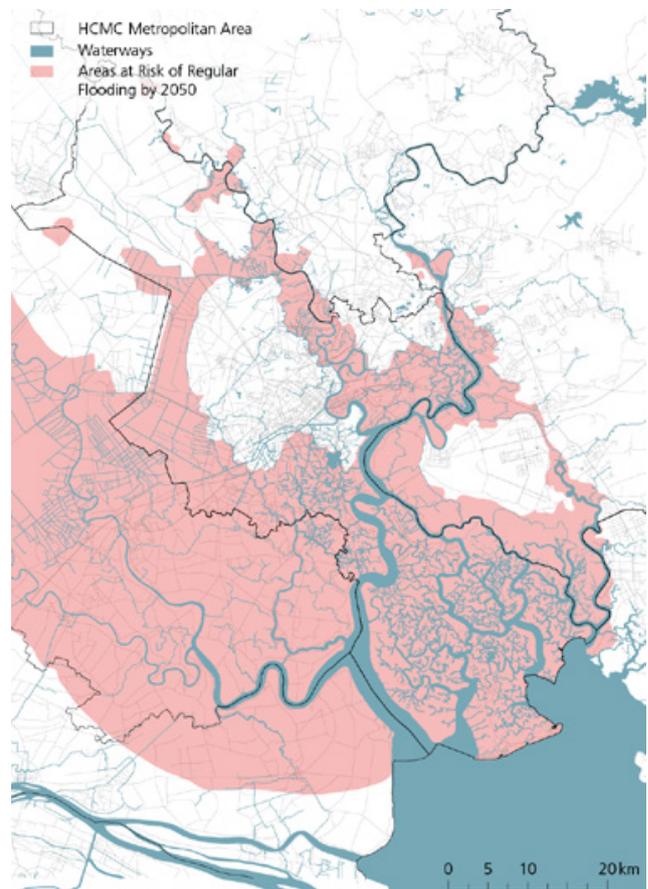


Fig. 16. Areas that will be exposed to flooding regularly by 2050

flooding has been further exacerbated; the frequency of extreme rainfall events with precipitation greater than 100mm has increased by a factor of three.

### Future Plans

On June 19, 2001, the Ho Chi Minh City Drainage Master Plan was approved by the Prime Minister in Decision No. 752/QD/TTg and to be implemented by 2020. This plan included steps to treat the urban water environment in four periods: 2001-2005, 2006-2010, 2011-2015 and 2016-2020, which includes, but is not limited to, the following:<sup>40</sup>

- Dredge and renovate the canals of the inner city
- Build additional tertiary sewers
- Improve the wastewater collection and treatment system
- Reduce flooding areas and limit the emergence of new ones
- Construct of 13 sluice gates to control significant water channels
- Build new dikes along the Saigon river

However, based on discussions with stakeholders, there have been delays in completing the above objectives. This is due to many reasons, including a lack of financial capacity of Ho Chi Minh City People's Committee, and the number of stakeholders involved, making it difficult to collaborate and distribute tasks. Many of these canals have also been manipulated by residents through encroachment, making it challenging for the city to evict illegal settlers.

### Data Availability

In general, the water drainage system in Ho Chi Minh City faces many issues relating to its reliability; this stems from the fact that much of the data used is outdated, missing or inaccurate. Even though SCFC does have the majority of this data, it is shallow and cannot be used for further analysis. The most recent projects feature further attributes including width, altitude, capacity and location, while the older datasets only contain information on the drain's name in a statistics table.



Fig. 17. Flooding also impacts the city's roads and transport networks (Source: Mrs Ngo Yen Nhi)

There are 15,422 drains in the whole city with a length of 4,176km, in which 65 per cent of the total is managed by SCFC while the rest are managed at district level.<sup>41</sup> The drains were established at multiple times, starting from the French colonial era to the current post-independence era. The database of these drains is currently incomplete; much of this data was lost or is inaccurate. This issue is further exacerbated by the lack of any mechanisms for coordinating and sharing information across city departments or related agencies. The parameters set previously for planning and expanding canal systems were to reach a capacity of 95.91mm – indicating the maximum possible rainfall in three hours. However, more recent rainfall events reached a total rainfall of 100-122 mm within 60 minutes, indicating that the current design parameters are out of date.<sup>42</sup> Providing an updated inventory on the drains can support in modifying the guidelines on building new drains and thus establishing a robust flood protection system.



Fig. 18. Encroachment has led to the deterioration of the canals, reducing the canal's capacity due to increased littering (Source: Anthony V., Flickr)

## Financial Analysis

### LOCAL FISCAL CAPACITY

Ho Chi Minh City is the largest economic hub in Vietnam. It has gained fiscal and policy autonomy over the past two decades and has therefore large capacity in raising revenues. The total revenue collected by the region from HCMC in 2016 was 345,017 billion dong, or USD 14.8 billion. However, most of these revenues need to be submitted to the central government.

Due to the current legal structure of People’s Committee, the HCMC has to submit most of its revenue to the central government, which is then distributed to the rest of the country according to the population distribution. While this fiscal system is successful in equalising public spending per capita for health and education country-wide, it does not take into consideration the degree of rapid urbanisation witnessed in urban areas such as HCM and their dire need to invest in infrastructure.<sup>43</sup>

The municipal capacity of the city can be therefore rather quantified through its expenditure. The expenditure of the city is of 80.064 billion dong or USD 3.4 billion, which makes a municipal expenditure of USD 400 per capita. This is relatively high compared to, for example, Bangkok’s municipal spending and revenue which stands at roughly USD 272 per capita.<sup>44</sup> However, it is important to note that municipal expenditure heavily depends on approvals from the central government, thereby limiting HCMC’s autonomy.

Revenues came mostly from business enterprises and individuals, which constitute 36.6 per cent. (Fig. 19) A small proportion of budget comes from land value, indicating lack of utilization of land-value capture in the city. There are reports of a new tax is under-consideration which would levy 0.4 per cent annually of property value. But this tax is expected to be levied by the central government.<sup>45</sup>

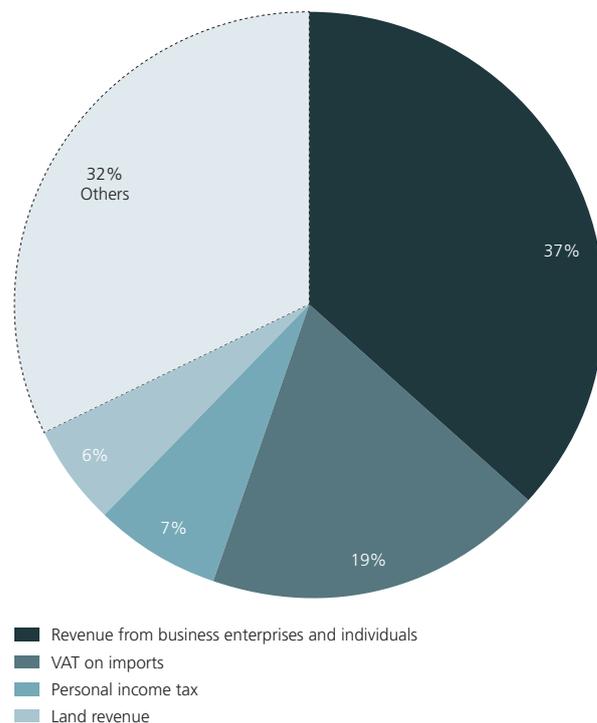


Fig. 19. State budget revenue from HCMC

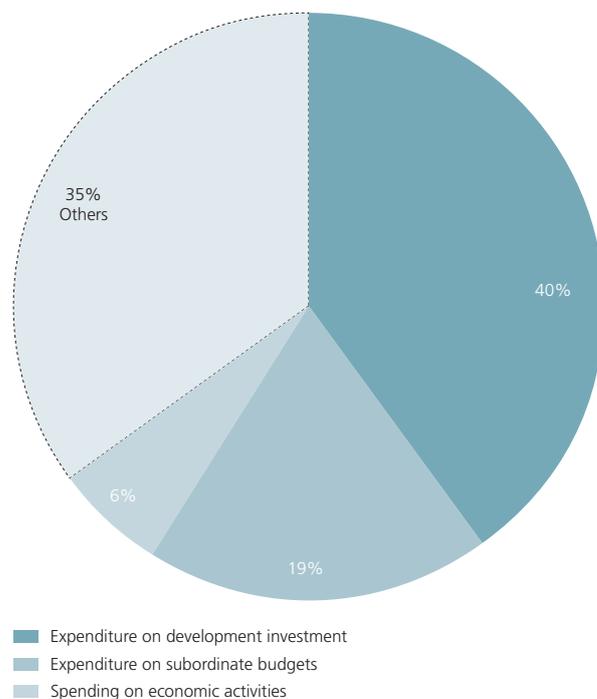


Fig. 20. Structure of local budget expenditure

As Fig. 20 shows, a significant proportion of the budget is allocated for investment purposes, which represents almost 40 per cent of total expenditure. This means a large capacity for capital expenditures. With regards to investments in environmental protection, the expenditure is low, accounting for 3.5 per cent of the total. Considering the impact of flooding on HCMC, it is crucial that HCMC considers further investment in flood protection. Figure 20 does not indicate that flood protection is considered as environmental protection, making it difficult to conclude the expenditure.

However, regarding transport there is a large investment gap in the city. While the transportation plan adopted in 2007 would require capital investments of USD 43 billion between 2007 and 2012, the total investment in transport in reality accounted for only USD 2.1 billion. This is illustrated in Fig. 21 below.

### RESTRICTIONS ON CAPITAL INVESTMENT

It is important to note that due to the involvement of national government in HCMC-PC's annual budget, national buy-in will be required for any future funding. National policies restrict the scale of projects that Ho Chi Minh City's People's Committee can finance from the budget. HCMC-PC is allowed to finance projects that are 'B' and 'C' scale projects, or projects that cost below USD 3 million but 'A' scale projects that cost more than USD 3 million must be approved by the Prime Minister<sup>46</sup>

HCMC-PC may be able to request upfront financing from the central government through a transfer to the city government. This can be justified in the case of both interventions due to the nature of the projects which could have potential gains at a regional level. In cases where there are wider gains, the city can request further funding from the central government.

Other sources may include grants from development partners. Aside from the UK FCO, the Japanese International Cooperation Agency (JICA), the World Bank and the Asian Development Bank are all major funders for projects in HCMC already.

HCMC-PC also has restrictions on local and international borrowing; it can borrow from both local and international markets but with restrictions set by the central government. The Government's Public Debt Management Strategy (2012) enacted a borrowing limit equal to 100 per cent of the annual capital budget for the city.<sup>47</sup> Borrowing can take place for capital investments but not for any recurrent expenditure.

It is important to note that there are special challenges regarding the involvement of international funding for the transport sector. The funding received from international donor agencies such as JICA and the World Bank is currently not enough to sustain the new developments, due to overspending that has been done on MRT Line 1.

Capital Investment required for urban transportation projects in masterplan vs. actual investment (in \$ billions)

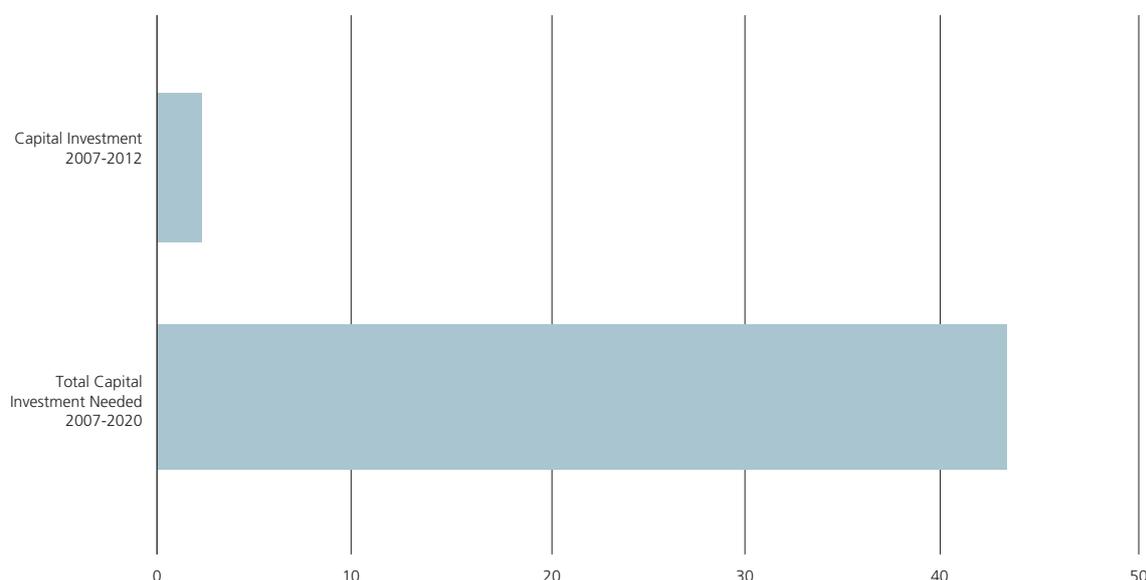


Fig. 21. Investment gap in transport

### SMART TICKETING SYSTEM OF TRANSPORT NETWORK

In the case of the smart ticketing system there is scope to bring in the private sector to finance the building, operation and maintenance of the intervention. The People's Committee recently introduced new decrees that encourage and provide the enabling legal framework to implement public private partnership (PPP).

The expertise of the private sector in this type of technology would allow systems to be appropriated for the Vietnamese context and ensure efficiency gains. However, the city lacks any precedent that could assess systems to provide viability and success. Moreover, given that the overall funding stream from user fees seems low,<sup>48</sup> this will be difficult to use to attract private sector financing, who will only want to invest if they can recoup a return. On the other hand, the city needs to ensure that the system and technologies that are recommended are affordable and contributing to the overall aim of the project to enhance accessibility for all.

In any case the fare system will need to have a dedicated funding stream both to repay capital investment as well as ensuring operation and maintenance. Ticketing directly from the bus system could be an option. However, the current low ridership revenues from the fare system cover only 60 per cent of the operational costs. If ridership is not significantly increased the city would need to find additional funding streams from other revenue sources.

### DEVELOPMENT OF GIS SYSTEM FOR UNDERGROUND DRAINAGE

There is an opportunity to link land value capture instruments with the mapping of the drainage system, in order to increase revenues that can be reinvested in paying back capital investments and funding the maintenance of the GIS drainage system. This can only be an option if the resultant maps of the intervention are used to undertake projects that will have an effect in land values. As explained before, there is a lack of land-value capture in the city. A new tax is under consideration but it is uncertain how independent would be the city of HCM to raise these revenues.

## Legal Analysis

### TRANSPORT GOVERNANCE STRUCTURE

The Ho Chi Minh City's People's Committee (HCMC-PC) is the principal administrative organ in charge of implementing urban policy in the city and overseeing the management of the city. As such, HCMC-PC is responsible for managing transportation through the following departments (Fig. 22):

- Department of Transport (DoT): the city authority responsible for public transport management and investments
- Management Authority for Urban Railways (MAUR): set up by HCMC-PC through Decision No.119/2007/QĐ-UBND to be the implementing and managing agency for urban railway projects, including metro lines
- Management Centre for Public Transport (MCPT) sits within DoT and controls the city's public bus system

Currently, buses within Ho Chi Minh City are operated by 22 different operators. The state-owned enterprise (Saigon Bus Company)—which is the largest provider in HCMC—joint venture (Saigon Star) private company (Citranco) and ten cooperatives are all subsidised by the government. PTMOC also houses other operators that are not subsidised, including eight which are responsible for student pickups. All bus operators are currently operating their buses from PTMOC and are not required to pay any fees for using the space.

Although all bus operators operate their buses from the same location, there is a lack of collaboration or cooperation between them. Each bus operator follows its own standards and regulations, manages its own bus fleet and has an established ticketing system; tickets are purchased per route and without an integrated ticketing system for all routes. This lack of collaboration has made it difficult to assess the efficiency of the bus system and has resulted in higher dissatisfaction rates among bus users.

Moreover, there are currently no policies to encourage bus operators to share data with each other. Without the presence of any privacy laws, the city has to ensure that the private sector or other third parties cannot monetise the data. This will also allow the city to consider further funding options by analysing appropriate data.

### FLOODING RESILIENCE GOVERNANCE STRUCTURE

In 2008, the Ho Chi Minh City's People's Committee established a Steering Centre for Urban Flood Control (SCFC) to implement the national strategy that was drafted by the Ministry of Agriculture and Rural Development and the Central Committee for Flood and Storm Control. Prior to establishing SCFC, urban

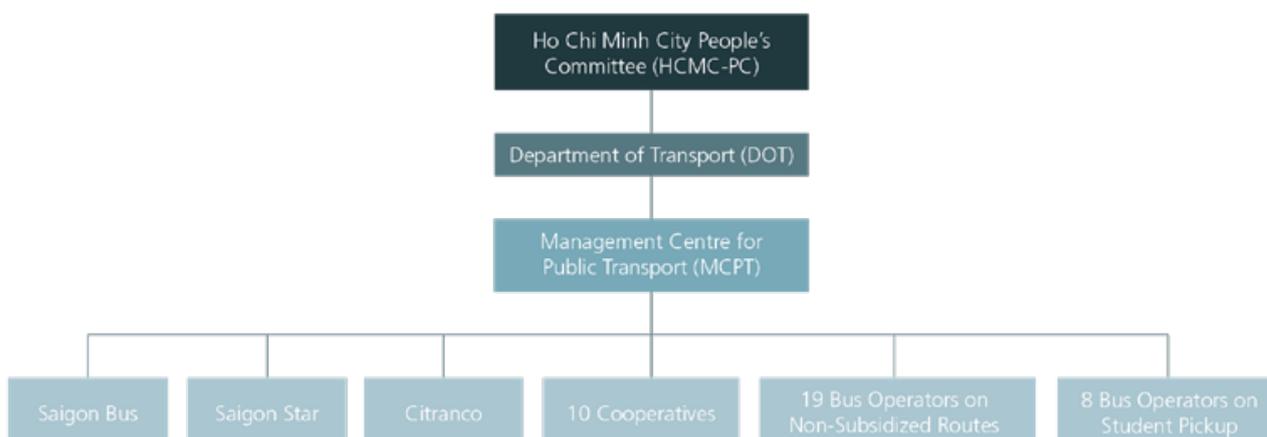


Fig. 22. Organisational structure of HCMC's transport related departments and operators

water management was within the mandate of various ministries including Department of Construction and Department of Agriculture and Rural Development; this fragmentation made it difficult to implement any policies or strategies.

Fig. 23 illustrates the structure of the public administration related to water management in Ho Chi Minh City. SCFC is responsible for planning, development, operation and maintenance of infrastructure for drainage, wastewater treatment and flood control.<sup>49</sup> However, due to the top-down structure of public governance in Vietnam, collaboration has been limited between various departments of the city; there is little integration between urban planning and flood risk management, which has resulted in urban development on flood-prone areas of the city.<sup>50</sup>

However, lack of collaboration in relation to flooding is still present. The planning and implementation functions are spread across several city-level and national-level departments, hindering the planning and implementation of flood risk management interventions in the city. Considering that flooding is an issue at a watershed scale, it is essential that a river-basin approach is undertaken to ensure effective collaboration with upstream reservoir operations.<sup>51</sup>

### INTERVENTIONS' ALIGNMENT TO EXISTING PLANS AND POLICIES

HCMC's Urban Transport Master Plan, adopted in April 2013, aims to provide and improve public transport options available for residents. It aims to reach a collective mobility share of 20-25 per cent by 2025 and 30-36 per cent by 2030, with HCMC-PC in charge of managing this shift. To achieve that, the city has proposed multiple MRT, BRT and LRT routes within the city. However, considering the fiscal and administrative capacity of the city, it will be difficult to achieve these goals. This has been proven through the implementation of the Metro system, where delays took place due to cost overruns and lack of funding.

The city also adopted a Smart City Master Plan in 2017, which aims to upgrade the system of "monitoring, control and digitising the infrastructure database of transportation sector," by establishing an Integrated Traffic Management Centre and Developing a Traffic Forecast Model for HCMC.<sup>52</sup>

Currently, there are two strategies to tackle flooding. The first, designed by the Japan International Cooperation Agency (JICA), focuses on "urban floods cause by rainfall by improving the efficiency of the city's drainage system for rainfall water."<sup>53</sup> The second, designed by the Ministry of Agriculture and Rural Development, tackles

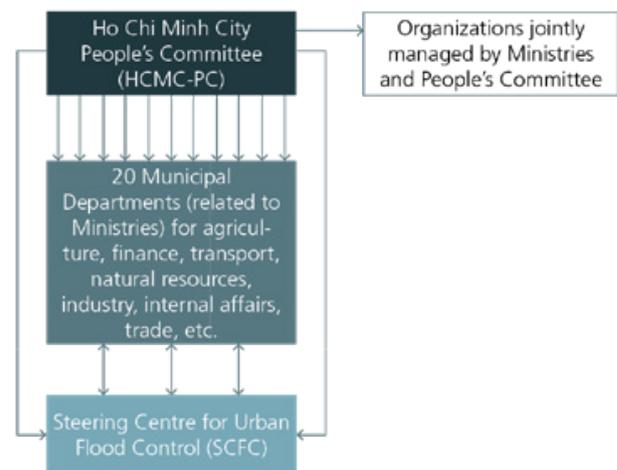


Fig. 23. Organisational structure of HCMC's water management related departments

floods from upstream rivers through a set of structural measures.<sup>54</sup>

In 2014, the Prime Minister issued Decree 103/TB-VPCP on National Climate Change, which indicates priority tasks to address climate change by improving the country's flood protection systems. This includes flood control projects for Ho Chi Minh City, with the Ministry of Natural Resources and Environment as the body responsible for coordinating the related agencies.<sup>55</sup>

### LEGAL FRAMEWORK FOR PUBLIC-PRIVATE PARTNERSHIPS

Recently, the Public Investment Law No. 49/QH13 of 2015, along with Decree No. 15/ND-CP of 2015, specifically targeted public-private partnerships. Both laws attempted to address the country's infrastructure challenges by engaging the private sector and are expected to help overcome the obstacles through public-private partnership (PPP) projects.<sup>56</sup>

The 2015 decree introduced new PPP models such as Build-Own-Operate (BOO), Build-Transfer-Lease (BTL), Build-Lease-Transfer (BLT) and Operate and Manage (O&M). It also expanded on key sectors in which PPP concessions may be granted, including transportation, street lighting, water supply wastewater treatment and any other sectors that are to be decided by the Prime Minister.<sup>57</sup> However, as the law has been recently promulgated, it is difficult to measure its success due to lack of precedent.

# INTERNATIONAL ALIGNMENT AND TECHNICAL RECOMMENDATIONS

## Potential Impact

The potential impact analysis outlines the main benefits that can be potentially achieved through the Global Future Cities Programme in each city. The impact analysis covers three phases: short-, medium- and long-term. Given that impact can arise from the complex interaction of context-specific factors, rather than as result of a single action, an empirical impact assessment is not part of the scope of this report.

Short-term aspects refer to outcomes that can be achieved through the implementation of the technical assistance that is provided through the interventions within the 2-3 year scope of the Global Future Cities Programme. The mid-term outcomes are only achievable once the intervention is executed at the city level, either through capital investments or the legal validation of key policies and plans. This phase is understood to take between 3-7 years. The long-term impact of the interventions is linked to their sustainability in a 7-15 year timeframe and is related to the project cycle phase of operation and maintenance.

### SHORT-TERM OUTCOME

In the short term, the 2-3 years of the Global Future Cities Programme's implementation in Ho Chi Minh City will positively impact the municipal technical and managerial capacity while ensuring citizens' inclusion in decision making processes. One of the main challenges observed in HCMC is the lack of coordination and collaboration between multiple stakeholders and its impact on the multiple Master Plans developed for the city. Both interventions include capacity-building components for that will lead to better governance and integrated planning processes, especially in combating climate change and its adverse impacts on Ho Chi Minh City.

Both interventions directly tackle the lack of capacity witnessed in the transport and water management sectors. The transport intervention will review and assess current fare policies and possible ticketing strategies for Ho Chi Minh City. It will also develop a capacity building plan, along with establishing the core system required to ensure the implementation of the smart ticketing system.

The resilience intervention will assess the existing capacity, define the scope of work and undertake necessary surveys of the drainage network, while engaging technical staff in establishing flood models for the city at multiple scales. The intervention will increase the amount of information available to technical staff. It will also suggest a long-term development strategy for the GIS system that can increase the current capacity in the short term and ensure a longer impact.

One of the financial challenges observed in the city is the involvement of the central government. As such, the transport intervention proposes a financial model and institutional setting that can ease the implementation of the intervention, enabling the city to finance the provision of the smart ticketing system and its future expansion.

### MEDIUM-TERM OUTCOME

In the mid-term timeline of 3-7 years, the city will see better decision making due to increased capacity to prioritise strategies and improved tools. The flood modelling at city-level scale can identify vulnerable areas in the drainage system and, as such, propose areas for expanding the drainage system. This can lead to a more efficient drainage system management, which can be most visible in flooding scenarios. Based on the outcomes of the flood modelling, the Steering Centre for Flood Control can propose future solutions to the city, which can lead to better flood management.

The information obtained from the resilience intervention can assist the stakeholders in better planning and managing the impacts of climate change. This can be achieved through the baseline assessments conducted to review and assess the drainage system in order to define the scope and carry out surveys on the drainage network in the city. The impact could reach the city spatially via informing the planning process, especially with regards to retention areas, flood protection mechanisms that could protect vulnerable groups living within high-risk flood areas.

The transport intervention includes an assessment of the current fare policies for the public transport system and proposes new ones based on the study conducted. This can ensure in the medium-term view that the mobility system is inclusive for lower-income men and women and other marginalised groups.

Hence, increased public transport ridership can be expected if the data due being collected by the smart ticketing system can also be used to increase efficiency, quality and reliability of the current public transport system. While the smart ticketing system may currently seem foreign to citizens and residents, a public engagement strategy can inform commuters on the use of the system, which could increase general knowledge and, as such, increase public transport ridership.

### **LONG-TERM POTENTIAL IMPACT**

In the long-term, an increased ability to access employment and services can be expected, especially for low-income communities and marginalised groups. This can be especially visible through integrating the smart ticketing system into the future transport lines, which increases the coverage and use of the system and could increase reliance on public transport.

The resilience intervention can protect vulnerable communities and infrastructure from future flooding events, which can be done by developing and integrating the data into a decision-making process for early warning, mitigate future flooding and manage the water resources of the city. The impact could also reach up to the watershed scale if the legal setting encourages collaboration and coordination amongst different stakeholders.

The city can have improved tools that can enhance evidence-based planning and, as such, lead to a more sustainable, resilient and socially-inclusive city. As the city would have access to data on transport and water management this can be used to monitor progress and inform future transport and land-use plans.

Through increasing the local capacity, it is expected that the city can evaluate and monitor the impact of urban plans, policies and strategies.

As both interventions are heavily reliant on data, the resilience intervention incorporates a data strategy that can allow the integration of drainage GIS data. This can allow for better plans to enhance collaboration and coordination amongst stakeholders, ensuring a sustainable growth of HCMC.

# Contribution to Sustainable Urban Development

## 2030 SUSTAINABLE DEVELOPMENT GOALS

The Global Future Cities Programme aims to contribute the implementation of the 2030 Agenda for Sustainable Development, whilst mobilise efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind.

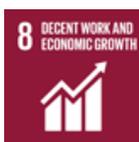
The GFCP interventions in Ho Chi Minh City can broadly impact on SDG 11 as they contribute to making Ho Chi Minh City more inclusive, sustainable and resilient. As Ho Chi Minh City witnessed rapid urbanisation since the reunification of Vietnam, ensuring that the city's future growth can accommodate the growing population is essential.

### SAFE AND INCLUSIVE PUBLIC TRANSPORT



The transport intervention encourages the use of public transport can lead to a safe and inclusive service by proposing fare policies for the system that are accessible for all (SDGs 3 and 11).

### INCREASED ACCESS TO EMPLOYMENT



Sustained, inclusive and sustainable economic growth can be achieved through the smart ticketing system by increasing accessibility to employment and services, particularly for women and lower-income groups (SDG 8).



### CAPACITY BUILDING

The capacity-building components of both intervention can enhance collaboration and coordination between national and local governments, the international community, civil society and private sector, leading to improved tools for decision making and monitoring performance (SDG 17).



### RELIABLE INFRASTRUCTURE

Both interventions can also increase efficiency, quality and reliability of infrastructure that can lead to higher rates of sustainable and inclusive economic growth, with greater investment and trade flows (SDG 9).



### MITIGATING RISKS

The development of flood models of the city can reduce the number of people affected by water-related disasters, as well as substantially decrease the direct economic losses relative to global gross domestic product (SDGs 11 and 16).



### BETTER PLANNING FOR CLIMATE CHANGE

The flooding intervention can strengthen resilience and adaptive capacity by better planning for and manage the impacts of climate change, especially ensuring the protection of vulnerable communities (SDGs 1 and 13).

## NEW URBAN AGENDA ALIGNMENT

The United Nations Conference on Housing and Sustainable Urban Development (Habitat III) held in Quito, Ecuador, in 2016 adopted the New Urban Agenda, a new framework that lays out how cities should be planned and managed to best promote sustainable urbanisation.

The New Urban Agenda encourages UN-Habitat and others “to generate evidence-based and practical guidance for the implementation and the urban dimension of the SDGs in close collaboration with Member States, local authorities, major groups and other relevant stakeholders, as well as through the mobilization of experts”.

The GFC Programme is directly related with the UN-Habitat’s draft Action Framework for Implementation of the New Urban Agenda (AFINUA). This framework is organised under has five categories: (1) national urban policies, (2) urban legislation, rules and regulations, (3) urban planning and design, (4) urban economy and municipal finance and (5) local implementation.

The interventions in Ho Chi Minh City have a direct relation to the five AFINUA categories, especially to urban legislation, municipal finance and local implementation with emphasis on strengthening partnerships and enhancing coordination.

Both interventions will focus on providing integrated, efficient and equitable urban service framework that can ensure these are delivered to under-serviced and marginalised groups (AFINUA key item 5.4). This can only be possible through horizontal and vertical coordination amongst engaged stakeholders to achieve the biggest impact spatially at a local level.

Recognising the role of local governments in incorporating monitoring and evaluation tools for better impact assessments (AFINUA key item 2.9) is essential for both interventions. The use of data is key to ensure that the desired results are achieved and evidence-based planning is adopted, increasing public transport ridership and the capacity and performance of the drainage system.

Developing an inventory of the drainage system strongly relates to defining the urban land vis-à-vis non-urban land by proposing flood protection mechanisms that requires coordination between multiple stakeholders on local and national governments in order to protect the non-urban land (AFINUA key item 2.1 and 3.2). In the case of HCMC, non-urban land is made up of rivers and canals that require the government’s protection against encroachment and environmental deterioration.

## ALIGNMENT WITH CROSS-CUTTING ISSUES AND THE PROSPERITY FUND

The Global Future Cities Programme seeks to achieve higher rates of sustainable and inclusive growth while increasing long-term investments in sustainable urban projects. Moreover, it will provide greater awareness, capability and confidence while establish regulatory frameworks resulting in higher incentives for partnerships and financial mechanisms.

The four Cross-Cutting Issues of UN-Habitat, as identified in the Strategic Plan 2014-2019, are mainstreamed to ensure that all UN-Habitat work targets those with the most need and promotes socially- and environmentally-sustainable cities.<sup>58</sup> In this regard, the interventions detailed for Ho Chi Minh City are shaped under the mainstreaming of environmental safeguards, youth, gender equality and Human Rights.

The goal of the Smart Ticketing System is to ensure that public transportation ridership is increased through making it more efficient. The capacity-building components will ensure that the bus system is optimised and efficient, while current bus fares are assessed to ensure that the future ticketing system tackles issues of social inclusion by being accessible to all, especially to vulnerable groups such as youth and the elderly. Improving the public transport system can also make it safer, encouraging more women to have access to the bus system and increasing their accessibility to jobs.

Considering the future impacts of climate change on Ho Chi Minh City, the development of a digitalised inventory of the drainage system will allow the city to mitigate these impacts and future flooding scenarios. Furthermore, the use of the inventory can allow the city to develop plans and strategies that incorporate future flooding scenarios. This will not only ensure environmental safeguards are set in place, it will also ensure the protection of vulnerable groups, specifically the urban poor residing by the canals.

Potential Benefit	Short term	Medium Term	Long term	SDG Alignment		New Urban Agenda	Programme Objectives and Cross-cutting issues
				GOALS	TARGETS	AFINUA Key Item	1. Climate change; 2. Gender equality; 3. Human Rights; 4. Youth; 5. Sustainable and inclusive economic growth
Better Governance & Integrated Management of cities due to increased coordination between different levels of government				17	17.14; 17.15	1.4; 1.6; 2.5; 5.5	Climate change; Human Rights; Sustainable and inclusive economic growth
Better planning for and managing the impacts of Climate Change				1, 11, 13, 15	1.5; 11.b; 15.1; 13.2; 13.1	2.1; 2.2; 2.3; 3.2; 3.6; 5.1	Climate Change; Sustainable and inclusive economic growth
Ensuring an inclusive mobility system for lower income men and women, and marginalised groups				9, 11	9.1; 11.2	3.3; 5.3; 5.4	Gender equality; Human Rights; Youth
Sustainable financial models for urban development, enabling the city to finance provision of basic services and local infrastructure				11, 16	11.a; 16.6	4.2; 4.6; 5.3	Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth
Increased capacity to prioritize strategies and improved tools for decision making based on informed economic, environmental and other holistic projections				11, 17	11.a; 17.18	1.1; 3.1	Climate change; Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth
Increased efficiency, quality and reliability of public infrastructure and basic services				9, 12	9.1; 12.2; 12.c	2.3; 4.2; 4.5; 5.4	Climate change; Human Rights; Sustainable and inclusive economic growth
More secure, safe and accessible public transport, particularly for women and the elderly				3, 11	3.6; 11.2	3.3; 5.4	Gender equality; Human Rights; Youth
Increased citizen participation in developing municipal plans and decision making processes				11, 16	11.3; 16.7	3.1; 4.5; 5.6	Gender equality; Human Rights; Youth
Protecting vulnerable communities from flooding events				1, 11, 13	1.5; 11.5; 13.b	5.2; 5.4	Human Rights
Increased ability to access employment and services, particularly for women and lower income groups				8	8.3	3.4; 3.8; 4.4; 4.5	Gender equality; Human Rights; Youth; Sustainable and inclusive economic growth
Integrated plans, frameworks and approaches that promote more sustainable, resilient and socially inclusive cities				1, 11, 13, 16	1.5; 11.3; 11.b; 16.7; 13.2	2.1; 2.2; 2.3; 2.7; 3.2; 4.5; 5.1; 5.2; 5.3; 5.4	Climate change; Gender equality; Human Rights; Youth

Fig. 24. Potential Impact and Programme Objectives Alignment

## Success Factors

The following statements are considered as evidenced success factors, based on international best practices, for the interventions in Ho Chi Minh City, in order to achieve maximum impact, in line with the Goals, the prosperity fund and the cross-cutting issues. Success factors are divided into design and planning, legal and financial and aim to address potential barriers for the long-term sustainability of the interventions.

### SPATIAL CONSIDERATIONS

#### **Knowledge and Human Capacities Must be Developed with a new Data Infrastructure**

Data-based methods are often considered as part of an isolated branch within the transport planning profession. This is particularly the case when it comes to the application of large datasets that cannot be handled by conventional software. The fundamental problems of transport planning have not changed with the advance of big data; the problems remained the same and what new data sources can provide is just an opportunity to improve the effectiveness of planning and operations.

Considering the complexities of transport planning in Ho Chi Minh City, it is crucial to develop human capacities and quantitative skills in the planning profession in parallel with investments in data technology. This ensures that the information encapsulated in expensive datasets can be turned into actual benefits for the users and the operators.

#### **Performance Measurements and Benchmarking to Ensure Optimal Service Quality**

As witnessed in the multiple workshops held in Ho Chi Minh City, the quality of urban transport services is in the focal point of local political debates as it affects the everyday life of almost all members of urban

communities. The measurement and benchmarking of the efficiency of service provision is, therefore, crucial to achieve an efficient allocation of resources available for development.

New trends in transport benchmarking emphasize the importance of customer-focused performance metrics. For example, the evaluation of service quality through the actual experience of travelers. In Ho Chi Minh City, increased ridership can be an indicator of a better service quality. Transport data applications can enable the recovery of passenger experience in large quantities.

#### **A Smart Ticketing System Alone will not Increase Public Transport Ridership**

As seen in Ho Chi Minh City, the current public transport ridership is only 4 per cent of the total mode share. A deeper understanding is required to understand why many residents prefer to use personal vehicles. While the intervention can increase the efficiency and accessibility of public transport, other solutions could be derived from the outputs considered within the transport intervention.

A more holistic approach to integrated transport planning can solve issues of traffic congestion and air pollution relating to increased private vehicle use in Ho Chi Minh City. This can engage land-use planning into forecasting future population growth, where people will be living and working to inform future transport plans. It can also lead to the development of transit-oriented development corridors around transport nodes, taking into account housing and employment opportunities.

#### **A Better Drainage System will not Solve the Flooding Problem**

While the intervention currently tackles developing the drainage sector, it is crucial that flood management is considered in a holistic approach, integrating it into planning. It is also important that the intervention is taken into consideration as a first step in mitigating the impact of climate change; with this digitalised inventory as a base, the model can be used to inform the city spatially at multiple scales and suggest future solutions that can work as a network of solutions.

At a smaller scale, it can be used to inform the current capacity of the drainage system and the maintenance required. As many of the canals have been heavily impacted by littering and sedimentation, the intervention could influence solid waste management in the city.

The inventory can inform the geographic location of future developments. It can also inform building regulations to promote flood-resistant building design to ensure that neighbourhoods are more resilient to flooding and climate change. By understanding the system's capacity, new approaches can be considered to increase the capacity in cases of extreme flooding, which includes retaining green areas to act as retention ponds.

## FINANCIAL CONSIDERATIONS

### National buy-in Requirements

As mentioned in the financial analysis, national buy-in will be required for any future funding beyond the scope of the Programme due to the cost of the project being above USD 3 million. For developing a smart-ticketing system, the current project costs will require the involvement of national government; upfront financing may be provided from the central government through a transfer to the city government in the case where the ticketing system is considered as a regional good, or the area of operations of the buses where the ticketing system is considered as an issue wider than the city itself.

The same can be considered for the development of the drainage inventory; understanding the underground system for drainage is more of a regional good. Given that flood prevention infrastructure can have benefits beyond municipal boundaries, it is considered a good with spillover effects.

### The advantage of using data to secure funding

As both interventions rely heavily on data and data analytics, better data analysis capacities can result in higher revenue streams due to the fact that efficiency improvements can be made in the system. In the case of transport, improvements in the origin-destination matrices will allow decisions to be made to run the system more efficiently which can improve revenue. In the case of resilience, optimisation in the drainage capacity can ensure that flooding can be mitigated, reducing the impact on people's lives and damage to built infrastructure.

### A Data-based Funding Stream will Have to be set up Carefully Considering Privacy

In the case of data, drawing on the private sector to support operation may be beneficial as they can have greater capacities to manage and analyse the data

coming from the system. However, the city will need to ensure that the private sector company cannot create a monopoly using the access of data they get from the system, and that privacy laws are set in place to ensure that the private sector does not monetise the data to the detriment of the city or the citizens.

## LEGAL CONSIDERATIONS

### There is use in Reusing Transport Data for Multiple Planning and Operational Purposes

Using transport data efficiently does not necessarily require investments in data collection, as data is constantly generated in various parts of the technological process of travelling. In many cases, the original purpose of a smart card system in public transport was to improve customer experience but as a side product, operators can extract useful information from the digital footprint of e-ticket use

Data owners should have the ability to find all areas within transport planning and operational processes where new data sources can be reused successfully. In the case of Ho Chi Minh City, the legal setting of the Management Centre for Public Transport provides an opportunity to engage operators in sharing data to make public transport more efficient.

### Integrated Approaches are Required to Increase Cities' Resilience to Shock and Stressors

Urban floods are only in part due to extraordinary or rare natural events. They are also outcomes of systematic governance failures that could be addressed by improved public policies and accompanying management systems.

Some deeper governance issues hampering improved urban flood management requiring immediate work could include administrative discretion, where senior officials do not always have complete powers to hire staff or modify the organisational structure. Citizen engagement in local decision making is often limited which in turn is exacerbated by lack of open data sharing. To undertake the removal of silo working within city governments, the process of designing integrated resilience strategies could provide unique opportunities to start interdepartmental conversations.

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### **Inter-departmental Sharing can Result in More Informed Land-use and Transport Planning**

Most countries' data systems are limited in ability to provide granular, sub-regional or even sub-country level natural hazard information. Besides boosting technical capacities in remote sensing, inter-departmental data sharing should be incentivised, which can result in more informed land-use and transport planning. This is especially critical for Ho Chi Minh City considering the impact of flooding on land-use and transport planning. The increased coordination and collaboration can result in better zoning and land-use policies that can further mitigate the impact of flooding on the city.

Early warning systems in Ho Chi Minh City still do not exist, causing unavoidable losses. Necessary institutional coordination mechanisms, covering the local, national and international levels must be established to overcome barriers, which are often political rather than technical. Cities then must be given the necessary permissions, incentives and capabilities to undertake open data sharing, which would support evidence-based disaster management approaches.

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